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TAXONOMIC AND BIOLOGICAL STUDIES OF PTEROPHORIDAE OF JAPAN (Lepidoptera)[1]

By Kôji Yano

ENTOMOLOGICAL LABORATORY, FACULTY OF AGRICULTURE,
KYUSHU UNIVERSITY, FUKUOKA, JAPAN

Abstract: The present paper treats 57 species belonging to 18 genera of the Japanese Pterophoridae. Fourteen new species are described, 4 species are recorded for the first time from Japan and 3 new synonyms are proposed. The larvae and pupae of 20 species belonging to 13 and 12 genera respectively are described as well as the biological notes of them. Eleven species are injurious to the useful plants. Forty-two host plants including those after the previous records are listed. Keys to subfamilies, genera and species for adults are given. Preliminary keys to subfamilies for both the larvae and pupae, those to genera of 2 subfamilies for larvae and to genera of 1 subfamily for pupae are also given.

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1. Contribution Ser. 2, No. 163, Entomological Laboratory, Kyushu University.

INTRODUCTION

Since the publications of Dr. S. Matsumura's great work entitled "6000 Illustrated Insects of Japan-Empire", in which 24 species including 21 new species of the family Pterophoridae from Japan, Korea and Formosa were illustrated, and the excellent papers written by Mr. H. Hori between 1931 and 1936, rather little advance on the taxonomic and biological studies on the family has been made in Japan.

In the present paper, I treat 57 species belonging to 18 genera of the present family from Japan. Fourteen species are originally described and 4 species are recorded for the first time from Japan. The redescriptions of some well-known species are excluded, but both male and female genitalia are described as far as possible.

On the early stages and biology of this family in Japan, 5 species have been reported and the host plants of only 11 other species have been listed till now. In the present paper, the larvae and pupae of 20 species belonging to 13 and 12 genera respectively are described in detail, and the biological observations are mentioned. The nomenclature and terminology used for the setae and facial parts of the head of the larva, except for the labrum, are those of Hinton (1946, 1947) respectively. On the setae of the labrum, the nomenclature of Heinrich (1916) is adopted.

In treating the species and other higher taxonomic categories, the characters of both adults and early stages are taken into consideration.

The region covered in the present paper is composed of Japan (Hokkaido, Honshu, Shikoku, Kyushu, Tsushima and her adjacent islets) and the Ryukyu Islands (Amami Is., Okinawa Is. and Sakishima Is.).

The following sources of materials are investigated for the present study: the collection of the Entomological Laboratory of Kyushu University, in which the types of the species described by Mr. H. Hori are included; the collection of the Entomological Institute of Hokkaido University, in which all the types of the species described by Dr. S. Matsumura are deposited; and my collection which includes specimens offered by many persons.

Unless otherwise stated, the type specimens of originally described species in this paper except for some paratypes, are preserved in the collection of the Entomological Laboratory, Kyushu University.

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HISTORICAL REVIEW

The first recorded species among the family Pterophoridae from Japan is *Pselnophorus vilis* (Butler) which was described in 1881 under the name *Aciptilus vilis* by the specimen collected at "Tokei" by Fenton. Nawa (1898) recorded the species infesting *Dolichos lablab* L. without giving its scientific name, but it may be *Sphenarches anisodactylus*. This report seems to be the first Japanese literature dealing with the species of this family. Matsumura (1905) listed 3 species from Japan: *Stenoptilia pinarodactyla*, *Platyptilia isodactyla* and *Alucita* (*Aciptilia*) *vilis*. Meyrick (1908) described a new species, *Platyptilia cretalis*, from Japan. Fletcher (1910) wrote a paper on *Deuterocopus*, in which he described *D. albipunctatus* from Japan. Sasaki (1913) described a new species, *Stenoptilia vitis*, infesting the grape. A short series of the enlightening papers written by Nohira appeared from 1916 to 1919. He (1916) listed 19 species from Japan, Saghalien and Formosa. In the next year, he treated the family and genera in outline and gave a key to genera, which followed Meyrick (1910). He (1919) also described a new species, *Agdistis takamukui*, from Kyushu. Takahashi (1921) reported the infestation of *Platyptilia ignifera* to the viticulture of Honshu under the name *Ennem* sp. It seems to be the first record of this species from Japan. Marumo (1923) described a new species *Pselnophorus japonicus* from Tanega-shima.

From 1931 to 1936 many important papers on the Japanese Pterophoridae have been published in succession. Matsumura (1931) illustrated 24 species including 21 new species from Japan and her adjacent countries as already mentioned in the introduction. A series of papers written by Hori appeared in these periods. These papers contributed much to the knowledge of the Japanese Pterophoridae. Hori (1931, 1933b, 1936a) redescribed or recorded 6 genera and 11 species, and described 2 new genera, *Xenopterophora* and *Pseudoxyroptila*, and 2 new species, *Xenopterophora mikado* and *Trichoptilus esakii*, from Japan, Korea and Formosa. In these papers, he gave the illustrations of the adults, venations and male genitalia of most species of the treated ones. Hori (1932) illustrated 11 species from Japan and Formosa in "Iconographia Insectorum Japonicorum." Hori (1933a) reported the species infesting the grape and its allied plants in Japan, viz. *Platyptilia ignifera*, *Nippoptilia vitis* and *Deuterocopus albipunctatus*, and described a new species, *Nippoptilia minor* in this paper. Hori (1934b, 1936c) observed the life histories of *Platyptilia gonodactyla* and *P. emarginata*. He (1934a) also wrote a paper on the synonymies of 6 species. He (1950) again illustrated 10 species from Japan in the revised edition of "Iconographia Insectorum Japonicorum."

Inoue (1955) listed 30 species including 2 newly recorded species from Japan. In 1957 and 1959, 2 books illustrated in colour were published in Japan. In the former one, Esaki

treated 16 species including 1 newly recorded species from Japan, while in the latter one Inoue treated 19 species including 2 newly recorded species from Japan. Yano (1960, 1961a, 1961b) described a new genus, *Tomotilus*, and 4 new species, *Platyptilia sinuosa*, *P. scutata*, *Tomotilus saitoi* and *Oidaematophorus nigridactylus*, and recorded *Platyptilia rhododactyla* from Japan. He (1961c) also wrote a paper on 3 species including a new species of *Nippoptilia* from Japan, viz. *N. vitis*, *N. issikii* and *N. minor*.

SYSTEMATICS

Characters of the family

Adult: Head with frons smooth, rarely slightly projecting forwards or forming a conspicuous conical tuft and with or without a small scale tuft just below base of each antenna. Ocellus obsolete. Antenna filiform, scaled above and ciliated beneath, ciliation often very minute; usually there is no distinct difference between both sexes. Labial palpus slender or stout. Maxillary palpus obsolete. Proboscis developed. Occipital fringe variable, viz. simple without furcation, bifurcated, trifurcated or rarely polyfurcated or simple hair-like as shown in figs. 1 and 2. Leg usually long, slender; inner spur of mid tibia longer than

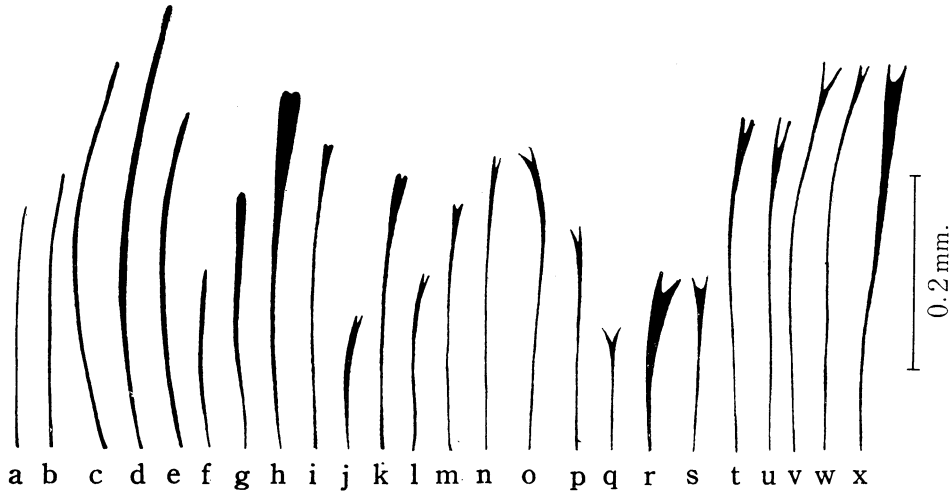

Fig. 1. Occipital fringes of various species.

outer, in some species both spurs equal; hind tibia with 2 pairs of spurs, medial and terminal pairs; inner spurs of both pairs longer than outer respectively, rarely equal or shorter. Forewing usually bifid, rarely trifid or not cleft into lobes; quadrifid species not found from Japan; cilia mixed with dark or pale scales or without them. Vein R_1 often absent; R_2 and R_3 usually separate, rarely connate or very rarely R_2 from R_4; R_3 and R_4 usually stalked, rarely connate or very rarely separate; M_1 and M_2 weak and very short except for the subfamily Agdistinae; M_3 and Cu_{1a} connate or stalked or rarely separate; 1A simple or rarely furcate. Hindwing trifid, or rarely not cleft into lobes; frenulum in ♀ simple or double; under surface with rows of spine-like scales on lower margin of cell, on veins Cu_{1b} and M_3 or Cu_{1a}, these scales (in the present paper, these scales are called as specia-

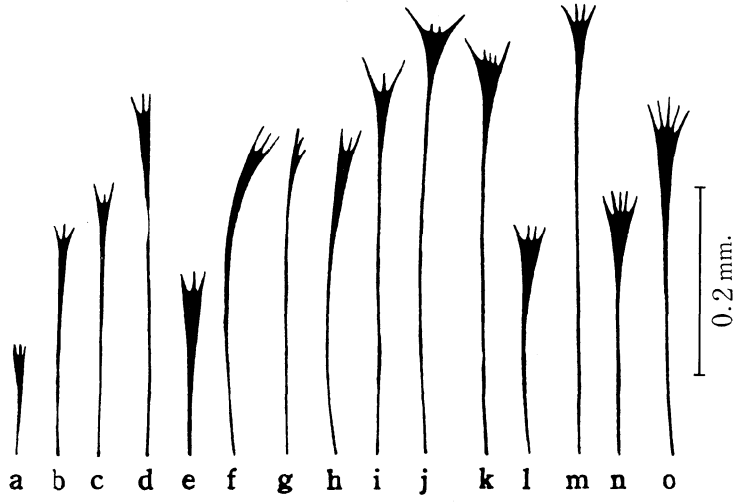

Fig. 2. Occipital fringes of various species.

lized scales on under surface) brown, dark brown or yellowish white and various in shape as shown in fig. 4i, usually scales on I and II slightly longer and broader than those on III; cilia of lobe 3, especially along inner margin, mixed with dark brown scales which provides a useful generic and specific characters, rarely without them. Veins M_1 and M_2 weak and very short except for the subfamily Agdistinae; M_3 rarely absent; Cu_{1a} rarely absent; Cu_2 well developed or weak and short; 1A simple or rarely furcate. Abdomen usually long and slender.

Male genitalia: Uncus usually represented as a pointed organ; tegumen developed, usually large; valva symmetrical or asymmetrical, in the latter case as seen in the subfamily Pterophorinae left valva usually larger than right; both valvae simple or provided with processi; in Pterophorinae, most species with a long concavity on outer surface of valva, this concavity containing a bundle of hair-like scales; juxta small or developed, rarely asymmetrical; aedeagus simple or conspicuously bent and sometimes with a basal process; an arched arm connects aedeagus with juxta in some species.

Female genitalia: Apophyses posteriores well developed; apophyses anteriores absent in about 2/3 of examined species, present in 1/3; ostium bursae situated mid-ventrally caudad of abdominal segment 7, rarely well beyond caudal end of that segment, rarely situated on right side in Platyptiliinae and usually on left side in Pterophorinae; sterigma often developed in Platyptiliinae; antrum of ostium bursae variably developed, rarely not differentiated; corpus bursae with or without signa. As the absolute characters for this family, the following points are indicated: rows of specialized scales on under surface of hindwing; trifid hindwing except for Agdistinae; occipital fringe usually furcate.

Mature larva: Body usually cylindrical in the species of Platyptiliinae, while somewhat flat in Pterophorinae; rather small, usually under 15 mm. Head with a vertical triangle usually rather shallow, sometimes deep; frontal suture rarely not extending to ventral mar-

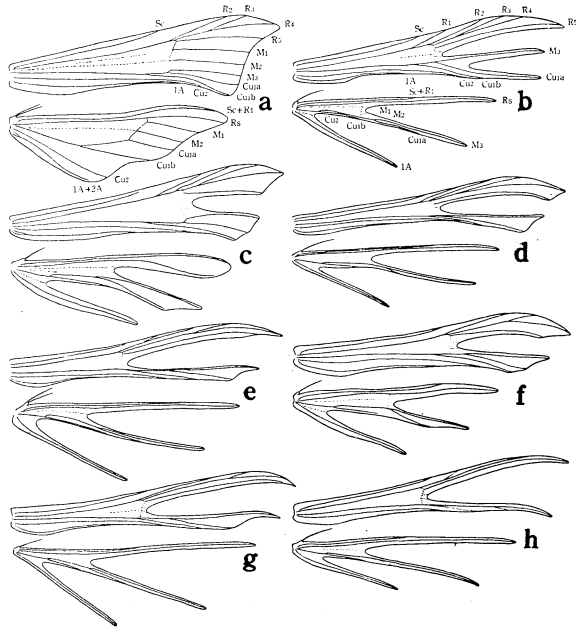

Fig. 3. Venations. a, *Ochyrotica concursa* (Walsingham); b, *Deuterocopus albipunctatus* Fletcher; c, *Platyptilia farfarella* (Zeller); d, *Nippoptilia vitis* (Sasaki); e, *Sphenarches anisodactylus* (Walker); f, *Tomotilus saitoi* Yano; g, *Procapperia pelecyntes* (Meyrick); h, *Trichoptilus wahlbergi* (Zeller).

gin of head; adfrontal area nearly extending to vertical triangle or a little before or very rarely distinctly before it; frontoclypeal area (excluding anteclypeus) longer than wide, sometimes nearly equal or very rarely shorter. Ocelli 6 on each side, sometimes slightly or distinctly irregular in size. Head with primary setae only; setae AF1 and AF2 distinct, rarely short or minute; P1 extremely long; P2 rarely short; AF1 very long; A2 short, rarely minute; V2 dorsad from Va, only in the species of *Deuterocopus* and *Nippoptilia* V1 nearer to Pb and V2 ventrad from Va; AFa often invisible, rest of head punctures distinct. Labrum with a slight or deep median incision at its ventral margin; setae of median group usually long; M1 and M3 usually shorter than M2; M3 and La3 very rarely minute; La1 short, usually latero-dorsad from La2, very rarely latero-ventrad; La3 sometimes nearer to M3. Mandible usually with 5 teeth, rarely 6 or very rarely 8; mandibular setae rarely minute. Thorax and abdomen with primary or secondary setae. According to the arrangements of setae on body, the examined larvae can be divided into 4 following groups: 1) only primary setae occur (excluding abdominal segment 10); 2) distinct primary setae and short numerous scattered secondary setae occur; 3) long numerous secondary setae from verrucae and scattered usually short secondary setae occur; 4) numerous long secondary setae occur from verrucae. Setae on verrucae usually almost invariable in number and arrangements of verrucae also regular within the species. Setae on body variable in structure, viz. simple, blunt, forked, inflated or barbed minutely. Chaetotaxy of 1st and 2nd groups as follows: setae of L group of prothorax trisetose; SV group of mesothorax bisetose; SV group of abdomen unisetose in abdominal segment 8, bisetose in abdominal segments 1–7, bisetose or trisetose in abdominal segment 2 and trisetose in abdominal segments 3–6. Spiracles on prothorax and abdomen nearly circular, sometimes distinctly protruded; those on prothorax and abdominal segment 8 usually larger than those on other segments; those on abdominal segment 8 dorsad from the level of those on other segments. Proleg long, slender and stem-like, rarely short, and bearing uniordinal slender crochets arranged in a mesoseries which somewhat resembles a mesopenelipse. The distinct characters for this family are as follows: proleg long, slender and stem-like bearing uniordinal crochets arranged in a mesoseries; prothorax with setae of L group trisetose; SV group of mesothorax bisetose; many species with secondary setae from verrucae and

these setae variable in structure. Setae of L group of prothorax have been described as bisetose or trisetose; this group, however, is trisetose so far as the Japanese species are examined, but sometimes L3 extremely minute. The preliminary keys to the genera of Platyptiliinae and Pterophorinae in the present paper are based on the known Japanese larvae. As the examined species were too few to make a satisfactory key, the present keys should be regarded as a step for further studies.

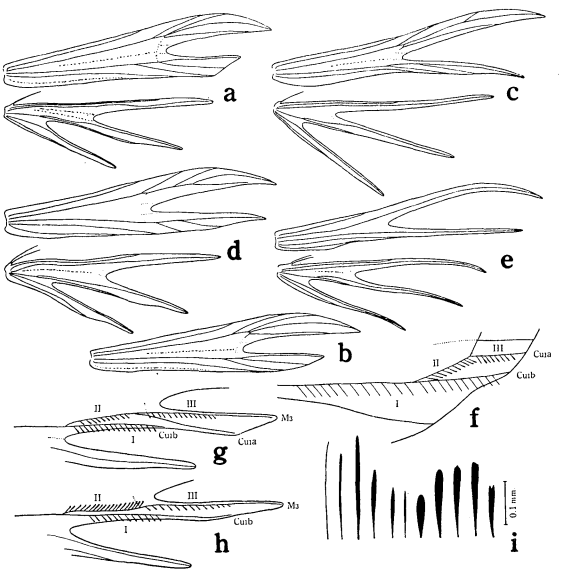

Fig. 4. a–e, venations. f–i, specialized scales on under surface of hindwing. a, *Oidaematophorus lienigianus* (Zeller); b, *O. acutus* n. sp.; c, *Adaina microdactyla* (Hübner); d, *Pselnophorus vilis* (Butler); e, *Aciptilia suffiata* n. sp.; f, *Ochyrotica concursa* (Walsingham); g, *Platyptilia farfarella* (Zeller); h, *Oidaematophorus lienigianus* (Zeller); i, specialized scales of various species.

Pupa: Body slender. Head with labial palpus small, often minute; clypeo-labral suture indistinct; maxillary palpus absent; pilifers discernible, sometimes indistinctly indicated; boundary line between glazed eye-piece and sculptured eye-piece indicated, rarely indistinct, glazed eye-piece usually bearing a seta, while sculptured eye-piece with 2 setae; maxilla exposed rather long basally, but overlaid by fore and often mid legs for a part of their length and usually again visible for a short distance at its distal end, rarely not exposed at its distal end; antenna extending to, rarely beyond, caudal end of wing in Pterophorinae, while not extending to it in Agdistinae and Platyptiliinae. Fore leg long exposed, rarely slightly beyond basal exposed part of maxilla; coxa of fore leg exposed in the species of Pterophorinae; mid leg very long exposed, usually extending beyond distal end of maxilla and caudal end of wing, very rarely before them; both mid legs, right and left, usually in contact with each other and again separated at their distal parts, rarely never in contact with each other; hind leg visible slightly or distinctly beyond distal end of maxilla or fore leg, very rarely concealed. Forewing slender, pointed, not reaching caudal end of mid leg, sometimes distinctly before it, very rarely extending beyond it; caudal part of hindwing covered by forewing, not visible; caudo-lateral end of exposed part of hindwing extending to abdominal segment 2, usually not reaching caudal margin of that segment, very rarely reaching it. Spiracles on mesothorax situated on cephalo-lateral angle. Abdomen with a conspicuous mass of hooked setae on mid-ventral cephalic margin of segment 10, in some species it is represented by a rounded prominence; caudal end of segment 10 with many hooked setae; cephalic margins of segments 9 and 10 strongly curved cephalad near meson and where these segments dovetailed together; strongly cephalad curved boundary line between segments 9 and 10 extremely indistinct; rarely a line discernible on caudo-ventral part of segment 10, this line somewhat seems as if it is the boundary line between segments 9 and 10. Genital opening situated on meson of segment

10, slit-like, in most species there is no difference between both sexes, in ♀ of some species another slight slit situated on caudal end of meson of segment 8. Anal opening not discernible, rarely obscurely indicated. Spiracles on abdomen present on segments 2–8, those on segment 1 concealed and those on segment 8 usually indistinct, in some species spiracles protruded. Species of the subfamily Pterophorinae and some species of Platyptiliinae with many or numerous setae on head, thorax, wing and abdomen, some of these species with many short setae even on antenna and fore leg. One species, *Tomotilus saitoi* Yano, with numerous setae all over its body. Many of the remaining species with 2 rows of spinous projections or barbed spines on dorsum of most abdominal segments, rarely without them. Most species with 2 longitudinal ridges on dorsum, which occur usually from mesothorax to abdominal segment 3. Description of the colour of the pupae of most of the species was not possible owing to the material preserved in alcohol. The preliminary key to the genera of Pterophorinae is based on the known Japanese pupae.

Biology: The larva feeds on the leaf, stem, flower-bud, flower and fruit of the host plant. Some species are leaf folders and a few are stem or flower borers, the rest of the species simply eat the part they select from the outer surface. The species of Platyptiliinae are almost all stem or flower borers or feeders and some are leaf feeders, while those of Pterophorinae are leaf feeders except for one which is supposed to be a stem borer, and the known single species of Agdistinae is a leaf feeder. Most species may have several generations a year. Some species spend the winter in adult stages and many seem to spend it in larval stages. The moth usually rests on the host plant or close to it, flying when disturbed and only for a short distance. Some species are occasionally attracted to light. When at rest, the moth holds its body with the fore and mid legs, while the free hind legs extend caudally and nearly parallel and in contact with the abdomen. It also holds its wings nearly horizontal and at right angles to the body, and the lobes of the hindwing are folded together and drawn under the forewing.

As the host plant, I list both the plants which are confirmed by me directly and the ones reported hitherto. In the viticulture of Japan, various strains of grapes are cultivated. As the name of the host plant, "grape" was listed hitherto for every species feeding on grapes. In the present paper, these reports are rerecorded as "*Vitis vinifera* L." The scientific names of the host plants follow Makino (1961).

Subdivision of the family

Up to the present, the subdivision of the family Pterophoridae has been discussed by the characters of the adults. The principal works on the problem are as follows: Tutt (1906) interpreted the present family as comprising 2 groups which he called superfamilies, viz. Agdistides and Alucitides, and he divided the latter into 2 groups which he called families, viz. Platyptilidae and Alucitidae. Spuler (1910) divided the family into 3 subfamilies, Agdistinae (contains *Agdistis*), Platyptiliinae (contains *Platyptilia*, *Amblyptilia*, *Stenoptilia*, *Marasmarcha*, *Gypsochares*, *Oxyptilus* and *Trichoptilus*) and Pterophorinae (contains *Pterophorus* and *Pselnophorus*) according to the cleft of the wing, the venation and the cell of the forewing. Meyrick (1910) is quite different. He divided the family into 2 groups according to the cleft of the hindwing. One group is subdivided into 2 sections according to the scales of the head, the black scales in the dorsal cilia of the hindwing and the frenulum in the female. The 1st section contains *Diacrotricha*, *Trichoptilus*, *Sphe-*

narches, *Oxyptilus*, *Heptaloba*, *Deuterocopus*, *Xyroptila*, *Koremaguia*, *Titanoptilus* and *Platyptilia*, the 2nd section contains *Alucita*, *Pselnophorus*, *Adaina*, *Pterophorus*, *Marasmarcha*, *Stenoptilia* and *Utuca*, while the other group is composed of *Ochyrotica*, *Atomopteryx* and *Agdistis*. The opinion of Barnes et Lindsey (1921) is identical in general to Spuler (1910). Beirne (1954) made the key to the subfamilies of this family, in which he divided it into 3 subfamilies, viz. Agdistinae, Platyptilinae and Pterophorinae, owing to the characters which are nearly the same as those of Spuler (1910). Some characters used by these authors are indeed fundamental. The fringes of the head and the shape of the cell of the forewing, however, are not the absolute characters for the subdivision of the family. After examinations and observations of the characters of the adults, the early stages and their habits, I have come to the conclusion that it is better to divide and arrange the present group of Japan as mentioned in the following pages. The outline of the relationships of the Japanese genera is as shown in fig. 5.

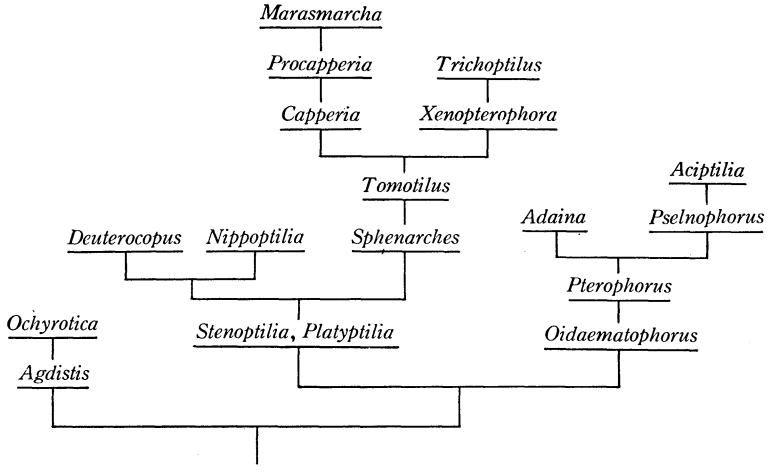

Fig. 5. Diagram showing the relationships of the Japanese genera.

KEY TO SUBFAMILIES OF PTEROPHORIDAE

1. Wings entire, not cleft into lobes..... **Agdistinae**
   Wings cleft into lobes 2
2. Lobe 2 of hindwing with 3 veins and lobe 3 with 1 vein; cilia of wings usually mixed with darker scales ..... **Platyptiliinae**
   Lobe 2 of hindwing with 2 veins and lobe 3 with 2 veins; cilia of wings usually not mixed with scales ..... **Pterophorinae**

KEY TO SUBFAMILIES OF PTEROPHORIDAE (LARVAE)

1. Body bearing secondary setae from only verrucae (fig. 79) ..... **Pterophorinae**
   Body bearing primary setae or secondary setae, when secondary setae present, numerous or sparse usually short setae occur on body in addition to primary setae, or tufted secondary setae occur from verrucae (fig. 70) 2
2. Frontal suture not extending to ventral margin of head; mandibular setae very

minute ..... **Agdistinae**
Frontal suture extending to ventral margin of head, when not extending to it, mandibular setae normal and seta V1 of head approximate to Pb and V_2 ventrad from Va ..... **Platyptiliinae**

KEY TO SUBFAMILIES OF PTEROPHORIDAE (PUPAE)

1. Coxa of fore leg not exposed; antenna not extending to caudal end of wing..... 2
   Coxa of fore leg exposed; antenna extending to caudal end of wing..... **Pterophorinae**
2. Mid legs, right and left, never in contact with each other through their length (fig. 9a) ..... **Agdistinae**
   Mid legs in contact with each other mid-ventrally beyond caudal end of fore leg and again separated at their distal parts (fig. 13a), when never in contact with each other, hind leg not exposed or barbed spine on dorsum of abdomen absent (fig. 22a)..... **Platyptiliinae**

Subfamily AGDISTINAE

Frons not projecting forwards. Occipital fringe polyfurcated. Forewing not cleft into lobes; vein R_1 present or absent; R_3 and R_4 stalked or separate; M_1 and M_2 long. Hindwing not cleft into lobes; under surface with rows of specialized scales as shown in fig. 4f; veins M_1 and M_2 long; M_3 absent.

Male genitalia: Uncus and tegumen developed; valva with processi.

Female genitalia: Ductus bursae rather broad near ostium bursae; signum absent.

Pupa: Antenna short, not extending to caudal end of wing; coxa of fore leg invisible; mid legs never in contact with each other through their length; hind leg exposed at its distal end; head, thorax, wing and abdomen without numerous setae, but with 2 rows of barbed spines on dorsum of abdomen. Spiracles on abdomen not protruded.

The species of this subfamily has entire both wings but it may be recognized at once from other entire wing moths by the presence of rows of specialized scales on under surface of hindwing. Up to the present, this subfamily has been represented by only *Agdistis* from Japan, but the species of *Ochyrotica* collected in Okinawa and Amami Islands is recorded here. I could not examine the species of *Agdistis* from Japan.

KEY TO JAPANESE GENERA OF AGDISTINAE

Forewing with veins R_3 and R_4 separate ..... **Agdistis**
Forewing with veins R_3 and R_4 stalked..... **Ochyrotica**

Genus **Agdistis** Hübner

Agdistis Hübner, 1826, Verz. bek. Schmett., 429.—Fletcher, 1909, Spol. Zeyl. **6** (21): 8.—Meyrick, 1910, Gen. Ins. **100**: 20.—Spuler, 1910, Schmett. Eur. **2**: 318.—Meyrick, 1913, Lep. Cat. **17**: 31.—Barnes et Lindsey, 1921, Cont. Nat. Hist. Lep. N. Amer. **4** (4): 446.—Pierce et Metcalfe, 1938, Gen. Brit. Pyr. Delt. Plume, 53, pl. 29.—Bigot, 1960, Alexanor **1**: 149.

Adactylus Curtis, 1833, Brit. Ent., 10.—Tutt, 1906, Brit. Lep. **5**: 135.

Ernestia Tutt, 1906, *ibid.*, 128.
Herbertia Tutt, 1906, *ibid.*, 129.

Type species: *Alucita adactyla* Hübner.

Spurs of mid and hind tibiae very short. Forewing with all veins separate; R_1 present; R_3 and R_4 separate; M_3 and Cu_{1a} approximated basally; discocellulars irregularly oblique. Hindwing with frenulum in ♀ simple or double; vein Cu_{1b} from before middle of cell; discocellulars outwardly oblique.

The above mentioned description is based on the European species of the genus. This genus has been represented by only the following species from Japan.

Agdistis takamukui Nohira

Agdistis takamukui Nohira, 1919, Ent. Mag. (Kyoto) **3** (5): 25.—Inoue, 1955, Check List Lep. Jap. **2**: 119.

DISTRIBUTION: Japan (Kyushu).

This species has not been recorded from Japan since the original description by Nohira (1919). I could not examine the specimen of this species.

Genus **Ochyrotica** Walsingham

Ochyrotica Walsingham, 1891, Ent. Month. Mag. **27**: 217.—Meyrick, 1910, Gen. Ins. **100**: 20; 1913, Lep. Cat. **17**: 31.
Steganodactyla Walsingham, 1891, *ibid.*: 241.—Fletcher, 1909, Spol. Zeyl. **6** (21): 9.

Type species: *Ochyrotica fasciata* Walsingham.

Forewing with termen inwardly sinuate; vein R_1 absent; R_3 and R_4 stalked; M_1, M_2 and M_3 nearly parallel; Cu_{1b} before angle of cell; discocellulars slightly inwardly sinuate. Hindwing with termen sinuate; frenulum in ♀ double; veins M_1, M_2 and Cu_{1a} nearly parallel; Cu_{1a} from angle of cell; Cu_{1b} from about middle of cell; 1A shortly furcate at its base.

Male genitalia: Uncus pointed; tegumen large; sacculus conspicuous, its caudal end characteristic; aedeagus long, bent and with an arm connected with vinculum.

Female genitalia: Apophyses anteriores absent; ductus bursae broad towards ostium bursae; signum absent.

This genus contains only a single species in Japan.

Ochyrotica concursa (Walsingham) Figs. 3a, 4f, 6–9.

Steganodactyla concursa Walsingham, 1891, Ent. Month. Mag. **27**: 241.—Fletcher, 1909, Spol. Zeyl. **6** (21): 9.—Shiraki *et al.*, 1934, Outl. Cont. Form. Inj. Ins. **2**: 68, pl. 4, figs. 10–13.
Ochyrotica concursa, Meyrick, 1910, Gen. Ins. **100**: 20; 1913, Lep. Cat. **17**: 31.—Hori, 1932, Icon. Ins. Jap., 1448, fig. 2865.

Male and ♀: Head with vertex pale ivory anteriorly, somewhat darker posteriorly; a broad pale ivory transverse line between base of antenna; frons greyish brown on upper 1/2, pale yellowish white on lower 1/2. Labial palpus long; basal segment nearly whitish, slightly mixed with dark brown; segments 2 and 3 pale yellowish white mixed with dark

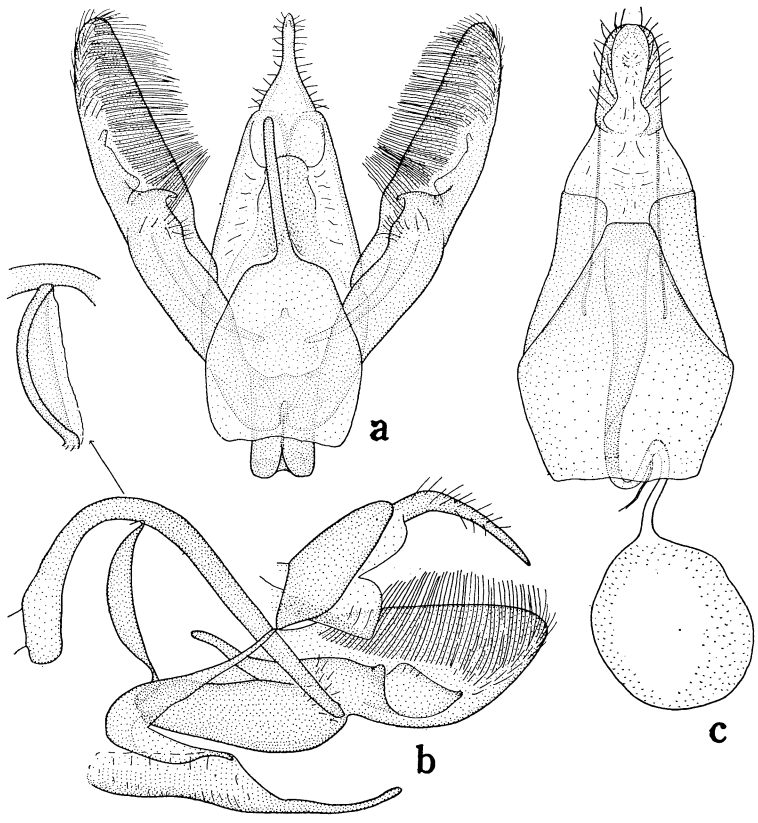

Fig. 6. *Ochyrotica concursa* (Walsingham). a, ♂ genitalia, ventral view, excluding aedeagus, including sternum 8; b, ditto, lateral view, excluding left valva, including sternum 8; c, ♀ genitalia.

brown scales. Antenna covered with pale yellowish white scales dotted with pale greyish brown scales above, terminal 1/2 nearly pale yellowish grey. Occipital fringe long, very conspicuous on dorsum; pale yellowish white on sides; brownish beneath. Occipital fringe on dorsum conspicuously furcated at tips (fig. 2 i–k). Thorax pale clay white, greyish brown on anterior margin and posterior area. Forewing dilated towards termen; apex rather pointed; termen and inner margin sinuate inwardly; anal angle rounded; pale yellowish white somewhat tinged with pale brownish yellow especially on veins and scattered with dark brown scales, these dark brown scales somewhat densely scattered along costal margin except near apex, also along inner margin and termen broadly on posterior 1/2; this dark brown inner margin broadened inwardly at about 3/4 from base of wing; a small dark brown patch on cell near costal margin at 3/8 from base of wing; dark brown costal margin mentioned above bearing 2 small pale yellowish white patches at a little beyond middle and 3/4 from base of wing; a whitish line composed of about 6 short stripes or dots closely along termen. Cilia on termen yellowish white with dark brown bases, this basal line interrupted at veins R_5 and M_1; inner margin with yellowish white cilia slightly mixed with dark brown scales, near anal angle pale greyish brown cilia situated. Hind-

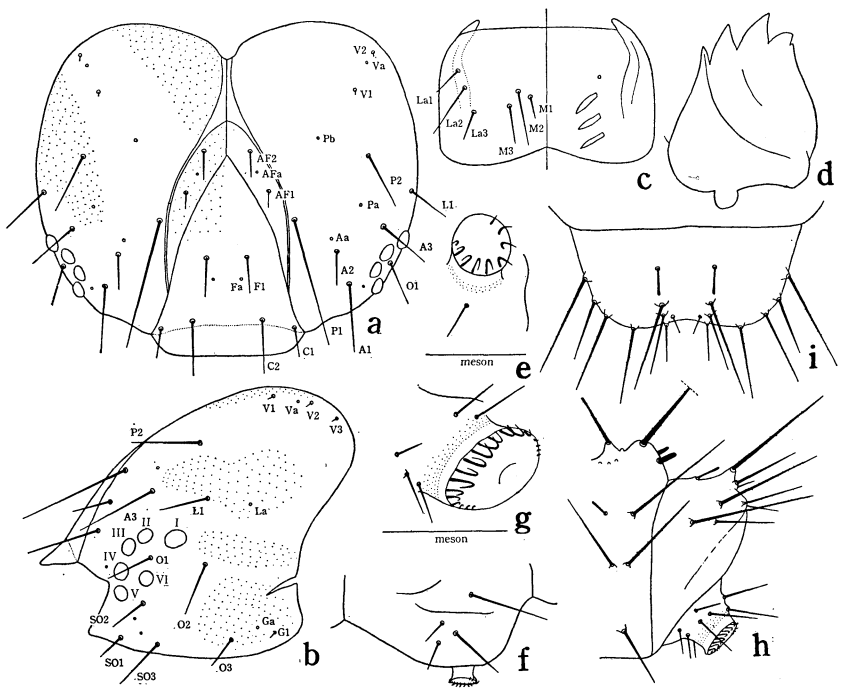

Fig. 7. *Ochyrotica concursa* (Walsingham), mature larva. a, head, frontal view; b, ditto, lateral view; c, labrum, with epipharyngeal surface on right; d, mandible; e, left ventral proleg of abdominal segment 6, ventral view; f, ditto, lateral view; g, left anal proleg, ventral view; h, abdominal segmenets 9 and 10, lateral view; i, abdominal segment 10, dorsal vlew.

wing with termen sinuate conspicuously; pale greyish brown. Cilia of all margins pale greyish brown; cilia on termen with darker bases. Specialized scales on under surface yellowish white and hair-like on I, dark brown and very slender on II and III. Abdomen pale yellowish white suffused with greyish brown; a large dark brown patch on dorsum from posterior margin of segment 3 to segment 6, the patch divided into 2 subdorsal line on segment 6; ventral surface of abdomen with some broad and narrow dark brown stripes. Length of forewing: 6–7 mm.

Male genitalia: Uncus moderately long, bent ventrally and broadened basally; tegumen large; ventral part of tuba analis slightly sclerotized; ventral part of vinculum weakly sclerotized; sacculus large and its caudal end with a long arm directed towards base of valva; a small weakly sclerotized area situated beyond caudal end of sacculus and its caudal end slightly pointed; aedeagus long, arched conspicuously; a slightly arched arm attached to aedeagus. Sternum 8 with a long process at its caudal margin (fig. 6).

Female genitalia: Papilla analis soft and round; apophyses posteriores long but without apophyses anteriores; abdominal segment 7 triangular mid-ventrally caudad; ductus bursae sclerotized and broadened towards ostium bursae; point of departure of ductus seminalis rather approached to corpus bursae; signum absent.

SPECIMENS EXAMINED: 3 ♂♂, 2♀♀, Tokuno-shima, 30. IV–7. V. 1960, reared by Kodama

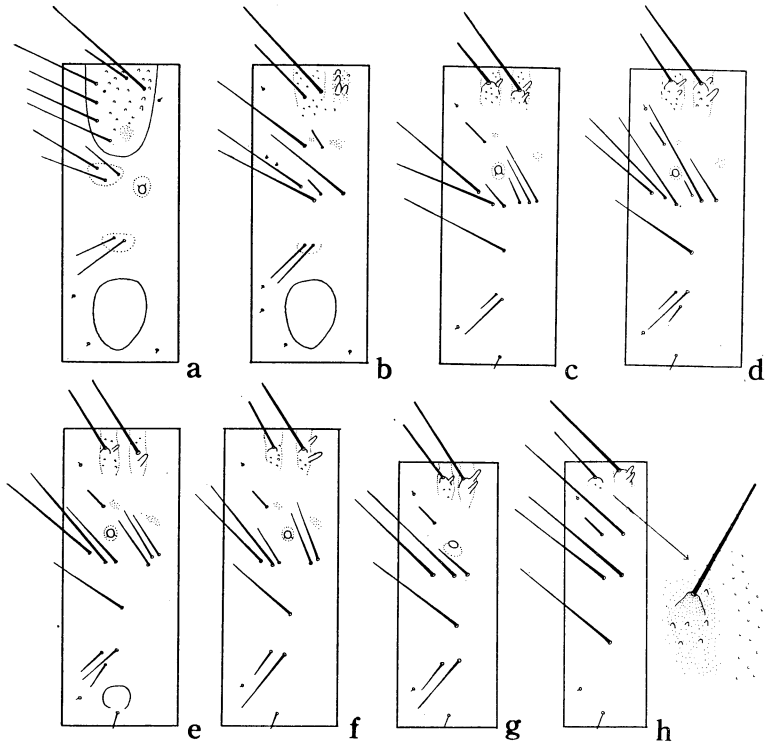

Fig. 8. *Ochyrotica concursa* (Walsingham), chaetotaxy of mature larva. a–h, pro-, mesothorax, abdominal segments 1, 2, 3, 7, 8 and 9.

(host plant: *Ipomoea batatas* Lam. var. *edulis* Makino); 2 ♀♀, Okinawa, 15–17. XI. 1960, Yasumatsu.

DISTRIBUTION: Ryukyu Is. (Tokuno-shima, Okinawa), Minami-Daito-jima, Formosa, China, Philippines, India, Ceylon, Molucca Is., New Guinea.

This is the first record of this species from Japan. It is easily supposed that this species may be found in Kyushu and other districts of Japan.

Mature larva: Head pale yellowish white; vertical triangle shallow but somewhat acute; frontal suture not extending to ventral margin of head; ocellus I larger than the others; seta AF1 very short; AFa visible, equidistant from AF1 and AF2; P1 approximate to frontal suture and ventrad from the level of AF1; Aa approximate to A2; Va and V2 approximate to each other. Labrum slightly incised at its ventral margin; setae of median group approximate to and equidistant from each other; setae of lateral group nearly arranged in a straight line. Mandible with 5 teeth; inner-most one extremely small; outer-most one small; mandibular setae minute. Thorax and abdomen without secondary setae but L group of each segment except for prothorax and abdominal segment 10 with 4–7 setae; setae barbed minutely as shown in fig. 8h; prothorax with XD1, XD2, SD1 and SD2 nearly arranged in a line along anterior margin of shield; SV group of abdominal segment 2 trisetose; basal parts of D group protruded and with minute somewhat seta-like projections.

Spiracles on prothorax and abdomen somewhat protruded. Ventral and anal prolegs rather short. Crochets of ventral proleg 9–12, rarely 8 or 9; those of anal proleg 15–19 and gradually lessening towards both ends of series which almost forming a mesopenelipse. Length: 8–9 mm. Head width: 0.74 mm. The larva of this species is conspicuously characterized by the following points: frontal suture not extending to ventral margin of head; seta P1 of head approximate to frontal suture and ventrad from the level of AF1; mandible with somewhat peculiar shape and with minute setae; L group of thorax and abdomen with 4–7 setae.

Pupa: Yellowish white, somewhat tinged with pale yellowish brown, especially towards dorsum. Body with greatest width at mesothorax; cephalic end of body round and flat, showing a transverse ridgy projection. Head with clypeo-labral suture indistinct; pilifers somewhat rugged; boundary line between glazed eye-piece and sculptured eye-piece rather indistinct; antenna not extending to caudal end of wing, its distal end nearer to distal end of fore leg than distal end of basal exposed maxilla; maxilla exposed at its distal end rather distinctly (fig. 9a) or slightly. Vertex and prothorax slightly rugged; meso- and metathorax with 2 longitudinal ridgy projections on dorsum, from which some short setae occur; spiracles on mesothorax distinct, not protruded; fore leg rather long exposed; mid leg never in contact with each other; hind leg exposed distinctly, its end slightly beyond distal end of mid leg; wing not extending to distal end of mid leg, ending slightly before it. Abdomen with 2 rows of barbed spines on dorsum, abdominal segments 1–3 with 2 of these spines on each side but in abdominal segment 1 weak, in abdominal segments 2 and 3 very strong, abdominal segments 4–8 with a spine on each side, abdominal segments 9 and 10 without distinct spines, these barbed spines occurring from somewhat rugged longitudinal elevated rows. Length: 8–9 mm. Width: 1.5. This pupa is characterized by the following points: cephalic end of body showing a somewhat transverse ridgy projection; both mid legs never in contact with each other; abdominal segments 2 and 3 bearing rather strong barbed spines.

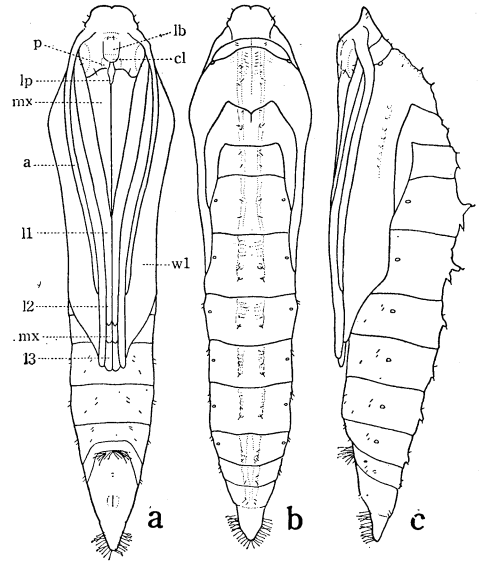

Fig. 9. *Ochyrotica concursa* (Walsingham), pupa, ♂, a, ventral view; b, dorsal view; c, lateral view. Abbreviations: a, antenna; cl, clypeus; lb, labrum; lp, labial palpus; l1, fore leg; l2, mid leg; l3, hind leg; mx, maxilla; p, pilifers; wl, forewing.

Biological notes: The life history of this species was given by Fletcher (1909) and Shiraki *et al.* (1934). The above mentioned description was made from the materials collected from Okinawa and Tokuno-shima by Prof. K. Yasumatsu and Mr. T. Kodama.

Host plant: *Ipomoea batatas* Lam. var. *edulis* Makino.

Subfamily PLATYPTILIINAE

Occipital fringe various, forked or simple. Forewing bifid or rarely trifid; vein R_1 often absent; R_2 usually separate; R_3 very rarely absent; R_3 and R_4 stalked; M_1 and M_2 weak and very short; M_3 and Cu_{1a} connate or stalked; 1A rarely furcate. Hindwing trifid; under surface with rows of brown specialized scales (fig. 4g); frenulum in ♀ usually simple, rarely double; veins M_1 and M_2 weak and very short; M_3 and Cu_{1a} stalked or rarely connate; Cu_2 weak and short, usually obsolete; 1A simple; lobe 2 with 3 veins, M_3, Cu_{1a} and Cu_{1b}, and lobe 3 with only a vein, 1A. Cilia of wing usually mixed with scales.

Male genitalia: Uncus represented as a pointed organ at caudal end of tegumen or ventral side of it or without a distinct uncus in many genera where dorsal part of tuba analis sclerotized, rarely 2 arms situated between tegumen and tuba analis; tegumen usually large and incised at its caudal margin; vinculum somewhat variable mid-ventrally; valva symmetrical but variable, simple or differentiated; juxta rather developed or small; aedeagus simple or with a basal process.

Female genitalia: Apophyses anteriores short or absent; sterigma variable in shape, sometimes absent; antrum of ostium bursae often developed; ostium bursae situated mid-ventrally at just caudal end of abdominal segment 7 or beyond it or rarely before it; corpus bursae with or without signa; ductus seminalis departed from corpus bursae together with ductus bursae, rarely before it.

Pupa: Antenna not extending to caudal end of wing, usually not extending to caudal end of fore leg, rarely reaching it or beyond it; coxa of fore leg invisible; both mid legs in contact with each other mid-ventrally beyond caudal end of fore leg and again separated at their distal parts, very rarely never in contact with or slightly in contact with each other; hind leg usually exposed beyond distal end of maxilla, very rarely not exposed; wing not extending to distal end of mid leg or beyond it; spiracles on abdomen not protruded; head, thorax and abdomen sometimes bearing many setae, rarely even on antenna and wing or very rarely with numerous setae all over body, while some species bearing 2 rows of spinous projections or barbed spines on dorsum of abdomen or bearing no spines or long setae on thorax and abdomen.

This subfamily contains 11 genera in Japan.

Key to Japanese genera of Platyptiliinae

1. Forewing trifid ..... **Deuterocopus**
   Forewing bifid 2
2 (1). Forewing with vein radius all present 3
   Forewing with vein R_1 absent, 3 or 4 branches of vein radius present 6
3 (2). Forewing with veins R_1 and R_2 stalked ..... **Sphenarches**
   Forewing with vein R_1 separate 4
4 (3). Hindwing with 3 lobes linear; vein Cu_{1a} of hindwing very weak ..... **Nippoptilia**
   Hindwing with at least lobes 1–2 broad, not linear; vein Cu_{1a} of hindwing distinct 5
5 (4). Inner margin of lobe 3 of hindwing with scattered dark scales or a dark scale tuft ..... **Platyptilia**

Inner margin of lobe 3 of hindwing without any dark scales ..... **Stenoptilia**

6 (2). Forewing with 3 branches of vein radius present, R_3 absent, R_2 and Cu_{1a} weak ..... **Trichoptilus**

Forewing with 4 branches of vein radius present, R_3 present, Cu_{1a} distinct 7

7 (6). Forewing with vein R_2 out of R_4 ..... **Xenopterophora**

Forewing with vein R_2 separate 8

8 (7). Hindwing with cilia of inner margin of lobe 3 bearing distinct darker scales, scattered or tufted 9

Hindwing with cilia of inner margin of lobe 3 bearing no darker scales ..... **Marasmarcha**

9 (8). Hindwing with 3 lobes moderate, not linear; tibiae of legs without rough scales at origin of spurs; forewing with well developed dark scales along all margins except for costa; ♂ genitalia with valva extremely broad ..... **Tomotilus**

Hindwing with 3 lobes slender, almost linear; tibiae of legs with rough scales at origin of spurs; forewing with less developed dark scales along margins; lobe 3 of hindwing with a developed scale tuft; ♂ genitalia with valva elongate 10

10 (9). Male genitalia with valva not provided with folds or appendages ..... **Procapperia**

Male genitalia with valva provided with a process ..... **Capperia**

PRELIMINARY KEY TO KNOWN JAPANESE GENERA OF PLATYPTILIINAE (LARVAE)

1. Body bearing primary setae only (excluding abdominal segment 10); head with seta V2 ventrad from Va 2

Body bearing secondary setae; head with seta V2 dorsad from Va 3

2 (1). Fronto-clypeal area (excluding anteclypeus) longer than wide; mandible with more than 5 teeth ..... **Deuterocopus**

Fronto-clypeal area (excluding anteclypeus) shorter than wide, or at least equal; mandible with 5 teeth ..... **Nippoptilia**

3 (1). Body bearing primary setae and scattered minute or short secondary setae ..... **Platyptilia**

Body bearing numerous secondary setae from verrucae and scattered rather short setae 4

4 (3). Body bearing distinctly bifurcated or expanded setae 5

Body not bearing such setae 6

5 (4). Body bearing distinctly bifurcated numerous setae ..... **Tomotilus**

Body bearing extremely expanded setae in addition to normal setae ..... **Sphenarches**

6 (4). Abdominal segments 3–6 with seta of V unisetose (fig. 70e) 7

Abdominal segments 3–6 with 4 or more setae on that position (fig. 25e) ..... **Stenoptilia**

7 (6). Prothoracic shield bearing about 10 setae, most of which is long ..... **Trichoptilus**

Prothoracic shield bearing many setae, long or short ..... **Procapperia**

Genus **Deuterocopus** Zeller

Deuterocopus Zeller, 1851, Linn. Ent. **6**: 402.—Fletcher, 1909, Spol. Zeyl. **6** (21): 16.—Meyrick, 1910, Gen. Ins. **100**: 7; 1913, Lep. Cat. **17**: 8.—Hori, 1933, Bul. Sci. Fak. Terk.

Kjusu Imp. Univ. **5** (4) : 387.

Leptodeuterocopus Fletcher, 1910, Trans. Ent. Soc. Lond. **1910** : 138.

Type species : *Deuterocopus tengstroemi* Zeller.

Frons smooth. Occipital fringe bifurcated or trifurcated. Tibiae of legs with scale tufts. Forewing trifid ; veins R_1 and R_2 separate ; R_5 to apex ; M_3 and Cu_{1a} connate; Cu_{1b} from before angle of cell. Hindwing with frenulum in ♀ simple; veins M_3 and Cu_{1a} stalked ; Cu_{1b} from before middle of cell.

Male genitalia : Tegumen large; tuba analis distinct ; paired arms situated between tegumen and tuba analis ; sacculus large, rarely with a process ; caudal end of valva with various structures ; aedeagus long, curved ; an arched arm attached to basal part of aedeagus.

Female genitalia : Papilla analis acutely pointed ; antrum of ostium bursae present ; ductus seminalis departed from caudal end of corpus bursae.

This interesting and distinct genus is characterized by a trifid forewing. Vein Cu_{1a} of hindwing is present, though it has been said to be absent by each author till now. This genus is represented by 2 species in Japan.

Key to Japanese species of Deuterocopus

Forewing with dark brown tipped yellowish brown scales in cilia within 1st cleft ; abdominal segments 1–3 with yellowish brown stripes on ventral surface..... **albipunctatus**

Forewing with narrow white scales in cilia along both margins of lobe 2 ; ventral surface of abdomen with a distinct dark brown transverse line on caudal margin of segment 3..... **socotranus**

Deuterocopus albipunctatus Fletcher Figs. 3b, 10–13.

Deuterocopus albipunctatus Fletcher, 1910, Trans. Ent. Soc. Lond. **1910** : 122, pl. 44, fig. 7. —Meyrick, 1913. Lep. Cat. **17** : 9.—Nohira, 1916, Ent. Mag. (Kyoto) **2** (1) : 37.—Hori, 1933, Ôyo Dobutsugaku Zasshi **5** (2) : 69 ; 1933, Bul. Sci. Fak. Terk. Kjusu Imp. Univ. **5** (4) : 388, pl. 7, figs. 7–8 ; 1950, Icon. Ins. Jap. (rev. ed.), 501, fig. 1365.—Inoue, 1955, Check List Lep. Jap. **2** : 115.—Esaki, 1957, Icon. Het. Jap. Col. Nat. **1** : 90, pl. 16, fig. 503.—Inoue, 1959, Icon. Ins. Jap. Col. Nat. Ed. **1** : 257, pl. 173, fig. 21.

Male and ♀ : Head with vertex and frons brown tinged with yellow. Labial palpus yellowish brown with small white patches. Antenna yellowish brown and dark brown dotted with white above. Occipital fringe yellowish brown, slightly mixed with yellowish white ; prosperously on dorsum, short on sides and below ; fringes on dorsum bifurcated and trifurcated as shown in fig. 1s, fig. 2 b, d ; long fringes usually trifurcated. Thorax yellowish brown ; metathorax with small yellowish white dots at subdorsal part and near base of hindwing ; pectus whitish. Fore leg with tibia brown mixed with white and thickened at its end ; tarsus yellowish brown above, white beneath. Mid leg with tibia yellowish brown with small whitish patches and a large projecting scale tuft at end, another small scale tuft at a little before it ; tarsus white above, yellowish brown beneath, terminal 2 segments almost dark brown. Hind leg with tibia yellowish brown slightly mixed with white, and with 3 conspicuous scale tufts at 1/7, 1/2 where medial spur is situated and terminal end, the lat-

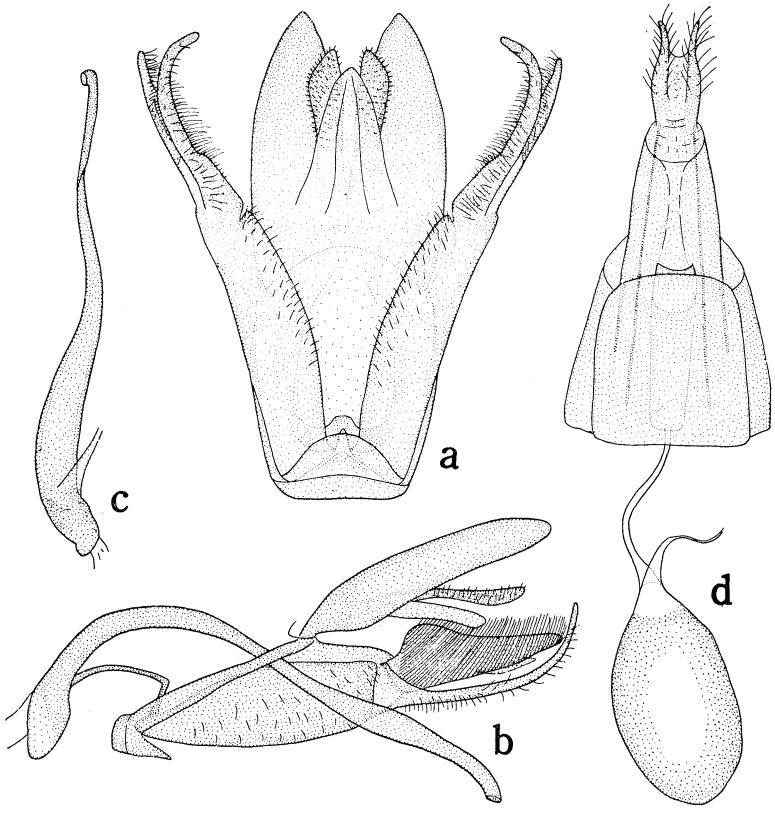

Fig. 10. *Deuterocopus albipunctatus* Fletcher. a, ♂ genitalia, ventral view, excluding aedeagus; b, ditto, lateral view, excluding left valva; c, ditto, aedeagus; d, ♀ genitalia.

ter 2 very large; tarsus yellowish brown slightly mixed with white, and somewhat thickened with rough scales at terminal end of each segment. Forewing cleft from about middle, lobe 2 again cleft from 1/5 of its length; yellowish brown, partly tinged with brown; minute white dots at 3/4 between base of wing and base of cleft, just base of cleft, 1/4, 2/3 and 5/6 of lobe 1 but the latter usually indefinite; a white stripe crossing lobes 2 and 3 at about 3/5 and 5/7 respectively; an indefinite white dot at base of lobe 3; dark brown linear patches on costa at just beyond base of cleft and about middle of lobe 1. Cilia pale yellowish brown; greyish brown at 2/3 of posterior margin of lobe 1, distal 3/7 of anterior margins of lobes 2 and 3 and about middle of posterior margin of lobe 3; dark brown cilia occurring at apex of lobe 1, just below apices of lobes 2 and 3; dark brown tipped yellowish brown scales scattered within 1st cleft but before middle of cleft; a few same coloured scales occurring at a little before base of cleft of inner margin. Hindwing with 3 lobes linear; brown. Cilia pale yellowish brown; lobe 3 with a large dark brown apical scale tuft and another small brown scale tuft at a little before middle of inner margin of lobe 3. Specialized scales on III very slender and pointed. Abdomen yellowish brown with whitish linear patches at subdoral and lateral parts of segments, indefinite on segments

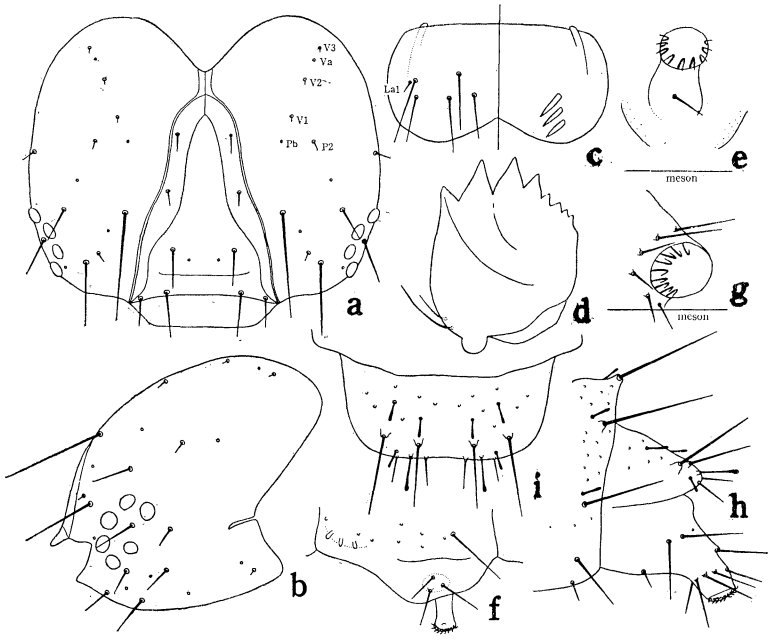

Fig. 11. *Deuterocopus albipunctatus* Fletcher, mature larva. a, head, frontal view; b, ditto, lateral view; c, labrum, with epipharyngeal surface on right; d, mandible; e, left ventral proleg of abdominal segment 5, ventral view; f, ditto, lateral view; g, left anal proleg, ventral view; h, abdominal segments 9 and 10, lateral view; i, abdominal segment 10, dorsal view.

2 and 4; ventral surface white and each of segments 1–3 with yellowish brown oblique stripes and caudal margin of segment 3 yellowish brown but sometimes indistinct. Length of forewing: 7 mm.

Male genitalia: Tegumen large, deeply incised caudally; tuba analis rather distinct; paired long arms situated at dorsal side of tuba analis which are rather distinct; vincutum rounded at caudal margin of mid-ventral part; valva with a long pointed harpe; cucullus somewhat triangular with a small weakly sclerotized process at its ventral margin; sacculus large; aedeagus long, curved; a conspicuously bent arm connected with aedeagus.

Female genitalia: Apophyses posteriores very long; apophyses anteriores short; antrum of ostium bursae long and broad; ductus seminalis departed from corpus bursae together with ductus bursae; corpus bursae with scobinations heavily, without a signum.

SPECIMENS EXAMINED: 4 ♀♀, Tachibanayama, Fukuoka Pref., 5–6. X. 1960, reared by Yano (host plant: *Vitis thunbergii* Sieb. et Zucc.); 1♂, 1♀, Shimoda, Amakusa, 10–20. X. 1960, reared by Yano (host plant: *Ampelopsis brevipedunculata* Trautv.), and many other specimens from the following localities.[2] SHIKOKU: Zentsuji, Kagawa Pref. (VIII). KYUSHU: Yukuhashi (VIII, IX), Hirayama (X), Fukuoka (VII, IX), Kashii (IX), Wakasugiyama (V), Tanushimaru (VIII), Fukuoka Pref.; Tatsudayama, Kumamoto Pref. (I); Tomi-

2. Roman numerals in parentheses indicate the month when the moths were collected.

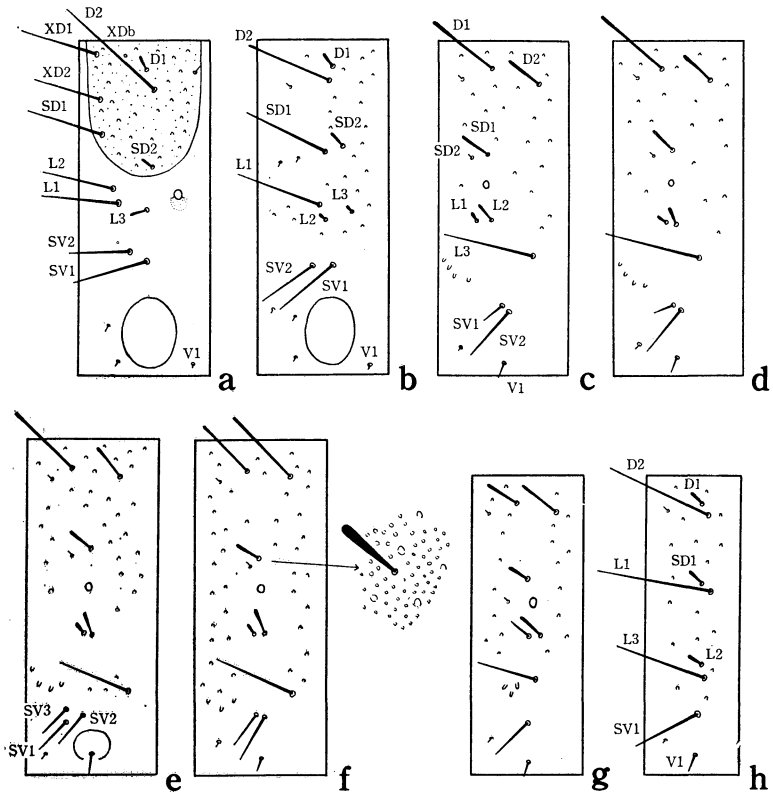

Fig. 12. *Deuterocopus albipunctatus* Fletcher, chaetotaxy of mature larva. a–h, pro-, mesothorax, abdominal segments 1, 2, 3, 7, 8 and 9.

oka (VIII, IX), Ushibuka (XI), Amakusa; Tsutsu – Komoda – Imazato (VII, IX), Izuhara (X), Tsushima; Miyanoura, Yaku-shima (VIII).

DISTRIBUTION: Japan (Honshu, Shikoku, Kyushu, Tsushima, Yaku-shima), Korea, China.

This species is closely allied to *D. socotranus* Rebel, but it is distinguished from the latter by the characters given in the key and by the characters of the genitalia.

Mature larva: Head brown; vertical triangle rather deep; adfrontal area extending to a little before vertical triangle; seta P1 ventrad from the level of AF1; P2, A2 and L1 very short; A2 approximate to A1; P2 nearer to Pb; Aa nearly equidistant from P1 and A2; V1 nearer to Pb than V2. Labrum with a slight median incision; setae of median group triangularly grouped; setae of lateral group approximate to each other; La1 distinctly approximate to La2 and latero-ventrad from La2. Mandible with 8 teeth; inner 4 very small. Thorax and abdomen pale yellow; prothoracic shield pale brownish yellow. Thorax and abdomen without secondary setae but invested with minute scobinations; abdominal segment 10 with many setae; setae blunt or pointed apically; D1, SD2 and L3 of prothorax, D1, SD2, L1 and L3 of meso- and metathorax, D2, SD1, L1 and L2 of abdomen short, espe-

cially D1, SD2 and L3 or L2 of thorax and L1 of abdomen minute, but D1 of abdominal segment 7 and L1 of abdominal segment 9 long; SV group of abdominal segment 2 bisetose. Spiracles nearly circular; those on prothorax and abdominal segment 8 protruded. Proleg not very long. Crochets of ventral proleg 7–9; those of anal proleg 9. Length: 8–9 mm. Head width: 0.52 mm. This larva is peculiar among the other larvae of Japanese Pterophoridae in the following points: P2, A1 and L1 of head very short; V1 of head nearer to Pb than Va, and V2 ventrad from Va; La1 of labrum latero-ventrad from La2; mandible with 8 teeth. This species is somewhat allied to the species of *Nippoptilia* in some characters.

Pupa: Pale yellow with small or large brown patches on pro-, mesothorax, abdominal segments 2, 4 and 5; abdominal segments 2–7 with a very small brown dot on dorsum respectively. Body somewhat stocky at thorax; cephalic end of body not projected. Head with pilifers not clearly indicated; boundary line between glazed eye-piece and sculptured eye-piece very indistinct; antenna rather short, extending slightly beyond caudal end of exposed basal maxilla. Meso- and metathorax with 2 longitudinal ridges which are rugged and slightly elevated; fore leg short, extending slightly beyond distal end of antenna and caudal end of exposed basal maxilla; both mid legs in contact with each other, not extending to caudal end of wing; hind leg distinctly exposed; proleg scar discernible. Dorsal ridges of thorax extending to middle of abdominal segment 3, but these ridgy projections not conspicuous on abdomen; abdomen without long setae or barbed spines. Length: 8 mm. Width: 1.5 mm. The pupa of this species is somewhat allied to those of *Nippoptilia*, but it is separated from *N. vitis* (Sasaki) and *N. issikii* Yano by the absence of dorsal spines on the abdomen and from *N. minor* Hori by the markings and shallow caudo-dorsal margin of the mesothorax.

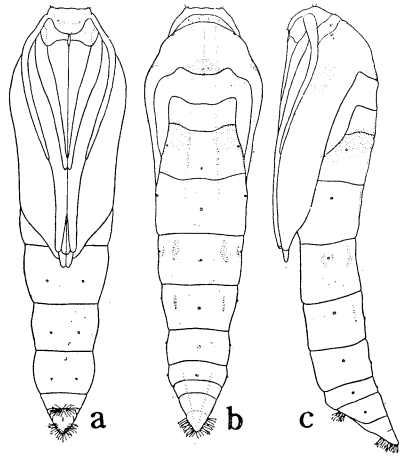

Fig. 13. *Deuterocopus albipunctatus* Fletcher, pupa, ♂. a, ventral view; b, dorsal view; c, lateral view.

Biological notes: The larva feeds on the flower-bud, flower and probably the fruit of the host plants. The pupa is generally attached to a flower-stalk or petiole of the host plants and directs to the main stem. The pupal period is 8–10 days in September and October. This species spends the winter in the adult stage.

Host plants: *Ampelopsis brevipedunculata* Trautv., *Vitis thunbergii* Sieb. et Zucc., *Vitis vinifera* L.

Deuterocopus socotranus Rebel Fig. 14.

Deuterocopus tengstroemi, Meyrick (*nec* Zeller), 1886, Trans. Ent. Soc. Lond. **1886**: 8 (partim).—Fletcher, 1909, Spol. Zeyl. **6** (21): 19.

Deuterocopus socotranus Rebel, 1907, Denk. Math-Nat. Ak. Wiss. **71** (2): 85, f. 37.—Fletcher, 1910, Trans. Ent. Soc. Lond. **1910**: 124, pl. 44. fig. 8.—Meyrick, 1913, Lep. Cat. **17**: 9.—Hori, 1934, Mushi **7** (1): 21; 1936, *ibid.* **9** (1): 15, fig. 2.

Deuterocopus triannulatus Meyrick, 1913, Exot. Micr. **1**: 107; 1913, Lep. Cat. **17**: 9.—Nohira, 1916, Ent. Mag. (Kyoto) **2** (1): 37.—Hori, 1933, Bul. Sci. Fak. Terk. Kjusu Imp. Univ. **5** (4): 389, pl. 5, fig. 1, pl. 6, fig. 2, pl. 7, figs. 3–4.

Male and ♀: Head with vertex and frons brown, the latter smooth. Labial palpus slender; yellowish brown with small whitish patches. Antenna almost dark brown dotted with white above. Occipital fringe on dorsum conspicuous; brown slightly mixed with pale yellowish white. Thorax dark brown; pectus whitish. Legs similar to that of *D. albipunctatus* Fletcher, but somewhat darker. Forewing cleft from slightly beyond middle, lobe 2 again cleft from about 2/7 of its length; lobe 1 falcate; lobes 2 and 3 slender; greyish brown or dark brown with paler patches and slightly scattered with white scales; near base of wing somewhat paler; a yellowish brown to pale yellowish white patch situated a little before base of cleft; lobe 1 with an indistinct yellowish brown transverse line at about 1/3 and with a narrow similar line at about 2/3, usually the latter pale yellowish white but sometimes very obscure; lobes 2 and 3 with a whitish line at about middle of their length respectively but usually not clearly indicated. Cilia pale yellowish brown or pale greyish brown; dark brown scales occurring beyond middle of posterior margin of lobe 1 but interrupted narrowly just before apex; lobe 2 mixed with narrow white scales along both margins before middle, beyond middle dark brown but interrupted rather conspicuously on posterior margin just before apex; anterior margin of lobe 3 beyond middle dark brown and continuing around apex, about middle of posterior margin widely greyish dark brown; lobe 3 mixed with some narrow white scales before middle of its length; inner margin mixed with white scales and dark brown scales partly, the latter situated about slightly beyond base of cleft. Hindwing with 3 lobes linear; brownish slightly mixed with pale yellowish white. Cilia pale yellowish brown; lobe 3 with a large dark brown apical scale tuft and another small dark brown one at a little before middle of inner margin. Abdomen dark brown, somewhat mixed with pale yellowish white on sides; segments 3, 5 and 6 with narrow pale yellowish white subdorsal longitudinal stripes; ventral surface pale yellowish white but caudal margin of segment 3 distinct-

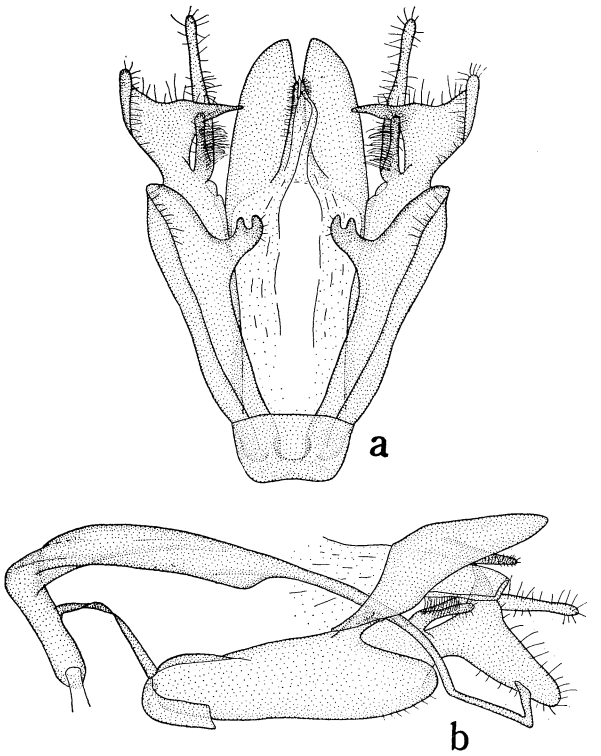

Fig. 14. *Deuterocopus socotranus* Rebel. a, ♂ genitalia, ventral view, excluding aedeagus; b, ditto, lateral view, excluding left valva.

ly dark brown. Length of forewing: 5 mm.

Male genitalia: Tegumen similar to *albipunctatus*; paired arms situated between tegumen and tuba analis more narrow than that of *albipunctatus*; sacculus developed, its dorsal margin with a bifurcated process; caudal end of valva showing very complex structures, dorsal part with 2 arms, long and short, ventral part with a wide process as shown in fig. 14; aedeagus very long and irregularly bent throughout its length, distal 1/2 conspicuously narrow; an arched arm attached to aedeagus.

SPECIMENS EXAMINED: 4 ♂♂, 3 ♀♀, Ishigakijima, 3. VI. 1932, Umeno; 1 ♂, 3 ♀♀, Ishigakijima, 24. XI. 1960, Yasumatsu.

DISTRIBUTION: Ryukyu Is. (Ishigaki-jima), Formosa, Palau Is., India, Ceylon, Burma, Thailand, Sumba, Sumbawa, New Guinea, Australia, Sokotra, Africa.

This species which is closely related to the preceding species, is somewhat variable in colour, viz. paler and somewhat darker specimens are found. The description mentioned above is based on the darker specimens.

Genus **Stenoptilia** Hübner

Stenoptilia Hübner, 1826, Verz. bek. Schmett., 430.—Fernald, 1898, Pter. N. Amer., 57.—Tutt, 1906, Brit. Lep. **5**: 360.—Fletcher, 1909, Spol. Zeyl. **6** (21): 10.—Meyrick, 1910, Gen. Ins. **100**: 18.—Spuler, 1910, Schmett. Eur. **2**: 321.—Meyrick, 1913, Lep. Cat. **17**: 28.—Barnes et Lindsey, 1921, Cont. Nat. Hist. Lep. N. Amer. **4** (4): 349.—Forbes, 1923, Lep. N. Y. Neighb. St., 646.—Pierce et Metcalfe, 1938, Gen. Brit. Pyr. Delt. Plume, 48, pl. 27.

Mimaeseoptilus Wallengren, 1859, Skand. Fjäderm., 18.

Adkina Tutt, 1905, Ent. Rec. **17**: 37; 1906, Brit. Lep. **5**: 318.

Type species: *Alucita pterodactyla* Linné.

The genus is divided into 2 groups. Group A contains *S. albilimbata* n. sp., *S. admiranda* n. sp., *S. saigusai* n. sp. and *S. zophodactyla* (Duponchel) and Group B contains *S. emarginata* (Snellen), *S. cretalis* (Meyrick) and *S. dissipata* n. sp. Frons pojecting forwards slightly in Group A, not projecting in Group B. Basal 2 segments of labial palpus broad in Group A, slender in Group B. Occipital fringe usually bifurcated. Inner spur of mid tibia usually longer than outer, rarely equal; inner terminal spur of hind tibia longer than outer or equal to or rarely shorter. Forewing bifid; veins R_1 and R_2 separate; R_4 to apex; R_5 to anal angle of lobe 1; M_3 and Cu_{1a} connate; Cu_{1b} from considerably before angle of cell. Hindwing with frenulum in ♀ simple; vein $Sc+R_1$ and Rs divergent beyond cleft; Cu_{1a} from near angle of cell; Cu_{1b} from before middle of cell. Cilia of lobe 3 of hindwing without dark scales, very rarely slightly discernible.

Male genitalia: Group A. Tegumen rather weakly sclerotized, large; a rather small pointed organ which may represent an uncus situated at ventral side of tegumen; caudal end of uncus showing an important specific character in relative position with caudal margin of tegumen; vinculum simple; valva differentiated into pointed cucullus and distinct valvula; sacculus large; juxta moderately or weakly sclerotized at medial area, with 2 sclerotized long arms caudally and with a bifurcated arm basally which is characteristic; aedeagus long but distinctly bent and with a basal process which is connected with juxta. Group B. Valva rather simple, without distinct cucullus and valvula.

Female genitalia: Group A. Apophyses posteriores well developed; apophyses anteriores usually absent; antrum of ostium bursae long and broad, often cup-shaped; ductus bursae somewhat sclerotized towards antrum of ostium bursae; point of departure of ductus seminalis approached to corpus bursae; corpus bursae with scobinations and 2 well developed pointed signa. Group B. Signum absent.

This genus is closely allied to *Platyptilia*, but it is recognizable from the latter by the following characters: cilia of lobe 3 of hindwing without dark scales; ♂ genitalia with rather differentiated valva than *Platyptilia*, viz. valva with distinct cucullus and valvula except for Group B. The species of Group B are very peculiar in the characters of adult and larva. However, I would like to place them in this genus at present. Eight species occur in Japan, 4 of which are originally described in the present paper.

Key to Japanese species of Stenoptilia

1. Frons somewhat projecting forwards; basal 2 segments of labial palpus broad; valva of ♂ genitalia with distinct cucullus and valvula; ♀ genitalia with 2 developed signa on corpus bursae (Group A) 2
   Frons not projecting forwards; labial palpus slender; valva of ♂ genitalia without cucullus and valvula; ♀ genitalia without signum on corpus bursae (Group B) 5
2 (1). Lobe 1 of forewing with a narrow white subterminal line, when it is obscure, a dark brown triangular patch is situated at base of cleft 3
   Lobe 1 of forewing without a subterminal line..... 4
3 (2). Ground colour of forewing pale yellowish brown heavily mixed with white scales; length of forewing 11–12 mm; caudal margin of tegumen of ♂ genitalia slightly incised ..... **admiranda**
   Ground colour of forewing grey suffused with dark brown; length of forewing 9–10 mm; caudal margin of tegumen of ♂ genitalia deeply incised..... **saigusai**
4 (2). Forewing pale greyish brown on costal 1/2, pale yellowish brown mixed with white scales on dorsal 1/2; length of forewing 12–14 mm; ♂ genitalia with uncus distinctly extending beyond caudal margin of tegumen.....**albilimbata**
   Forewing grey with pale brownish tinge; length of forewing 9–10 mm; ♂ genitalia with uncus not extending to caudal margin of tegumen..... **zophodactyla**
5 (1). Forewing white slightly mixed with pale greyish brown and termens of both lobes clearly margined with dark brown..... **cretalis**
   Forewing greyish brown and termens of both lobes not clearly or never margined 6
6 (5). Lobe 1 of forewing with a white distinct subterminal line..... **dissipata**
   Lobe 1 of forewing without a subterminal line ..... **emarginata**

Stenoptilia albilimbata Yano, n. sp. Figs. 15a, 16.

Stenoptilia coprodactyla, Inoue (*nec* Zeller), 1959, Icon. Ins. Jap. Col. Nat. Ed. **1**: 258, pl. 173, fig. 29.

Male and ♀: Head with vertex and frons grey tinged with pale brown, the latter slightly projecting forwards and with pale yellowish white lateral and anterior margins.

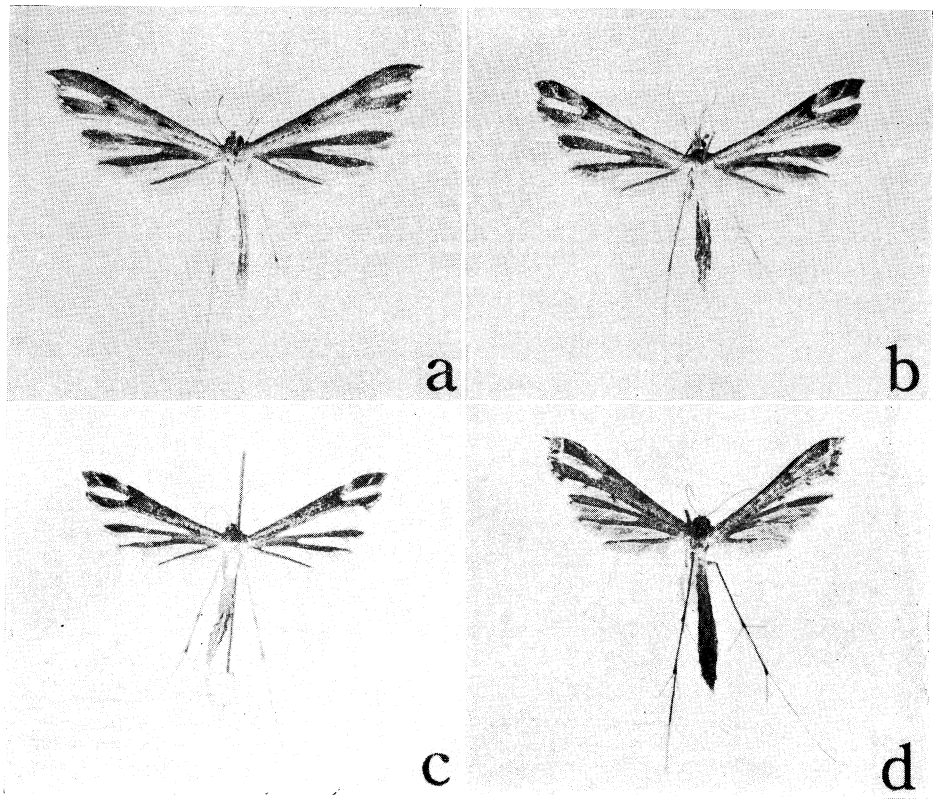

Fig. 15. a, *Stenoptilia albilimbata* n. sp., holotype, ♂; b, *S. admiranda* n. sp., allotopotype, ♀; c, *S. saigusai* n. sp., allotype, ♀; d, *S. dissipata* n. sp., paratype, ♀.

Labial palpus pale yellowish white tinged with pale greyish brown. Antenna greyish brown dotted with white above. Occipital fringe pale yellowish white, slightly tinged with greyish brown on dorsum, pale yellowish brown on sides; fringes on dorsum bifurcated (fig. 1l, n). Thorax yellowish white suffused with pale greyish brown anteriorly. Fore leg with coxa, femur and tibia greyish brown and pale yellowish white, the latter dilated towards end; tarsus pale yellowish white, distal 2 segments greyish brown. Coxae of mid and hind legs pale yellowish white. Mid leg with femur, tibia and tarsus pale yellowish white with a greyish brown stripe, last segment of the latter greyish brown. Hind leg with femur, tibia and tarsus pale yellowish white on inner side, pale greyish brown on outer side. Terminal spurs of hind tibia equal in length. Forewing cleft from about 2/3; 2 lobes broad; pale greyish brown on costal 1/2, pale yellowish brown on dorsal 1/2; costa dotted with white from base of wing to near base of cleft, but usually indefinite; dark brown scales scattered mainly on lobe 1, slightly on lobe 2 and other part of wing; whitish scales scattered mainly from base of wing to base of cleft; 2 dark brown patches at middle between base of wing and base of cleft and at a little before base of cleft. Cilia pale greyish brown; basal part of termen of lobe 1 and within cleft white; basal part of termen of lobe 2 and inner margin whitish; short dark brown scales occurring at extremity of vein R_5,

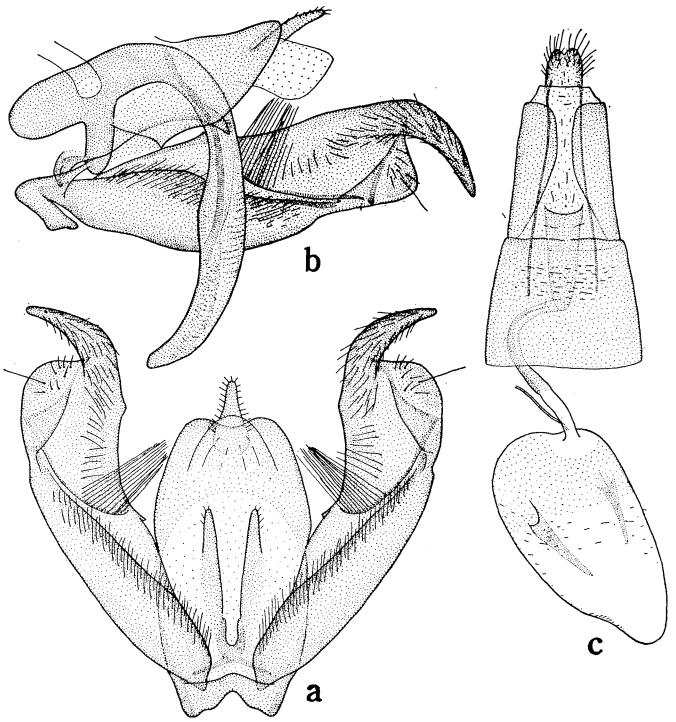

Fig. 16, *Stenoptilia albilimbata* n. sp. a, ♂ genitalia, ventral view, excluding aedeagus; b, ditto, lateral view, excluding left valva; c, ♀ genitalia.

apex of lobe 2 and just below apex of lobe 2; at anal angle of lobe 2 cilia somewhat dark brown. Hindwing cleft firstly from 4/9; lobe 1 gradually dilated to 4/5 of its length, then narrowing towards apex; lobe 3 slender; first 2 lobes brown; lobe 3 brown suffused with pale yellowish brown basally or greyish brown suffused with pale yellowish white basally. Cilia pale yellowish brown, tinged with greyish brown mainly at posterior margins of lobes 2–3; dark brown cilia occuring around tips of first 2 lobes, short, but sometimes indefinite. Abdomen pale yellowish white, rarely tinged with pale greyish brown; small dark brown dots on posterior margins of segments 3–6 or 7 at subdorsal parts; dark brown linear patches on sides of segments 2–7, but the patches usually unite together. Length of forewing: 12–14 mm.

Male genitalia: Uncus distinctly extending beyond caudal margin of tegumen; caudal margin of tegumen slightly and roundly incised, cephalic part of tegumen weakly sclerotized; vinculum rather deeply incised mid-ventrally; margin of valvula rounded; juxta rather weakly sclerotized; aedeagus stout and bent at an acute angle.

Female genitalia: Apophyses posteriores very long; ostium bursae situated beyond caudal margin of abdominal segment 7; antrum of ostium bursae well developed.

Holotype ♂, Shigakogen, Nagano Pref., 19. VII. 1960, Yano; allotopotype ♀, and paratopotypes, 14♂♂, 10♀♀, same data as holotype. Paratypes 1♀, Nikko–Yumoto, Shimo-

zuke, 14. VIII. 1937, Esaki & Yasumatsu; 5♂♂, 3♀♀, Shinkazawa, Gunma Pref., 28. VII. 1961, Yano; 1♂, Hoppo-onsen, 1600 m, 23–24. VII. 1952, Inoue; 2♀♀, Shirahone, Shinano, 24. VII. 1937, Miyamoto.

DISTRIBUTION: Japan (Honshu).

Inoue (1959) recorded the species from Japan under the name *S. coprodactyla* (Zeller). In examining the specimen through the kindness of Dr. H. Inoue, I found that the specimen is not *coprodactyla* but its allied new species described above. This species seems close to *S. grandis* Chapman from Europe and *S. pterodactyla* (Linné) from Europe, Asia Minor and N. America judging by the descriptions of these species, but it may be separated from the former by the absence of a subterminal line on lobe 1 of forewing and it may be distinguished from the latter by the presence of a dark brown patch at middle between base of wing and base of cleft of forewing. It is somewhat similar to *S. coprodactyla* (Zeller) from Europe, Asia Minor and Siberia, but it is obviously distinguished from the latter by the absence of a subterminal line on lobe 1 of the forewing and by the presence of well extending uncus which is beyond the caudal margin of the tegumen.

Biological notes: The moth occurs generally in the open place of the mountainous district. The host plant still remains unknown, but the moth is usually caught by beating *Veronicastrum sibricum* Pennel var. *japonicum* Hara or bushes in its vicinity.

Stenoptilia admiranda Yano, n. sp. Figs. 15b, 17.

Male and ♀: Head with vertex and frons greyish with white margins, the latter projecting forwards. Labial palpus stout; basal segment pale yellowish brown and white; segment 2 pale yellowish brown, slightly mixed with white; segment 3 white. Antenna dark brown slightly mixed with white above. Occipital fringe pale yellowish white on dorsum, pale yellowish brown on sides and below; fringes on dorsum bifurcated (fig. 1p). Thorax greyish anteriorly, white on middle, pale yellowish brown posteriorly. Fore and mid legs with tibiae white and with a dark brown stripe respectively, and dilated towards ends; fore tarsus with segment 1 white with a dark brown line, segments 2–3 white, 2 terminal segments white on outer side and greyish brown on inner side; mid tarsus white with a pale greyish brown stripe. Hind leg with femur and tibia greyish brown on outer side, white on inner side; tarsus with segment 1 white on inner side, greyish brown on outer side; the rest of tarsus white slightly tinged with pale greyish brown on outer side. Forewing cleft from 2/3; lobe 1 broad; pale yellowish brown heavily mixed with white scales mainly from base of wing to base of cleft, slightly on 2 lobes; greyish brown scales mainly scattered on 2 lobes; costa greyish brown; a rather small dark brown patch near costa at middle between base of wing and base of cleft; a dark brown triangular costal patch just before base of cleft followed by a white linear patch on costa; an irregular white stripe crossing lobe 1 at about 2/3. Cilia within cleft, of termen of lobe 1 and around anterior angle of lobe 2 white but those of termen of lobe 1 and around anterior angle of lobe 2 greyish brown basally; termen of lobe 2 except for near anterior angle and inner margin pale greyish brown tinged with pale yellowish brown. Hindwing cleft firstly from 3/7; lobe 3 slender; lobes 1 and 2 brown; lobe 3 brown tinged with pale yellowish brown. Cilia pale greyish brown, slightly tinged with pale yellowish brown partly; short greyish brown cilia occurring around tips of first 2 lobes. Abdomen with segment 1 pale

yellowish white, slightly mixed with pale yellowish brown; from segment 2 to caudal end of abdomen pale yellowish brown tinged with dark brown, slightly mixed with pale yellowish white; ventral surface greyish brown with a pale yellowish white stripe, mixed with pale yellowish white scales and dark brown ones. Length of forewing: 11–12 mm.

Male genitalia: Uncus pointed and extending to caudal margin of tegumen; tegumen large, its caudal margin slightly incised; vinculum slightly and roundly incised mid-ventrally; margin of valvula not rounded; juxta rather distinctly sclerotized medially; basal bifurcated arm of juxta broader than that of the preceding species aedeagus bent at nearly a right angle, basal process long.

Female genitalia: Ostium bursae scarcely beyond caudal margin of abdominal segment 7; antrum of ostium bursae cup-shaped.

Holotype ♂, Shigakogen, Nagano Pref., 18. VII. 1960, Yano; allotopotype ♀, and paratopotypes, 17♂♂, 6♀♀, same data as holotype. Paratypes 2♂♂, Shigakogen, Nagano Pref., 19. VII. 1960, Yano.

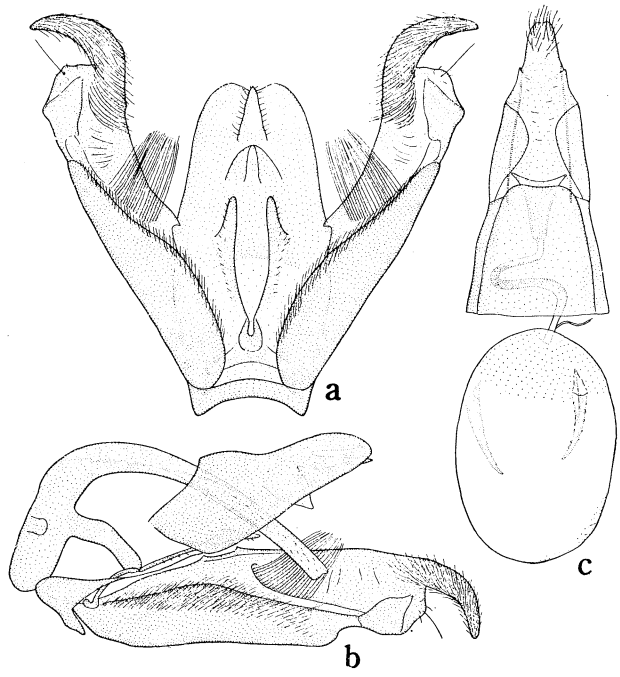

Fig. 17. *Stenoptilia admiranda* n. sp. a, ♂ genitalia, ventral view, excluding aedeagus; b, ditto lateral view. excluding left valva; c, ♀ genitalia.

DISTRIBUTION: Japan (Honshu).

This new species is somewhat related to *S. coprodactyla* (Zeller) and the preceding species, but it is easily distinguished from these species by the presence of a white subterminal line of lobe 1 of the forewing.

Biological notes: The moth of this species occurs generally in the open place of the mountainous district.

Stenoptilia saigusai Yano, n. sp. Figs. 15c, 18.

Male and ♀: Head with vertex and frons dark grey with white margins, the latter projecting forwards. Labial palpus with basal 2 segments pale yellowish brown mixed with white; segment 3 white mixed with greyish brown. Antenna greyish brown dotted with above. Occipital fringe white on dorsum, pale yellowish brown on sides, whitish below; fringes on dorsum bifurcated. Thorax dark grey anteriorly, pale yellowish white posteriorly. Fore and mid legs with tibiae white with a dark brown stripe respectively, dilated distally; fore tarsus with 3 basal segments white on outer side, tinged with greyish brown on

inner side, 2 distal segments greyish brown; mid tarsus white slightly tinged with pale greyish brown. Hind leg with tibia greyish brown on outer side, pale yellowish white on inner side; inner terminal spur shorter than outer; tarsus nearly whitish. Forewing cleft from 2/3; grey suffused with dark brown, especially on 2 lobes and just base of cleft where dark brown scales form a costal triangular patch followed by a white linear patch on costa; just below the above mentioned white costal linear patch of lobe 1, pale yellowish brown mixed with white scales; a white line crossing at about 2/3 of lobe 1; same part of lobe 2 rarely with a white line; white scales mainly scattered from base of wing to before costal triangular patch, on distal part of lobe 1 and slightly on lobe 2. Cilia within cleft white; termen of lobe 1 white with greyish brown bases; cilia around anal angle of lobe 1 and anterior angle of lobe 2 greyish brown; cilia near anterior angle of lobes 2 white with greyish brown bases, the rest cilia of termen of lobe 2 greyish brown; inner margin pale yellowish brown. Hindwing cleft firstly from about 4/9; lobe 1 dilated distally; lobe 3 slender; dark brown. Cilia pale yellowish brown; those around tips of lobes 1 and 2 somewhat darker. Abdomen pale yellowish brown; basal part pale yellowish white; small dark brown dots at subdorsal part on posterior margins of segments 2–5 or 6, but sometimes indefinite; same dots occurring on sides of these segments; ventral surface greyish brown and pale yellowish brown and with pale yellowish white stripes. Length of forewing: 9–10 mm.

Male genitalia: Uncus rather short, slightly extending beyond bottom of incised caudal margin of tegumen, rarely not extending it; tegumen deeply incised at its caudal margin which is variable in shape; vinculum similar to that of the preceding species; basal process of aedeagus stout.

Female genitalia: Closely allied to the preceding species, but weakly sclerotized; antrum of ostium bursae cup-shaped but gradually narrowing towards ductus bursae.

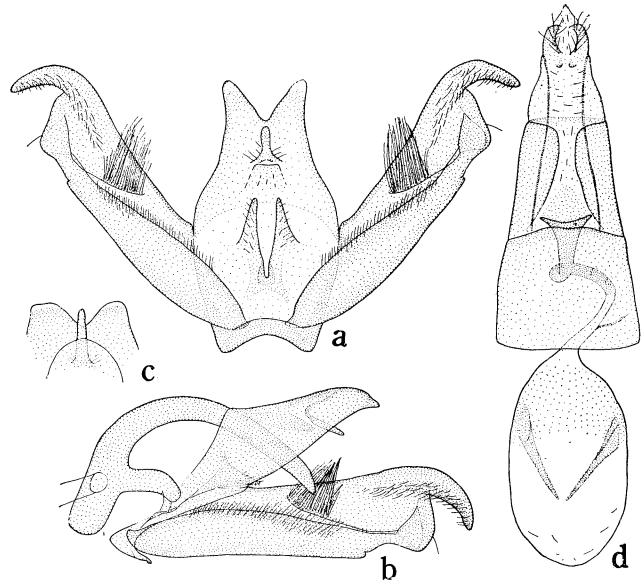

Fig. 18. *Stenoptilia saigusai* n. sp. a, ♂ genitalia, ventral view, excluding aedeagus; b, ditto, lateral view, excluding left valva; c, ditto, caudal end of tegumen; d, ♀ genitalia.

Holotype ♂, Kanayama, Yamanashi Pref., 1. XI. 1958, Saigusa; allotype ♀, Kanayama, Yamanashi Pref., 24. VII. 1960, Yano. Paratypes 1 ♂, Masutomi, Yamanashi Pref., 24. VII. 1957, Saigusa; 2 ♀♀, Kanayama, Yamanashi Pref., 25. VII. 1960, Yano; 3 ♂♂, Karuizawa, Shinano, 7–14. VII. 1959, Morimoto.

DISTRIBUTION: Japan (Honshu).

This species is similar to *S. graphodactyla* (Treitschke) from Europe, but it may be separable from the latter by the following characters: a dark brown patch situated at just base of cleft of forewing; yellowish brown scales almost absent on wings; a space between termen and a subterminal line of forewing less mixed with white scales. I could compare the species with *S. graphodactyla* through the kindness of Dr. H. G. Amsel. This species is somewhat variable in the ♂ genitalia, viz. caudal margin of tegumen moderately pointed or bluntly pointed and uncus extending beyond or before base of incision of caudal margin of tegumen.

Stenoptilia zophodactyla (Duponchel) Fig. 19.

Pterophorus zophodactylus Duponchel, 1838, Hist. Nat. Lép., 11, pl. 314, fig. 4.
Pterophorus loewi Zeller, 1847, Isis **38**: 904.
Pterophorus (*Pterophorus*) *loewi*, Zeller, 1851, Linn. Ent. **6**: 364.
Pterophorus canalis Walker, 1864, Cat. Lep. Het. Brit. Mus. **30**: 944.—Meyrick, 1885, Trans. Ent. Soc. Lond. **1885**: 425.
Adkina zophodactyla, Tutt, 1906, Brit. Lep. **5**: 319.
Stenoptilia zophodactyla, Fletcher, 1909, Spol. Zeyl. **6** (21): 10.—Meyrick, 1910, Gen. Ins. **100**: 19.—Spuler, 1910, Schmett. Eur. **2**: 322.—Meyrick, 1913, Lep. Cat. **17**: 29.—Barnes et Lindsey, 1921, Cont. Nat. Hist. Lep. N. Amer. **4** (4): 354, pl. 42, fig. 16, pl. 49, fig. 15.

Male and ♀: Head with vertex and frons grey with white margins. Labial palpus with basal segment greyish brown and white; segment 2 greyish brown mixed with white distally; segment 3 whitish. Antenna grey mixed with white basally and somewhat tinged with dark brown basally. Occipital fringe whitish on dorsum, greyish brown on sides and below; fringes on dorsum bifurcated (fig. 11). Thorax grey anteriorly, whitish tinged with pale yellowish brown posteriorly. Fore leg with tibia greyish brown on inner side, white on outer side, slightly dilated distally; tarsus with segment 1 white with a greyish brown stripe on inner side, the rest of tarsus white slightly tinged with pale greyish brown on inner side. Mid leg with tibia grey on inner side, white on outer side; tarsus pale grey on inner side, white on outer side.

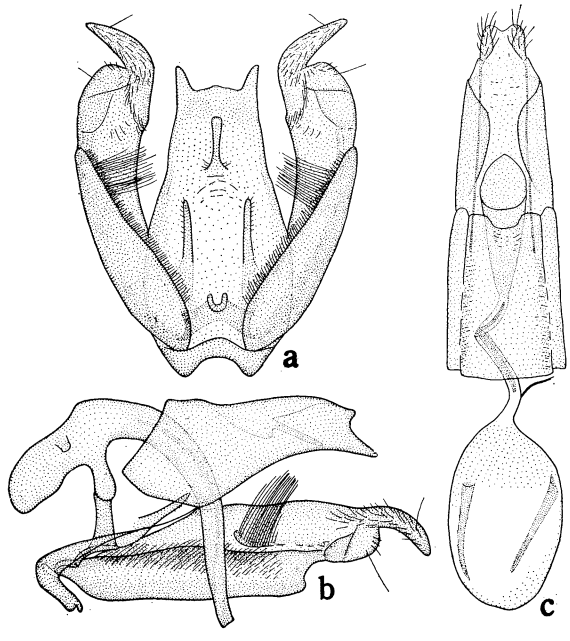

Fig. 19. *Stenoptilia zophodactyla* (Duponchel). a, ♂ genitalia, ventral view, excluding aedeagus; b, ditto, lateral view, excluding left valva: c, ♀ genitalia.

Hind leg with tibia grey slightly tinged with brown on outer side, paler on inner side; tarsus pale greyish brown, paler distally. Forewing cleft from about 3/5; termen of lobe 1 nearly straight; grey with pale brownish tinge; white scales distinctly scattered, especially on basal 1/2 of wing, distal 1/2 of lobe 1 and lobe 2; dark brown scales slightly scattered, somewhat densely along costa where it is dotted by indefinite white spots from base of wing to base of cleft; a dark brown dot at middle between base of wing and base of cleft; a dark brown patch just base of cleft, this patch sometimes extending to costa. Cilia grey; within cleft densely mixed with white; 3 small and short dark brown groups of cilia occurring at extremity of vein R_5, apex and just below apex of lobe 2. Hindwing cleft firstly from about 2/5; greyish brown. Cilia grey tinged with pale brown; short darker cilia occurring around tips of lobes 1 and 2; narrow greyish brown scales scattered along inner margin from base of wing to near middle. Abdomen with segment 1 whitish; from segment 2 to caudal end of abdomen pale yellowish brown slightly mixed with dark brown and white scales. Length of forewing: 9–10 mm.

Male genitalia: Uncus not extending to caudal margin of tegumen; tegumen large, its caudal margin widely incised; vinculum incised roundly; 2 sclerotized arms of juxta rather separated from each other than that of the preceding species, basal bifurcated arm very broad; aedeagus broadened basally, basal process rather short.

Female genitalia: Apophyses posteriores very long; dorsal part of ostium bursae well sclerotized and pointed caudally; caudal margin of abdominal segment 7 waved; 2 signa of corpus bursae very long.

SPECIMENS EXAMINED: 1 ♂, Wakasugiyama, Fukuoka Pref., 28. X. 1958, Yano; 1 ♀, Kanayama, Fukuoka Pref., 25. X. 1959, Yano.

DISTRIBUTION: Japan (Kyushu), Europe, India, Ceylon, Asia Minor, S. Africa, Australia, New Zealand, N. & S. America.

This is the first record of this species from Japan.

Stenoptilia pinarodactyla (Erschoff)

Mimaeseoptilus pinarodactylus Erschoff, 1877, Hor. Soc. Ent. Ross. **12**: 348.

Stenoptilia pinarodactyla, Rebel, 1901, Cat. Lep. Pal. Faun. **2**: 76.—Matsumura, 1905, Cat. Ins. Jap. **1**: 221.—Meyrick, 1910, Gen. Ins. **100**: 19; 1913, Lep. Cat. **17**: 29.—Nohira, 1916, Ent. Mag. (Kyoto) **2** (1): 38.—Inoue, 1955, Check List Lep. Jap. **2**: 116.

DISTRIBUTION: Japan (Hokkaido), Siberia.

Matsumura (1905) listed the species in his "Catalogus Insectorum Japonicum I" without giving the data of the specimens. I would like to leave out the species from the key. According to the description of this species, it seems to be separable from other Japanese species by the absence of darker patches of the forewing.

Stenoptilia emarginata (Snellen) Figs. 20–22.

Pterophorus (*Mimaesoptilus*) *emarginatus* Snellen, 1884, Tijdschr. v. Ent. **27**: 193, pl. 10, fig. 8.

Stenoptilia emarginata, Rebel, 1901, Cat. Lep. Pal. Faun. **2**: 77.—Meyrick, 1910, Gen. Ins. **100**: 19.

Marasmarcha emarginata, Meyrick, 1913, Lep. Cat. **17**: 27.
Stenoptilia nakanensis Matsumura, 1931, 6000 Ill. Ins. Jap., 1058, no. 2083.
Stenoptilia sapporensis Matsumura, 1931, *ibid.*, 1059, no. 2085.
Platyptilia emarginata, Hori, 1936, Mushi **9** (1): 17, pl. 2, figs. 1–7, pl. 3, figs. 1–5.—Fletcher, 1940, Proc. R. Ent. Soc. Lond. (B) **9**: 139.—Inoue, 1955, Check List Lep. Jap. **2**: 116.—Esaki, 1957, Icon. Het. Jap. Col. Nat. **1**: 92, pl. 16, fig. 515.—Inoue, 1959, Icon. Ins. Jap. Col. Nat. Ed. **1**: 258, pl. 173, fig. 28.

Male and ♀: Head with vertex and frons greyish white. Labial palpus slender; pale yellowish white suffused with brown. Antenna greyish tinged with brown towards base above. Occipital fringe pale yellowish white; fringes on dorsum slightly bifurcated at tips, rarely trifurcated, these are shown in fig. 1 i, j and fig. 2g. Thorax greyish on anterior 1/2, white tinged with chrome yellow on posterior 1/2. Fore and mid legs with tibiae brown and white, thickened distally; fore tarsus greyish brown on inner side, white on outer side; mid tarsus white usually mixed with brown on inner side. Hind leg with tibia white on inner side, brown mixed with white scales on outer side, slightly thickened at origins of both spurs; tarsus white on inner side, tinged with brown on outer side. Forewing cleft from about 5/8; pale greyish brown, 2 lobes darker, basal part of wing paler; white scales rather distinctly scattered; 2 dark brown patches at about 1/2 and at about 3/5 between base of wing and base of cleft, the former nearer to inner margin, the latter nearer to costa, these patches usually indefinite; a dark brown patch just before base of cleft but not sharply indicated. Cilia white; apices and anal angles of both lobes and about 3/5 of inner margin greyish brown, anal angle of lobe 2 very widely greyish brown; cilia at a little beyond and a little before base of cleft of inner margin slightly mixed with greyish brown; dark brown scales scattered along inner margin. Hindwing cleft firstly from 1/2; lobe 1 gradually broadening towards apex; pale brown. Cilia pale brownish white. Abdomen with segment 1 pale yellowish white, sometimes heavily tinged with chrome yellow, with a brown stripe on dorsum; the rest segments of abdomen greyish brown with pale yellowish white longitudinal stripes. Length of forewing: 8–12 mm.

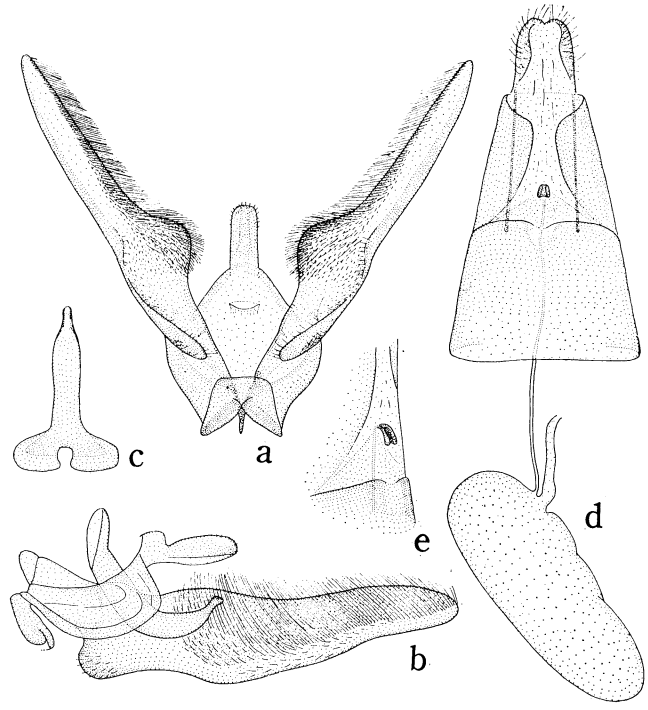

Fig. 20. *Stenoptilia emarginata* (Snellen). a, ♂ genitalia, ventral view, excluding aedeagus; b, ditto, lateral view, excluding left valva; c, ditto, aedeagus; d, ♀ genitalia; e, ditto, sterigma.

Male genitalia: Uncus developed, rather broad arm; tegumen small; vinculum developed, mid-ventral part of it broad; valva rather simple, costa of valva projected roundly at about 2/5; ventral margin of valva towards base forming a projecting area; juxta weakly sclerotized; aedeagus rather short, bent dorsally, constricted at distal end and conspicuously inflated at basal part where a small but distinct incision is situated.

Female genitalia: Sterigma small but heavily sclerotized, situated well beyond caudal end of abdominal segment 7 and protruded as shown in fig. 20e.

SPECIMENS EXAMINED: 1 ♂ (type of *nakanensis*) labelled "Juniso, Tsunoharu, Tokyo, 12–8–1913, S. Hirayama"; 1 ♀ (type of *sapporensis*) labelled "Sapporo, Matsumura, 22/7, 1919"; 6 ♂♂, 3 ♀♀, Kisoagematsu, Nagano Pref., 1–4. VIII. 1961, reared by Yano (host plant: *Lespedeza bicolor* Turcz. var. *japonica* Nakai), and many other specimens from the following localities. HOKKAIDO: Ashoro (VII), Nukabira (VII), Tokachi. HONSHU: Karuizawa (VII), Dokkôzan (VI), Nagano Pref.; Gifu, Gifu Pref. (VIII, IX); Tukigase, Nara Pref. (VI); Makinoosan (VIII), Sayama (VI), Osaka Pref. KYUSHU: Fukuoka (V–IX), Yukuhashi (VIII), Wakasugiyama (VII, VIII), Hikosan (VI, VIII), Inugatake (VII), Fukuoka Pref.; Beppu (VII, VIII), Sobosan (V–IX), Oita Pref.; Tomioka, Amakusa (VI, IX); Kirishima, Kagoshima Pref. (VII).

DISTRIBUTION: Japan (Hokkaido, Honshu, Kyushu), Kuril Is., Korea, China, Amur.

There are 2 forms, large and small, in the present species from Japan, but the difference

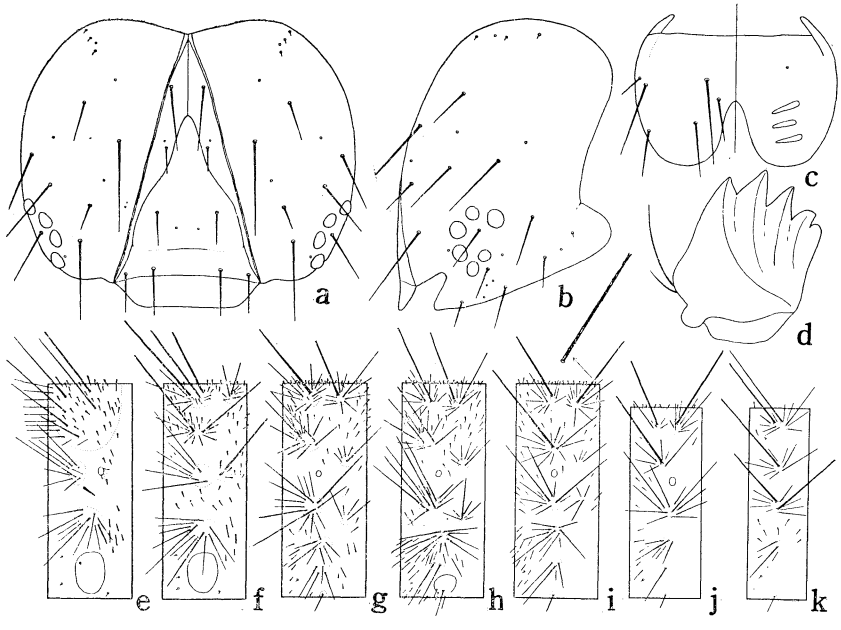

Fig. 21. *Stenoptilia emarginata* (Snellen), mature larva. a, head, frontal view; b, ditto, lateral view; c, labrum, with epipharyngeal surface on right; d, mandible; e–k, chaetotaxies of pro-, mesothorax, abdominal segments 1, 3, 7, 8 and 9.

between them is very slight. The above mentioned description is based on the large form. The small form differs from the large form as mentioned below: head with frons nearly pale yellowish white; mid leg with tarsus white, slightly mixed with brown on inner side of segment 1, the rest of tarsus usually without brown tinge even on inner side; hind leg with tibia white on inner side, pale brown on outer side; tarsus nearly white; forewing somewhat paler than large form; abdomen nearly whitish, sometimes mixed with pale brown.

Mature larva: Head with adfrontal area extending to vertical triangle which is very shallow; frontal suture nearly straight; fronto-clypeal area (excluding anteclypeus) slightly longer than wide; ocelli I, III and IV slightly larger than the others; seta AF2 conspicuously dorsad from dorsal end of fronto-clypeal area; P1 slightly dorsad from the level of AF1; A2 remote from A1 and nearer to Aa than A1. Labrum with an acute, deep median incision; M3 nearly equidistant from M2 and ventral margin of labrum; La3 slightly ventrad from the level of M3. Mandible with 5 teeth; inner-most one blunt. Thorax and abdomen with long secondary setae which are slightly forked at tips and with numerous short secondary setae which are blunt and inflated at tips; long setae occurring from verrucae and barbed very indistinctly (fig. 21i); short setae scattered and somewhat mixed with rather long setae; brown short setae longitudinally arranged rather densely on dorsum of thorax and abdomen. Spiracles on prothorax protruded. Proleg long, slender. Crochets of ventral proleg 9–10; those of anal proleg 11. Length: 11 mm. Head width: 0.8. The larva of this species has some distinct characters as follows: frontal suture nearly straight; labrum with a deep median incision; short brown setae on dorsum of thorax and abdomen.

Pupa: Pale yellowish white, somewhat tinged with pale yellowish green. Greatest width of body at mesothorax; cephalic end of body not projected. Head with pilifers somewhat elevated; boundary line between both eye-pieces indistinct; basal part of maxilla rather long exposed, then overlaid by fore leg and never exposed at its distal part. Thorax with some short setae which are inflated apically; fore leg extending beyond distal end of antenna; both mid legs never in contact with each other; hind leg exposed for a long distance of its length beyond distal end of fore leg and extending slightly beyond distal end of mid leg; wing not extending to distal end of mid leg but nearly reaching it; caudo-lateral end of exposed hindwing extending slightly before caudal margin of abdominal segment 2. Meso-, metathorax and abdomen with 2 longitudinal ridges on dorsum, those on meso-, metathorax and abdominal segments 1–3 distinct, those on abdominal segments 6–8 weak; abdominal segments 2–8 with a barbed spine on each ridge, the spine divided dorsally into 2 parts which are directed cephalad and caudad; abdominal segment 1 with a minute barbed spine on each ridge; abdominal segments 8 and 9 without barbed spines but with long setae; boundary line between abdominal segments 9 and 10 very indistinct. Length: 10–12 mm. Width: 2. This pupa is rather peculiar as

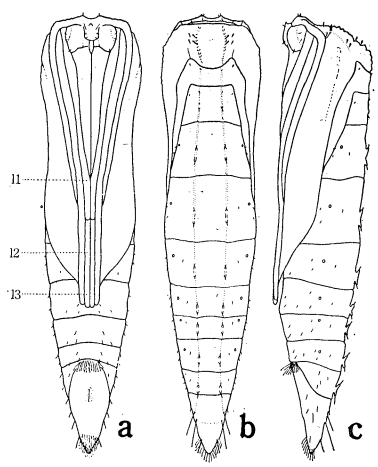

Fig. 22. *Stenoptilia emarginata* (Snellen), pupa, ♂. a, ventral view; b, dorsal view; c, lateral view.

mentioned below: distal part of maxilla not exposed; both mid legs not in contact with each other; hind leg long exposed; thorax with short peculiar setae.

Biological notes: Hori (1936 c) recorded the early stages of this species based on the materials reared from *Lespedeza cuneata* G. Don. I observed the early stages and described them in the present paper based on the materials reared from *Lespedeza bicolor* Turcz. var. *japonica* Nakai. The larva feeds on the leaf of the host plant and pupates on the under surface of a leaf, very rarely on the upper surface. The pupa directs to the petiole. The adult appears from May to September.

Host plants: *Lespedeza bicolor* Turcz. var. *japonica* Nakai, *Lespedeza cuneata* G. Don.

Stenoptilia cretalis (Meyrick), n. comb. Figs. 23–26.

Platyptilia cretalis Meyrick, 1908, Trans. Ent. Soc. Lond. **1907**: 487; 1910, Gen. Ins. **100**: 12; 1913, Lep. Cat. **17**: 15.—Nohira, 1916, Ent. Mag. (Kyoto) **2** (1): 37.—Hori, 1934, Mushi **7** (1): 21; 1950, Icon. Ins. Jap. (rev. ed.), 500, fig. 1363.—Inoue, 1955, Check List Lep. Jap. **2**: 117.—Esaki, 1957, Icon. Het. Jap. Col. Nat. **1**: 91, pl. 16, fig. 508.—Inoue, 1959, Icon. Ins. Jap. Col. Nat. Ed. **1**: 258, pl. 173, fig. 27.

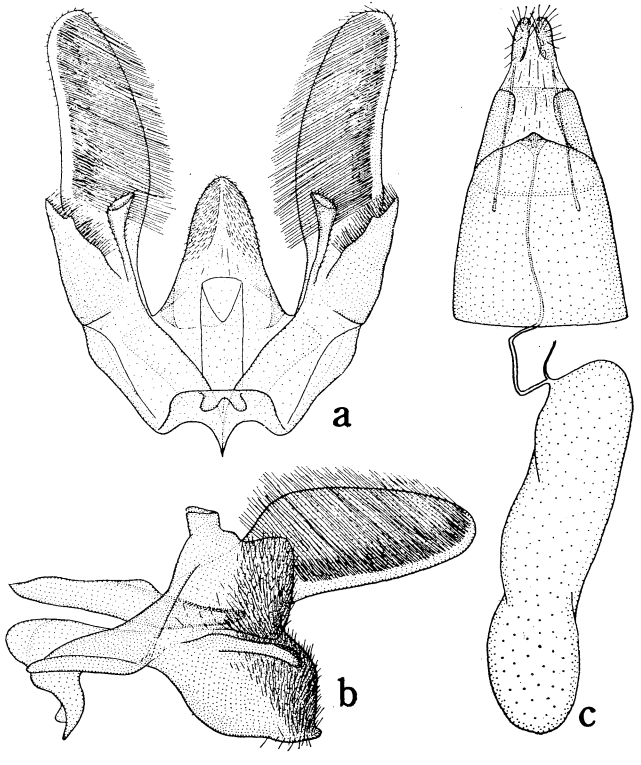

Fig. 23. *Stenoptilia cretalis* (Meyrick). a, ♂ genitalia, ventral view, excluding aedeagus; b, ditto, lateral view, excluding left valva; c, ♀ genitalia.

Stenoptilia kiiensis Matsumura, 1931, 6000 Ill. Ins. Jap., 1058, no. 2082.

Length of forewing: 9–12 mm.

Male genitalia: Uncus large, broad and hairy; tegumen small; vinculum with a bifurcated small process at caudal margin of mid-ventral part; valva with a large, broad process at caudal end of sacculus; a sclerotized arm situated at base of this process, this arm broadened apically; aedeagus short, stout and nearly straight.

Female genitalia: Sterigma small and sclerotized, situated at caudal end of abdominal segment 7.

SPECIMENS EXAMINED: 1 ♂ (type of *kiiensis*) labelled "Kii, 22–VII, 1913, Issiki"; 9 ♂♂, 7 ♀♀, Tachibanayama, Fukuoka Pref., 4–21. VII. 1960, reared by Yano (host plant: *Desmodium racemosum* DC.), and many other specimens from the following localities. KYUSHU: Fukuoka (V–IX), Tachibanayama (V, VI), Wakasugiyama (V, VII), Hikosan (VIII), Fukuoka Pref.; Sobosan, Oita Pref. (VII, VIII); Izuhara, Tsushima (VII).

DISTRIBUTION: Japan (Honshu, Kyushu, Tsushima).

The species is easily recognized by its whitish colour among the Japanese species of this genus. The specimen figured by Matsumura (1931) under the name *cretalis* is a quite different one from this species. It seems to be *Platyptilia farfarella* (Zeller) or its allied species.

Mature larva: Head pale yellowish white, rarely with patches; adfrontal area extend-

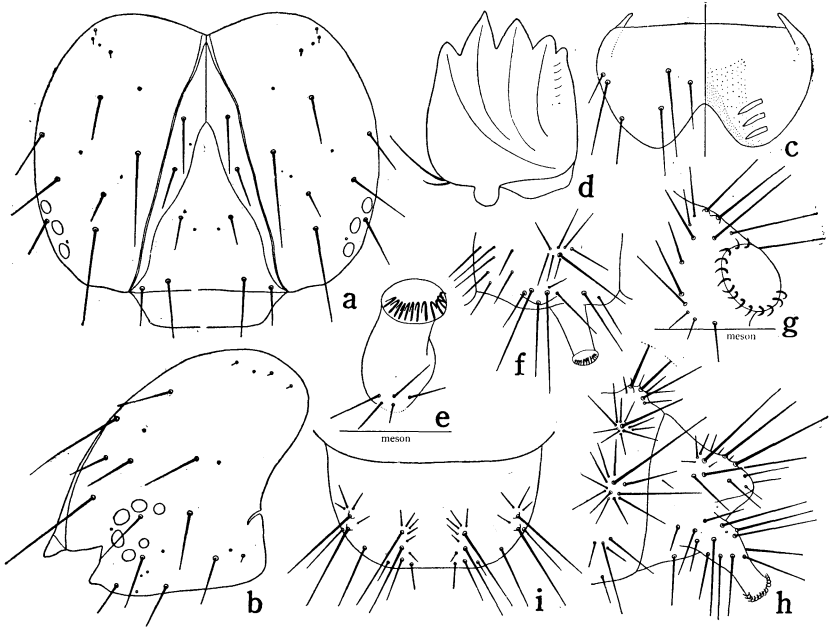

Fig. 24. *Stenoptilia cretalis* (Meyrick), mature larva. a, head, frontal view; b, ditto, lateral view; c, labrum, with epipharyngeal surface on right; d, mandible; e, left ventral proleg of abdominal segment 6, ventral view; f, ditto, lateral view; g, left anal proleg, ventral view; h, abdominal segments 9 and 10, lateral view; i, abdominal segment 10, dorsal view.

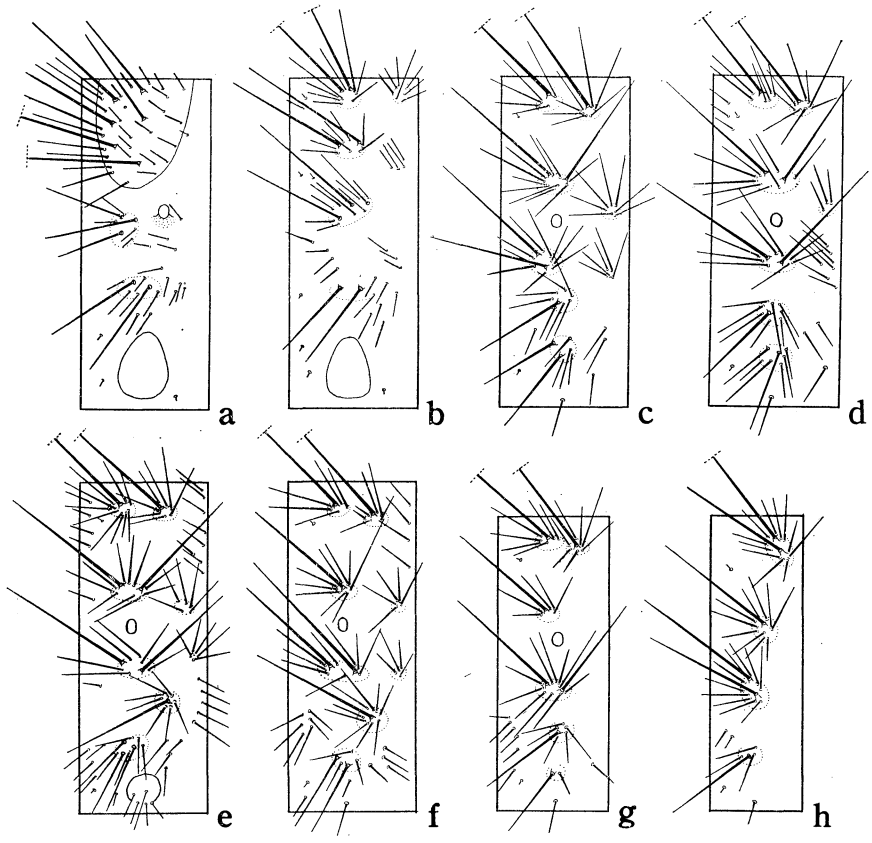

Fig. 25. *Stenoptilia cretalis* (Meyrick), chaetotaxy of mature larva. a–h, pro-, mesothorax, abdominal segments 1, 2, 3, 7, 8 and 9.

ing to vertical triangle which is very shallow; fronto-clypeal area (excluding anteclypeus) slightly longer than wide; ocellus VI smaller than the others; seta AF2 somewhat variable in position, slightly dorsad from the level of dorsal end of fronto-clypeal area; P1 dorsad from the level of AF1; A1 remote from ventral margin of head; A2 dorsad from the level of F1; Aa nearly equidistant from A2 and P1; P2 dorsad from the level of AF2; O1 approximate to ocellus II. Labrum with a rather deep median incision; M3 nearly equidistant from M2 and ventral margin of labrum. Mandible very broad, slightly longer than wide; inner 2 of 5 teeth blunt. Thorax and abdomen with long secondary setae from verrucae and with some scattered secondary setae which are blunt apically on prothoracic shield. Proleg slender. Crochets of ventral proleg 9–11; those of anal proleg 14–16. Length: 10–12 mm. Head width: 0.72.

Pupa: Cephalic end of body not projected. Head with pilifers rather distinctly indicated; labial palpus minute; distal part of maxilla not exposed. Both mid legs in contact with each other for some distance of their length; hind leg distinctly exposed beyond contacted part of mid leg and its distal end extending beyond distal end of mid leg; wing

extending fairly before distal end of mid leg; spiracle slightly protruded. Head, basal part of antenna and thorax bearing many long setae; fore leg with a row of minute setal projections; wing with some rows of setae. Meso-, metathorax and abdominal segments 1–3 with 2 longitudinal ridges on dorsum, these ridges with long setae; abdominal segments 4–8 with a spinous projection on each side, from which long setae occur; abdominal segments 9 and 10 without such projections but bearing long setae; remainder of setae on abdomen rather long. Length: 10–11 mm. Width: 2. This pupa is somewhat allied to those of *Sphenarches anisodactylus* (Walker), *Procapperia pelecyntes* (Meyrick) and *Trichoptilus wahlbergi* (Zeller) mainly according to their long setae on body but distinguished from them by the following points: distal part of maxilla not exposed; wing extending fairly before distal end of mid leg; fore leg extending beyond distal end of antenna.

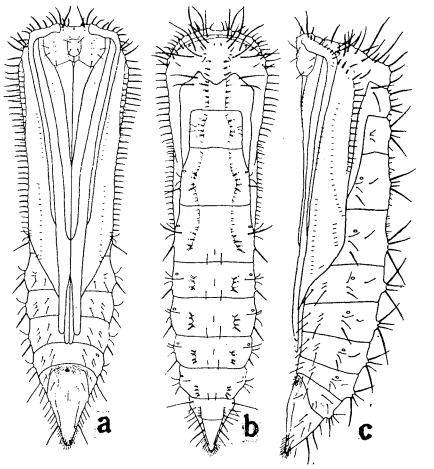

Fig. 26. *Stenoptilia cretalis* (Meyrick), pupa, ♂. a, ventral view; b, dorsal view; c, lateral view.

Biological notes: The larva eats the sprout, terminal young leaf and usually the terminal stem of the host plant. The pupa attaches itself to the under surface of the midrib of a leaf and directs to the base of a leaf. The moth is captured from May to September.

Host plant: *Desmodium racemosum* DC.

Stenoptilia dissipata Yano, n. sp. Figs. 15d, 27.

Male and ♀: Head with vertex and frons brown. Labial palpus pale yellowith white mixed with dark brown. Antenna pale yellowish white with a greyish brown line above. Occipital fringe yellowish brown or pale yellowish white; fringes on dorsum conspicuously bifurcated as shown in fig. 1 p, u, v. Thorax greyish brown, paler posteriorly. Tibiae of fore and mid legs pale yellowish white with a dark brown stripe, the latter moreover mixed with greyish brown scales, thickened at their ends; tarsus of fore leg pale yellowish white with a greyish brown stripe, mid leg with a dark brown stripe basally. Hind leg with tibia dark brown mixed with white scales on outer side, pale yellowish white on inner side; tarsus white except for outer side of segment 1. Forewing cleft from about 3/5; termen of lobe 1 nearly straight; lobe 2 broadening towards termen; greyish brown, somewhat darker on distal 1/2 of wing; white scales scattered rather conspicuously; 2 indefinite dark brown patches at about 1/3 and 1/2 between base of wing and base of cleft, the former nearer to inner margin, the latter slightly nearer to costa, these patches sometimes almost invisible; a dark brown patch just before base of cleft but usually not sharply indicated; a white line crossing lobe 1 at 2/3, the same part of lobe 2 with a very indefinite white line; white linear patches on costa at 1/4 and between white line and apex. Cilia white; those just before anal angles of both lobes, anterior angle of lobe 2 greyish brown; tufts of short, dark brown scales situated at anal angles of both lobes and anterior angle of lobe 2, the tuft of anal angle of lobe 2 sometimes connected with greyish

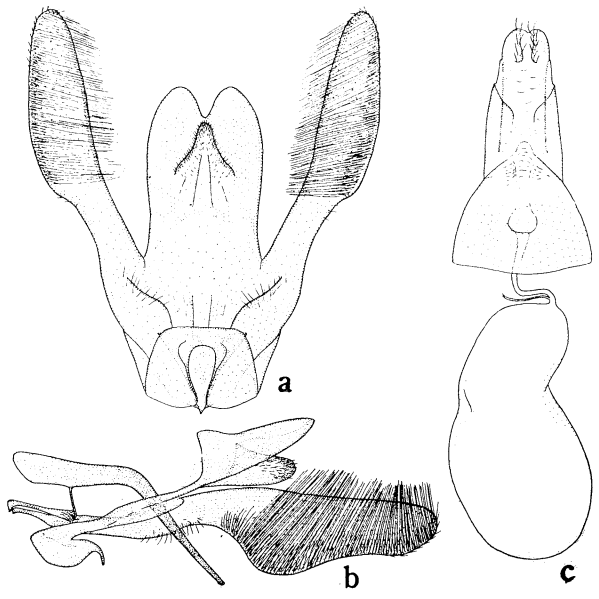

Fig. 27. *Stenoptilia dissipata* n. sp. a, ♂ genitalia, ventral view, excluding aedeagus; b, ditto, lateral view, excluding left valva; c, ♀ genitalia.

brown cilia just before angle; cilia within cleft straight mixed with dark brown scales; 2 small dark brown scale tufts before and beyond base of cleft on inner margin, and some other dark brown scales scattered on inner margin. Hindwing cleft firstly from about 3/7; lobe 2 nearly equal in width on basal 2/3, then narrowing to apex; lobe 3 slender; greyish brown. Cilia brownish white; inner margin of lobe 3 slightly scattered with greyish brown scales mainly on basal 2/3, but these scales usually very few in number and indefinite. Abdomen greyish brown with basal part pale yellowish white; ventral surface greyish brown with pale yellowish white longitudinal stripes. Sometimes abdomen nearly pale yellowish white. Length of forewing: 7–10 mm.

Male genitalia: Tegumen large, its caudal margin incised rather deeply; at ventral side of tegumen a hairy and weakly sclerotized organ situated; vinculum developed, somewhat similar to that of *S. emarginata* (Snellen); valva simple, constricted at about middle of its length; juxta weakly triangularly sclerotized and with a flat short arm which is connected with aedeagus; aedeagus slender, gradually broadened towards base.

Female genitalia: Ostium bursae situated nearer to cephalic end of abdominal segment 7 than to caudal end of it and opened somewhat broadly; ductus bursae rather short.

Holotype ♂, Tachibanayama, Fukuoka Pref., 25. IX. 1960, Yano; allotype ♀, Tachibanayama, Fukuoka Pref., 25. V. 1958, Yano. Paratypes 1 ♂, Uenoharamachi, Yamanashi Pref., 6. IX. 1959, Saigusa; 1 ex., Hikosan, Buzen, 12. VIII. 1933, Esaki; 1 ♀, Hikosan, Fukuoka Pref., 15. VII. 1958, Yano; 1 ♀, Wakasugiyama, Chikuzen, 22. V. 1929, Hori; 3♀♀. *ibid.*, 31. VII–4. VIII. 1934, reared by Hori; 1 ♀, Takanabe, Miyazaki Pref., 13. VI. 1960, Yano.

DISTRIBUTION: Japan (Honshu, Kyushu).

This new species is somewhat allied to *S. saigusai* n. sp., but it is easily separated from the latter by having the slender labial palpus and not projecting frons. It is also allied to *Platyptilia rhynchophora* Meyrick, *P. insularis* Walsingham from Hawaii so far as recognized from the original descriptions and figures and to *P. taprobanes* (Felder), but it is distinguished from the former 2 species by the absence of darker patches before subterminal lines on both lobes of forewing and by the presence of dark brown scales on termens of both lobes of forewing, and it is easily separated from *P. taprobanes* by the absence of a dark brown costal triangular patch before base of cleft and by the absence of dark brown

scales before apex of inner margin of lobe 3 of hindwing.

Genus **Platyptilia** Hübner

Platyptilia Hübner, 1826, Verz. bek. Schmett., 429.—Fernald, 1898, Pter. N. Amer., 22.—Tutt, 1906, Brit. Lep. **5**: 182.—Fletcher, 1909, Spol. Zeyl. **6** (21): 11.—Meyrick, 1910, Gen. Ins. **100**: 9.—Spuler, 1910, Schmett. Eur. **2**: 319.—Meyrick, 1913, Lep. Cat. **17**: 10.—Barnes et Lindsey, 1921, Cont. Nat. Hist. Lep. N. Amer. **4** (4): 308.—Forbes, 1923, Lep. N. Y. Neighb. St., 642.—Pierce et Metcalfe, 1938, Gen. Brit. Pyr. Delt. Plume, 47, pl. 26.—Lange, 1950, Hilgardia **19** (19): 568.

Amblyptilia Hübner, 1826, *ibid.*, 430.—Tutt, 1906, *ibid.*, 268.—Spuler, 1910, *ibid.*: 321.—Pierce et Metcalfe, 1938, *ibid.*, 46, pl. 26.

Platyptilus Zeller, 1841, Isis **10**: 764.

Cnaemidophorus Wallengren, 1859, Skand. Fjäderm., 10.

Sochchora Walker, 1864, Cat. Lep. Het. Brit. Mus. **30**: 952.

Eucnaemidophorus Wallengren, 1881, Ent. Tidsk. **2**: 96.—Pierce et Metcalfe, 1938, *ibid.*, 46, pl. 26.

Gilbertia Walsingham, 1891, Ent. Month. Mag. **27**: 259.

Crocydoscelus Walsingham, 1897, Trans. Ent. Soc. Lond. **1897**: 35.

Gillmeria Tutt, 1905, Ent. Rec. **17**: 37; 1906, Brit. Lep. **5**: 219.

Fredericina Tutt, 1905, Ent. Rec. **17**: 37; 1906, Brit. Lep. **5**: 160.

Eucnemidophorus Tutt, 1906, Brit. Lep. **5**: 254.

Type species: *Alucita gonodactyla* Denis et Schiffermüller.

Frons smooth or projecting forwards or rarely forming a conical tuft. Labial palpus moderate or long. Occipital fringe various, viz. simple, bifurcated or trifurcated. Inner spur of mid tibia usually longer than outer, very rarely equal. Inner medial spur of hind tibia longer than outer, rarely equal or very rarely shorter; inner terminal spur of hind tibia longer than outer, rarely equal. Forewing bifid; lobe 1 dilated towards termen; anal angles of both lobes rather distinct than *Stenoptilia*. Fore- and hindwings with the same venation as *Stenoptilia*. Frenulum in ♀ simple. Cilia of lobe 3 of hindwing usually with developed dark scales which often form a conspicuous scale tuft. Lobe 3 of hindwing usually moderate, very rarely linear.

Male genitalia: Uncus narrow but stout, pointed and bent ventrally; tegumen large, more distinctly sclerotized than that of *Stenoptilia*; vinculum developed mid-ventrally, usually incised at its cephalic end, caudal margin sometimes incised or rarely projected; mid-ventral part of vinculum showing a useful specific difference; valva usually simple; juxta with a pair or 2 pairs of pointed arms caudally (this structure is the same one which I called anellus in 1960); aedeagus usually conspicuously bent ventrally, rarely almost straight, and usually with a basal process which is connected with juxta and rarely situated beyond middle from base of aedeagus; dorsal part of tuba analis rarely sclerotized.

Female genitalia: Papilla analis rarely sharply pointed; apophyses posteriores developed, its cephalic end sometimes provided with a useful specific character; apophyses anteriores short, rarely absent or well developed; ostium bursae usually situated at caudal end of mid-ventral part of abdominal segment 7, sometimes situated well beyond caudal end of abdominal segment 7 and rarely on right side; sterigma sometimes developed; ductus bursae

usually broad and heavily sclerotized towards ostium bursae; corpus bursae with scobinations at caudal 1/2 and with 2 developed signa, rarely without them; ductus seminalis departed from caudal end of corpus bursae.

This is the largest genus from Japan and is closely related to *Stenoptilia*. These genera had not been clearly separated from each other in some species until now. This genus contains rather various species in some structures of the adult, but it is distinguished from *Stenoptilia* by the characters mentioned in the key. Dark scales of lobe 3 of the hindwing is an important specific character. Male genitalia of *P. ignifera* Meyrick, *P. taprobanes* (Felder), *P. sythoffi* Snellen and *P. rhododactyla* (Den. et Schiff.) and the ♀ genitalia of the latter 2 species are peculiar among the species of the genus. Sixteen species occur in Japan, 5 of which are described as new in the present paper.

Key to Japanese species of Platyptilia

1. Inner margin of lobe 3 of hindwing with a scale tuft at middle or before it or without a distinct scale tuft 2
   Inner margin of lobe 3 of hindwing with a distinct scale tuft between 2/3 from base of wing and apex; when the scale tuft somewhat obscure, frontal tuft strong 9
2 (1). Inner margin of lobe 3 of hindwing with a scale tuft at middle or before it..... 3
   Inner margin of lobe 3 of hindwing without a scale tuft; when very obscurely indicated, a narrow subterminal line crossing both lobes of forewing 7
3 (2). Forewing with a dark brown triangular costal patch just before base of cleft ... 4
   Forewing without a distinct triangular costal patch..... 6
4 (3). Length of forewing 13–15 mm; lobe 3 of hindwing with its broadest width at 2/5, then narrowing to apex; a dark brown scale tuft situated at 3/7 of lobe 3 of hindwing, from it to apex dark brown scales continuously occur; ♂ genitalia with sacculus distinctly folded towards distally and arms of juxta rather broad..... **sinuosa**
   Length of forewing 7–12 mm; lobe 3 of hindwing nearly equal in width through its length, slightly broadened at about middle; ♂ genitalia with sacculus not distinctly folded towards distally and arms of juxta distinctly pointed..... 5
5 (4). Ground colour of forewing greyish brown scattered with white scales; ♂ genitalia with caudal margin of vinculum moderately incised mid-ventrally; ♀ genitalia with papilla analis bearing long hairs and cephalic end of apophyses posteriores not inflated ..... **farfarella**
   Ground colour of forewing usually pale yellowish white suffused with brown; ♂ genitalia with caudal margin of vinculum forming 2 extremely pointed projections mid-ventrally; ♀ genitalia with papilla analis bearing minute hairs, very slightly mixed with long hairs and cephalic end of apophyses posteriores distinctly inflated..... **ainonis**
6 (3). Male genitalia with caudal margin of tegumen very shallowly incised and arms of juxta distinctly pointed ..... **isodactyla**
   Male genitalia with caudal margin of tegumen deeply incised and arms of juxta blunt..... **profunda**
7 (2). Frons with a long conical tuft; forewing without a triangular costal patch;

length of forewing 12–14 mm ..... **sachalinensis**
Frons with a short tuft; forewing with a dark brown triangular costal patch just before base of cleft 8
8 (7). Forewing greyish brown, partly dark brown and heavily mixed with white scales especially near termens of both lobes ..... **optata**
Forewing pale yellowish brown suffused with dark brown partly and without white scales ..... **montana**
9 (1). Lobe 3 of hindwing linear; head, thorax and abdomen with lemon yellow scales distinctly ..... **sythoffi**
Lobe 3 of hindwing not linear; lemon yellow scales never found 10
10 (9). Scale tuft on inner margin of lobe 3 of hindwing situated at apex or just before apex 11
Scale tuft on inner margin of lobe 3 of hindwing situated at 2/3 or 4/7 from base 14
11 (10). Length of forewing 12–13 mm; lobe 3 of hindwing brown on anterior margin and distal 1/3, the rest part distinctly white ..... **rhododactyla**
Length of forewing 7–10 mm; lobe 3 of hindwing without white area or scales...12
12 (11). Frons smooth; tibiae with large scale tufts ..... **ignifera**
Frons slightly projecting; tibiae without distinct scale tufts, at least somewhat thickened at origins of spurs 13
13 (12). Lobe 2 of hindwing broad, nearly equal in width to lobe 1; ♂ genitalia with valva not specialized ..... **bella**
Lobe 2 of hindwing slender, especially distal part narrow; ♂ genitalia with valva specialized, viz. distinct cucullus and valvula found ..... **taprobanes**
14 (10). Frons with a long conical tuft reaching distal end of labial palpus; forewing without a distinct triangular costal patch; scale tuft on inner margin of lobe 3 of hindwing not well developed ..... **scutata**
Frons somewhat projecting forwards, not reaching distal end of labial palpus; forewing with a distinct triangular costal patch just before base of cleft; scale tuft on inner margin of lobe 3 of hindwing well developed 15
15 (14). Metathorax nearly black on anterior margin, greyish brown on mid-dorsally and distinctly white on other parts; costal margin of forewing distinctly dotted with white; length of forewing 10–11.5 mm ..... **japonica**
Metathorax brownish on anterior part, whitish on posterior part; costal margin of forewing not distinctly dotted with white; length of forewing 8–10 mm ..... **jezoensis**

Platyptilia farfarella (Zeller) Figs. 3c, 4g, 28–31.

Platyptilus farfarellus Zeller, 1867, Stett. Ent. Zeit. **28**: 334.
Pterophorus (*Platypt.*) *farfarellus*, Zeller, 1870, *ibid.* **31**: 310.
Platyptilia farfarella, Rebel, 1901, Cat. Lep. Pal. Faun. **2**: 72.—Meyrick, 1910, Gen. Ins. **100**: 11; 1913, Lep. Cat. **17**: 14.
Platyptilia (*Platyptilia*) *farfarella*, Spuler, 1910, Schmett. Eur. **2**: 320.
Platyptilia gonodactyla, Hori (*nec* Denis et Schiffermüller), 1934, Bull. Kagoshima Imp. Coll. Agr. For., Ded. 25th Anniv. **1**: 120.—Inoue, 1955, Check List Lep. Jap. **2**: 115.

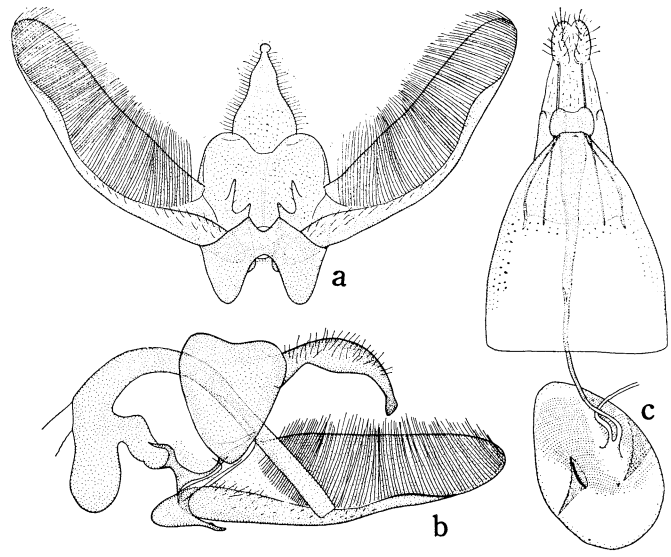

Fig. 28. *Platyptilia farfarella* (Zeller). a, ♂ genitalia, ventral view, excluding aedeagus ; b, ditto, lateral view, excluding left valva ; c, ♀ genitalia.

—Esaki, 1957, Icon. Het. Jap. Col. Nat. **1** : 90, pl. 16, fig. 505.—Inoue, 1959, Icon. Ins. Jap. Col. Nat. Ed. **1** : 257, pl. 173, fig. 24.

Male and ♀ : Occipital fringes on dorsum not furcated as shown in fig. 1c, mixed with furcated ones as shown in fig. 1 k–m. Length of forewing : 7–11 mm.

Male genitalia : Uncus stout, constricted just before caudal end ; caudal margin of vinculum moderately incised mid-ventrally, cephalic margin with a deep incision and distance between both cephalic and caudal incisions very short ; aedeagus long, basal process stout.

Female genitalia : Apophyses posteriores long, not inflated at its cephalic end, in European specimens slightly inflated ; apophyses anteriores very short ; 2 small elliptical lobes situated at caudal side of ostium bursae ; ostium bursae opened at caudal end of abdominal segment 7 ; ductus bursae gradually narrowing towards corpus bursae ; 2 signa rather broad basally.

SPECIMENS EXAMINED : 3 ♂♂, 4 ♀♀, Makinoosan, Osaka Pref., 1–14. IX. 1959, reared by Yano (host plant : *Erigeron canadensis* L.) ; 9 ♂♂, 12 ♀♀, Fukuoka, Fukuoka Pref., 30. V–10. VI. 1959, reared by Yano (host plant : *Calendula arvensis* L.) ; 25 ♂♂, 26 ♀♀, Wakasugiyama, Fukuoka Pref., 26–27. X. 1957, Yano, and many other specimens from the following localities. HONSHU : Todai, Nagano Pref. (VIII) ; Sakai, Osaka Pref. (X). KYUSHU : Fukuoka (IV–XI), Tachibanayama (VI, X), Kanayama (X), Wakasugiyama (IX), Hikosan (VIII), Fukuoka Pref. ; Sobosan, Oita Pref. (VI, VII) ; Miyazaki (III, VI, X) ; Kagoshima (X, XI).

DISTRIBUTION : Japan (Hokkaido, Honshu, Shikoku, Kyushu), Europe.

This species has been treated in Japan under the name *P. gonodactyla* (Den. et Schiff.). After examining the species compared with *farfarella* and *gonodactyla* both from Europe, I am convinced that the species which has been treated as *gonodactyla* in Japan is best regarded as *farfarella.* I don't know whether the species listed by Inoue (1955) under the name *farfarella* is identical to the present species or not. The identification mentioned above was possible through the kindness of Dr. H. G. Amsel and Dr. L. Bigot who sent the European specimens of these species. The specimens reared from *Erigeron canadensis* L. are distinctly small and usually have pale greyish brown or brownish white ground colour in the forewing.

Mature larva: Head dark brown; vertical triangle shallow; fronto-clypeal area narrow; ocelli rather small; seta AF1 remote from AF2; P1 distinctly dorsad from the level of AF1; O1 approximate to ocellus II; Pb variable in position, usually dorsad from the level of AF2, sometimes ventrad; V2 slightly mesad from a line joining Va and V3, rarely laterad. Labrum with a distinct median incision; La3 slightly ventrad from the level of M3. Mandible with 5 teeth; inner 2 small and blunt. Thorax and abdomen with numerous minute secondary setae in addition to primary setae and with numerous scattered minute spinous scobinations; L group of abdominal segments 1–7 with 4 or rarely 5 setae; abdominal segment 10 with many long setae; secondary setae scarce in number on prothorax and abdominal segments 8–10; setae on thorax and abdomen from pale brown pinacula which are not heavily sclerotized except for prothoracic shield and dorsal pinaculum of abdominal segment 9; anal plate pale yellowish brown; D1 and D2 of metathorax with a

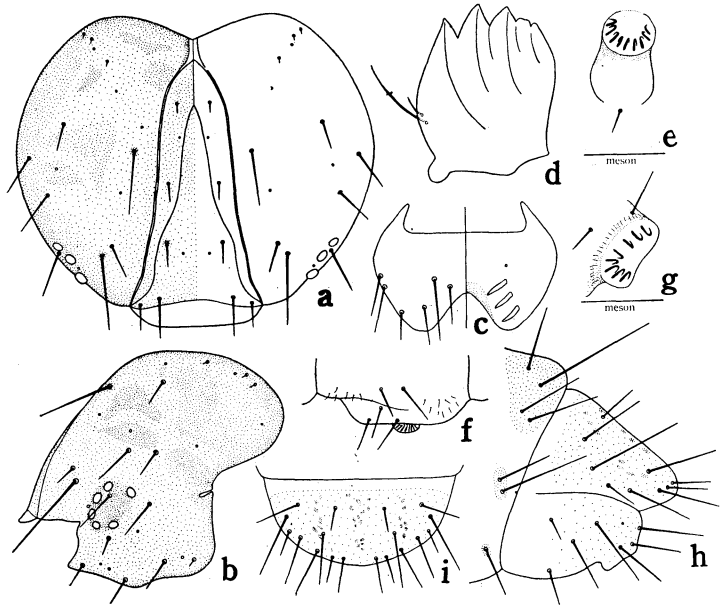

Fig. 29. *Platyptilia farfarella* (Zeller), mature larva. a, head, frontal view; b, ditto, lateral view; c, labrum, with epipharyngeal surface on right; d, mandible; e, left ventral proleg of abdominal segment 3, ventral view; f, ditto, lateral view; g, left anal proleg, ventral view; h, abdominal segments 9 and 10, lateral view; i, abdominal segment 10, dorsal view.

separated pinaculum, rarely with a common one; abdominal segment 8 with 2 transverse pinacula on dorsum from which D1 and D2 occur; abdominal segment 9 with a large transverse pinaculum on dorsum. Spiracles not protruded; those on prothorax and abdominal segment 8 larger than those on other abdominal segments. Proleg rather short. Crochets of ventral proleg 8–11, rarely 7 or 12; those of anal proleg 7–10. Length: 8–10 mm. Head width: 0.86.

Pupa: Pale yellow, slightly tinged with pale yellowish brown. Body rather short, greatest width at mesothorax, slightly constricted at abdominal segment 1 or 2 and again somewhat expanded at abdominal segment 3. Head and thorax rugged. Head with clypeolabral area rather pointed cephalad; eye rugged; distal part of maxilla narrowly exposed; basal part of antenna distinctly roughly rugged. Fore leg fairly long; mid legs slightly in contact with each other for a very short distance of their length beyond distal end of fore leg but again separated distally; hind leg exposed, slightly beyond distal end of mid leg; wing not extending to distal end of mid leg. Abdomen without long setae or barbed spines; cephalic mass of hooked setae on abdominal segment 10 consisting of only 4 setae and these setae from a rounded prominence; proleg scar discernible; abdominal segment 8 with a slight slit-like genital opening in ♀ in addition to a distinct one of abdominal segment 10. Length: 8–10 mm. Width: 2. The pupa of this species is differentiated from those of other species of *Platyptilia* by a rounded prominence which bears only 4

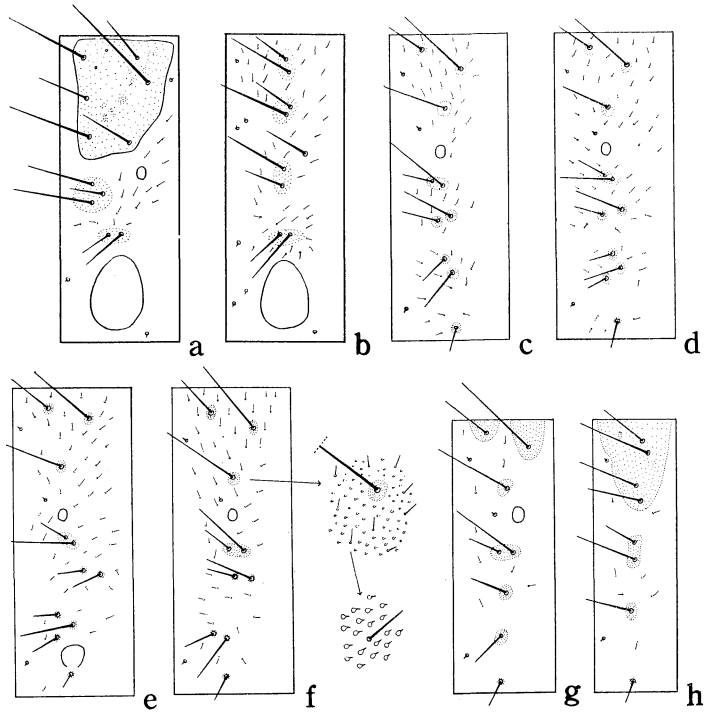

Fig. 30. *Platyptilia farfarella* (Zeller), chaetotaxy of mature larva. a-h, pro-, mesothorax, abdominal segments 1, 2, 3, 7, 8 and 9.

hooked setae on cephalic end of abdominal segment 10 and slightly contacted mid legs.

Biological notes: As the host plant of this species, various species of Compositae were recorded from Japan. Hori (1934b) wrote a paper on the present species, in which he arranged the past records on the biological notes on this species and gave his observations. I observed the life history of this species to feed on *Calendula arvensis* L. and *Erigeron canadensis* L. The larva bores into the flower-bud, flower, terminal end of the stem or the fork of stems of the former host plant. When the larva bores into the stem, it makes a tunnel which is 20–30 mm in length. In the latter host plant, the larva bores into the terminal end of the stem and also makes a short tunnel, the part occupied by the larva is slightly expanded. The larva pupates within the stem or flower of these plants. I observed one ♀ adult ovipositing the egg on the under surface of the distal part of a leaf of *Calendula arvensis* L., while it has been said that the eggs are laid on the flower-bud and stem. The moths emerged from *Erigeron canadensis* L. are evidently smaller than those from *Calendula arvensis* L. The moth appears from April to November.

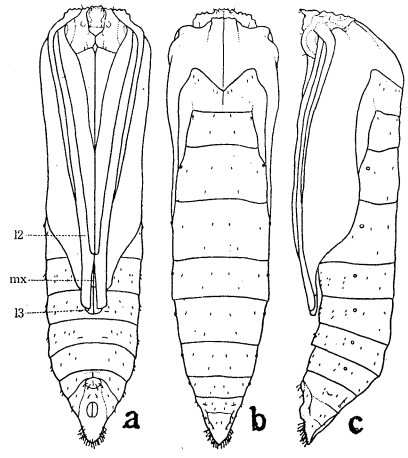

Fig. 31. *Platyptilia farfarella* (Zeller), pupa, ♀. a, ventral view; b, dorsal view; c, lateral view.

Host plants: *Calendula arvensis* L., *Calendula officinalis* L., *Callistephus chinensis* Nees, *Centaurea cyanus* L., *Dahlia pinnata* Cav., *Emilia flammea* Cass., *Erigeron canadensis* L., *Erigeron linifolius* Willd., *Helichrysum bracteatum* Willd., *Senecio cruentus* DC.

Platyptilia ainonis Matsumura Fig. 32.

Platyptilia ainonis Matsumura, 1931, 6000 Ill. Ins. Jap., 1055, no. 2064.—Inoue, 1955, Check List Lep. Jap. **2**: 116.

Platyptilia calodactyla, Inoue (*nec* Den. et Schiff.), 1955, *ibid.*: 115; 1959, Icon. Ins. Jap. Col. Nat. Ed. **1**: 257, pl. 173, fig. 23.

Male and ♀. Head with vertex and frons pale yellowish white, sometimes slightly tinged with pale brown; frons projecting forwards. Labial palpus yellowish brown mixed with pale yellowish white on basal and terminal segments. Occipital fringe on dorsum not furcated (fig. 1 e, f), and slightly as in fig. 1i. Thorax pale yellowish white, slightly tinged with pale brown. Fore and mid legs with tibiae brown mixed with white scales on inner side, white on outer side; tarsi white slightly mixed with greyish brown on inner side of segment 1 and distal part nearly greyish brown. Hind leg with tibia nearly whitish, near origins of medial and terminal spurs brown but paler on inner side of that part, medial spur situated at about 2/3; tarsus with basal segment greyish brown on distal 1/2, terminal segment greyish brown, the rest of tarsus nearly white. Forewing cleft from 2/3; pale yellowish white, suffused with brown on costa, 2 lobes and slightly along inner margin; costa dotted with white from base of wing to costal triangular patch; a brown patch touching costa at middle between base of wing and base of cleft, but the patch not sharp-

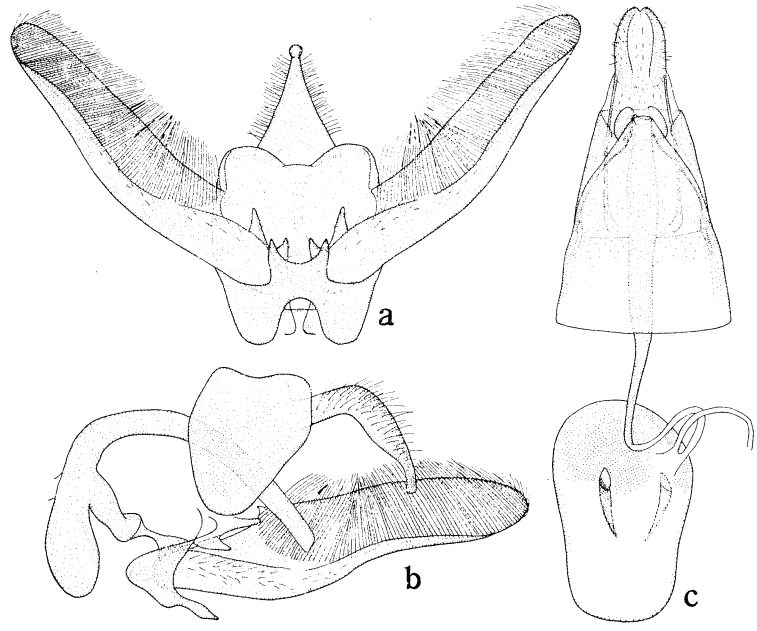

Fig. 32. *Platyptilia ainonis* Matsumura. a, ♂ genitalia, ventral view, excluding aedeagus; b, ditto, lateral view, excluding left valva; c, ♀ genitalia.

ly defined; a brown triangular patch on costa just before base of cleft, the patch sharply bordered by pale yellowish white ground colour; costa just beyond triangular patch shortly pale yellowish white; a nearly whitish subterminal line rather broad and more distinct than that of *P. farfarella*; white scales scattered between this subterminal line and termens of both lobes; cleft narrowly margined with brown. Cilia white; dark brown scales and scale tufts occurring within cilia of forewing similar to that of *farfarella*, but in the present species white scales scattered within cleft and along inner margin. Hindwing cleft firstly from about 1/2; greyish brown except for basal 1/2 of lobe 3 where it is pale yellowish white. Cilia pale greyish brown; those around apices of lobes 1–2 with short darker cilia; inner margin of lobe 3 with a dark brown scale tuft at about middle, the tuft not developed as *farfarella*; dark brown scales slightly scattered from base of wing to scale tuft; white scales scattered also along inner margin of lobe 3 but few near apex. Abdomen pale yellowish white slightly mixed with yellowish brown. Length of forewing: 10–12 mm.

Male genitalia: Similar to the preceding species but different characters are found found as follows: tegumen in lateral view somewhat angular; mid-ventral part of vinculum with 2 sharply pointed projections at caudal margin.

Female genitalia: Papilla analis with minute hairs, very slightly mixed with long ones; apophyses posteriores distinctly inflated at its end; apophyses anteriores short; ostium bursae opened at caudal end of abdominal segment 7 and with 2 elliptical lobes caudally; ductus bursae broad but slightly sinuate towards ostium bursae; 2 signa well developed.

SPECIMENS EXAMINED: 1♀ (type of *ainonis*) labelled "Sapporo, Mats., 19.VII. 08"; 16

♂♂, 12♀♀, Asahidake, Daisetsu. Nat. Park, Hokkaido, 23–24. VII. 1959, Yano; 4 ♂♂, 2 ♀♀, Ashoro, Tokachi, Hokkaido, 30–31. VII. 1959, Yano; 7 ♂♂, 5 ♀♀, Nukabira, Daisetsu. Nat. Park, Hokkaido, 25–27. VII. 1959, Yano; 3♂♂, 4♀♀, Nibushi–Kawayu, Akan. Nat. Park, Hokkaido, 3. VIII. 1959, Yano; 1♂, Kanayama, Yamanashi Pref., 28. VII. 1957, Yamamoto; 1♂, 3♀♀, *ibid.*, 25. VII. 1960, Yano; 1♂, Kitazawa, Yamanashi Pref., 17. VII. 1957, Saigusa; 3♂♂, Kitazawa-toge, Yamanashi Pref., 6. VIII. 1958, Yamamoto; 15♂♂, 3 ♀♀, *ibid.*, 27. VII. 1960, Yano; 1 ♀, Sigakoogen, Sinano 11. VII. 1959, Moriuti; 5 ♂♂, 5 ♀♀, Shigakogen, Nagano Pref., 19. VII. 1960, Yano; 1♂, Simazimadani, Sinano, 21. VIII. 1957, Moriuti; 1♀, Utsukushigahara, Nagano Pref., 16. VII. 1960, Yano.

DISTRIBUTION: Japan (Hokkaido, Honshu).

This species is closely allied to *P. gonodactyla* (Den. et Schiff.) from Europe, but it is separable from the latter by the character of the genitalia. The specimens from Hokkaido are generally paler in the ground colour of forewing than those from Honshu. Male genitalia is somewhat variable regarding the mid-ventral projections of vinculum.

Biological notes: The life history of this species still remains unknown, but the moth is usually resting on *Anaphalis margaritacea* Benth. et Hook. fil.

Platyptilia montana Yano, n. sp. Figs. 33, 34.

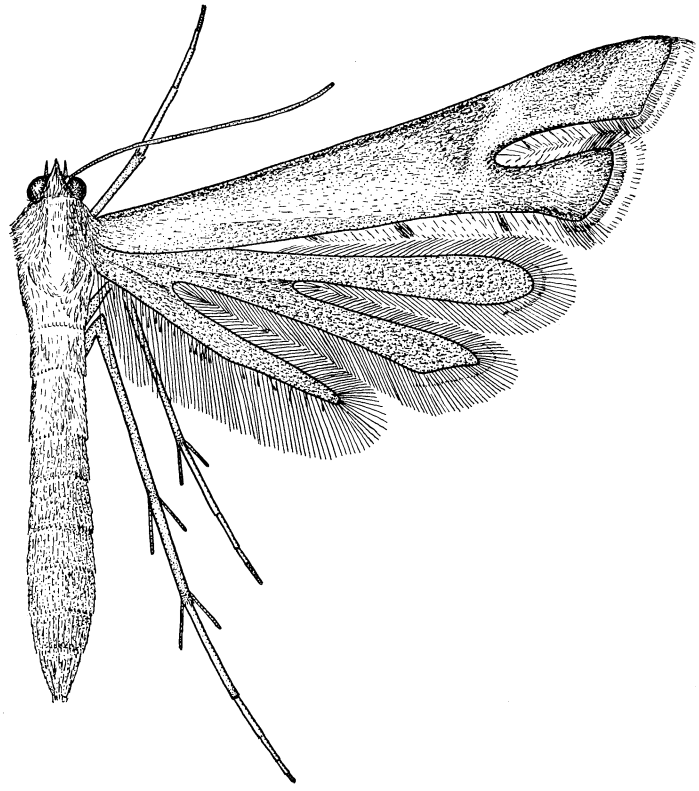

Fig. 33. *Platyptilia montana* n. sp., allotopotype, ♀.

The present species is very similar to *P. ainonis* Matsumura, especially to the specimens from Honshu of the latter. It has, however, some characters differing from the latter species mentioned as follows.

Male and ♀ : Head with vertex and frons yellowish brown. Labial palpus yellowish brown or brown slightly mixed with pale yellowish white. Thorax pale yellowish brown, tinged with brown anteriorly. Fore and mid legs with tarsi rather distinctly tinged with greyish brown than those of *ainonis*. Hind leg with tibia brown on outer side, pale yellowish white on inner side but tinged with brown on distal part, medial spur situated at about 2/3. Forewing cleft from 2/3; ground colour pale yellowish brown suffused with dark brown partly; a dark brown triangular costal patch not sharply indicated as in *ainonis*; a subterminal line crossing both lobes pale yellowish brown or pale yellowish white and more indefinite than *ainonis*. Hindwing also darker than *ainonis* in ground colour. Cilia of inner margin of lobe 3 with a dark brown scale tuft at about middle but the scale tuft very weak, sometimes slightly indicated and not forming a scale tuft. Length of forewing: 10–11 mm.

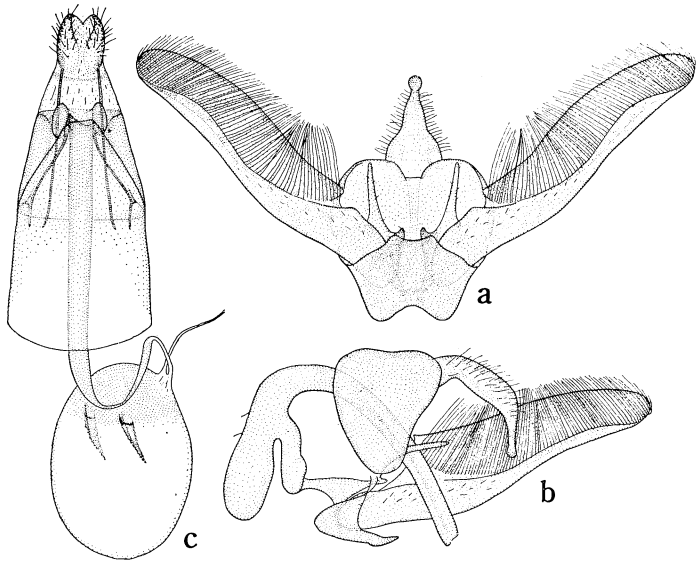

Fig. 34. *Platyptilia montana* n. sp. a, ♂ genitalia, ventral view, excluding aedeagus; b, ditto, lateral view, excluding left valva; c, ♀ genitalia.

Male genitalia: Similar to the preceding 2 species but the following points are different from these 2 species: mid-ventral part of vinculum with shallow incisions at both caudal and cephalic margins, especially the former incision slight; juxta with 2 pairs of pointed arms, but basal pair slightly projected, caudal pair very long; basal process of aedeagus nearly directed towards base of aedeagus.

Female genitalia: Apophyses posteriores not inflated at its end; apophyses anteriores short; ductus bursae broad and nearly parallel-sided towards ostium bursae, and gradually narrowing towards corpus bursae; corpus bursae with 2 signa.

Holotype ♂, Kitadake, Yamanashi Pref., 30. VII. 1960, Saigusa; allotype ♀, and paratopotypes, 3♂♂, same data as holotype. Paratypes 2♂♂, 1♀, Senjogadake – Ryomata, Yamanashi Pref., 29. VII. 1960, Saigusa; 2♀♀, Mt. Senjohgadake – Mt. Shirane-Kitadake, Yamanashi Pref., 28–29. VII. 1959, Miyatake; 1♂, Senjogadake, Nagano Pref., 28. VII. 1960, Yano; 1♀, *ibid.*, 26. VII. 1961, Saigusa.

DISTRIBUTION: Japan (Honshu).

This species is somewhat related to *P. calodactyla* (Den. et Schiff.) from Europe and Asia Minor, but it is separable from the latter by nearly the same points mentioned above. This species occurs in the mountainous districts of Honshu.

Platyptilia sinuosa Yano

Platyptilia sinuosa Yano, 1960, Mushi **34** (6): 137, figs. 1–2.

Male and ♀: Occipital fringes on dorsum are shown in fig. 1 c, d. In the original description, I erroneously described that the forewing is cleft from 2/7, but wish here to correct it to 5/7. Length of forewing: 13–15 mm.

Male genitalia: Sclerotization distinct; caudal margin of mid-ventral part of vinculum distinctly incised but 2 projections not so acute as in *P. ainonis* Matsumura; distance between cephalic and caudal incisions very short; distal extension of sacculus distinctly folded dorsally; 2 pairs of projections of juxta rather broad, not long arm-like projections; basal process of aedeagus rather long.

Female genitalia: Apophyses posteriores long, slightly inflated at its end; apophyses anteriores very short; 2 elliptical lobes approaching each other at their caudal ends; ductus bursae gradually narrowing towards corpus bursae, twisted partly, sclerotized heavily except for short distance near corpus bursae; corpus bursae with 2 developed signa.

SPECIMENS EXAMINED: 1 ♀, Utoro – Iwaubetsu, Abashiri, Hokkaido, 27. VII. 1960, Tonosaki; 1♂, 2♀♀, Utsukushigahara, Nagano Pref., 17. VII. 1960, Yano, and 3 type specimens.

DISTRIBUTION: Japan (Hokkaido, Honshu).

This is the largest among the present genus from Japan.

Platyptilia sachalinensis Matsumura Fig. 35.

Platyptilia sachalinensis Matsumura, 1911, J. Coll. Agr. Tohoku Imp. Univ. **4** (1): 58.—Nohira, 1916, Ent. Mag. (Kyoto) **2** (1): 38.—Matsumura, 1931, 6000 Ill. Ins. Jap., 1058, no. 2084.—Inoue, 1955, Check List Lep. Jap. **2**: 117.

Platyptilia pallidiola Matsumura, 1931, 6000 Ill. Ins. Jap., 1055, no. 2069.—Inoue, 1955, *ibid.*: 116. **New Synonymy.**

Male and ♀: Head with vertex and frons pale yellowish brown, the latter with a conspicuous conical tuft and nearly reaching distal end of labial palpus. Labial palpus very long; pale yellowish brown, somewhat paler on basal segment. Occipital fringe on dorsum distinctly bifurcated, mixed with hair-like fringes. Thorax similar in colour to head. Fore and mid legs with femora brown and pale yellowish brown; tibiae brown and pale yellowish white and somewhat thickened at their ends; tarsus of fore leg nearly whitish; tarsus of mid leg pale brown, whitish basally. Hind leg with femur pale yellowish brown; tibia pale yellowish white on basal 1/2, almost brown on distal 1/2, medial spur situated at

about 2/3; tarsus nearly whitish slightly tinged with pale brown. Forewing cleft from about 2/3; pale yellowish white suffused with brown partly; costa narrowly darker; an indistinct brown patch in cell at 2/7 from base and another large brown patch situated just before base of cleft, but the latter usually not clearly indicated; both lobes brown towards termens, and margined narrowly by brown at termens and outer 2/7 of cleft. Cilia within cleft whitish, outer 2/7 of cleft brown; both termens with greyish brown cilia which are somewhat whitish basally; cilia on inner margin of wing whitish, mixed with brown scale tufts or scales. Hindwing pale brown, somewhat tinged with greyish brown towards base of wing. Cilia pale brown on first 2 lobes; cilia on anterior margin of lobe 3 pale brown or pale yellowish brown, those on inner margin pale brown but whitish basally; a reddish brown scale tuft at about 2/3 of inner margin of lobe 3. Abdomen pale yellowish brown, with an indistinct longitudinal brown line on dorsum. Length of forewing: 12–14 mm.

Male genitalia: Uncus moderate, bent acutely; mid-ventral part of vinculum with a round but slightly projected caudal margin; valva simple; juxta with 2 pairs of arms which are not sharp; aedeagus rather short, broadening towards basally, process to juxta short and situated at about 2/3 from base; dorsal part of tuba analis somewhat sclerotized and hairy.

Female genitalia: Apophyses posteriores inflated at its end; apophyses anteriores short; 2 lobes present; ductus bursae gradually narrowing towards corpus bursae; corpus bursae with 2 rather short signa.

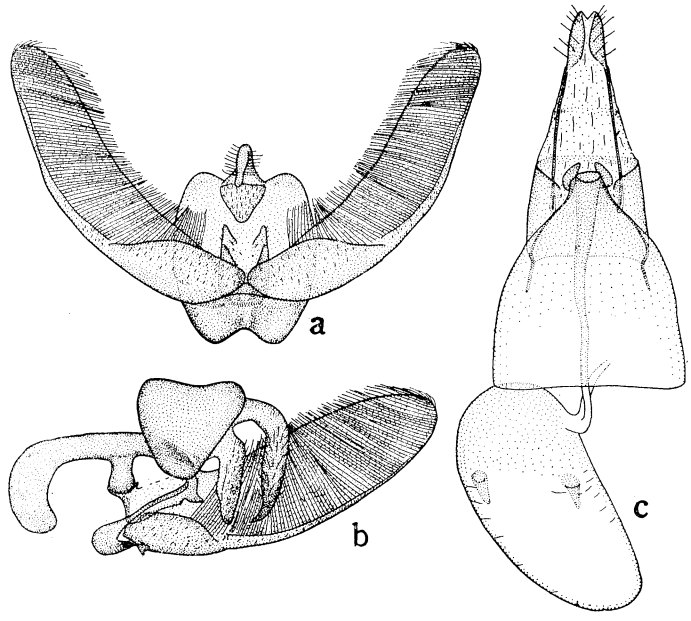

Fig. 35. *Platyptilia sachalinensis* Matsumura. a. ♂ genitalia, ventral view, excluding aedeagus; b, ditto, lateral view, excluding left valva; c, ♀ genitalia.

SPECIMENS EXAMINED: 1 ♂ (type of *sachalinensis*) labelled "Sagalin, Oguma, Kushun-

nai, 5/8"; 1♂ (type of *pallidiola*) labelled "Sapporo, 15/VII, 1903"; 1♂, Horokanai, Hokkaido, 29. VII. 1958, Kumata; 1♂, Utoro – Iwaubetsu, Abashiri, Hokkaido, 27. VII. 1960, Tonosaki; 3♂♂, 1♀, Keiki-wan, Abashiri, Hokkaido, 23–24. VII. 1961, Tonosaki.

DISTRIBUTION: Japan (Hokkaido), Saghalien.

This species was originally described by Matsumura (1911) from Saghalien, while *P. pallidiola* was described by him from Hokkaido in 1931. After careful observations of the type specimens of these species, I have come to the conclusion these 2 species are identical.

Platyptilia scutata Yano

Platyptilia scutata Yano, 1961, Kontyû **29** (3): 151, figs. 1–2.

Male and ♀: Occipital fringes on dorsum are shown in fig. 1e, f, l, n. In my original description, I erroneously described that the forewing is cleft from 2/7, but wish here to correct it as about 3/4. Length of forewing: 11–13 mm.

Male genitalia: Uncus very slender, somewhat constricted before apex and pointed apically; valva simple, long; cephalic margin of vinculum deeply incised mid-ventrally and with a sclerotized triangular plate at caudal part; juxta heavily sclerotized with 2 pointed arms; aedeagus short, stout, heavily sclerotized and pointed apically and turned towards base; process of aedeagus situated at 4/7 from base.

Female genitalia: Papilla analis long, pointed; apophyses posteriores long, gradually inflated towards its end; apophyses well developed, long; 2 lobes approached each other at their caudal ends and somewhat pointed; lamella postvaginalis triangular; ductus bursae broadened for short distance and irregular cup-shaped near ostium bursae; 2 signa slender.

SPECIMENS EXAMINED: 6 type specimens.

DISTRIBUTION: Japan (Honshu).

Platyptilia isodactyla (Zeller) Fig. 36.

Alucita monodactyla, Haworth (*nec* Linné), 1829, Lep. Brit. **3**: 476.
Pterophorus similidactyla Stephens, 1835, Ill. Brit. Ent. **4**: 375.
Pterophorus (*Platyptilia*) *isodactyla* Zeller, 1851, Linn. Ent. **6**: 328.
Platyptilia isodactyla, Rebel, 1901, Cat. Lep. Pal. Faun. **2**: 72.—Matsumura, 1905, Cat. Ins. Jap. **1**: 221.—Meyrick, 1910, Gen. Ins. **100**: 11; 1913, Lep. Cat. **17**: 14.—Nohira, 1916, Ent. Mag. (Kyoto) **2** (1): 37.—Pierce et Metcalfe, 1938, Gen. Brit. Pyr. Delt. Plume, 48, pl. 26, fig.—Beirne, 1954, Brit. Pyr. Plume Moths, 170, pl. 15, fig. 2.—Inoue, 1955, Check List. Lep. Jap. **2**: 115.
Platyptilia isodactylus, Tutt, 1906, Brit. Lep. **5**: 183.
Platyptilia (*Platyptilia*) *isodactyla*, Spuler, 1910, Schmett. Eur. **2**: 320.

Length of forewing: 10 mm.

Male genitalia: Uncus long and stout; tegumen large; vinculum with a waved caudal margin mid-ventrally; valva simple; 2 pairs of arms of juxta pointed; basal process of aedeagus waved.

DISTRIBUTION: Japan (Hokkaido), Europe.

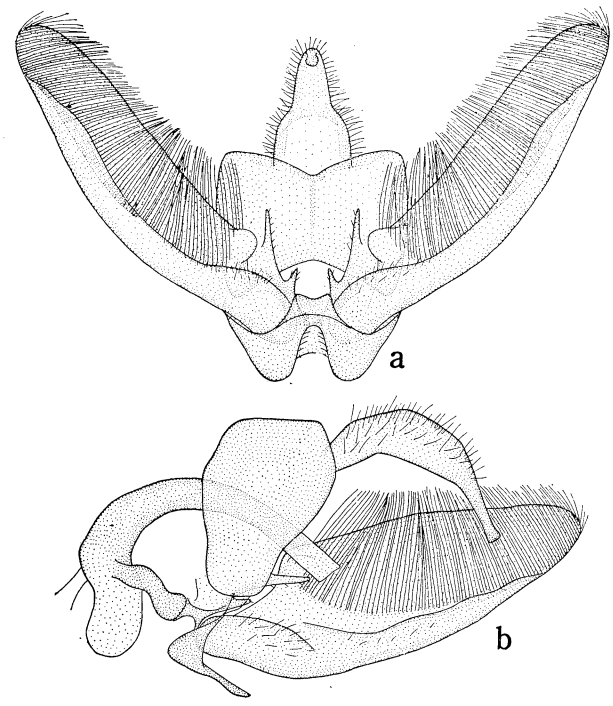

Fig. 36. *Platyptilia isodactyla* (Zeller). a, ♂ genitalia, ventral view, excluding aedeagus; b, ditto, lateral view, excluding left valva.

In Japan, this species was listed firstly by Matsumura (1905). Since then no specimen has been reported. I could not see the specimen of this species from Japan. The above mentioned description is based on the European specimen.

Platyptilia profunda Yano, n. sp. Figs. 37a, 38–41.

Male: Head with vertex and frons pale yellowish brown, the latter projecting forwards but not strongly. Labial palpus moderate; brown mixed with pale yellowish white. Antenna whitish, dotted with dark brown basally above. Occipital fringe pale yellowish brown; fringes on dorsum long, dilated towards tip, without furcation (fig. 1 g, h). Thorax pale yellowish brown tinged with pale yellowish white. Fore and mid legs with tibiae white and greyish brown, thickened distally; fore tarsus nearly white, slightly mixed with pale brown; mid tarsus whitish mixed with greyish brown. Hind leg with tibia yellowish brown mixed with pale yellowish white scales on outer side, pale yellowish white on inner side, the parts near origins of both spurs yellowish brown; tarsal segment 1 white suffused with greyish brown distally, the rest of tarsus white slightly mixed with pale greyish brown. Spurs of legs whitish tinged with pale yellowish brown or brown. Forewing cleft from 2/3; 2 lobes broad; termens of both lobes slightly sinuate, the former inwardly, the latter outwardly; pale yellowish brown or pale yellowish white, tinged with yellowish brown on costa, along inner margin and sometimes on 2 lobes; costa dotted with white

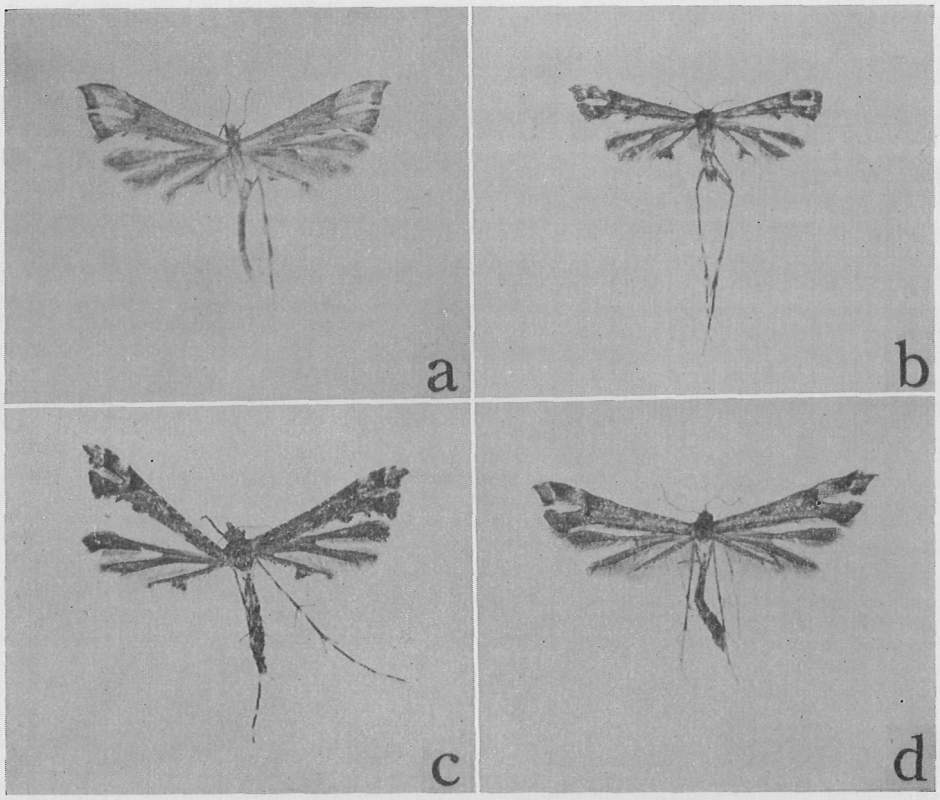

Fig. 37. a, *Platyptilia profunda* n. sp., holotype, ♂; b, *P. bella* n. sp., holotype, ♂; c, *P. japonica* n. sp., holotype, ♀; d, *P. optata* n. sp., holotype, ♂.

indefinitely from base of wing to dark brown triangular patch; a dark brown triangular patch on costa a little before base of cleft, but not sharply indicated; this patch followed by a pale yellowish white area which is extending to costa; pale yellowish white area situated before termens of both lobes, outer margin of the area rather definitely indicated like a broad subterminal line. Cilia white or pale yellowish white; termens of both lobes with short dark brown scales; cilia around anal angles of both lobes and anterior angle of lobe 2 greyish brown or brownish; inner margin with 2 dark brown scale tufts, the one at about 3/4 between base of wing and base of cleft and the other at just below base of cleft or a little beyond it. Hindwing cleft firstly from about 4/9; lobe 1 with round apex, lobe 2 with nearly straight termen; lobe 3 with broadest width at about 1/5, then narrowing to apex; pale greyish brown slightly tinged with pale yellowish white on lobe 3. Cilia pale brownish grey; around tips of first 2 lobes with a dark subbasal line respectively; inner margin of lobe 3 with a rather developed dark brown scale tuft at about middle; dark brown scales slightly scattered between base of wing and scale tuft; pale yellowish white scales and cilia occurring between scale tuft and apex. Abdomen pale yellowish brown. Length of forewing: 11–14 mm.

Male genitalia: Uncus long, somewhat slender than that of *P. isodactyla* (Zeller); caudal margin of tegumen deeply but roundly incised; caudal margin of vinculum rather

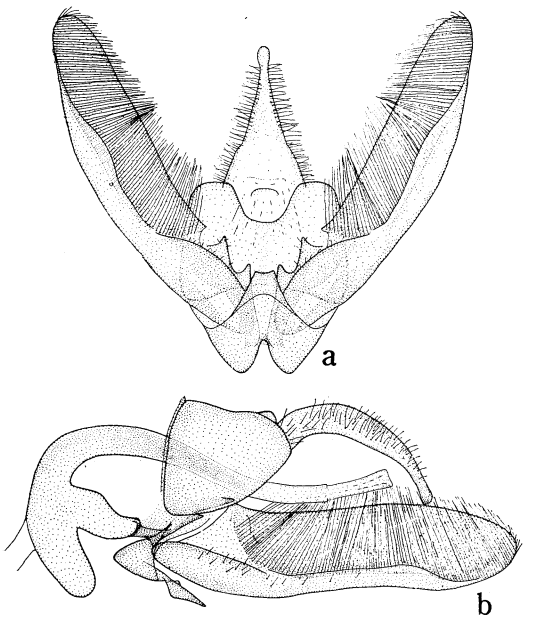

Fig. 38. *Platyptilia profunda* n. sp. a, ♂ genitalia, ventral view, excluding aedeagus; b, ditto, lateral view, excluding left valva.

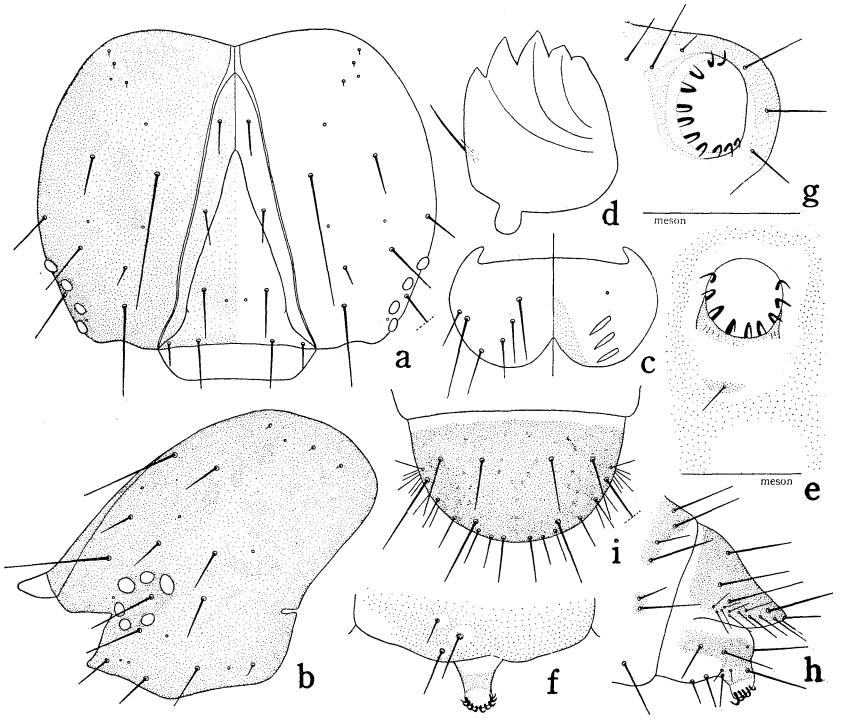

Fig. 39. *Platyptilia profunda* n. sp., mature larva. a, head, frontal view; b, ditto, lateral view; c, labrum, with epipharyngeal surface on right; d, mandible; e, left ventral proleg of abdominal segment 6, ventral view; f, ditto, lateral view; g, left anal proleg, ventral view; h, abdominal segments 9 and 10 lateral view; i, abdominal segment 10, dorsal view.

angular than that of *isodactyla*; 2 pairs of arms of juxta not so pointed as seen in *isodactyla*; basal process of aedeagus broad.

Holotype ♂, Shimajimadani, Nagano Pref., 31. VII. 1957, Saito. Paratype 1 ♂, Kawamata, Tochigi Pref., VII. 1959, reared by Kodama (host plant: Compositae).

DISTRIBUTION: Japan (Honshu).

This species is very similar to *P. isodactyla* (Zeller), but it is different from the latter chiefly by the characters mentioned in the key.

Mature larva: Head dark brown; vertical triangle very shallow; ocelli I and III larger than the others; seta AF2 conspicuously dorsad from dorsal end of fronto-clypeal area; A2 somewhat remote from A1; Aa nearly equidistant from P1 and A2; Va laterad from a line joining V1 and V2. Labrum with a moderate median incision; setae of median group arranged in nearly a straight line; La3 ventrad from level of M3. Mandible with 5 teeth; inner-most one blunt. Thorax and abdomen whitish with scattered minute secondary setae in addition to primary setae and invested with many scobinations; abdominal segment 10 with many long setae; pinacula on thorax and abdomen heavily sclerotized and dark brown; abdominal segment 8 with a transverse pinaculum on dorsum from which setae D2 occur; D1 with a separated pinaculum on each side, rarely with a common; abdominal segment 9 also with a large transverse pinaculum; anal plate heavily sclerotized, dark brown; SV group of abdominal segment 2 trisetose. Proleg long. Crochets of ventral proleg 9–11; those of anal proleg 8–12. Length: 14–15 mm. Head width: 1.2.

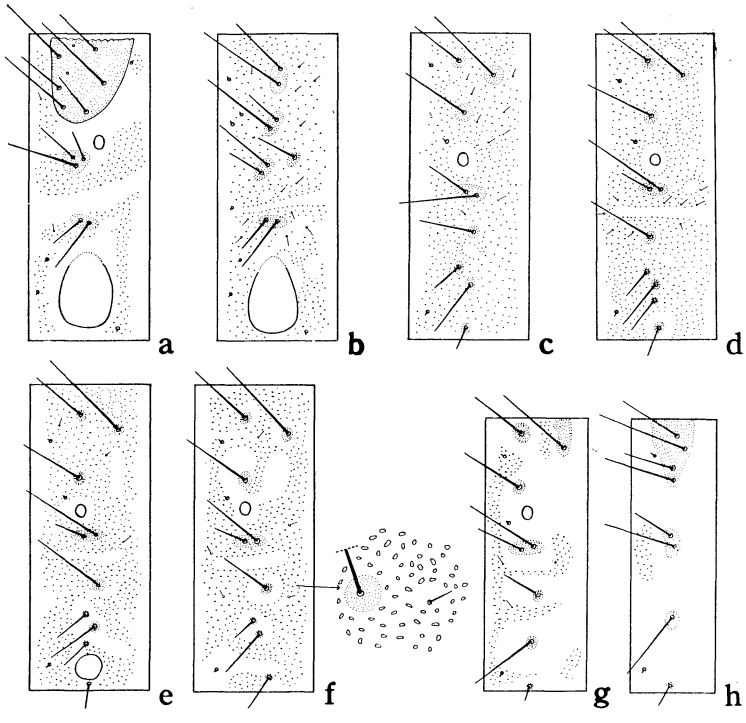

Fig. 40. *Platyptilia profunda* n. sp., chaetotaxy of mature larva.
a-h, pro-, mesothorax, abdominal segments 1, 2, 3, 7, 8 and 9.

This larva is characterized by the following points: setae of median group of labrum arranged in a straight line; minute secondary setae on body very scarce; distinct pinacula on thorax and abdomen.

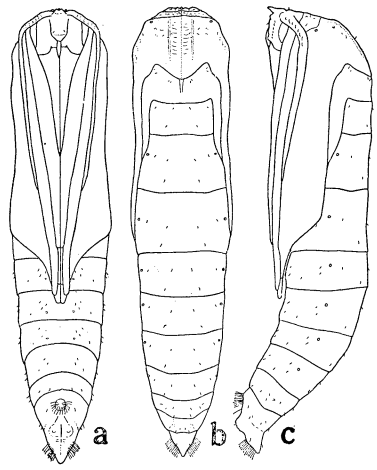

Fig. 41. *Platyptilia profunda* n. sp., pupa, ♂. a, ventral view; b, dorsal view; c, lateral view.

Pupa: Pale yellowish brown. Greatest width at abdominal segment 3. Cephalic end of body projected. Head and thorax somewhat rugged; both eye-pieces and basal part of antenna distinctly rugged; boundary line between both eye-pieces distinctly indicated; distal part of maxilla rather long exposed; distal end of antenna nearer to caudal end of basal part of maxilla than distal end of fore leg. Mesothorax with 2 slight longitudinal rugged ridges on dorsum; both mid legs not in contact with each other; hind leg exposed; wing not extending to distal end of mid leg. Abdomen without long setae or barbed spines; caudal end of abdomen rather pointed; cephalic mass of hooked setae on abdominal segment 10 from a round prominence; both sides of genital opening distinctly projected; proleg scar discernible. Length: 12 mm. Width: 2.5. The present pupa is allied to that of *P. farfarella* (Zeller), but it is easily separated from the latter by the following points: body distinctly larger; both mid legs not in contact with each other; a cephalic rounded prominence of abdominal segment 10 bearing rather many setae.

Biological notes: I collected the larva and pupa of this species from *Senecio nemorensis* L. at Shimajimadani, Nagano Prefecture. These larvae are identical to that collected by Mr. T. Kodama who reared a moth (holotype) from them.

Host plant: *Senecio nemorensis* L.

Platyptilia jezoensis Matsumura Fig. 42.

Platyptilia jezoensis Matsumura, 1931, 6000 Ill. Ins. Jap., 1055, no. 2067.—Inoue, 1955, Check List Lep. Jap. **2**: 116.

Platyptilia punctidactyla, Hori (*nec* Haworth), 1932, Icon. Ins. Jap., 1444, fig. 2857; 1950, Icon. Ins. Jap. (rev. ed.), 500, fig. 1364.—Inoue, 1955, *ibid.*: 115.—Esaki, 1957, Icon. Het. Jap. Col. Nat. **1**: 90, pl. 16, fig. 504.

Male and ♀: Labial palpus with basal segment white mixed with greyish brown; segments 2 and 3 greyish brown slightly mixed with white. Antenna white dotted with greyish brown above. Occipital fringe greyish brown and white; fringes on dorsum bifurcated at their tips (fig. 1 l, p). Thorax brownish with whitish posterior margin. Fore and mid legs with tibiae white and brown, thickened at their ends; tarsi white mixed partly with greyish brown. Hind leg with tibia brown and whitish, thickened slightly at origins of medial and terminal spurs; tarsus with basal 2 segments and terminal one nearly greyish brown, the rest nearly white. Forewing cleft from 2/3; lobe 1 slightly dilated towards termen which is inwardly sinuate; lobe 2 distinctly dilated towards termen which is convex at middle; brown or greyish brown, somewhat darker along costa, inner margin and

on 2 lobes; costa marked with small white dots from base of wing to costal triangular patch, but sometimes indefinite; a dark brown triangular patch on costa just before base of cleft, outer margin of it rather sharply indicated; this patch followed by a pale yellowish white or nearly whitish area which is extending to costa; a narrow white subterminal line crossing both lobes at about 2/3 of the lobes, the line preceded by dark brown, followed by dark grey or greyish brown, the line indefinte in lobe 2; the part on vein R_4 beyond subterminal line greyish white; small white dots on costa between triangular patch and subterminal line, rarely in definite, and at near apex. Cilia white; termens of both lobes with dark brown subbasal line interrupted at above anal angle and at angle of lobe 1, at below and above both angles of lobe 2, but these 4 interruptions usually indefinite except for at anal angle of lobe 1; cilia near anal angle of both lobes and anterior angle of lobe 2 greyish brown; cilia within cleft tinged with grey and slightly scattered with dark brown scales; inner margin with 2 scale tufts at about 2/3 and just below base of cleft, the former tuft strong; dark brown scales slightly scattered along inner margin. Hindwing cleft firstly from about 3/7; termen of lobe 2 slightly sinuate and pointed at apex; lobe 3 slender; pale greyish brown, slightly tinged with brown on lobe 3. Cilia pale brownish grey; apex of lobe 1 with darker subbasal line, slightly so at lobe 2; apex of lobe 3 with whitish cilia; inner margin of lobe 3 with a strong dark brown scale tuft at about 2/3; dark brown scales slightly scatterd from base of wing to scale tuft; white scales rarely occurring just before scale tuft. Abdomen with segment 1 white with greyish brown on dorsum; segments 2 and 3 rarely 4 greyish brown with white oblique stripes; the rest of abdomen nearly greyish brown. Length of forewing: 8–10 mm.

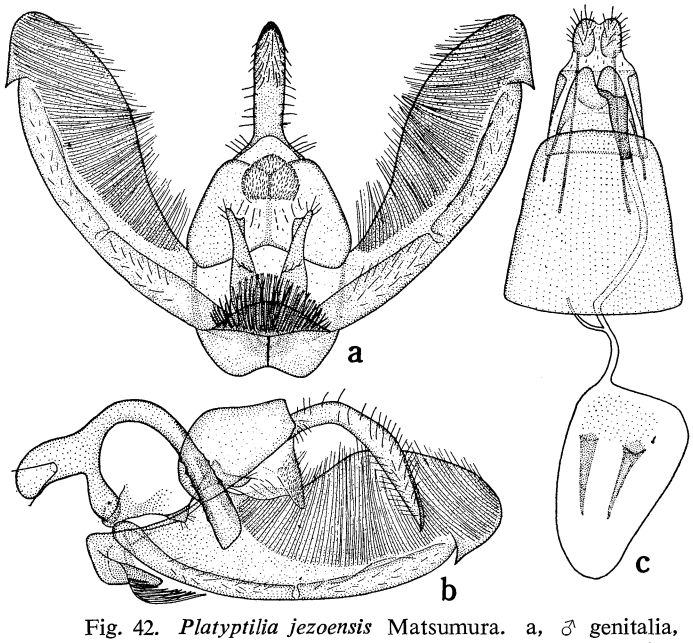

Fig. 42. *Platyptilia jezoensis* Matsumura. a, ♂ genitalia, ventral viaw, excluding aedeagus; b, ditto, lateral view, excluding left valva; c, ♀ genitalia.

Male genitalia: Uncus long and pointed; tegumen large; vinculum developed mid-ventrally, its caudal margin rounded and massively covered with bifurcated scales; sacculus of valva conspicuous; a small heavily sclerotized and sharply pointed projection situated at ventral margin of valva just before distal end; juxta distinctly sclerotized, 2 arms stout; aedeagus bent at nearly a right angle, distal part heavily sclerotized and indented; dorsal part of tuba analis sclerotized and hairy.

Female genitalia: Apophyses posteriores long; apophyses anteriores short; ostium bursae situated on right side and well beyond caudal end of abdominal segment 7; lamella post-vaginalis well developed as a round plate, connected with an allied plate which is situated on left side; ductus bursae broadened and heavily sclerotized towards ostium bursae; corpus bursae with 2 long signa and partly scobinatious; point of departure of ductus seminalis situated before corpus bursae.

SPECIMENS EXAMINED: 1 ♀ (type of *jezoensis*) labelled "Sapporo, Matsumura, IX, 1909"; 2 ♀♀, Kamiotoineppu, Hokkaido, 25. VIII. 1922, Esaki; 1 ♀, Shirasaka, Fukushima Pref., 29. XI. 1959, Ishikawa; 8 ♂♂, Makinoosan, Osaka Pref., 25–31. VIII. 1959, Yano; 3 ♂♂, *ibid.*, 25. VIII. 1959, Yasuda; 2 ♂♂, Tukigase, Yamato, 7. IX. 1959, Yasuda; 1 ♀, Fukuoka, Chikuzen, 11. VII. 1929, Hori; 1 ♀, Kakuyama, Amakusa, 21. IX. 1931, reared by Hori; 1 ♂, Sago, Tsushima, 6. XII. 1960, Ishikawa.

DISTRIBUTION: Japan (Hokkaido, Honshu, Shikoku, Kyushu, Tsushima).

This species is closely related to *P. acanthodactyla* (Hübner) from Europe, Asia Minor, N. America, etc., but at present I wish to treat them different from each other. This species is variable in size and slightly so in colour. The specimens which have been treated in Japan under the name *P. punctidactyla* (Haworth) or *P. cosmodactyla* (Hübner) are either identical to the present species or not.

Biological notes: Up to the present some host plants of the present species were listed from Japan, but the life history has not been reported. Mr. R. Ishikawa gave me 2 specimens which were unearthed in winter when he was going to collect the hibernating Carabid-beetles. The moth is collected from July to December. Judging from the facts mentioned above, this species may spend the winter in the adult stage. *Allium fistulosum* L. has been treated as a host plant of this species. It is very peculiar among the species of Pterophoridae regarding the feeding habits.

Host plants: *Allium fistulosum* L., *Aquilegia flabellata* Sieb. et Zucc., *Geranium* sp., *Stachys sieboldi* Miq.

Platyptilia bella Yano, n. sp. Figs. 37b, 43a.

Male: Antenna pale yellowish white slightly tinged with grey above, without dot; greyish brown beneath. Hind tibia with medial and terminal spurs shorter compared with the length of tibia; medial spur situated at 5/7, inner one of which shorter than outer. Forewing with a dark brown patch in cell at 4/7 between base of wing and base of cleft but not sharply defined; a subterminal line somewhat broad. Dark brown subbasal line of cilia of both lobes with interruption very indefinite, showing nearly a continuous line. Hindwing cleft firstly from middle; lobe 2 broader than the preceding species; inner margin of lobe 3 with a dark brown scale tuft at just before apex. Length of forewing: 8 mm.

Male genitalia: Very similar to *P. jezoensis* Matsumura. Uncus more slender than that of *jezoensis*; lateral view of the shape of tegumen is different from *jezoensis* as shown in fig. 43a.

Holotype ♂, Gojo, Nara Pref., 22. VII. 1960, Yasuda.

DISTRIBUTION: Japan (Honshu).

This species is closely allied to *P. jezoensis* Matsumura, but it is easily separated from the latter by the following characters: inner margin of lobe 3 of hind-wing with a dark brown scale tuft at just before apex; medial and terminal spurs of hind tibia distinctly shorter, and character of genitalia.

Platyptilia japonica Yano, n. sp. Figs. 37c, 43b, c.

Female: Head with vertex and frons greyish brown, the latter slightly projecting forwards. Labial palpus with basal segment pale yellowish white slightly mixed with greyish brown; segments 2 and 3 greyish brown slightly mixed with pale yellowish white. Antenna greyish brown dotted with pale yellowish white above, but the dot sometimes indefinite. Occipital fringe greyish brown and pale yellowish white; fringes on dorsum bifurcated mixed with not furcated ones, these are shown in fig. 1 b, l, n. Thorax greyish brown except for metathorax which is nearly black on anterior margin, greyish brown on dorsum, the rest of metathorax distinctly white. Fore and mid legs with tibiae dark brown and pale yellowish white, fore tibia distinctly thickened distally, mid tibia also thickened distally and with a slight scale tuft at about middle but very indefinite; tarsus of fore leg dark brown and whitish, the rest of tarsus nearly greyish brown slightly mixed with white; tarsus of mid leg with 3 basal segments greyish brown and whitish, the rest greyish brown. Hind leg with tibia dark brown mixed with white scales, heavily so on inner side, origins of both spurs thickened, tarsus with 2 basal segments greyish brown with white at their basal ends, segment 3 white with greyish brown distally, the rest greyish brown. Forewing cleft from about 5/7; lobe 1 slightly dilated towards termen; lobe 2 dilated towards termen; greyish brown suffused with dark brown partly, scattered with white scales; costa dark brown dotted distinctly with white from base of wing to dark brown triangular patch; a dark brown triangular patch on costa little before base of cleft, outer margin of patch rather sharply defined; patch followed by a paler area which is extending to costa where this area is white; a narrow pale yellowish white subterminal line crossing both lobes at about 3/5 of the lobes, this line in lobe 2 indefinite; area between this line and termens suffused with whitish scales; area before subterminal line dark brown, this dark brown area sometimes not extending to costa and inner margin; subterminal line rarely not visible; 2 small white dots on costa, the one between white patch following triangular patch

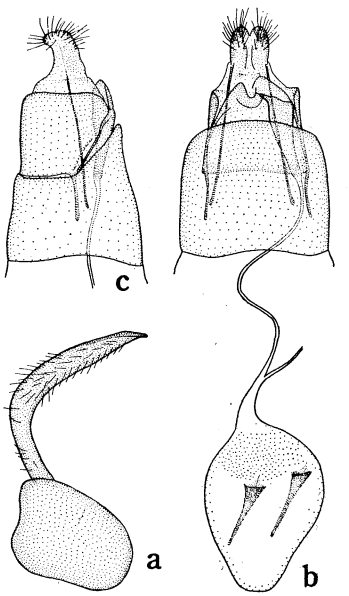

Fig. 43. a, *Platyptilia bella* n. sp., ♂ genitalia, uncus and tegumen, lateral view. b-c, *Platyptilia japonica* n. sp. b, ♀ genitalia; c, ditto, lateral view, excluding corpus bursae.

and subterminal line, the other just before apex. Cilia white; termens of both lobes with dark brown scales interrupted at just below middle of termen of lobe 1, anal angle of lobe 1 and just below anterior angle of lobe 2, the last interruption sometimes indefinite; cilia within cleft greyish, near anal angle lobe 1 and anterior angle of lobe 2 dark brown; around anal angle of lobe 2 dark brown; inner margin with dark brown scale tufts at about 2/3 and just below base of cleft, the former strong; dark brown cilia occurring between the latter scale tuft and anal angle of lobe 2; dark brown scales slightly scattered between base of wing and strong scale tuft. Hindwing cleft firstly from about 3/7; lobe 1 broad distally; lobe 2 with a slight inwardly sinuate termen; lobe 3 slender; greyish brown. Cilia pale brownish grey; lobes 1 and 2 with darker subbasal line at their distal ends; inner margin of lobe 3 with a strong dark brown scale tuft at about 4/7 and another slight scale tuft at just below apex; dark brown scales scattered from base of wing to strong scale tuft; cilia beyond strong scale tuft whitish, slightly so before it. Abdomen with segment 1 greyish brown and white; the rest of abdomen greyish brown suffused with dark brown and mixed with white on sides; ventral surface greyish brown suffused with dark brown and mixed with white on posterior margins of segments. Length of forewing: 10–11.5 mm.

Female genitalia: Apophyses posteriores long; apophyses anteriores short; ostium bursae opened on right side and well beyond caudal end of abdominal segment 7; lamella postvaginalis presented as a round plate and with a rather small plate on left side, these plates connected with each other by an arched sclerotized band; ductus bursae broadened and heavily sclerotized towards ostium bursae, the rest of it narrow; corpus bursae with 2 elongate signa and partly scobinatious.

Holotype ♀, Kanayama, Yamanashi Pref., 25. VII. 1960, Yano. Paratypes 1 ♀, Kanayama, Yamanashi Pref., 22. VIII. 1958, Yano; 1 ♀, *ibid.*, 25. VII. 1960, Yano; 1 ♀, Shirahone, Shinano, 24. VII. 1937, Miyamoto; 1 ♀, Sigakogen, Tyubu-Nagano, 11. IX. 1953, Kodama. One paratype is preserved in the collection of the Entomological Laboratory of the University of Osaka Prefecture.

DISTRIBUTION: Japan (Honshu).

This species is somewhat allied to *P. cosmodactyla* (Hübner) from Europe and N. America judging from the description of the latter and the European specimens which were identified as *cosmodactyla* by Dr. H. G. Amsel, but it is easily separated from the latter by the following characters: forewing distinctly darker and less scattered with white scales, while in *cosmodactyla* white scales heavily mixed; a costal triangular patch before base of cleft on forewing dark brown and distinct; a dark brown area of lobe 2 of forewing usually distinct.

Platyptilia optata Yano, n. sp. Fig. 37d.

Male: Head with vertex and frons brown tinged with grey, the latter projecting forwards. Labial palpus with segment 3 small, slender; basal segment pale yellowish white; segments 2 and 3 brown mixed with pale yellowish white. Antenna white dotted with greyish brown above; pale yellowish brown beneath. Occipital fringe brownish mixed with pale yellowish white. Thorax brown tinged with grey, posteriorly pale yellowish white. Fore and mid legs with tibiae brown and pale yellowish white, thickened distally; tarsi nearly pale yellowish white slightly tinged with pale brown. Hind leg with tibia brown on

outer side, pale yellowish white on inner side but near origins of both spurs brown, thickened at origins of both spurs; inner terminal spur of tibia equal with outer; tarsus pale yellowish white, suffused mainly on outer side of segment 1 and terminal segment. Spurs of legs pale yellowish white and brown. Forewing cleft from 2/3; both lobes slightly dilated towards termens which are nearly straight but very slightly inwardly sinuate in lobe 1, outwardly in lobe 2; greyish brown but along costa, inner margin and 2 lobes dark brown; white scales heavily scattered over wing; yellowish brown scales also scattered; a dark brown indefinite patch in cell at middle between base of wing and base of cleft; a dark brown triangular patch on costa just before base of cleft, outer margin of it sharply indicated and followed by a paler area which extends to costa; basal part and distal part heavily mixed with white scales, inner margin of this distal white area nearly straight as if it is a subterminal line. Cilia white; termens and around angles of both lobes with dark brown subbasal line; cilia of apex, towards angles within cleft and around anal angle of lobe 2 greyish brown; cilia towards base of cleft tinged with grey; white scales slightly scattered within cleft; cilia of inner margin somewhat tinged with greyish brown partly; 2 very slight dark brown scale tufts on inner margin at 3/4 and just below base of cleft, but these 2 tufts indefinite; white and dark brown scales scattered along inner margin. Hindwing cleft firstly from just before middle; anal angle of lobe 2 very indefinite; lobe 3 slender; pale greyish brown. Cilia pale brownish grey; lobes 1–2 with a darker subbasal line respectively at their ends; cilia of inner margin of lobe 3 nearly greyish white; narrow dark brown scales forming a slight tuft situated a little before apex of lobe 3 on inner margin; dark brown scales scattered from base of wing to slight scale tuft. Abdomen with segment 1 and anterior part of segment 2 pale yellowish white; the rest of abdomen greyish brown; ventral surface greyish brown heavily suffused with pale yellowish white. Length of forewing: 11 mm.

Holotype ♂, Sujiyu, Bungo, 28. V. 1932, Hori.

DISTRIBUTION: Japan (Kyushu).

This species is unique among the Japanese species of *Platyptilia* owing to its scattered dark brown scales on inner margin of lobe 3 of hindwing. This species is somewhat similar to *P. baueri* Lange and *P. edwardsii* (Fish) both from N. America so far as recognized from the descriptions and figures of these species given by Lange (1950), Fish (1881) and Fernald (1898), but it may be separated from these species by its rather uniform ground colour of forewing and scattered dark brown scales on inner margin of lobe 3 of hindwing.

Platyptilia ignifera Meyrick Fig. 44.

Platyptilia ignifera Meyrick, 1908, Trans. Ent. Soc. Lond. **1907**: 481; 1910, Gen. Ins. **100**: 10; 1913, Lep. Cat. **17**: 10.—Hori, 1933, Ôyo Dobutsugaku Zasshi **5** (2): 64, figs. 1–2.—Inoue, 1955, Check List Lep. Jap. **2**: 116.—Esaki, 1957, Icon. Het. Jap. Col. Nat. **1**: 92, pl. 16, fig. 514.

Male and ♀: Head with vertex and frons brown, the latter smooth. Labial palpus strong, long; segment 3 long, pointed; brown mixed with yellowish brown and slightly scattered with white scales. Antenna brown above. Occipital fringe brown tipped with yellowish mixed with yellowish brown fringes; fringes on dorsum distinctly bifurcated and trifurcated (figs. 1r, 2 f, h). Thorax brown partly tinged with dark brown. All legs except for tarsi brown partly mixed with pale yellowish white; tarsi yellowish brown or brown

mixed with pale yellowish white except for hind tarsus. Medial spur of hind tibia situated at about middle. Large expanded scale tufts situated at distal ends of all tibia, 1/3 of mid tibia, near base and origin of medial spur of hind tibia. Basal 3 segments of hind tarsus roughly scaled at their distal ends. Inner spur of mid tibia equal with outer. Spur of legs brown mixed with pale yellowish white or yellowish brown. Forewing cleft from about 3/4; 2 lobes moderately broad; brown slightly tinged with grey; medial parts and along termens broadly dark brown in both lobes; a small pale yellowish white spot on costa a little beyond base of cleft, but very indefinite. Cilia brownish grey; termens of both lobes with dark brown scales; around anal angle of lobe 2 with long brown scales; within cleft scattered with dark brown scales; inner margin with 2 dark brown scale tufts at 2/3 from base and just below base of cleft. Hindwing cleft firstly from about 5/9; termen of lobe 2 inwardly sinuate and pointed at apex; lobe 3 slender. Cilia brownish grey; apex of lobe 1 with a darker subbasal line; inner margin of lobe 3 with a developed dark brown scale tuft at apex; dark brown, broad but short scales scattered from base of wing to apical scale tuft. Specialized scales on III nearly hair-like, on I and II broad. Abdomen brown tinged with dark brown; ventral surface brown mixed with pale yellowish white and each of segments 4–6 with 2 white distinct dots. Length of forewing: 9–10 mm.

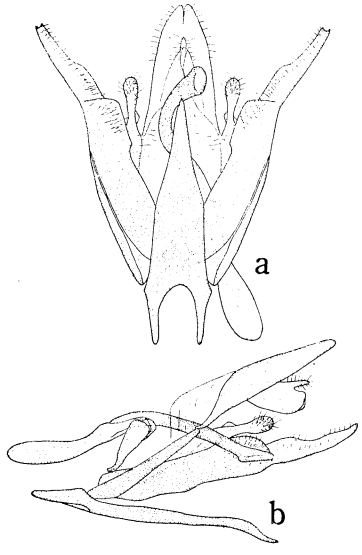

Fig. 44. *Platyptilia ignifera* Meyrick. a, ♂ genitalia, ventral view; b, ditto, lateral view, excluding left valva.

Male genitalia: Tegumen large; dorsal part of tuba analis sclerotized, with a hairy pointed organ dorsally; vinculum heavily sclerotized, its mid-ventral part extremely extending and pointing caudally, its cephalic end extending into 2 pointed arms; sacculus large; distal part of valva heavily sclerotized and forming a narrow projection, basal part of this projection with a small projection which is inflated distally; juxta triangularly sclerotized in ventral view, distally broadening in lateral view and a flat and bent arm connected with aedeagus; aedeagus long, curved and heavily sclerotized distally, distal end inflated.

SPECIMENS EXAMINED: 2 ♂♂, 2 ♀♀, Kôshu, 4–6. VIII. 1930, Kanzawa; 1 ♂, Kasuga, Nara, 27. V. 1959, Saito; 1 ♂, Hikosan, 17. IX. 1948, Yasumatsu; 1 ♂, 1 ♀, Tanushimaru, Chikugo, IX. 1935, Tateishi; 1 ♂, Uchiyama – Tsutsu, Tsushima, 26. VII. 1930, Hori & Chô.

DISTRIBUTION: Japan (Honshu, Kyushu, Tsushima), India.

This species is distinctly characterized by its smooth frons, large scale tufts on tibiae and genitalia.

Biological notes: The larva is known as a feeder on the grape.

Host plant: *Vitis vinifera* L.

Platyptilia rhododactyla (Denis et Schiffermüller)

Alucita rhododactyla Denis et Schiffermüller, 1775, Ank. Syst. Werk. Schmett. Wien., 146.

—Treitschke, 1833, Schmett. Eur. **9** (2): 228.

Pterophorus rhododactylus, Fabricius, 1794, Ent. Syst. **3**: 347.

Platyptilia rhododactyla, Hübner, 1826, Verz. bek. Schmett., 429.—Rebel, 1901, Cat. Lep. Pal. Faun. **2**: 72.—Meyrick, 1910, Gen. Ins. **100**: 10; 1913, Lep. Cat. **17**: 11.—Barnes et Lindsey, 1921, Cont. Nat. Hist. Lep. N. Amer. **4** (4): 313, pl. 43, fig. 3.—Fletcher, 1932, Imp. Counc. Agr. Res. Sci. Mon. **2**: 6, pl. 4, figs. 1–6.—Hori, 1936, Bul. Sci. Fak. Terk. Kjusu Imp. Univ. **7** (1): 80, pl. 1, fig. 2.—Yano, 1960, Mushi **34** (6): 140, fig. 3.

Pterophorus (*Platyptilia*) *rhododactylus*, Zeller, 1851, Linn. Ent. **6**: 326.

Platyptilia rhododactylus, Herr.-Schäff., 1855, Schmett. Eur. **5**: 366.

Cnaemidophorus rhododactylus, Wocke, 1876, Hein. Schmett. Deutsch. **2** (2): 782.—South, 1885, Entom. **18**: 275, pl. 1, fig. 3.

Eucnemidophorus rhododactyla, Tutt, 1906, Brit. Lep. **5**: 256.—Pierce et Metcalfe, 1938, Gen. Brit. Pyr. Delt. Plume, 46, pl. 26, fig.—Beirne, 1954, Brit. Pyr. Plume Moths, 165, pl. 14, fig. 8.

Platyptilia (*Eucnemidophorus*) *rhododactylus*, Spuler, 1910, Schmett. Eur. **2**: 319, pl. 82, fig. 55.

Platyptilia koreana Matsumura, 1931, 6000 Ill. Ins. Jap., 1055, no. 2068.

Length of forewing: 12–13 mm.

Male genitalia: Uncus stout, slightly bent ventrally, heavily sclerotized at its distal end which is pointed; a sclerotized process situated at basal ventral part of uncus; tegumen large; vinculum forming a somewhat broad lobe mid-ventrally; valva elongate oval; sacculus with a sclerotized arm directed to base of valva; juxta small but with 2 distinct arms; aedeagus gradually tapering and sclerotizing towards distal end which is pointed, basal part of aedeagus with a small lobe on each lateral side.

Female genitalia: Apophyses anteriores not developed; sterigma presented as a heavily sclerotized tubular structure and situated well beyond caudal end of abdominal segment 7; corpus bursae large, with minute scobinations.

SPECIMENS EXAMINED: 1 ♂ (type of *koreana*) labelled "Suigen, Corea, –5–1916, Kinzenshi"; 1♀, Utoro – Iwaubetsu, Abashiri, Hokkaido, 27. VII. 1960, Tonosaki, and 5 examples recorded by Yano (1960).

DISTRIBUTION: Japan (Hokkaido), Korea, Europe, India, Africa, Asia Minor, N. America.

This widely distributed species was recently recorded from Japan. The ♂ and ♀ genitalia of this species are rather peculiar.

Biological notes: After Mr. T. Kumata, the larva of this species feeds on *Rosa rugosa* Thunb. in Hokkaido. It is easily supposed that the larva may attack the cultivated rose in Japan.

Host plant: *Rosa rugosa* Thunb.

Platyptilia sythoffi Snellen Figs. 45–48.

Platyptilia (*Amblyptilia*) *sythoffi* Snellen, 1903, Tijdschr. v. Ent. **46**: 54, pl. 15, figs. 15–16.

Platyptilia taprobanes, Fletcher (*nec* Felder), 1909, Spol. Zeyl. **6** (21): 14; 1921, Mem. Dep. Agr. India Ent. Ser. **6** (1): 19, pl. 3, fig. 1.

Platyptilia sythoffi, Inoue, 1959, Icon. Ins. Jap. Col. Nat. Ed. **1**: 257, pl. 173, fig. 25.

Male and ♀: Head with vertex and frons dark brown with purplish tinge; lemon yellow between base of antenna, sides of vertex and margins of frons. Labial palpus with basal segment yellowish white or lemon yellow slightly mixed with dark brown; segments 2–3 dark brown mixed with lemon yellow. Antenna dark brown above, dotted with lemon yellow laterally. Occipital fringe dark brown on dorsum, rest lemon yellow; fringes on dorsum bifurcated (fig. 1 l). Thorax dark brown with purplish tinge, lemon yellow ventrally and dorso-lateral sides of metathorax. Coxae of all legs dark brown suffused with lemon yellow; femora dark brown scattered with yellowish or whitish dots. Tibiae of fore and mid legs dark brown with white dots, thickened distally; tibia of hind leg dark brown scattered with white scales on outer side, brownish white patches on inner side and medial spur situated at about 3/5, thickened slightly at distal end. Tarsi of all legs dark brown with white patches. Forewing cleft from 2/3; dark brown with purplish tinge, sometimes tinged with greyish towards termens of both lobes; brownish white scales scattered mainly in cell and on basal parts of 2 lobes; costa marked with small white dots from base of wing to base of lobe 1, before base of cleft on costa triangularly darker than ground colour; this darker area followed by a white elongated patch on costa; a white subterminal line crossing both lobes at about 2/3 but not extending to inner margin; area before this line darker; a minute white dot on costa at middle between costal elongate white patch and subterminal line, and the same dot situated at near apex but usually indistinct; lemon yellow scales slightly scattered along cleft and termens. Cilia brownish white; termens of both lobes with dark brown scales interrupted at about middle in lobe 1, at below and above both angles in lobe 2; cilia near angles within cleft dark brown; pale yellowish white scales slightly scattered within cleft; inner margin with 2 rather strong scale tufts at 7/10 between base of wing and base of cleft and at just before base of cleft, around

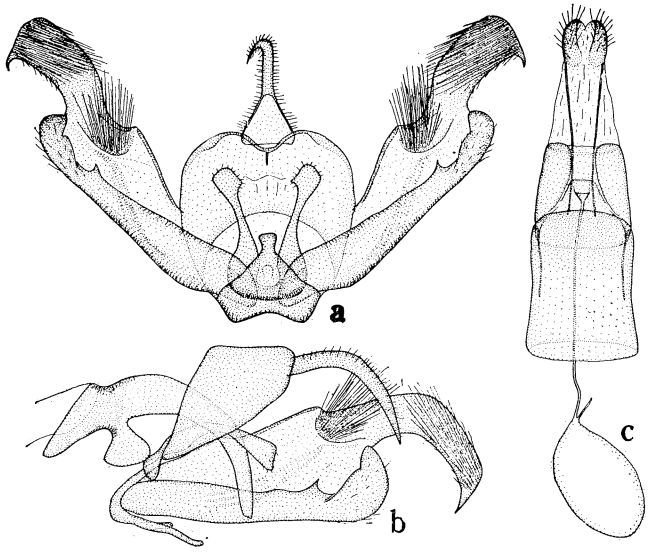

Fig. 45. *Platyptilia sythoffi* Snellen. a, ♂ genitalia, ventral view, excluding aedeagus; b, ditto, lateral view, excluding left valva; c, ♀ genitalia.

anal angle of lobe 2 and about middle of lobe 2 dark brown. Hindwing cleft firstly from a little before middle; lobe 1 round at apex; distal part of lobe 2 narrow; lobe 3 linear; dark brown. Cilia pale yellowish brown partly tinged with grey; lobes 1–2 with a dark brown subbasal line at their distal ends respectively; lobe 3 with a strong dark brown scale tuft a little before apex. Abdomen dark brown with purplish tinge dorsally; segment 1 lemon yellow laterally; remaining segments scattered with lemon yellow scales, slightly with whitish scales; ventral surface with lemon yellow and slightly whitish patches. Length of forewing: 6.5–8 mm.

Male genitalia: Uncus slender, broadened towards base; tegumen rather stout; midventral part of vinculum slightly incised at cephalic end, triangularly extended caudally and constricted just before caudal end, a small concavity present at about centre of this triangular part; sacculus stout; distal part of valva constricted and pointed distally; juxta rather heavily sclerotized, composed of 2 long arms which are narrowed at 2/3 from base; aedeagus tapering towards distal end, inflated towards base but constricted just before base where sclerotization is rather heavy, basal process constricted at its base.

Female genitalia: Apophyses posteriores very long; apophyses anteriores short, about 3/7 of apophyses posteriores; ostium bursae somewhat sclerotized, cup-shaped and situated midventrally beyond caudal end of abdominal segment 7; ductus bursae narrow; signum absent.

SPECIMENS EXAMINED: 2 ♂♂, 4 ♀♀, Makinoosan, Osaka Pref., 30. VIII–3. IX. 1959, reared by Yano (host plant: *Salvia japonica* Thunb.); 2 ♀♀, Tachibanayama, Fukuoka

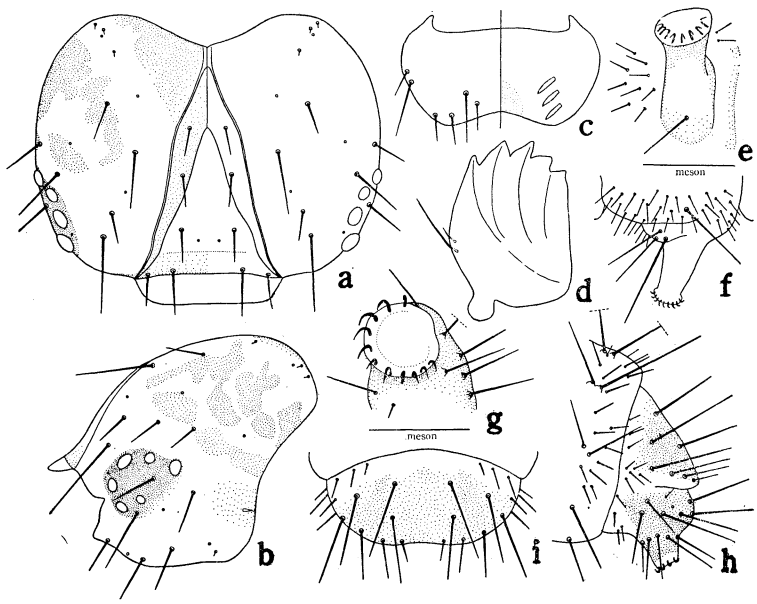

Fig. 46. *Platyptilia sythoffi* Snellen, mature larva. a, head, frontal view; b, ditto, lateral view; c, labrum, with epipharyngeal surface on right; d, mandible; e, left ventral proleg of abdominal segment 6, ventral view; f, ditto, lateral view; g, left anal proleg, ventral view; h, abdominal segments 9 and 10, lateral view; i, abdominal segment 10, dorsal view.

Pref., 2. X. 1960, reared by Yano (host plant: *Salvia japonica* Thunb.); 3 ♂♂, 1 ♀, *ibid.*, 30–31. V. 1961, reared by Yano (host plant: *Scutellaria indica* L.); and many other specimens from the following localities. HONSHU: Makinoosan (VIII), Iwawakisan (VIII), Osaka Pref. KYUSHU: Fukuoka (VI), Tachibanayama (V, VII, IX, X), Wakasugiyama (VIII), Inunakiyama (VIII), Korasan (VI), Sefuriyama (VIII), Hikosan (VIII), Fukuoka Pref.; Sobosan, Oita Pref. (VIII); Kakuyama, Amakusa (IX); Ishikawachi, Miyazaki Pref. (VI).

DISTRIBUTION: Japan (Honshu, Kyushu), India, Ceylon.

This species is peculiar among the species of this genus according to its linear lobe 3 of hindwing and its genitalia. It is easily recognized from other Japanese species by its linear lobe 3 of hindwing and lemon yellow scales.

Mature larva: Head pale yellow with pale yellowish brown patches; ocellar area dark brown; vertical triangle shallow; length of fronto-clypeal area (excluding anteclypeus) nearly equal with width; ocelli I, III and IV slightly larger than the others; seta AF1 variable in position, rarely dorsad from the level of P1; AF2 sometimes dorsad from the level of dorsal end of fronto-clypeal area; Aa nearer to A2 than P1; V1 remote from other vertical setae; Va, V2 and V3 approximate to each other. Labrum with a shallow median incision; setae of median group arranged near ventral margin of labrum; M2 ventrad from the level of La2; La3 approximate to M3. Mandible with 5 teeth. Thorax and abdomen

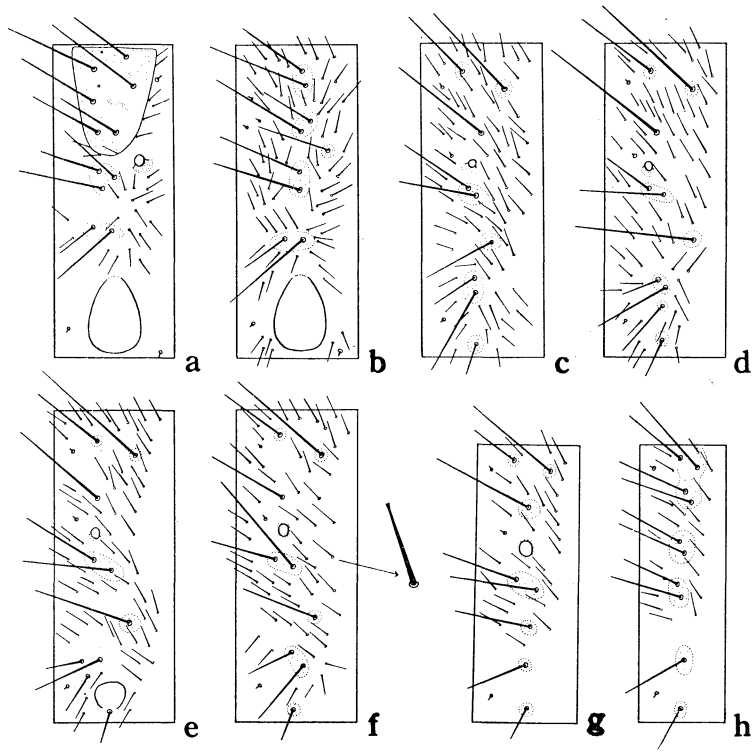

Fig. 47. *Platyptilia sythoffi* Snellen, chaetotaxy of mature larva. a–h, pro-, mesothorax, abdominal segments 1, 2, 3, 7, 8 and 9.

with distinct numerous secondary setae, but primary setae also easily discernible; secondary setae somewhat slightly forked at their tips and mixed with dark brown setae and semi-transparent ones; SV group of abdominal segment 2 trisetose. Spiracles nearly circular; those on prothorax and abdominal segment 8 larger than those on other abdominal segments. Proleg long. Crochets of ventral proleg often contacted together, 6–10; those of anal proleg 8–11. Length: 8–9 mm. Head width: 0.74.

Pupa: Cephalic end of body projected but directed somewhat ventrally. Glazed eye-piece with some small but distinct projections; pilifers somewhat elevated; basal part of maxilla rather short, nearly 1/2 the length of fore leg and exposed again at its distal end. Mesothorax with 2 distinct ridges on dorsum, these 2 ridges rugged and more conspicuous towards caudal margin and distance between them expanded near middle of their length, each side of mesothorax with small projections; metathorax with similar ridges on dorsum; mid legs in contact with each other for a rather long distance of their length; hind leg slightly discernible; wing extending fairly before distal end of mid leg. Abdominal segments 1–3 with similar ridges on dorsum as those of meso- and metathorax; abdominal segments 3–8 with distinct barbed spines on each side of dorsum, those on abdominal segment 3 extremely large, those on abdominal segments 4–8 small but distinctly projected; abdominal segments 1, 2, 9 and 10 with 1 or 2 minute barbed spines on each side respectively but indistinct. Length: 7.5–8.5 mm. Width: 1.4–1.8. The pupa of this species is easily separated from other pupae by the conspicuous spines on dorsum of abdomen.

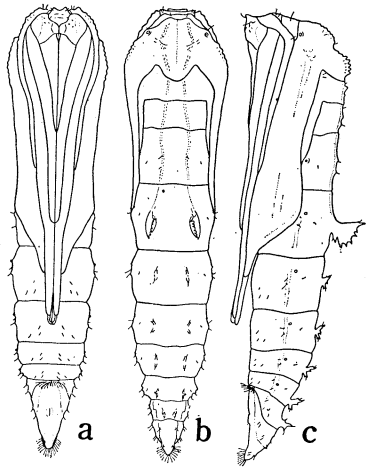

Fig. 48. *Platyptilia sythoffi* Snellen, pupa. a, ventral view; b, dorsal view; c, lateral view.

Biological notes: The larva usually feeds on the flower of *Salvia japonica* Thunb., rarely on the leaf and probably the flower of *Scutellaria indica* L. The pupa is attached to the stem of the host plants and directs downwards, or very rarely upwards. The pupal period is about 7 or 8 days in June. The adult appears from May to October.

Host plants: *Salvia japonica* Thunb., *Scutellaria indica* L.

Platyptilia taprobanes (Felder) Figs. 49–52.

Amblyptilia taprobanes Felder, 1875, Reise Novara, Lep. Het., pl. 140, fig. 54.—Moore, 1887, Lep. Ceylon **3**: 527.

Platyptilia brachymorpha Meyrick, 1888, Trans. Ent. Soc. Lond. **1888**: 240.—Walsingham, 1907, Faun. Haw. **1**: 474, pl. 10, fig. 5.—Meyrick, 1908, *ibid.* **1907**: 483.—Fletcher, 1909, Spol. Zeyl. **6** (21): 12, pl. A, fig. 3.—Meyrick, 1910, Gen. Ins. **100**: 10; 1913, Lep. Cat. **17**: 11.—Fletcher, 1921, Mem. Dep. Agr. Ind. Ent. Ser. **6** (1): 21, pl. 3, fig. 2, pl. 6.—Meyrick, 1921, Entom. **54**: 275.

Amblyptilia seeboldi Hofmann, 1898, Iris **11**: 33.

Platyptilia seeboldi, Rebel, 1901, Cat. Lep. Pal. Faun. **2**: 73.

Platyptilia taprobanes, Meyrick, 1910, Gen. Ins. **100**: 10 (partim); 1913, Lep. Cat. **17**: 10 (partim).—Fletcher, 1932, Imp. Counc. Agr. Res. Sci. Mon. **2**: 5, pl. 3, figs. 1–4.

Platyptilia crenulata Barnes et McDunnough, 1913, Cont. Nat. Hist. Lep. N. Amer. **2**: 185, pl. 3, fig. 8.—Barnes et Lindsey, 1921, Cont. Nat. Hist. Lep. N. Amer. **4** (4): 316, pl. 41, fig. 15, pl. 50, fig. 5.

Platyptilia terlizzii Turati, 1926, Ann. Soc. Ital. Sci. Nat. Milano **65**: 67, fig. 28.

Stenoptilodes taprobanes brachymorpha, Zimmerman, 1958, Ins. Hawaii **8**: 410, figs. 340, 341, 344.

Length of forewing: 7–9 mm.

Male genitalia: Sclerotization rather weak generally; uncus very slender, pointed apically; sclerotization in tegumen very weak towards cephalic part; tuba analis enveloped by a weakly sclerotized structure; valva with cucullus, valvula and sacculus all developed,

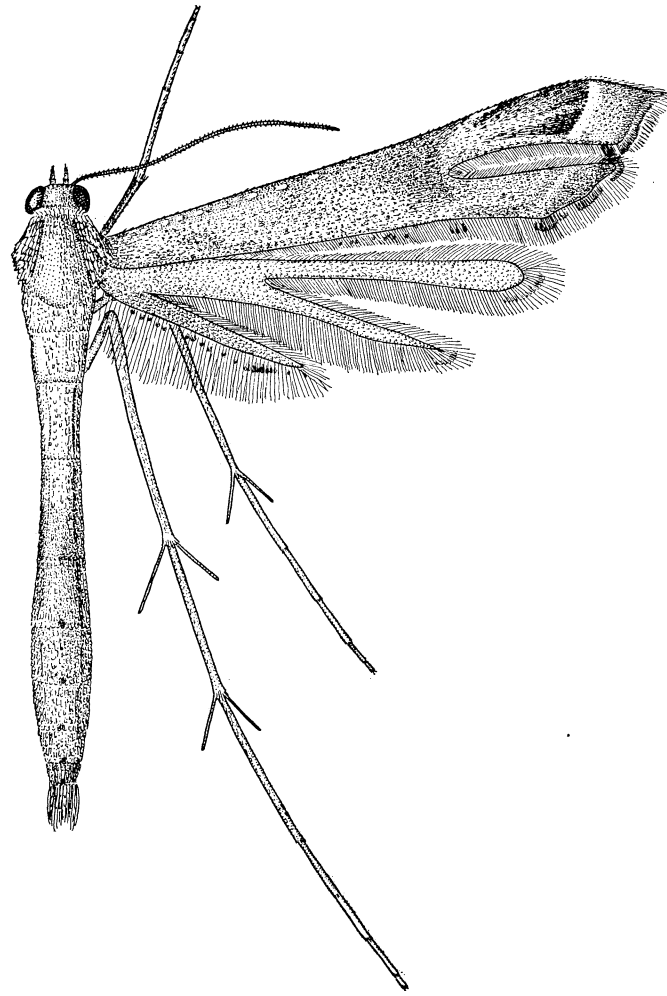

Fig. 49. *Platyptilia taprobanes* (Felder), ♂.

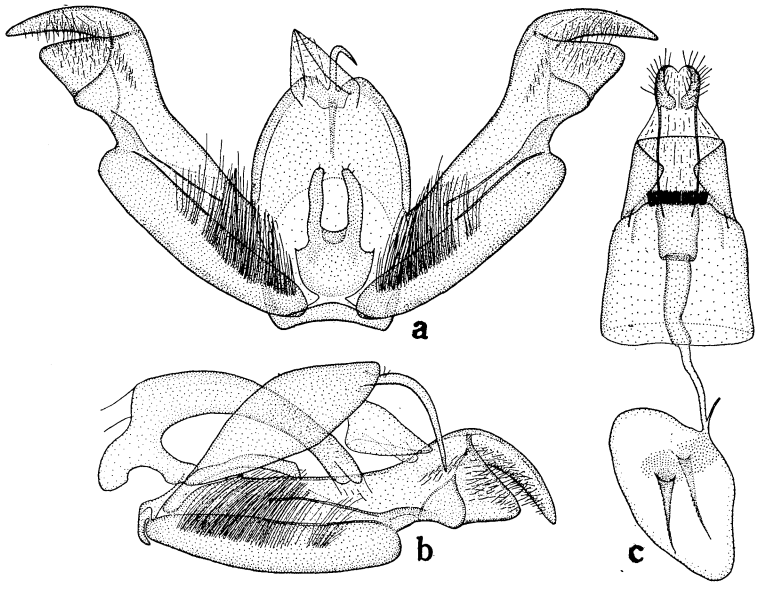

Fig. 50. *Platyptilia taprobanes* (Felder). a, ♂ genitalia, ventral view, excluding aedeagus; b, ditto, lateral view, excluding left valva; c, ♀ genitalia.

valvula somewhat pointed; basal part of juxta sclerotized weakly; aedeagus rather broad, inflated towards basal process which is short and blunt.

Female genitalia: Apophyses anteriores presented very shortly; antrum of ostium bursae broad, weakly sclerotized; ductus bursae broad about 1/2 the length of it from antrum of ostium bursae.

SPECIMENS EXAMINED: 1 ♂, Karuizawa, Shinano, 7–14. VII. 1959, Morimoto; 1 ♀, Iwawakisan, Osaka Pref., 30. VIII. 1958, Yano; 1 ♀, Monobe-mura, Kochi Pref., 27. VIII. 1958, Morimoto; 1 ♀, Tachibanayama, Fukuoka Pref., 28. IX. 1961, reared by Yano (host plant: *Centipeda minima* O. Kuntze); 6 ♂♂, 5 ♀♀, *ibid.*, 19. IX. 1961, Yano; 15 ♂♂, 9 ♀♀, *ibid.*, 24. IX. 1961, Yano; 1 ♀, Fukuoka, Fukuoka Pref., 8. IX. 1960, Yano; 1 ♀, Nokonoshima, Fukuoka, City, 17. VI. 1955, Yamamoto; 1 ♂, Izumimura, Buzen, 16. VII. 1931, Tateishi; 1 ♂, Hikosan, Buzen, 28. VIII. 1935, Esaki; 1 ♀, Beppu, Bungo, 15. IX. 1936, Torikata; 1 ♀, Sasuna, Tsushima, 18. VII. 1960, Kamiya.

DISTRIBUTION: Japan (Honshu, Shikoku, Kyushu, Tsushima), Europe, Syria, India, Ceylon, Burma, Thailand, Hawaiian Is., N. & S. America, Africa.

It seems to be possible that this species might be transferred to *Stenoptilia* according to its genitalia which is differentiated as seen in *Stenoptilia*. In spite of the characters mentioned above, it may be better that this species belongs to *Platyptilia* owing to the rather developed dark brown scales on inner margin of lobe 3 of hindwing.

Mature larva: Head pale yellowish white with pale yellowish brown patches; vertical triangle shallow; ocelli III and IV conspicuously larger than the others and these 2 ocelli extremely approximate to each other; seta AF2 conspicuously dorsad from the level of dorsal end of fronto-clypeal area; P1 slightly dorsad from the level of AF1; Aa laterad

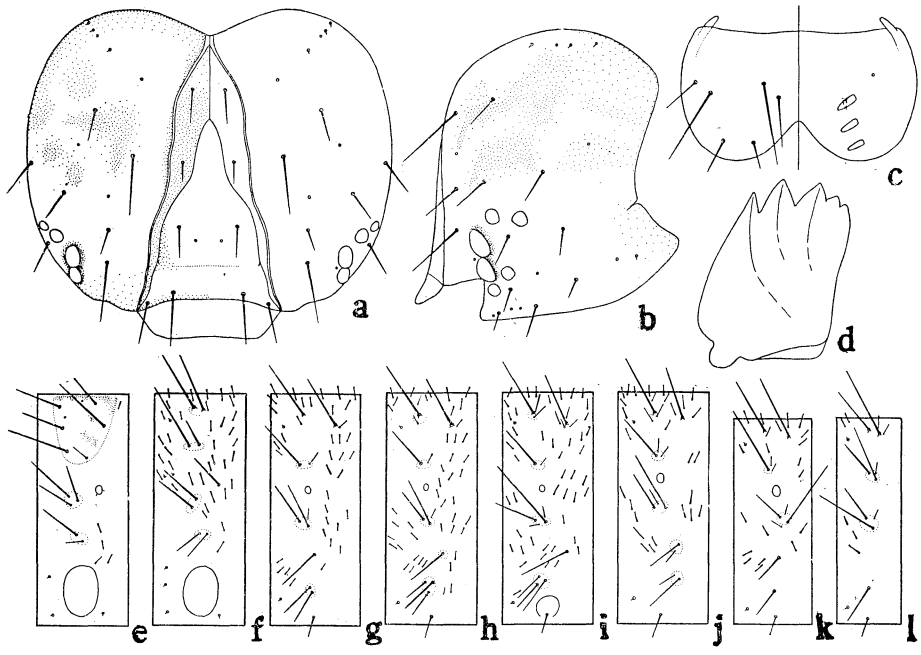

Fig. 51. *Platyptilia taprobanes* (Felder), mature larva. a, head, frontal view; b, ditto, lateral view; c, labrum, with epipharyngeal surface on right; d, mandible; e–l, chaetotaxies of pro-, mesothorax, abdominal segments 1, 2, 3, 7, 8 and 9.

from a line joining P1 and A2; setae of vertical group arranged in nearly a straight line; Va and V2 somewhat approximate to each other. Labrum with a moderate median incision; M3 nearer to ventral margin; La3 nearer to M3 than La2. Mandible with 5 teeth; inner-most one small; mandibular setae minute. Thorax and abdomen with many numerous secondary setae which are brown, short, blunt and somewhat inflated at their tips; prothorax and caudal part of abdomen with scarce secondary setae, almost without them; primary setae easily discernible, tips of them not sharply pointed; SV group of abdominal segment 2 trisetose. Proleg long. Crochets of ventral proleg 8–10; those of anal proleg 10–11. Length: 9 mm. Head width: 0.7. This larva is mainly distinguished by the following points: ocelli III and IV conspicuously larger than the others; labrum with M3 distinctly remote from other median setae and nearer to ventral margin of labrum; mandible with very minute setae; thorax and abdomen with short, peculiar shaped numerous secondary setae.

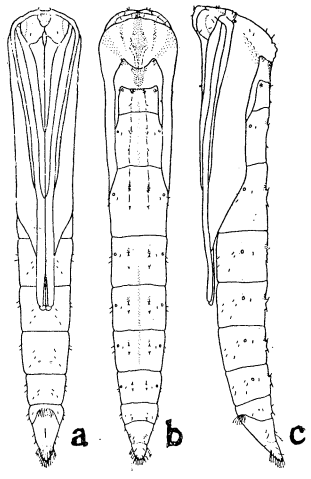

Fig. 52. *Platyptilia taprobanas* (Felder), pupa, ♀. a, ventral view; b, dorsal view; c, lateral view.

Pupa: Thorax and abdomen with brown patches on dorsum. Body very slender, greatest width at mesothorax.

Head with clypeo-labral suture discernible; boundary line between glazed eye-piece and sculptured eye-piece rather distinct; antenna extending slightly before distal end of fore leg; distal part of maxilla visible again narrowly in addition to basal exposed part. Mesothorax with 2 oblique rows of small projections on dorsum of its caudal margin and with same projections on each side; mid legs in contact with each other for a rather long distance of their length; hind leg slightly exposed; caudo-lateral end of exposed hindwing extending slightly beyond caudal margin of abdominal segment 1; wing extending fairly before distal end of mid leg. Abdominal segments 1–3 each with 2 slight ridges on dorsum; each abdominal segment with 2 small barbed spines on each side of dorsum, these spines very minute and each spine divided into 2 parts dorsally, directed cephalad and caudad, but these spines on abdominal segments 1, 2, 9 and 10 very indistinct. Length: 9–9.5 mm. Width: 1.3–1.5. The present pupa is characterized by its slender body, 2 oblique ridges on caudo-dorsal end of mesothorax and weak barbed spines on dorsum of abdomen.

Biological notes: I collected the larvae and pupae from *Centipeda minima* O. Kuntze which is evidently the host plant of this species.

Host plant: *Centipeda minima* O. Kuntze

Genus **Nippoptilia** Matsumura

Nippoptilia Matsumura, 1931, 6000 Ill. Ins. Jap., 1054.—Yano, 1961, Pub., Ent. Lab., Univ. Osaka Pref. **6**: 71.

Type species: *Stenoptilia vitis* Sasaki.

Frons not projecting forwards. Labial palpus slender. Occipital fringe usually trifurcated or polyfurcated, slightly mixed with bifurcated ones. Inner terminal spur of hind tibia usually longer than outer, rarely shorter. Forewing bifid; lobe 1 slightly dilated towards termen, rarely slender; lobe 2 dilated towards termen which is usually very sinuate. Hindwing with 3 lobes all linear; inner margin of lobe 3 with a conspicuous scale tuft at apex or just before apex. Frenulum in ♀ double, rarely simple. Venation of wing allied to *Platyptilia*. Forewing with vein Cu_{1a} to anal angle of lobe 2; Cu_{1b} from a little before angle of cell. Hindwing with veins $Sc+R_1$ and Rs not divergent beyond cleft; Rs to apex of lobe 1; M_3 and Cu_1, stalked; Cu_{1a} weak, rarely almost invisible.

Male genitalia: Tegumen deeply incised centrally; a hairy distally pointed structure situated at ventral side of tegumen; vinculum incised at its cephalic end; valva elongate, sacculus definitely separated from costal 1/2 of valva, rarely sacculus developed as a pointed arm; juxta usually very small; aedeagus long.

Female genitalia: Papilla analis rather pointed; apophyses posteriores long; apophyses anteriores absent, rarely shortly present; antrum of ostium bursae usually exceedingly developed into a heavily sclerotized long tubular structure, rarely cup-shaped; usually lobes attached on each side of antrum and with many soft hair-like scales densely; ductus seminalis departed from caudal end of corpus bursae; corpus bursae with or without 2 signa. This genus is a distinct one. It may be easily separated from the somewhat allied genera, *Stenoptilia* and *Platyptilia*, by the linear lobes of hindwing, weak vein Cu_{1a} of hindwing and the characters of genitalia and larva. It is differentiated from *Sphenarches* by vein R_1 of forewing separate. This genus is represented by 3 species in Japan.

KEY TO JAPANESE SPECIES OF NIPPOPTILIA

1. Lobe 1 of forewing with an anal angle; length of forewing 7–9 mm.....2
   Lobe 1 of forewing without an anal angle; length of forewing 5–6 mm ..... **minor**
2. Ground colour of forewing dark brown; metathorx pale yellowish white; juxta of ♂ genitalia without arms.....**vitis**
   Ground colour of forewing greyish brown; metathorax greyish brown; juxta of ♂ genitalia with 2 arms..... **issikii**

Nippoptilia vitis (Sasaki) Figs. 3d, 53–55.

Stenoptilia vitis Sasaki, 1913, Ins. World (Gifu) **17** (1): 3, fig.—Nohira, 1916, Ent. Mag. (Kyoto) **2** (1): 38.—Inoue, 1955, Check List Lep. Jap. **2**: 116.—Esaki, 1957, Icon. Het. Jap. Col. Nat. **1**: 91, pl. 16, fig. 506.—Inoue, 1959, Icon. Ins. Jap. Col. Nat. Ed. **1**: 258, pl. 173, fig. 26.

Nippoptilia vitis, Matsumura, 1931, 6000 Ill. Ins. Jap., 1054, no. 2060.—Hori, 1933, Ôyo Dobutsugaku Zasshi **5** (2): 66, fig. 3; 1950, Icon. Ins. Jap. (rev. ed.), 498, fig. 1357.—Yano, 1961, Pub., Ent. Lab., Univ. Osaka Pref. **6**: 72, figs. 1, 4-A, B, C, pl. 18, fig. H.

Oxyptilus formosanus Matsumura, 1931, *ibid.*, 1054, no. 2061.

Male and ♀: Head with vertex and frons dark brown, latter with a whitish anterior margin. Labial palpus long; basal segment pale yellowish white slightly mixed with dark brown; remaining segments dark brown scattered with pale yellowish white. Antenna dark brown dotted with yellowish white laterally above, but on outer side dot usually forming a line towards base. Occipital fringe dark brown, mixed with pale yellowish white on sides and beneath; fringes on dorsum usually distinctly trifurcated (fig. 2 b, d), rarely mixed with bifurcated ones. Thorax dark brown except for metathorax which is pale yellowish white. Tibiae of all legs dark brown scattered with pale yellowish white, inner side of hind tibia heavily suffused with pale yellowish white; fore tibia thickened distally, mid tibia with scale tufts at 3/8 and distal end; hind tibia with 3 scale tufts, the 1st at 3/7 between base of tibia and origin of medial spur, the 2nd at origin of medial spur which is situated at 5/9 of tibia and the 3rd at end; tarsi of all legs dark brown with pale yellowish patches. Forewing cleft from a little beyond middle; lobe 1 nearly equal width through the lobe; brown suffused with dark brown, often tinged with reddish brown; costa marked with pale yellowish white dots from base of wing to beyond base of cleft; dark brown indefinite patches at about 3/5 in cell between base of wing and base of cleft and before base of cleft; a pale yellowish white subterminal line crossing both lobes; pale yellowish white scales at base of cleft and on costa at about middle between base of cleft and subterminal line; subterminal line preceded by broad dark brown area. Cilia pale yellowish white tinged with pale brown; apex of lobe 1 greyish brown, just before apex short white cilia; cilia within cleft greyish brown heavily mixed with dark brown scales and narrow pale yellowish white scales; just below apex of lobe 2 with short dark brown scales; cilia along distal 1/2 of posterior margin of lobe 2 greyish brown; dark brown scale tufts at a little before and beyond base of cleft on inner margin; dark brown scales scattered along inner margin. Hindwing cleft firstly from 3/8; 3 lobes linear; greyish brown. Cilia pale greyish brown mainly in lobes 1 and 2, pale grey or pale yellowish white in lobe 3; inner margin of lobe 3 with a strong triangular dark brown scale tuft at distal end; some dark brown scales scattered along inner margin of lobe 3 from base of wing to the distal

scale tuft, anterior margin also with dark brown scale tuft at about distal 1/3. Abdomen greyish brown mixed with dark brown and with pale yellowish white scales on sides of segment 1 and posterior margin of dorsum of segment 3; segments 3, 5 and 6 usually with paler posterior margins. Length of forewing: 7–8 mm.

Male genitalia: Vinculum deeply incised centrally, caudal margin rounded; valva simple; juxta very small, without an arm; aedeagus somewhat bulbous at base, distal part bent dorsally, with small hook-like projections near distal end; aedeagus connected with juxta at about 1/6 from base.

Female genitalia: Apophyses posteriores very long; apophyses anteriores absent; caudal end of antrum of ostium bursae incised; caudal 1/2 of antrum somewhat flat, its cephalic 1/2 broadened; lobes attached on each side of caudal 1/2 of antrum and with many inwardly directed soft hair-like scales; corpus bursae with 2 signa.

SPECIMENS EXAMINED: 1 ♀ (type of *formosanus*) labelled "Formosa, Taito, 25. II–27. III. 1919, S. Inamura, J. Sonan, M. Yoshino", and many other specimens from the following localities. HONSHU: Tukigase, Nara Pref. (IX); Iwawakisan (VIII), Makinoosan (VIII, IX), Sakai (VIII), Osaka Pref.; Daisen, Tottori Pref. (VIII). KYUSHU: Fukuoka (IV, VII–X), Tachibanayama (IV, VI, IX, X), Wakasugiyama (VIII), Inunakiyama (VIII), Hikosan (VII, VIII), Fukuoka Pref.; Tomioka, Amakusa (IX); Izuhara (X), Ko-

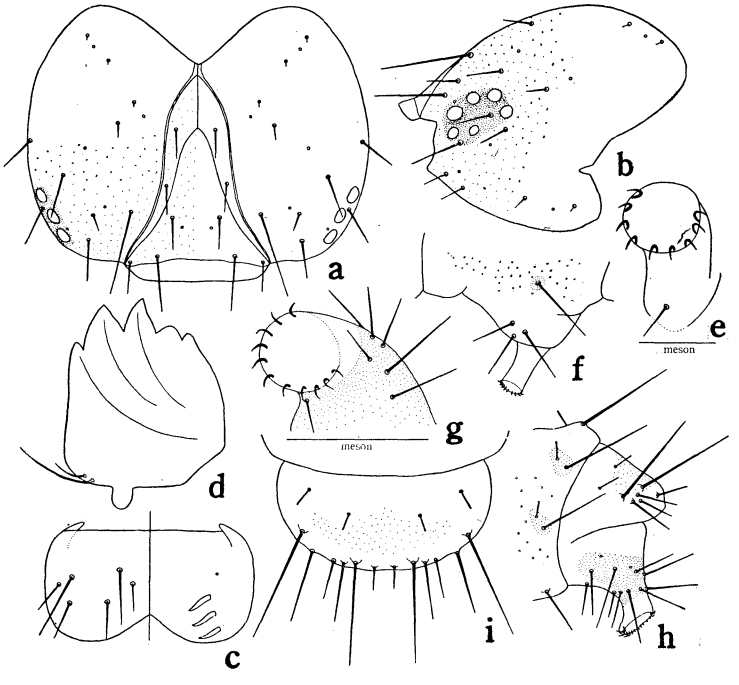

Fig. 53. *Nippoptilia vitis* (Sasaki), mature larva. a, head, frontal view; b, ditto, lateral view; c, labrum, with epipharyngeal surface on right; d, mandible; e, left ventral proleg of abdominal segment 6, ventral view; f, ditto, lateral view; g, left anal proleg, ventral view; h, abdominal segments 9 and 10, lateral view; i, abdominal segment 10, dorsal view.

moda – Imazato (IX), Azamo – Taterayama (IX), Tsushima; Kagoshima (VII).

DISTRIBUTION: Japan (Honshu, Shikoku, Kyushu, Tsushima), Korea, Formosa, Thailand.

This economically important species is similar to the following species, but is easily separated from the latter mainly by the points mentioned in the key.

Mature larva: Head pale yellowish white; slightly darker ventrally; ocellar area dark brown; vertical triangle deep; adfrontal area extending to just before vertical triangle; fronto-clypeal area (excluding anteclypeus) slightly shorter than wide; AF2 nearly on the same level of dorsal end of fronto-clypeal area; P1 extremely nearer to ventral margin of head, slightly dorsad from the level of F1; P2 short, slightly dorsad from the level of AF2; A2 nearly on the same level of P1; Aa approximate to A2; L1, O3 and SO3 short; V1 approximate to Pb; V2 ventrad from Va; V2, Va and V3 arranged nearly in a straight line, Va rarely mesad from a line joining V2 and V3. Labrum with a moderate median incision; M3 nearly equidistant from M2 and ventral margin of labrum; La1 latero-ventrad from La2; La3 nearly on the same level of M3. Mandible with 5 teeth; outer-most one and inner 2 small, the others large and pointed. Thorax and abdomen pale yellowish white, subdorsal line and the level of seta L3 on abdomen pale brown. Thorax and abdomen without secondary setae, but abdominal segment 10 with many setae, body invested

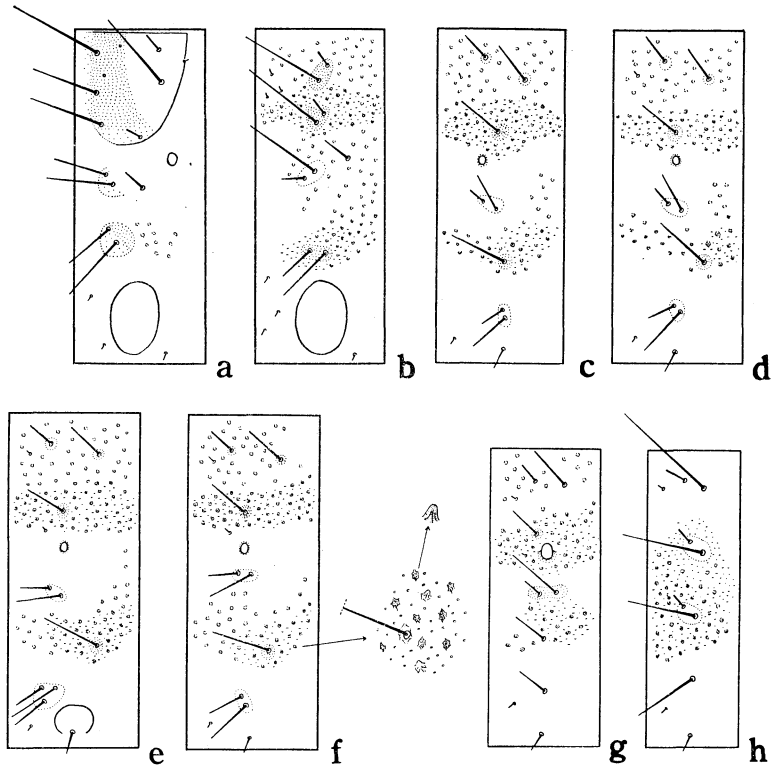

Fig. 54. *Nippoptilia vitis* (Sasaki), chaetotaxy of mature larva. a–h, pro-, mesothorax, abdominal segments 1, 2, 3, 7, 8 and 9.

with scobinations which are scarce on prothorax and caudal end of abdomen; setae from rather distinct pinacula; anterior 1/2 of prothoracic shield and some pinacula of thorax and abdomen brown; setae of thorax and abdomen rather short except for some setae and blunt apically; SV group of abdominal segment 2 bisetose. Spiracle on abdominal segment 8 distinctly larger than those on other segments. Proleg long. Crochets of ventral proleg 8–10; those of anal proleg 9–11. Length: 7.5–8.5 mm. Head width: 0.63. The larva of this genus is characterized by the following points: head with seta P1 nearer to ventral margin of head; P2 short or minute; V1 nearer to Pb than V2; V2 ventrad from Va; labrum with La1 latero-ventrad from La2; body without secondary setae. The larva of this species is easily separated from the larva of *N. minor* Hori by the following characters: body with brown longitudinal lines; head with P1 nearly on the same level of A2; mandible with outer-most tooth and inner 2 distinctly smaller than the others.

Pupa: Head with 2 longitudinal ridgy projections on cephalic end; pilifers indicated; boundary line between both eye-pieces very obscure, glazed eye-piece with a small elevated part; maxilla again exposed at its distal part; antenna extending to nearly distal end of fore leg, rarely slightly before. Mesothorax with spiracles rather large; mid legs in contact with each other for some distance and again separated distally; hind leg distinctly exposed at its distal end, extending beyond distal end of mid leg; wing not extending to distal end of mid leg, nearly reaching distal end of maxilla. Two longitudinal ridges on dorsum occurring from mesothorax to abdominal segment 3, distance between these ridges narrowed metathorax and caudal end of them ending at middle of abdominal segment 3; abdominal segments 2–7 with a barbed spine on each side of dorsum, those on abdominal segments 2–3 rather conspicuous and dark brown and latter with another small one at its base, those on abdominal segments 4–7 small and divided into 2 parts dorsally; proleg scar indistinct; body without long setae. Length: 8 mm. Width: 1.5. The pupa of this species is closely allied to that of *N. issikii* Yano, but it is separated from the latter by the following characters; antenna almost reaching distal end of fore leg; fore leg rather long exposed; abdominal segments 4–7 each bearing a small but distinct barbed spine on each side of dorsum.

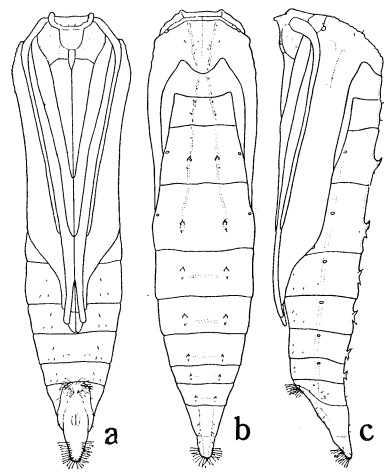

Fig. 55. *Nippoptilia vitis* (Sasaki), pupa. a, ventral view; b, dorsal view; c, lateral view.

Biological notes: I observed the larva feeding on the flower of *Vitis thunbergii* Sieb. et Zucc., flower and leaf of *Cayratia japonica* Gagn. and leaf of *Ampelopsis brevipedunculata* Trautv. It may be supposed that the part of the plant fed on by the larva is differentiated according to its host plants. When the larva feeds on the leaf of *Cayratia japonica* Gagn., it eats a leaf from the under surface. The pupal period lasts for about a week in September. The moths usually fly about the flower of *Cayratia japonica* Gagn.

Host plants: *Ampelopsis brevipedunculata* Trautv., *Cayratia japonica* Gagn., *Vitis thun-*

bergii Sieb. et Zucc., *Vitis vinifera* L.

Nippoptilia issikii Yano Fig. 56.

Nippoptilia issikii Yano, 1961, Pub., Ent. Lab., Univ. Osaka Pref. **6**: 73, figs. 2, 4-D, pl. 18, fig. I.

Male and ♀: Occipital fringes on dorsum various (figs. 1s, 2e, l–o). Length of forewing: 8–9 mm.

Male genitalia: Tegumen large, long; vinculum deeply and rather roundly incised at cephalic end, caudal margin slightly rounded; juxta small, sclerotized, with 2 narrow arms which are parallel; aedeagus bulbous just before base, distal end with a slight incision; aedeagus connected with juxta at about 1/3 from base.

Female genitalia: Papilla analis acutely pointed; apophyses posteriores very long but without apophyses anteriores; antrum of ostium bursae very long, tubular but flat, greatest width at about 1/3 from cephalic end; lobes attached to cephalic part of antrum and with many outwardly directed soft hair-like scales; corpus bursae with 2 signa.

SPECIMENS EXAMINED: 6 type specimens.

DISTRIBUTION: Japan (Hokkaido).

This species, at the present time, occurs only in Hokkaido, but it is easily supposed that the species will be found in Honshu and other districts of Japan owing to its widely cultivated host plant.

Pupa: Closely allied to that of *N. vitis* (Sasaki). Metathorax, abdominal segments 2 and 3 with darker patches. Body with greatest width at metathorax and somewhat distintly tapering to abdominal segment 2, then slightly broadening to abdominal segments 3 or 4 and gradually narrowing towards caudal end of body. Head with facial parts similar to that of *vitis*; basal part of maxilla rather long exposed, distinctly over 1/2 the length of fore leg and again visible at its distal end but narrowly; antenna not reaching distal end of fore leg. Mid legs in contact with each other for some distance of their length; hind leg visible at its distal end; wing nearly reaching distal end of maxilla. Two longitudinal ridges on dorsum occurring from mesothorax to abdominal segment 3, these ridges ending at middle of abdominal segment 3; abdominal segments 2–3 each with a rather conspicuous spine on each side of dorsum just from ridge mentioned above, these spines directed cephalad; abdominal segments 4–8 each with a minute projection on each side of dorsum but very indistinct; proleg scar discernible. Length: 8–9 mm. Width: 2. This pupa is closely allied to that

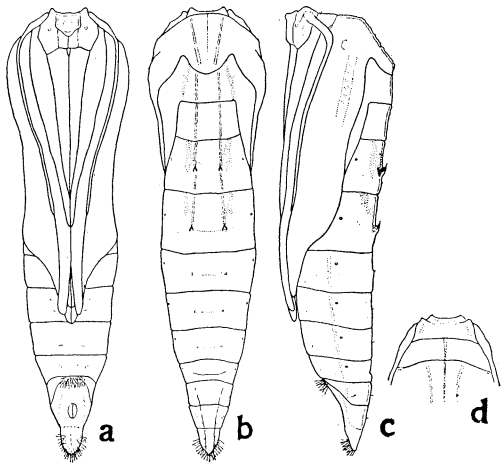

Fig. 56. *Nippoptilia issikii* Yano, pupa, ♀. a, ventral view; b, dorsal view; c, lateral view; d, cephalic part, dorsal view.

of *vitis*, but it is differentiated from the latter by the characters mentioned as follows: basal part of maxilla rather long exposed, nearer to distal end of fore leg; only abdominal segments 2 and 3 each with a distinct spine on each side of dorsum, remaining abdominal segments without distinct spines.

Biological notes: I found the larva of this species at Yoichi, Hokkaido in 1959, biting the fruit of *Vitis vinifera* L. The pupa is attached to the pedicel.

Host plant: *Vitis vinifera* L.

Nippoptilia minor Hori Figs. 57–59.

Nippoptilia minor Hori, 1933, Ôyo Dobutsugaku Zasshi **5** (2): 68, 70, fig. 4.—Yano, 1961, Pub., Ent. Lab., Univ. Osaka Pref. **6**: 76, figs. 3, 4-E, pl. 18, fig. J.

Stenoptilia minor, Inoue, 1955, Check List Lep. Jap. **2**: 116.—Esaki, 1957, Icon. Het. Jap. Col. Nat. **1**: 91, pl. 16, fig. 507.

I wish to add the following description to the original description given by Hori (1933 a).

Male and ♀: Antenna nearly black dotted with white above, distance between each dot shortening towards base of antenna. Occipital fringe yellowish brown on dorsum, pale yellowish white on sides and below; fringes on dorsum trifurcated (fig. 2 a, b, e). Hind leg with inner terminal spur of tibia shorter than outer. Forewing with 2 lobes slender; lobe 1 without termen; lobe 2 without distinct anal angle. Hindwing cleft firstly from 1/4; 3 lobes all linear. Specialized scales on I and II short and spoon-shaped. Length of forewing: 5–6 mm.

Male genitalia: Valva slender and dilated towards distal end; sacculus extending and forming a long narrow arm, basal part of sacculus bulbous; juxta large, incised caudally; anellus developed at dorsal side of aedeagus and with scobinations heavily; aedeagus long, bent ventrally at middle, somewhat bulbous towards base.

Female genitalia: Apophyses posteriores long; apophyses anteriores short; antrum of ostium bursae cup-shaped; signum absent.

SPECIMENS EXAMINED: 13 type specimens and many other specimens from the following locality. KYUSHU: Tachibanayama, Fukuoka Pref. (IX, X).

DISTRIBUTION: Japan (Kyushu).

This species is a unique one among the species of this genus owing to the following characters: lobe 1 of forewing without anal angle; ♂ genitalia with a pointed arm on sacculus; ♀ genitalia without tubular antrum of ostium bursae and without a signum; inner terminal spur of hind tibia shorter than outer. This species, however, may be best regarded as a member of *Nippoptilia* owing to the characters mentioned in the present paper.

Mature larva: Head pale yellow; ocellar area dark brown; frontal suture not extending to ventral margin of head; adfrontal area extending to vertical triangle which is rather deep; setae AF1 and AF2 minute; AF2 ventrad from the level of dorsal end of frontoclypeal area; P1 ventrad from the level of F1; P2 short and ventrad from the level of AF2; A2 very short, approximate to A1; Aa remote from A2 and slightly nearer to P1 than P2; V1 approximate to Pb and nearly on the same level of Pb and nearly equidis-

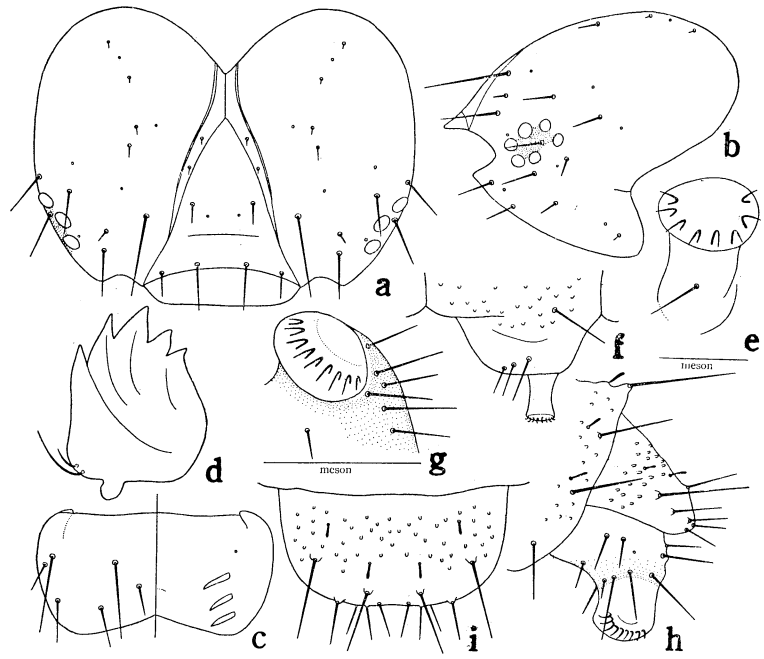

Fig. 57. *Nippoptilia minor* Hori, mature larva. a, head, frontal view; b, ditto, lateral view; c, labrum, with epipharyngeal surface on right; d, mandible; e, left ventral proleg of abdominal segment 6, ventral view; f, ditto, lateral view; g, left anal proleg, ventral view; h, abdominal segments 9 and 10, lateral view; i, abdominal segment 10, dorsal view.

tant from Pb and P2. Labrum with a very shallow median incision; M3 nearer to ventral margin than M2; setae of lateral group approximate to each other; La1 latero-ventrad from La2. Mandible with 5 conspicuous teeth which are all acutely pointed. Thorax and abdomen without secondary setae; scobinations occur on body, partly they are distinct; setae on body similar to *N. vitis* (Sasaki); setae of D group, SD1, L1, L2 of abdominal segments 1–8 more shorter than *vitis*; D1 of prothorax approximate to D2; SV group of abdominal segment 2 bisetose. Proleg long, sometimes not protruded. Crochets of proleg often not clearly indicated; those of ventral proleg 7–9; those of anal proleg 9. Length: 6–6.5 mm. Head width: 0.52. The larva of this species is distinguished by the following characters: frontal suture not extending to ventral margin of head; head with seta P1 ventrad from the level of F1; V1 nearly on the same level of Pb.

Pupa: Pale yellow, slightly tinged with pale yellowish green and minute brown dots densely scattered dorsally; abdominal segments 1–7 with small dark brown patches mainly on dorsum. Cephalic end of body round; greatest width at mesothorax and gradually tapering towards caudal end of body. Head with clypeo-labral area rather broad; pilifers slightly rugged; boundary line between both eye-pieces obscure; maxilla again exposed at its distal part; antenna almost reaching distal end of fore leg. Mid legs in contact with each other for some distance of their length and again separated, not reaching distal end of wing; hind leg distinctly exposed; wing almost reaching distal end of hind leg. Two longitudinal ridges on dorsum occurring from mesothorax to abdominal segment 3, but

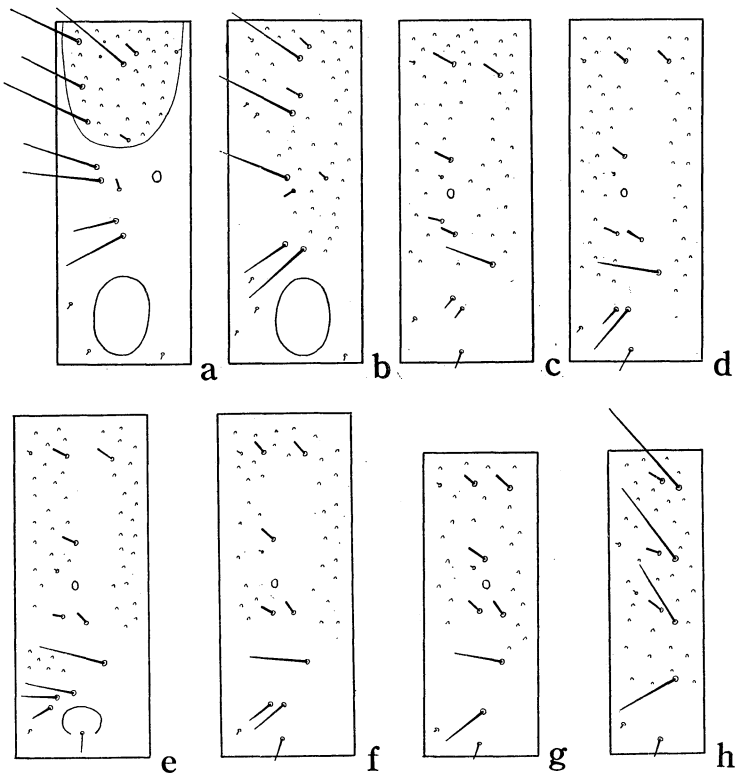

Fig. 58. *Nippoptilia minor* Hori, chaetotaxy of mature larva. a–h, pro-, mesothorax, abdominal segments 1, 2, 3, 7, 8 and 9.

these ridges weak; abdomen without distinct spinous projections or long setae; proleg scar discernible. Length: 6 mm. Width: 1–1.2. The pupa of this species is allied to that of *Deuterocopus albipunctatus* Fletcher, but is easily separated from the latter by the following characters: wing extending to distal end of hind leg; coloration of body; caudo-dorsal margin of mesothorax rather more acute than that of the latter species.

Biological notes: *Cayratia japonica* Gagn. was listed as a host plant of this species in the original description given by Hori (1933a). The early stages, however, have not been reported till now. Above mentioned descriptions of the early stages are based on the materials reared from *Cayratia japonica* Gagn. The larva bites the flower-bud and flower of the host plant and pupates usually on the tendril, or rarely pedicel. The pupal life lasts for 7–8 days in Septem-

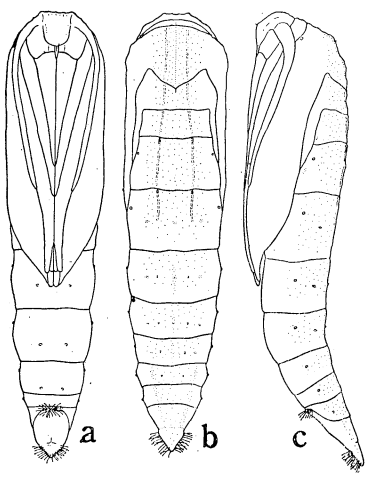

Fig. 59. *Nippoptilia minor* Hori, pupa. a, ventral view; b, dorsal view; c, lateral view.

ber. The eggs are laid on the flower-bud. The adults fly about the flower of the host plant frequently. The moth emerges in September and October.

Host plant: *Cayratia japonica* Gagn.

Genus **Sphenarches** Meyrick

Sphenarches Meyrick, 1886, Trans. Ent. Soc. Lond. **1886**: 8.—Fletcher, 1909, Spol. Zeyl. **6** (21): 21.—Meyrick, 1910, Gen. Ins. **100**: 6; 1913, Lep. Cat. **17**: 5.—Hori, 1931, Bul. Sci. Fak. Terk. Kjusu Imp. Univ. **4** (3): 259.

Type species: *Oxyptilus anisodactylus* Walker.

Frons without a conical tuft. Forewing bifid; lobe 1 slender; veins R_1 and R_2 stalked; R_4 to apex; M_3 and Cu_{1a} stalked; Cu_{1a} to anal angle of lobe 2; Cu_{1b} from angle of cell. Hindwing with frenulum in ♀ double; lobe 3 slender; veins M_3 and Cu_{1a} stalked.

Male genitalia: Tegumen rather weakly sclerotized; valva simple; aedeagus simple, not armed.

Female genitalia: Apophyses anteriores absent; signum absent.

This genus is somewhat allied to *Capperia* and *Nippoptilia*, but is distinguished from *Capperia* by the absence of vein R_1 of forewing, and from *Nippoptilia* by vein R_1 of forewing stalked with R_2. Vein Cu_{1a} of hindwing is present, though it has been overlooked till now. This genus is represented by the following species in Japan.

Sphenarches anisodactylus (Walker) Figs. 3e, 60–63.

Oxyptilus anisodactylus Walker, 1864, Cat. Lep. Het. Brit. Mus. **30**: 934.

Sphenarches synophrys Meyrick, 1886, Trans. Ent. Soc. Lond. **1886**: 17.

Sphenarches caffer Fletcher (*nec* Zeller), 1909, Spol. Zeyl. **6** (21): 21 (partim).—Meyrick, 1910, Gen. Ins. **100**: 6 (partim); 1913, Lep. Cat. **17**: 5 (partim).—Fletcher, 1921, Mem. Dep. Agr. Ind. Ent. Ser. **6** (1): 9 (partim).—Hori, 1931, Bul. Sci. Fak. Terk. Kjusu Imp. Univ. **4** (3): 259, pl. 9, figs. 5–6, pl. 10, figs. 6–8; 1950, Icon. Ins. Jap. (rev. ed.), 501, fig. 1366.

Sphenarches anisodactylus, Adamczewski, 1951, Bull. Brit. Mus. Ent. **1**(5): 328, pl. 18, figs. 47–48, 50, 53.—Inoue, 1955, Check List Lep. Jap. **2**: 114.—Esaki, 1957, Icon. Het. Jap. Col. Nat. **1**: 90, pl. 16, fig. 501.—Inoue, 1959, Icon. Ins. Jap. Col. Nat. Ed. **1**: 257, pl. 173, fig. 18.

Male and ♀. Occipital fringe pale yellowish brown mixed with pale yellowish white; fringes on dorsum trifurcated and bifurcated (figs. 1q, 2b–d). Thorax greyish brown or yellowish brown, pale yellowish white posteriorly. Forewing cleft from 3/7; lobe 1 rather slender, falcate; termen of lobe 2 distinctly sinuate inwardly; pale brown slightly tinged with grey; costa scattered with white scales; a minute dark brown dot in cell at about 2/3 between base of wing and base of cleft, sometimes indistinct; this dot usually followed by paler area; dark brown scales at base of cleft; basal part of lobe 1, just beyond middle of both lobes widely greyish brown; a pale yellowish white subterminal line crossing both lobes along outer margin of outer greyish brown area mentioned above; area between 2 greyish brown areas of lobe 1 pale yellowish white, at the same place of lobe 2 indefinitely pale yellowish white. Cilia pale yellowish white tinged with pale brown; within cleft black

scales scattered along 3 greyish brown areas of both lobes; remaining margins within cleft scattered with whitish scales; tips of both lobes with greyish brown slightly; inner margin near anal angle of lobe 2 widely greyish brown; black scales scattered along inner margin, white scales slightly so. Hindwing cleft firstly from about 1/3; 3 lobes linear; brown or pale brown slightly tinged with grey. Cilia pale greyish brown except for apex of lobe 3 where cilia pale yellowish white; cilia of inner margin of lobe 3 tinged with pale yellowish white; lobe 3 with a rather developed black scale tuft at distal 2/5 along both margins; remainder of both margins of lobe 3 scattered with black scales, narrow white scales scattered mainly on inner

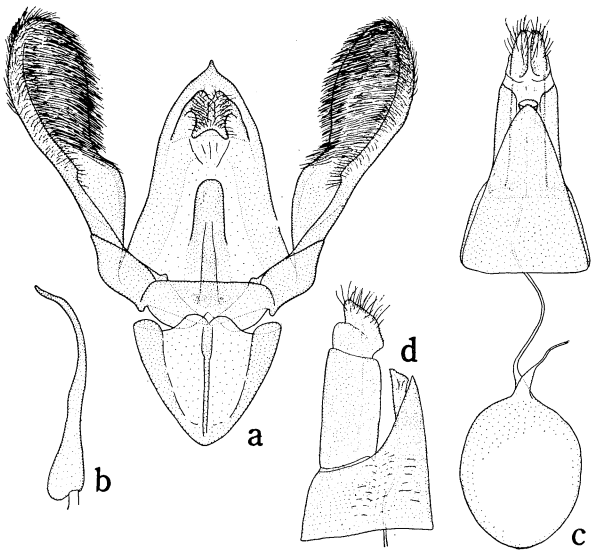

Fig. 60. *Sphenarches anisodactylus* (Walker). a, ♂ genitalia, ventral view, excluding aedeagus, including sternum 8; b, ditto, aedeagus; c, ♀ genitalia; d, ditto, lateral view, excluding corpus bursae.

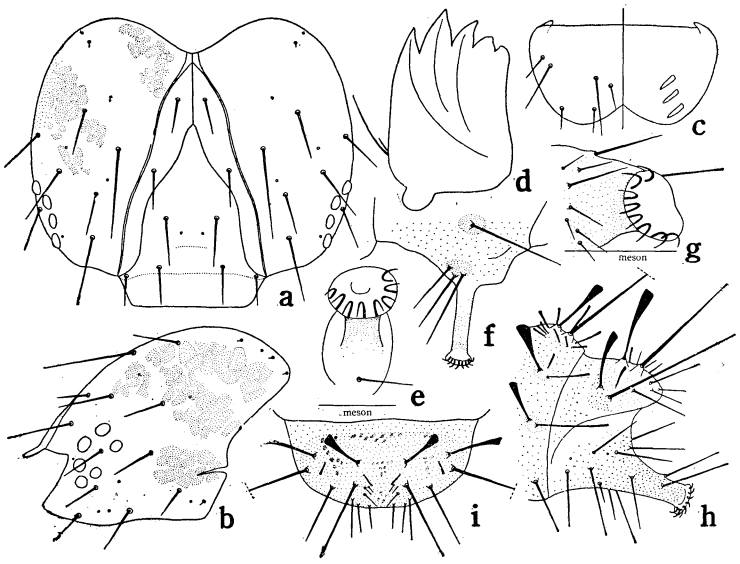

Fig. 61. *Sphenarches anisodactylus* (Walker), mature larva. a, head, frontal view; b, ditto, lateral view; c, labrum, with epipharyngeal surface on right; d, mandible; e, left ventral proleg of abdominal segment 4, ventral view; f, ditto, lateral view; g, left anal proleg, ventral view; h, abdominal segments 9 and 10, lateral view; i, abdominal segment 10, dorsal view.

margin. Abdomen with segment 1 pale yellowish white, on dorsum of that segment greyish brown; remainder of abdomen greyish brown; segment 3 with 2 pale yellowish white oblique stripes on dorsum; segments 2 and 3 with pale yellowish white posterior margins. Length of forewing: 7–10 mm.

Male genitalia: Caudal part of tegumen triangular and pointed at caudal end; a well developed hairy organ situated at ventral side of tegumen, bent ventrally and sclerotized; mid-ventral caudal margin of vinculum almost straight, cephalic margin incised; valva simple, spoon-like and concave; juxta represented as a rather broad, long projection; aedeagus long, slender, narrowing towards distal end. Sternum 8 weakly sclerotized, triangular and covering cephalic 1/2 of genitalia.

Female genitalia: Sterigma represented as a tubular structure and situated at triangular caudal end of abdominal segment 7; corpus bursae with scobinations.

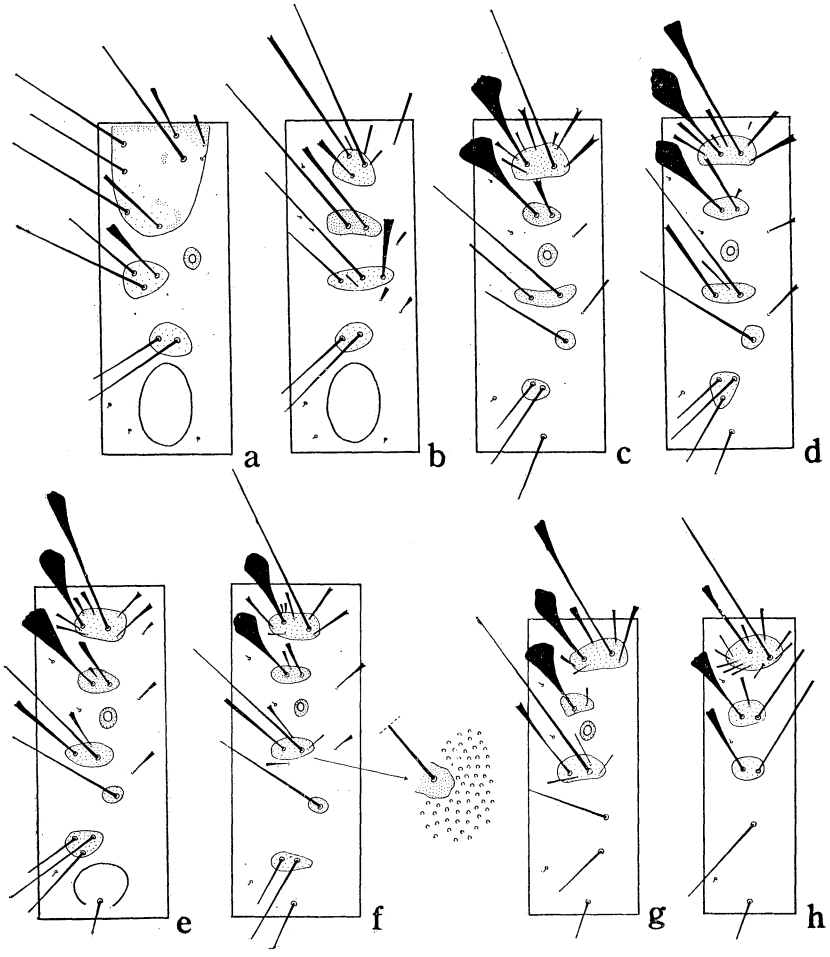

Fig. 62. *Sphenarches anisodactylus* (Walker), chaetotaxy of mature larva. a–h, pro-, mesothorax, abdominal segments 1, 2, 3, 7, 8 and 9.

SPECIMENS EXAMINED: 1 ♀, Ohata, Aomori, 14. VIII. 1957, Saigusa; 1 ♂, 4 ♀♀, Fukuoka, Fukuoka Pref., 19–26. X. 1959, reared by Yano (host plant: *Dolichos lablab* L.); 1 ♂, *idid.*, 9. IX. 1961, Yano; 20 ♂♂, 36 ♀♀, Fukuoka, Chikuzen, 20. VIII–30. IX. 1929, Hori; 1 ♂, 2 ♀♀, *ibid.*, 4–16. VIII. 1934, Hori; 27 ♂♂, 26 ♀♀, Fukuoka, 22. IX–16. X. 1930, Hori; 1 ♀, *ibid.*, 26. VII. 1933, Yasumatsu; 1 ♀, *ibid.*, 15. VIII. 1933, Tateishi; 1 ♂, Tachibanayama, Fukuoka Pref., 24. IX. 1961, Yano; 1 ♀, Hirayama, Chikuzen, 13. X. 1930, Esaki & Hori; 3 ♂♂, 5 ♀♀, Aizu, Amakusa, 21–26. IX. 1931, reared by Hori.

DISTRIBUTION: Japan (Hokkaido, Honshu, Shikoku, Kyushu, Tsushima), India, Ceylon, Thailand, New Hebrides Is., Australia, W. Indies, S. America, Madagascar, W. Africa.

Adamczewski (1951) mentioned the distinct difference between *anisodactylus* and *caffer*. The Japanese species feeding on *Dolichos lablab* L. should be referable to *anisodactylus*.

Mature larva: Head pale yellowish brown with darker patches; length of fronto-clypeal area (excluding anteclypeus) nearly equal with width; seta AF2 conspicuously dorsad from the level of dorsal end of fronto-clypeal area; P1 dorsad from the level of AF1; A2 rather long, remote from A1 and dorsad from the level of F1; Pb slightly dorsad from the level of AF2. Labrum with a shallow median incision; M3 remote from other setae of median group, slightly laterad from M2; La1 and La2 both dorsad from the level of M2; La3 nearly on the same level of M3. Mandible with 5 teeth, and distinctly longer than wide; inner 2 somewhat blunt. Thorax and abdomen with heavily sclerotized pale brown pinacula, from which secondary setae occur, and some scattered setae occur; setae variable in structure, viz. simple, forked and extremely expanded apically; body invested with minute scobinations. Thoracic legs heavily sclerotized, brown. Proleg very long, slender. Crochets of ventral proleg 6–8; those of anal proleg 8–9. Length: 10 mm. Head width: 0.8. The larva of this species is a peculiar one, characterized by the specialized setae on body described as above.

Pupa: Body with greatest width at mesothorax and gradually tapering towards caudal end. Head with pilifers discernible; labial palpus minute, boundary line between both eye-pieces distinct; maxilla exposed again at its distal part; antenna extending nearly distal end of fore leg, its basal part with a row of small projections. Thorax bearing long setae and 2 rows of small projections on dorsum of meso- and metathorax; wing bearing some rows of minute projections. Abdomen with a conspicuous spinous projection on each side of dorsum of abdominal segments 1–8, these projections bifurcated or trifurcated apically and usually barbed with 2 long or short setae; those on abdominal segments 2 and 3 very large; abdominal segments 3–7 with 1 or 2 minute projections on each side of dorsum, these projections situated between large spinous projections mentioned before; other setae on abdo-

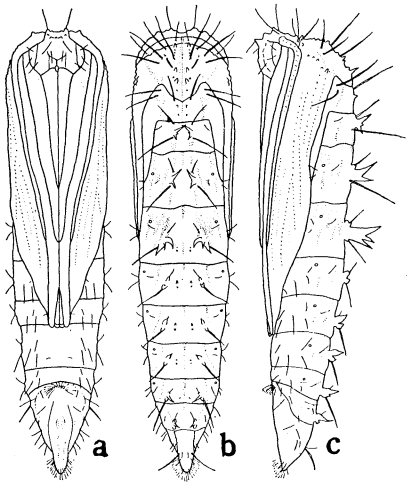

Fig. 63. *Sphenarches anisodactylus* (Walker), pupa. a, ventral view; b, dorsal view; c, lateral view.

men rather long. Length: 7.2–8.5 mm. Width: 1.8–2. The pupa of this species is differentiated from other somewhat allied species, *Procapperia pelecyntes* (Meyrick) and *Trichoptilus wahlbergi* (Zeller), by the points mentioned as follows: fore leg extending to distal end of antenna; large spinous projections on dorsum of abdomen; abdominal segments 3–7 with minute projections on dorsum in addition to the large spinous projections.

Biological notes: The larva feeds into the flower-bud and pod of *Dolichos lablab* L., but it never goes fully inside of them. The pupa is usually attached to the stem of that plant so far as I observed.

Host plants: *Dolichos lablab* L., *Lagenaria leucantha* Rosby var. *clavata* Makino, *Lagenaria leucantha* Rosby var. *gourda* Makino.

Genus **Tomotilus** Yano

Tomotilus Yano, 1961, Mushi **35** (12): 87.

Type species: *Tomotilus saitoi* Yano

Frons without a conical tuft. Labial palpus slender. Leg slender, smooth, without conspicuous rough scales at origin of spurs. Forewing bifid; both lobes moderately broad and with well developed dark scales along all margins except for costa; vein R_1 absent; R_2 separate; M_3 and Cu_{1a} stalked; Cu_{1b} from a little before angle of cell. Hindwing with frenulum in ♀ simple; 3 lobes slender but not linear; inner margin of lobe 3 with scattered dark scales; vein $Sc+R_1$ to beyond middle of costa; M_3 and Cu_{1a} connate.

Male genitalia: Uncus hairy, an elongate oval organ; tegumen narrow; vinculum with a broad plate mid-ventrally; valva very large, broad, angulate, with a slender arm near distal end; aedeagus supported by 2 narrow arms which are directed ventrally.

Female genitalia: Apophyses anteriores absent; sterigma sclerotized heavily, forming a globular structure; corpus bursae elongate, with 2 signa. Ventral side of abdominal segment 7 not projected caudally.

This genus is related to *Capperia* and *Procapperia*, but is distinguished from these genera by the following characters: tibia of leg without rough scales at origin of spurs; inner margin of lobe 3 of hindwing with well developed scattered dark scales, not forming apical or subapical scale tuft; slender but not linear lobes of hindwing; peculiar structures of ♂ genitalia; larva and pupa very unique. This genus contains only a single species.

Tomotilus saitoi Yano Figs. 3f, 64–66.

Tomotilus saitoi Yano, 1961, Mushi **35** (12): 88, figs. 1–2.

Length of forewing: 6–8 mm.

Male genitalia: Uncus pointed dorso-ventrally, elongate oval densely covered with hairs; tegumen moderately sclerotized, constricted towards base; sclerotized 2 ventrally directed arms supporting aedeagus; vinculum somewhat pointed towards cephalic end and with a broad weakly sclerotized plate mid-ventrally which is reversed; valva enormously broad, angulate; ventro-distal margin of valva distinctly arched and with a slender pointed arm near distal end; 2 narrow arched arms situated between aedeagus and vinculum; aedeagus short, stout, constricted at just before its base.

Female genitalia: Apophyses posteriores long; sterigma heavily sclerotized and globular structure and situated well beyond caudal margin of abdominal segment 7; ductus bursae rather short; corpus bursae long, gradually widened towards distal end and with 2 pointed signa; ductus seminalis departed from caudal end of corpus bursae.

SPECIMENS EXAMINED: 7 type specimens.

DISTRIBUTION: Japan (Honshu).

The present species is distinguished from the other species of the generic group *Oxyptilus* Zeller by the absence of the scale tuft at the origin of spur in tibia, the lobes of hindwing which are not linear and the peculiar character of genitalia. In general appearance, it is somewhat allied to *Stenoptilia cretalis* (Meyrick) and *S. emarginata* (Snellen), but it is easily separated from these species by the dark brown scales in the cilia of lobe 3 of hindwing.

Mature larva: Head pale yellowish white; ocelli II, III and IV arranged in a nearly straight line; seta AF1 nearer to the level of dorsal end of fronto-clypeal area; P1 dorsad from the level of AF1, rarely ventrad; A2 slightly dorsad from level of F1, and slightly mesad from a line joining P1 and A1; P2 nearly equidistant from Pb and P1. Labrum with a moderate median incision; setae not strong; M2 slightly ventrad from level of La2; La3 slightly ventrad from the level of M3. Mandible with 5 teeth; inner-most one not distinct. Thorax and abdomen with numerous secondary setae from verrucae and scattered secondary setae, most setae bifurcated at their tips but abdominal segment 10 without these bifurcated setae. Proleg very long, slender. Crochets of ventral proleg in-

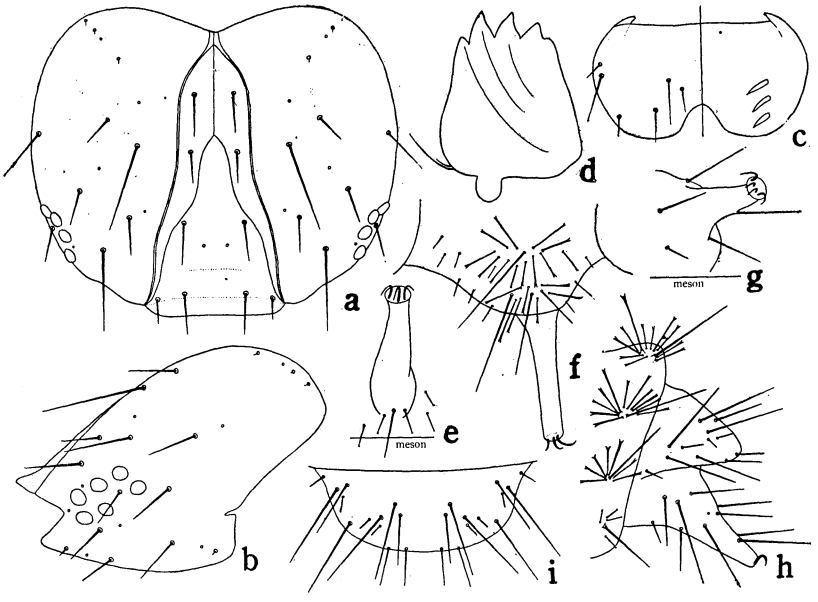

Fig. 64. *Tomotilus saitoi* Yano, mature larva. a, head, frontal view; b, ditto, lateral view; c, labrum, with epipharyngeal surface on right; d, mandible; e, left ventral proleg of abdominal segment 6, ventral view; f, ditto, lateral view; g, left anal proleg, ventral view; h, abdominal segments 9 and 10, lateral view; i, abdominal segment 10, dorsal view.

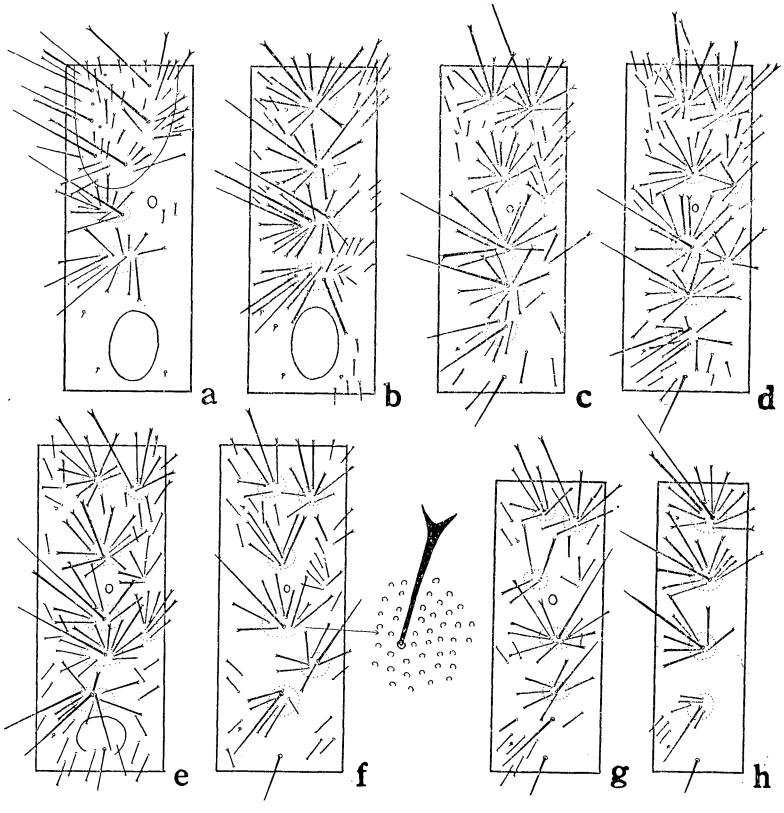

Fig. 65. *Tomotilus saitoi* Yano, chaetotaxy of mature larva. a–h, pro-, mesothorax, abdominal segments 1, 2, 3, 7, 8 and 9.

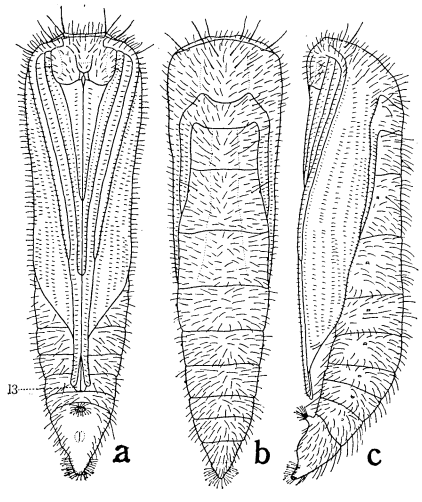

Fig. 66. *Tomotilus saitoi* Yano, pupa. a, ventral view; b, dorsal view; c, lateral view.

variably 3; those of anal proleg also invariably 4. Crochets very slender. Length: 7–8 mm. Head width: 0.52. This is a distinct, peculiar larva which has the following conspicuous characters: body with numerous bifurcated secondary setae except for abdominal segment 10; very slender ventral and anal prolegs, these prolegs with only 3 and 4 crochets respectively.

Pupa: Body short; cephalic end of body without any projection; numerous setae occur all over body. Head with pilifers clearly indicated; maxilla overlaid by legs at its distal part; antenna not extending to distal end of fore leg. Mid legs in contact with each other for a long distance of their length, and conspicuously extending caudad; hind leg exposed for a short distance at its distal part; wing not extending to distal end of mid leg; caudo-lateral end of exposed hindwing almost reaching

caudal margin of abdominal segment 2. Abdominal segments 1–3 somewhat angular at each side of dorsum; boundary line between abdominal segments 9 and 10 very obscure, indiscernible; a rounded prominence on cephalic end of abdominal segment 10 distinctly protruded ventrad. Length: 6–7 mm. Width: 1.3. This pupa is conspicuously characterized by numerous setae all over the body.

Biological notes: The larva lives in a sort of tent formed by a folded ternate leaf of the host plant (upper surface of a leaf exhibits itself outwardly) and eats the folded leaf from inside and pupates usually within it. The pupal period is 4–6 days in June and July.

Host plant: *Dunbaria villosa* Makino.

Genus **Capperia** Tutt

Capperia Tutt, 1905, Ent. Rec. **17**: 37; 1906, Brit. Lep. **5**: 470.—Pierce et Metcalfe, 1938, Gen. Brit. Pyr. Delt. Plume, 46, pl. 25.—Adamczewski, 1951, Bull. Brit. Mus. Ent. **1** (5): 345.

Oxyptilus, Meyriek (*nec* Zeller), 1910, Gen. Ins. **100**: 6.—Spuler, 1910, Schmett. Eur. **2**: 323.—Meyrick, 1913, Lep. Cat. **17**: 5.

Type species: *Oxyptilus britanniodactylus* Gregson.

Frons not projecting forwards. Tibia thickened with rough scales at origin of each spur. Forewing bifid; lobe 1 slender. Hindwing with frenulum in ♀ simple; 3 lobes slender, almost linear; lobe 3 with a developed scale tuft. Venation of forewing similar to *Tomotilus*. Forewing with vein Cu_{1a} from near angle of cell; 1A weak. Hindwing with veins M_3 and Cu_{1a} stalked; Cu_{1a} weak.

Male genitalia: Tegumen rather weakly sclerotized, triangular; mid-ventral part of vinculum represented as a simple plate; valva elongate, with processi; aedeagus conspicuously curved. Sternum 8 developed, rather elongate, caudal end bifurcated.

Female genitalia: Apophyses anteriores absent; ostium bursae opened on inner side of abdominal segment 7; signum absent.

The genus contains a single species in Japan.

Capperia jozana (Matsumura), n. comb. Fig. 67.

Oxyptilia jozana Matsumura, 1931, 6000 Ill. Ins. Jap., 1054, no. 2062.
Oxyptilus jozana, Inoue, 1955, Check List Lep. Jap. **2**: 114.

Male and ♀. Head with vertex greyish brown with pale yellowish white lateral margins; frons greyish brown with anterior margin pale yellowish white. Labial palpus slender; segments 2 and 3 greyish brown and pale yellowish white. Antenna greyish brown dotted with white above. Occipital fringe greyish brown on dorsum and on sides, pale yellowish white on sides and below; fringes on dorsum bifurcated, rarely trifurcated (figs. 1 m–o, 2b). Thorax greyish brown on anterior 1/2, pale yellowish white slightly tinged with pale brown on posterior 1/2. Tibiae of fore and mid legs white with a dark brown stripe and patches, thickened distally and mid tibia with a scale tuft at 3/8; tarsi of fore and mid legs white and greyish brown. Hind leg with tibia white with greyish brown patches, thickened at origins of medial and terminal spurs, the former situated at 3/5; tarsus white, distal parts of 4 basal segments greyish brown. Forewing cleft from just

beyond middle; lobe 1 subfalcate; greyish brown; white scales scattered along costa from base of wing to base of cleft, usually indefinite; some white scales gather in cell near costa at about 2/3 between base of wing and base of cleft; a small white dot situated at just above base of cleft; 2 narrow white lines crossing both lobes at 1/3 and 2/3, in lobe 2 these lines irregular; costa beyond this outer white line in lobe 1 white. Cilia pale greyish brown, somewhat darker along anterior margin of lobe 2 and distal part of posterior margin of the lobe; cilia of posterior 1/2 of termen of lobe 2 and about middle of posterior margin of lobe 2 white, and 2 small tufts of white cilia occurring at a little before apex of lobe 1 within cleft; dark brown scales and white scales slightly scattered within cleft; inner margin with 4 dark brown scale tufts at a little before base of cleft, at 1/3 and at 2/3 between base of cleft and anal angle of lobe 2, and at anal angle of lobe 2. Hindwing cleft firstly from 1/3; 3 lobes linear; vein Sc+R_1 to before middle of costa; greyish brown, mixed with white scales at about middle of lobe 3. Cilia pale greyish brown, partly pale yellowish white; lobe 3 with a strong dark brown scale tuft at distal end, the tuft covers both margins; dark brown and white scales scattered along both margins of lobe 3; some white scales occurring at apex of lobe 3. Abdomen greyish brown with white narrow oblique stripes on dorsum of basal 3 segments, white scales on other segment; ventral surface greyish brown with a distinct white longitudinal line on ventre and heavily mixed with white scales. Length of forewing: 7–8 mm.

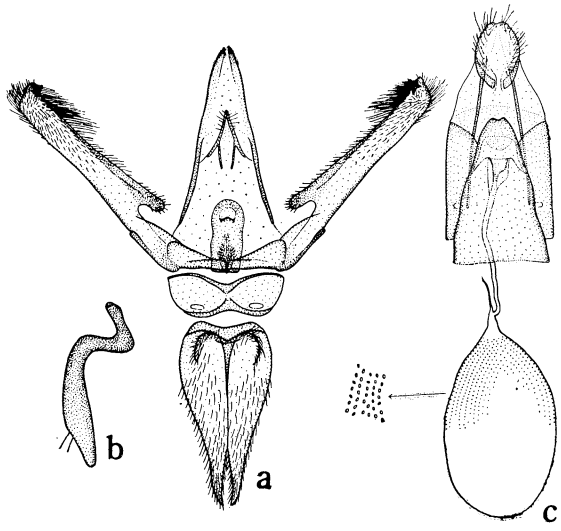

Fig. 67. *Capperia jozana* (Matsumura). a, ♂ genitalia, ventral view, excluding aedeagus, including sternum 8; b, ditto, aedeagus; c, ♀ genitalia.

Male genitalia: Tegumen triangular; inside of tegumen with a small hairy organ; mid-ventral part of vinculum with sinuate cephalic and caudal margins; valva heavily sclerotized, elongate, with a small process at its distal end, cephalic end of costa forming a small process, sacculus heavily sclerotized, stout; juxta with a deep concavity at its cephalic part; aedeagus conspicuously S-like curved, and heavily sclerotized. Sternum 8 elongate, bifurcated at its caudal end.

Female genitalia: Caudo-ventral end of abdominal segment 7 sclerotized and slightly sinuate; ostium bursae opened on inner side and well before caudal end of abdominal segment 7; antrum of ostium bursae small and cup-shaped; ductus seminalis departed from caudal end of corpus bursae; corpus bursae with scobinations at caudal 1/2.

SPECIMENS EXAMINED: 1 ♂ (type of *jozana*) labelled "Sapporo, Mats., 20. VIII. 1917"; 1 ♂, Esasi, Hokkaido, 30. V. 1958, Kumata; 6 ♂♂, 6 ♀♀, Hamakoshimizu, Abashiri, Hokkaido, 5. VIII. 1959, Yano.

DISTRIBUTION: Japan (Hokkaido).

This species was originally described in 1931 as belonging to *Oxyptilus*. In 1951, Adamczewski revised the species of the generic group *Oxyptilus* mainly based on the character of genitalia. This species may belong to *Capperia* according to the characters adopted by him to whom I follow at present.

Genus **Procapperia** Adamczewski

Procapperia Adamczewski, 1951, Bull. Brit. Mus. Ent. **1** (5) : 338.

Type species: *Oxyptilus maculatus* Constant.

Frons without a conical tuft. Tibia thickened with rough scales at origin of each spur. Forewing bifid. Hindwing with frenulum in ♀ simple; 3 lobes slender, almost linear; lobe 3 with a developed scale tuft. Venation of wings similar to *Capperia*.

Male genitalia: Tegumen weakly sclerotized, triangular; mid-ventral part of vinculum represented as a rather simple plate; valva simple, elongate, without a process; aedeagus curved, without a process. Sternum 8 angular.

Female genitalia: Apophyses anteriores absent; sterigma not developed; signum absent.

This genus, closely allied to *Capperia*, was created by Adamczewski (1951) mainly based on its genital structures. The genus contains a single species in Japan.

Procapperia pelecyntes (Meyrick) Figs. 3g, 68–71.

Oxyptilus pelecyntes Meyrick, 1908, Trans. Ent. Soc. Lond. **1907**: 477; 1910, Gen. Ins. **100**: 6; 1913, Lep. Cat. **17**: 6.—Esaki, 1957, Icon. Het. Jap. Col. Nat. **1**: 92, pl. 16, fig. 513.—Inoue, 1959, Icon. Ins. Jap. Col. Nat. Ed. **1**: 257, pl. 173, fig. 20.

Procapperia pelecyntes, Adamczewski, 1951, Bull. Brit. Mus. Ent. **1** (5) : 344, pl. 20, fig. 60.

Male and ♀. Ground colour of head, thorax, wing and abdomen brown, rarely greyish brown as usually seen in *Capperia jozana* (Matsumura). Tarsus of hind leg greyish brown distally on only 2 basal segments. Lobe 2 of forewing with only 1 narrow white subterminal line, without an inner one. Vein $Sc+R_1$ of hindwing to conspicuously before middle of costa. Specialized scales on under surface of hindwing more narrow than *C. jozana*. Ventral surface of abdomen almost whitish making a contrast with *C. jozana* which has a longitudinal white line on ventre. Length of forewing: 7–8 mm.

Male genitalia: Tegumen elongate, triangular; a process situated at inside of tegumen; mid-ventral part of vinculum weak-

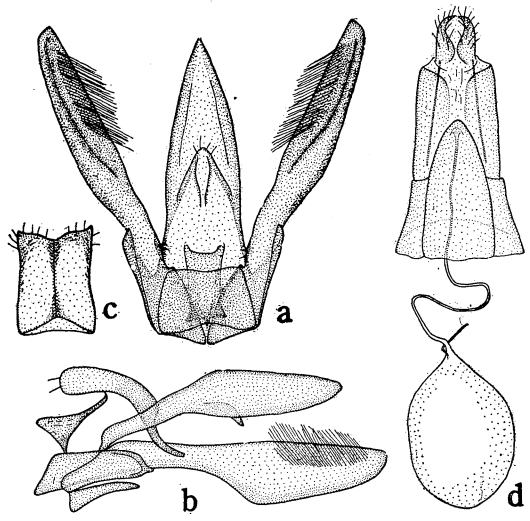

Fig. 68. *Procapperia pelecyntes* (Meyrick). a, ♂ genitalia, ventral view, excluding aedeagus; b, ditto, lateral view, excluding left valva; c, ditto, sternum 8; d, ♀ genitalia.

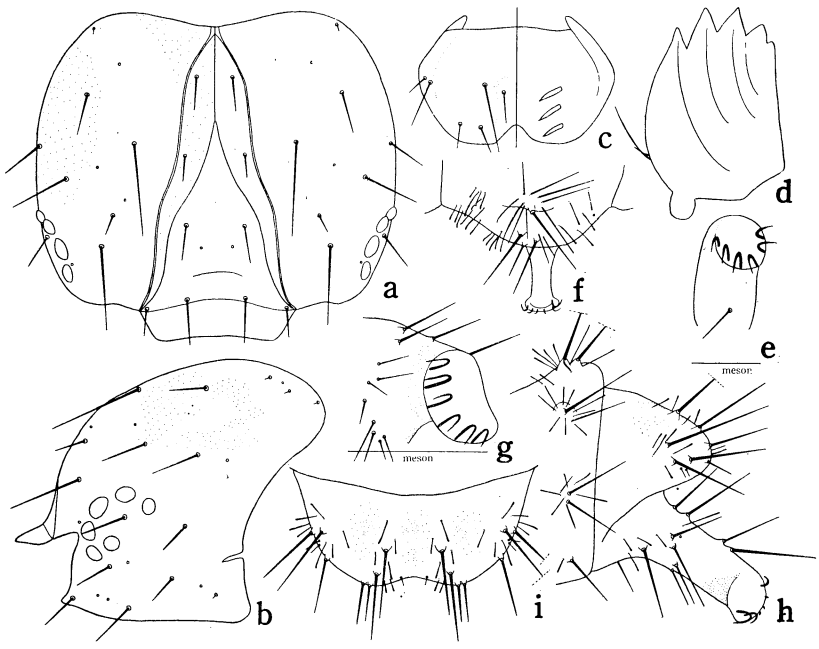

Fig. 69. *Procapperia pelecyntes* (Meyrick), mature larva. a, head, frontal view; b, ditto, lateral view; c, labrum, with epipharyngeal surface on right; d, mandible; e, left ventral proleg of abdominl segment 6, ventral view; f, ditto, lateral view; g, left anal proleg, ventral view; h, abdominal segments 9 and 10, lateral view; i, abdominal segment 10, dorsal view.

ly sclerotized, somewhat angular; valva simple without a process, constricted at about 2/5 from base; sacculus stout; juxta sclerotized with a deep concavity at its cephalic end; aedeagus rather broad but distinctly constricted at its distal part. Sternum 8 angular as shown in figure.

Female genitalia: Ventral side of abdominal segment 7 triangular; ostium bursae opened at caudal end but on inner side of abdominal segment 7; ventral side of abdominal segment 7 triangularly projected caudally; corpus bursae with scobinations but not distinct, without a signum.

SPECIMENS EXAMINED: 6 ♂♂, 1 ♀, Tachibanayama, Fukuoka Pref., 8–11. V. 1960, Yano; 1 ♀, *ibid.*, 11. V. 1960, reared by Yano (host plant: *Scutellaria indica* L.); 1 ♂, 2 ♀♀, *ibid.*, 26. IX–9. X. 1960, reared by Yano (host plant: *Scutellaria indica* L.); 1 ♀, Kusaba-Kôsen, Chikuzen, 26–27. VI. 1936, Kawahara; 5 ♂♂, Fukuoka, Chikuzen, 18–22. V. 1929, Hori; 2 ♀♀, *ibid.*, 2. VII. 1929, Hori; 6 ♂♂, *ibid.*, 14–23. V. 1934, Hori; 3 ♂♂, 1 ♀, *ibid.*, 22–28. VI. 1934, Hori; 1 ♂, 1 ♀, *ibid.*, 12–18. VIII. 1934, Hori; 1 ♀, *ibid.*, 15. IX. 1934, Hori; 1 ♀, Tomioka, Amakusa, 11. IX. 1931, Hori & Chô; 1♀, Tomioka–Tororo, Amakusa, 18. VI. 1931, Esaki & Hori; 1 ♀, Kakuyama, Amakusa, 1. XI. 1960, reared by Yano (host plant: *Scutellaria indica* L.).

DISTRIBUTION: Japan (Kyushu), China, India, Ceylon.

The present species is closely allied to the preceding species, but it is separable from

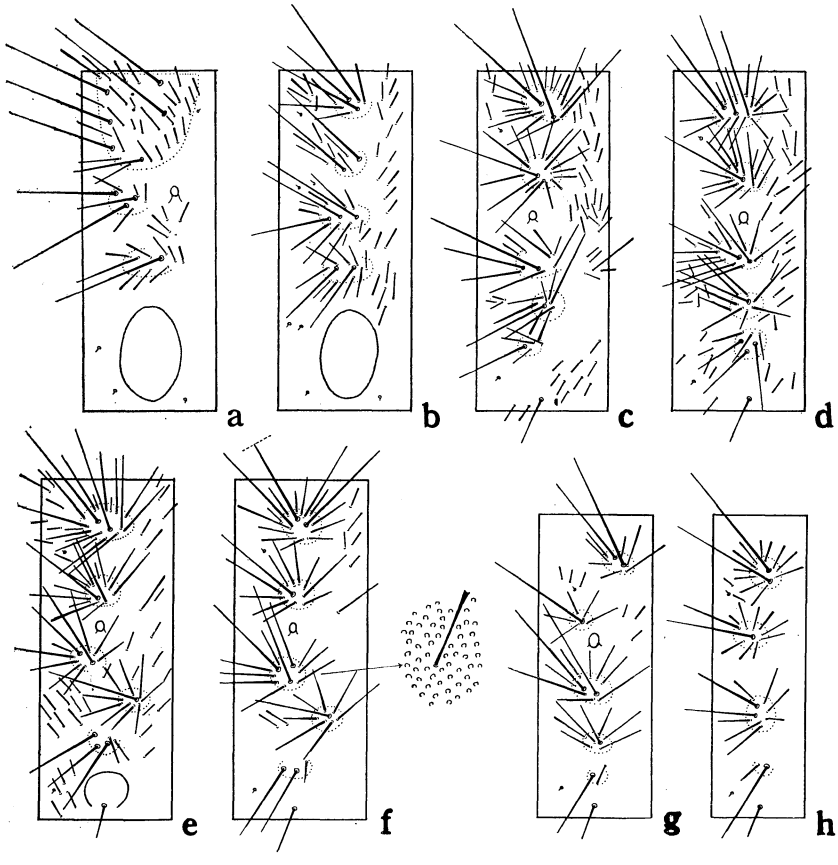

Fig. 70. *Procapperia pelecyntes* (Meyrick), chaetotaxy of mature larva. a–h, pro-, mesothorax, abdominal segments 1, 2, 3, 7, 8 and 9.

the latter by the above mentioned characters. This species was revised by Adamczewski (1951) and recorded from Japan by Esaki (1957).

Mature larva: Head with some indistinct patches; adfrontal area almost extending to vertical triangle which is very shallow; ocellus III larger than the others; seta AF2 nearly equidistant from each dorsal end of adfrontal area and fronto-clypeal area; A2 dorsad from the level of F1; V2 laterad from a line joining V1, Va and V3 and nearer to Va than V3, sometimes very approximate to Va. Labrum with a slight median incision; La3 nearer to M3. Mandible with 5 teeth; inner-most one minute. Thorax and abdomen with numerous long secondary setae from verrucae and with scattered rather short secondary setae which are blunt, slightly bifurcated at their tips; body invested with minute scobinations. Spiracles on prothorax and abdomen somewhat protruded. Proleg long. Crochets of ventral proleg 5–6; those of anal proleg 6. Length: 8–9 mm. Head width: 0.63.

Pupa: Head and thorax with many long setae; antenna bearing a row of setae; wing also bearing some rows of setae. Head with maxilla again exposed at its distal part slight-

ly; antenna extending beyond distal end of fore leg. Mid legs in contact with each other for some distance of their length; hind leg exposed at its distal end, slightly beyond distal end of mid leg; wing not extending to distal end of mid leg, almost reaching distal end of maxilla; caudo-lateral end of exposed hindwing extending beyond middle of abdominal segment 2. Meso-, metathorax, abdominal segments 1–3, 9 and 10 with 2 longitudinal ridges on dorsum; abdominal segments 1–8 bearing a conspicuous spinous projection on each side of dorsum, on segments 1–3 these projections occurring from ridges mentioned before; these spinous projections bifurcated or trifurcated dorsally and bearing usually 2 setae respectively; other setae on abdomen long, conspicuous. Length: 7–7.5 mm. Width: 1.3–1.5. The pupa of this species is distinguished from those of *Sphenarches anisodactylus* (Walker) and *Trichoptilus wahlbergi* (Zeller) by the presence of a row of setae on antenna and some rows of setae on wing.

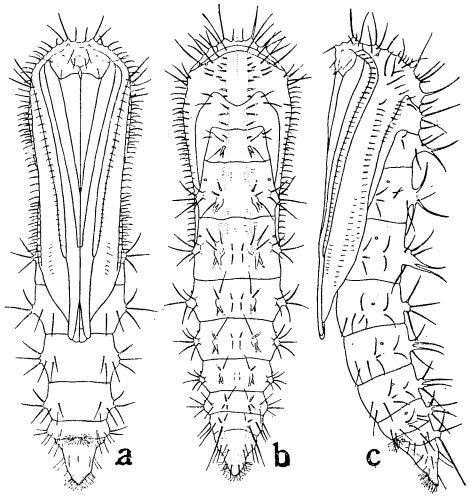

Fig. 71. *Procapperia pelecyntes* (Meyrick), pupa. a, ventral view; b, dorsal view; c, lateral view.

Biological notes: This species was originally described from Assam by Meyrick (1907). Later, Fletcher (1921) reported the larva feeding on *Scutellaria discolor*. Esaki (1957) mentioned that *Scutellaria indica* L. is the host plant of this species in Japan. The early stages have never been reported till now. The description in the present paper is based on the materials reared from *Scutellaria indica* L. The larva eats usually on the under surface of a leaf, and pupates on the stem very near the soil level or rarely on the under surface of a leaf. The pupa directs downwards. The adult appears from May to November.

Host plant: *Scutellaria indica* L.

Genus **Marasmarcha** Meyrick

Marasmarcha Meyrick, 1886, Trans. Ent. Soc. Lond. **1886**: 11.—Tutt, 1906, Brit. Lep. **5**: 387.—Meyrick, 1910, Gen. Ins. **100**: 17.—Spuler, 1910, Schmett. Eur. **2**: 322.—Meyrick, 1913, Lep. Cat. **17**: 26.—Barnes et Lindsey, 1921, Cont. Nat. Hist. Lep. N. Amer. **4** (4): 348.—Forbes, 1923, Lep. N. Y. Neighb. St., 646.—Hori, 1933, Bul. Sci. Fak. Terk. Kjusu Imp. Univ. **5** (4): 393.

Exelastis Meyrick, 1907, J. Bomb. Nat. Hist. Soc. **17**: 730.—Fletcher, 1909, Spol. Zeyl. **6** (21): 32.—Barnes et Lindsey, 1921, *ibid.* **4** (4): 346.

Type species: *Alucita lunaedactyla* Haworth.

Frons projecting forwards. Labial palpus slender. Forewing bifid; 2 lobes moderate; vein R_1 absent; R_2 separate; M_3 and Cu_{1a} stalked; Cu_{1b} from near angle of cell. Hindwing with frenulum in ♀ simple; lobes 1–2 moderately broad; lobe 3 slender and without a scale tuft; veins $Sc+R_1$ and Rs divergent beyond cleft; M_3 and Cu_{1a} connate or stalked. Only a single species has been reported from Japan.

Marasmarcha pumilio (Zeller)

Mimeseoptilus pumilio Zeller, 1873, Verh. Zool.-Bot. Ges. Wien. **23**: 324.
Marasmarcha liophanes Meyrick, 1886, Trans. Ent. Soc. Lond. **1886**: 19; 1910, Gen. Ins. **100**: 18, fig. 15; 1913, Lep. Cat. **17**: 27.—Nohira, 1916, Ent. Mag. (Kyoto) **2** (1): 38.
Mimaeseoptilus gilvidorsis, Hedemann (*nec* Zeller), 1896, Stett. Ent. Zeit. **57**: 8.
Stenoptilia pumilio, Fernald, 1898, Pter. N. Amer., 58.—Meyrick, 1910, Gen. Ins. **100**: 18; 1913, Lep. Cat. **17**: 28.
Leioptilus (?) *griseodactylus* Pagenstecher, 1900, Zoologica **29**: 240.
Exelastis liophanes, Fletcher, 1909, Spol. Zeyl. **6** (21): 33, pl. A, fig. 12; 1919, Bull. Agr. Res. Inst., Pusa **89**: 81.
Marasmarcha pumilio, Barnes et Lindsey, 1921, Cont. Nat. Hist. Lep. N. Amer. **4** (4): 348, pl. 42, fig. 7, pl. 49, fig. 13.—Hori, 1933, Bul. Sci. Fak. Terk. Kjusu Imp. Univ. **5** (4): 394, pl. 5, fig. 3, pl. 6, fig. 5.
Exelastis pumilio, Fletcher, 1932, Imp. Counc. Agr. Res. Sci. Mon. **2**: 7, pl. 5, figs. 1–3.

Female: Head with vertex and frons pale brown. Labial palpus slender; pale yellowish brown. Antenna pale brown above somewhat darker towards base, pale yellowish white line on inner side towards base. Occipital fringe pale brown. Thorax pale brown on anterior 1/3, remainder pale yellowish white. Tibia of fore leg white with a greyish brown stripe, slightly thickened distally; tibia of mid leg with 2 greyish brown stripes, slightly thickened distally; tarsi of fore and mid legs white with a greyish brown stripe respectively. Hind leg with tibia greyish brown on outer side, nearly white on inner side, medial spur situated at about 4/7, slightly thickened at origin of terminal spur, inner one of terminal spur equal with outer; tarsus nearly whitish, slightly mixed with greyish brown on outer side mainly towards base. Spurs of mid and hind legs nearly white with a dark brown stripe. Forewing cleft from about 5/8; lobe 1 gradually narrowing towards apex; lobe 2 with a very indefinite anal angle; pale brown tinged with pale yellowish white mainly on basal part of wing; 2 small darker patches in cell at 1/3 and at 3/5 between base of wing and base of cleft, the former usually very indefinite, the latter distinct; a darker patch situated just before base of cleft, usually not sharply indicated. Cilia pale yellowish white tinged with greyish; apex of lobe 2 with dark brown scales, of lobe 1 with few; dark brown scales scattered within cleft, pale yellowish brown and yellowish white scales slightly scattered; inner margin with scattered dark brown scales, these scales somewhat gathering in some parts. Hindwing cleft firstly from about 2/5; brown. Cilia pale greyish brown; lobes 1–2 with some dark brown scales at their distal ends but not distinct. Abdomen pale brown tinged with yellow; each side and ventral surface pale brown mixed with greyish brown. Length of forewing: 5–7 mm.

SPECIMENS EXAMINED: 3 ♀♀, Ishigakijima, 5. VI. 1932, Umeno.

DISTRIBUTION: Ryukyu Is. (Ishigaki-jima), Formosa, China, India, Ceylon, Borneo, Bismarck Arch., Marquesas Is., Africa, N. America.

Hori (1933b) reported this species by the specimens collected from Ishigaki-jima and Formosa. I examined these specimens.

Genus **Xenopterophora** Hori

Xenopterophora Hori, 1933, Bul. Sci. Fak. Terk. Kjusn Imp. Univ. **5** (4): 386.

Type species: *Xenopterophora mikado* Hori.

Frons without a conical tuft. Labial palpus rather slender. Forewing bifid; 2 lobes not broad; vein R_1 absent; R_2 and R_3 out of R_4; M_3 and Cu_{1a} stalked; Cu_{1b} from angle of cell. Hindwing with frenulum in ♀ simple; 3 lobes rather slender; vein $Sc+R_1$ to beyond middle of costa; M_3 and Cu_{1a} stalked. This is a distinct genus created by Hori (1933b). He gave the remark in the original description that this genus is allied to *Pterophorus*, but this genus may belong to the subfamily Platyptiliinae considered from the following points: vein Cu_{1a} of hindwing present; lobe 2 of hindwing with 3 veins and lobe 3 with a vein. The genus is represented by a single species from Japan.

Xenopterophora mikado Hori

Xenopterophora mikado Hori, 1933, Bul. Sci. Fak. Terk. Kjusu Imp. Univ. **5** (4): 386, pl. 5, fig. 5, pl. 6, fig. 1, pl. 7, figs. 5–6; 1950, Icon. Ins. Jap. (rev. ed.), 498, fig. 1358.—Inoue, 1955, Check List Lep. Jap. **2**: 114.—Esaki, 1957, Icon. Het. Jap. Col. Nat. **1**: 90, pl. 16, fig. 511 (not fig. 502).—Inoue, 1959, Icon. Ins. Jap. Col. Nat. Ed. **1**: 257, pl. 173, fig. 19.

I wish to add the following description to the original description given by Hori (1933b).

Male and ♀: Occipital fringe dark brown tipped with pale yellowish white; fringes on dorsum distinctly bifurcated (fig. 1 m, t, w, x). Forewing cleft from 3/7; lobe 1 narrow; termen of lobe 2 inwardly sinuate; anal angle of lobe 2 round. Hindwing cleft firstly from 1/3; 3 lobes narrow; brown but lobes 1 and 2 somewhat paler than lobe 3. Inner margin of lobe 3 with a strong triangular dark brown scale tuft at 3/5 and another smaller one at distal end; whitish cilia occurring between these 2 scale tufts and white scales slightly scattered along inner margin. Length of forewing: 11–13 mm.

SPECIMENS EXAMINED: 1 ♀, Kusaba Kôsen, Kashii, Chikuzen, 5. VI. 1935, Esaki *et al.*; 1 ♂, *ibid.*, 9. VI. 1936, Hori *et al.*, and 3 type specimens.

DISTRIBUTION: Japan (Honshu, Kyushu).

This is a distinct species originally described by Hori (1933b). This species has not been recorded ever since. The ♂ genitalia of this species was figured by Hori (1933b).

Genus **Trichoptilus** Walsingham

Trichoptilus Walsingham, 1880, Pter. Calif., 62.—Fernald, 1898, Pter. N. Amer., 13.—Fletcher, 1909, Spol. Zeyl. **6** (21): 27.—Meyrick, 1910, Gen. Ins. **100**: 4.—Spuler, 1910, Schmett. Eur. **2**: 325.—Meyrick, 1913, Lep. Cat. **17**: 3.—Barnes et Lindsey, 1921, Cont. Nat. Hist. Lep. N. Amer. **4** (4): 288.—Forbes, 1923, Lep. N. Y. Neighb. St., 645.—Hori, 1936, Bul. Sci. Fak. Terk. Kjusu Imp. Univ. **7** (1): 73.

Buckleria Tutt, 1905, Ent. Rec. **17**: 37; 1906, Brit. Lep. **5**: 491.

Stangeia Tutt, 1908, Ent. Rec. **20**: 53.

Type species: *Trichoptilus pygmaeus* Walsingham.

Frons not projecting forwards. Inner terminal spur of hind tibia longer than outer, rarely shorter. Tibia thickened with rough scales at origin of each spur. Forewing bifid; 2 lobes slender; veins R_1 and R_3 absent; R_2 weak, short and out of R_4; R_5 to apex; M_3

and Cu_{1a} stalked; Cu_{1a} short and very weak; Cu_{1b} from almost angle of cell. Hindwing with frenulum in ♀ simple; 3 lobes slender; cilia of inner margin of lobe 3 with a scale tuft or scales, rarely without them; veins M_3 and Cu_{1a} stalked, the latter very weak.

Male genitalia: Tegumen deeply incised at its caudal margin or not; mid-ventral part of vinculum small; valva with a process; aedeagus slender.

Female genitalia: Apophyses anteriores not developed; sterigma present but rather simple.

This genus has been represented by 2 species from Japan. One species, however, is transferred to this genus in this paper. Now 3 species occur in Japan.

KEY TO JAPANESE SPECIES OF TRICHOPTILUS

1. Inner margin of lobe 3 of hindwing with scale tufts or scattered scales 2
   Inner margin of lobe 3 of hindwing without scales..... **paludum**
2. Forewing light brown; inner margin of lobe 3 of hindwing with 2 dark brown scale tufts, at about 2/3 from base of lobe and at distal end, the latter minute ..... **wahlbergi**
   Forewing pale yellowish brown; inner margin of lobe 3 of hindwing with narrow scattered white scales ..... **esakii**

Trichoptilus wahlbergi (Zeller) Figs. 3h, 72–75.

Pterophorus (*Oxyptilus*) *wahlbergi* Zeller, 1851, Linn. Ent. **6**: 346.
Oxyptilus wahlbergi, Walker, 1864, Cat. Lep. Het. Brit. Mus. **30**: 934.
Pterophorus rutilalis Walker, 1864, *ibid.*: 943.
Trichoptilus pyrrhodes Meyrick, 1889, Proc. Linn. Soc. N. S. W. **14**: 1113.
Trichoptilus wahlbergi, Fletcher, 1909, Spol. Zeyl. **6** (21): 27, pl. A, fig. 10.—Meyrick, 1910, Gen. Ins. **100**: 5; 1913, Lep. Cat. **17**: 4.—Hori, 1936, Bul. Sci. Fak. Terk. Kjusu Imp. Univ. **7** (1): 76, pl. 1, fig. 4, pl. 2, figs. 1–3.—Inoue, 1955, Check List Lep. Jap. **2**: 114.—Esaki, 1957, Icon. Het. Jap. Col. Nat. **1**: 90, pl. 16, fig. 500.—Inoue, 1959, Icon. Ins. Jap. Col. Nat. Ed. **1**: 257, pl. 173, fig. 17.
Buckleria wahlbergi, Fletcher, 1910, Trans. Linn. Soc. Lond. (Zool. ii) **13**: 399, fig. 2; 1921, Mem. Dep. Agr. Ind. Ent. Ser. **6** (1):

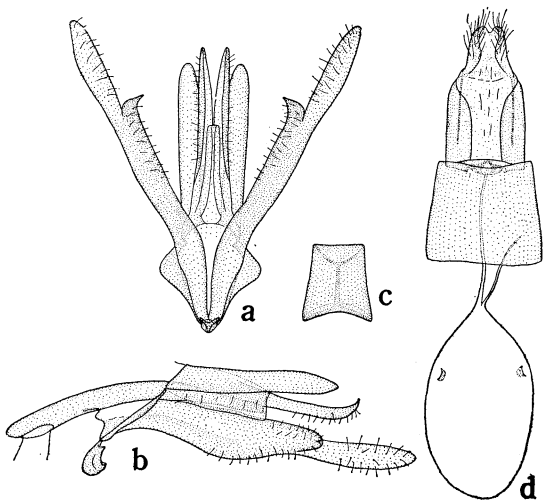

Fig. 72. *Trichoptilus wahlbergi* (Zeller). a, ♂ genitalia, ventral view, excluding aedeagus; b, ditto, lateral view, excluding left valva; c, ditto, sternum 8; d, ♀ genitalia.

8, pl. 1, fig. 2.

Oxyptilus kinbane Matsumura, 1931, 6000 Ill. Ins. Jap., 1054, no. 2063.

Length of forewing: 6–7 mm.

Male genitalia: Tegumen composed of 2 long plates; tuba analis rather distinct; dorsal side of tuba analis with 2 narrow, long and pointed processi; mid-ventral part of vinculum small; valva elongate, distal part weakly sclerotized, basal 2/3 rather distinctly sclerotized and ending in a pointed process; aedeagus long and simple. Sternum 8 simple, angulate.

Female genitalia: Apophyses posteriores moderate; lamella postvaginalis rather developed; ductus bursae narrow; ductus seminalis departed from corpus bursae together with ductus bursae; corpus bursae with 2 signa.

SPECIMENS EXAMINED: Many specimens from the following localities. HONSHU: Namarionsen, Iwate Pref. (VII); Gifu, Gifu Pref. (VIII, IX); Taihisankei, Shiga Pref. (VIII); Makinoosan (VIII), Iwawakisan (VIII), Osaka Pref. KYUSHU: Fukuoka (IV–VII, IX, X), Tachibanayama (IX), Wakasugiyama (V, VIII, X), Inunakiyama (VI), Hikosan (VII), Korasan (V), Fukuoka Pref.; Sobosan, Oita Pref. (VII); Tomioka, Amakusa (VI, X); Komoda (VII), Azamo–Taterayama (IX), Tshushima; Takanabe, Miyazaki Pref. (VI); Kirishima (VII), Koshikijima (VII), Kagoshima Pref.

DISTRIBUTION: Japan (Honshu, Kyushu, Tsushima), China, Ceylon, India, Australia, S. Africa, St. Helena, Mauritius, Seychelles, Rodriguez.

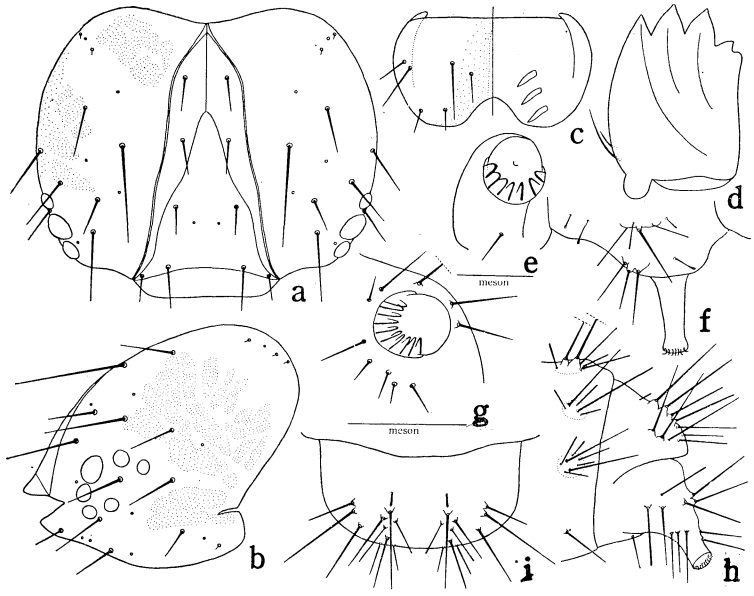

Fig. 73. *Trichoptilus wahlbergi* (Zeller), mature larva. a, head, frontal view; b, ditto, lateral view; c, labrum, with epipharyngeal surface on right; d, mandible; e, left ventral proleg of abdominal segment 6, ventral view; f, ditto, lateral view; g, left anal proleg, ventral view; h, abdominal segments 9 and 10, lateral view; i, abdominal segment 10, dorsal view.

This common species is easily separated from the other 2 species of the genus by its light brown ground colour. Hori (1936a) described and figured (in the description of the characters of this genus) the vein Cu_{1a} of both wings as absent. These veins, however, are discernible but very weak.

Mature larva: Head pale yellowish white with somewhat darker patches; adfrontal area nearly extending to vertical triangle which is very shallow; ocellus III distinctly larger than the others; seta AF2 nearly equidistant from each dorsal end of adfrontal area and fronto-clypeal area; P1 nearly on the same level of AF1 or slightly ventrad; Pb ventrad from the level of AF2; vertical setae and puncture nearly equidistant from each other; setae P1 and A1 dark brown or brown, remaining setae semitransparent. Labrum with a moderate median incision; La3 nearly on the same level of M3. Mandible with 5 teeth; inner 2 small; inner-most one blunt. Thorax and abdomen with long secondary setae from verrucae and with some scattered short secondary setae; long setae mostly and short setae on prothorax and abdomen inflated apically. Spiracles on prothorax and abdomen protrud-

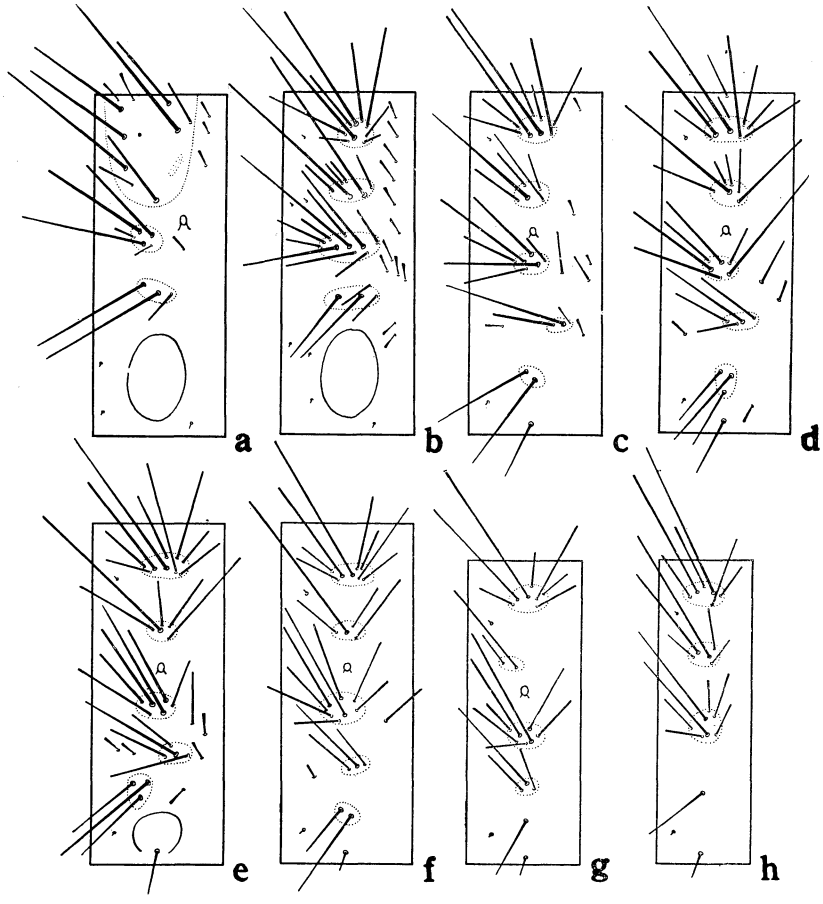

Fig. 74. *Trichoptilus wahlbergi* (Zeller), chaetotaxy of mature larva. a–h, pro-, mesothorax, abdominal segments 1, 2, 3, 7, 8 and 9.

ed. Proleg long. Crochets of ventral proleg 7–8, rarely 6; those of anal proleg 9–10. Length: 8–9 mm. Head width: 0.63.

Pupa: Each side of vertex distinctly elevated, from which 1 or 2 long setae occur respectively. Head with pilifers and boundary line between both eye-pieces clearly indicated; cephalic end of clypeus with 2 small projections; distal part of maxilla exposed distinctly; antenna extending fairly beyond distal end of fore leg. Thorax with mid legs in contact with each other and separated for a short distance at their distal part; hind leg exposed at its distal end; wing extending beyond distal end of mid leg, nearly reaching distal end of maxilla. Prothorax with 3 long setae on each side; mesothorax with 4 long setae on each side, spiracles slightly protruded; metathorax with 3 long setae on each side. Two longitudinal ridges situated on dorsum from mesothorax to abdominal segment 3 and also abdominal segments 8–10, but those on thorax and abdominal segment 3 weak; abdominal segments 1–8 with a spinous projection on each side of dorsum, those on abdominal segments 1, 2 and 8 rather slightly elevated, those on abdominal segment 3 very strong, these projections bearing 1 or 2 long setae respectively; other setae on abdomen long and distinct. Length: 8–9 mm. Width: 1.3. This pupa is easily separated from the other long setae bearing pupae of this subfamily by the following characters: antenna extending fairly beyond distal end of fore leg; antenna, fore leg and wing without setae; wing extending beyond distal end of mid leg.

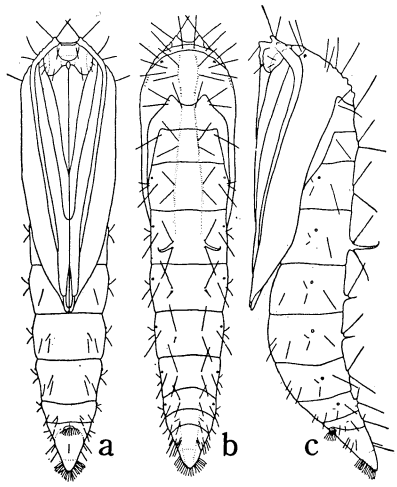

Fig. 75. *Trichoptilus wahlbergi* (Zeller), pupa. a, ventral view; b, dorsal view; c, lateral view.

Biological notes: The life history of this species in Japan has remained unknown for a long time. I searched for the larva on *Oxalis corniculata* L., as Fletcher (1921) stated that the larva feeds upon *Oxalis* sp. in India. The search on this plant has succeeded in finding the larva and pupa of this species. The larva feeds on the leaf and pod of the host plant. I once saw a moth flying about the flower of red clover. The moth appears from April to October.

Host plant: *Oxalis corniculata* L.

Trichoptilus paludum (Zeller) Fig. 76.

Pterophorus paludum Zeller, 1841, Isis **11–12**: 866.
Pterophorus (*Aciptilia*) *paludum*, Zeller, 1851, Linn. Ent. **6**: 400.
Buckleria paludum, Tutt, 1906, Brit. Lep. **5**: 493.
Trichoptilus paludum, Chapman, 1906, Trans. Ent. Soc. Lond. **1906**: 133, pl. 7.—Meyrick, 1910, Gen. Ins. **100**: 5.—Spuler, 1910, Schmett. Eur. **2**: 325, pl. 82, fig. 61.—Meyrick, 1913, Lep. Cat. **17**: 3.
Trichoptilus paludicola, Fletcher, 1907, Spol. Zeyl. **5** (17): 20; 1909, *ibid.* **6** (21): 31, pl. A, fig. 7.

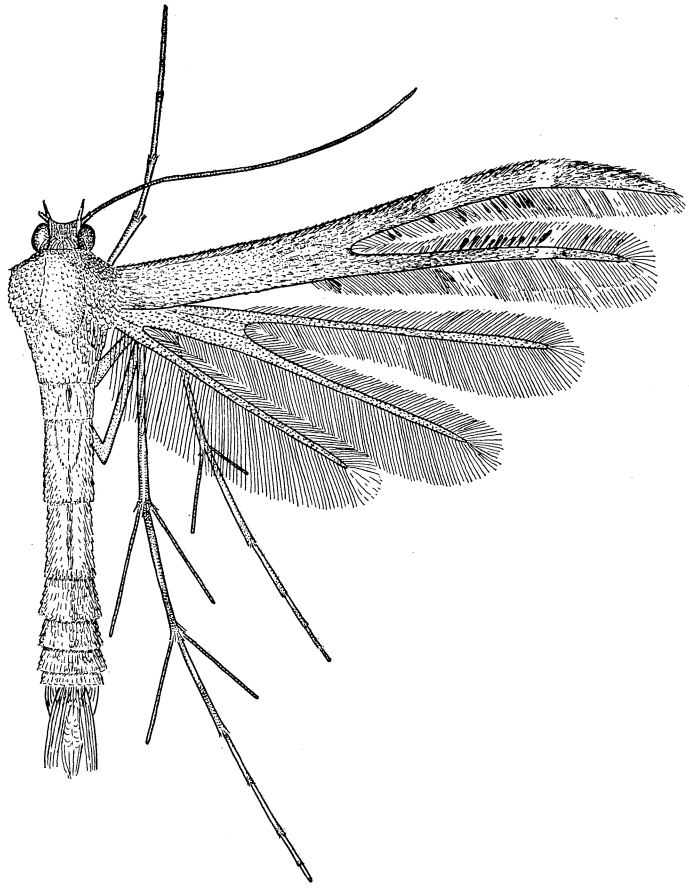

Fig. 76. *Trichoptilus paludum* (Zeller), ♂.

Pselnophorus dolichos Matsumura, 1931, 6000 Ill. Ins. Jap., 1056, no. 2071. **New Synonymy.**

Male: Head with vertex and frons pale greyish brown, lateral sides of the former narrowly white. Labial palpus with segments 2 and 3 white with 2 dark brown stripes. Antenna dark brown above, white laterally. Occipital fringe pale greyish brown; fringes on dorsum distinctly bifurcated (fig. 1 u, v). Thorax pale yellowish brown on anterior part, the rest white somewhat mixed with pale yellowish brown. Fore leg with tibia white with 2 dark brown stripes and slightly thickened distally; tarsus dark brown with a greyish white stripe. Mid leg with tibia white with a dark brown stripe and slightly scattered with same coloured scales, slightly thickened distally; 3 basal segments of tarsus dark brown with a white linear patch respectively, remaining segments dark brown. Hind leg with tibia white and dark brown, 2 slight scale tufts occurring at origin of medial spur which is situated at 5/9 and at distal end, inner terminal spur shorter than outer; tarsus dark brown and white above, greyish white beneath. Forewing cleft from 3/7; lobe 1 narrow; lobe 2 narrower than lobe 1; pale yellowish brown, partly tinged with greyish brown mainly on 2 lobes; costa greyish brown; a white linear patch at a little before base of cleft; 2

rather broad white lines crossing lobe 1 at 1/3 and 3/5 of the lobe, the former somewhat indefinite; lobe 2 with a same one at 2/3. Cilia pale greyish brown mixed with paler ones, partly dark brown; with 3 tufts of white cilia, 2 at 3/4 of posterior margin of lobe 1, 1 at 3/4 of posterior margin of lobe 2; dark brown scales, white scales and pale yellowish brown narrow scales scattered within cleft; inner margin with also these scales but dark brown scales are few; white scales gathering rather widely at 2/5 of posterior margin of lobe 2. Hindwing cleft firstly from about 2/7; 3 lobes linear; greyish brown. Cilia greyish brown; apex of lobe 3 with paler cilia. Abdominal segment 1 white with 3 pale yellowish brown stripes on dorsum; segment 2 white with dark brown stripes on dorsum and mixed with pale yellowish brown; remaining segments pale yellowish brown mixed with dark brown and white scales; each side of abdomen scattered with dark brown scales. Length of forewing: 6.5 mm.

Male genitalia: Tegumen triangularly sclerotized; valva represented as a heavily sclerotized narrow long arm and with a rather broad projecting plate at about 3/8 from base, this plate directing ventrally.

SPECIMENS EXAMINED: 1 ♂ (type of *dolichos*) labelled "Sapporo, Matsumura, 16/VIII, 18"; 1 ♂, Tukigase, Yamato, 7. IX. 1959, Yasuda.

DISTRIBUTION: Japan (Hokkaido, Honshu), Europe, India, Ceylon.

Hori (1934a) mentioned that *Pselnophorus dolichos* Matsumura is identical to *Sphenarches caffer* (Zeller). After careful examination of the type specimen of *dolichos*, however, I am convinced that it is a synonym of this species. This species is somewhat unique among the Japanese species of the genus owing to the following points: inner margin of lobe 3 of hindwing without scales; inner terminal spur of hind tibia shorter than outer.

Trichoptilus esakii Hori

Trichoptilus esakii Hori, 1936, Bul. Sci. Fak. Terk. Kjušu Imp. Univ. **7** (1): 79, pl. 1, fig. 3.

Female: Head with vertex and frons pale yellowish brown slightly mixed with white, margins of these whitish. Labial palpus moderate; segment 2 with a minute scale tuft at distal end in front, white mixed with pale yellowish brown and greyish yellow; terminal segment slender, white slightly mixed with greyish yellow. Antenna greyish brown dotted with white above. Occipital fringe pale yellowish brown mixed with white. Thorax pale yellowish brown on anterior 1/2, white on posterior 1/2. Tibia of fore leg white and greyish brown and thickened distally; tibia of mid leg white and greyish brown, this greyish brown area with a narrow white line, slightly thickened distally; tarsi of these legs white with a rather broad greyish brown stripe. Hind leg with tibia white with greyish brown stripes, scale tufts at origin of medial spur which is situated at a little beyond middle and at distal end; basal segment of tarsus white suffused with greyish brown above, remainder of tarsus nearly white. Spurs of legs white with a greyish brown stripe. Forewing cleft from 3/7; 2 lobes slender; pale yellowish brown, somewhat darker on costa and lobe 1; white scales slightly mixed; inner margin towards base of wing white; some white scales gathering at a little before base of cleft. Cilia pale yellowish brown, partly greyish brown; costa of lobe 1 white at 3/8 and 2/3 of the lobe; white cilia occurring at a little before distal end of inner margin; white and pale yellowish brown scales, both narrow, scattered within cleft and along inner margin, these white scales partly gather; 2 dark brown scale tufts a little before and beyond base of cleft of inner margin. Hindwing cleft firstly from

3/10; 3 lobes linear; greyish brown. Cilia pale greyish brown; cilia of apex of lobe 3 whitish; narrow white scales scattered from base of wing to a little before apex of inner margin; some dark brown scales occurring at about 2/3. Abdomen with segment 1 white slightly tinged with pale yellow; remaining segments pale yellowish brown with a greyish brown subdorsal line respectively. Length of forewing: 7 mm.

SPECIMENS EXAMINED: 2 type specimens.

DISTRIBUTION: Ryukyu Is. (Ishigaki-jima, Yonakuni-jima).

This species was described by Hori (1936a) based on 2 examples from Ishigaki-jima and Yonakuni-jima. I could not examine the venation of this species, and wish to retain the decision of the sure position for this species until more specimens are available.

Subfamily PTEROPHORINAE

Frons without a conical tuft. Occipital fringe hair-like or bifurcated. Forewing bifid; lobe 1 pointed, without an anal angle; vein R_1 absent; R_2 separate; R_3 and R_4 stalked or connate or very rarely separate; R_3 and R_4 rarely from R_5; M_1 and M_2 weak and very short; M_3 and Cu_{1a} connate or stalked. Hindwing trifid; under surface with rows of specialized scales (fig. 4h); frenulum in ♀ usually double, rarely simple; veins M_1 and M_2 weak and very short; Cu_{1a} absent; Cu_2 long, distinct; lobe 2 with 2 veins, M_3 and Cu_{1b}, and lobe 3 with 2 veins, Cu_2 and 1A. Cilia of wing not mixed with scales.

Male genitalia: Uncus narrow, pointed; tegumen weakly sclerotized, triangular; vinculum simple; valva; asymmetrical, very rarely symmetrical; left valva with a developed harpe and sclerotized areas; right valva rather simple than left valva, rarely with a process; juxta with 2 arms which are asymmetrical; aedeagus simple, very rarely with cornuti.

Female genitalia: Apophyses anteriores usually absent, rarely present; ostium bursae opened ventrally and usually on left side of caudal margin of abdominal segment 7, very rarely mid-ventrally; corpus bursae with or without signa.

Pupa: Antenna extending to caudal end of wing, rarely beyond it; coxa of fore leg exposed; mid legs never in contact with each other through their length; hind leg slightly or distinctly exposed beyond distal end of maxilla or not exposed; wing extending to distal end of mid leg or not extending to it. Spiracles on abdomen protruded distinctly or slightly; head, thorax, wing and abdomen bearing many setae, often even on antenna and fore leg.

Four genera of this subfamily have been recorded from Japan. I examined the species of *Aciptilia* from Japan. There occur, consequently, 5 genera in Japan.

KEY TO JAPANESE GENERA OF PTEROPHORINAE

1. Forewing with only 1 branch of vein radius, remaining branches of radius absent ..... **Aciptilia**
   Forewing with 4 branches of vein radius 2
2 (1). Forewing with branches of vein radius separate or at least connate in 2 branches ... 3
   Forewing with some branches of vein radius stalked 4
3 (2). Male genitalia with left valva bearing a pointed harpe (excluding sclerotized plates at its base) and right valva rather simple, at least with a small pro-

cess; hindwing with frenulum in ♀ double ..... **Oidaematophorus**
Male genitalia with valva extremely asymmetrical, left valva bearing 2 developed processi and right valva ending in a pointed process; hindwing with frenulum in ♀ simple ..... **Pterophorus**
4 (2). Forewing with vein R_5 separate ..... **Adaina**
Forewing with veins R_4 and R_5 stalked ..... **Pselnophorus**

PRELIMINARY KEY TO KNOWN JAPANESE GENERA OF PTEROPHORINAE (LARVAE)

1. Spiracles on abdominal segments 1–7 conspicuously protruded ..... **Oidaematophorus**
Spiracles on abdominal segments 1–7 not protruded, when slightly protruded labrum with seta La1 latero-ventrad from La2 2
2. Mandible with 5 teeth; spiracle on abdominal segment 8 not protruded 3
Mandible with 6 teeth; spiracle on abdominal segment 8 protruded; labrum with seta La1 latero-ventrad from La2 ..... **Pselnophorus**
3. Labrum with setae M_3 and La3 visible ..... **Aciptilia**
Labrum with setae M_3 and La3 invisible ..... **Pterophorus**

PRELIMINARY KEY TO KNOWN JAPANESE GENERA OF PTEROPHORINAE (PUPAE)

1. Antenna and fore leg bearing a row of short setae respectively 2
Antenna and fore leg bearing no setae ..... **Pselnophorus**
2. Thorax and abdominal segments 1–3 bearing short scattered setae in addition to long setae ..... **Pterophorus**
Thorax and abdomen bearing no short scattered setae in addition to long setae ... . **Oidaematophorus**

Genus **Oidaematophorus** Wallengren

Oidaematophorus Wallengren, 1859, Skand. Fjäderm., 19.—Barnes et Lindsey, 1921, Cont. Nat. Hist. Lep. N. Amer. **4** (4): 374.—Forbes, 1923, Lep. N. Y. Neighb. St., 647.—Pierce et Metcalfe, 1938, Gen. Brit. Pyr. Delt. Plume, 50, pls. 27–28.
Leioptilus Wallengren, 1859, *ibid.*, 21.
Pterophorus, Fernald (*nec* Geoffroy), 1898, Pter. N. Amer., 39.—Fletcher, 1909, Spol. Zeyl. **6** (21): 34.—Meyrick, 1910, Gen. Ins. **100**: 15.—Spuler, 1910, Schmett. Eur. **2**: 325.—Meyrick, 1913, Lep. Cat. **17**: 21.
Ovendenia Tutt, 1905, Ent. Rec. **17**: 37.
Hellinsia Tutt, 1905, *ibid.*, 37.

Type species: *Alucita lithodactyla* Treitschke.

Occipital fringe simple or bifurcated. Labial palpus short or long. Inner terminal spur of hind tibia usually equal with outer, rarely longer. Forewing with 2 lobes moderately broad; lobe 1 subfalcate; veins R_3 and R_4 connate or separate; M_3 and Cu_{1a} connate; Cu_{1b} from before angle of cell. Hindwing with frenulum in ♀ double; specialized scales on under surface dark brown; veins $Sc+R_1$ and Rs slightly or considerably divergent beyond cleft.

Male genitalia: Uncus slender, pointed, hook-like and usually bent ventrally; tegumen triangular, its cephalic part weakly sclerotized; vinculum simple; valva asymmetrical;

left valva usually larger than right valva and with a long pointed harpe; right valva rather simple, rarely with a small harpe or process; outer surface of valva with a long concavity, rarely without it, this concavity containing a bundle of hair-like scales which spring up from its cephalic end; juxta distinctly sclerotized, its caudal end bifurcated, 2 arms of juxta usuallyunequal in length and width; aedeagus simple.

Female genitalia: Apophyses posteriores long; apophyses anteriores absent, rarely present; ostium bursae opened on left side and usually at caudal margin of abdominal segment 7, often covered by that segment; ostium bursae usually sclerotized; ductus bursae and corpus bursae which is elongate oval, not differentiated from each other; corpus bursae with 2 circular signa, rarely without signa.

This genus, which is closely allied to *Pterophorus*, is represented by 11 species in Japan, 4 of which are originally described in the present paper.

Key to Japanese species of Oidaematophorus

1. Mid tibia without distinct scale tufts, rarely slightly thickened at its end.....2
   Mid tibia with 2 conspicuous scale tufts at about middle and at its end 10
2 (1). Thorax pale yellowish white dorsally, never mixed with darker scales.....3
   Thorax pale greyish brown or nearly dark brown dorsally 9
3 (2). Ground colour of forewing pale yellowish white, rarely dark brown scales somewhat scattered.....4
   Ground colour of forewing pale greyish brown suffused exceedingly with dark brown except for basal part where pale yellowish white..... **mutuurai**
4 (3). Forewing without darker patches..... **osteodactylus**
   Forewing with dark brown patches, at least with 2 minute pale brown spots between base of wing and base of cleft..... 5
5 (4). Forewing with dark brown or brown dots on costa; when dots very obscure, thorax and abdomen tinged with pale chrome lemon distinctly 6
   Forewing without any dots on costa ..... **lacteolus**
6 (5). Thorax and abdomen tinged with pale chrome lemon; left valva of ♂ genitalia with a long pointed harpe; ♀ genitalia without circular signa on corpus bursae..... **acutus**
   Thorax and abdomen whitish or pale yellowish white, never tinged with pale chrome lemon; left valva with a rather short harpe; ♀ genitalia with 2 circular signa on corpus bursae..... 7
7 (6). Thorax white; ground colour of forewing whitish with no yellowish tinge; forewing without dark brown dots at extremities of veins M_3, Cu_{1a} and Cu_{1b}, rarely with them very indistinctly; ♂ genitalia with a large caudally directed basal sclerotized area of harpe on left valva, right valva with a small process and concavity at caudal end of sacculus..... **albidactylus**
   Thorax pale yellowish white, at least slightly tinged with pale yellow posteriorly; ground colour of forewing pale yellowish white; forewing usually with dark brown dots at extremities of veins M_3, Cu_{1a} and Cu_{1b}; ♂ genitalia with a rather small caudally directed basal sclerotized area of harpe on left valva, right valva without a process.....8
8 (7). Forewing usually scattered with dark brown scales and markings distinctly;

length of forewing 8–10 mm; abdominal segments 2–6 with a small dorsal dark brown dot at posterior margin respectively; caudo-ventral part of abdominal segment 8 of ♀ not folded.....**lienigianus**

Forewing slightly scattered with dark brown scales and markings not strongly indicated; length of forewing 10–11 mm; dorsal dark brown dot on abdomen absent; caudo-ventral part of abdominal segment 8 of ♀ folded ..... **ishiyamanus**

9 (2). Fore- and hindwings, thorax and abdomen almost dark brown..... **nigridactylus**

Forewing pale yellowish white mixed with dark brown scales, thorax pale greyish brown and abdomen nearly pale yellowish white tinged with pale greyish brown on dorsum..... **kuwayamai**

10 (1). Thorax whitish tinged with greyish brown partly; 2 dark brown patches at slightly before base of cleft and on costa at just above base of cleft of forewing followed distinctly by pale yellowish white; ♂ genitalia with caudal end of valva round and left valva with an extremely long harpe..... **iwatensis**

Thorax pale greyish white or pale yellowish brown; forewing with similar dark brown patches but patch on costa usually not strong and both patches not distinctly followed by paler area; ♂ genitalia with caudal end of valva forming a minute process and a harpe of left valva not so long..... **lithodactylus**

Oidaematophorus lienigianus (Zeller) Figs. 4 a, h, 77 a–c, 78, 79, 80 a–c.

Pterophorus (*Pterophorus*) *lienigianus* Zeller, 1851, Linn. Ent. **6**: 380.

Leioptilus lienigianus, South, 1882, Entom. **15**: 105, pl. 2, fig. 3.—Beirne, 1954, Brit. Pyr. Plume Moths, 182, pl. 16, fig. 6.—Inoue, 1955, Check List Lep. Jap. **2**: 118.—Esaki, 1957, Icon. Het. Jap. Col. Nat. **1**: 91, pl. 16, fig. 512.—Inoue, 1959, Icon. Ins. Jap. Col. Nat. Ed. **1**: 258, pl. 173, fig. 34.

Leioptilus serindibanus Moore, 1887, Lep. Ceylon **3**: 527, pl. 209, fig. 14.

Pterophorus lienigianus, Rebel, 1901, Cat. Lep. Pal. Faun. **2**: 75.—Fletcher, 1909, Spol. Zeyl. **6** (21): 34.—Meyrick, 1910, Gen. Ins. **100**: 15; 1913, Lep. Cat. **17**: 22; 1921, Entom. **54**: 267.

Pterophorus (*Leioptilus*) *lienigianus*, Spuler, 1910, Schmett. Eur. **2**: 327.

Pterophorus victorianus Strand, 1912, Arch. Naturg. **78**, A(12): 130.

Pterophorus hirosakianus Matsumura, 1931, 6000 Ill. Ins. Jap., 1056, no. 2073.

Oidaematophorus lienigianus, Fletcher, 1932, Imp. Counc. Agr. Res. Sci. Mon. **2**: 9, pl. 7, figs. a–d.—Hori, 1934, Mushi **7** (1): 20; 1950, Icon. Ins. Jap. (rev. ed.), 499, fig. 1360.

Male and ♀: Head with vertex pale yellowish white anteriorly, pale brownish yellow posteriorly; frons dark brown scattered with pale yellowish white below. Labial palpus pale yellowish white, suffused with dark brown on outer sides. Antenna pale yellowish white dotted with dark brown above, these dark brown dots indistinct on terminal 1/2. Occipital fringe on dorsum rather conspicuous, creamy and bifurcated at tips (fig. 1 n, p, w); short and whitish on sides. Thorax pale yellowish white. Fore leg with tibia whitish with 2 dark brown stripes, terminal end slightly thickened; tarsus nearly whitish except for slight dark brown stripe on inner side of basal segment. Mid leg with tibia whitish with a dark brown stripe on inner side and a short same coloured stripe on upper side basally, terminal end slightly thickened; tarsus whitish, dark brown stripe on inner side. Hind leg with tibia whitish scattered with dark brown scales near origin of medial and

terminal spurs and between them on outer side; medial spur of tibia situated at about 3/5; tarsus whitish scattered with pale or dark brownish yellow on outer side, rarely slightly so on inner side. Forewing cleft from about 4/7; pale yellowish white with pale brownish yellow subcostal line and on vein M_3, sometimes other parts slightly scattered with pale brownish yellow scales; a dark brown patch just before base of cleft; dark brown patches on costa at a little beyond base of cleft and at about 3/5 of lobe 1; small dark brown dots at just before apex of lobe 1, at extremities of veins R_5, M_3, Cu_{1a} and Cu_{1b}; dark brown scales scattered over wing. Cilia on costa towards apex pale yellowish white; within cleft pale yellowish or greyish white, towards apex and anterior angle of lobe 2 pale greyish brown; cilia with whitish scales at extremity of vein R_5; inner margin pale yellowish white, towards anterior angle of lobe 2 long pale greyish brown. Hindwing pale

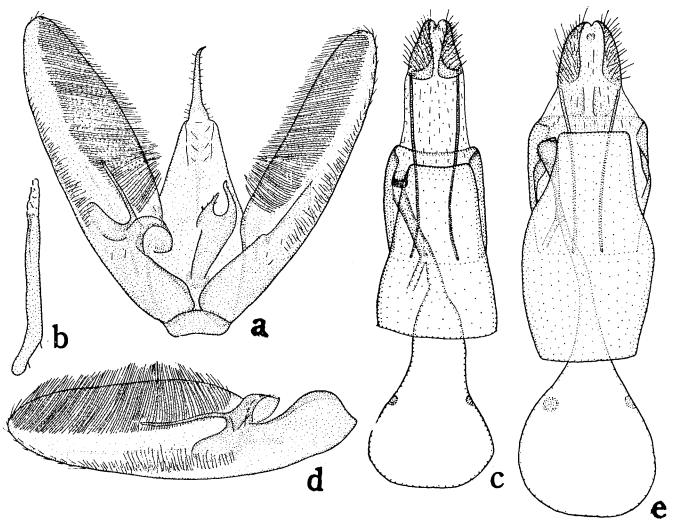

Fig. 77. a-c, *Oidaematophorus lienigianus* (Zeller). a, ♂ genitalia, ventral view, excluding aedeagus; b, ditto, aedeagus; c, ♀ genitalia. d-e, *O. ishiyamanus* (Matsumura). d, ♂ genitalia, left valva; e, ♀ genitalia.

yellowish white slightly tinged with pale greyish brown. Cilia pale greyish brown mixed with pale yellowish white towards base of wing. Abdomen pale yellowish white, tinged with pale brownish yellow on dorsum caudally, sides and ventral surface, sometimes on sides and ventral surface these pale brownish yellow scales forming some longitudinal stripes; each of segments 2–6 with small dark brown dots on dorsum at posterior margins, dot on segment 2 rarely indistinct; a small dark brown dot on each side of segment 8, rarely on the same part of segments 2 and 3. Length of forewing: 8–10 mm.

Male genitalia: Left valva larger than right and with a slender pointed harpe; basal part of this harpe sclerotized heavily into 2 parts, the one rather round and directed towards caudal end of valva, the other heavily arched towards dorso-cephalic end of valva; right valva simple, only with a small concavity at caudal end of sacculus; outer surface of left valva with a large concavity but in right valva indistinct; 2 arms of juxta different in length; aedeagus simple, somewhat bent near its base.

Female genitalia: Apophyses posteriores very long; ostium bursae situated at just before caudal margin of abdominal segment 7; caudo-ventral part of abdominal segment 8 simple; corpus bursae with 2 circular signa.

SPECIMENS EXAMINED: 1 ex. (type of *hirosakianus*) labelled "Hirosaki, 10/IX. 1911, Matsumura"; 6♂♂, 1♀, Shintotsugawa, Sorachi, Hokkaido, 29. VII–2. VIII. 1961, reared by Yano (host plant: *Artemisia vulgaris* L. var. *vulgatissima* Bess.); 1♂, 2♀♀, Sakai, Osaka Pref., 15–16. VI. 1959, reared by Saito (host plant: *Artemisia vulgaris* L. var. *indica* Maxim.); 11♂♂, 3♀♀, Tachibanayama, Fukuoka Pref., 27. V–9. VI. 1960, reared by Yano (host plant: *Artemisia vulgaris* L. var. *indica* Maxim.), and many other specimens from the following localities. HOKKAIDO: Nukabira (VII), Ashoro (VII), Tokachi. HONSHU: Karuizawa, Nagano Pref. (VIII); Gifu, Gifu Pref. (V); Iwawakisan, Osaka Pref. (VIII). KYUSHU: Fukuoka (V–VIII), Tachibanayama (IX), Inunaki-toge (V, VI), Wakasugiyama (IV–VI, X), Hikosan (IV, V, VIII), Kanayama (VI), Fukuoka Pref.; Tomioka, Amakusa (VI); Kechi, Tsushima (VII); Ishikawachi, Miyazaki Pref. (VI); Satamisaki, Kagoshima Pref. (V).

DISTRIBUTION: Japan (Hokkaido, Honshu, Shikoku, Kyushu, Tsushima), Europe, India, Ceylon, New Guinea, Africa.

This is a common species throughout Japan. It is somewhat variable regarding the degree of the development of markings and scattered dark brown scales on the forewing. It is closely allied to *O. ishiyamanus* Matsumura and *O. acutus* n. sp., but is distinguished from *ishiyamanus* by the following characters: body smaller; dark brown markings and scattered scales on forewing more distinct; antenna usually dotted with dark brown above; abdominal segments 2–6 with a small dark brown dot on dorsum at posterior margin respectively. It is easily separated from *acutus* mainly by the following points: a dark brown

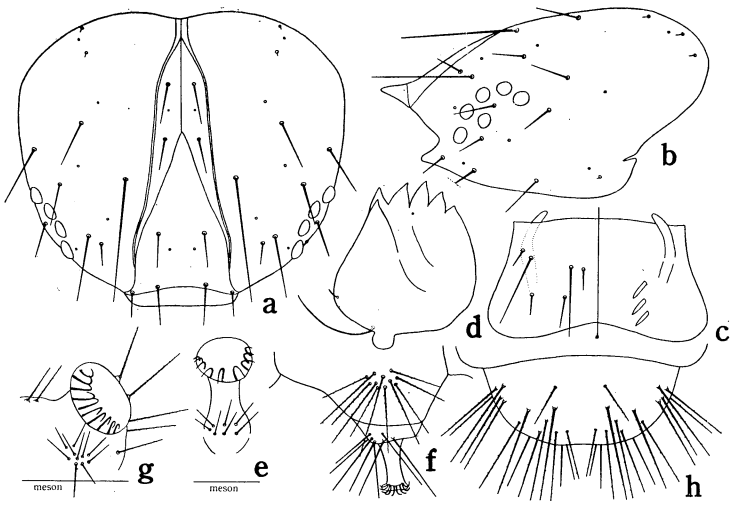

Fig. 78. *Oidaematophorus lienigianus* (Zeller), mature larva. a, head, frontal view; b, ditto, lateral view; c, labrum, with epipharyngeal surface on right; d, mandible; e, left ventral proleg of abdominal segment 6, ventral view; f, ditto, lateral view; g, left anal proleg, ventral view; h, abdominal segment 10, dorsal view.

patch just before base of cleft of forewing conspicuous than that of *acutus*; thorax and abdomen without pale chrome lemon tinge as seen in *acutus*; ♀ genitalia with 2 circular signa.

Mature larva: Head pale yellowish white; fronto-clypeal area narrow; frontal suture not extending to ventral margin of head; seta AF1 approximate to the level of dorsal end of fronto-clypeal area; A2 ventro-mesad from A1; Pb ventrad from the level of AF2; Va nearer to V2 than V1. Median incision of labrum very shallow; M3 nearly equidistant from M2 and ventral margin of labrum; La3 nearly on the same level of M3. Mandible with 6 teeth; 1 of which on oral side; 1 of mandibular setae minute. Thorax and abdomen with numerous long secondary setae from verrucae, these setae mixed with short ones; long setae barbed minutely (fig. 79c); thorax and abdomen invested with minute scobinations. Spiracles on prothorax and abdomen distinctly protruded. Proleg long. Crochets of ventral proleg 6–9; those of anal proleg 10–11, rarely 8. Length: 12–13 mm. Head width: 0.7.

Pupa: Metathorax and abdomen with longitudinal patches as shown in figures. Head with labrum slightly rugged; pilifers rather clearly indicated; maxilla rather long exposed

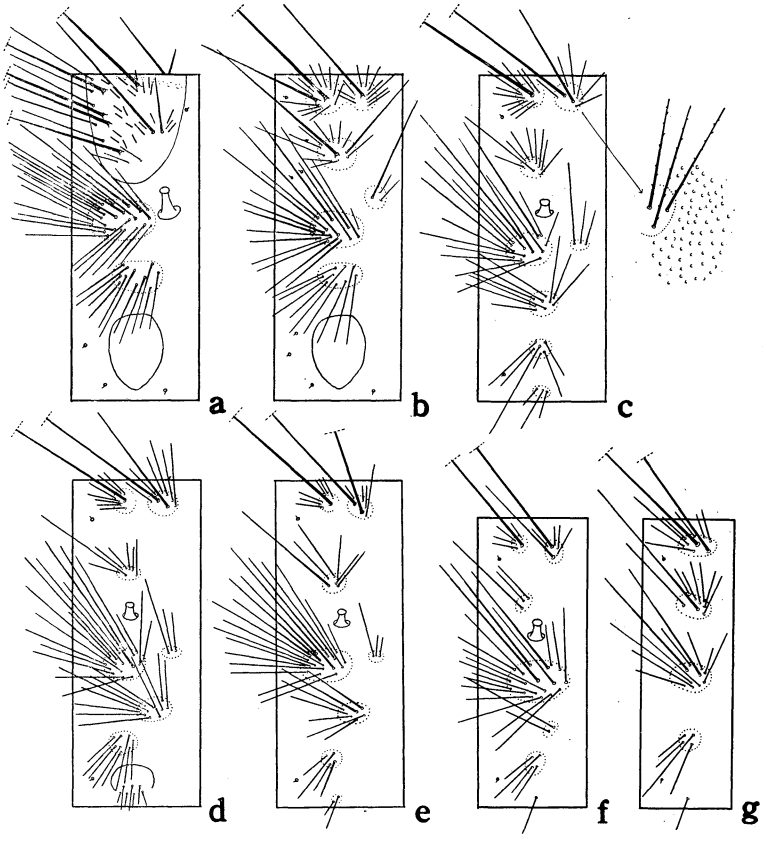

Fig. 79. *Oidaematophorus lienigianus* (Zeller), chaetotaxy of mature larva. a–g, pro-, mesothorax, abdominal segments 1, 3, 7, 8 and 9.

both basal and distal parts and reaching distal end of mid leg or slightly before or beyond; antenna very rarely not extending to distal end of wing; hind leg slightly but distinctly exposed at its distal end, rarely almost overlaid by distal part of maxilla. Head, thorax and wing with many long or short setae; antenna and fore leg (excluding coxa) with a row of short setae respectively. Spiracles on mesothorax protruded. Abdomen bearing tufts of setae as shown in figures; basal parts of these tufts on dorsum somewhat elevated; spiracles on abdominal segments 2–7 conspicuously protruded, those on abdominal segment 8 not protruded and very indistinct. Length: 8–9 mm. Width: 2.

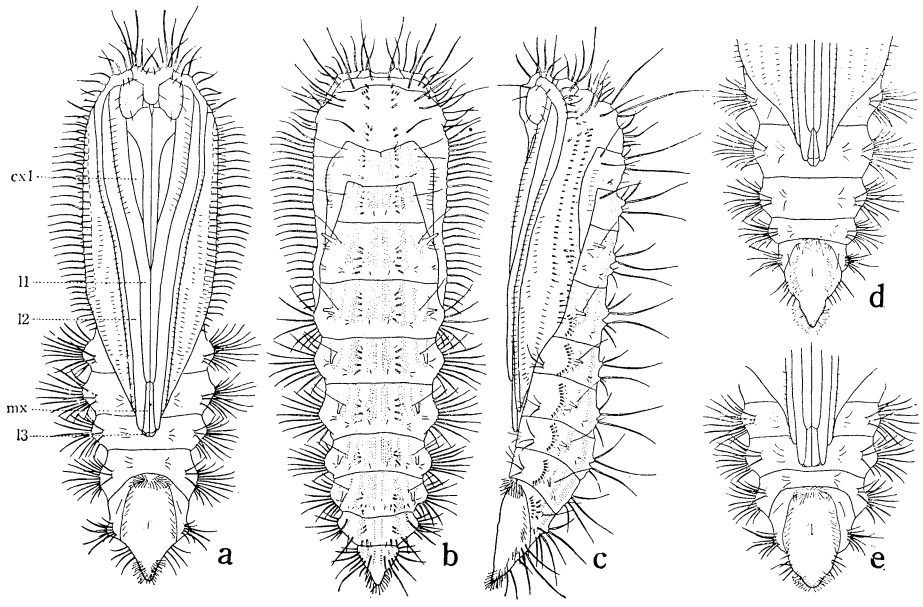

Fig. 80. a–c, *Oidaematophorus lienigianus* (Zeller), pupa, ♀. a, ventral view; b, dorsal view; c, lateral view. d, *O. ishiyamanus* (Matsumura), pupa, caudal part, ventral view. e, *O. nigridactylus* Yano, pupa, caudal part, ventral view.

Biologial notes: The larva folds a cleft leaf of the host plant and forms a sort of tent (upper surface of the leaf exhibits itself outwardly) and eats the folded leaf from inside, upper epidermis being left untouched. One or 2 leaves are folded by a larva. The down on under surface, where a larva feeds on, are gathered usually into strings by a larva. The pupal period lasts for about 13 days in April and May.

Host plants: *Artemisia vulgaris* L. var. *indica* Maxim., *Artemisia vulgaris* L. var. *vulgatissima* Bess.

Oidaematophorus ishiyamanus (Matsumura), n. comb. Figs. 77 d, e, 80d.

Pterophorus ishiyamanus Matsumura, 1931, 6000 Ill. Ins. Jap., 1056, no. 2074.—Inoue, 1955, Check List Lep. Jap. **2**: 117.

Male and ♀: Head similar to *O. lienigianus* (Zeller). Antenna pale yellowish white tinged with pale brownish grey above, rarely with dark brown dots basally. Occipital fringe on dorsum similar but slightly paler than that of *lienigianus*. Thorax whitish slightly tinged

with pale yellow posteriorly. Fore leg similar to *lienigianus*. Mid leg with femur whitish with dark brown stripes; tibia and tarsus allied to *lienigianus*. Hind leg with tibia nearly whitish scattered with dark brown scales near origin of medial and terminal spurs, slightly on other part; the former spur situated at about 2/3; tarsus whitish scattered with dark brown scales on outer side. Forewing cleft about 4/7; pale yellowish white slightly tinged with pale brownish yellow; a dark brown patch just before base of cleft rather oblique; a dark brown patch on costa a little beyond base of cleft; a small dark brown patch on costa at about 2/3 of lobe 1; a short dark brown line on costa just before apex of lobe 1; small dark brown dots at extremities of veins R_5, M_3, Cu_{1a} and Cu_{1b}, the last dot sometimes indistinct; dark brown scales slightly scattered over wing. Hindwing pale yellowish white slightly tinged with greyish brown; a somewhat darker patch just before base of cleft of lobes 1 and 2. Cilia of fore- and hindwings similar to that of *lienigianus*. Abdomen pale yellowish white without dark brown dots on dorsum; ventral surface tinged with pale brownish yellow, usually with a rather darker longitudinal stripe on middle. Length of forewing: 10–11 mm.

Male genitalia: Closely allied to that of *lienigianus*. Pointed harpe of left valva relatively longer than that species.

Female genitalia: Closely allied to that of *lienigianus*. Ostium bursae rather distinctly sclerotized than that species; caudo-ventral part of abdominal segment 8 folded.

SPECIMENS EXAMINED: 1 ♀ (type of *ishiyamanus*) labelled "Ishiyama, 7. VIII. 1903"; 6 ♂♂, 3 ♀♀, Nukabira, Daisetsu. Nat. Park, Hokkaido, 25–27. VII. 1959, Yano; 6 ♂♂, 6 ♀♀, Karuizawa, Nagano Pref., 4–8. VIII. 1959, Ishikawa; 1 ♂, 1 ♀, Utsukushigahara, Nagano Pref., 27–29. VII. 1960, reared by Yano (host plant: *Artemisia vulgaris* L. var. *vulgatissima* Bess.); 7 ♂♂, 14 ♀♀, Kitazawa-toge, Yamanashi Pref., 27. VII. 1960, Yano, and many other specmiens from the following localities. HOKKAIDO: Rausu, Nemuro (VIII); Ashoro, Tokachi (VII, VIII); Sapporo, Ishikari (VII). HONSHU: Ohata, Aomori Pref. (VIII); Karuizawa, Nagano Pref. (VII); Kanayama, Yamanashi Pref. (VII, VIII).

DISTRIBUTION: Japan (Hokkaido, Honshu).

This species is closely allied to *O. lienigianus* (Zeller) and *O. inulae* (Zeller) from Europe so far as recognized from its original description, but it may be separated from these species by the following points: forewing bearing almost no scattered dark brown scales; abdomen without small dark brown dots on dorsum; caudo-ventral part of abdominal segment 8 of ♀ folded.

Mature larva: The larva is closely related to that of *lienigianus*. Only following characters are different from that species: body slightly larger; head with setae of V group longer than that species; labrum with M3 and La3 invisible; setae of each verrucae on abdomen slightly fewer than that species; crochets of ventral proleg 7–9, rarely 6 or 10; those of anal proleg 10–11.

Pupa: The pupa of this species is closely allied to that of *lienigianus*. There is no distinct difference between these 2 species, but hind leg of this pupa is somewhat more distinctly exposed than that of *lienigianus*.

Biological notes: The larva feeds on the leaf of *Artemisia vulgaris* L. var. *vulgatissima* Bess. in the same method as seen in *lienigianus*.

Host plant: *Artemisia vulgaris* L. var. *vulgatissima* Bess.

Oidaematophorus albidactylus Yano, n. sp. Figs. 81a, 82 a–c.

Male and ♀ : Head with vertex whitish anteriorly, pale greyish brown or dark brown posteriorly; frons pale brown. Labial palpus pale brownish white, tinged with pale greyish brown on outer sides. Antenna whitish dotted with dark brown above. Occipital fringe pale creamy and long, bifurcated (fig. 1 l, n, w). Thorax whitish. Fore and mid legs

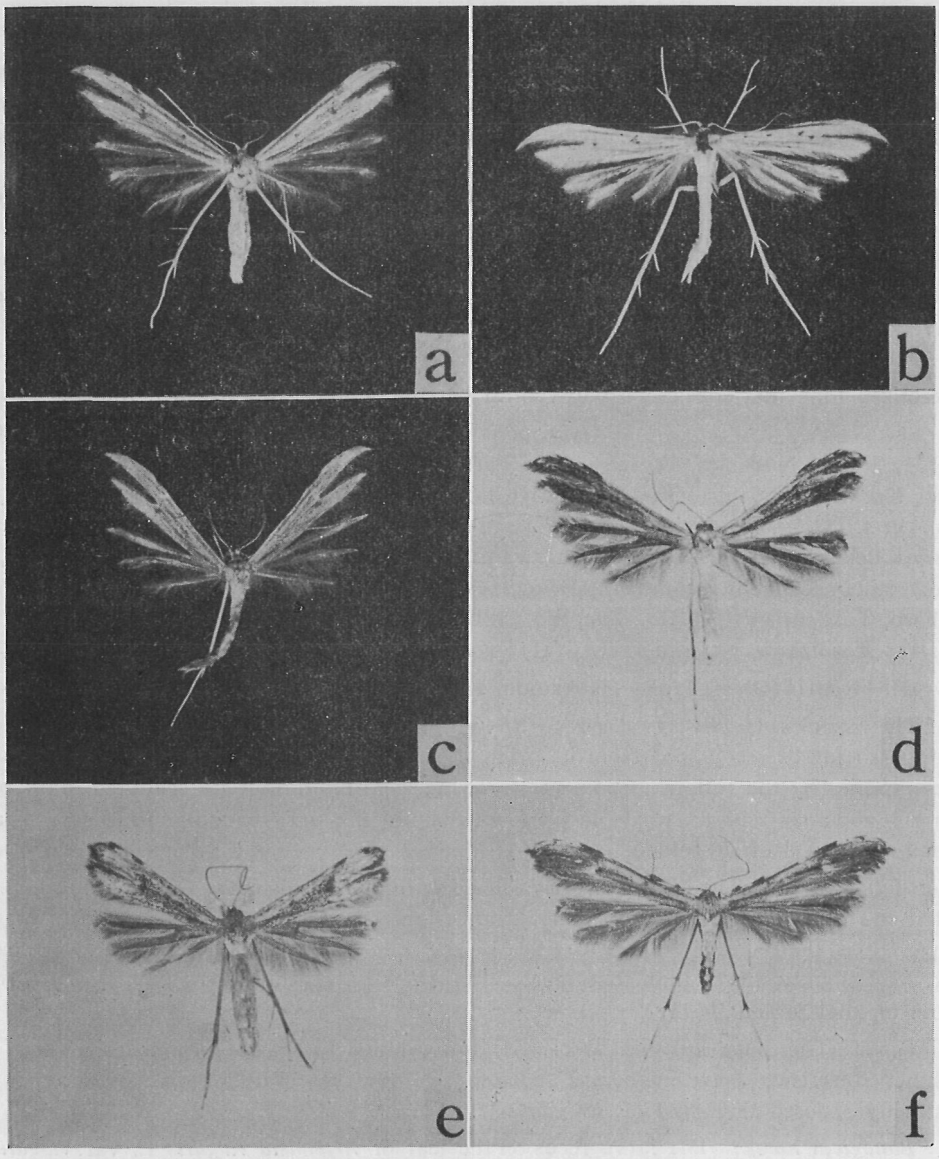

Fig. 81. a, *Oidaematophorus albidactylus* n. sp., allotopotype, ♀ ; b, *O. lacteolus* n. sp., holotype, ♂ ; c, *O. acutus* n. sp., paratopotype, ♂ ; d, *O. mutuurai* n. sp., allotype, ♀ ; e, *O. kuwayamai* (Matsumura), ♀ ; f, *O. iwatensis* (Matsumura), ♂.

with tarsi whitish; others of these legs similar to *O. lienigianus* (Zeller). Hind leg with femur and tibia whitish, the latter slightly scattered with greyish brown near origin of both spurs; tarsus whitish. Forewing cleft from about 3/5; 2 lobes slightly slender than that of *O. ishiyamanus* (Matsumura); lobe 1 subfalcate; whitish with no yellowish tinge in ground colour; with a pale yellowish or greyish brown subcostal line, the line sometimes indistinct on basal 1/2; greyish or dark brown scales scattered more densely than in *ishiyamanus*; 3 dark brown patches at just before base of cleft, a little beyond base of cleft on costa and at about 2/3 of lobe 1; apex of lobe 1 darker but without a distinct dark brown dot or short line which is seen in *ishiyamanus* and *lienigianus*; a small dark brown dot at extremity of vein R_5, but without dots at extremities of veins M_3, Cu_{1a} and Cu_{1b}. Cilia within cleft pale yellowish white or nearly whitish towards base of cleft and at extremity of vein R_5, cilia towards apex of lobe 1 and anterior angle of lobe 2 gradually darkening, especially so on near apex of lobe 1; cilia on inner margin whitish, gradually darkening towards anterior angle of lobe 2. Hindwing with 3 lobes moderately slender; pale greyish white. Cilia pale greyish brown, gradually becoming pale towards base of wing. Abdomen whitish rarely tinged with pale yellow on dorsum; small dark brown dots on dorsum at posterior ends of segments 3–6; ventral surface whitish, suffused with pale greyish brown, rarely mixed with dark brown scales. Length of forewing: 10–11 mm.

Male genitalia: Mid-ventral part of vinculum distinctly incised at cephalic end; left valva allied to that of *lienigianus*, but basal sclerotized area of harpe larger; right valva

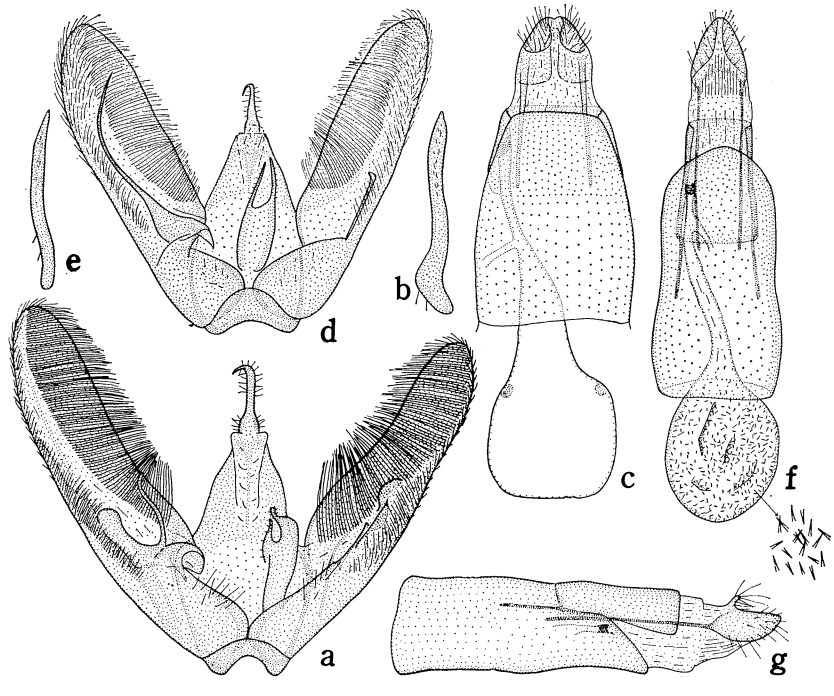

Fig. 82. a–c, *Oidaematophorus albidactylus* n. sp. a, ♂ genitalia, ventral view, excluding aedeagus; b, ditto, aedeagus; c, ♀ genitalia. d–g, *O. acutus* n. sp. d, ♂ genitalia, ventral view, excluding aedeagus; e, ditto, aedeagus; f, ♀ genitalia; g, ditto; lateral view, excluding corpus bursae.

with a small process and concavity at caudal end of sacculus; concavity of outer surface of valva allied to that of *lienigianus*; aedeagus simple, somewhat bulbous at base.

Female genitalia: Closely allied to that of *lienigianus* and *ishiyamanus*. Apophyses posteriores not so long as seen in these species; caudo-ventral part of abdominal segment 8 simple.

Holotype ♂, Utsukushigahara, Nagano Pref., 17. VII. 1960, Yano; allotopotype ♀, and paratopotypes, 1 ♂, 2 ♀♀, same data as holotype. Paratypes 1 ♀, Yumoto, Nikko, 5. VIII. 1934, Issiki; 2 ♀♀, Sin-Kazawa, Koozuke, 12. VII. 1959, Moriuti; 1 ♀, Kanayama, Yamanashi Pref., 24. VII. 1960, Yano; 1 ♂, 1 ♀, Karuizawa, Shinano, 7–14. VII. 1959, Morimoto; 2 ♂♂, 1 ♀, Karuizawa, Nagano Pref., 20. VII. 1960, Yano.

DISTRIBUTION: Japan (Honshu).

This species is closely allied to *O. ishiyamanus* (Matsumura), but is distinguished by having whitish thorax, forewing and abdomen, not clearly indicated markings of forewing and by having ♂ genitalia with a small process on right valva.

Oidaematophorus lacteolus Yano, n. sp. Fig. 81b.

Male and ♀: Head with vertex pale brownish yellow; pale yellowish white between base of antenna; frons pale brownish yellow. Labial palpus rather short; pale yellowish white tinged with pale brown on sides. Antenna whitish above. Occipital fringe pale yellowish white, sometimes pale brownish yellow, somewhat paler on sides; fringes on dorsum long, not furcated (fig. 1b) and mixed with slightly bifurcated ones. Thorax whitish tinged with pale brownish yellow posteriorly. Fore leg with femur pale yellowish white with 2 dark brown stripes; tibia whitish tinged with pale brownish yellow; tibial end thickened rather distinctly with scales; tarsus whitish. Mid leg with tibia whitish with a dark brown stripe beneath, scale tufts situated at 4/7 and at end, the former minute; tarsus whitish. Coxae of mid and hind legs pale yellowish white. Hind leg with femur and tibia pale yellowish white or nearly whitish, the latter slightly tinged with pale brown on origin of terminal spur; tibial spurs situated at 2/3 and terminal end; tarsus nearly whitish, slightly scattered with pale brownish white scales. Forewing cleft from about 2/3 or 3/5; 2 lobes moderately broad; whitish, tinged with pale yellowish white; pale brownish yellow scales sometimes scattered mainly on basal 1/2 of wing; a pale brownish yellow subcostal line occurring from base of wing to nearly apex of lobe 1, but this subcostal line usually indistinct towards apex of lobe 1; a small pale brown spot at a little before base of cleft; another pale brown spot at about middle between base of wing and pale brown spot mentioned above, but this spot somewhat indistinct. Cilia on posterior margin of lobe 1 pale greyish brown towards apex, pale yellowish white towards base of cleft; cilia on other parts pale yellowish white mixed with pale brownish yellow. Hindwing with 3 lobes whitish slightly tinged with pale brown. Cilia pale brownish yellow; cilia on extremities of 3 lobes pale yellowish white. Abdomen whitish tinged with pale brownish yellow; ventral surface with 3 pale brown longitudinal stripes, these stripes rarely indistinct. Length of forewing: 10–11 mm.

Holotype ♂, Sobosan, Bungo, 5. VII. 1932, Hori, Fujino & Chô; allotype ♀, Sobosan, Bungo, 9. IX. 1933, Yasumatsu. Paratypes 1 ♂, Gotenba, Suruga, 23. VII. 1933, Kurosawa; 1 ♀, Sobosan, Bungo, 15. VII. 1931, Esaki & Fujino; 1 ♂, *ibid.*, 5. VII. 1932, Hori, Fujino & Chô.

DISTRIBUTION: Japan (Honshu, Kyushu).

This species is closely related to *O. osteodactylus* (Zeller), but is different from the latter by having a pale brownish yellow subcostal line and 2 small pale brown spots between base of wing and base of cleft of forewing.

Oidaematophorus osteodactylus (Zeller)

Alucita microdactylus, Zetterstedt (*nec* Hübner), 1840. Ins. Lapp., 1013.
Pterophorus osteodactylus Zeller, 1841, Isis **11–12**: 851, pl. 4, figs. 8–9.—Rebel, 1901, Cat. Lep. Pal. Faun. **2**: 76.—Meyrick, 1910, Gen. Ins. **100**: 16; 1913, Lep. Cat. **17**: 23.
Pterophorus (*Pterophorus*) *osteodactylus*, Zeller, 1851, Linn. Ent. **6**: 388.
Pterophorus (*Leioptilus*) *osteodactylus*, Spuler, 1910, Schmett. Eur. **2**: 326.
Hellinsia osteodactyla, Chapman, 1911, Ent. Rec. **23**: 1, 29, pl. 1, fig. 2.
Oidaematophorus osteodactylus, Pierce et Metcalfe, 1938, Gen. Brit. Pyr. Delt. Plume, 52, pl. 28, fig.
Leioptilus osteodactylus, Beirne, 1954, Brit. Pyr. Plume Moths, 184, pl. 16, fig. 8.

Male and ♀: Head with vertex pale yellowish white anteriorly, pale greyish brown posteriorly; frons pale greyish brown, pale yellowish white narrowly along eye. Labial palpus long; basal segment whitish; segments 2–3 whitish suffused with pale brown. Antenna pale yellowish white above. Occipital fringe pale yellowish white on dorsum and sides; fringes on dorsum mixed with furcated and without furcated fringes. Thorax whitish suffused with pale chrome lemon. Fore leg with coxa pale yellow with greyish brown broad stripe; femur pale yellow with 2 dark brown stripes; tibia pale yellowish white and dark brown, slightly thickened at end; tarsus pale yellowish white with a pale greyish brown stripe on inner side. Mid leg with tibia whitish with a dark brown stripe, slightly thickened at origin of spur; tarsus whitish slightly tinged with pale greyish brown. Hind leg with femur pale yellowish white; tibia whitish slightly tinged with pale yellow; tarsus whitish. Forewing cleft from about 4/7; lobe 1 rather narrow; apex of lobe 2 pointed; whitish slightly tinged with pale chrome lemon, rarely tinged with pale brown on lobe 1, terminal half of lobe 2 and towards base of wing; a minute dark brown dot on base of cleft. Cilia on posterior margin of lobe 1 pale greyish brown; cilia towards base of cleft mixed with whitish, dark brown cilia occurring at extremity of vein R_5; cilia on anterior margin of lobe 2 whitish; cilia on inner margin pale yellowish white towards base of wing, pale greyish brown towards anterior angle of lobe 2. Hindwing with 3 lobes slender; whitish slightly tinged with pale greyish brown. Cilia pale greyish brown, towards base of wing somewhat paler. Abdomen whitish suffused with pale chrome lemon; ventral surface with 3 dark brown longitudinal stripes. Length of forewing: 10 mm.

SPECIMENS EXAMINED: 1 ♀, Kamuikotan, Ishikari, Hokkaido, 22. VIII. 1922, Esaki; 1 ♂, 1 ♀, Sounkei, Ishikari, Hokkaido, 24. VII. 1930, Esaki.

DISTRIBUTION: Japan (Hokkaido), Europe.

Oidaematophorus acutus Yano, n. sp. Figs. 4b, 81c, 82 d–g.

Male and ♀: Head with vertex whitish anteriorly, yellowish brown posteriorly; frons yellowish brown. Labial palpus pale yellowish white tinged with yellowish brown. Antenna whitish above. Occipital fringe pale yellowish white; those on dorsum hair-like (fig. 1a), slightly mixed with bifurcated fringes as shown in fig. 1 l. Thorax white tinged with pale

chrome lemon. Femora of fore and mid legs whitish with dark brown stripes; tibiae of these legs whitish with a dark brown stripe respectively; tibial ends of these legs slightly thickened with rough scales. Tibia of hind leg whitish with pale brown only on basal parts of both spurs. Coxa of hind leg and tarsi of all legs whitish except for segment 1 of fore tarsus which is whitish with a pale brown stripe on inner side. Forewing cleft from 4/7; 2 lobes rather narrow; lobe 1 subfalcate; lobe 2 moderately pointed at apex; vein R_3 scarcely separate from vein R_4 at its origin; whitish, rarely tinged with pale chrome lemon along costa towards base of wing; pale greyish brown scales scattered mainly from base of wing to base of cleft, lobe 2 sometimes without these scales; these brown scales forming a small dot at a little before and below base of cleft; 3 small brown dots on costa at 1/5, 3/5 of lobe 1 and extremity of vein R_5, these dots sometimes indistinct. Cilia pale brownish grey or pale yellowish grey, slightly darker towards apex of posterior margin of lobe 1. Hindwing cleft firstly from 3/8 and secondly from near base of wing; lobes 1 and 2 slender; lobe 3 narrow; whitish slightly tinged with pale brown. Cilia slightly darker than those of forewing. Abdomen whitish tinged with pale chrome lemon on dorsum. Length of forewing: 9–10 mm.

Male genitalia: Mid-ventral part of vinculum with a round caudal margin and roundly incised at its cephalic end; left valva slightly wider than right and with a long pointed harpe which is widened basally; right valva with a heavily sclerotized club-like plate at caudal end of sacculus; sacculus very enlarged basally; outer surface of both valvae with a rather distinct concavity respectively; juxta developed, sclerotized laterally, 2 arms narrow; aedeagus simple.

Female genitalia: Apophyses posteriores long; apophyses anteriores present, well developed; ostium bursae situated at well before caudal end of abdominal segment 7; corpus bursae with many minute needle-like signa, sometimes scattered on only terminal 1/2.

Holotype ♂, Kanayama, Yamanashi Pref., 22. VIII. 1958, Yano; allotopotype ♀, paratopotypes, 8 ♂♂, same data as holotype. Paratype 1 ♀, Mt. Kanayama, Masutomi, Yamanashi Pref., 2. VIII. 1959, Miyatake.

DISTRIBUTION: Japan (Honshu).

This new species is very similar to *O. lienigianus* (Zeller), but may be separated by the following characters: antenna never dotted with dark brown; thorax and abdomen white, tinged with pale chrome lemon; ♂ genitalia with a long pointed harpe on left valva and a heavily sclerotized club-like plate on right valva; ♀ genitalia without a circular signum but with many minute scattered needle-like signa.

Oidaematophorus mutuurai Yano, n. sp. Figs. 81d, 83 a, b.

Male and ♀: Head with vertex pale yellowish white anteriorly, yellowish brown posteriorly; frons yellowish brown, anterior margin narrowly paler. Labial palpus pale yellowish white suffused with brown on outer sides. Antenna somewhat roughly scaled with pale yellowish white dotted with brown above; rather distinctly ciliated beneath. Occipital fringe pale brownish yellow and pale yellowish white on dorsum, whitish on sides and below; those on dorsum shown in fig. 1 l, n. Thorax pale yellowish white on anterior and posterior parts, other parts tinged with pale cream. Fore leg with coxa and femur pale yellowish white, the former with a broad brown stripe, the latter with 3 dark brown

stripes; tibia whitish with dark brown on inner side, thickened at end distinctly; tarsus whitish except for dark brown stripe on inner side of segment 1. Mid leg with tibia whitish with dark brown broadly on inner side and with a narrow same coloured stripe on outer side basally, scale tufts at 5/9 and terminal end, the latter distinct; tarsus whitish with dark brown stripe beneath, the stripe indistinct on terminal 1/2. Hind leg with tibia pale yellowish white suffused with greyish brown and dark brown mainly above and outer side, sometimes basal 1/2 nearly pale yellowish white; origins of tibial spurs slightly thickened; tarsus whitish, segment 1 suffused with brown, segments 2 and 3 slightly suffused with brown, all tarsal segments whitish beneath. Forewing cleft from about 3/5; pale greyish brown suffused exceedingly with dark brown except for basal part of wing which is pale yellowish white; with a pale brownish yellow subcostal line which is usually indistinct basally; a pale yellowish white line on costa from just before base of cleft to apex of lobe 1, the line interrupted at a little beyond base of cleft rather long and at about 2/3 short; a small pale yellowish white patch just before apex; lobe 1 rarely tinged with pale brownish white along posterior margin; a dark brown patch at base of cleft; another small dark brown dot at middle between base of wing and base of cleft. Cilia greyish brown, somewhat paler towards base of cleft and towards base of wing on inner margin; pale yellowish white cilia occurring at extremities of veins R_5, Cu_{1a} and Cu_{1b}, but these cilia usually indistinct. Hindwing cleft firstly from about 4/9, secondly from about 2/9; lobe 2 narrowing from about middle towards apex; pale greyish brown, somewhat darker at base of cleft of lobes 1 and 2. Cilia pale greyish brown. Abdomen pale yellowish white tinged with brownish white on dorsum; segments 2–6 with small dark brown dots. Abdomen sometimes nearly pale yellowish white and without dark brown dots on dorsum. Length of forewing: 9–10 mm.

Male genitalia: Mid-ventral part of vinculum simple; left valva distinctly larger than right, with a somewhat long harpe; basal sclerotized area of this harpe somewhat angular; sacculus of left valva large; right valva simple, with a small concavity near ventral margin; sacculus of right valva enlarged basally; concavity of outer surface of valva indistinct; aedeagus simple.

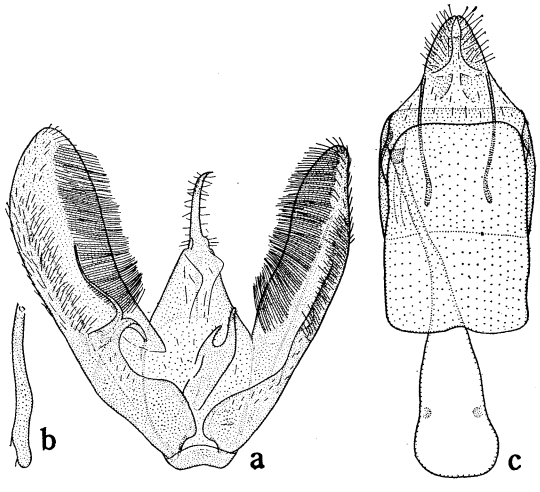

Fig. 83. a–b, *Oidaematophorus mutuurai* n. sp. a, ♂ genitalia, ventral view, excluding aedeagus; b, ditto, aedeagus. c, *O. kuwayamai* (Matsumura), ♀ genitalia.

Female genitalia: Closely allied to that of *O. ishiyamanus* (Matsumura).

Holotype ♂, Kamikoti, Nagano, 13. VII. 1957, reared by Mutuura (host plant: Compositae); allotype ♀, Kanayama, Yamanashi Pref., 25. VII. 1960, Yano. Paratypes 1 ♂, 1 ♀, Kamikoti, Nagano, 10–12. VII. 1957, reared by Mutuura (host plant: Compositae); 1 ♂, Kanayama, Yamanashi Pref., 25. VII. 1960, Yano; 1 ♂, Shinkazawa, Gunma Pref., 28.

VII. 1961, Yano. Holotype and 2 paratypes are preserved in the collection of the Entomological Laboratory of the University of Osaka Prefecture.

DISTRIBUTION : Japan (Honshu).

This species occurs in mountainous districts of Honshu. It is somewhat similar to *O. kuwayamai* (Matsumura) and *O. nigridactylus* Yano, but is easily recognized by having thorax, abdomen and basal part of forewing pale yellowish white slightly tinged with pale brown. These paler areas are distinct in contrast with other parts of forewing.

Biological notes: Dr. A. Mutuura collected the larva boring into the terminal part of a species of Compositae. If it is the usual habit of this larva, this species is a very peculiar one among the species of Pterophorinae so far as the feeding habit is concerned.

Oidaematophorus kuwayamai (Matsumura), n. comb. Figs. 81e, 83c.

Pterophorus kuwayamai Matsumura, 1931, 6000 Ill. Ins. Jap., 1057, no. 2078.—Inoue, 1955, Check List Lep. Jap. **2**: 118.

Male and ♀ : Head with vertex brownish white anteriorly, brown posteriorly; between antenna pale yellowish white. Labial palpus brownish white suffused with dark brown on outer sides of segments 2 and 3. Antenna pale yellowish white dotted with greyish brown above. Occipital fringe pale brownish yellow on dorsum, pale yellowish white on sides and below; those on dorsum bifurcated. Thorax pale greyish brown except for posterior part where the colour is pale yellowish. Fore and mid legs with tibiae whitish with 2 dark brown stripes, the former thickened at its end; segment 1 of fore tarsus whitish with a dark brown stripe on inner side and another narrow stripe on dorsum of basal 1/2; each segment of mid tarsus whitish with a dark brown or greyish brown stripe. Hind leg with tibia pale yellowish white suffused with greyish brown except for a part between both spurs on outer side; tarsal segment 1 greyish brown, whitish beneath; remainder of tarsus pale yellowish white, and greyish brown narrowly at their distal margins. Forewing cleft from about 3/5; pale yellowish white densely mixed with dark brown scales but less mixed on basal part of wing and 2 lobes; with a pale brownish yellow subcostal line; a dark brown patch just before base of cleft; 2 dark brown linear patches on costa at a little beyond base of cleft and at about 4/7, the latter being sometimes indistinct; costa with a dark brown line usually just before apex; a small dark brown dot at extremity of vein R_5. Cilia within cleft pale greyish brown, somewhat darker towards apex and anterior angle of lobe 2, pale near base of cleft; termen of lobe 2 and inner margin pale greyish brown; cilia towards base of wing pale yellowish white; pale yellowish white cilia occurring at extremities of veins R_5, Cu_{1a} and at anterior angle of lobe 2. Hindwing with lobe 2 nearly equal in width from base to middle, from where it is becoming narrow rather rapidly and terminating in an acute pointed apex; pale greyish brown. Cilia pale greyish brown tinged with pale yellowish white. Abdomen pale yellowish white, usually tinged with pale greyish brown on dorsum, rarely almost pale greyish brown; minute dark brown dots on dorsum at posterior ends of segments 1–6, these dots sometimes indistinct; ventral surface pale yellowish white with 5 narrow greyish brown longitudinal stripes, 2 of them being sometimes indistinct. Length of forewing: 8–9 mm.

Female genitalia: Closely allied to that of *O. albidactylus* n. sp. Apophyses posteriores inflated at its end.

SPECIMENS EXAMINED: 1 ♀ (type of *kuwayamai*) labelled "Japan, Kuwayama"; 1 ♀, Ônuma, Oshima, Hokkaido, 14. VIII. 1961, reared by Yano (host plant: *Aster* sp.); 2 ♀♀, Karuizawa, Nagano Pref., 5. VIII. 1960, reared by Yano (host plant: *Aster ageratoides* Turcz. var. *ovatus* Nakai f. *hortensis* Ohwi); 1 ♀, Kanayama, Yamanashi Pref., 10. VIII. 1960, reared by Yano (host plant: *Aster* sp.); 1 ♀, Utsukushigahara, Nagano Pref., 29. VII. 1960, reared by Yano (host plant: *Aster* sp.); 1 ♀, Fukuoka, Fukuoka Pref., 25. VI. 1960, reared by Yano (host plant: *Aster yomena* Makino); 1 ♂, Fukuoka, Chikuzen, 16. IX. 1933, Hori; 1 ♂, *ibid.*, 15. X. 1936, Hashimoto; 2 ♀♀, Tachibanayama, Fukuoka Pref., 15–19. IX. 1960, reared by Yano (host plant: *Aster* sp.); 1 ♂, Kashii, Chikuzen, 30. V. 1931, Esaki *et al.*; 2 ♂♂, Tomioka, Amakusa, 11–12. IX. 1931, Hori & Chô; 1 ♂, Ozikajima, Goto Islands, 8. V. 1936, Takenouchi; 3 ♀♀, Ishikawachi, Miyazaki Pref., 27–28. VI. 1960, reared by Yano (host plant: *Aster yomena* Makino).

DISTRIBUTION: Japan (Hokkaido, Honshu, Kyushu).

This species was originally described by Matsumura (1931) and afterwards no specimen has been reported. This species is very similar to *O. mutuurai* n. sp., but is different from the latter by having pale greyish brown thorax.

Biological notes: The early stages of this species remain unknown at present, but I have reared the moths from *Aster yomena* Makino and *Aster ageratoides* Turcz. var. *ovatus* Nakai f. *hortensis* Ohwi which are evidently the host plants.

Host plants: *Aster ageratoides* Turcz. var. *ovatus* Nakai f. *hortensis* Ohwi, *Aster yomena* Makino.

Oidaematophorus nigridactylus Yano Figs. 80e, 84.

Oidaematophorus nigridactylus Yano, 1961, Kontyû **29** (3): 154, figs. 3–4.

Length of forewing: 8–9 mm.

Male genitalia: Left valva distinctly larger than right; left valva with a wide sclerotized area about middle, this area with 2 rows of heavily sclerotized projections; base of this sclerotized area with a long pointed harpe; a rather narrow slightly sclerotized area present at ventral side of this wide sclerotized area; an arched plate situated at basal part of harpe; right valva with a broad, flat harpe at caudal end of sacculus; concavity of outer surface of valva allied to that of *O. lienigianus* (Zeller); aedeagus simple.

Female genitalia: Closely allied to that of *lienigianus*.

SPECIMENS EXAMINED: 46 type specimens.

DISTRIBUTION: Japan (Honshu, Kyushu).

This species is closely related to *O. medius* Barnes et Lindsey from N. America according to the original description, but it is distinguished from the latter by the following characters: thorax greyish brown or almost dark brown and lacking a band across tips of patagia; right valva of ♂ genitalia with a broad, flat harpe at caudal end of sacculus. It is somewhat related to *O. fishii* (Fernald) from N. America and *O. kuwayamai* (Matsumura), from which it differs by having greyish or nearly dark brown thorax, wings and abdomen.

Mature larva: The larva of this species is allied to *O. lienigianus* (Zeller). Head pale yellowish brown; frontal suture not extending to ventral margin of head; seta AF1 dis-

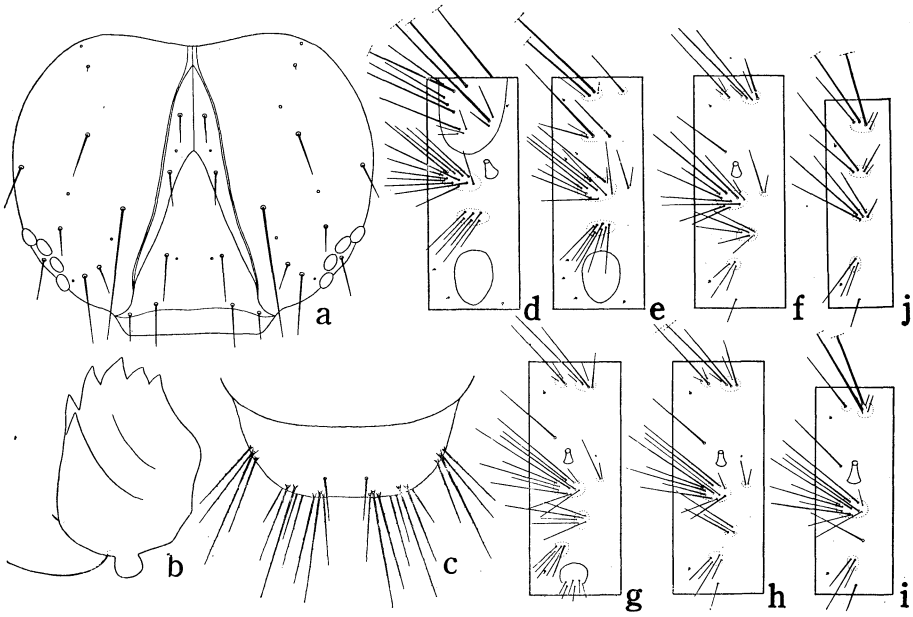

Fig. 84. *Oidaematophorus nigridactylus* Yano, mature larva. a, head, frontal view; b, mandible; c, abdominal segment 10, dorsal view; d–j, chaetotaxies of pro-, mesothorax, abdominal segments 1, 3, 7, 8 and 9.

tinctly ventrad from the level of dorsal end of fronto-clypeal area; Fa nearer to the level of F1; A2 dorso-mesad from A1. Labrum closely allied to *O. ishiyamanus* (Matsumura). Mandible with 6 teeth but somewhat different from those of *lienigianus* and *ishiyamanus*. Thorax and abdomen with numerous secondary setae from verrucae; these setae of each verruca somewhat fewer than *lienigianus* and *ishiyamanus*, especially on prothoracic shield and D group of thorax and abdomen. Spiracles on prothorax and abdomen distinctly protruded. Proleg long. Crochets of ventral proleg 7–9; those of anal proleg 10–11, rarely 13. Length: 9–10 mm. Head width: 0.7.

Pupa: Pale green, slightly tinged with yellow; ventral surface paler, whitish green; abdominal segments 9–10 semitransparent on dorsum and tinged with pale brown; metathorax and abdomen with greenish patches. This species is closely related to *lienigianus*. There is no difference between these 2 species except for the following point: hind leg of this species scarcely exposed at its distal end, while in *lienigianus* hind leg usually distinctly exposed.

Biological notes: The larva folds usually 3 or 4 terminal leaves of the host plant (under surface of the leaves exhibit outwardly) and the larva feeds on the folded leaves from inside, or folds a leaf (upper surface of the leaf exhibits outwardly) and feeds on patches of the under green tissue of the under surface, the upper epidermis being left untouched, or the larva does not fold a leaf and feeds on the under surface of a leaf, the upper epidermis being left untouched also. The young and middle instar larvae feed usually by the last style. Pupation takes place usually on the upper surface of the midrib of a leaf and directs to the base of a leaf.

Host plant: *Aster yomena* Makino.

Oidaematophorus iwatensis (Matsumura), n. comb. Figs. 81f, 85 a–c.

Pterophorus iwatensis Matsumura, 1931, 6000 Ill. Ins. Jap., 1057, no. 2075.
Oidaematophorus lithodactylus, Hori (*nec* Treitschke), 1936, Bul. Sci. Fak. Terk. Kjušu Imp. Univ. **7** (1): 83 (partim).—Inoue, 1955, Check List Lep. Jap. **2**: 118 (partim).

Male and ♀: Head with vertex whitish slightly tinged with pale brown anteriorly, brown posteriorly; frons brown. Labial palpus yellowish brown mixed with dark brown. Antenna pale yellowish white dotted with dark brown above, these dots indefinite towards terminal 1/2. Occipital fringe pale brownish yellow mixed with brown; fringes on dorsum bifurcated. Thorax whitish, rarely slightly tinged with pale yellow and suffused with greyish brown at posterior margins of tegula and mesothorax. Fore and mid legs with tibiae whitish with a dark brown linear patch; fore tibia with a large scale tuft almost covering terminal 1/2, mid tibia with 2 large scale tufts, the one at a little before middle and another at terminal end; these scale tufts of both tibiae dark brown with whitish tips; tarsi of fore and mid legs pale yellowish white, slightly mixed with brown on mid tarsus. Hind leg with tibia yellowish brown, slightly thickened with rough scales, which are white on tips, at terminal end; tarsus whitish suffused with brown at basal part of segment 1 and terminal part of each segment. Forewing cleft from about 2/3; greyish brown from base of wing to base of cleft and on lobe 2, gradually darkening towards lobe 2; costal 1/2 of wing before cleft usually whitish except for narrow greyish brown costa; basal 1/2 of lobe 1 yellowish brown, where the same coloured subcostal line running almost to apex, sometimes indistinct; remainder of lobe 1 pale yellowish white; a pale yellowish white patch just base of cleft, which is preceded by dark brown; a dark brown linear patch on costa just above base of cleft, which is followed by pale yellowish white; 2 small dark brown dots along costa of lobe 1 at 1/3 and at 3/5, the former usually minute, rarely another one at extremity of vein R_5; area just before apex of lobe 1 suffused with greyish brown; greyish white scales rarely scattered on lobe 2. Cilia pale greyish brown, somewhat darker within cleft and basal part of cilia on termen of lobe 2, somewhat paler on inner margin; extremity of vein R_5 narrowly whitish; cilia between extremities of veins Cu_{1a} and Cu_{1b} whitish, sometimes the part extending to near extremity of vein M_3, basal part of which is greyish brown. Hindwing pale greyish brown. Cilia pale greyish brown to pale greyish yellow; near base of wing pale yellowish white. Abdomen whitish slightly tinged with pale brown on dorsum and dark brown on sides, distinctly dark brown on segments 3–6; segments 4–5 bearing dark brown subdorsal stripes, the latter usually broad and nearly covering segment 5. Length of forewing: 13–15 mm.

Male genitalia: Mid-ventral part of vinculum represented as a narrow arched plate; both valvae nearly equal in length, but left valva slightly wider than right; left valva with an extremely long harpe, basal part of this harpe heavily curved and enveloped by sacculus; base of harpe heavily sclerotized; right valva simple with only a minute process at ventral margin; outer surface of valva with a narrow slight concavity; juxta developed, 2 arms long, right one of which distinctly longer than left; aedeagus rather broad but simple.

Female genitalia: Apophyses posteriores long; membranous dorsal part of papilla analis projected; antrum of ostium bursae very broad and long; corpus bursae elongate, without

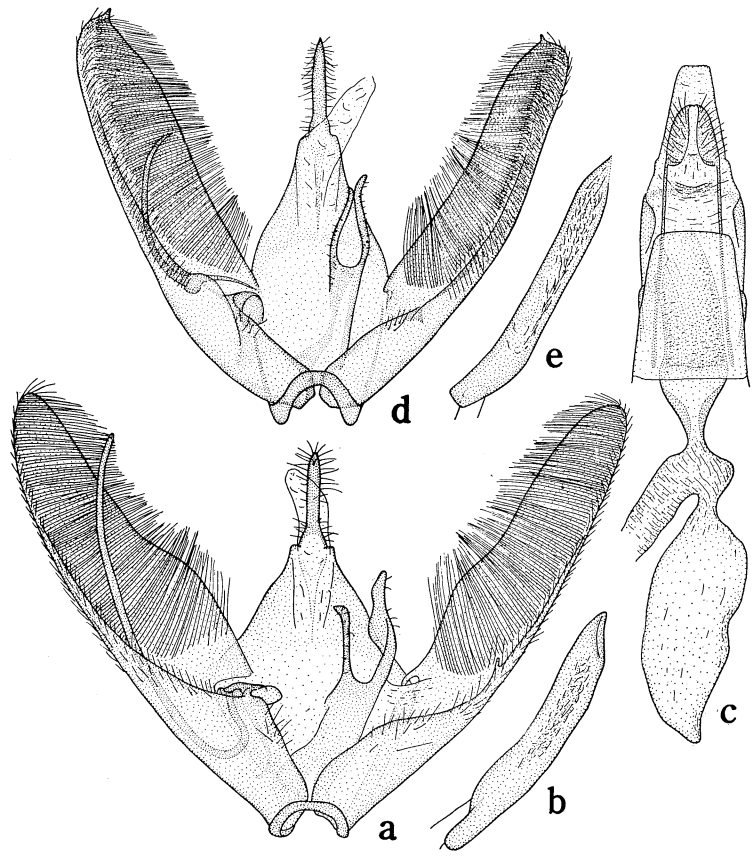

Fig. 85. a-c, *Oidaematophorus iwatensis* (Matsumura). a, ♂ genitalia, ventral view, excluding aedeagus; b, ditto, aedeagus; c, ♀ genitalia. d-e, *O. lithodactylus* (Treitschke). d, ♂ genitalia, ventral view, excluding aedeagus; e, ditto, aedeagus.

a signum; ductus seminalis broad.

SPECIMENS EXAMINED: 1 ♀ (type of *iwatensis*) labelled "Iwate, Ogasawara"; 1♂, 2♀♀, Utukusigahara, Nagano, 20-26. VII. 1955, Mutuura; 1 ♀, Daisen, 12. VII. 1950, Mutuura.

DISTRIBUTION: Japan (Honshu).

This species was treated as a synonym of *O. lithodactylus* (Treitschke) by Hori (1936a). After careful examination of the type specimen of *iwatensis*, however, I have come to the conclusion that this species is different from *lithodactylus*. This species is distinguished from *lithodactylus* by the following points: thorax, abdomen and costal 1/2 of forewing nearly whitish; left valva of ♂ genitalia with an extremely long harpe and its basal part curved and enveloped by sacculus.

Oidaematophorus lithodactylus (Treitschke) Fig. 85 d, e.

Alucita lithodactyla Treitschke, 1833, Schmett. Eur. **9** (2): 245,
Alucita septodactyla Treitschke, 1833, *ibid.*: 246,

Pterophorus lithoxylodactylus Duponchel, 1838, Hist. Nat. Lép., 11, pl. 313, fig, 3.
Pterophorus lithodactylus, Zeller, 1841, Isis **11–12**: 843, pl. 4, fig. 6.—Rebel, 1901, Cat. Lep. Pal. Faun. **2**: 75.—Meyrick, 1910, Gen. Ins. **100**: 17; 1913, Lep. Cat. **17**: 25.
Pterophorus (*Pterophorus*) *lithodactylus*, Zeller, 1851, Linn. Ent. **6**: 377.
Oidaematophorus lithodactylus, South, 1882, Entom. **15**: 103, pl. 2, fig. 2.—Hori, 1936, Bul. Sci. Fak. Terk. Kjusu Imp. Univ. **7** (1): 83 (partim).—Pierce et Metcalfe, 1938, Gen. Brit. Pyr. Delt. Plume, 50, pl. 27, fig.—Inoue, 1955, Check List Lep. Jap. **2**: 118 (partim).—Beirne, 1954, Brit. Pyr. Plume Moths, 185, pl. 16, fig. 10, fig. 174.
Pterophorus (*Oedematophorus*) *lithodactylus*, Spuler, 1910, Schmett. Eur. **2**: 325, pl. 82, fig. 62.

Length of forewing: 12–13 mm.

Male genitalia: Mid-ventral part of vinculum distinctly arched; both valvae nearly equal in length and size; caudal ends of both valvae forming a minute pointed process respectively; left valva with a long harpe; basal part of this harpe with a sclerotized arched plate; right valva simple; outer surface of valva with a long concavity; juxta developed but rather narrow; aedeagus simple.

SPECIMENS EXAMINED: 1 ♂, Hakodateyama, Hokkaido, 4. VIII. 1959, Maeta; 1 ♂, Sagashio Spa, Yamanashi Pref., 25. VII. 1959, Sonda; 1 ♀, Kamikochi, 20. VIII. 1918, Takeuchi; 1 ♂, Nakamura-Tano, Bungo, 19. VII. 1929, Esaki & Fujino.

DISTRIBUTION: Japan (Hokkaido, Honshu, Kyushu), Europe, Asia Minor.

I examined 4 specimens of this species from Japan, 2 of which were already recorded by Hori (1936a). The ♂ genitalia of the examined specimen of this species has a slight difference in comparison with the figure of Pierce and Metcalfe (1938) as follows: caudal end of valva of the Japanese specimen forming a minute process, while the figure of Pierce and Metcalfe without such a process.

Genus **Pterophorus** Geoffroy

Pterophorus Geoffroy, 1762, Hist. Nat. Ins. **2**: 90.—Fernald, 1898, Pter. N. Amer., 39.—Meyrick, 1910, Gen. Ins. **100**: 15.—Spuler, 1910, Schmett. Eur. **2**: 325.—Meyrick, 1913, Lep. Cat. **17**: 21.
Emmelina Tutt, 1905, Ent. Rec. **17**: 37.—Pierce et Metcalfe, 1938, Gen. Brit. Pyr. Delt. Plume, 52, pl. 29.

Type species: *Alucita monodactyla* Linné.

Occipital fringe bifurcated. Fore- and hindwings with the similar venation to *Oidaematophorus*. Hindwing with frenulum in ♀ simple.

Male genitalia: Uncus slender, pointed; tegumen triangularly sclerotized; vinculum simple; valva extremely asymmetrical; left valva with developed processi; right valva also with a process; juxta with 2 arms; aedeagus simple.

Female genitalia: Apophyses anteriores absent; ostium bursae opened widely and situated on left side at caudal end of abdominal segment 7 which is sclerotized; ductus bursae narrow; corpus bursae without a signum; point of departure of ductus seminalis approached to corpus bursae,

This genus is closely related to *Oidaematophorus*. Beirne (1954) adopted the following character for the present genus: inner medial spur of hind tibia longer than outer. In European specimens of *Pterophorus monodactylus* (Linné), certainly, this spur is distinctly longer than outer. But all the Japanese species of *Oidaematophorus* and *Pterophorus* also have this character. These 2 genera, after all, are separated from each other by the characters mentioned in the key.

KEY TO JAPANESE SPECIES OF PTEROPHORUS

Ground colour of forewing brownish white; length of forewing 9–11 mm; right valva of ♂ genitalia with a caudal pointed arm, caudal end of left valva without spines ..... **jezonicus**

Ground colour of forewing brownish white usually tinged with yellowish brown; length of forewing 11–13 mm; right valva of ♂ genitalia with another pointed arm on inner surface in addition to caudal pointed end of valva, caudal end of left valva round and with many spines, costal process of left valva slender than that of *jezonicus* ..... **monodactylus**

Pterophorus monodactylus (Linné)

Alucita monodactyla Linné, 1758, Syst. Nat. ed. **10**: 542.
Alucita pterodactyla, Hübner (*nec* Linné), 1825, Samml. Eur. Schmett., fig. 4.
Pterophorus pterodactylus, Zeller (*nec* Linné), 1841, Isis **11–12**: 846, pl. 4, fig. 7.
Pterophorus (*Pterophorus*) *pterodactylus*, Zeller (*nec* Linné), 1851, Linn. Ent. **6**: 377.
Pterophorus cineridactylus Fitch, 1854, Trans. N. York Agr. Soc. **14**: 848.
Pterophorus naevosidactylus Fitch, 1854, *ibid.*: 849.
Pterophorus pergracilidactylus Packard, 1873, Ann. Lyc. Nat. Hist. N. Y. **10**: 265.
Pterophorus monodactylus, South, 1885, Entom. **18**: 277, pl. 1, fig. 4.—Rebel, 1901, Cat. Lep. Pal. Faun. **2**: 75.—Meyrick, 1910, Gen. Ins. **100**: 17; 1913, Lep. Cat. **17**: 26.—Beirne, 1954, Brit. Pyr. Plume Moths, 185, pl. 16, fig. 11, figs. 145, 147, 172, 175.
Pterophorus (*Pterophorus*) *monodactylus*, Spuler, 1910, Schmett. Eur. **2**: 326, pl. 82, fig. 63.
Oidaematophorus monodactylus, Barnes et Lindsey, 1921, Cont. Nat. Hist. Lep. N. Amer. **4** (4): 443, pl. 46, figs. 13–15, pl. 54, fig. 13.
Emmelina monodactylus, Pierce et Metcalfe, 1938, Gen. Brit. Pyr. Delt. Plume, 52, pl. 29, fig.

DISTRIBUTION: Japan, Europe, C. Asia, N. Africa, N. America.

The specimens which were treated by Japanese authors under the name *monodactylus* are nothing but *P. jezonicus* Matsumura. I have seen no specimen of this species from Japan.

Pterophorus jezonicus Matsumura Figs. 86 a–c, 87–89.

Pterophorus jezonicus Matsumura, 1931, 6000 Ill. Ins. Jap., 1057, no. 2076.
Pterophorus komabensis Matsumura, 1931, *ibid.*, 1057, no. 2077.
Pterophorus menoko Matsumura, 1931, *ibid.*, 1057, no. 2079.—Inoue, 1955, Check List Lep. Jap. **2**: 118. **New Synonymy.**
Pterophorus yanagawanus Matsumura, 1931, *ibid.*, 1058, no. 2080.
Oidaematophorus monodactylus, Hori (*nec* Linné), 1934, Mushi **7** (1): 20; 1950, Icon. Ins.

Jap. (rev. ed.), 499, fig. 1359.

Pterophorus monodactylus, Esaki (*nec* Linné), 1957, Icon. Het. Jap. Col. Nat. **1**: 91, pl. 16, fig. 502 (not fig. 511).—Inoue, 1959, Icon. Ins. Jap. Col. Nat. Ed. **1**: 258, pl. 173, fig. 33.

Male and ♀: Head with vertex whitish suffused with pale greyish brown; frons brown, sometimes pale yellowish brown. Labial palpus with basal segment distinctly brushy; pale yellowish white slightly tinged with pale yellowish brown. Antenna pale yellowish white or pale greyish white above; sometimes basal part dotted with brown above. Occipital fringe whitish with brown tips; fringes on dorsum bifurcated (fig. 1 l, n). Thorax whitish tinged with greyish yellow; tegula tinged with pale brown. Fore and mid legs with tibiae brown and pale yellowish white, slightly thickened at their ends; mid tibia with a slight scale tuft at middle; tarsi of these legs whitish. Hind leg with tibia pale yellowish white on inner side, suffused with brown on outer side; a slight scale tuft occurring on tibia at about middle; tarsus pale greyish brown. Forewing cleft from about 4/7; brownish white; a dark brown patch a little before base of cleft and another on costa at

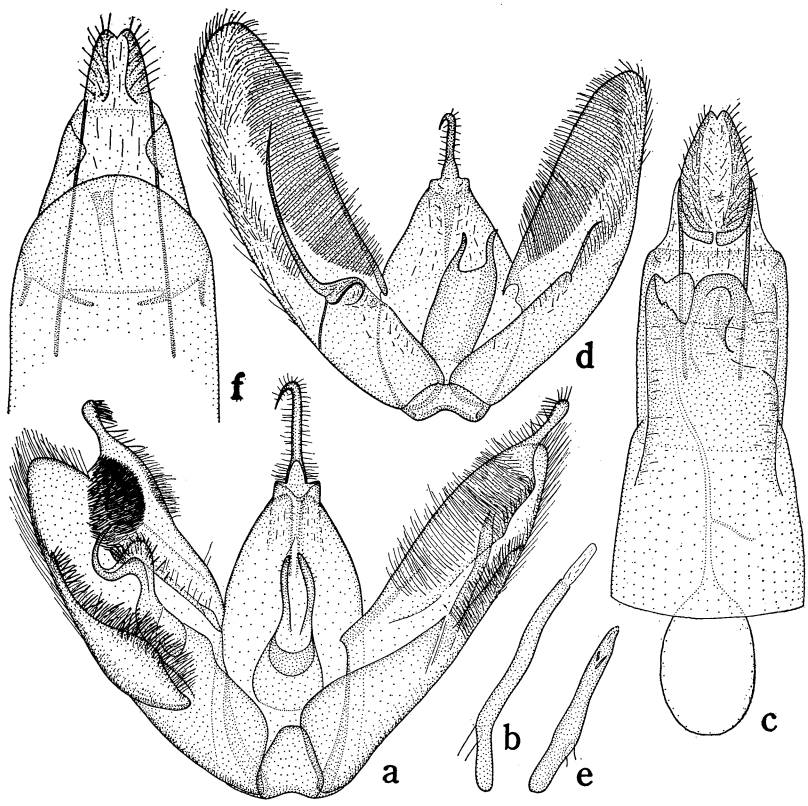

Fig. 86. a–c, *Pterophorus jezonicus* Matsumura. a, ♂ genitalia, ventral view, excluding aedeagus; b, ditto, aedeagus; c, ♀ genitalia. d–f, *Adaina microdactyla* (Hübner). d, ♂ genitalia, ventral view, excluding aedeagus; e, ditto, aedeagus; f, ♀ genitalia, excluding bursa copulatrix.

about 1/3 of lobe 1; a minute dark brown dot at 3/7 from base of wing to base of cleft; minute dark brown dots occurring at 5/8 on costa of lobe 1, apex of lobe 1, extremity of vein R_5, anterior angle of lobe 2 and a little below anterior angle of lobe 2, but these dots usually indefinite. Cilia greyish white somewhat tinged with brown; cilia within cleft towards apex of lobe 1 and around anterior angle of lobe 2 greyish brown; pale yellowish white cilia mixed at anterior angle and termen of lobe 2. Hindwing with 3 lobes narrow; pale greyish brown. Cilia greyish white somewhat tinged with brown. Abdomen whitish, suffused with yellowish brown from segment 2 or 3 to caudal end; a pale yellowish white subdorsal line occurring on these segments. Length of forewing: 9–11 mm.

Male genitalia: Uncus bent ventrally; tegumen weakly sclerotized; mid-ventral part of vinculum simple; both valvae nearly equal in length but left valva wider than right; ventral margin of left valva heavily sclerotized and projecting at about middle; at about middle of left valva a strongly arched sclerotized harpe situated; costal margin of left valva with an extremely large spinous process, its distal end extending beyond caudal end of valva; inner surface of right valva sclerotized towards caudally and forming a pointed arm which is extending beyond caudal end of valva; sacculus distinct, right sacculus emitting a narrow sclerotized plate towards dorso-caudally; juxta with 2 long arms; aedeagus slightly bent just before base.

Female genitalia: Apophyses posteriores long; ostium bursae opened ventrally on left side, irregular cup-shaped; caudal end of abdominal segment 7 connected with ostium

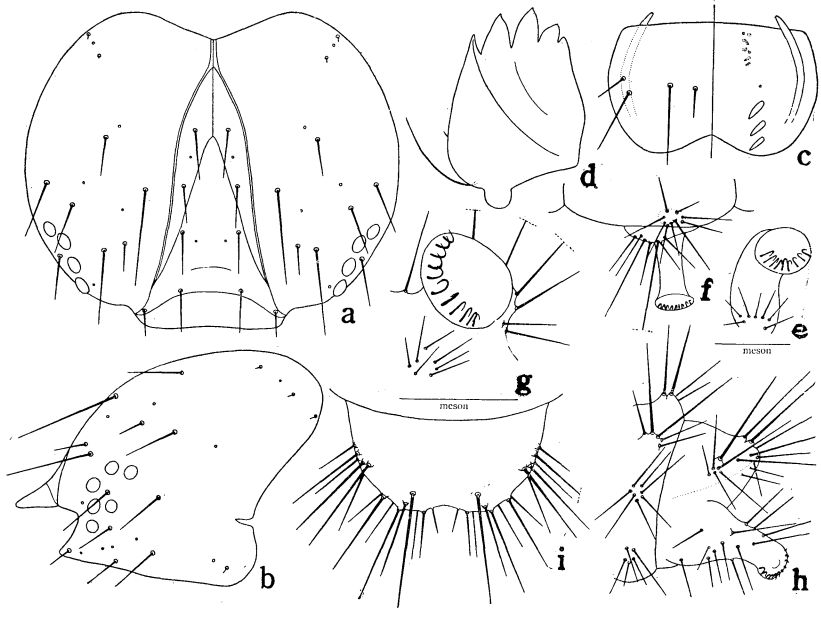

Fig. 87. *Pterophorus jezonicus* Matsumura, mature larva. a, head, frontal view; b, ditto, lateral view; c, labrum, with epipharyngeal surface on right; d, mandible; e, left ventral proleg of abdominal segment 5, ventral view; f, ditto, lateral view; g, left anal proleg, ventral view; h, abdominal segments 9 and 10, lateral view; i, abdominal segment 10, dorsal view.

bursae and irregularly sclerotized.

SPECIMENS EXAMINED: 1 ♂ (type of *jezonicus*) labelled "Sapporo, Mats., 2. X. 1910"; 1 ♂ (type of *komabensis*) labelled "Komaba, Tokyo, 5–4–1915, S. Hirayama"; 1 ♂ (type of *menoko*) labelled "Sapporo, Matsumura, 14. VIII. 18"; 1 ♂ (type of *yanagawanus*) labelled "Yanagawa, Chikugo, 20–9. 1918, T. Takamuku"; 1 ♂, 1 ♀, Fukuoka, Fukuoka Pref., 26. VI. 1961, reared by Yano (host plant: *Calystegia soldanella* Roem. et Schult.), and many other specimens from the following localities. HONSHU: Hirosaki, Aomori Pref. (X); Gifu, Gifu Pref. (X); Kotoen, Hyogo Pref.; Tukigase, Nara Pref. (IX); Sakai, Osaka Pref. (V). KYUSHU: Fukuoka (IV–VI, IX), Hikosan (VI), Fukuoka Pref.; Kirishima, Kagoshima Pref. (VII).

DISTRIBUTION: Japan (Hokkaido, Honshu, Kyushu).

Formerly this species was treated as a synonym of *P. monodactylus* (Linné) by Hori (1934a), together with *P. komabensis* Matsumura and *P. yanagawanus* Matsumura. This species and *monodactylus* are variable in colour and closely related to each other. These 2 species, however, are separable by the coloration in addition to the distinct character of

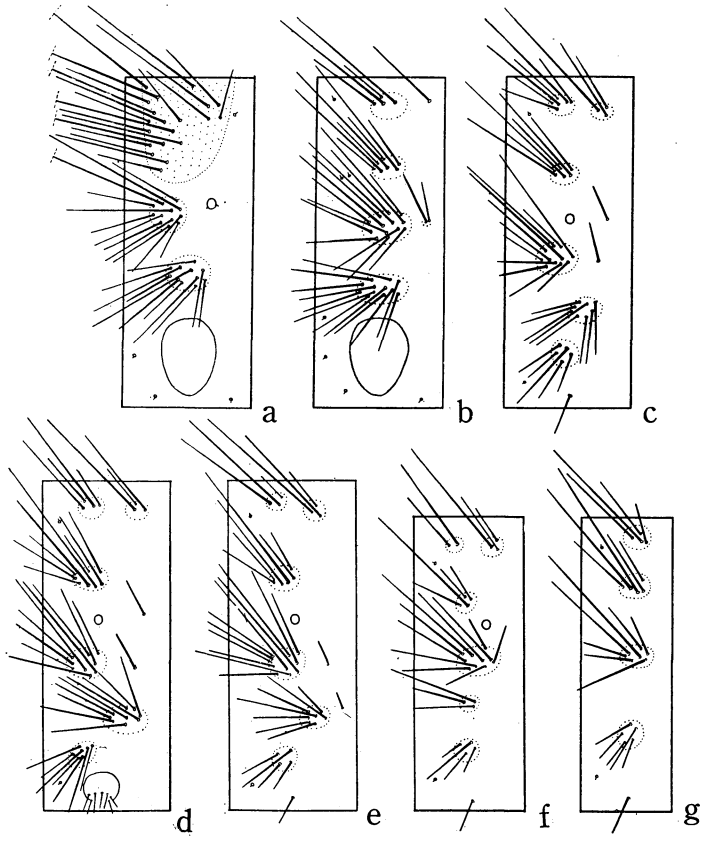

Fig. 88. *Pterophorus jezonicus* Matsumura, chaetotaxy of mature larve. a–g, pro-, mesothorax, abdominal segments 1, 3, 7, 8 and 9.

genitalia as mentioned in this paper. It is my opinion that *jezonicus* is a valid species. I also found that *P. menoko* Matsumura is identical to the present species as well as *komabensis* and *yanagawanus* after examinations of the type specimens of these species.

Mature larva: Head pale yellow somewhat tinged with pale brown; vertical triangle shallow; frontal suture not extending to ventral margin of head; setae AF1 and AF2 rather long; AF2 slightly dorsad from the level of dorsal end of fronto-clypeal area; P1 nearly on the same level of AF1 or slightly ventrad; A2 dorso-mesad from A1; Aa nearer to P1 than A2; P2 ventrad from the level of AF2; Pb approximate to P2. Labrum with a slight median incision; M3 and La3 invisible. Mandible with 5 teeth; 1 of mandibular setae minute. Thorax and abdomen pale green with yellowish white longitudinal stripe; long numerous secondary setae occurring from verrucae; these setae barbed minutely, these barbs very obscure than that of *Oidaematophorus lienigianus* (Zeller). Spiracle on prothorax protruded; those on abdomen not protruded. Proleg long. Crochets of ventral proleg 9–10, rarely 7 or 8; those of anal proleg 9–11. Length: 12–13 mm. Head width: 0.9.

Pupa: Pale green, somewhat paler ventrally; abdominal segments 8–10 semitransparent; thorax and abdomen with brown patches as shown in figures. Head with pilifers clearly indicated and slightly elevated; distal part of maxilla exposed distinctly extending beyond distal end of mid leg (fig. 89a) or not reaching it. Hind leg slightly (fig. 89a) or distinctly exposed at its distal end; spiracle on mesothorax not protruded. Head, thorax and wing with many long and short setae, antenna and fore leg (excluding coxa) with a row of setae respectively; thorax bearing many scattered short setae in addition to long setae mentioned above. Abdomen bearing tufts of setae as shown in figures; basal parts of these tufts on dorsum somewhat elevated; abdominal segments 1–3 with many scattered short setae; abdominal segments 4–7 with a transverse row of short setae on their cephalic margins of dorsum respectively, these setae directed caudad; abdominal segments 1–8 with some caudad directed setae on their caudal parts of dorsum; spiracles on abdominal segments 2–7 protruded but not so distinct as species of *Oidaematophorus*, those on abdominal segment 8 not protruded and indistinct. Length: 8.5–9 mm. Width: 1.5–1.8. The pupa of this species is easily separated from other pupae of Pteropho-

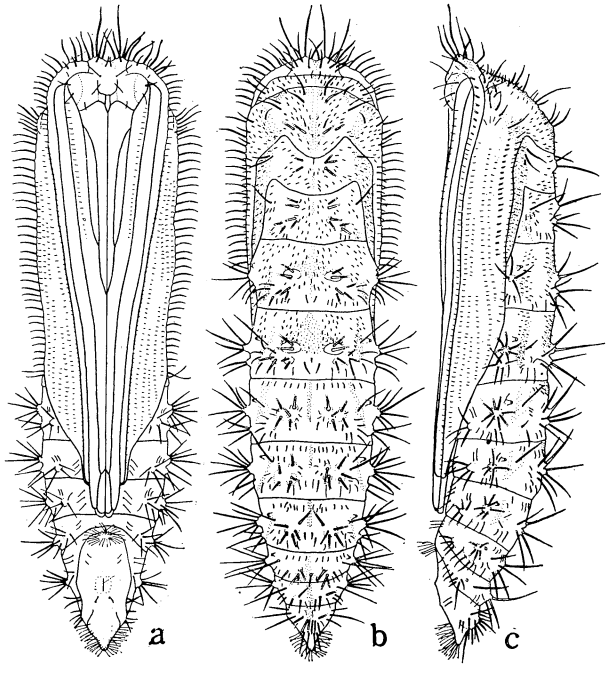

Fig. 89. *Pterophorus jezonicus* Matsumura, pupa, ♀. a, ventral view; b, dorsal view; c, lateral view.

rinae by the following points: thorax and abdominal segments 1–3 bearing numerous short setae; abdominal segments 4–7 with a transverse row of setae on their cephalic margins of dorsum respectively.

Biological notes: The larva usually rests on the upper surface of a leaf of the host plant and feeds on the upper green tissue of the leaf surface, the lower epidermis being untouched when the larva is not mature. The adult appears from April to October.

Host plants: *Calystegia japonica* Choisy, *Calystegia soldanella* Roem. et Schult., *Ipomoea batatas* Lam. var. *edulis* Makino.

Genus **Adaina** Tutt

Adaina Tutt, 1905, Ent. Rec. **17**: 37.—Meyrick, 1910, Gen. Ins. **100**: 15; 1913, Lep. Cat. **17**: 21.—Barnes et Lindsey, 1921, Cont. Nat. Hist. Lep. N. Amer. **4** (4): 363.—Forbes, 1923, Lep. N. Y. Neighb. St., 651.—Hori, 1933, Bul. Sci. Fak. Terk. Kjusu Imp. Univ. **5** (4): 391.

Pterophorus, Spuler (*nec* Geoffroy), 1910, Schmett. Eur. **2**: 325.

Type species: *Alucita microdactyla* Hübner.

Occipital fringe hair-like. Labial palpus slender. Tibia simple. Forewing with 2 lobes slender; vein R_3 out of R_4; M_3 and Cu_{1a} stalked; Cu_{1b} from near angle of cell. Hindwing with frenulum in ♀ double; 3 lobes slender; vein $Sc+R_1$ to before middle of costa.

Male genitalia: Uncus slender, pointed; tegumen triangular, rather weakly sclerotized; vinculum simple; valva asymmetrical; left valva with a long harpe; right valva rather simple; outer surface of valva with a long concavity; juxta developed, broad, with 2 arms; aedeagus simple, with cornuti.

Only a single species occurs in Japan.

Adaina microdactyla (Hübner) Figs. 4c, 86 d–f.

Alucita microdactyla Hübner, 1825, Samml. Eur. Schmett., 26, 27.—Treitschke, 1833, Schmett. Eur. **9** (2): 248.

Pterophorus microdactylus, Zeller, 1841, Isis **11–12**: 854.—Rebel, 1901, Cat. Lep Pal. Faun. **2**: 76.

Pterophorus (*Pterophorus*) *microdactylus*, Zeller, 1851, Linn. Ent. **6**: 388.

Leioptilus microdactylus, South, 1882, Entom. **15**: 102, pl. 2, fig. 1.

Adaina microdactyla, Meyrick, 1910, Gen. Ins. **100**: 15; 1913, Lep. Cat. **17**: 21.—Hori, 1933, Bul. Sci. Fak. Terk. Kjusu Imp. Univ. **5** (4): 392, pl. 5, fig. 2, pl. 6, fig. 3, pl. 7, figs. 1–2.—Beirne, 1954, Brit. Pyr. Plume Moths, 181, pl. 16, fig. 5.—Inoue, 1955, Check List Lep. Jap. **2**: 117; 1959, Icon. Ins. Jap. Col. Nat. Ed. **1**: 258, pl. 173, fig. 32.

Male and ♀: Head with vertex pale yellowish white; frons greyish yellow. Labial palpus pale yellowish white, mixed with brown at tip. Antenna pale yellowish white above. Occipital fringe pale yellowish white; those on dorsum hair-like (fig. 1a). Thorax whitish tinged with pale yellow. Tibiae of fore and mid legs pale yellowish white with a dark brown stripe respectively and thickened with rough scales at their ends. Tarsus of fore leg whitish tinged with pale greyish brown basally; tarsus of mid leg nearly whitish. Hind leg

almost whitish. Forewing cleft from just before middle; 2 lobes narrow; pale yellowish white slightly tinged with pale yellowish brown, rarely somewhat distinctly mixed with pale brown scales; a small dark brown dot just base of cleft; a dark brown dot on costa at 1/6 of lobe 1; a minute dark brown dot at extremity of vein R_5 and another dot on costa at 4/7 of lobe 1, the latter one sometimes indefinite. Cilia pale yellowish white. Hindwing pale yellowish white tinged with pale brownish white. Cilia pale yellowish white slightly tinged with pale brownish. Abdomen pale yellowish white. Length of forewing: 6–6.5 mm.

Male genitalia: Uncus bent ventrally; left valva extremely larger than right, with a long pointed harpe which is enlarged and arched basally; right valva rather simple, with a sclerotized bar-like plate at caudal end of sacculus; sacculus stout; outer surface of valva with a rather long concavity; juxta sclerotized laterally, median part weakly sclerotized; 2 arms of juxta almost equal in length; aedeagus simple with 2 cornuti.

Female genitalia: Apophyses posteriores very long; apophyses anteriores very short; cephalic dorsal margin of abdominal segment 8 with 2 arms directed medially; (bursa copulatrix broken).

SPECIMENS EXAMINED: 1♂, 1♀, Iwawakisan, Osaka Pref., 7–8. VIII. 1957, Yano; 2 exs., Hirao, Fukuoka, 17. V. 1929, Esaki *et al.*; 1 ♀, *ibid.*, 28. VI. 1930, Yasumatsu *et al.*; 1 ♂. *ibid.*, 27. IV. 1935, Hori & Kawahara; 1♀, Korasan, Chikugo, 26. V. 1929, Esaki *et al.*; 1♂, Kujusan, Oita Pref., 12. VI. 1960, Yano; 1 ♂, Sobosan, Bungo, 30. VI. 1932, Hori, Fujino & Chô; 1♂, *ibid.*, 9. IX. 1933, Yasumatsu.

DISTRIBUTION: Japan (Honshu, Kyushu), Europe, Asia Minor.

Genus **Pselnophorus** Wallengren

Pselnophorus Wallengren, 1881, Ent. Tidsk. **2**: 96.—Meyrick, 1910, Gen. Ins. **100**: 14.—Spuler, 1910, Schmett. Eur. **2**: 327.—Meyrick, 1913, Lep. Cat. **17**: 20.—Barnes et Lindsey, 1921, Cont. Nat. Hist. Lep. N. Amer. **4** (4): 361,—Hori, 1931, Bul. Sci. Fak. Terk. Kjusu Imp. Univ. **4** (3): 254.
Gypsochares Meyrick, 1890, Trans. Ent. Soc. Lond. **1890**: 488.
Crasimetis Meyrick, 1890, *ibid.*: 489.

Type species: *Alucita brachydactyla* Treitschke.

Occipital fringe bifurcated. Labial palpus moderate. Tibia thickened with rough scales at origin of each spur. Forewing with 2 lobes moderately broad, gradually narrowing posteriorly; both veins R_3 and R_4 out of R_5; Cu_{1a} out of M_3; Cu_{1b} out of M_3. Hindwing with frenulum in ♀ double; 3 lobes moderate; vein $Sc+R_1$ to before middle of costa.

Male genitalia: Uncus slender, pointed; tegumen rather weakly sclerotized, triangular; vinculum simple; valva asymmetrical or symmetrical; left valva with a harpe, right valva with or without it; sacculus distinct; outer surface of valva with a long, large concavity or without it; juxta weakly sclerotized medially, with 2 arms which are asymmetrical or symmetrical; aedeagus bent, with a small basal process.

Female genitalia: Apophyses posteriores short; apophyses anteriores absent; ostium bursae situated at caudal end of abdominal segment 7 mid-ventrally or on left side; antrum of ostium bursae broad; ductus seminalis departed from antrum or near it; corpus bursae with or without signa.

Two species of the genus occur in Japan.

KEY TO JAPANESE SPECIES OF PSELNOPHORUS

Ground colour of both wings, thorax and abdomen white partly suffused with greyish brown or pale yellowish brown; ♂ genitalia asymmetrical..... **vilis**
Ground colour of both wings, thorax and abdomen dark brown; ♂ genitalia symmetrical.....**japonicus**

Pselnophorus vilis (Butler) Figs. 4d, 90 a–c, 91–93.

Aciptilus vilis Butler, 1881, Trans. Ent. Soc. Lond. **1881**: 594.
Aciptilia amurensis Christoph, 1882, Bull. Soc. Nat. Mosc., 43.
Pselnophorus vilis, Meyrick, 1908, Trans. Ent. Soc. Lond. **1907**: 492; 1910, Gen. Ins. **100**: 14; 1913, Lep. Cat. **17**: 21.—Hori, 1931, Bul. Sci. Fak. Terk. Kjusu Imp. Univ. **4** (3): 255, pl. 9, figs. 3–4, pl. 10, figs. 1–2.—Matsumura, 1931, 6000 Ill. Ins. Jap., 1056, no. 2072.—Hori, 1950, Icon. Ins. Jap. (rev. ed.), 500, fig. 1362.—Inoue, 1955, Check List Lep. Jap. **2**: 117.—Esaki, 1957, Icon. Het. Jap. Col. Nat. **1**: 91, pl. 16, fig. 509. —Inoue, 1959, Icon. Ins. Jap. Col. Nat. Ed. **1**: 258. pl. 173, fig. 30.

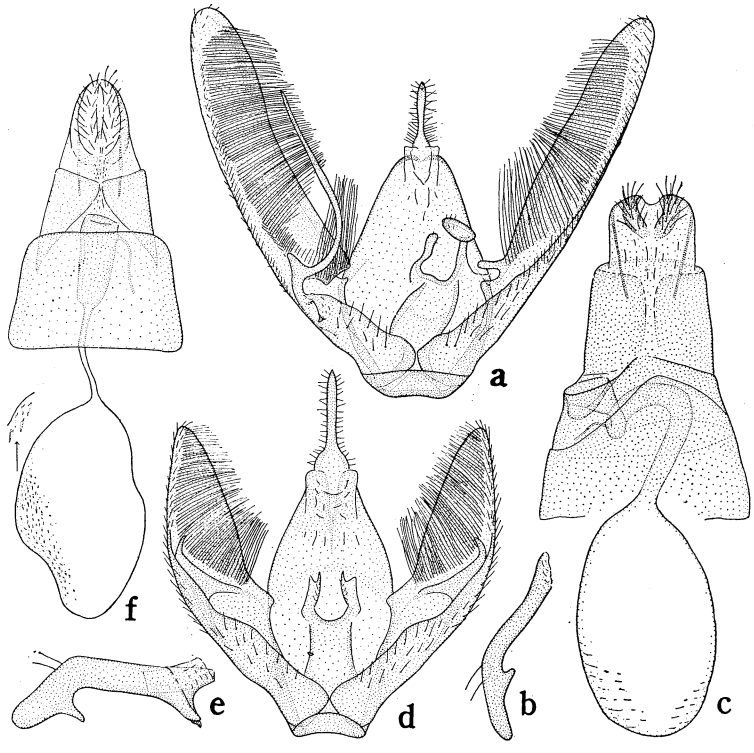

Fig. 90. a–c, *Pselnophorus vilis* (Butler). a, ♂ genitalia, ventral view, excluding aedeagus; b, ditto, aedeagus; c, ♀ genitalia. d–f, *P. japonicus* Marumo. d, ♂ genitalia, ventral view, excluding aedeagus; e, ditto, aedeagus; f, ♀ genitalia.

Length of forewing: 9–11 mm.

Male genitalia: Caudal margin of vinculum nearly straight; valva asymmetrical; both valvae elongate and equal in length; left valva with a long pointed harpe; right valva simple; sacculus distinct; outer surface of valva with a large concavity; juxta weakly sclerotized medially; 2 arms of juxta asymmetrical, left arm shorter than right, distal end of right arm extremely bulbous; aedeagus simple, with a small basal process.

Female genitalia: Ostium bursae opened on left side, cup-shaped; ductus bursae rather broad; corpus bursae without a signum.

SPECIMENS EXAMINED: 6 ♂♂, 9 ♀♀, Tachibanayama, Fukuoka Pref., 6–14. VI. 1961, reared by Yano (host plant: *Ligularia tussilaginea* Makino); 2 ♂♂, 5 ♀♀, Hikosan, Fukuoka Pref., 19–28. V. 1960, reared by Yano (host plant: *Ligularia fisheri* Turcz.), and many other specimens from the following localities. HOKKAIDO: Sounkei, Ishikari (VII); Nukabira (VII), Ashoro (VIII), Tokachi. HONSHU: Gifu, Gifu Pref. (V); Iwawakisan, Osaka Pref. (VII); Oshima (IV), Shionomisaki (VII), Wakayama Pref.; Daisen, Tottori Pref. (VII). KYUSHU: Fukuoka (V–VIII), Tachibanayama (V, VI, IX), Wakasugiyama (V, VI, VIII), Fukuoka Pref.; Beppu (VII), Hita (IX), Sobosan (VI, IX), Oita Pref.; Aoidake, Miyazaki Pref. (VI); Koshikijima (VII), Satamisaki (V), Kagoshima Pref.; Nishinoomote, Tanega-shima (VII).

DISTRIBUTION: Japan (Hokkaido, Honshu, Kyushu, Tanega-shima, Yaku-shima), Amur, China.

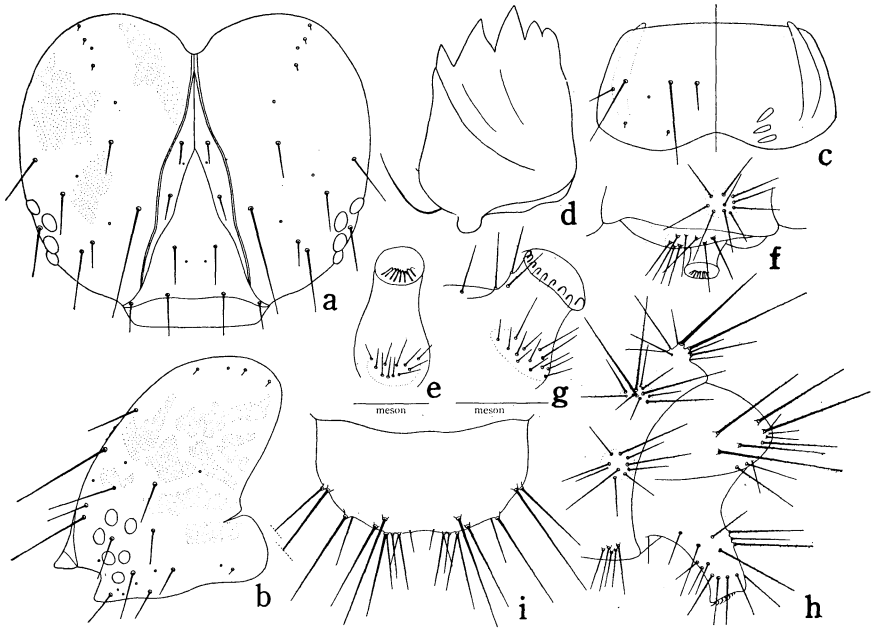

Fig. 91. *Pselnophorus vilis* (Butler), mature larva. a, head, frontal view; b, ditto, lateral view; c, labrum, with epipharyngeal surface on right; d, mandible; e, left ventral proleg of abdominal segment 6, ventral view; f, ditto, lateral view; g, left anal proleg, ventral view; h, abdominal segments 9 and 10, lateral view; i, abdominal segment 10, dorsal view.

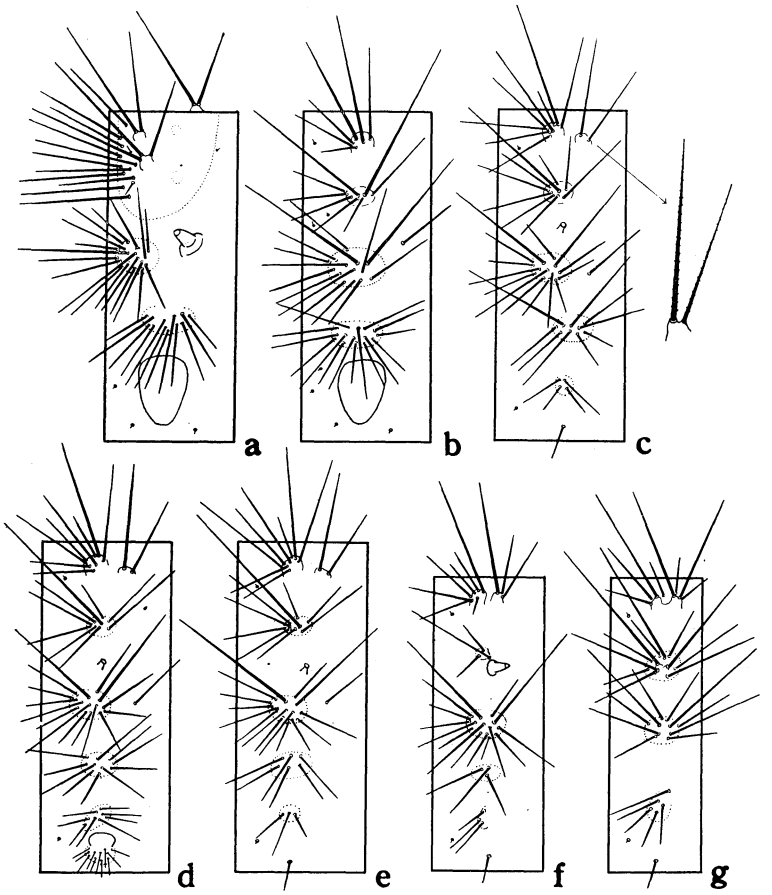

Fig. 92. *Pselnophorus vilis* (Butler), chaetotaxy of mature larva. a–g, pro-, mesothorax, abdominal segments 1, 3, 7, 8 and 9.

This common species was often recorded and figured from Japan. There is no difficulty to distinguish the species.

Mature larva: Head whitish tinged with very pale brown and scattered with dark brown patches; vertical triangle somewhat deep; frontal suture not extending to ventral margin of head; seta AF2 slightly dorsad from the level of dorsal end of fronto-clypeal area; P2 nearly on the same level of AF2; A2 dorso-mesad from A1; Aa slightly nearer to A2 than P1; Pb somewhat remote from P2. Labrum with a slight median incision; M1, M2 and La2 nearly on the same level; M3 and La3 minute; La1 latero-ventrad from La2. Mandible with 6 teeth, 1 of which on oral side; 1 of mandibular setae minute. Prothorax pale greenish white on dorsum, dorsal and subdorsal lines creamy white, remaining part semi-transparent; meso-, metathorax and abdominal segments 1–9 greenish with creamy white longitudinal lines and dark green on dorsum; long numerous secondary setae occurring from conspicuous verrucae, these setae barbed minutely. Spiracles on prothorax and abdominal segment 8 distinctly protruded; those on abdominal segments 1–7 somewhat protrud-

ed. Proleg long. Crochets of ventral proleg 7–8, rarely 6 or 9; those of anal proleg 8–13. Length: 12–13 mm. Head width: 0.9. This larva is characterized by the following points: head with dark brown patches; labrum with setae M3 and La3 minute; thorax and abdomen with very conspicuous verrucae.

Pupa: Prothorax with a brown patch on each lateral side; meso-, metathorax and abdominal segment 1 with a longitudinal brown patch on each subdorsal part, mesothorax rarely without it and on metathorax and abdominal segment 1 the patch broadening; abdominal segments 2–7 each with a small brown dot on caudal part of spiracle; abdominal segments 2–7 each with a longitudinal rather broad brown patch on dorsum; metathorax, abdominal segments 1 and 8 rarely with a similar indistinct one respectively. Head with labrum and pilifers slightly rugged and the latter somewhat elevated; boundary line between both eye-pieces clearly indicated; sculptured eye-piece with 2 long setae but glazed eye-piece without setae; maxilla exposed again for a somewhat long distance at its distal part; antenna extending beyond distal end of wing. Vertex and basal part of antenna with long setae. Prothorax with 3 long setae on each side; mesothorax and wing with many long and short setae as shown in figures; metathorax with 1 short and 4 long setae on each side of dorsum and 2 long setae on each cephalo-lateral angle; fore leg without setae; hind leg exposed for a short distance at its distal end, almost reaching distal end of mid leg. Abdomen with 2 rows of long and short setae on each side of dorsum, basal parts of these setae somewhat elevated; other setae on abdomen rather long and distinct; spiracles on abdominal segments 2–7 slightly protruded, those on abdominal segment 8 not protruded and rather indistinct; cephalic mass of hooked setae on abdominal segment 10 divided into 2 parts. Length: 9–10 mm. Width: 2–2.2. This pupa is differentiated from other pupae of Pterophorinae by the following points: fore leg without setae; distal part of maxilla rather long exposed; markings of body with slightly protruded spiracles on abdomen; cephalic mass of hooked setae on abdominal segment 10 divided into 2 parts.

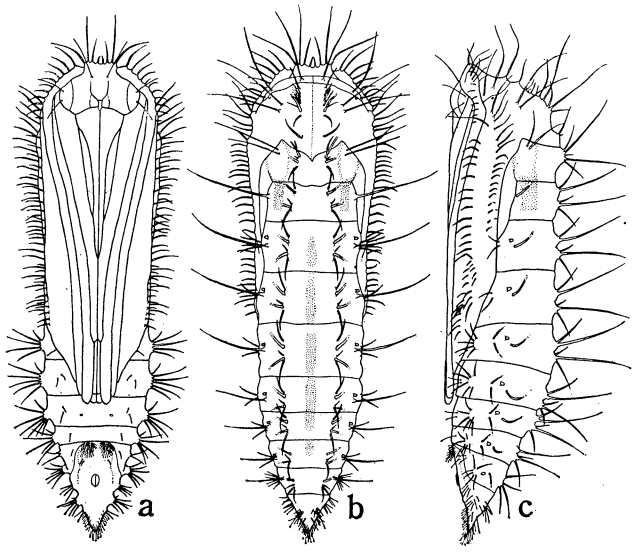

Fig. 93. *Pselnophorus vilis* (Butler), pupa. a, ventral view; b, dorsal view; c, lateral view.

Biological notes: The larva usually eats the leaf of *Ligularia tussilaginea* Makino from the upper surface and the lower epidermis is left untouched but sometimes it is not left; rarely the larva eats the leaf from the under surface. The pupa is usually attached to the upper surface of a leaf. The larva eats the leaf of *Ligularia fisheri* Turcz. from the upper

or under surface and eats large patches and the epidermis is not left.

Host plants: *Ligularia fisheri* Turcz., *Ligularia tussilaginea* Makino, *Petasites japonicus* Miq.

Pselnophorus japonicus Marumo Fig. 90 d–f.

Pselnophorus japonicus Marumo, 1923, J. Coll. Agr. Imp. Univ. Tokyo **8** (2): 197, pl. 3, fig. 10.—Hori, 1931, Bul. Sci. Fak. Terk. Kjušu Imp. Univ. **4** (3): 257, pl. 9, figs. 1–2, pl. 10, figs. 3–5; 1934, Mushi **7** (1): 21; 1950, Icon. Ins. Jap. (rev. ed.), 499, fig. 1361.—Inoue, 1955, Check List Lep. Jap. **2**: 117.—Esaki, 1957, Icon. Het. Jap. Col. Nat. **1**: 91, pl. 16, fig. 510.—Inoue, 1959, Icon. Ins. Jap. Col. Nat. Ed. **1**: 258, pl. 173, fig. 31.

Stenoptilia hirayamai Matsumura, 1931, 6000 Ill. Ins. Jap., 1058, no. 2081.

Length of forewing: 8–9 mm.

Male genitalia: Caudal margin of vinculum rounded; valva symmetrical, with a rather short harpe which is enlarged basally; sacculus developed; juxta symmetrical, 2 arms pointed; aedeagus broad, stout, bent at about 1/3 from base, distal end bifurcated, basal process distinct.

Female genitalia: Ostium bursae opened mid-ventrally and slightly beyond caudal margin of abdominal segment 7; antrum of ostium bursae broad, from its caudal end ductus seminalis departed; corpus bursae with minute pointed signa partly.

SPECIMENS EXAMINED: 1 ♀ (type of *hirayamai*) labelled "Komaba, Tokyo, 5–1921, S. Hirayama", and many other specimens from the following localities. SHIKOKU: Kajigamori, Kochi Pref. (VIII). KYUSHU: Wakasugiyama (V–VII, IX), Inunakiyama (V, VI, VIII), Kanayama (V), Hikosan (VI, VIII), Korasan (V), Fukuoka Pref.; Beppu (VII), Sobosan (VI, VII), Nakamura-Tano (VII), Oita Pref.; Kakuyama, Amakusa (VI, IX); Mine, Tsushima (VII); Kirishima, Kagoshima Pref. (VIII); Kosugidani, Yaku-shima (VIII).

DISTRIBUTION: Japan (Honshu, Shikoku, Kyushu, Tsushima, Tanega-shima, Yaku-shima).

This is the only species having symmetrical ♂ genitalia within the Japanese species of Pterophorinae. This species is easily distinguished from the preceding species by its dark brown body.

Genus **Aciptilia** Hübner

Aciptilia Hübner, 1826, Verz. bek. Schmett., 430.—Barnes et Lindsey, 1921, Cont. Nat. Hist. Lep. N. Amer. **4** (4): 359.

Aciptilus Zeller, 1841, Isis **10**: 768.

Alucita, Fernald (*nec* Linné), 1898, Pter. N. Amer., 36.—Fletcher, 1909, Spol. Zeyl. **6** (21): 35.—Meyrick, 1910, Gen. Ins. **100**: 12.—Spuler, 1910, Schmett. Eur. **2**: 328.—Meyrick, 1913, Lep. Cat. **17**: 16.—Pierce et Metcalfe, 1938, Gen. Brit. Pyr. Delt. Plume, 50, pl. 27.

Merrifieldia Tutt, 1905, Ent. Rec. **17**: 37.

Porrittia Tutt, 1905, *ibid.*: 37.

Wheeleria Tutt, 1905, *ibid.*: 37.

Type species: *Alucita pentadactyla* Linné,

Occipital fringe bifurcated. Labial palpus moderate. Inner spur of mid tibia distinctly longer than outer, viz. 1.8–1.9 times. Fore- and hindwings with all lobes linear, often curved dorsally near apex. Veins in forewing of Japanese species conspicuously rudiment; Sc, R_5, M_1, M_2, M_3, Cu_2 and 1A discernible. Hindwing with vein $Sc+R_1$ to before middle of costa; Cu_{1b} from near middle of cell.

Male genitalia: Uncus narrow, pointed; tegumen weakly sclerotized towards cephalic end; vinculum rather simple; valva asymmetrical, with a developed harpe; sacculus large, stout; juxta developed with 2 arms; aedeagus simple.

Only a single species from Japan is treated in the present paper. I have some examples which may differ from the following species. These examples, which were collected from Ishigaki-jima, are not in good condition for the description.

Aciptilia suffiata Yano, n. sp. Figs. 4e, 94–96.

Male and ♀: Head with vertex pale yellowish white, slightly tinged with pale yellowish brown posteriorly; frons pale greyish yellow. Labial palpus with segments 2 and 3 slender; pale yellowish white, rarely slightly mixed with pale brown. Antenna white above; pale yellowish white beneath. Occipital fringe whitish; those on dorsum bifurcated (fig. 1 n, w). Thorax pale yellowish white. Coxae of all legs pale yellowish white; femora pale yellowish white tinged with pale greyish brown, on mid and hind legs this tinge indistinct. Tibiae of fore and mid legs white on outer side, greyish brown on inner side, slightly thickened at their ends; tarsi of these legs white slightly mixed with greyish brown. Hind leg with tibia and tarsus nearly whitish. Spurs of mid leg white with a greyish brown stripe; those of hind leg white slightly mixed with pale brown at medial spur. Forewing cleft from 2/5 to 5/11; 2 lobes linear and oblique distally; white slightly tinged with pale yellow. Cilia white, somewhat tinged partly with pale grey; minute greyish brown scales scattered along posterior margin of lobe 1 and near base of cleft of anterior margin of lobe 2; 3 small greyish brown scale tufts at a little before and beyond base of cleft and about 2/3 on inner margin. Hindwing with 3 lobes linear; white tinged slightly with pale yellow. Cilia white or pale yellowish white, rarely slightly mixed with pale grey. Abdomen pale yellowish white, sometimes slightly mixed with pale yellowish brown. Length of forewing: 8–10 mm.

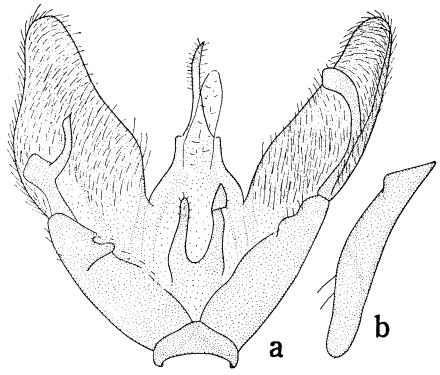

Fig. 94. *Aciptilia suffiata* n. sp. a, ♂ genitalia, ventral view, excluding aedeagus; b, ditto aedeagus.

Male genitalia: Mid-ventral part of vinculum distinct; left valva wider than right and with a rather broad bifurcated harpe; sacculus of left valva large and stout and with a small process before its caudal end; right valva with a broad, arched harpe which is broadened distally; sacculus of right valva large, stout; juxta with 2 developed arms which are asymmetrical, right arm long and bent distally; aedeagus simple, rather broad.

Holotype ♂, Asani, Nase, Okinawa, 30. IV. 1960, Kodama; allotopotype ♀, same data

as holotype. Paratypes 1♀, Aoshima, Miyazaki Pref., 25. X. 1958, Inokuchi; 2 ♂♂, Okinoerabu, 24. IV. 1960, Kodama; 1 ♀, Tokunoshima, 7. V. 1960, reared by Kodama (host plant: *Pharbitis nil* Choisy); 1♂, Nase, Okinawa, 1. V. 1960, Kodama. Holotype, allotopotype and 2 paratypes are preserved in the collection of the Entomological Laboratory of the University of Osaka Prefecture.

DISTRIBUTION: Japan (Kyushu), Ryukyu Is. (Tokuno-shima, Okinoerabu-jima, Okinawa).

This species is closely related to *Aciptilia candidalis* (Walker), but may be distinguished from the latter by the following characters: cilia within cleft of forewing mixed with greyish brown scattered scales; inner margin of forewing usually with 3 small greyish brown scale tufts.

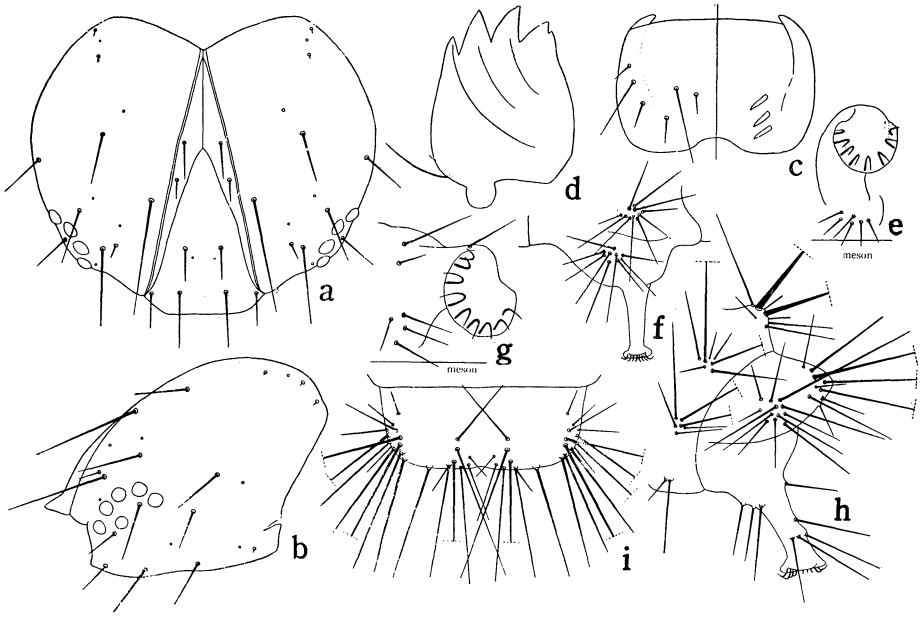

Fig. 95. *Aciptilia suffiata* n. sp., matura larva. a, head, frontal view; b, ditto, lateral view; c, labrum, with epipharyngeal surface on right; d, mandible; e, left ventral proleg of abdominal segment 6, ventral view; f, ditto lateral view; g, left anal proleg, ventral view; h, abdominal segments 9 and 10, lateral view; i, abdominal segment 10, dorsal view.

Mature larva: Head with a moderate vertical triangle; fronto-clypeal area narrow; frontal suture nearly straight; seta AF2 slightly dorsad from the level of dorsal end of fronto-clypeal area; P1 approximate to frontal suture; P2 slightly dorsad from the level of AF2; A2 dorso-mesad from A1. Labrum with a slight median incision; M2 ventrad from the level of La2; setae of lateral group arranged in nearly a straight line; La3 slightly nearer to La2 than M3. Mandible with 5 teeth; inner-most one minute; 1 of mandibular setae minute. Thorax and abdomen with numerous very long secondary setae from verrucae; some of these setae not pointed apically. Spiracles on prothorax and abdomen not protruded. Sclerotization of thoracic leg very weak. Proleg long, slender. Crochets of ventral proleg 7–8; those of anal proleg 9. Length: 9–10 mm. Head width: 0.74.

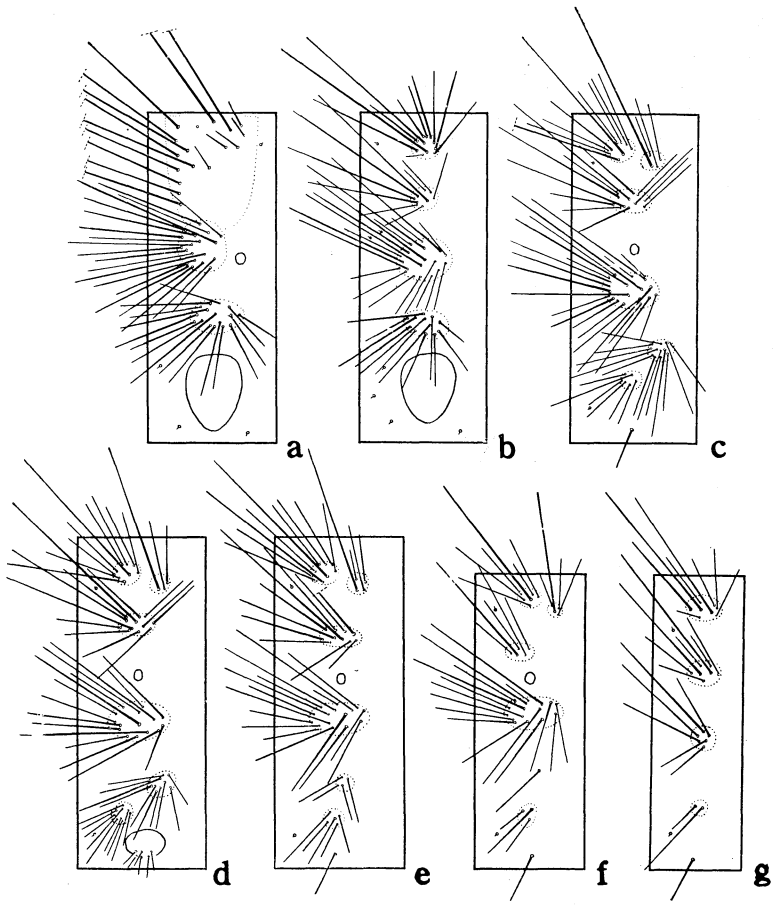

Fig. 96. *Aciptilia suffiata* n. sp., chaetotaxy of mature larva. a–g, pro-, mesothorax, abdominal segments 1, 3, 7, 8 and 9.

Biological notes: Mr. T. Kodama collected the larva of this species from *Pharbitis nil* Choisy.

Host plant: *Pharbitis nil* Choisy.

NOTES ON THE HOST PLANTS AND ECONOMIC SIGNIFICANCE

The known larvae of the Japanese Pterophoridae feed on the plants of Dicotyledoneae, except the larva of *Platyptilia jezoensis* Matsumura which is said to feed on *Allium fistulosum* L. (Liliaceae, Monocotyledoneae). This fact presents some suggestions regarding the origin of the present family.

In Dicotyledoneae, 20 species of Compositae are listed as the host plants for 8 Pterophorid-species, and 5 species of Leguminosae for 4 species, 4 species of Vitaceae for 5 species, 4 species of Convolvulaceae for 3 species and 1–3 species of Labiatae, Cucurbita-

ceae, Ranunculaceae, Rosaceae, Oxalidaceae and Geraniaceae for 1 or 3 species respectively are listed as the host plants. Forty-two species are known as the host plants for the Japanese Pterophoridae at the present time.

All the larvae feed upon 1 or several species of 1 plant family, but the larvae of 2 species, *Sphenarches anisodactylus* (Walker) and *Platyptilia jezoensis* Matsumura, feed upon the species of 2 and 4 plant families respectively, the latter in particular feeds on the plants of both Dicotyledoneae and Monocotyledoneae.

Considering the economical point of view, it is very important that many species attack the reproductive organ of the host plant or bore into the stem and so it causes serious damage for a useful plant.

Eleven species are injurious to the plants cultivated for flowers, vegetables and fruits which are already listed. These 11 species are as follows: *Ochyrotica concursa* (Walsingham), *Deuterocopus albipunctatus* Fletcher, *Platyptilia farfarella* (Zeller), *P. jezoensis* Matsumura, *P. ignifera* Meyrick, *Nippoptilia vitis* (Sasaki), *N. issikii* Yano, *Sphenarches anisodactylus* (Walker), *Pterophorus jezonicus* Matsumura, *Pselnophorus vilis* (Butler) and *Aciptilia suffiata* n. sp. The remaining species feed on the wild plants at the present time, but some of them which feed on the allied plants to the useful ones are supposed to extend their feeding objects to the useful plants.

A LIST OF THE SPECIES OF THE JAPANESE PTEROPHORIDAE

Subfamily AGDISTINAE

Genus **Agdistis** Hübner, 1826

Agdistis takamukui Nohira, 1919.

Genus **Ochyrotica** Walsingham, 1891

Ochyrotica concursa (Walsingham, 1891).

Subfamily PLATYPTILIINAE

Genus **Deuterocopus** Zeller, 1851

Deuterocopus albipunctatus Fletcher, 1910.
Deuterocopus socotranus Rebel, 1907.

Genus **Stenoptilia** Hübner, 1826

Stenoptilia albilimbata n. sp.
Stenoptilia admiranda n. sp.
Stenoptilia saigusai n. sp.
Stenoptilia zophodactyla (Duponchel, 1838).
Stenoptilia pinarodactyla (Erschoff, 1877).
Stenoptilia emarginata (Snellen, 1884).
Stenoptilia cretalis (Meyrick, 1908).
Stenoptilia dissipata n. sp.

Genus **Platyptilia** Hübner, 1826

Platyptilia farfarella (Zeller, 1867).
Platyptilia ainonis Matsumura, 1931.
Platyptilia montana n. sp.
Platyptilia sinuosa Yano, 1960.
Platyptilia sachalinensis Matsumura, 1911.
Platyptilia scutata Yano, 1961.
Platyptilia isodactyla (Zeller, 1851).
Platyptilia profunda n. sp.
Platyptilia jezoensis Matsumura, 1931.
Platyptilia bella n. sp.
Platyptilia japonica n. sp.
Platyptilia optata n. sp.
Platyptilia ignifera Meyrick, 1908.
Platyptilia rhododactyla (Denis et Schiffermüller, 1775).
Platyptilia sythoffi Snellen, 1903.
Platyptilia taprobanes (Felder, 1875).

Genus **Nippoptilia** Matsumura, 1931

Nippoptilia vitis (Sasaki, 1913).
Nippoptilia issikii Yano, 1961.
Nippoptilia minor Hori, 1933.

Genus **Sphenarches** Meyrick, 1886

Sphenarches anisodactylus (Walker, 1864).

Genus **Tomotilus** Yano, 1961

Tomotilus saitoi Yano, 1961.

Genus **Capperia** Tutt, 1905

Capperia jozana (Matsumura, 1931).

Genus **Procapperia** Adamczewski, 1951

Procapperia pelecyntes (Meyrick, 1908).

Genus **Marasmarcha** Meyrick, 1886

Marasmarcha pumilio (Zeller, 1873).

Genus **Xenopterophora** Hori, 1933

Xenopterophora mikado Hori, 1933.

Genus **Trichoptilus** Walsingham, 1880

Trichoptilus wahlbergi (Zeller, 1851).
Trichoptilus paludum (Zeller, 1841).
Trichoptilus esakii Hori, 1936.

Subfamily PTEROPHORINAE

Genus **Oidaematophorus** Wallengren, 1859

Oidaematophorus lienigianus (Zeller, 1851).
Oidaematophorus ishiyamanus (Matsumura, 1931).
Oidaematophorus albidactylus n. sp.
Oidaematophorus lacteolus n. sp.
Oidaematophorus osteodactylus (Zeller, 1841).
Oidaematophorus acutus n. sp.
Oidaematophorus mutuurai n. sp.
Oidaematophorus kuwayamai (Matsumura, 1931).
Oidaematophorus nigridactylus Yano, 1961.
Oidaematophorus iwatensis (Matsumura, 1931).
Oidaematophorus lithodactylus (Treitschke, 1833).

Genus **Pterophorus** Geoffroy, 1762

Pterophorus monodactylus (Linné, 1758).
Pterophorus jezonicus Matsumura, 1931.

Genus **Adaina** Tutt, 1905

Adaina microdactyla (Hübner, 1825).

Genus **Pselnophorus** Wallengren, 1881

Pselnophorus vilis (Butler, 1881).
Pselnophorus japonicus Marumo, 1923.

Genus **Aciptilia** Hübner, 1826

Aciptilia suffiata n. sp.

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3. Asterisk indicates the references cited indirectly.

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