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Title	ANTHOMYIIDAE OF JAPAN (DIPTERA)
Author(s)	Suwa, Masaaki
Citation	Insecta matsumurana. New series : journal of the Faculty of Agriculture Hokkaido University, series entomology, 4, 1-247
Issue Date	1974-11
Doc URL	http://hdl.handle.net/2115/9777
Type	bulletin (article)
File Information	4_p1-247.pdf

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INSECTA MATSUMURANA

NEW SERIES 4 NOVEMBER, 1974

ANTHOMYIIDAE OF JAPAN (DIPTERA)

Part of a thesis submitted to the Hokkaidô University in partial fulfillment of the requirements for the degree of Doctor of Agriculture, 1974

By MASAAKI SUWA

Abstract

SUWA, M. 1974. Anthomyiidae of Japan (Diptera). *Ins. matsum. n. s.* 4: 247 pp., 2 tables, 669 figs.

Japanese species of the family Anthomyiidae are reviewed and arranged taxonomically. A total of 172 species are dealt with; of them 44 are new to science and 92, including 5 undetermined, new to Japan. Two new genera are proposed and described. The genera and species treated are given under "Enumeration of genera and species." The following new nomenclatorial changes are made: — *Chionomyia* Ringdahl is included within *Paregle* Schnabl; *Pegomyza* Schnabl & Dziedzicki and *Arctopegomyia* Ringdahl are included within *Eutrichota* Kowarz; *Melinia bisinuata* Tiensuu is transferred to *Meliniella* gen. nov.; *Eustalomyia lepraota* Séguy is suppressed as a synonym of *Eustalomyia vittipes* (Zetterstedt).

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Introduction

In spite of a large number of described species, the Calyptratae may be one of the most unclarified groups among the Diptera, and out of many subdivisional systems of authors on this group it is difficult to find two ones which agree completely with each other (see Hori, 1967). Nevertheless, the Anthomyiidae as here accepted after Hennig (1955 & 1966) have usually been recognized as a good group if having no regard to the taxonomic rank, and may be distinguished from other groups of the Muscoidea by the combination of the following characters: — Wings with anal vein reaching to wing-margin, or nearly so; lower calyptra not much reduced as forming only a membraneous fold; scutellum haired on ventral surface; if lower calyptra much reduced and scutellum not haired ventrally then interfrontalia with a pair of crossed setae or setulae (*if*).

In the sense here adopted this family is a large group of true flies, being represented by about 1000 described species in the world, mostly from Europe and North America. So far as I am aware, 36 species of the family have been recorded from Japan mainly by Kato (1939, 1941 & 1950), Hori & Kurahashi (1969) and Suwa (1970b, 1971a & 1971b). So that this study is the first attempt to review and to arrange taxonomically the Japanese species of this family. In the course of the present study carried on since 1966 have been examined thousands of specimens collected from various localities covering almost all prefectures of Japan. These specimens are classified into 171 species, of which 44 are new to science and 92, including 5 undetermined species, new to Japan. All of them, with another species previously described from Japan but not available to the present study, will be given hereinafter. Further, 2 new genera are proposed in this paper. All of the holotypes of the new species are deposited in the collection of the Entomological Institute, Hokkaidô University.

Acknowledgements

My grateful acknowledgement is made to Prof. T. Nakashima of the Hokkaidô University for his continuous encouragement and support. I wish to express my sincere thanks to Dr. C. Watanabe, former professor of entomology in the Hokkaidô University, under whose guidance the present work was attempted. Particular acknowledgement is made to Mr. D. M. Ackland of Oxford, England, Mr. E. C. M. d'Assis Fonseca of Bristol, England, and Dr. G. C. Steyskal of the United States Department of Agriculture for their kindness in giving me valuable material and helpful information, and to Prof. M. Sasakawa of the Kyôto Prefectural University, Mr. N. Fukuhara of the National Institute of Agricultural Sciences, and Mr. T. Tomioka of the Hokkaidô Prefectural Agricultural Experiment Station for the loan of some valuable material. My sincere appreciation is extended to Dr. S. Takagi and Dr. T. Kumata of the Hokkaidô University for their kind help in various ways. Many thanks are also due to Dr. H. Takada of the Kyôto Prefectural University, Dr. M. Miyazaki of the National Grassland Research Institute, Dr. K. Kusigemati of the Kagoshima University, Dr. H. Higuchi of the Hokkaidô University, Mr. H. Takizawa of the Japan Monopoly Corporation, Mr. T. Kocha of the Yokohama Plant Protection Station, and Mr. Sk. Yamane, Mr. S. Aoki and Mr. T. Hattori, all of the Hokkaidô University, for their kindness in offering valuable material.

Biology

The adult flies of the Anthomyiidae are found everywhere from the seashore to above the timber-line. The biology of most of the species is, however, little known. Nevertheless, some published observations show that their habits are widely differentiated. Among the family oviparity is an ordinary type of reproduction, yet some species of the genus *Hylemya*, e.g. *H. strenua* and *H. nigrimana*, are ovoviviparous. Larvae of the family are mostly phytophagous, saprophagous or omnivorous, yet certain species of *Tettigoniomyia* and *Acridomyia*, both of which have not been found from Japan, are known to be parasitic on grasshoppers. Species belonging to *Fucellia*, known as kelp flies, inhabit seashores, living on animal or plant organisms cast in the tidal zone. Species of *Chiastocheta* are alpine flies, the adults being found on the flower-heads of *Trollius*, in which the larvae grow. The larvae of certain species of *Chirosia* are known as leaf-miners of ferns. *Anthomyia pluvialis* and *A. procellaris* have been bred from the nests of several species of birds. Adult flies of *Hyporites*, *Alliopsis* and *Paraprosalpia* are predatory upon midges or gnats. Species belonging to *Leucophora* are associated with andrenid bees, the larvae living on pollen or honey stored by the bees. Larvae of the genus *Eustalomyia* are found in the nests of crabronid wasps built in herbs, shrubs or trees, probably feeding on preys caught by the wasps. From the economic point of view, some species are well known as serious pests of agricultural crops or coniferous trees. *Pegomya mixta* (=*hyoscyami* of Japanese authors) is an important pest in Japan and known as the beet-fly or the spinach leaf-miner. *Delia platura*, *D. antiqua* and *D. floralis* are respectively known as the seed-corn maggot, the onion maggot and the radish maggot. According to Yamada et al. (1972) the larch cone maggot, *Lasiomma laricicola*, is the most injurious species among the larch-infesting insects in Japan, the damage by the species running as high as 50–70% of the seeds in individual cones. Apart from the species mentioned above there are known a few as pests of garden plants, e.g., *Phorbia servadeii* injurious to iris and *Delia echinata* to carnation. On the other hand, *Pegohylemyia seneciella*, known as the ragwort seed fly, is a beneficial species. During the larval stage it feeds on the seeds of *Senecio jacobaea*, a poisonous weed belonging to Compositae; it was introduced into New Zealand, Australia and North America from Europe and proved to be an excellent natural enemy to that weed.

Terminology and measurements

Head. The eyes usually more or less approximate to each other in frontal view in the male and are widely separated in the female. In some genera, e.g. *Fucellia*, *Chiastocheta*, etc., and in certain species of some other genera the eyes are widely separated in both sexes, while in most or all species of *Paraprosalpia*, *Hyporites*, *Alliopsis* and *Leucophora* the eyes more or less approximate in the female as in the male. The distance between the eyes or the width of the frons is measured at the narrowest part. The frons, which is the area between the eyes limited by the lunule and the vertex, is composed of an interfrontalia and a pair of parafrontals, the latter being contiguous to each other or separated by the former. The profrons means the part of the orbit (parafrontalia and parafacialia) at level of the lunule. The width of the profrons and parafacials is measured at right angles to the plane of each area. The height of the cheeks is measured with

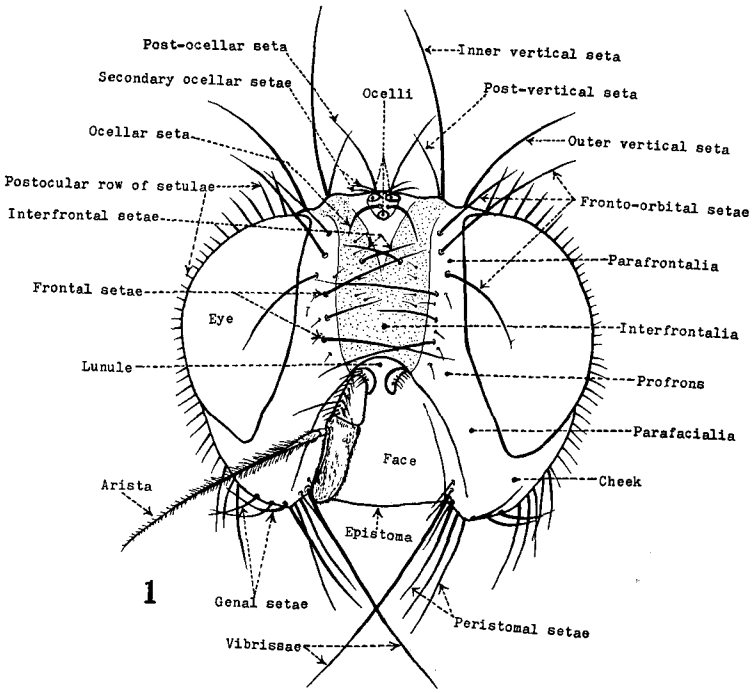


Fig. 1. Head in frontal view. *Meliniella sikisima* sp. nov., ♀.

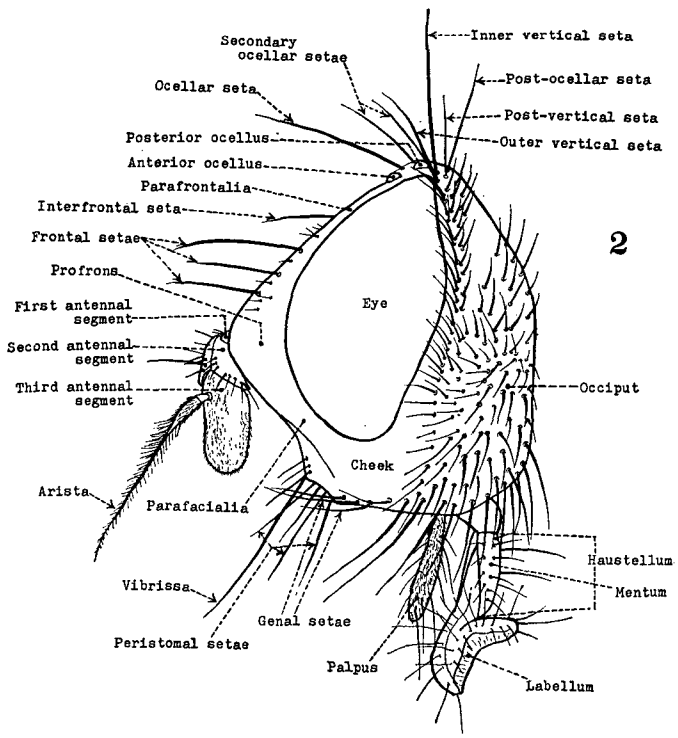
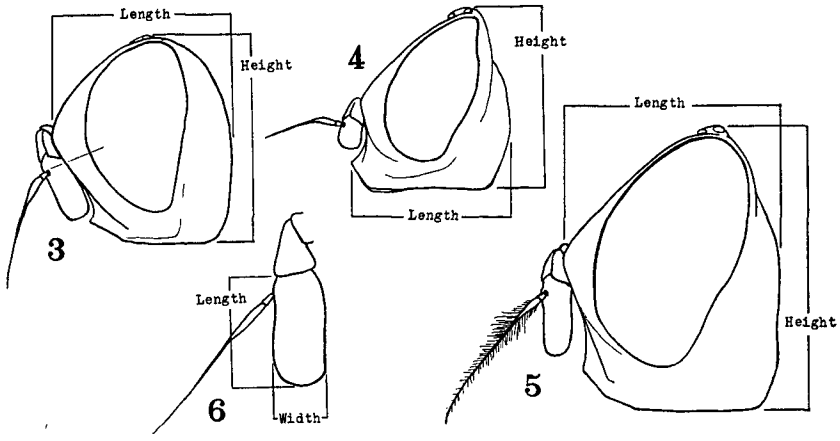


Fig. 2. Head in lateral view. *Meliniella sikisima* sp. nov., ♂.



Figs. 3–5. Head in lateral view, showing measurements. 3, *Shakshainia rametoka* sp. nov., ♂; 4, *Egle longipalpis* (Malloch), ♂; 5, *Pegohylemyia silva* sp. nov., ♂.
Fig. 6. Antenna (right), showing measurements. *Pegomya japonica* sp. nov., ♂.

the head in profile and it is the shortest distance between the bottom of the eyes and the ventral margin of the head. Setae above and just behind the vibrissae are termed peristomal setae. The term genal setae is restricted to the setae on the anterior half of the cheeks and behind the peristomal setae, the genal setae being usually more or less curved upwards. Epistoma is stated with the head in profile. Other characters and measurements are given in Figs. 1–6.

Thorax. The arrangement of the primary setae is important, the number, position and length of the setae being always counted and measured. The distance between the rows of *acr* is measured between the setae of the first distinct or strong pair unless otherwise mentioned. Accessory or ground setulae are found among the primary setae, and the density is used. The term suture means the transverse suture when it is used in connection with the mesonotum. The mesonotum

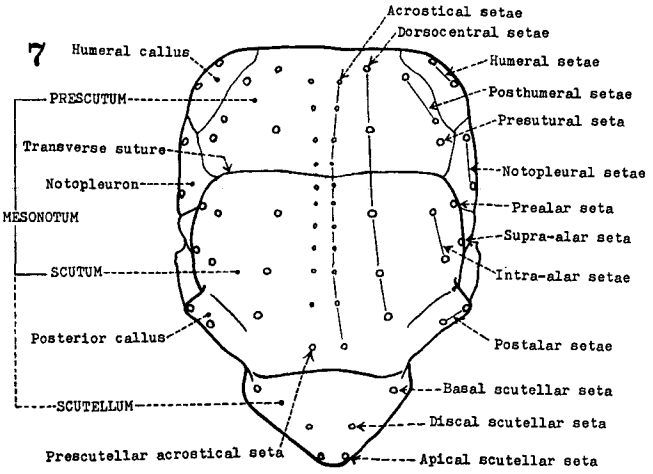


Fig. 7. Thorax in dorsal view. Chaetotaxy is indicated by the setal position.

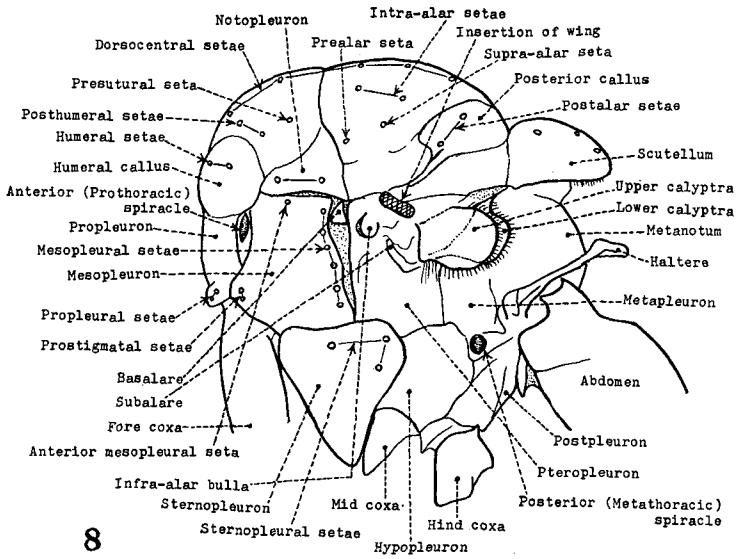


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Fig. 8. Thorax in lateral view.

occupies almost the whole of the dorsal surface of the thorax, consisting of the prescutum, scutum and scutellum. In the present paper, however, the term mesonotum is used for the part exclusive of the scutellum. In describing the colouration the term vitta is used for a longitudinal band and the term band for a transverse one. The median vitta is seen between the rows of *acr*, often protruding beyond the rows. The paramedian vittae are seen between the rows of *dc* and *acr* or along the rows of *dc*. The sublateral vittae are short ones between *ia* and *dc* behind the suture. The lateral vittae or patches are situated on the lateral angles of the mesonotum. These markings are usually shifting according to the point of view because of a different inclination of the tomentum or pollen. Other characters, see Figs. 7 & 8.

Abdomen. The first and second tergites are more or less fused together, yet they are counted as distinct from each other. The 6th tergite of the male, which is termed the prebasal sclerite of hypopygium, is usually more or less reduced and partly or entirely hidden beneath the 5th tergite. The suranal and subanal plates and cerci of the ovipositor are sometimes named collectively as terminal sclerites. Main characters including those of the hypopygium and ovipositor are given in Figs. 9–16.

Legs. The chaetotaxy is important. The position of the setae is determined in the condition of the legs extended laterally in a straight line at right angles with the body as generally adopted by modern dipterists. Setae changeful or equivocal in position are expressed, for example, *pd–p* or *p–pv*. Apart from the true apical setae the tibial setae which should be called *preapical* in the strict sense are also termed *apical* in this study. The height of femora or tibiae refers to that of the heighest part of the femur or tibia. Main parts of the legs are given in Figs. 17 & 18.

Wings. The venation is given in Fig. 19. The posterior cross-vein (*m-m*) is described as *oblique* or *erect* to the 4th longitudinal vein (M_{1+2}).

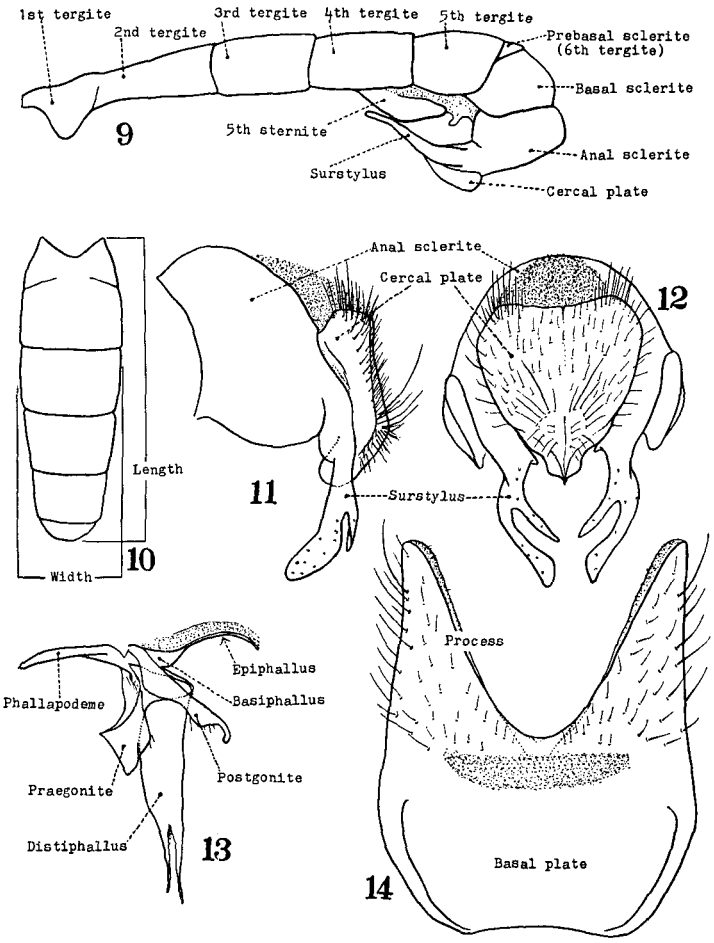
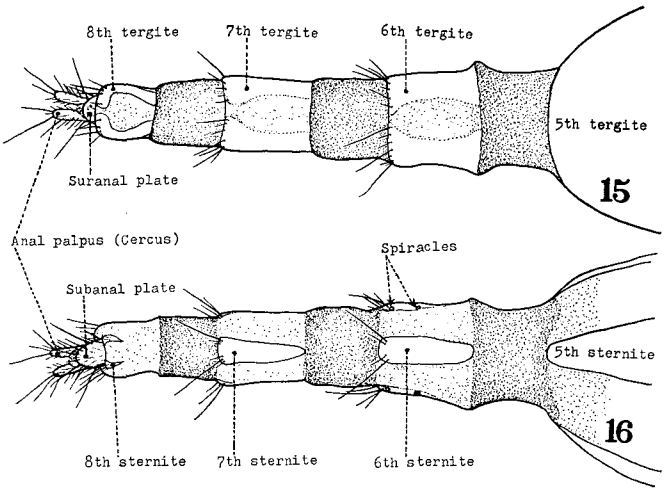


Fig. 9. Abdomen in lateral view. *Delia longitheca* sp. nov., ♂.
Fig. 10. Abdomen in dorsal view, showing measurements. *Meliniella watanabei* sp. nov., ♂.
Figs. 11–14. *Shakshainia rametoka* sp. nov., ♂. 11, hypopygium in lateral view; 12, hypopygium in dorsal view; 13, aedeagus; 14, 5th sternite in ventral view.

Abbreviations. The abbreviations used in the present paper are as follows:—

A_1, A_2, A_3	First, 2nd and 3rd antennal segments respectively
ori	Frontal seta
ors	Fronto-orbital seta
if	Cruciate or interfrontal seta
acr	Acrostical seta
dc	Dorsocentral seta
ia	Intra-alar seta
sa	Supra-alar seta
pa	Postalar seta
pra	Prealar seta
ph	Posthumeral seta
prst	Presutural seta
ntpl	Notopleural seta
mpl	Mesopleural seta
stpl	Sternopleural seta
prpl	Propleural seta
pstg	Prostigmatal seta
pre	Presutural
post	Postsutural
prsc	Prescutellar
f_1, f_2, f_3	Fore, mid and hind femora respectively
t_1, t_2, t_3	Fore, mid and hind tibiae respectively
a	Anterior seta



Figs. 15 & 16. Ovipositor. *Delia pilipyga* (Villeneuve), ♀. 15, dorsal view; 16, ventral view.

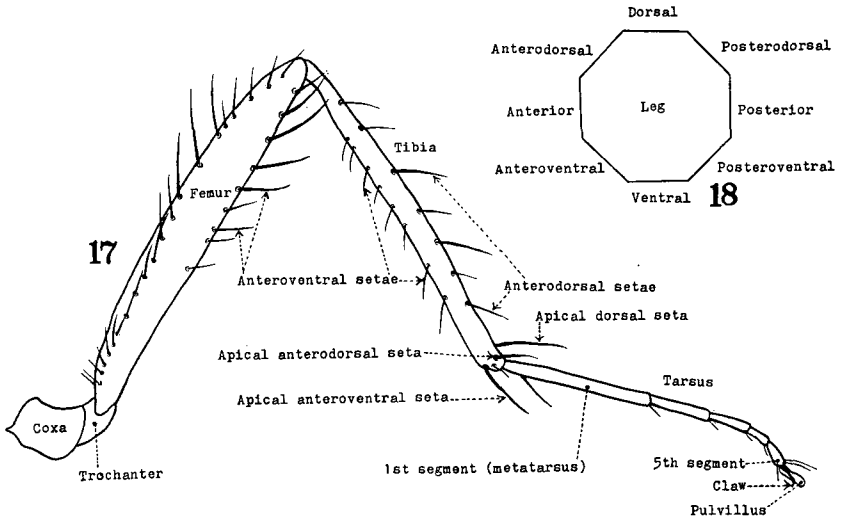


Fig. 17. Leg (hind, left) in frontal view.
Fig. 18. Diagram showing cross-section of leg, with surface terminology.

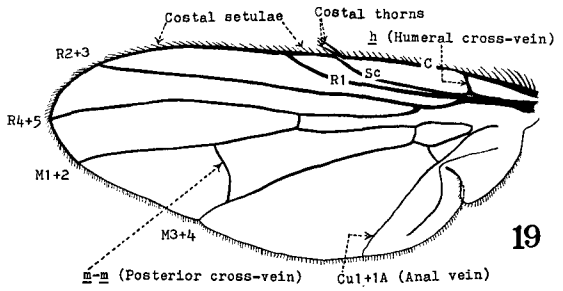


Fig. 19. Wing.

d	Dorsal seta	*pd*	Posterodorsal seta
p	Posterior seta	*pv*	Posteroventral seta
v	Ventral seta	*h*	Humeral cross-vein
av	Anteroventral seta	*m-m*	Posterior cross-vein
ad	Anterodorsal seta		

Scales accompanying figures all show a length of 0.5 mm.

Classification

Section Calyptratae: Superfamily Muscoidea
Family Anthomyiidae

Although the species of the Anthomyiidae were usually treated within the family Muscidae, they have recently been separated from the latter as a distinct family (Hennig, 1955 & 1966; Huckett, 1965b & 1971; Ackland, 1965a & 1967; Steyskal, 1967). According to Huckett (l.c.) the Scatophagidae are included in the family Anthomyiidae and placed as its subfamily, but in the present paper they are excluded from the Anthomyiidae as generally accepted. The Anthomyiidae in the present sense are usually divided into 2 subfamilies, Fucelliinae and Anthomyiinae, the latter being usually subdivided into 2 tribes, Myiopinini and Anthomyiini, on the basis of the frons-width of the males. Nevertheless, in this study the family is not divided into subfamilies or tribes in accordance with Hennig (1966).

Structures common in both sexes may be more primitive than those characteristic only of one sex, and species with a narrow frons in the male may have derived from ancestors with a wide frons in either sex. A narrow frons in males must be, however, understood as a polyphyletic character, because species with a wide frons in the male are seen intragenerically in various genera, e.g. in *Chirosia* (incl. *Pycnoglossa*), *Eutrichota* (incl. *Pegomyza*), *Pegohylemyia* and *Paraprosalpia* (incl. *Pseudochirosia*). With this assumption the division of the Anthomyiinae into Myiopinini and Anthomyiini, based only on the width of male frons, will not be accepted. On the other hand there may be found some reliable characters other than the frons-width between the genus *Fucellia* and the rest of the family to separate them into different subfamilies, although this separation is reserved in this study. Further knowledge as to the phylogenetic significance of the characters of the Anthomyiidae is necessary in order to give a natural system to the family. The generic classification of this family is also variable according to authors. In the present study I have recognized 30 genera, which may be distinguishable by the following key.

Key to the genera (♂♂)*

1. Frons wider or only a little narrower than one-third head-width. 2
– Frons distinctly narrower than one-third head-width. 7
2. Arista plumose. 3
– Arista pubescent. 4
3. Frons slightly narrower than one-third head-width; interfrontalia with *if.* .....
..... 27. *Mycophaga* Rondani

* Keys are merely ones of convenience. Among species not treated in this paper there might be ones which do not run out in the key with their own genera.

– Frons wider than one-third head-width; interfrontalia without *if*. ..... 30. *Eutrichota* Kowarz *pt.*

4. Costa with spinular setae widely set on ventral surface. ..... 1. *Fucellia* Robineau-Desvoidy

– Costa without spinular setae on ventral surface. 5

5. Hind tibia with apical *pv* vestigial..... 2. *Chiastocheta* Pokorny

– Hind tibia with apical *pv* strong. 6

6. Interfrontalia with strong *if*; parafrontals with 2–3 strong *ors*; haustellum robust. ..... 3. *Chirosia* Rondani *pt.*

– Interfrontalia without *if*, at most with very fine or vestigial ones; parafrontals normally with no *ors*; haustellum not robust. ..... 4. *Shakshainia* gen. nov.

7. Propleura haired. ..... 7. *Anthomyia* Meigen

– Propleura bare. 8

8. Arista plumose; 5th sternite more or less heart-shaped and with a matt-like tuft of setulae along inner margin of each process. .... 24. *Pegoplata* Schnabl & Dziedzicki

– Otherwise in combination of characters. 9

9. Lower calyptra distinctly protruded beyond the upper. 10

– Lower calyptra not distinctly protruded beyond the upper. 12

10. Pteropleura with 1 or a few setae. ..... 28. *Emmesomyia* Malloch

– Pteropleura with no setae. 11

11. Arista with the longest hairs at least about 3 times as long as basal diameter of arista. ..... 25. *Hydrophoria* Robineau-Desvoidy

– Arista with the longest hairs at most about as long as basal diameter of arista. ..... 29. *Pegomya* Robineau-Desvoidy *pt.*

12. Body densely covered with whitish grey pollen; mesonotum well marked with 3 broad black vittae; scutellum with black lateral markings. ..... 12. *Eustalomyia* Kowarz

– Otherwise in colouration. 13

13. Vibrissae separated from each other by a distance shorter than cheek-height. ..... 13. *Leucophora* Robineau-Desvoidy

– Vibrissae separated from each other by a distance longer than cheek-height. 14

14. A_3 at most only a little longer than the width; epistoma projecting forwards beyond frons at lunule; palpi and haustellum slender; t_2 with neither *av* nor *v*. ..... 16. *Egle* Robineau-Desvoidy

– Otherwise in combination of characters. 15

15. Parafrontals with *ors* even if minute. 16

– Parafrontals without *ors*. 28

16. Abdomen strongly swollen on caudal half, club-shaped in profile; 5th sternite with a tuft of short setulae at inner margin of each process; haustellum with mentum not slender nor polished. ..... 26. *Phorbia* Robineau-Desvoidy *pt.*

– Otherwise in combination of characters. 17

17. Mid tibia with *av* or *v*. 18

– Mid tibia with neither *av* nor *v*. 21

18. Hind tibia with apical *pv*. ..... 8. *Acrostilpna* Ringdahl *pt.*

– Hind tibia without apical *pv*. 19

19. Interfrontalia without *if*, or t_2 with *v*. ..... 17. *Paregle* Schnabl

– Interfrontalia with *if*; t_2 with *av*. 20

20. Fore tibia with 1–2 *ad*; t_2 with 2–3 *pd*. ..... 19. *Pegohylemyia* Schnabl *pt.*

– Fore tibia with no *ad*; t_2 with 1 *pd*. ..... 20. *Delia* Robineau-Desvoidy *pt.*

21. Hind tibia with *pv* and/or apical *pv*. 22

– Hind tibia with neither *pv* nor apical *pv*. 26

22. Mesonotum with 2–4 well developed *ph*; interfrontalia with *if* lacking, if present then haustellum with mentum slender and polished. ..... 15. *Lasiomma* Stein *pt.*

– Otherwise in combination of characters. 23

23. Hind tibia without apical *pv*. ..... 19. *Pegohylemia* Schnabl *pt.*

– Hind tibia with apical *pv*. 24

24. Notopleura with accessory setulae. ..... 5. *Meliniella* gen. nov. *pt.*
– Notopleura with no accessory setulae. 25
25. Scutellum not haired ventrally, if haired then haustellum very robust or *ors* much longer than secondary ocellar setae. ..... 3. *Chirosia* Rondani *pt.*
– Scutellum haired ventrally; haustellum not robust; *ors* much shorter than secondary ocellar setae. ..... 6. *Craspedochoeta* Macquart
26. Legs largely yellowish. ..... 29. *Pegomya* Robineau-Desvoidy *pt.*
– Legs wholly blackish. 27
27. Fifth sternite more or less heart-shaped, largely setose and not polished. ..... 23. *Nupedia* Karl
– Fifth sternite not heart-shaped, largely devoid of setae and polished. ..... 22. *Pseudonupedia* Ringdahl
28. Interfrontalia with *if* present, if not then t_3 with *pv* and/or apical *pv*. 29
– Interfrontalia with *if* absent; t_3 with neither *pv* nor apical *pv* even if with *p*. 41
29. Abdomen depressed at least basally; occiput setulose on upper part below postocular row of setulae; mesonotum with 2 strong *ph* (often in addition with 1–2 rather weaker ones); t_3 with apical *pv* present even if minute. ..... 15. *Lasiomma* Stein *pt.*
– Otherwise in combination of characters. 30
30. Abdomen conical or half-depressed; hypopygium with basal sclerite black and polished; t_1 without *pd*; t_3 with many (10–24) *pv*. ..8. *Acrostilpna* Ringdahl *pt.*
– Otherwise in combination of characters. 31
31. Hind tibia with apical *pv*. 32
– Hind tibia without apical *pv*. 35
32. Mid tibia with *av*. ..... 10. *Hyporites* Pokorny
– Mid tibia without *av*. 33
33. Prebasal sclerite of hypopygium with some strong setae along hind margin. ..... 18. *Botanophila* Lioy
– Prebasal sclerite of hypopygium with no strong setae. 34
34. Mesopleura with 1–2 strong anterior *mpl*. ..... 5. *Meliniella* gen. nov. *pt.*
– Mesopleura with no strong anterior *mpl*. ..26. *Phorbia* Robineau-Desvoidy *pt.*
35. Arista with the longest hairs longer than A_3-width. ..... 14. *Hylemya* Robineau-Desvoidy
– Arista with the longest hairs much shorter than A_3-width. 36
36. Haustellum with mentum polished; abdomen conical or half-depressed; 5th sternite strongly chitinized and shining, largely devoid of setae on inner half of each process. ..... 11. *Paraprosalpia* Villeneuve
– Otherwise in combination of characters. 37
37. Interfrontalia with *if* absent; legs largely yellow. ..30. *Eutrichota* Kowarz *pt.*
– Interfrontalia with *if* present, if not then legs blackish. 38
38. Abdomen strongly swollen on caudal half, club-shaped in profile. ..... 26. *Phorbia* Robineau-Desvoidy *pt.*
– Abdomen not so strongly swollen on caudal half and not club-shaped in profile. 39
39. Hind tibia with 2 *pd* and no *pv*. ..... 21. *Paradelia* Ringdahl
– Hind tibia with more than 2 *pd* and usually with *pv*. 40
40. Occiput rather densely setulose on upper part below postocular row of setulae; anal sclerite in dorsal view rounded, if ovoid then t_2 with 2 or more *pd*. ..... 19. *Pegohylemyia* Schnabl *pt.*
– Occiput bare or nearly so on upper part below postocular row of setulae, if rather densely setulose then anal sclerite in dorsal view ovoid and t_2 with 1 *pd*. ..... 20. *Delia* Robineau-Desvoidy *pt.*
41. Abdomen conical or slightly depressed; 5th sternite with processes nearly parallel-sided and with no strong setae along inner margin; surstyli club- or stick-shaped and cleft apically, with stiffish setulae or spine-like setae. ..... 30. *Eutrichota* Kowarz *pt.*

– Otherwise in combination of characters. ....29. *Pegomya* Robineau-Desvoidy *pt.*

Key to the genera (♀♀)

1. Frons much narrower than one-third head-width. 2
– Frons wider or only a little narrower than one-third head-width. 5
2. Hind tibia with apical *pv* strong. .....10. *Hyporites* Pokorny
– Hind tibia with apicl *pv* vestigial or lacking. 3
3. Eyes densely haired. .....9. *Alliopsis* Schnabl & Dziedzicki
– Eyes practically bare. 4
4. Haustellum with mentum pollinose; ovipositor with some recurrent spine-like setae on terminal sclerites. .....13. *Leucophora* Robineau-Desvoidy *pt.*
– Haustellum with mentum polished; ovipositor with no spine-like setae on terminal sclerites. .....11. *Paraprosalpia* Villeneuve
5. Costa with spinular setae widely set on ventral surface. .....
.....1. *Fucellia* Robinaeu-Desvoidy
– Costa without spinular setae on ventral surface. 6
6. Propleura haired. .....7. *Anthomyia* Meigen
– Propleura bare. 7
7. Pteropleura with 1 or a few setae. .....28. *Emmesomyia* Malloch
– Pteropleura with no setae. 8
8. Arista with the longest hairs as long as or a little longer than A_3-width; t_3 black, with 2 *pd* and no *pv*; palpi blade-like. ....24. *Pegoplata* Schnabl & Dziedzicki
– Otherwise in combination of characters. 9
9. Lower calyptra distinctly protruded beyond the upper. 10
– Lower calyptra not distinctly protruded beyond the upper. 11
10. Arista with the longest hairs longer than A_3-width, or t_2 with *av*. .....
.....25. *Hydrophoria* Robineau-Desvoidy
– Arista with the longest hairs much shorter than A_3-width; t_2 without *av*. .....
.....29. *Pegomya* Robineau-Desvoidy *pt.*
11. Haustellum with mentum conspicuously enlarged; interfrontalia with *if* fine or lacking; mesonotum with *acr* very fine and indistinguishable from accessory setulae; t_3 with strong apical *pv*. .....18. *Botanophila* Lioy
– Otherwise in combination of characters. 12
12. Interfrontalia without *if*, at most with very fine ones; parafrontals normally with no *ors*; t_3 with no *pv*, yet with strong apical *pv*. ....4. *Shakshainia* gen. nov.
– Otherwise in combination of characters 13
13. Interfrontalia without *if*. 14
– Interfrontalia with *if*. 18
14. Body densely covered with whitish grey pollen; mesonotum well marked with 3 broad black vittae; scutellum with black lateral markings. .....
.....12. *Eustalomyia* Kowarz
– Otherwise in colouration. 15
15. Vibrissae separated from each other by a distance about as long as cheek-height.
.....13. *Leucophora* Robineau-Desvoidy *pt.*
– Vibrissae separated from each other by a distance distinctly longer than cheek-height. 16
16. Costa bare ventrally; legs wholly blackish; f_2 with *av*. .....
..... 19. *Pegohylemyia* Schnabl *pt.*
– Costa haired ventrally; legs at least partly yellow, if wholly blackish then f_2 without *av*. 17
17. Arista plumose, if only pubescent then f_2 with *av* or fore tarsus with 3rd and 4th segments more or less broadened. .....30. *Eutrichota* Kowarz
– Arista not plumose; f_2 without *av*; fore tarsus with 3rd and 4th segments normal.
.....29. *Pegomya* Robineau-Desvoidy *pt.*

18. Ovipositor compressed on terminal segment. ....26. *Phorbia* Robineau-Desvoidy
– Ovipositor not compressed on terminal segment. 19
19. Arista with the longest hairs at least about as long as A_3-width. 20
– Arista with the longest hairs much shorter than A_3-width. 22
20. Hind tibia with apical *pv*. .....3. *Chirosia* Rondani *pt.*
– Hind tibia without apical *pv*. 21
21. Arista with the longest hairs much longer than A_3-width; abdomen black in ground colour. .....14. *Hylemya* Robineau-Desvoidy
– Arista with the longest hairs about as long as A_3-width; abdomen yellow in ground colour. .....27. *Mycophaga* Rondani
22. Hind tibia with apical *pv* at least about as long as height of the tibia..... 23
– Hind tibia with apical *pv* distinctly shorter than height of the tibia or absent... 25
23. Haustellum stout, at least as thick as f_1.....3. *Chirosia* Rondani *pt.*
– Haustellum normal or slender. 24
24. Haustellum with mentum wholly pollinose. .....5. *Meliniella* gen. nov. *pt.*
– Haustellum with mentum largely polished. .....8. *Acrostilpna* Ringdahl *pt.*
25. Mid tibia with *av* or *v*. 26
– Mid tibia with neither *av* nor *v*. 28
26. Mid tibia with *v*, if the seta located more or less anteroventral then parafrontals with 4–5 *ors*. .....17. *Paregle* Schnabl
– Mid tibia with *av*; parafrontals with at most 3 *ors*. 27
27. Occiput distinctly setulose on upper part below postocular row of setulae; t_2 with 2 or more *pd*. .....19. *Pegohylemyia* Schnabl *pt.*
– Occiput bare or nearly so on upper part below postocular row of setulae; t_2 with 1–2 *pd*. .....20. *Delia* Robineau-Desvoidy *pt.*
28. Head in profile rounded except on flat ventral margin; A_3 only a little longer than the width; occiput setulose on upper part below postocular row of setulae; cheeks distinctly less high than A_3-width; epistoma projecting forwards about as far as frons at lunule; haustellum not robust or slender, with mentum pollinose. ....2. *Chiastocheta* Pokorny
– Otherwise in combination of characters. 29
29. Epistoma projecting forwards beyond frons at lunule; A_3 as long as or only a little longer than the width. .....16. *Egle* Robineau-Desvoidy
– Otherwise in combination of characters. 30
30. Haustellum slender, with mentum polished; *stpl* 2:2; t_2 with 2 *ad* and 2 *pd*; t_1 with apical *pd* strong; costa distinctly haired on ventral surface. ....8. *Acrostilpna* Ringdahl *pt.*
– Otherwise in combination of characters. 31
31. Mesonotum with 2 *ph*, if with only 1 *ph* then haustellum slender and with mentum polished and epistoma projecting forwards beyond frons at lunule; occiput densely setulose on upper part below postocular row of setulae...15. *Lasiomma* Stein
– Otherwise in combination of characters. 32
32. Occiput distinctly setulose on upper part below postocular row of setulae; t_2 with 2 or more *pd*. .....19. *Pegohylemyia* Schnabl *pt.*
– Occiput bare or nearly so on upper part below postocular row of setulae, if distinctly setulose then t_2 with only 1 *pd*.....20. *Delia* Robineau-Desvoidy *pt.*

1. Genus *Fucellia* Robineau-Desvoidy

Fucellia Robineau-Desvoidy, 1842:269. Type-species: *Fucellia arenaria* Robineau-Desvoidy, 1842.

According to Hennig (1966) and Hori & Kurahashi (1969) 15 species are known to occur in the Palaearctic region, and of them 5 species in Japan. The Japanese species may be distinguished by the following key.

Key to the species (♂♂)

1. Mid tibia with *av*; f_3 swollen at base ventrally, thereon anteroventrally with a tuft of short setae and posteroventrally with a knob-like projection. ..... 4. *fucorum* (Fallén)
– Mid tibia without *av*; f_3 not swollen at base ventrally, and without such setae or projection. 2
2. Legs wholly blackish; prebasal sclerite setose. ..... 5. *kamtchatica* Ringdahl
– Legs at least partly yellowish; prebasal sclerite bare. 3
3. Hypopygium with anal sclerite conspicuously large. .... 3. *hypopygialis* Ringdahl
– Hypopygium with anal sclerite normal. 4
4. Wings with a dark brownish spot at apex; t_1 usually with 1 *p–pv*. ..... 1. *apicalis* Kertész
– Wings without a spot-like marking; t_1 usualy with 2 *p–pv*. . . 2. *boninensis* Snyder

Key to the species (♀♀)

1. Legs wholly blackish. 2
– Legs at least yellow on t_2 and t_3. 3
2. Mid tibia with *av*. ..... 4. *fucorum* (Fallén)
– Mid tibia without *av*. ..... 5. *kamtchatica* Ringdahl
3. Palpi largely or at least on apical half blackish; t_1 usually with 1 *p–pv*. ..... 1. *apicalis* Kertész
– Palpi wholly or largely yellowish, at most slightly blackish at apex; t_1 usually with 2 *p–pv*. 4
4. Parafacials in profile at narrowest part much narrower than A_3-width; ovipositor with 8th tergite deeply cleft on cephalic margin into 3 long limbs. ..... 2. *boninensis* Snyder
– Parafacials in profile at narrowest part only a little narrower than A_3-width; ovipositor with 8th tergite shallowly cleft on cephalic margin. ..... 3. *hypopygialis* Ringdahl

1. *Fucellia apicalis* Kertész

Fucellia apicalis Kertész, 1908:71. *Fucellia apicalis*: Stein, 1918: 179; Hori, 1961: 36; Snyder, 1965:203; Hennig, 1966:7; Hori & Kurahashi, 1969:239.

Material examined*. A lot of specimens (173♂♂, 226♀♀) have been examined, their localities being as follows: HOKKAIDÔ — Rishiri-tô; Abashiri; Shiretoko; Akkeshi; Fuyujima; Tomakomai. HONSHÛ — Noda & Omoto, Iwateken; Kôbe, Hyôgo-ken; Ise & Kumano, Mie-ken; Nagato, Yamaguchi-ken. SHIKOKU — Shôdo-shima; Uwajima; Tosashimizu. KYÛSHÛ — Tsushima; Sasebo; Amakusa; Aoshima; Fukiage; Sata-misaki.

♂. Wings always with a distinct apical marking except in some specimens (7♂♂ from Noda & Omoto, Iwate-ken), which have a rather obscure one (owing to their young age?).

♀. Wings always with no markings; t_2 usually with 1–2 short *av*.

Distribution. Japan; Bonin Is.; China.

2. *Fucellia boninensis* Snyder

Fucellia boninensis Snyder, 1965:204. *Fucellia boninensis*: Hori & Kurahashi, 1969: 243.

*) The specimens are collected by myself unless otherwise stated.

Material examined. HONSHÛ — Omoto, Iwate-ken, 2♂♂, 13-viii-69; Inubô-saki, Chiba-ken, 1♂, 29-viii-63 (S. Takagi); Ise, Mie-ken, 3♂♂, 2♀♀, 24-v-63 (S. Takagi). KYÛSHÛ — Amakusa, 1♂, 20-iv-67; Fukiage, 13♂♂, 7♀♀, 8-v-67; Amami-Ôshima, 1♂, 23-iii-70 (H. Takizawa); Yoron-tô, 4♂♂, 17-iii-70 (H. Takizawa).

♀. Mid tibia with 1 short *av.*

Distribution. Japan; Bonin Is.

3. *Fucellia hypopygialis* Ringdahl

Fucellia hypopygialis Ringdahl, 1930:7. *Fucellia hypopygialis*: Huckett, 1965a:26; id., 1965b:842; Hennig, 1966:13. *Fucellia hypopygialis*: Hori & Kurahashi, 1969:245.

Material examined. HOKKAIDÔ — Abashiri, 1♂, 1♀, 25-v-62 (S. Takagi); Wakasakanai, 1♀, 3-viii-61 (S. Takagi); Akkeshi, 1♂, 18-vii-66; Zenibako, 10♂♂, 5♀♀, 23-vii-69.

♀. Mid tibia with 1–3 short *av.*

Distribution. Japan; Kamchatka; North America.

4. *Fucellia fucorum* (Fallén)

Scatomyza fucorum Fallén, 1819:5. *Fucellia fucorum*: Hennig, 1966:11. *Fucellia fucorum*: Hori & Kurahashi, 1969:239.

Material examined. HOKKAIDÔ—Rishiri-tô, 4♂♂, 1♀, 31-vii-69; Kitami-Esashi, 20♂♂, 4♀♀, 29-vii-69; Abashiri, 8♂♂, 4♀♀, 25-vii-62 (S. Takagi); Akkeshi, 3♂♂, 18-vii-66; Fuyujima, 18♂♂, 7♀♀, 28-vi-67; Shiretoko, 1♂, 1♀, 10–17-vii-65 (T. Kumata & I. Miyagi). SAKHALIEN — Chirie, 1♂, 6-viii-14 (S. Isshiki).

Distribution. Asia; Europe; North America.

5. *Fucellia kamtchatica* Ringdahl

Fucellia kamtchatica Ringdahl, 1930:7. *Protofucellia syuitimorii* Séguy, 1936:282 (syn. after Hori & Kurahashi, 1969). *Fucellia kamtchatica*: Huckett, 1965a: 26; Hennig, 1966: 14. *Fucellia syuitimorii*: Hennig, 1966:18. *Fucellia kamtchatica*: Hori & Kurahashi, 1969:241.

Material examined. HOKKAIDÔ—Kitami-Esashi, 6♂♂, 1♀, 29-vii-69; Shiretoko, 1♂, 10–17-vii-65 (T. Kumata & I. Miyagi); Akkeshi, 6♂♂, 18-vii-66; Fuyujima, 1♂, 28-vi-67; Zenibako, 40♂♂, 14♀♀, 23-vii-69; Ishikari-hama, 1♀, 9-vii-68. HONSHÛ — Omoto, Iwate-ken, 6♂♂, 5♀♀, 13-viii-69; Noda, Iwate-ken, 33♂♂, 10♀♀, 13-viii-69.

Distribution. Japan; Kamchatka; Aleutian Is.; Alaska.

2. Genus *Chiastocheta* Pokorny

Chiastocheta Pokorny, 1889:568. Type-species: *Aricia trollii* Zetterstedt, 1845.

This genus is a small group represented by 6 species with 2 other uncertain ones in the Palaearctic region (Hennig, 1966) and 2 endemic ones in the Nearctic region (Huckett, 1966b). The adult flies of the genus are commonly found on the flower-head of *Trollius*, in which the larvae of *Chiastocheta trollii* (Zetterstedt) are known to grow (Collin, 1954).

In Japan the following species is found on the flower-head of *Trollius riederianus* var. *japonicus*.

*1. *Chiastocheta trollii* (Zetterstedt)

Aricia trollii Zetterstedt, 1845:1609. *Chiastochaeta inermella*: Hennig, 1953:656, nec Zetterstedt, 1838. *Chiastochaeta trollii*: Collin, 1954:100; Hennig, 1966:37.

Material examined. HOKKAIDÔ — Mt. Daisetsu, 1♂, 1♀, 28-vii-59 (S. Ueda) & 6♂♂, 7♀♀, 20–21-vii-68; Mt. Shokambetsu, 3♂♂, 2♀♀, 1-vii-71.

Host plants. *Trollius europae* (in Europe, after Mik, 1895 through Collin, 1954).

Distribution. Japan; Europe.

3. Genus *Chirosia* Rondani

Chirosia Rondani, 1856:102. Type-species: *Aricia albitarsis* Zetterstedt, 1845.

Pycnoglossa Coquillett, 1901:613. Type-species: (*Pycnoglossa flavipennis* Coquillett, 1901)=*Musca flavipennis* Fallén, 1823.

Only on the basis of the frons-width of the males the genera *Chirosia* and *Pycnoglossa* have been recognized as distinct from each other and often referred into different tribes. Recently, however, *Pycnoglossa* was suppressed as a synonym of *Chirosia* by Hennig (1966), whose opinion may be justified and is adopted in the present study. The larvae of some species are known to mine the leaves of ferns.

In the Palaearctic region are known to occur 15 species (Hennig, l.c.), of which 7 ones have been found also in Japan. In addition 5 other species will be described as new to science from Japan.

Key to the species (♂♂)

1. Frons wider than one-third head-width. 2
– Frons narrower than one-third head-width. 4
2. Mid femur with some distinct *av*; t_2 with 2 *pd*. .....1. *parvicornis* (Zetterstedt)
– Mid femur with no distinct *av*; t_2 with 1 *pd*. 3
3. Mesonotum with some setulae between rows of *pre acr*, which are separated from each other by a distance about as long as that between *dc* and *acr*; *stpl* 1:2. ....3. *asperistilata* sp. nov.
– Mesonotum with no setulae between rows of *pre acr*, which are separated from each other by a distance slightly longer than half of that between *dc* and *acr*; *stpl* 1:1. .....2. *hirtipedella* sp. nov.
4. Arista longly plumose. .....4. *flavipennis* (Fallén)
– Arista shortly pubescent, or nearly bare. 5
5. Frons about as wide as A_3-length. .....7. *nigripes* Bezzi
– Frons much narrower than A_3-length. 6
6. Mid femur with some strong *av*. 7
– Mid femur with no strong *av*. 9
7. Mid femur with no stout *pv*, at most with some slender ones. ..9. *yukara* sp. nov.
– Mid femur with some stout *pv*. 8
8. Hind femur with some distinct *pv*, which are longer than height of the femur; scutellum with some setulae on lateral margin below the primary setae. ....10. *nudisternata* sp. nov.
– Hind femur with no distinct *pv*, at most with some fine ones, which are not longer

than height of the femur; scutellum with no setulae on lateral margin below the primary setae. .....5. *cinerosa* (Zetterstedt)

9. Mid tibia without *ad*; f_3 with *av* shorter than height of the femur; *pra* shorter than posterior *ntpl*. .....8. *sapporensis* sp. nov.
– Mid tibia with *ad*; f_3 with *av* longer than height of the femur; *pra* at least as long as posterior *ntpl*. 10

10. Mesonotum with rows of *pre acr* separated from each other by a distance about as long as that between *dc* and *acr*; *stpl* 1:2. .....6. *hystrix* (Brischke)
– Mesonotum with rows of *pre acr* separated from each other by a distance much shorter than that between *dc* and *acr*; *stpl* 2:2 or 2:3. 11

11. Fore tibia with 1 distinct and 1–2 fine *ad*, and with apical *pv* strong. ....12. *similata* (Tiensuu)
– Fore tibia with no *ad*, at most with 1 fine one, and with apical *pv* weak or vestigial. .....11. *betuleti* (Ringdahl)

*1. *Chirosia parvicornis* (Zetterstedt)
(Figs. 20–24)

Aricia parvicornis Zetterstedt, 1845:1600. *Chirosia parvicornis*: Hennig, 1966:66.

Material examined. HOKKAIDÔ — Sapporo, 1♂, 15-v-70; Eniwa, 2♂♂, 25-v-66. HONSHÛ — Shibahara, Fukushima-ken, 2♂♂, 18-vii-72 (M. Miyazaki), ex *Pteridium aquilinum*, as leaf-miner; Nishi-Nasuno, Tochigi-ken, 1♂, 1♀, 13-vii-72 (M. Miyazaki), ex *P. aquilinum*, as leaf-miner.

♂. Body-length 3.2–3.5 mm. Body blackish in ground colour, thinly covered with greyish pollen, which is a little tinged with brown; abdomen half-shining; wings slightly tinged with brown; calyptrae whitish, slightly tinged with yellow on margin.

Frons about 0.4 times as wide as head; interfrontalia about as wide as A_3-length; parafrontals with 2–3 *ori* and 2–3 *ors*; A_3 1.5 times or a little more as long as wide; aristal pubescence distinct although short; haustellum robust.

Mesonotum with *pra* shorter than posterior *ntpl*; distance between rows of *pre acr* distinctly shorter than that between *dc* and *acr*; *stpl* 1: 2; scutellum bare ventrally.

Abdomen long-ovoid, with strong marginal setae, of which outer ones are about twice as long as the tergites; 5th sternite (Figs. 23 & 24) with many setae on outer margin of each process, which is large and rounded apically; hypopygium with slender surstyli (Figs. 20 & 21); distiphallus broad (Fig. 22).

Mid tibia with 1 *ad*, 2 *pd* and 2 *pv*; t_3 with some *av*, 2 long and 2 shorter *ad*, 2–3 long and 1–2 shorter *pd* and no *pv*, in 1 specimen with 1 *p*.

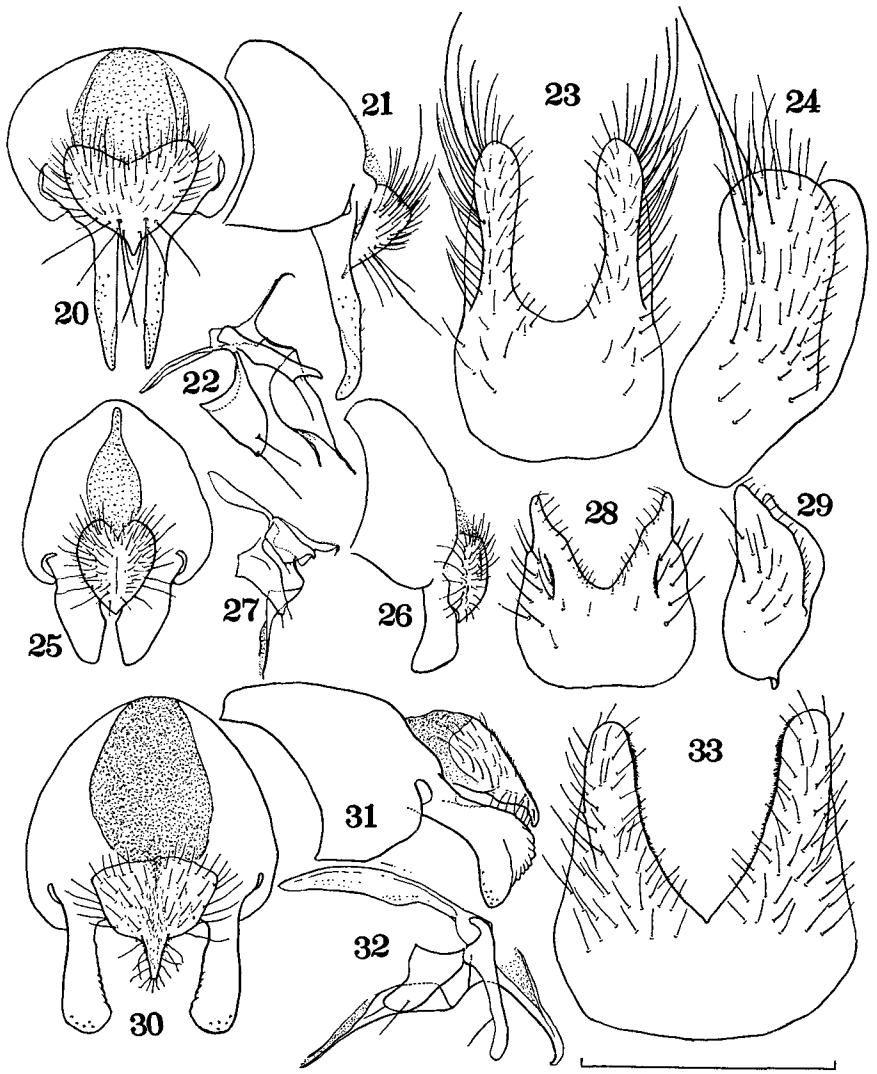
♀. Only 1 specimen has been examined. Mid tibia with 1 short distinct *pv* or 2 minute ones.

Host plants. *Pteridium aquilinum*. In Europe some species of ferns, *Pteridium* (incl. *aquilinum*), *Asplenium*, and *Dryopteris* (incl. *dilatata*), are recorded as host plants of this species (see Hering, 1957 & Hennig, 1966).

Distribution. Japan; Europe.

2. *Chirosia hirtipedella* sp. nov.
(Figs. 25–29)

Type-material. HOKKAIDÔ — Sapporo, 1♂ (holotype), 11-v-66.



Figs. 20–24. *Chirosia parvicornis* (Zetterstedt), ♂: 20, hypopygium, dorsal view; 21, *ditto*, lateral view; 22, aedeagus; 23, 5th sternite, ventral view; 24, *ditto*, lateral view.
Figs. 25–29. *Chirosia hirtipedella* sp. nov., ♂: 25, hypopygium, dorsal view; 26, *ditto*, lateral view; 27, aedeagus; 28, 5th sternite, ventral view; 29, *ditto*, lateral view.
Figs. 30–33. *Chirosia asperistilata* sp. nov., ♂: 30, hypopygium, dorsal view; 31, *ditto*, lateral view; 32, aedeagus; 33, 5th sternite, ventral view. Scale, 0.5 mm (same for succeeding figures).

♂. Body-length 3.4 mm. Interfrontalia dark brownish, with pale brownish grey pollen; parafacials and cheeks dark brownish, with dull greyish pollen; occiput blackish, thinly with dull grey pollen; antennae and palpi black. Thorax dark brownish, covered with greyish pollen, which is more or less tinged with brown; mesonotum when viewed from behind half-shining and faintly vittate medially and on lateral margin. Abdomen dark brownish, thinly with brownish

grey pollen, and shining when viewed from behind. Legs dark brownish. Wings a little tinged with brown; calyptrae pale, slightly with a brownish yellow tinge; halteres yellowish. (The dark brownish ground colour of the body and legs may be due to the young age after the emergence, and the normal ground colour may be blackish.)

Head about as high as long, with swollen occiput, consequently rounded in profile; frons wide, about 0.41 times of head-width; interfrontalia slightly less than 3 times as wide as parafrontalia, with a pair of strong *if*; parafrontals with 2 strong and 1–2 minute *ori*, and with 3 *ors*, the upper reclinate one being shorter; A_3 shrunken, probably about 1.5 times as long as wide; arista minutely pubescent; profrons probably more or less narrower than A_3; cheeks a little less high than profrons-width; parafacials much narrowing ventrad; haustellum with mentum much enlarged.

Mesonotum with 3 pairs of fine *pre acr* and with no setulae between the rows, which are separated from each other by a distance slightly longer than half of that between *dc* and *acr*; 2nd *ph* like accessory setula; *pra* a little less than half of anterior *ntpl* in length; *stpl* 1: 1; mesopleura with no distinct anterior *mpl*, and with 1 strong and 1 weak *pstg*; scutellum on lateral margin near apical setae with 1–2 accessory setulae, between the apical setae with 1 setula, and not haired ventrally.

Abdomen with marginal setae not much elongate, the outer ones being about as long as the tergites; 5th sternite and hypopygium as in Figs. 25–29.

Fore tibia with 1 *ad*, 1 *pd* and 1 *pv*; f_2 with no distinct *av* nor *pv*; t_2 with 1 *ad*, 1 *pd* and 1 *p–pv*; f_3 with 5 distinct *av* becoming longer towards apex of the femur, the longest one being a little longer than height of the femur, and with no distinct *pv*; t_3 with 1 *av*, 3 *ad*, 2 distinct and 1 shorter *pd* and no *pv*; fore tarsus a little longer than t_1; hind tarsus slightly shorter than t_3. Wings with costal thorns minute; costa haired on ventral surface; *m-m* straight.

♀. Unknown.

Distribution. Japan

In the wide frons and in the setal pattern of *stpl* in the male this species may resemble *Chirosia hirtipes* Stein from Tibet. It may, however, be readily distinguished from that species by some aspects: — Interfrontalia not so narrowing ventrad; abdomen not club-shaped; t_1 with *pd*; 5th sternite more pointed apically and less densely setose. Judging from the 5th sternite and the hypopygium this species may be more closely related to *Chirosia cinerosa* (Zetterstedt), although they are very different from each other in their external characters.

3. *Chirosia asperistilata* sp. nov.
(Figs. 30–33)

Type-material. HOKKAIDÔ — Sapporo, 1♂, 2-vi-67, & 1♂, 27-v-68; Jôzankei, 1♂, 26-v-68 (K. Kusigemati); Soranuma, 1♂, 11-vii-67; Eniwa, 3♂♂, 25-v-66, & 39♂♂ (one the holotype), 11♀♀, 27-v-71.

♂. Body-length *ca.* 5 mm, wing-length 4.4–5 mm. (In most of the specimens the abdomen is in poor condition because of shrinkage, still there are 2 rather good conditioned specimens, of which one is 5.2 mm in the body-length and 4.8 mm in the wing-length, and the other one is 5.3 mm in the body-length and 5 mm in the

wing-length.) Interfrontalia, parafacials and cheeks dark brownish to black in ground colour, with more or less brownish grey pollen; occiput blackish in ground colour, and a little brownish in pollinosity; antennae, palpi and haustellar mentum black, the last being pollinose. Thorax blackish in ground colour and greyish in pollinosity; mesonotum tinged with brownish yellow in pollinosity, when viewed from behind with rather broad median and lateral vittae. Abdomen blackish in ground colour, and shining though thinly covered with greyish pollen, which is tinged with brown. Legs black. Wings distinctly tinged with yellow; calyptrae and halteres yellowish.

Head rounded in profile, only a little higher than the length; frons about 0.4 times as wide as head; interfrontalia a little more than twice of parafrontalia in width, with a pair of distinct or strong *if*; parafrontals with 1–2 *ori* and 1 proclinate and 1 (rarely 2) reclinate *ors*, and with 4–10 minute setulae outside of *ori* and *ors*; A_3 broadening apicad, about 1.4–1.5 times as long as wide; arista distinctly pubescent although the longest hairs being at most only a little longer than basal diameter of arista; profrons about 0.7–0.8 times as wide as A_3; cheeks about half as high as A_3-width; occiput usually with a few or some setulae on upper part below postocular row of setulae; palpi stick-like; haustellum with mentum much enlarged.

Mesonotum with 5–6 pairs of fine *pre acr* and with some setulae between the rows, the distance between the rows being a little longer or shorter than that between *dc* and *acr*; 2nd *ph* like accessory setula; *pra* half to two-thirds of posterior *ntpl* in length; mesopleura with no distinct anterior *mpl*, and with 1 strong and 1 (somtimes 2) fine *pstg*; *stpl* 1:2; scutellum not haired ventrally, with 0–3 short setulae on lateral margin below the primary setae and on apical part between the apical setae respectively. Abdomen depressed except on rather swollen hypopygium, and about twice as long as wide, loosely narrowing caudad.

Fore tibia with 1 (sometimes 2) *ad* and 1 (sometimes 2) *pv*; f_2 with no distinct *av* and on basal half with 2–4 distinct *pv*, which are as long as or a little longer than height of the femur; t_2 with 1 *ad*, 1 *pd*, 1–2 *p* and 1 (sometimes 2) *pv*; f_3 with 5–8 *av*, the longest one about 1.4 times as long as height of the femur, and on basal half or more with 2–5 *pv*, which are about as long as height of the femur; t_3 with 2–5 *av*, 2–6 (2–3 strong and 0–4 weaker) *ad*, 2–4 (2–3 strong and 0–2 weaker) *pd* and 0–4 (usually 2–4) fine *pv*; fore tarsus a little longer than t_1. Wings with costal thorns usually strong; costa haired ventrally; *m-m* nearly erect and straight.

♀. Interfrontalia with *if* usually as long as or a little longer than *ori*; antennae somewhat tinged with brown on two basal segments; A_3 a little longer than 1.5 times of the width. Mid tibia with 1 *ad*, 1 *pd*, 2 *p* and 1–2 *pv*; t_3 with 2–3 *av*, 3–5 (of them 2–3 stronger) *ad*, 3–5 (of them 2–3 stronger) *pd* and no *pv*, apical *ad* being stronger than that of male. Wings with *m-m* erect or a little leant inwards.

Distribution. Japan.

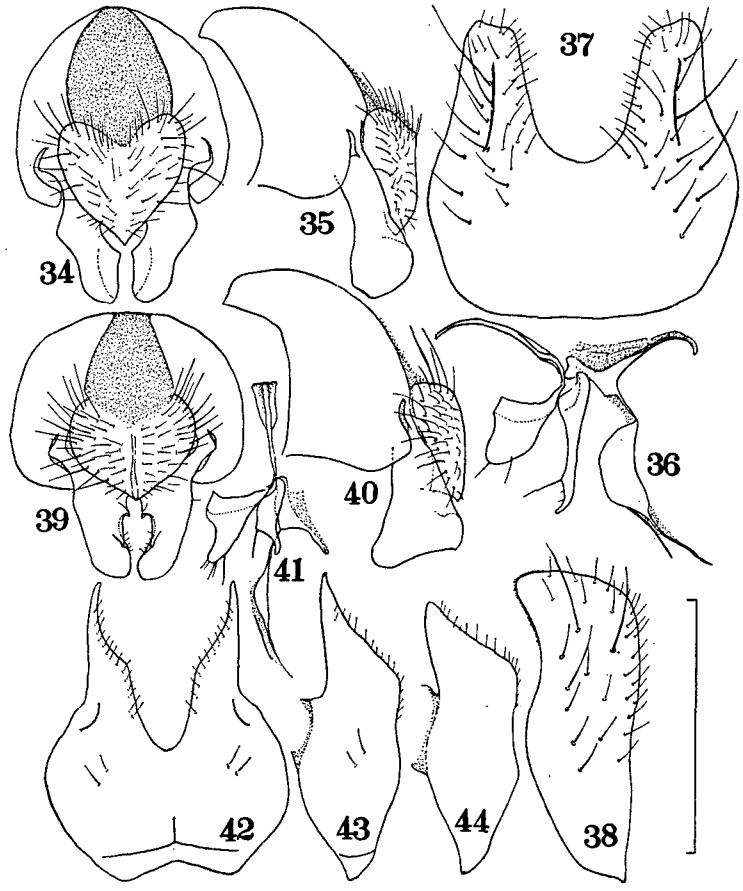
From any other known species with a wide frons in the male this species can be distinguished by the following aspects: — Body larger in size; parafrontals with short setulae although variable in number; mesonotum with *pre acr*-rows more widely separated from each other and with some setulae between the rows; *stpl* 1:2; f_2 with no distinct *av*; 5th sternite and hypopygium otherwise in structure. In spite of the dissimilarity in the external characters the present new species may be rather closely related to *Chirosia flavipennis* (Fallén) in having slender postgonites and broad praegonites in the male genitalia.

*4. *Chirosia flavipennis* (Fallén)
(Figs. 34–38)

Musca flavipennis Fallén, 1823:59. *Hylemyia* (*Pycnoglossa*) *flavipennis*: Huckett, 1949:60. *Pycnoglossa flavipennis*: Collin, 1955:97. *Chirosia flavipennis*: Hennig, 1966:61.

Material examined. HOKKAIDÔ — Shimamatsu, 1♂, 25-vii-65 (K. Kusigemati); Kunneppu, 3♂♂, 25-vii-66; Obihiro, 1♀, 15-vii-66; Kenebetsu, 1♀, 3-viii-71 (T. Kumata & M. Miyazaki); Teuri-tô, 1♀, 3-viii-59 (T. Kumata). HONSHÛ — Naeba, Niigata-ken, 1♀, 14-viii-69 (T. Kocha); Tsumakoi, Gumma-ken, 1♂, 1♀, 11-vii-71 (T. Kocha).

♂. Body-length 5.8–6.8 mm; wing-length 5.1–5.9 mm. Body black in ground colour; mesonotum brownish grey pollinose; abdomen dark greyish pollinose, with a broad median vitta; wings strongly tinged with yellow or brownish yellow; calyptrae pale yellow; halteres yellowish at knob.



Figs. 34–38. *Chirosia flavipennis* (Fallén), ♂: 34, hypopygium, dorsal view; 35, *ditto*, lateral view; 36, aedeagus; 37, 5th sternite, ventral view; 38, *ditto*, lateral view.

Figs. 39–44. *Chirosia cinerosa* (Zetterstedt), ♂: 39, hypopygium, dorsal view; 40, *ditto*, lateral view; 41, aedeagus; 42, 5th sternite (from Mt. Soranuma), ventral view; 43, *ditto*, lateral view; 44, 5th sternite (from Mt. Kiso-Komagatake), lateral view.

Head about 1.27–1.35 times as high as long; frons somewhat narrower than distance between posterior ocelli inclusive; interfrontalia about as wide as anterior ocellus, with *if* strong; parafrontals with 2 strong and some vestigial *ori*, and with 1 distinct *ors*; A_3 less than twice (about 1.7–1.9 times) as long as wide; arista with many long and straggling hairs; profrons about as wide as A_3; cheeks as high as or slightly higher than A_3-width; haustellum with mentum much enlarged.

Mesonotum with rows of *pre acr* separated from each other by a distance slightly less than half of that between *dc* and *acr*; *pra* not longer than half of posterior *ntpl*; *stpl* 1: 2; scutellum sparsely haired ventrally, with some setulae on lateral margin.

Abdomen depressed except on rather developed hypopygium, more than twice as long as wide; tergites with strong discal and marginal setae; 5th sternite and hypopygium as in Figs. 34–38.

Fore tibia with 3–4 *ad* and 1 *pv*; f_2 on apical third with some short *av*, of which 2–3 are strong, and on basal two-thirds with 4–5 robust *pv*; t_2 with 1 *ad*, 2–3 *pd–p*, and no *pv*; f_3 with about 10 *av*, and on basal two-thirds with about 4 slender *pv*; t_3 with 6–9 *av*, 4–6 *ad*, 4–5 *pd* and 7–9 *pv*. Wings with costal thorns distinct or strong; *m-m* somewhat oblique.

♀. Abdomen more thinly pollinose than in male, median vitta being faint although broad. Head about 1.2 times as high as long; frons about 0.4 times as wide as head; parafrontals with 1 proclinate and 2 reclinate *ors*, the upper reclinate one being shorter than the lower. Mesonotum with *pra* as long as or a little longer than half of posterior *ntpl*. Mid femur with *pv* not so robust as in male yet strong; t_3 with 4–5 *av*. Wings with *m-m* nearly upright and straight.

Distribution. Japan; Europe; North America.

*5. *Chirosia cinerosa* (Zetterstedt)
(Figs. 39–44)

Aricia cinerosa Zetterstedt, 1845:1450. *Hylemyia* (*Pycnoglossa*) *cinerosa*: Huckett, 1949:59. *Chirosia cinerosa*: Collin, 1955:97; Hennig, 1966:59.

Material examined. HOKKAIDÔ — Sapporo, 2♀♀, 2-vi-67, 1♂, 27-v-68, & 1♂, 26-v-68 (H. Torikura); Nopporo, 1♂, 2-vi-68; Soranuma, 8♂♂, 17-vi-67; Eniwa, 6♂♂, 25-v-66 & 27-v-71; Mt. Shokambetsu, 3♂♂, 1-vii-71. HONSHÛ — Takao-san, Tôkyô-to, 1♂, 5-v-69 (H. Takizawa); Mt. Kiso-Komagatake, Nagano-ken, 2♂♂, 25-vii-70; Mt. Hodaka, Nagano-ken, 1♀, 1-viii-70.

♂. Body-length 4.1–5.6 mm; wing-length 3.8–5.1 mm. Abdomen rather thinly pollinose and half-shining, with broad median vitta and rather broad fore marginal bands although the markings are not very sharp.

Frons narrow, about as wide as distance between posterior ocelli inclusive. Mesonotum with about 3 pairs of distinct *pre acr*, setae of the middle pair being strongest, distance between the rows being shorter than that between *dc* and *acr*; *stpl* 1: 2; scutellum not haired on ventral surface, and with no setulae on lateral margin. Abdomen with 5th sternite scarcely setose, the processes being more strongly pointed in the specimens from Hokkaidô than in those from Honshû (Figs. 43 & 44). Fore tibia with 1 (rarely 2) *ad*, 1 (rarely 2) *pd* and 2–5 (usually 2–3) *p–pv*; f_2 with 3–5 strong *av* on apical third and 3–4 robust *pv* on basal half; t_3 with 6–12 fine *pv*.

♀. Abdomen very thinly pollinose and shining, with no markings. Frons about 0.39 times as wide as head; parafrontals with 1 proclinate and 2 reclinate *ors*. *Stpl* 1: 1. Mid femur with 1–3 *av*, which are weaker than those of male, and with 2–5 *pv* not robust; t_3 with some *pv*, which are shorter and finer than those of male.

Host plants. *Struthiopteris* (in Europe, after Hering, 1957).

Distribution. Japan; Europe; North America.

There is found a slight difference between the Japanese form and the North American one. According to Huckett (1949) the scutellum of this species has a few fine hairs on the ventral surface, but the Japanese form has no hairs on the ventral surface of the scutellum at least in the specimens examined. The ventral hairing of the scutellum may be variable as seen in *Chirosia betuleti* (Ringdahl) mentioned hereinafter.

*6. *Chirosia hystrix* (Brischke)
(Figs. 45–49)

Anthomyia hystrix Brischke, 1880:287. *Pogonomyza proboscidalis* Malloch, 1920a:185. *Pycnoglossa setifemur* Ringdahl, 1939:147. *Hylemyia* (*Pycnoglossa*) *proboscidalis*: Huckett, 1949:62. *Chirosia setifemur*: Collin, 1955:97. *Pycnoglossa hystrix*: Hering, 1957:130. *Chirosia hystrix*: Hennig, 1966:63.

Material examined. HONSHŪ — Hannô, Saitama-ken, 1 ♂, 2-v-68 (H. Takizawa).

♂. Length of head and thorax combined *ca.* 2.5 mm; wing-length 4 mm. Body blackish in ground colour and whitish grey in pollinosity; abdomen half-shining, with median vitta broad and faint. Wings with a brownish yellow tinge; calyptrae whitish; halteres yellow at knob

Head about 1.3 times as high as long; frons about three-fourths as wide as distance between posterior ocelli inclusive; interfrontalia about as wide as anterior ocellus, with *if* strong; parafrontals with 3 strong *ori* and 1 slender *ors*; A_3 aobut 1.7 times as long as wide; arista distinctly pubescent, the hairs being about as long as basal diameter of arista; profrons a little narrower than A_3-width; cheeks about as high as A_3-width, with lowest peristomal seta very strong, about four-fifths as long as vibrissal seta; upper part of occiput with only a few setulae below postocular row of setulae; haustellum more or less stout, yet not so strong as in *flavipennis* or *cinerosa*.

Mesonotum with 3 pairs of *pre acr*, setae of the middle pair being strong, and with 2 accessory setulae between the rows, which are separated from each other by a distance somewhat shorter than that between *dc* and *acr*; 2nd *ph* distinguishable from accessory setulae although not strong; *pra* long, about as long as anterior *ntpl*; *stpl* 1: 2; scutellum not haired ventrally, with some setulae on lateral margin below the primary setae.

Abdomen with strong marginal and discal setae, which become longer laterad; 5th sternite and hypopygium as in Figs. 45–49.

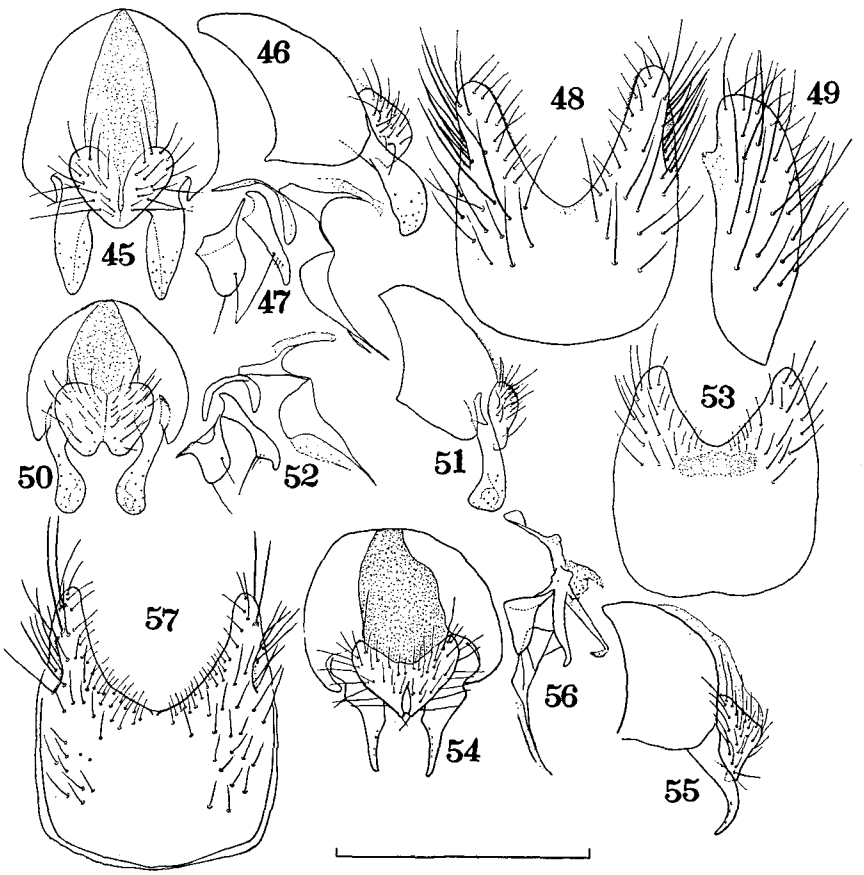
Fore tibia with 1 *ad* and 1 *pv*; f_2 with no distinct *av*, and on basal half with 4 *pv*, which are long although not robust; t_2 with 1 *ad*, 1 *pd*, 1 *p* and 1 *pv*; f_3 with 8 long *av*, and on basal half with about 5 slender *pv*; t_3 with 4 *av*, 7 *ad* (not uniform in length), 3 long and 2 shorter *pd* and some fine and short *pv*. Wings with costal thorns distinct although not very strong.

♀. Unknown to me. According to Huckett (1949) and Hennig (1966), abdomen shining, with no markings, 5th tergite being polished; t_3 with no *pv*.

Host plants. *Pteridium aquilinum, Asplenium, Athyrium, Blechnum, Cystopteris, Dryopteris, Polypodium, Osmunda, Polystichum* and *Struthiopteris* (in Europe, after Hering, 1957 & 1962).

Distribution. Japan; Europe; North America.

This species may be more closely related to *C. betuleti* rather than to any other known species of the genus in having the following aspects: — Body rather densely whitish grey pollinose; calyptrae whitish; head distinctly higher than its length; *pra* about as long as anterior *ntpl*; haustellum less robust. It can be, however, distinguished from that species by the mesonotum with rows of *pre acr* more widely separated from each other and by the setal pattern of *stpl* arranged in 1: 2.



Figs. 45–49. *Chirosia hystrix* (Brischke), ♂: 45, hypopygium, dorsal view; 46, *ditto*, lateral view; 47, aedeagus; 48, 5th sternite, ventral view; 49, *ditto*, lateral view.

Figs. 50–53. *Chirosia nigripes* Bezzi, ♂: 50, hypopygium, dorsal view; 51, *ditto*, lateral view; 52, aedeagus; 53, 5th sternite, ventral view.

Figs. 54–57. *Chirosia sapporensis* sp. nov., ♂: 54, hypopygium, dorsal view; 55, *ditto*, lateral view; 56, aedeagus; 57, 5th sternite, ventral view.

*7. *Chirosia nigripes* Bezzi
(Figs. 50–53)

Chirosia nigripes Bezzi, 1895:63. *Chirosia nigripes*: Hennig, 1966:65.

Material examined. HOKKAIDÔ — Toyotomi, 1♂, 10-vii-68.

♂. Body-length 3.5 mm; wing-length 3.1 mm. Body blackish in ground colour and densely grey pollinose; interfrontalia blackish on upper half and dark brownish on lower half, with pale grey pollen; parafrontals blackish, with whitish grey pollen; parafacials and cheeks dark brown in ground colour and silvery or whitish grey in pollinosity; occiput black, with whitish grey and a little bluish pollen; antennae and palpi black; haustellum with mentum black and thinly pollinose. Mesonotum with median and lateral vittae, the median one being brownish pollinose. Abdomen with median vitta broad, obscure-margined and brownish pollinose. Legs blackish, femora more or less dark brownish. Wings with a brownish yellow tinge; calyptrae pale, somewhat tinged with yellow; halteres yellow at knob.

Head about 1.24 times as high as long; frons about as wide as A_3-length; interfrontalia about 2.5 times as wide as parafrontalia, with *if* strong; parafrontals with 2 strong and a few vestigial *ori*, and with 1 strong *ors*, which is directed inwards, and still between the *ors* and the upper *ori* on the right parafrontalia with 1 strong seta, which may be regarded as proclinate one though directed inwards; A_3 about 1.8 times as long as A_2; arista distinctly pubescent although the hairs being short, about as long as basal diameter of arista; profrons and cheeks respectively narrower and less high than A_2-length; occiput bare on upper part below postocular row of setulae.

Mesonotum with 3–4 pairs of distinct *pre acr*, distance between the rows shorter than that between *dc* and *acr*; 2nd *ph* like accessory setula or only a little developed; *pra* about half as long as posterior *ntpl*; *stpl* 1: 2, the lower posterior about half as long as the upper; scutellum not haired ventrally, and in the present specimen with or without 1 setula on lateral margins and with no setulae between the apical setae.

Abdomen subcylindrical, about twice as long as wide; 5th sternite (Fig. 53) with processes short; cercal plate (Fig. 50) emarginate apically; surstyli swollen at apex, and thereon inside concave.

Fore tibia with 1 *ad* and 1 *pv*; f_2 with 3–4 *pv* on basal half; t_2 with 1 *pd* and 2 *p–pv*, and without *ad*; f_3 with 5 *av* on apical two-thirds, and with 3–4 *pv* on basal half or a little more; t_3 with 3 *av*, 5 *ad*, 4 *pd*, and 4 *pv*. Wings with costal thorns minute; *m-m* straight.

♀. Unknown.

Distribution. Japan; Italy.

This species may be included in the same group with *Chirosia albifrons* Tiensuu and *Chirosia albitarsis* (Zetterstedt), both of which have not been found in Japan, by the male having the frons with intermediate width, t_2 with no *ad*, cercal plate emarginate apically and 5th sternite similar-shaped. Judging from the 5th sternite and hypopygium the known species most closely related to this group may be *Chirosia similata* (Tiensuu), although the latter has a narrow frons in the male.

8. *Chirosia sapporensis* sp. nov.
(Figs. 54–57)

Type-material. HOKKAIDÔ — Sapporo, 1 ♂ (holotype), 9-v-66 (T. Kocha).

♂. Body-length 4.8 mm; wing-length 4 mm. Blackish in ground colour and dull greyish in pollinosity; interfrontalia with greyish pollen which is tinged with brown; parafacials somewhat yellowish in pollinosity; cheeks with pollen more or less tinged with brown; antennae blackish; haustellum with mentum pollinose. Mesonotum brownish grey pollinose and hardly vittate, at most blackish laterally when viewed from behind. Abdomen thinly pollinose and half-shining, with median vitta narrowing caudad on each tergite and triangulate; basal sclerite of hypopygium shining black. Legs blackish brown; fore tarsus dark brown basally and brown apically. Wings tinged with yellow although not so strongly as in *flavipennis*; calyptrae yellowish; halteres brownish at base and yellowish at knob.

Head about 1.3 times as high as long; frons a little wider than anterior ocellus; interfrontalia slightly narrower than parafrontalia at level of *ors*, and with a pair of strong *if*, some vestigial hair-like setulae being present below the *if*; parafrontals with 3 strong and some vestigial *ori*, and with 1 strong *ors* at middle between anterior ocellus and *if*; A_3 about 1.4 times as long as wide; arista very minutely pubescent; profrons about 0.8 times as wide as A_3; cheeks slightly less high than A_3-width; haustellum rather stout, yet not so robust as in *flavipennis*.

Mesonotum with 4 pairs of fine *pre acr* and with no setulae between the rows, which are separated from each other by a distance about half as long as that between *dc* and *acr*; 2nd *ph* fine; *pra* weaker and a little shorter than posterior *ntpl*; mesopleura with 1 strong and 1–2 fine *pstg*; *stpl* 1: 2; scutellum not haired on ventral surface, with some setulae on lateral margin below the primary setae. Abdomen depressed, about 1.8 times as long as wide and slightly narrowing caudad.

Fore tibia with 1–2 *pv*, and with no *ad* nor *pd*, apical *pv* being distinct though not very strong; f_2 with no distinct *av*, and with 4–5 *pv* on basal half, the longest one being slightly shorter than height of the femur; t_2 with 2 *pd* and 3 *p–pv*, and without *ad*; f_3 with a row of about 10 *av* becoming longer towards apex of the femur, the longest one slightly shorter than height of the femur, and with some slender *pv* on basal half; t_3 with 4–5 short and fine *av*, 5 *ad*, 4 *pd* and 5–6 short and fine *pv*; fore tarsus a little longer than t_1; hind tarsus nearly as long as t_3. Wings with costal thorns short; *m-m* straight.

♀. Unknown.

Distribution. Japan.

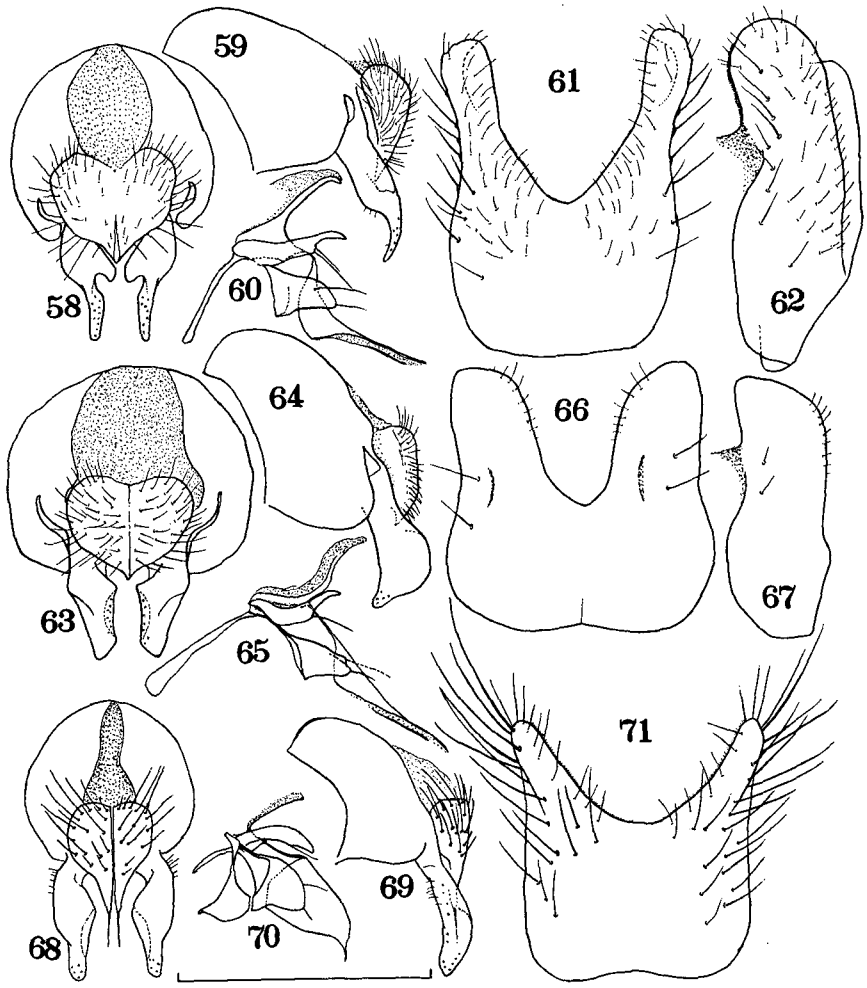
In the shape of the 5th sternite and the profile of the hypopygium *C. sapporensis* remarkably resembles the North American *Chirosia filicis* (Huckett), from which it can be, however, readily distinguished by the dissimilar dorsal view of the hypopygium, shorter *pra*, distinct apical *pv* and absence of *ad* on t_1, and short costal thorns on the wings.

9. *Chirosia yukara* sp. nov.
(Figs. 58–62)

Type-material. HOKKAIDÔ — Mt. Soranuma, 4♂♂ (one the holotype), 17-vi-67,

& 2♂♂, 11-vii-67; Mt. Shokambetsu, 1♂, 1-vii-71.

♂. Body-length 4.4–5.4 mm; wing-length 4.1–4.9 mm. Blackish in ground colour; interfrontalia black, with whitish grey pollen; parafacials and cheeks more or less tinged with yellow in pollinosity; antennae and palpi black; haustellum with mentum black and thinly pollinose. Mesonotum thinly covered with brownish grey pollen, median and lateral vittae being faintly visible when viewed from behind. Abdomen thinly pollinose, more or less brownish in pollinosity; median vitta broad although faint and obscure-margined. Legs black. Wings, calyptrae and halteres strongly yellowish.



Figs. 58–62. *Chirosia yukara* sp. nov., ♂: 58, hypopygium, dorsal view; 59, *ditto*, lateral view; 60, aedeagus; 61, 5th sternite, ventral view; 62, *ditto*, lateral view.

Figs. 63–67. *Chirosia nudisternata* sp. nov., ♂: 63, hypopygium, dorsal view; 64, *ditto*, lateral view; 65, aedeagus; 66, 5th sternite, ventral view; 67, *ditto*, lateral view.

Figs. 68–71. *Chirosia betuleti* (Ringdahl), ♂: 68, hypopygium, dorsal view; 69, *ditto*, lateral view; 70, aedeagus; 71, 5th sternite, ventral view.

Head about 1.1–1.2 times as high as long; frons as wide as or slightly wider than distance between posterior ocelli inclusive; interfrontalia twice or a little more as wide as parafrontalia, and with a pair of strong *if*; parafrontals with 2 (sometimes 3) strong and a few or some vestigial *ori*, and with 1 distinct *ors*; A_3 about 1.4–1.5 times as long as wide; arista distinctly pubescent although the hairs being not longer than diameter of aristal base; profrons and cheeks about 0.7–0.8 times as wide and high respectively as A_3-width; occiput with no setulae on upper part below postocular row of setulae; haustellum with mentum much enlarged.

Mesonotum with 4–6 pairs of *pre acr*, the setae of 1–2 pairs being rather distinct, and with no setulae between the rows, which are separated from each other by a distance as long as or a little longer than half of that between *dc* and *acr*; 2nd *ph* like accessory setula; *pra* strong although shorter than half of posterior *ntpl*; mesopleura with 1 strong and 0–1 fine *pstg*; *stpl* 1:2; scutellum with or without 1–2 setulae on lateral margin below the primary setae and between apical setae respectively, and not haired on ventral surface.

Abdomen depressed basally, about 2.3–2.8 times as long as wide, and slowly narrowing caudad; discal and marginal setae strong although not so stout as in *flavipennis*; 5th sternite and hypopygium as in Figs. 58–62.

Fore tibia with 1 *ad*, 1–2 (usually 1) *pd* and 1–2 *pv*; f_2 with a row of rather short *av*, the setae on basal half being fine, and the setae (about 5–7 in number) on apical half being strong or stout although at most as long as height of the femur, and on basal half with 3–5 slender *pv*; t_2 with 1 *ad*, 1–2 (usually 2) *pd*, 1 *p* and 1–2 *pv*; f_3 with a row of about 10 strong *av*, the longest one being as long as or a little shorter than height of the femur, and with no distinct *pv* except preapical one; t_3 with 4–7 (usually 4–5) *av*, of which distal one is the strongest, and with 4–5 (2–3 strong and 1–2 weak) *ad*, 3–4 *pd* and 5–7 fine *pv*; hind tarsus about 0.8 times as long as t_3. Wings with costal thorns short although more or less stronger than costal setulae; costa haired on ventral surface rather anteriorly; *m-m* straight.

♀. Unknown.

Distribution. Japan.

At first sight this species resembles *C. cinerosa*, from which it can be, however, readily distinguished by f_2 with no robust *pv*, f_3 with *av* not longer than height of the femur, and the 5th sternite not pointed at apex in each process. Although readily distinguishable from *C. parvicornis* by the narrower frons of the male, *C. yukara* bears a striking resemblance to that species in the shape of the 5th sternite and the aedeagus.

10. *Chirosia nudisternata* sp. nov.
(Figs. 63–67)

Type-material. HOKKAIDÔ — Mt. Soranuma, 4♂♂ (one the holotype), 17-vi-67, & 1♂, 15-vi-68 (K. Kusigemati); Mt. Shokambetsu, 1♂, 1-vii-71; Yukomambetsu, 1♂, 8-vii-62 (S. Takagi). HONSHÛ — Mt. Yatsugatake, Nagano-ken, 1♂, 1♀, 18–20-vii-70.

♂. Body-length 4.8–5.7 mm; wing-length 4.2–5 mm. Blackish in ground colour; interfrontalia black, with whitish grey pollen; parafacials and cheeks whitish grey and slightly yellowish in pollinosity; occiput more or less brownish in pollinosity; antennae blackish, often slightly brownish on the 2nd segment

apically; palpi black; haustellum with mentum black and thinly pollinose. Thorax black in ground colour and brownish grey in pollinosity; mesonotum when viewed from behind with rather broad and faintly visible median and lateral vittae. Abdomen brownish grey pollinose, shining in some lights, and with broad and faint median vitta; 5th sternite with processes largely polished on apical half. Wings and calyptrae strongly yellow; halteres brownish or reddish at base and yellowish at knob.

Head about 1.2 times as high as long; frons a little narrower than distance between posterior ocelli inclusive; interfrontalia usually about as wide as parafrontalia, with a pair of strong *if*; parafrontals with 2 strong and a few or some vestigial *ori* and 1 distinct *ors*; A_3 about 1.5–1.6 times as long as wide; arista distinctly pubescent although the hairs being not longer than basal diameter of arista; profrons and cheeks respectively about 0.6–0.8 times as wide and high as A_3-width; occiput bare on upper part below postocular row of setulae, or at most thereon with 1–2 setulae; haustellum with mentum much enlarged.

Mesonotum with 3–6 irregular pairs of *pre acr*, of which a few pairs are rather strong, and usually with a few setulae between the rows, which are separated from each other by a distance a little longer or shorter than half of that between *dc* and *acr*; 2nd *ph* fine, like accessory setula or slightly longer; *pra* strong although short, about half as long as posterior *ntpl*; *stpl* 1: 2, often with rather distinct additional posterior one; scutellum with a few setulae on lateral margin below the primary setae and with 1 or a few setulae between the apical setae, and not haired on ventral surface. Abdomen depressed except on rather swollen hypopygium, and about 2–2.25 times as long as wide, becoming narrower caudad.

Fore tibia with 2–3 (only 1 on the right body-side in the holotype) *ad* and 1–3 (usually 2) *p–pv*, and in 2 paratypes with 1 strong *pd* on one body-side; f_2 with a row of *av*, of which some (6–8) ones on apical half to two-thirds are strong or stout although the longest one is a little shorter than height of the femur, and on basal half to two-thirds with 3–4 robust *pv*, the longest one about 1.5 times as long as height of the femur; t_2 with 1 (rarely 2) *ad*, 1 *pd*, 1–2 (usually 1) *p* and 1–2 *pv*; f_3 with a row of 7–10 strong *av*, the longest one being more or less longer than height of the femur, and on basal half to two-thirds with some slender *pv*, the longest one rather distinctly longer than height of the femur; t_3 with 4–5 *av*, 5–6 *ad* (not uniform in length), 3 strong and 1–4 weak *pd* and 6–10 fine *pv*; hind tarsus about 0.8 times as long as t_3. Wings with costal thorns distinct though short; costa haired ventrally; *m-m* straight.

♀. On the basis of a single specimen the female characters will be given as follows: — Interfrontalia dark brownish on lower half and blackish on the upper; abdomen more thinly pollinose than in male and shining. Head only a little higher than the length, about 1.1 times so; frons about 0.36 times as wide as head; interfrontalia slightly more than twice as wide as parafrontalia; parafrontals with 2 strong and 1–2 vestigial *ori*, and with 1 proclinate and 1 reclinate *ors* (in addition with 1 short setula above the reclinate *ors* on the right parafrontalia in this specimen); profrons about four-fifths of A_3 in width; cheeks about two-thirds as high as A_3-width; upper part of occiput with a few setulae below postocular row of setulae. Mesonotum with no setulae between rows of *acr*; *stpl* 1: 2. Abdomen not depressed, about twice as long as wide, and long ovoid when viewed from above.

Fore tibia with 1 *ad*, and on the right body-side with 1 *pv* (absence of *pv* on the left may not be normal); f_2 with 6–7 *av* on apical half and 3 *pv* on basal half, these setae being not so strong as those of male and the longest ones of *av* and *pv* being about as long as height of the femur; t_2 with 1 *ad*, 1 *pd*, 1 *p* and 1 *pv*; f_3 with 8–9 *av* and 3 *pv*; t_3 with 3 *av*, 2 long and 3 short *ad*, 3–4 long and 1 short *pd* and only 1 fine *pv*.

Distribution. Japan.

C. nudisternata may be placed between *flavipennis* and *cinerosa* by having the male 5th sternite similar to that of *flavipennis* in the outline and to that of *cinerosa* in the setal pattern and by having the male genital structures showing a intermediate state. This species, however, can be readily distinguished from *flavipennis* by the arista merely pubescent and from *cinerosa* by the longer *pv* on f_3 in the male and the setal pattern of *stpl* arranged in 1: 2 in the female.

*11. *Chirosia betuleti* (Ringdahl)
(Figs. 68–71)

Anthomyia signata Brischke, 1888:1, nec Meigen, 1826. *Hylemyia* (*Melinia*) *betuleti* Ringdahl, 1935:30. *Chirosia signata*: Collin, 1955:97. *Chirosia betuleti*: Hennig, 1966:58.

Material examined. HOKKAIDÔ — Sapporo, 1♂, 27-v-68; Nopporo, 1♂, 14-v-69, & 1♂, 5-v-70; Eniwa, 1♂, 25-v-66; Mt. Soranuma, 1♂, 27-v-66, & 2♂♂, 17-vi-67; Shikotsu-ko, 1♂, 2♀♀, 18-v-71; Mt. Shokambetsu, 1♂, 1-vii-71; Mt. Daisetsu, 1♂, 22-vii-68. HONSHÛ — Mt. Yatsugatake, Nagano-ken, 2♂♂, 4-vi-67 (T. Kocha).

♂. Body-length 3.8–6.6 mm (mostly 4.5–6 mm); wing-length 3.2–5.4 mm. Blackish in ground colour and whitish- or bluish-grey in pollinosity. Interfrontalia sometimes brownish in ground colour. Mesonotum usually with a brownish tinge in pollinosity, and when viewed from behind with obscure median and lateral vittae. Abdomen rather distinctly pollinose, with median vitta narrow or broad and not sharp; 5th tergite usually shining although thinly pollinose. Wings with a brownish tinge, darker at base; calyptrae whitish, slightly yellowish marginally.

Head about 1.2–1.3 times as high as long; frons about 1.5–2 times as wide as anterior ocellus; interfrontalia at most half as wide as anterior ocellus, and with *if* as strong as or distinctly weaker than *ors*; parafrontals with 3–5 (usually 4–5) strong and no or a few fine or vestigial *ori* and with 1 strong *ors*; A_3 about 1.4–1.6 times as long as wide; arista very minutely pubescent; profrons usually about as wide as A_3; cheeks as high as or somewhat less high than A_3-width; occiput with many setulae on upper part below postocular row of setulae; haustellum with mentum not so enlarged.

Mesonotum with 3 pairs of strong *pre acr* and often in addition with 1–2 pairs of fine ones, setae of the 1st pair being separated from each other by a distance as long as half or slightly more of that between *dc* and *acr*; in larger specimens some setulae often present between the rows of *pre acr*; 1–2 secondary *ph* rather well developed; *pra* about as long as anterior *ntpl*; *stpl* 2:3, the lowest posterior being weaker than the uppers, sometimes only a little stronger than accessory setulae; scutellum with some (in smaller specimens) or many (in larger ones) fine accessory setulae on dorsal surface laterally and on lateral margin, often (in 7 specimens of the 12 examined ones) with 1 or a few fine hairs on ventral surface.

Abdomen depressed, about 2–2.7 (usually 2.2–2.4) times as long as wide, and slowly narrowing caudad; 5th sternite and hypopygium as in Figs. 68–71.

Fore tibia usually with no *ad*, and with 1–3 *pv*, apical *pv* being weak; f_2 with no distinct *av*, and with 4–8 distinct *pv* on basal half to two-thirds, the longest one distinctly longer than height of the femur in most cases; t_2 with 1 *ad*, 1 *pd* and 3–4 *p–pv*; f_3 with a row of 7–11 strong *av*, the longest one being slightly or distinctly longer than height of the femur, and with 2–6 distinct or strong *pv* on middle half or basal two-thirds, the longest one being shorter or longer than height of the femur; t_3 with 5–9 *av*, 5–7 *ad* (not uniform in length), 3–6 (of them 3 longer than the rest) *pd* and many (7–16) *pv*; fore tarsus about as long as t_1; hind tarsus a little shorter than t_3. Wings with costal thorns short; *m-m* nearly straight.

♀. Abdomen very thinly pollinose and shining, without markings. Wings yellowish rather than brownish.

Frons about one-third as wide as head; interfrontalia about 2.5–3 times as wide as parafrontalia; parafrontals with 3 *ors*, and with 1–2 minute setulae outside *ors*; occiput somewhat swollen; haustellum with mentum rather enlarged. Mesonotum with 1–2 short secondary *ph*; *stpl* 2: 2, the lower anterior being fine though distinguishable from accessory setulae, and the lower posterior fine or strong; scutellum with or without a fine hair on ventral surface. Abdomen long-ovoid, about 1.6–1.7 times as long as wide.

Fore tibia with 1 *ad* and 1–2 *pv*, apical *pv* being strong; t_3 without *pv*; fore tarsus a little longer than t_1.

Distribution. Japan; Europe.

*12. *Chirosia similata* (Tiensuu)
(Figs. 72–75)

Acrostilpna similata Tiensuu, 1939:246. *Chirosia similata*: Collin, 1955:97; Hennig, 1966:67.

Material examined. HOKKAIDÔ — Sapporo, 1♂, 17-v-60 (S. Takagi), & 23 ♂♂, 2-vi-68 (K. Kusigemati); Nopporo, 1♂, 14-v-69, & 1♂, 17-v-70.

♂. Body-length 5–6.4 mm; wing-length 4.5–5.2 mm. Black in ground colour and whitish grey or bluish grey in pollinosity. Interfrontalia, parafacials and cheeks sometimes brownish in ground colour. Mesonotum with or without a brownish tinge in pollinosity. Abdomen densely pollinose, half-shining in some lights, with median vitta narrow and sharp or obscure. Wings more or less tinged with brown or brownish yellow; calyptrae whitish, only a little yellowish marginally.

Head about 1.2–1.3 times as high as long; frons twice as wide as anterior ocellus, or nearly so; interfrontalia narrow, at most half as wide as anterior ocellus, and with *if* strong; parafrontals with 3–4 (usually 3) *ori* and 1 strong *ors*; A_3 about 1.5 times as long as wide; arista very minutely pubescent, nearly bare; profrons usually a little narrower than A_3; cheeks less high than profrons-width; occiput with many setulae on upper part below postocular row of setulae; haustellum with mentum not so enlarged.

Mesonotum with 3 pairs of strong and a few pairs of fine *pre acr*, and with or without a few setulae between the rows; distance between the rows of *pre acr* about two-thirds of that between *dc* and *acr*; 1 distinct secondary *ph* present; *pra* about

as long as anterior *ntpl*; *stpl* 2:2 or 2:3, the lower anterior and the lowest posterior being often very fine; scutellum with some or many setulae on dorsal surface laterally and on lateral margin, and with some fine hairs on ventral surface.

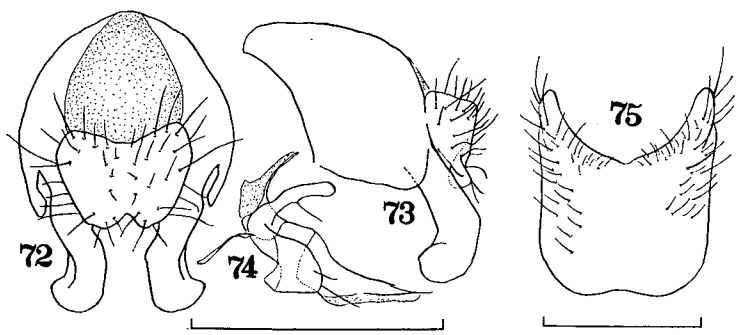
Abdomen depressed, slowly narrowing caudad, and about 2.5–2.9 times as long as wide; 5th sternite and hypopygium as in Figs. 72–75.

Fore tibia with 1 distinct *ad* (usually in addition with 1–2 weaker *ad* on apical third), and with 1 (rarely 2 or 3) *pv*, apical *pv* being rather well developed although shorter than apical *pd*; f_2 with no distinct *av*, and with 4–5 strong *pv* on basal half, the longest one distinctly longer than height of the femur; t_2 with 1 *ad*, 1 *pd* and 2–4 (usually 3) *p–pv*; f_3 with a row of 7–11 strong *av*, the longest one slightly or distinctly longer than height of the femur, and on basal half to two-thirds with 4–5 strong *pv*, which are nearly as long and strong as *av*; t_3 with 4–7 *av*, 5 *ad*, 5–6 *pd* (not uniform in length) and many (9–14) *pv*; fore tarsus a little longer than t_1; hind tarsus about four-fifths of t_3 in length. Wings with costal thorns distinct.

♀. Unknown.

Distribution. Japan; Europe.

It may not be easy to distinguish *C. similata* from *C. betuleti* unless the hypopygial structure is seen. Nevertheless some external characters of the male of the present species may be useful to separate it from *betuleti*: — Abdomen pollinose on 5th tergite as densely as on preceding tergites; profrons a little narrower than A_3; t_1 always with *ad*, and with strong apical *pv*; fore tarsus a little longer than t_1.



Figs. 72–75. *Chirosia similata* (Tiensuu), ♂: 72, hypopygium, dorsal view; 73, *ditto*, lateral view; 74, aedeagus; 75, 5th sternite, ventral view.

4. Genus *Shakshainia* gen. nov.

Type-species: *Shakshainia rametoka* sp. nov.

This genus is erected for the reception of a single new species on the basis of the combination of the following characters:—

♂ & ♀. Frons wider than one-third head-width; interfrontalia without *if*, at most with very fine or vestigial ones; parafrontals normally with no *ors*; haustellum not robust or slender, with mentum pollinose. Propleura, pteropleura and prosternum bare; mesopleura with a strong anterior *mpl*; scutellum haired on ventral surface. Mid tibia without *av* or *v*; t_3 with strong apical *pv*. Wings with costa haired on ventral surface; lower calyptra smaller than the upper.

♂. Abdomen subcylindrical; prebasal sclerite of hypopygium bare and concealed beneath 5th tergite; surstyli cleft apically; praegonites and distiphallus not reduced.

Each of the characters mentioned above is seen in various genera of this family, but the combination of the wide-fronted head and the absence of *ors* is characteristic of the present new genus and may afford a sound basis to recognize this genus as distinct. Without consideration given to this combination of characters the genus may be closer to *Meliniella* gen. nov. described hereinafter rather than to any other known genera in having the haustellum normal and with pollinose mentum, a strong anterior *mpl* on the mesopleura, a strong apical *pv* on t_3, the apically cleft surstyli of the male, and the distiphallus of the male without a projection at base.

1. *Shakshainia rametoka* sp. nov.
(Figs. 3 & 11–14)

Type-material. HOKKAIDÔ — Shikotsu-ko, 7♂♂ (one the holotype), 25♀♀, 18-v-71; Sapporo, 3♂♂, 20-iv-59 (S. Ueda), 3♂♂, 1♀, 20-v-59 (S. Ueda), 2♂♂, 9–15-v-65 (T. Kocha), 2♂♂, 1♀, 11-v-66, 1♂, 1-v-68 (T. Kocha), 1♀, 1-vi-68 (H. Torikura), 1♀, 18-v-68 (H. Torikura), 2♂♂, 3-v-69, & 2♂♂, 3-v-70; Jôzankei, 1♀, 26-v-68 (K. Kusigemati), 2♀♀, 15-vi-66, & 1♂, 4-v-69; Mt. Soranuma, 1♀, 19-v-68 (S. Umezawa); Hiroshima-mura, 1♀, 11-vi-66; Eniwa, 4♀♀, 25-v-66, 1♀, 27-v-71; Nopporo, 1♀, 18-v-66, 2♂♂, 6-v-68, 2♂♂, 1♀, 14-v-69, 8♂♂, 3♀♀, 5–17-v-70; Mt. Shokambetsu, 1♀, 1-vii-71.

♂. Body-length 5.8–6.9 mm; wing-length 4.8–5.6 mm. Blackish in ground colour. Interfrontalia black, with whitish grey pollen often more or less tinged with yellow; parafrontals, parafacials and cheeks black in ground colour, with a yellowish tinge in pollinosity; occiput black, with greyish pollen, which is more or less tinged with brown or yellow; antennae and palpi black; haustellum with mentum black and pollinose. Thorax black in ground colour and brownish grey pollinose; mesonotum when viewed from front with brownish pollinose median vitta, and when viewed from behind with broad median and lateral black vittae and with narrow and faint sublateral ones. Abdomen black in ground colour, whitish grey and more or less bluish in pollinosity, which is often faintly tinged with yellow, and in some lights with tessellations; median vitta rather broad and usually distinct when viewed from behind; tergites more or less darkened on fore margin when viewed from behind; hypopygium pollinose; 5th sternite black and shining. Legs black. Wings rather distinctly tinged with brown or brownish yellow; calyptrae whitish, slightly tinged with yellow marginally; halteres yellow at knob.

Head (Fig. 3) distinctly protruded forwards at lunule, and only a little higher than the length, about 1.1–1.15 times as high as long; frons about 0.38–0.4 times as wide as head; interfrontalia as wide as or a little narrower than A_3-length, and without *if*, at most in some specimens with fine or microscopical ones, which are paired or not; parafrontals with 4–9 (usually 5–7) strong *ori* from the level near lunule to the level near anterior ocellus, in some specimens the uppermost one being proclinate and may be referred to reverted *ors*; A_3 about 2–2.25 times as long as wide; arista rather distinctly swollen at base, and practically bare; profrons about 1.2–1.5 times as wide as A_3; cheeks about as high as A_3-width, with genal

setae in a row, space between eyes and genal setae being broadly maintained caudad; epistoma distinctly behind frons at lunule, about as far as anterior eye-margin; occiput swollen, with some setulae on upper part below postocular row of setulae; ocellar setae longer and stronger than *ori*; ocellar triangle with 3–5 (usually 4) long and 0–3 shorter secondary ocellar setae, the longer ones being a little longer than half of ocellar setae; post-ocellar setae divergent, and as long as or a little longer than secondary ocellar setae; inner vertical setae more or less longer and stronger than ocellar setae; outer vertical setae a little shorter than *ori*; palpi stick-like and only a little shorter than A_2 and A_3 combined; haustellum rather small for the head-size, about as long as A_3.

Mesonotum with 3–4 pairs of *pre acr*, which are fine and like accessory setulae, the rows being very narrowly separated from each other; 1 *ph* present; *pra* about as long as anterior *ntpl*; notopleura sometimes with 1–2 accessory setulae; mesopleura with a strong anterior *mpl*, and with 1 strong and 1 weaker *pstg*; *stpl* 2: 2, the lower anterior being more or less shorter and weaker than the upper; scutellum sparsely setulose on dorsum laterally, with a few setulae between the apical setae, and haired on ventral surface.

Abdomen slightly depressed, subcylindrical, twice or a little more as long as wide, and becoming narrower caudad; tergites with strong marginal setae longer laterad, and with a few strong lateral setae shorter than the marginal ones; 5th sternite (Fig. 14) flat and strongly chitinized, with processes tapering apicad; hypopygium with very large cercal plate and deeply cleft surstyli; praegonites and postgonites (Fig. 13) with no strong setae.

Fore tibia with 1 distinct *ad* near apical third (rarely with 1 additional *ad* near apical fourth) and 1–2 (usually 2) strong *pv*, sometimes with 1 distinct or strong *p* near basal third, and with 4 strong apical setae (*ad*, *d*, *pd* and *pv*); f_2 with no distinct *av*, and on basal two-thirds with some (4–8) slender *pv*, the longest one being a little longer than height of the femur; t_2 with 1 *ad*, and with 3 strong and 0–2 (usually 1) additional *pd–pv*; f_3 on apical two-thirds with 4–7 (usually 5–6) *av*, the longest one being rather distinctly longer than height of the femur, and with a few or some *pv* near middle and 1 or a few stronger *pv* near apex, the longest preapical one being as long as or somewhat longer than height of the femur; t_3 with 3–5 (usually 3) *av*, 3–6 (2–3 long and 1–4 shorter) *ad*, 3–5 (2–4 long and 1–2 shorter) *pd* and no *pv*, and with 5 strong apical setae (*av*, *ad*, *d*, *pd* and *pv*); hind tarsus distinctly longer than t_3, about 1.3 times; pulvilli small. Wings with costa haired on ventral surface; costal thorns distinguishable from costal setulae although short; *m-m* only a little curved inwards.

♀. Body-length 6–8.2 mm; wing-length 5.6–6.6 mm. In general appearance there are found no distinct differences from the male. Eyes more or less relatively smaller than those of male, and consequently frons, profrons and cheeks more or less relatively wider and higher than those of male respectively. Mesonotum with *pra* as long as or a little shorter than anterior *ntpl*. Abdomen depressed, and ovoid when viewed from above.

Distribution. Japan.

5. Genus *Meliniella* gen. nov.

Type-species: *Meliniella sikisima* sp. nov.

This genus is characterized by the combination of the following aspects:—

♂. Frons much narrower than one-third head-width; interfrontalia with *if* even if they are fine; epistoma distinctly behind frons at lunule; occiput setulose on upper part below postocular row of setulae; haustellum not robust or lengthened, with mentum pollinose. Mesonotum with *pra* longer than posterior *ntpl*; mesopleura with anterior *mpl* at least distinguishable from accessory setulae; scutellum haired or bare on ventral surface. Abdomen with hypopygium polished on prebasal sclerite and on cephalic margin of basal sclerite, or wholly pollinose; postgonites narrow and not projected at setal base; praegonites not reduced; distiphallus not reduced, without a projection at base. Hind tibia with or without *pv*, and with strong apical *pv*. Wings with costa haired ventrally; lower calyptra smaller than the upper.

♀. The females of this genus are unknown except for that of *M. sikisima*. Frons not narrower than one-third head-width; interfrontalia with strong *if*; parafrontals with 3 strong *ors*; t_3 with apical *pv* strong as in male, and with no *pv*.

Apart from the preceding *Shakshainia*, which is separable from *Meliniella* by the wide frons of the male and by the absence of *if* and *ors* in both sexes, the present genus closely resembles *Craspedochoeta* in general appearance. However, it may be separated from the latter by the narrow postgonites and by the distiphallus lacking a projection at base. In this sense *Melinia* [=*Craspedochoeta*] *bisinuata* Tiensuu will be transferred to this genus. Hereinafter will be described 3 new species under the genus.

Key to the species (♂♂)

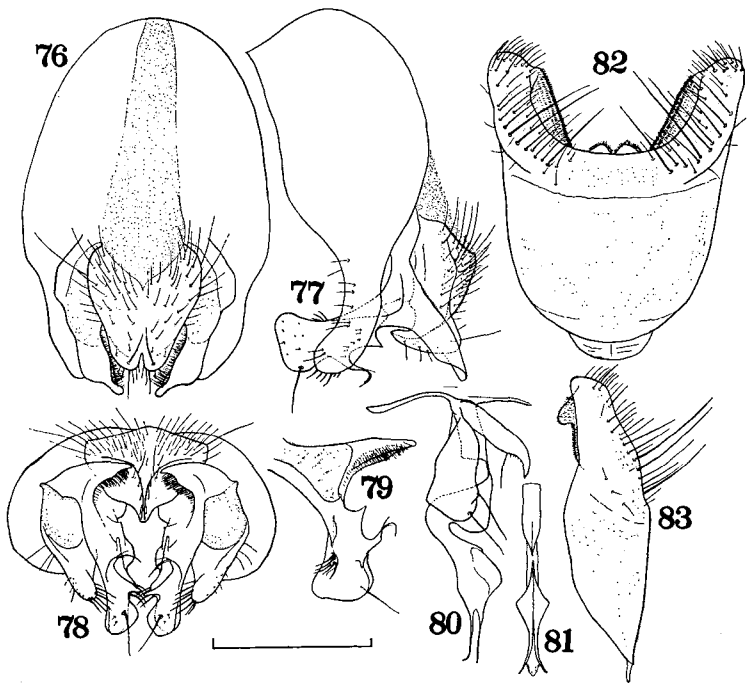
1. Notopleura with a few or some accessory setulae. 2
– Notopleura with no accessory setulae. 3
2. Larger and hairy species, body-length about 7 mm; 2nd *ph* well developed; abdomen with tufts of setae on 3rd and 4th sternites. .....2. *miyazakii* sp. nov.
– Smaller and not so hairy species, body-length 4.4–5.3 mm; 2nd *ph* fine; abdomen with no tufts of setae on 3rd and 4th sternites. .....3. *bisinuata* (Tiensuu)
3. Abdomen stout, shorter than head and thorax combined; arista with the longest hairs more or less longer than basal diameter of arista; t_3 with apical *pv* about half as long as apical *av*. .....1. *sikisima* sp. nov.
– Abdomen elongate, longer than or at least as long as head and thorax combined; arista with the longest hairs shorter than basal diameter of arista; t_3 with apical *pv* about as long as apical *av*. .....4. *watanabei* sp. nov.

1. *Meliniella sikisima* sp. nov.
(Figs. 1, 2 & 76–83)

Type-material. HONSHÛ — Mt. Hakkôda, Aomori-ken, 1♂, 19-viii-66; Mt. Hodaka, Nagano-ken, 55♂♂ (one the holotype), 16♀♀, 1–3-viii-70; Mt. Chôgatake, Nagano-ken, 1♂, 1♀, 30-vii-70; Mt. Shirouma, Nagano-ken, 4♂♂, 1♀, 5-viii-70; Mt. Yatsugatake, Nagano-ken, 1♂, 20-vii-70; Mt. Kiso-Komagatake, Nagano-ken, 1♂, 1♀, 27-vii-70.

♂. Body-length 6.1–8.4 mm; wing-length 5.7–7.5 mm. Body black in ground colour and densely covered with whitish grey pollen, which is more or less tinged with blue. Interfrontalia black, with whitish pollen; parafrontals, parafacials and cheeks silvery white in pollinosity, pollen of the last being sometimes slightly tinged with yellow; face with a brownish tinge in pollinosity; occiput more

or less tinged with brown in pollinosity especially on lower part; antennae and palpi black; haustellum with mentum black and distinctly pollinose. Mesonotum variously vittate according to visual angles, when viewed from behind with narrow median and broad lateral vittae, the median one somewhat broadening caudad. Abdomen sometimes with a faint yellowish tinge in pollinosity, and tessellated in some lights; hypopygium densely pollinose like preceding segments; median vitta rather broad; fore marginal bands not present. Wings tinged with yellow, strongly at base; veins yellow on basal half and brown on apical half; calyptrae strongly yellow; halteres brown at base and yellow at knob.



Figs. 76–83. *Meliniella sikisima* sp. nov., ♂: 76, hypopygium, dorsal view; 77, *ditto*, lateral view; 78, *ditto*, caudal view; 79, surstylus, inside view; 80, aedeagus; 81, distiphallus, dorsal view; 82, 5th sternite, ventral view; 83, *ditto*, lateral view.

Head (Fig. 2) about 1.2 times as high as long; frons about 1.5–1.8 times as wide as distance between posterior ocelli inclusive; interfrontalia wider than anterior ocellus, often twice as wide as the latter, with a pair of strong *if*, and usually with a few or some fine or vestigial setulae near *if*; parafrontals with 3 strong (the middle one being often weakened) *ori* and above them often with 1 weaker one, some vestigial setulae being present outside these *ori*, and without *ors*; A_3 as long as or somewhat longer than twice the width; arista distinctly pubescent, the longest hairs being more or less longer than basal diameter of arista; profrons 1.4–1.9 (usually 1.5–1.6) times as wide as A_3; cheeks as high as or a little higher than profrons-width, with genal setae in a row; palpi shorter than A_2 and A_3 combined; haustellum with mentum more or less shorter than palpi.

Mesonotum with 3–5 irregular pairs of distinct *pre acr*, the rows being very narrowly separated from each other and almost contiguous near the suture; 2nd *ph* fine and like accessory setula; *pra* more or less longer than anterior *ntpl*; notopleura with no accessory setulae; mesopleura with 1–2 strong anterior *mpl*, and with 2 strong (1 long and 1 shorter) *pstg* and some (4–9) associated fine setulae, of which 1–2 are often seta-like; stpl 2: 2, the lower anterior shorter and weaker than the upper although much stronger than accessory setulae; scutellum not setulose on dorsal centre, and very sparsely haired or entirely bare on ventral surface.

Abdomen stout and conical, about 2.3–2.6 times as long as wide, being widest on 2nd segment and becoming narrower caudad; lateral margins of tergites approximate to each other on ventral side and nearly contiguous on 3rd and 4th segments; prebasal sclerite entirely exposed and fused to basal sclerite, rarely with 1–2 fine setulae; 5th sternite (Fig. 82) with setae directed inwards; anal sclerite much prolonged caudo-laterally and thereon with some short and strong setae; cercal plate folded back near apex laterally; surstyli (Figs. 78 & 79) much complicated; aedeagus as in Figs. 80 & 81.

Fore tibia with 1–2 *ad* (the proximal one shorter) and 2–3 strong *pv*, and with strong apical *d*, *pd* and *pv*; apical *ad* fine, apical *p* rather strong, and accessory setulae on posteroventral surface rather lengthened; f_2 with a row of short and strong *a* although the row is often interrupted near the apical third, on apical half with 2–5 short and strong *av*, the longest one being at most as long as height of the femur, and on basal two-thirds with 4–6 long *pv*, the longest one being 1.5 or more times as long as height of the femur, accessory setulae on posteroventral surface rather lengthened; t_2 with 1–2 (usually 1) *ad*, 1 *pd* and 2–6 (usually 4–5) *p–pv*; f_3 with rows of long *av* and *pv*, the *pv*-row being interrupted near the apical third, and with an oblique row of many (15–20) long and rather strong setae from posteroventral at base to posterodorsal at basal fourth to third; t_3 with a row of about 10 long and slender *av*, accessory setulae just above the row being rather lengthened and forming a row, and with 3–4 strong and some rather distinct *ad*, with 6–8 *pd* (not uniform in length), the seta near apical third being the strongest and about one-third as long as the tibia, and usually with some fine *pv*; t_3 with apical *pv* about half as long as apical *av* though strong; hind tarsus shorter than t_3, about four-fifths of the latter. Wings with costa haired ventrally; costal thorns distinct or rather strong though usually not very long; *m-m* upright and nearly straight.

♀. Body-length 6.5–8.7 mm; wing-length 5.9–7.7 mm. Interfrontalia black to reddish brown in ground colour and often tinged with yellow or brown in pollinosity; parafacials and cheeks often somewhat reddish in ground colour. Abdomen less densely pollinose than in male, half-shining in some lights; median vitta absent, if present very obscure.

Head about 1.1–1.2 times as high as long; frons as wide as or a little wider than one-third head-width; interfrontalia about twice as wide as parafrontalia; parafrontals with 3 strong normal *ors*, the upper reclinate one being more or less shorter than the lower (in 3 specimens with 1 additional proclinate *ors* at the level between the 2 reclinate ones on right or left body-side); profrons about 1.5–2 times as wide as A_3; cheeks less high than profrons-width. Abdomen depressed or not, according to drying condition, and ovoid when viewed from above; tergites

with rather strong discal and lateral setae and strong marginal setae.

Fore tibia usually with 2 *ad* and 2 *pv*; t_2 usually with 2 *ad*, 1 *pd* and 3–4 *p–pv*; t_3 with 5–8 *av*, which are more or less shorter and stronger than those of male, and with no *pv*; f_3 on posterior side near base with setae less numerous and weaker than those of male; accessory setulae on legs not lengthened. Wings with costal thorns usually somewhat stronger than those of male.

Distribution. Japan.

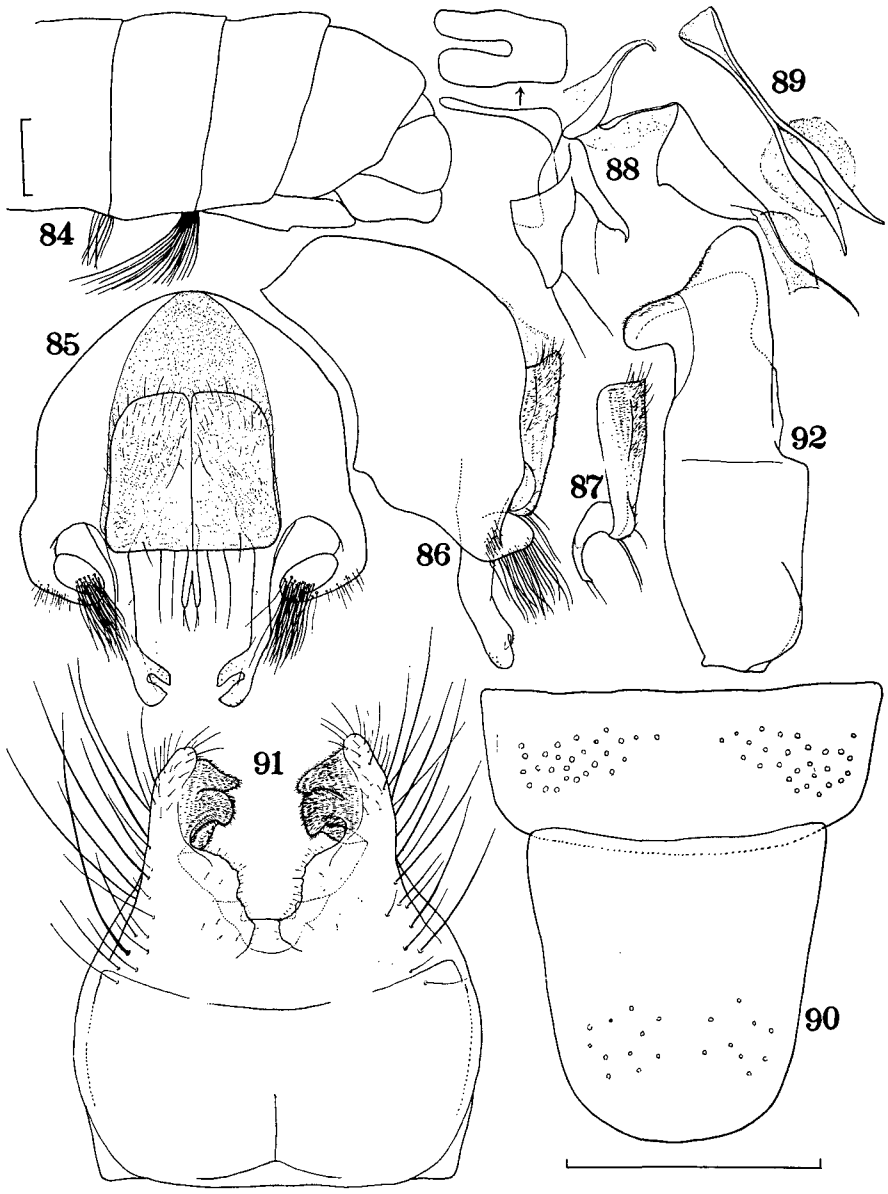
2. *Meliniella miyazakii* sp. nov.
(Figs. 84–92)

Type-material. HONSHÛ — Mt. Seppiko, Hyôgo-ken, 1 ♂ (holotype), 19-iv-66 (M. Miyazaki).

♂. A stout and hairy species. Body-length 7 mm; wing-length 6.3 mm. Body including appendages black in ground colour. Interfrontalia whitish grey pollinose; parafacials silvery white in pollinosity; cheeks whitish grey and slightly brownish yellow in pollinosity; haustellum with mentum pollinose. Thorax bluish grey pollinose, more or less tinged with brown in pollinosity on pleura; mesonotum when viewed from front with narrow paramedian vittae between *acr* and *dc* from anterior margin of mesonotum to near 2nd *post dc*, and with sublateral and lateral dark markings, and when viewed from behind with 3 broad black markings, which are separated from each other by a narrow grey vitta along *dc* and when viewed from front at low angle are largely brownish pollinose; scutellum brownish pollinose, and when viewed from behind wholly blackish. Abdomen rather densely pollinose, with broad median vitta and distinct fore marginal bands, the markings on 4th and 5th tergites being triangulate; hypopygium pollinose. Wings strongly tinged with brownish yellow; calyptrae yellow; halteres brownish at base and brownish yellow at knob.

Head about 1.26 times as high as long; frons about 1.5 times as wide as anterior ocellus; interfrontalia about half of anterior ocellus in width, with a pair of strong and a single distinct *if* respectively a little above and below the middle between anterior ocellus and uppermost *ori*, and with some vestigial setulae at narrowing part; parafrontals with 8–9 long and strong and some short and fine *ori*; left parafrontalia with 1 distinct proclinate *ors* at the level a little below the paired *if*; head in profile with distance between anterior ocellus and tip of profrons much longer than that between tip of profrons and vibrissal base and about 1.6 times as long as the latter; antennal base situated near middle of head-height; A_3 about 1.5 times as long as wide; arista gradually narrowing apicad and practically bare; profrons and cheeks respectively a little narrower and less high than A_3-width; cheeks with genal setae in a few rows; epistoma as far as anterior eye-margin; palpi stick-like, about as long as A_2 and A_3 combined, and with many slender setae; haustellum with mentum about as long as A_3; labella rather large; postocular row being composed of long and short setae reciprocally, the longer ones being about as long as outer vertical setae.

Thorax rather densely setulose, primary setae long; mesonotum with 3 irregular pairs of distinct *pre acr*, setae of the middle pair the strongest, about as long as anterior *ntpl*, the rows very narrowly separated from each other; *post acr* except a prescutellar pair like accessory setulae; 2 well developed and 2 rather



Figs. 84–92. *Meliniella miyazakii* sp. nov., ♂: 84, abdomen, lateral view; 85, hypopygium, dorsal view; 86, *ditto*, lateral view; 87, cercal plate, lateral view; 88, aedeagus; 89, distiphallus, dorsal view; 90, 3rd (lower) and 4th (upper) sternites, ventral view, showing setal position; 91, 5th sternite, ventral view; 92, *ditto*, lateral view.

strong *ph* present; *pra* about as long as anterior *ntpl*; notopleura with 2 accessory setulae near base of anterior *ntpl*; mesopleura with 3 strong anterior *mpl*, and with 2 normal *pstg* and 7–8 rather long associated setulae; *stpl* 1: 3, with many slender accessory setulae; scutellum rather densely setulose dorso-laterally and bare on dorsal centre, rather densely haired on ventral surface.

Abdomen cylindrical, about 1.8 times as long as wide, and when viewed from above distinctly narrowing caudad; 3rd sternite with many short setae directed downwards; 4th sternite with tufts of many long setae directed cephalad; 5th sternite and hypopygium as in Figs. 85–89, 91 & 92; anal sclerite prolonged and curled up inwards at caudo-lateral parts and thereon with many slender setae; cercal plate quadrate, densely covered with minute hairs, and with a bifurcated apical projection.

Fore tibia with 1 *pd* and 3 *pv*, and without *ad*, apical *ad* distinct although not very strong, apical *pv* strong; f_2 with no distinct *av* and with a row of slender *pv*, which are longer than height of the femur; t_2 with about 10 *pd–pv* and without *ad*; f_3 with a row of long *av* becoming stronger towards apex of the femur, the strongest one about 1.4 times as long as height of the femur, and with no distinct *pv* except for some preapical ones; t_3 with 5–6 *av*, 4–5 *ad*, 5–6 *pd* and no *pv*, and with 5 strong apical setae (*av*, *ad*, *d*, *pd* and *pv*). Wings with costa haired ventrally; costal thorns vestigial and indistinguishable from costal setulae; *m-m* nearly upright and very slightly sinuate.

♀. Unknown.

Distribution. Japan.

This species shares some aspects with members of some other genera: — A bifurcated apical projection on the cercal plate and apically cleft surstyli are often seen in *Pegohylemyia*; the presence of more than 2 *ph* is seen in *Lasiomma*; the combination of a short and pollinose mentum of the haustellum, a strong apical *pv* on t_3 and strong anterior *mpl* on the mesopleura is also seen in *Craspedochoeta*; the broad distiphallus of this species is similar to those of certain species of *Chirosia*. The present species, however, cannot be referred to *Pegohylemyia* because of the strong apical *pv* on t_3 and of the well-developed praegonites and distiphallus, to *Lasiomma* because of the stout abdomen and the peculiar cercal plate, to *Craspedochoeta* because of the surstyli with no spine-like setae and the distiphallus without a projection at base, and to *Chirosia* because of the smaller haustellum, the ventrally haired scutellum and the apically cleft surstyli. At present I am inclined to the opinion that this new species is to be included in *Meliniella*.

*3. *Meliniella bisinuata* (Tiensuu) comb. nov.
(Figs. 93–97)

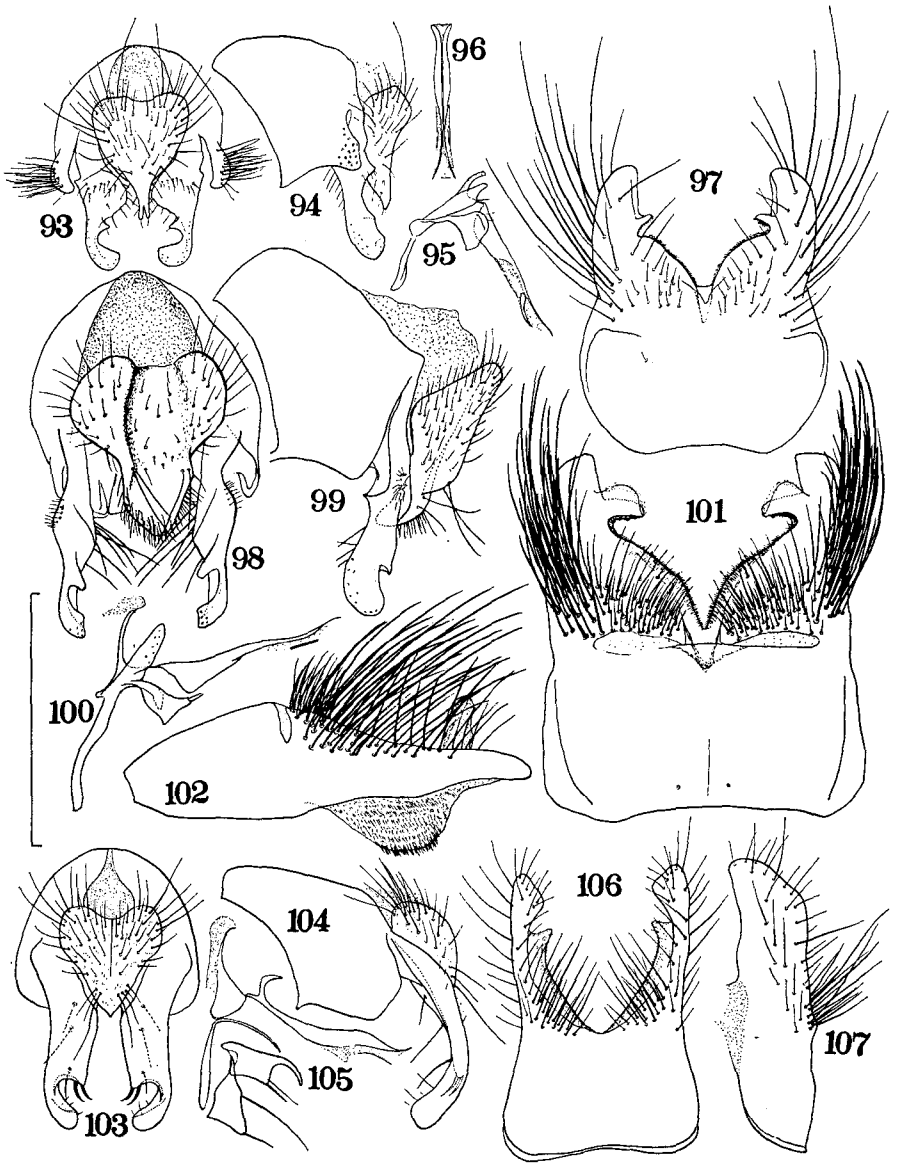
Melinia bisinuata Tiensuu, 1939:244. *Craspedochoeta bisinuata*: Hennig, 1966:42.

Material examined. HOKKAIDÔ — Sapporo, 4♂♂, 27-v-68 & 2-vi-68 (K. Kusigemati), & 1♂, 27-v-68.

♂. Body-length 4.4–5.3 mm. Abdomen with broad median vitta and broad fore marginal bands; 5th tergite and hypopygium shining black although thinly pollinose; prebasal sclerite and cephalic margin of basal sclerite polished. Wings strongly tinged with brown, much darkened at base; calyptrae whitish and more or less tinged with yellow.

Interfrontalia with *if* not strong; parafrontals with 7–9 *ori* almost up to the level of anterior ocellus, the uppermost one probably corresponding to *ors*; A_3 about 1.4–1.5 times as long as wide; profrons and cheeks respectively a little narrower and less high than A_3-width. Thorax with 2–4 accessory setulae on notopleura; mesopleura with anterior *mpl* distinguishable from adjacent setulae

even if fine; *stpl* 1: 2. Abdomen slightly depressed and subcylindrical, about 2.3–2.6 times as long as wide, and slowly narrowing caudad; 5th sternite and hypopygium as in Figs. 93–97.



Figs. 93–97. *Meliniella bisinuata* (Tiensuu), ♂: 93, hypopygium, dorsal view; 94, *ditto*, lateral view; 95, aedeagus; 96, distiphallus, dorsal view; 97, 5th sternite, ventral view.
Figs. 98–102. *Meliniella watanabei* sp. nov., ♂: 98, hypopygium, dorsal view; 99, *ditto*, lateral view; 100, aedeagus; 101, 5th sternite, ventral view; 102, *ditto*, lateral view.
Figs. 103–107. *Craspedochoeta angulata* (Tiensuu), ♂: 103, hypopygium, dorsal view; 104, *ditto*, lateral view; 105, aedeagus; 106, 5th sternite, ventral view; 107, *ditto*, lateral view.

Fore tibia with 1 *ad* and 2–3 *pv*; f_2 with some slender *pv* on basal half; t_2 with 1 *ad*, 1 *pd* and 3–4 *p–pv*; f_3 with rows of slender *av* and *pv*, the *pv* abruptly shortened near apical third and becoming longer again towards apex of the femur; t_3 with 3–6 *av*, 2 long and 3 shorter *ad*, 3–6 *pd* (of them 2–3 longer) and 5–9 *pv*, apical *pv* well developed and not weaker than apical *av*. Wings with costal thorns minute.

♀. Unknown.

Distribution. Japan; Finland; Sweden.

By the surstyli with no spine-like setae and by the distiphallus lacking a projection at the base this species may be included in this genus.

4. *Meliniella watanabei* sp. nov.
(Figs. 98–102)

Type-material. HOKKAIDÔ — Mt. Shokambetsu, 4♂♂ (one the holotype), 1-vii-71; Rishiri-tô, 1♂, 3-viii-65 (T. Kocha); Sapporo, 1♂, 6-vi-68; Jôzankei, 15-vi-66; Shimamatsu, 1♂, 10-vi-68 (K. Kusigemati); Mt. Kariba, 9♂♂, 19–23-vii-73. HONSHÛ — Mt. Yatsugatake, Nagano-ken, 1♂, 3-vi-67 (T. Kocha).

♂. Body-length 5.4–7.6 mm; wing-length 4.5–6.2 mm. Body blackish in ground colour and whitish grey in pollinosity. Interfrontalia, parafacials and cheeks blackish or sometimes dark brownish in ground colour and whitish grey in pollinosity; parafacials with silvery grey reflections; antennae and palpi black; haustellum with mentum black and pollinose. Thorax whitish grey and more or less bluish in pollinosity, which is usually tinged with brown especially on mesonotum; mesonotum often with a brownish pollinose median vitta, and when viewed from behind with rather broad median and lateral vittae and faint sublateral ones. Abdomen rather densely covered with whitish grey pollen, which is more or less tinged with blue and sometimes yellow or brown; median vitta narrow or moderate in width; fore marginal bands usually absent except on 5th tergite which is rather broadly darkened on fore margin; hypopygium thinly pollinose, prebasal sclerite and cephalic margin of basal sclerite polished. Wings with a brownish yellow tinge, rather strongly yellow at base; calyptrae and halteres at knob yellow.

Head about 1.24–1.3 times as high as long; frons usually a little wider than distance between posterior ocelli inclusive; interfrontalia very narrow, at most about half as wide as anterior ocellus, with *if* fine and often vestigial; parafrontals with 4–6 strong and often 1–2 fine *ori*, and often with 1 vestigial *ors* near anterior ocellus or between anterior ocellus and uppermost *ori*; A_3 usually about 1.6–1.8 times as long as wide; arista minutely pubescent; profrons as wide as or a little wider than A_3; cheeks as high as or a little higher than A_3-width, with genal setae in 1 row; palpi about as long as A_2 and A_3 combined; haustellum normal.

Mesonotum with 3–4 pairs of *pre acr* and with no setulae between the rows, which are separated from each other by a distance about half of that between *dc* and *acr*; 2nd *ph* fine and like accessory setula; *pra* more or less longer than anterior *ntpl*; notopleura with no accessory setulae; mesopleura with 1–2 distinct anterior *mpl*, and with 1 strong and 1 weaker *pstg* and 1–5 associated setulae; *stpl* 2:2; scutellum not setulose on dorsal centre, and very sparsely haired ventrally (1–5 hairs being visible). Abdomen only a little depressed on basal half and subcylindrical, elongate, about 2.7–3 times as long as wide, and at least as long

as head and thorax combined; 5th sternite and hypopygium as in Figs. 98–102.

Fore tibia with 1 *ad* and 2–3 *pv*; f_2 with no distinct *av* and on basal half with 3–5 *pv*, which are longer than height of the femur; t_2 with 1 *ad*, 1 *pd* and 3–6 (usually 4–5) *p–pv*; f_3 with rows of long *av* and *pv*, a few *pv* near apical third being usually weakened; t_3 with 3–6 *av*, 4–7 (usually 5–6) *ad*, 5–8 (usually 6–7) *pd* and about 10 *pv*, and often with 1 long and strong *p* near middle on one body-side (never on each leg in the present specimens), apical *av*, *ad*, *d*, *pd* and *pv* all being long and strong; hind tarsus as long as or a little shorter than t_3. Wings with costa haired ventrally; costal thorns strong though rather weak in smaller specimens; *m-m* erect and nearly straight.

♀. Unknown.

Distribution. Japan.

Judging from the fine *if*, the subcylindrical abdomen, the 5th sternite with a projection at inner margin of each process and the shape of the surstyli this species may be more closely related to *bisinuata* than to any other known species, though it can be readily distinguished from *bisinuata* by the notopleura with no accessory setulae and by the 5th sternite more densely setose.

6. Genus *Craspedochoeta* Macquart

Craspedochoeta Macquart, 1850:241. Type-species: *Anthomyia punctipennis* Wiedemann, 1830.

Melinia Ringdahl, 1929:270, as subgenus of *Hylemyia*, nec Costa, 1859 in Hymenoptera. Type-species: *Aricia pullula* Zetterstedt, 1845.

This genus will be defined by the combination of the following aspects: — Interfrontalia with *if*; haustellum with mentum pollinose and not enlarged or lengthened; propleura not setulose; mesopleura with anterior *mpl* at least more or less distinct; t_3 with strong apical *pv*; surstyli concave near apex inside and thereon with a few or some spine-like setae; postgonites subquadrate except on prolonged apex; distiphallus with a projection at base.

By the introduction of the above definition for the genus *Melinia bisinuata* Tiensuu, which is treated under *Craspedochoeta* by Hennig (1966), is excluded from this genus and transferred to the preceding *Meliniella*. On this occasion the following species will be recorded from Japan.

*1. *Craspedochoeta angulata* (Tiensuu) (Figs. 103–107)

Melinia angulata Tiensuu, 1938:26. *Craspedochoeta angulata*: Hennig, 1966:41.

Material examined. HOKKAIDÔ — Sapporo, 1♂, 8-v-68, 2♂♂, 12-v-68 (K. Kusigemati), & 1♂, 21-v-69.

♂. Body-length 3.7–5.1 mm; wing-length 3.3–4.2 mm. Body blackish in ground colour and densely whitish grey pollinose. Mesonotum with a trace of 3 narrow vittae between rows of *acr* and along rows of *dc*. Abdomen with median vitta broad or moderate in width, and obscure-margined; fore marginal bands absent, if present very narrow; basal sclerite shining on cephalic margin. Wings more or less tinged with brownish yellow, rather distinctly yellow at base; calyptrae whitish, faintly tinged with yellow marginally.

Frons as wide as or a little wider than anterior ocellus; interfrontalia with *if* strong; parafrontals nearly contiguous to each other, with 3–4 *ori* and 1 short *ors*; A_3 about 2–2.2 times as long as wide; arista shortly pubescent, the longest hairs as long as or a little longer than basal diameter of arista; profrons as wide as or slightly narrower than A_3; cheeks as high as or slightly higher than A_3-width, with genal setae in 1–2 rows.

Mesonotum with *pra* about as long as posterior *ntpl*; notopleura with no accessory setulae; mesopleura with anterior *mpl* distinct or fine, but always distinguishable from adjacent setulae, and with 2 (1 strong and 1 weak) *pstg* and 1–2 associated setulae; *stpl* 1: 2, if 2:3 the lowest posterior is fine; scutellum distinctly haired on ventral surface.

Abdomen depressed especially on basal half, about 2.1–2.4 times as long as wide, and a little narrowing caudad; 5th sternite and hypopygium as in Figs. 103–107.

Fore tibia with 1–2 short *ad* and 2 *pv*, in 1 specimen with 1 *pd* on left body-side; f_2 with a row of short and fine *av* and with a row of distinct *pv* becoming shorter and finer towards apex of the femur, in 1 specimen with 1 strong *av*; t_2 with 1 *ad*, 2–3 *pd* and 2–4 *pv*; f_3 with rows of long *av* and *pv*, a few *pv* near apex being shortened; t_3 with 5–9 *av*, 5–6 *ad*, 4–5 *pd* and 5–10 *pv*, apical *pv* being strong though shorter than apical *av*. Wings with costa haired ventrally; costal thorns minute though distinguishable from costal setulae; *m-m* slightly oblique on anterior half.

♀. Unknown.

Distribution. Japan; Finland.

There are found no serious differences between the Japanese form based on the present material and the European one given by Tiensuu (1938) except for the chaetotaxy of the legs: — In the European form t_1 with 2 *pd* and 3 *pv*, on the other hand in the Japanese one t_1 with 1–2 *ad* and 2 *pv*, and usually with no *pd*.

7. Genus *Anthomyia* Meigen

Anthomyia Meigen, 1803:281. Type-species: *Musca pluvialis* Linné, 1758.

Key to the species (♂♂)

1. Arista with the longest hairs at least twice as long as basal diameter of arista; f_3 with no *pv* except for a few preapical ones and some *p–pv* near base. 2
– Arista with the longest hairs at most slightly longer than basal diameter of arista; f_3 with some *pv* apart from preapical ones and *p–pv* near base. 3
2. Mesonotum with a pair of large presutural spots, which are fused anteriorly; *pra* a little longer than posterior *ntpl*; postgonites with a hook-shaped seta. . .4. Sp. A
– Mesonotum with no presutural markings, at most with a pair of small ones; *pra* as long as or a little shorter than posterior *ntpl*; postgonites with a blade-like seta. .....3. *illocata* Walker
3. Mesonotum with postsutural markings fused in a band with four clefts on posterior margin; *pra* as long as or a little shorter than posterior *ntpl*; postgonites with a blade-like seta. .....1. *pluvialis* (Linné)
– Mesonotum with postsutural markings separated into 3 large spots, or nearly so; *pra* a little longer than posterior *ntpl*; postgonites with a normal seta. .....2. *procellaris* Rondani

Key to the species (♀♀)

1. Arista with the longest hairs 3–4 times as long as basal diameter of arista; mesopleura with no accessory setulae near *pstg*. 2
– Arista with the longest hairs only a little longer than basal diameter of arista; mesopleura with 1–3 accessory setulae near *pstg*. 3
2. Mesonotum with a pair of large presutural spots, which are fused anteriorly; scutellum almost blackish, only with a very small greyish spot at apex; *pra* a little longer than posterior *ntpl*. .....4. Sp. A
– Mesonotum with or without a pair of small presutural spots; scutellum blackish on basal half or less; *pra* as long as or a little shorter than posterior *ntpl*. ....3. *illocata* Walker
3. Mesonotum with a band-like postsutural marking. .....5. Sp. B
– Mesonotum with 3 spot-like or vitta-like postsutural markings. 4
4. Mesonotum with a pair of large presutural spots; *pra* a little longer than posterior *ntpl*. .....2. *procellaris* Rondani
– Mesonotum with or without a pair of small presutural spots; *pra* as long as or a little longer than posterior *ntpl*. .....1. *pluvialis* (Linné)

1. *Anthomyia pluvialis* (Linné)
(Fig. 108)

Musca pluvialis Linné, 1758:597. *Anthomyia pluvialis*: Séguy, 1929:68; Tiensuu, 1935:12. *Anthomyia pluvialis*: Wu, 1939:333, ? *pt*. *Anthomyia pluvialis*: Hennig, 1968: 207, *pt*.

Material examined. HOKKAIDÔ — Sapporo, 1♀, 12-viii-67; Nopporo, 1♂, 6-v-68, 1♂, 1♀, 14-v-69, & 14♂♂, 25-v-70; Teine, 1♀, 15-v-59 (S. Ueda). HONSHÛ — Urabandai, Fukushima-ken, 1♀, 2-ix-66.

♂. Mesonotum with a pair of large presutural spots and with postsutural markings fused in a band with four clefts on posterior margin; scutellum black laterally, these black markings being often fused basally. Abdominal margkins on 3rd and 4th tergites fused anteriorly, or entirely separated from each other.

Head about 1.4–1.5 times as high as long; frons as wide as or slightly narrower than anterior ocellus; parafrontals broadly contiguous to each other, with 3–4 *ori* and 1 vestigial *ors*; interfrontalia with a pair of fine *if*. Mesonotum with *pra* as long as or a little shorter than posterior *ntpl*; mesopleura with 1–3 accessory setulae near *pstg*. Postgonites (Fig. 108) with a blade-like seta.

Fore tibia with 1 (rarely 2) *pv*; t_2 with 1 *ad*, 2 *pd* and 2–3 *pv*; t_3 with 1 *av*, 3–8 (usually 5–6) *ad*, 2 normal and often 1–2 additional *pd* and 2–6 *pv*.

♀. Mesonotum with or without a pair of small presutural spots, and with 3 rather small postsutural markings, of which the lateral ones are restricted from base of *pra* or *sa* to base of 1st *pa* and hardly visible when viewed from above, and of which the median one is vitta-like; scutellum with lateral markings not reaching to bases of discal setae. Abdominal markings not fused to each other.

Head about 1.3 times as high as long; frons a little wider than one-third head-width; parafrontals with 2 *ori* and 3 *ors*. Fore tibia with 1 *ad* and 1 *pv*; t_3 with 1 *av*, 5–6 *ad*, 2 *pd* and no *pv*.

Distribution. Holarctic and Ethiopian regions.

So far as I know, Wu (1939) and James (1947, through Hennig, 1968) gave Japan as a locality of *pluvialis*; however, their records might be based on specimens of the following species, *procellaris* Rondani.

The Japanese form does not entirely agree with definitions of *pluvialis* given by authors in the following aspects: — ♂: Mesonotum with postsutural markings fused to each other; the longest aristal hairs not much shorter than basal diameter of arista; frons at most about as wide as anterior ocellus; parafrontals broadly contiguous to each other. In the shape of postsutural markings on the mesonotum the present form agrees with the Ethiopian species, *Anthomyia tempestatum* Wiedemann. It, however, may be identified with *pluvialis* by the genital structures agreeing well with those of the species figured by Tiensuu (1935), Séguy (1929) and Hennig (1968).

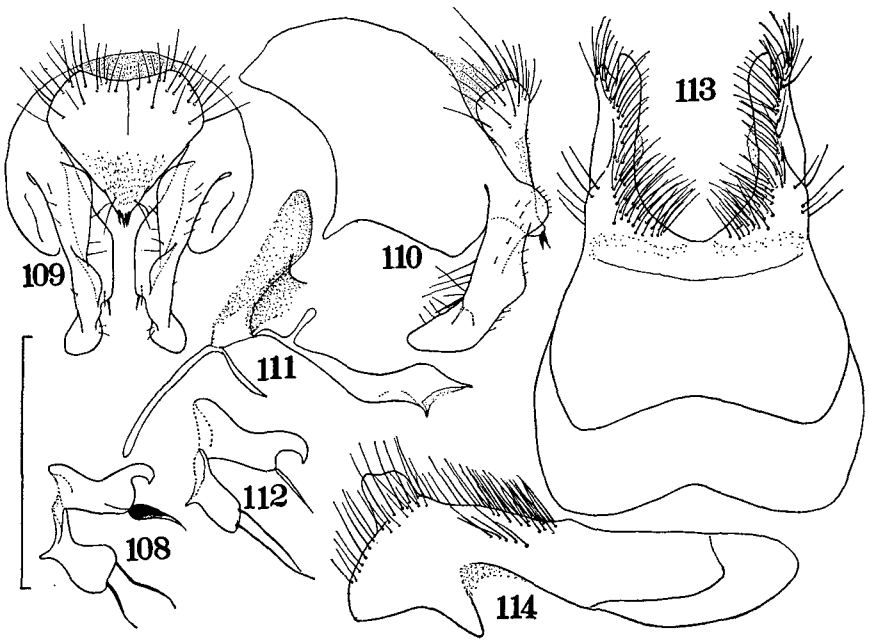


Fig. 108. *Anthomyia pluvialis* (Linné), ♂: prae- and postgonites.
Figs. 109–114. *Anthomyia procellaris* Rondani, ♂: 109, hypopygium, dorsal view; 110, *ditto*, lateral view; 111, distiphallus; 112, prae- and postgonites; 113, 5th sternite, ventral view; 114, *ditto*, lateral view.

*2. *Anthomyia procellaris* Rondani
(Figs. 109–114)

Anthomyia procellaris Rondani, 1866:147. *Anthomyia procellaris*: Séguy, 1929:69. *Anthomyia pluvialis* var. *procellaris*: Tiensuu, 1935:13. *Anthomyia procellaris*: Steyskal, 1967:240. *Anthomyia pluvialis*: Hennig, 1968:207, *pt.*

Material examined. HOKKAIDÔ — Sapporo, 6♂♂, 2-vi-68 (K. Kusigemati); Jôzankei, 1♀, 26-v-68 (K. Kusigemati). HONSHÛ — Takao-san, Tôkyô-to, 1♀, 23-v-67.

♂. Mesonotum with a pair of large presutural spots, and with postsutural markings completely separated into 3 large spots, or nearly so; scutellum largely blackish, with a small greyish apical marking, which is sometimes deeply sunk, yet

not reaching to base of scutellum. Abdominal markings on 3rd and 4th tergites fused anteriorly.

Head about 1.4–1.5 times as high as long; frons usually about half as wide as anterior ocellus; parafrontals broadly contiguous to each other, with 3–4 *ori* and 1 vestigial *ors*; interfrontalia with or without a single vestigial *if*, which is indiscernible unless carefully examined; aristal hairs not longer than basal diameter of arista. Mesonotum with *pra* a little longer than posterior *ntpl*, usually 1.2–1.3 times as long as the latter; mesopleura usually with 1–3 accessory setulae near *pstg*. Hypopygium and 5th sternite as in Figs. 109–114; postgonites with a normal seta.

Fore tibia with 1 *pv*; t_2 with 1 *ad*, 2 (rarely 3) *pd* and 2 (rarely 3) *pv*; t_3 with 1 *av*, 5–9 *ad*, 2 long and 1–2 additional *pd* and 3–9 *pv*.

♀. Mesonotum with black markings more or less smaller than in male, yet distinctly larger than those of female of *pluvialis*; scutellum with lateral markings expanded to bases of discal setae. Abdominal markings on 3rd and 4th tergites fused anteriorly.

Head about 1.35 times as high as long; frons a little wider than one-third head-width; parafrontals with 2 *ori* and 3 *ors*. Fore tibia with 1 *ad* and 1 *pv*; t_3 with 1 *av*, 5–6 *ad*, 2 *pd* and no *pv*.

Distribution. Holarctic and Ethiopian regions.

Though Hennig (1968) has treated *procellaris* as a synonym of *pluvialis*, it may be reasonable to recognize them as distinct from each other on account of their sympatric distribution and the constant morphological differences.

3. *Anthomyia illocata* Walker
(Figs. 115–119)

Anthomyia illocata Walker, 1856:129. *Anthomyia illocata*: Malloch, 1924:271; Karl, 1935:47. *Anthomyia illocata*: Hori, 1960:93; Kano et al., 1964:131; Kano, 1965:232. *Anthomyia illocata*: Snyder, 1965:206; Hennig, 1968:205.

Material examined. HONSHÛ — Yokohama, Kanagawa-ken, 1♂, 3-x-70 (T. Kocha); Kamakura, Kanagawa-ken, 1♀, 26-iv-70 (H. Torikura). KYÛSHÛ — Kagoshima, 1♀, 13-v-59 (K. Kamijo), & 1♂, 15-iv-67 (T. Kocha); Eboshi-dake, 1♀, 4-v-69 (K. Kusigemati); Amami-Ôshima, 2♂♂, 1♀, 13–23-iii-70 (H. Takizawa), & 1♂, 1♀, 27-iv-67; Yoron-tô, 2♂♂, 4♀♀, 17-iii-70 (H. Takizawa).

♂. Body-length 3.6–5.9 mm; wing-length 3.6–5.2 mm. Mesonotum with a broad black band behind the suture and usually with no presutural spots (in 1 specimen from Yokohama with a small spot at base of 1st *pre dc*); scutellum black on basal half; these markings strongly brownish pollinose. Abdomen yellowish in ground colour near base.

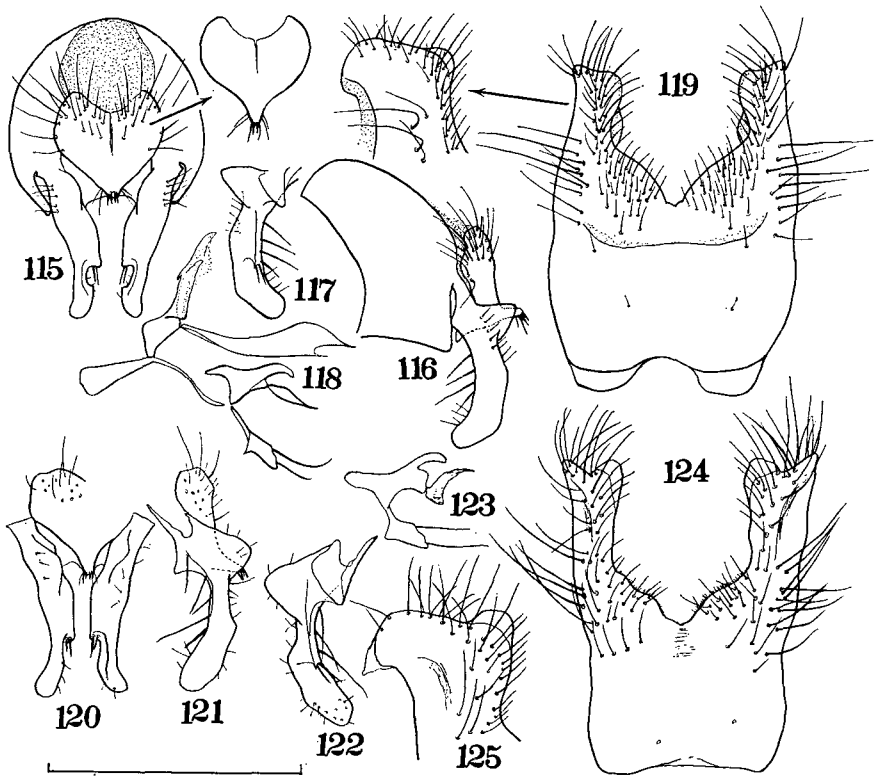
Head about 1.6–1.7 times as high as long; parafrontals usually contiguous to each other, with 2–3 (usually 2) *ori* and usually with 1 minute *ors*; interfrontalia often with a pair of fine *if*; A_3 about 2.3–2.8 (usually 2.5–2.6) times as long as wide; arista with the longest hairs about 2–3 times as long as basal diameter of arista; profrons usually a little narrower than A_3; cheeks about 1.6–1.9 times as high as A_3-width. Mesonotum with no accessory setulae between rows of *acr*; *pra* as long as or a little shorter than posterior *ntpl*; mesopleura usually with no accessory setulae near *pstg*. Hypopygium and 5th sternite as in Figs. 115–119;

postgonites with a lobe-like seta.

Fore tibia with 1 *pv*; t_2 with 1 short *ad*, which is often very fine or lacking, and with 1 *pd*, 1 *p* (practically *pd*) and 2–3 *pv*; t_3 with 1 *av*, 5–6 *ad*, 2 *pd* and 0–5 (usually 3–4) *pv*.

♀. Mesonotum with or without a faint spot at base of 1st *pre dc*; scutellum black on basal third to half. Head about 1.4–1.5 times as high as long; frons about 0.28–0.30 times as wide as head; parafrontals with 1 *ori* and 3 *ors*; arista with the longest hairs about 3 times as long as basal diameter of arista. Mesonotum sometimes with a few setulae between rows of *pre acr*. Fore tibia with 1 (rarely 2) *ad* and 1 *pv*; t_2 with 1–3 *pv*; t_3 with no *pv*.

Distribution. Japan; Oriental and Australian regions.



Figs. 115–119. *Anthomyia illocata* Walker, ♂: 115, hypopygium, dorsal view; 116, *ditto*, lateral view; 117, surstylus, inside view; 118, aedeagus; 119, 5th sternite, ventral view.
Figs. 120–125. *Anthomyia* sp. A, ♂: 120, hypopygium, dorsal view; 121, *ditto*, lateral view; 122, surstylus, inside view; 123, prae- and postgonites; 124, 5th sternite, ventral view; 125, *ditto* (process), lateral view.

4. *Anthomyia* sp. A
(Figs. 120–125)

Material examined. HOKKAIDÔ — Sapporo, 1♂, 2-vi-67, & 1♀, 22-vi-67 (T. Kumata).

♂. Length of head and thorax combined 3.1 mm; wing-length 4.8 mm. Mesonotum with 2 large presutural spots, which are fused anteriorly, extending to anterior margin of thorax, and with a broad postsutural band on more than anterior half of scutum, the posterior margin of the band waving; scutellum wholly black; this and the black markings of mesonotum more or less brownish pollinose. Abdomen in ground colour somewhat yellowish near base only ventrally. Legs dark brownish, not yellowish at all.

Head about 1.5 times as high as long; frons a little wider than anterior ocellus; parafrontals broadly contiguous to each other, with 3 *ori* and without *ors*; interfrontalia without *if*; A_3 about 2.3 times as long as wide; arista with the longest hairs about twice as long as basal diameter of arista. Mesonotum with no accessory setulae between rows of *acr*; *pra* a little longer than posterior *ntpl*; mesopleura with no accessory setulae near *pstg*. Hypopygium and 5th sternite as in Figs. 120–125; postgonites with a hook-shaped seta.

Fore tibia with 2 *pv*; t_2 with 2 *pd* and 3 *pv*, and with 1 short and fine *ad* on the right body-side; t_3 with 1 *av*, 7 *ad*, 2 *pd* and 0–1 fine *pv*. Wings with costal thorns vestigial.

♀. Mesonotum with postsutural band more or less narrower than that of male; scutellum with a small grey spot at apex. Head about 1.4 times as high as long; frons about one-third head-width; parafrontals with 2 *ori* and 3 *ors*; arista with hairs longer than in male; occiput with many setulae in a row on upper part below postocular row of setulae. Fore tibia with 1–2 *ad* and 1 *pv*; t_2 with 1 *ad*, 2 *pd* and 2 *pv*; t_3 with 1 *av*, 5 *ad*, 2 *pd* and no *pv*.

In general appearance this species is similar to *illocata*, from which it can, however, be distinguished by the characters mentioned in the key. Some species which have a band-like marking on the mesonotum are known from Africa, namely, *A. abyssinica* Jeannicke, *A. amoena* (Macquart), *A. fasciata* Walker, *A. griseobasis* Malloch and *A. spinigera* Malloch. At present it is uncertain to me whether this species should be identified with one of them.

5. *Anthomyia* sp. B

Material examined. SHIKOKU—Mt. Tsurugi, 1♀, 16-vii-71. KYÛSHÛ—Hikosan, 1♀, 15-v-67; Amami-Ôshima, 1♀, 23-iii-70 (H. Takizawa).

♀. Body-length 6–6.7 mm; wing-length 5.7–6.1 mm. Mesonotum with a pair of large presutural spots, which are widely set apart from each other and not extending to the anterior margin of the thorax, and with a broad postsutural band, which is a little protruded cephalad and caudad at middle; scutellum largely black, with a grey spot at apex.

Head about 1.4 times as high as long; frons 0.34–0.35 times as wide as head; parafrontals with 2 *ori* and 3 *ors*; A_3 about 2.6 times as long as wide; arista with the longest hairs only a little longer than basal diameter of arista; occiput with many setulae in 2–3 rows on upper part below postocular row of setulae. Mesonotum with some accessory setulae between rows of *pre acr*; *pra* as long as anterior *ntpl* or nearly so; mesopleura with a few accessory setulae near *pstg*.

Fore tibia with 1 *ad* and 1 *pv*; t_2 with 1 *ad*, 2 *pd* and 2 *pv*; t_3 with 1 *av*, 5–9 *ad*, 2 long and 0–1 additional *pd* and no *pv*. Wings with costal thorns minute; *m-m* a little oblique and slightly or hardly sinuate.

This species may be distinguishable from *illocata* and sp. A by the wider

frons, the shorter aristal hairs and the large and not fused presutural spots on the mesonotum.

8. Genus *Acrostilpna* Ringdahl

Acrostilpna Ringdahl, 1929:269, as subgenus of *Hylemyia*. Type-species: *Aricia latipennis* Zetterstedt, 1838.

This genus is represented by 7 species, all of which are known to occur in North America and 4 species in the Palaearctic region. On this occasion will be recorded from Japan the following 3 species: — *A. latipennis* (Zetterstedt), *A. atricauda* (Zetterstedt) and *A. collini* Ringdahl.

In the characters of the 5th sternite and hypopygium *atricauda* and *collini* may be more closely related to *Crinurina cuneicornis* (Zetterstedt), the type-species of *Crinurina* Karl, than to *latipennis*, the type-species of *Acrostilpna*. On the basis of the bare propleura this genus is separated from *Crinurina*, but this character alone may not be sufficient to recognize it as a distinct genus. In this study *Acrostilpna* is tentatively recognized since I have examined no specimens of *C. cuneicornis*.

Key to the species (♂♂ & ♀♀)

1. Hind femur with *av* and *pv* near base to apex. .....1. *latipennis* (Zetterstedt)
– Hind femur with *av* and *pv* only on apical half. 2
2. Mid tibia with *av*; t_3 with apical *pv* long and strong.....3. *collini* Ringdahl
– Mid tibia without *av*; t_3 with apical *pv* short and fine. . .2. *atricauda* (Zetterstedt)

*1. *Acrostilpna latipennis* (Zetterstedt)
(Figs. 126–130)

Aricia latipennis Zetterstedt, 1838:676. *Hylemyia* (*Acrostilpna*) *latipennis*: Huckett, 1946:120. *Acrostilpna latipennis*: Hennig, 1966:49.

Material examined. HOKKAIDÔ — Nopporo, 2♂♂, 25-v-70; Mt. Soranuma, 1♀, 17-vi-67, 1♀, 15-vi-68 (K. Kusigemati), & 1♀, 24-vii-69; Rishiri-tô, 1♀, 15-vii-68 (H. Takizawa); Shikaribetsu-ko, 1♀, 14-vii-66. HONSHÛ — Mt. Naeba, Niigata-ken, 1♂, 8-viii-72 (H. Takizawa); Mt. Yatsugatake, Nagano-ken, 1♂, 20-vii-70; Mt. Senjô, Nagano-ken, 1♀, 10-vii-71.

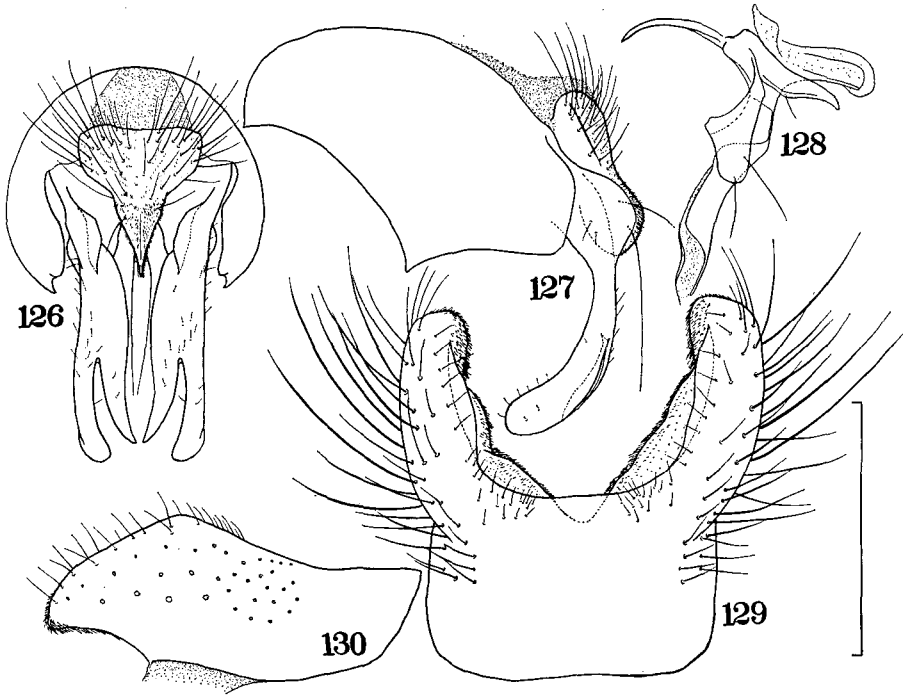
♂. Body-length 6.6–7.6 mm. Mesonotum whitish grey or bluish grey in pollinosity, with faint or distinct brownish pollinose vittae along rows of *dc*. Abdomen pale yellowish grey or bluish grey pollinose; median vitta rather broad or moderate, narrowing caudad on each tergite; fore marginal bands narrow to rather broad, or lacking; basal sclerite polished; anal sclerite pollinose. Wings tinged with yellow, strongly at base; calyptrae yellowish.

Frons about 1.5–2 times as wide as anterior ocellus; interfrontalia with *if* distinct or strong; parafrontals nearly contiguous to each other, with 4–5 *ori*; A_3 about 2–2.6 times as long as wide. Mesonotum with 2nd *ph* slighty developed or like accessory setula; *pra* a little longer than anterior *ntpl*; *stpl* 2: 3. Abdomen more or less depressed, about 2.4–2.7 times as long as wide, and slowly narrowing caudad; tergites with strong discal setae; 5th sternite and hypopygium as in Figs. 126–130.

Fore tibia with 1 *ad* and 2–3 *pv*, and with 3 strong apical setae (*d*, *pd* and *pv*); f_2 on apical third with a few or some short and strong *av*, and on basal two-thirds with 5–7 long *pv*; t_2 with 2 *ad*, 3–4 *pd* and 2–5 *pv*; f_3 with rows of long and strong *av* and *pv*; t_3 with 4–6 *av*, 5–6 *ad*, 3–4 long and some short *pd* and 10–14 *pv*, and with apical *pv* long and strong. Wings with costal thorns distinct; *m-m* straight or slightly concave inwards.

♀. More or less yellowish in pollinosity. Mesonotum with distinct brownish pollinose vittae along rows of *dc*. Abdomen half-shining in some lights; median vitta very broad; fore marginal bands broad, occupying anterior two-thirds of 3rd and also of 4th tergite and entire 5th tergite. Thorax with *stpl* 2:2. Fore tibia with 1 *ad* and 1–2 *pv*; t_2 with 2 *ad*, 3 *pd* and 2–3 *pv*; t_3 without *pv*. Wings with costal thorns strong.

Distribution. Japan; Europe; North America.



Figs. 126–130. *Acrostilpna latipennis* (Zetterstedt), ♂: 126, hypopygium, dorsal view; 127, *ditto*, lateral view; 128, aedeagus; 129, 5th sternite, ventral view; 130, *ditto*, lateral view.

*2. *Acrostilpna atricauda* (Zetterstedt)
(Figs. 131–135)

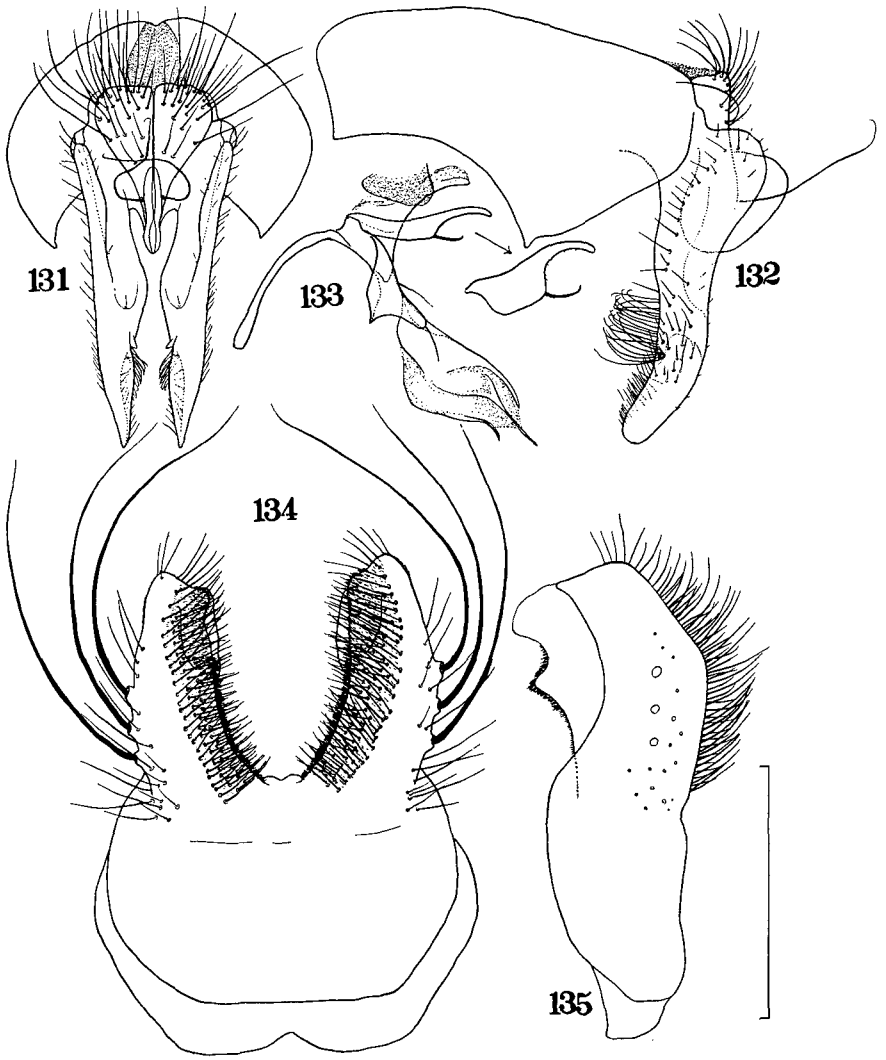
Aricia atricauda Zetterstedt, 1845:1529. *Hylemyia* (*Acrostilpna*) *atricauda*: Huckett, 1946: 122. *Acrostilpna atricauda*: Hennig, 1966:49.

Material examined. HOKKAIDÔ — Mt. Daisetsu, 1♀, 26-vii-67 (M. Miyazaki); Yukomambetsu, 1♂, 8-vii-62 (S. Takagi); Mt. Kariba, 2♂♂, 19–23-vii-72. HONSHÛ — Mt. Yatsugatake, Nagano-ken, 1♂, 21-vii-70; Mt. Senjô, Nagano-ken, 2♂♂, 10-vii-71

(M. Suwa & H. Takizawa).

♂. Body-length 6–8 mm. Mesonotum brownish pollinose except for pale greyish humeral calli and notopleura, and when viewed from behind with narrow median and broad lateral vittae. Abdomen pale grey or bluish grey in pollinosity, which is more or less tinged with yellow or brown; median vitta broadened cephalad and more or less triangulate on each tergite; fore marginal bands usually distinct; basal sclerite polished; anal sclerite thinly pollinose. Wings distinctly tinged with brown or brownish yellow, at base strongly yellow; calyptrae yellowish.

Frons usually less than twice as wide as anterior ocellus; interfrontalia with



Figs. 131–135. *Acrostilpna atricauda* (Zetterstedt), ♂: 131, hypopygium, dorsal view; 132, *ditto*, lateral view; 133, aedeagus; 134, 5th sternite, ventral view; 135, *ditto*, lateral view.

if rather fine; A_3 2–2.4 times as long as wide; profrons more or less wider than A_3; cheeks as high as or slightly higher than A_3-width. Mesonotum with rows of *pre acr* narrowly separated from each other; 2nd *ph* more or less distinct; *pra* as long as or a little longer than anterior *ntpl*; *stpl* 2:3; mesopleura with 1–2 (usually 1) strong anterior *mpl*. Abdomen conical, with discal setae only a little stronger than accessory setulae; 5th sternite and hypopygium as in Figs. 131–135.

Fore tibia with 1–2 *pv* and no *ad*, and with weak or vestigial apical setae except for strong dorsal one; f_2 near base with some short *av*, which are not longer than height of the femur, and on basal two-thirds with 7–8 *pv*, the longest one distinctly longer than height of the femur; t_2 with 1 *ad*, 1 (none in 2 specimens) *pd* and 2–3 *p–pv*; f_3 with some long and some short *av* and *pv* on apical half; t_3 with 5–9 *av*, 5–7 *ad*, 5–7 (of them 3 long) *pd* and many (about 20) *pv*, the *pv*-series being duplicated on basal half; t_3 with apical *pd* much shorter and weaker than apical *d*, at most half as long as the latter, and with apical *pv* minute or vestigial. Wings with costal thorns short or minute; *m-m* straight or slightly sinuate.

♀. Mesonotum paler than in male in pollinosity, with brownish pollinose vittae along rows of *dc*. Abdomen half-shining though distinctly pollinose, when viewed from behind triangularly darkened on each tergite except on 5th tergite which is almost blackish. Fore tibia with 1 *ad* and 1 *pv*, apical *pd* and *pv* being strong; t_2 with 2 *ad*, 2 *pd* and 1 *pv*; t_3 with no *pv*.

Distribution. Japan; Scandinavia; North America.

*3. *Acrostilpna collini* Ringdahl
(Figs. 136–141)

Hylemyia (*Acrostilpna*) *collini* Ringdahl, 1929:271; Huckett, 1946:122. *Acrostilpna collini*: Hennig, 1966:49.

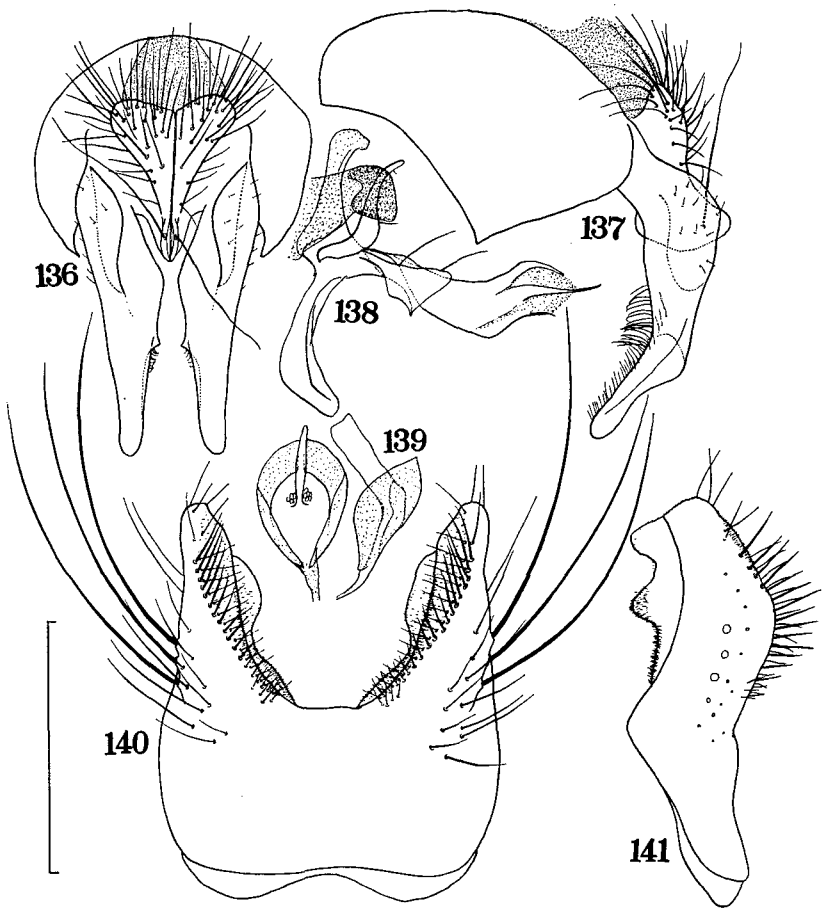
Material examined. HONSHÛ — Mt. Yatsugatake, Nagano-ken, 1 ♂, 21-vii-70.

♂. Body-length 6.8 mm. Abdomen whitish grey and slightly yellowish in pollinosity; median vitta distinct and moderate in width; fore marginal bands absent.

Frons about twice as wide as anterior ocellus; parafrontals very narrowly separated from each other by linear interfrontalia, and with 5–6 *ori*, 1 distinct *ors* being present on the left body-side; interfrontalia with a single *if* in the present specimen; A_3 about 2.4 times as long as wide; epistoma projecting beyond frons at lunule. Mesopleura with 2 strong anterior *mpl*, and near *pstg* with 1 accessory setula; *stpl* 2: 2. Abdomen depressed except on caudal segments which are somewhat swollen, nearly parallel-sided and about 2.5 times as long as wide; 5th sternite and hypopygium as in Figs. 136–141.

Fore tibia with 1 *pv* and no *ad*, apical *pv* being weak or vestigial; t_2 with 1 *av*, 2 *ad*, 3–4 *pd* and 2–3 *pv*; f_3 with 6–8 *av* and *pv* on apical half; t_3 with 7 *av*, 7 *ad*, 6–7 *pd* and about 20 *pv*, the *pv*-series being duplicated on basal half, apical *pv* long and strong. Wings with costal thorns distinct though short; *m-m* slightly oblique and hardly sinuate.

♀. Unknown to me. According to Huckett (1946) the species *collini* possesses a more extensive series of anteroventral bristles on hind femur than *atricauda* or *restorata*, but in no case the series extends to the proximal region as in *latipennis* and *replicata*.



Figs. 136–141. *Acrostilpna collini* Ringdahl, ♂: 136, hypopygium, dorsal view; 137, *ditto*, lateral view; 138, aedeagus; 139, ejaculatory apodeme; 140, 5th sternite, ventral view: 141, *ditto*, lateral view.

Distribution. Japan; Sweden; North America.

9. Genus *Alliopsis* Schnabl & Dziedzicki

Alliopsis Schnabl & Dziedzicki, 1911:92. Type-species: *Aricia glacialis* Zetterstedt, 1845.

This genus is a small group represented by 8 species, which are all distributed in the Nearctic region (Huckett, 1965a and 1966b), and of which 2 species in the Palaearctic region (Hennig, 1967). In the course of the present study the following 2 undetermined species have been found from Japan.

Key to the species (♀♀)

1. Prosternum with some setulae on each lateral side; interfrontalia with *if.* . . 1. Sp. A
– Prosternum with no setulae; interfrontalia without *if.* . . . . . 2. Sp. B

1. *Alliopsis* sp. A

Material examined. HOKKAIDÔ — Mt. Daisetsu, 1♀, 21-vii-68.

♀. Body-length 7 mm; wing-length 7 mm. Body including appendages black in ground colour. Mesonotum largely brownish in pollinosity, with rather broad median and paramedian vittae. Abdomen pale greyish pollinose and half-shining, with median vitta brownish pollinose. Wings tinged with brown, distinctly along veins, and much darkened at base; calyptrae rather distinctly yellow marginally.

Eyes densely haired; frons about as wide as A_3; interfrontalia slightly narrower than distance between posterior ocelli inclusive, with a pair of *if*, of which one is distinct and the other is very fine and vestigial; parafrontals with about 8 strong and many finer *ori* and without *ors*; A_3 about 1.5 times as long as wide; arista practically bare; profrons much wider than A_3, about 1.5 times as wide as the latter; parafacials at narrowest part slightly narrower than A_3; cheeks about as high as profrons-width, with genal setae in about 4 rows; epistoma distinctly behind frons at lunule.

Mesonotum with 3 pairs of rather distinct *pre acr* and with many accessory setulae between and along the rows; 2nd *ph* well developed, as strong as the 1st; *pra* longer than anterior *ntpl*; mesopleura with no strong anterior *mpl*, and with numerous accessory setulae near *pstg*; prosternum with some setulae on each lateral side. Abdomen depressed and ovoid, about 1.3 times as long as wide.

Fore tibia with 1 *ad*, 1 *pd* and 1 *pv*, and with 3 strong apical setae (*d*, *pd* and *pv*); t_2 with 2 *ad*, 3 *pd* and 3 *pv*; t_3 with 3 *av*, 3–4 *ad*, 3 strong and 2–3 weaker *pd*, and 4 *pv*. Wings with costa sparsely haired on ventral surface from base to near costal thorns; costal thorns short though more or less stronger than costal setulae; *m-m* nearly upright and straight.

In having setulose prosternum and *if* this species may be similar to the North American *A. obesa* Malloch, from which it may, however, be distinguishable by the epistoma which is not protruded forwards as far as the frons at lunule.

2. *Alliopsis* sp. B.

Material examined. HOKKAIDÔ — Mt. Poroshiri, 1♀, 23-vii-73 (T. Hattori).

♀. Body-length 6.5 mm; wing-length 6.5 mm. Similar to the preceding species in general appearance. Frons a little narrower than A_3 and slightly wider than distance between posterior ocelli inclusive; interfrontalia about twice as wide as anterior ocellus, without *if*; A_3 about 1.5 times as long as wide; profrons about 1.4 times as wide as A_3; parafacials at narrowest part slightly narrower than A_3. Mesonotum with 2nd *ph* as strong as the 1st on the right body-side, yet like accessory setula on the left; prosternum with no setulae. Abdomen depressed and ovoid, about 1.2 times as long as wide.

Fore tibia with 1 *ad*, 3 *pd* and 1 *pv*, and with 3 strong apical setae; t_2 with 2 *ad*, 4–5 *pd* and 1 or 3 *pv*; t_3 with 3 *av*, 3 strong and some finer *ad*, 3 strong and some finer *pd* and some *pv*. Wings with *m-m* nearly upright and straight.

This species may resemble *A. glacialis* (Zetterstedt) in the bare prosternum, the absence of *if* on the interfrontalia, and the presence of 3 strong apical setae on t_1. However, it may be different from *glacialis* by the epistoma situated behind the frons at lunule and by the wings with *m-m* hardly sinuate. *A. glacialis* var.

uralica is described by Schnabl (1916) from Tobolsk, yet I have little knowledge of it.

10. Genus *Hyporites* Pokorny

Hyporites Pokorny, 1893:54. Type-species: *Eriphia montana* Schiner, 1862.

This genus has been represented by a single species, *H. montanus*, distributed in Europe. On this occasion will be recorded from Japan 2 other species, of which one is described as new to science and the other is unnamed as no specimens of the male are seen.

1. *Hyporites shakshain* sp. nov.
(Figs. 142–146)

Type-material. HOKKAIDÔ — Jôzankei (Hôheikyô), 1 ♂ (holotype), 16-vi-66 (M. Miyazaki).

♂. Body-length 7.1 mm. Body including appendages black in ground colour. Interfrontalia whitish pollinose; parafacials and cheeks whitish grey and faintly yellowish in pollinosity; occiput whitish grey and more or less bluish in pollinosity; haustellum black and polished. Thorax whitish grey and slightly bluish in pollinosity; mesonotum faintly brownish pollinose along rows of *acr* and *dc*, and weakly vittate, when viewed from behind with obscure median and sublateral and rather distinct lateral vittae; scutellum slightly brownish in pollinosity. Abdomen whitish grey pollinose, half-shining in some lights; median vitta not very distinct. Wings whitish basally, tinged with brown on apical half; calyptrae whitish; halteres dark reddish brown at base and brownish yellow at knob.

Head about 1.24 times as high as long; frons less than twice as wide as anterior ocellus, about 1.7 times; interfrontalia about as wide as anterior ocellus, with a pair of *if*, which are rather strong, yet more or less shorter than secondary ocellar setae; parafrontals with 6–7 strong and some fine or minute *ori*, and without *ors*; A_3 about 1.4 times as long as wide; arista nearly bare; profrons about 1.3 times as wide as A_3; parafacials at narrowest part about as wide as A_3; cheeks about 1.2 times as high as profrons-width; epistoma projecting forwards as far as frons at lunule; occiput swollen on lower part, and with 7–8 setulae on either side of upper part below postocular row of setulae; palpi long, with many long setae on ventral margin; haustellum long and strongly chitinized, tappering apicad.

Mesonotum with 5 strong and 4 fine *pre acr*, which are irregularly paired and the rows are very narrowly separated from each other; 1 strong and 2 rather distinct *ph* present; *pra* about as long as 1st *ia*; notopleura with no accessory setulae; mesopleura with no distinct anterior *mpl*, and with 1 long and 1–2 shorter *pstg*, near which 7 associated fine setulae are present; *stpl* 2: 3 or 2:4.

Abdomen stout, club-shaped in profile, about 3 times as long as wide; anal sclerite very large and in profile distinctly protruded beyond dorsal line of the abdomen; 5th sternite and hypopygium as in Figs. 142–146.

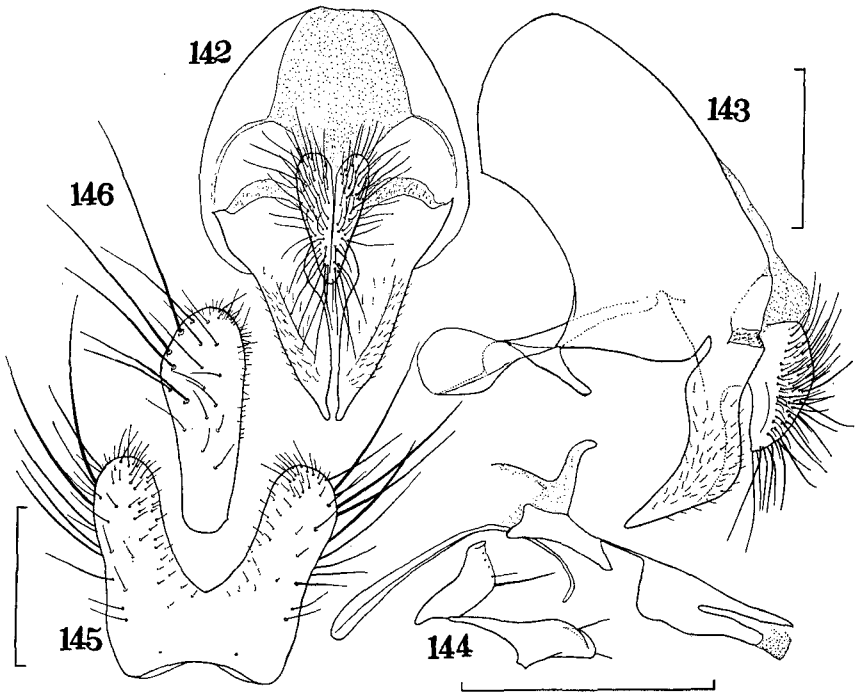
Fore tibia with 1 strong and 2 weak *ad*, 1 *pd* and 2 *pv*, and with 4 long and strong apical setae (*ad*, *d*, *pd* and *pv*); f_2 with a row of strong and rather short *a*, and on basal two-thirds with 8–9 long and strong *av* and *pv*; t_2 with 1–2 *av*, 2 *ad*, 3 *pd* and 2 *pv*; f_3 with rows of long and strong *av* and *pv*, the longest ones being

twice or slightly more as long as height of the femur; t_3 with 3 strong and some weak *av*, 6 strong and some weaker *ad*, of which distal 2 strong ones are displaced rather on the anterior surface, 5 strong and a few weak *pd*, the seta near apical third being the longest, about 0.4 times as long as the tibia, and about 10 fine *pv*; apical *pv* of t_3 more than twice as long as height of the tibia. Wings with costal thorns minute though distinguishable from costal setulae; costa haired on ventral surface near *h*; *m-m* oblique and strongly sinuate.

♀. Unknown.

Distribution. Japan.

This species may be readily distinguished from *montanus* by the narrower profrons and cheeks, by the sinuate surstyli, and by the cercal plate gradually narrowing apicad.



Figs. 142–146. *Hyporites shakshain* sp. nov., ♂: 142, hypopygium, dorsal view; 143, *ditto*, lateral view; 144, aedeagus; 145, 5th sternite, ventral view; 146, *ditto*, lateral view from left-side.

2. *Hyporites* sp. A

Material examined. HOKKAIDÔ — Mt. Daisetsu, 3♀♀, 17-24-vii-68.

♀. Body-length 9–10 mm; wing-length 8–9 mm. Body including appendages black in ground colour. Interfrontalia whitish grey pollinose; parafacials brownish yellow in pollinosity, with golden reflections in some lights; cheeks yellowish grey and more or less brownish in pollinosity. Thorax brownish grey pollinose. Abdomen yellowish grey in pollinosity; median vitta rather broad, interrupted on hind margin of each tergite. Wings strongly tinged with brown;

calyptrae pale yellow; halteres dark brown at base and yellow or brownish yellow at knob.

Head about 1.25–1.3 times as high as long; frons less than twice (about 1.8 times) as wide as anterior ocellus; interfrontalia about as wide as anterior ocellus, and with a pair of fine *if*; parafrontals with 6–7 strong and some fine or minute *ori*, and without *ors*; A_3 about 1.5 times as long as wide; arista practically bare; profrons about 1.3–1.5 times as wide as A_3; cheeks about 1.3–1.4 times as high as profrons-width, with genal setae in a row.

Mesonotum with *pra* as long as *ia*; mesopleura with many (8–13) accessory setulae near *pstg*; *stpl* 2:3 or 2:4. Abdomen depressed or not so according to drying condition, and ovoid when viewed from above; 5th tergite more or less compressed as in *Paraprosalpia*.

Fore tibia with 2–3 *ad*, 1–2 *pd* and 2 *pv*; t_2 with 2 *av*, 2–3 *ad*, 3 *pd* and 2–4 *pv*, and in 1 specimen with 1 *a* near apical third; t_3 with 3 *av*, 7 *ad*, of which distal 2–3 are displaced rather on anterior surface, 6 *pd* and 4–5 short *pv*, in 1 specimen with *pv* indiscernible; f_3 with *av* and *pv* less than twice as long as height of the femur. Wings with costal thorns more or less distinct though short; *m-m* oblique and strongly sinuate.

This species is recognized as distinct from the preceding *shakshain* by the darker colouration, the finer *if* and the shorter setae on the hind femur. However, there may be the possibility that they are conspecific.

11. Genus *Paraprosalpia* Villeneuve

Prosalpia Pokorny, 1893:54, nec Koch, 1872 (Arachnoidea). Type-species: (*Prosalpia styriaca* Pokorny, 1893) = *Anthomyza billbergi* Zetterstedt, 1838.

Paraprosalpia Villeneuve, 1922:511, as subgenus of *Prosalpia*. Type-species: *Prosalpia* (*Paraprosalpia*) *rambolitensis* Villeneuve, 1922.

Pseudochirosia Ringdahl, 1928:22. Type-species: *Chirosia fractiseta* Stein, 1908.

The Palaearctic species of this genus were recently revised by Hennig (1966), who suppressed *Pseudochirosia* Ringdahl, which was originally erected as a distinct genus and often included in the tribe Myiopinini against the tribe Anthomyiini (Séguy, 1937; Huckett, 1965a & 1965b), as a synonym of *Paraprosalpia*. According to him the former has in reality no significant differences from the latter except for the wide frons in the males and it should conveniently be recognized as a subgenus. According to him 22 species, of which 20 species belong to the subgenus *Paraprosalpia*, are distributed in the Palaearctic region. From Japan will be recorded 3 described and 1 new species, which all belong to the subgenus *Paraprosalpia*.

Key to the species (♂♂)

1. Prosternum with some setulae on each lateral side; t_3 with no *pv*; hind tarsus on 2nd, 3rd and 4th segments with setae much longer than the claws. ..... 4. *pilitarsis* (Stein)
– Prosternum with no setulae; t_3 with 1–2 strong *pv*; hind tarsus on 2nd, 3rd and 4th segments with setae much shorter than the claws. 2
2. Calyptrae only a little yellowish marginally; cheeks with genal setae in about 3 rows; arista very minutely pubescent and nearly bare... 3. *billbergi* (Zetterstedt)

– Calyptrae strongly yellowish; cheeks with genal setae in 1 row; arista distinctly pubescent although shortly..... 3

3. Hind femur with *pv* longer than height of the femur; t_1 with 4 strong apical setae. .....2. *silvestris* (Fallén)

– Hind femur with *pv* shorter than height of the femur; t_1 with 3 strong apical setae. .....1. *silvatica* sp. nov.

Key to the species (♀♀)

1. Body thinly pollinose; calyptrae only a little yellowish marginally; arista very minutely pubescent and nearly bare.....3. *billbergi* (Zetterstedt)

– Body densely pollinose; calyptrae strongly yellowish; arista distinctly pubescent although shortly. 2

2. Fore tarsus with 2nd and 3rd segments much broader than the other segments; t_1 with 4 strong apical setae; parafrontals usually with no *ors*, at most with only 1 *ors*. .....2. *silvestris* (Fallén)

– Fore tarsus with 2nd and 3rd segments slightly broader than the other segments; t_1 with 3 strong apical setae; parafrontals with 2 *ors*. ....1. *silvatica* sp. nov.

1. *Paraprosalpia silvatica* sp. nov.
(Figs. 147–151)

Type-material. HOKKAIDÔ — Mt. Shokambetsu, 29♂♂ (one the holotype), 7♀♀, 1-vii-71; Sapporo, 1♀; Nopporo, 5♂♂, 6♀♀; Shikotsu-ko, 1♀; Mt. Soranuma, 3♂♂, 6♀♀; Mt. Apoi, 3♂♂, 1♀; Obihiro, 2♂♂; Mt. Poroshiri, 1♀; Shikaribetsu-ko, 1♂; Nukabira, 1♂, 2♀♀; Akkeshi, 10♂♂, 3♀♀; Daikokujima, 1♂; Nemuro, 1♂; Kawayu, 1♀; Kunneppu, 2♀♀; Wakkanai, 1♀; Rishiri-tô, 2♂♂, 1♀; Bifuka, 5♀♀; Moshiri, 3♀♀; Toikambetsu, 1♀; Toyotomi, 1♂; Horokanai, 1♀; Mt. Daisetsu, 8♂♂, 13♀♀; Mt. Yûbari, 1♂; Mt. Ashibetsu, 1♀; Niseko, 1♀.

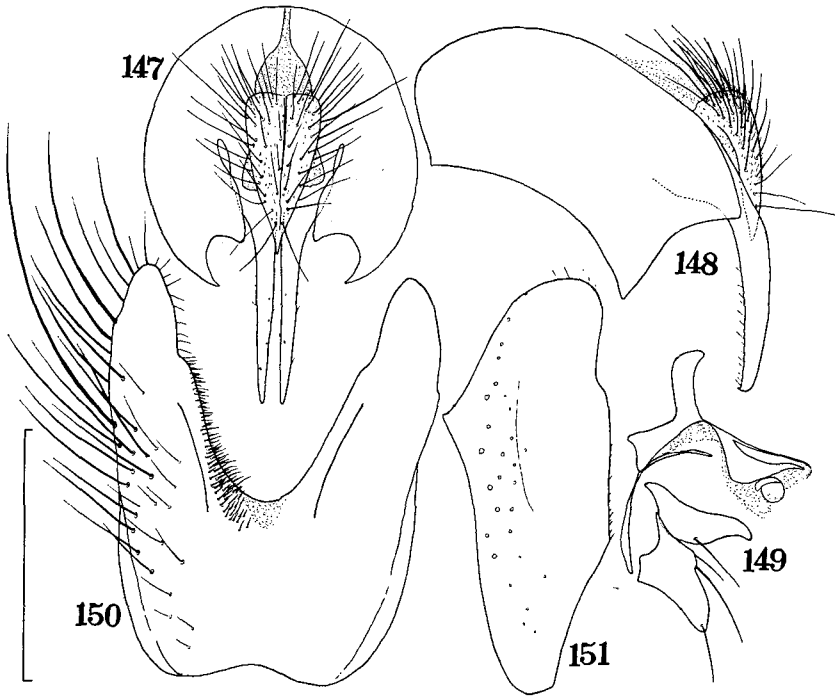
♂. Body-length 6–9 mm; wing-length 5.5–7.6 mm. Body blackish in ground colour and yellowish grey or brownish yellow in pollinosity. Interfrontalia, parafacials and cheeks black or sometimes brownish in ground colour, and usually with yellowish tinge in pollinosity; antennae and palpi black; haustellum black and polished. Mesonotum pale yellowish grey to brownish yellow in pollinosity, and variously vittate according to view points, when viewed from behind with narrow or rather broad median, narrow sublateral and broad lateral vittae, paramedian ones being visible in some lights between *acr* and *dc* and along rows of *dc*. Abdomen rather dense and more or less yellowish in pollinosity; median vitta moderate in width; tergites sometimes with narrow bands on fore and hind margins; basal sclerite largely polished, only a little pollinose on caudal margin; anal sclerite polished on cephalic margin. Wings with a brownish yellow tinge, strongly yellow at base; calyptrae strongly yellow; halteres brownish at base and yellowish at knob.

Frons about as wide as distance between posterior ocelli inclusive and more or less wider than A_3; interfrontalia about two-thirds as wide as frons and a little narrower than A_3, with *if* usually strong; parafrontals with 2–4 *ori* and no *ors*; A_3 about 2–2.5 (usually 2.2–2.4) times as long as wide; arista shortly and distinctly pubescent, the longest hairs being about as long as basal diameter of arista; profrons about 1.3–1.7 times as wide as A_3; cheeks usually more or less higher than profrons-width, with genal setae in a row.

Mesonotum with 3–4 irregular pairs of *pre acr*, of which 1–3 pairs are composed

of strong setae, and with or without a few accessory setulae between the rows, which are very narrowly separated from each other; 1 *ph* present; *pra* as long as 1st *post dc* or 1st *ia*; *stpl* 1: 2 or 1:3; scutellum bare on dorsal centre.

Abdomen conical, about 2–2.4 times as long as wide; 5th sternite (Figs. 150 & 151) more or less concave on inner margin near apex of each process; hypopygium and aedeagus as in Figs. 147–149.



Figs. 147–151. *Paraprosalpia silvatica* sp. nov., ♂: 147, hypopygium, dorsal view; 148, *ditto*, lateral view; 149, aedeagus; 150, 5th sternite, ventral view; 151, *ditto*, lateral view.

Fore tibia with 2 *ad*, 1 *pv* and sometimes 1 *pd*, apical *pd* being weak and apical *p* strong; f_2 on basal two-thirds with 6–10 short and strong *av*, the longest one being half to two-thirds as long as height of the femur, and on basal two-thirds or a little more with 5–10 strong *pv*, the longest one more or less longer than height of the femur; t_2 with 2 *ad*, 2 *pd* and 1 *pv*, and with or without 1 *av*; f_3 with a row of strong *av*, the longest one usually about 1.5 times as long as height of the femur, and with a row of shorter *pv*, the longest one two-thirds to four-fifths as long as height of the femur (rarely as long as the latter); t_3 with 2–3 (usually 2) *av*, the proximal one displaced a little to anterior surface, 2–4 *ad* (not uniform in length), 2–4 *pd* and 1–2 (usually 1) *pv*. Wings with costal thorns usually rather strong; costa on ventral surface haired rather densely from base to outlet of subcosta and sparsely beyond the outlet; *m-m* slightly oblique and nearly straight or rather distinctly sinuate.

♀. Abdomen with median vitta very obscure and merging into dark reflections in some lights; 5th tergite densely pollinose like preceding tergites.

Frons about 1.6–1.9 (usually 1.6–1.7) times as wide as distance between posterior ocelli inclusive; interfrontalia as wide as or slightly wider than distance between posterior ocelli inclusive; parafrontals with 1 proclinate and 1 reclinate *ors*.

Mid tibia always with 1 *av*; f_3 with some *pv* which are much longer than height of the femur; fore tarsus with 2nd and 3rd segments slightly broadened. Wings with *m-m* hardly sinuate.

Distribution. Japan.

In a key to the Palaearctic species of *Paraprosalpia* given by Hennig (1966) this species runs out near *borealis* (Stein), from which it may, however, be readily distinguishable by the parafrontals with less than 6 *ori* in either sex, t_2 with only 1 *pv* in either sex and fore tarsus of the female with 5th segment not broadened. In a key to the North American species of the genus given by Huckett (1950 & 1965a) the present new species comes near *angustitarsis* (Malloch), from which it may be distinguished by the fore tarsus of the female with 2nd and 3rd segments slightly broadened and f_3 of the male with no *pv* longer than height of the femur (in *angustitarsis* with *pv* presumably longer than height of the femur).

*2. *Paraprosalpia silvestris* (Fallén)
(Figs. 152–158)

Musca silvestris Fallén, 1824:70. *Paraprosalpia* (*Paraprosalpia*) *silvestris*: Hennig, 1967:97.

Material examined. HOKKAIDÔ — Mt. Daisetsu, 1♂, 1♀, 28–29-vii-59 (S. Ueda), 3♂♂, 1♀, 4-viii-60 (S. Takagi & S. Ueda), 5♀♀, 25–26-vii-67 (K. Kusigemati & M. Miyazaki), & 2♂♂, 6♀♀, 17–21-vii-68; Shiretoko, 2♀♀, 15–17-viii-69 (H. Takizawa); Mt. Poroshiri, 1♂, 22-vii-67 (T. Kocha). HONSHÛ — Mt. Chôgatake, Nagano-ken, 4♀♀, 30–31-vii-70; Mt. Hodaka, Nagano-ken, 1♂, 3-viii-70; Mt. Yatsugatake, Nagano-ken, 2♂♂, 16–18-vii-70; Mt. Senjô, Nagano-ken, 1♂, 10-vii-71; Mt. Chausu, Shizuoka-ken, 1♂, 27-vii-70 (H. Takizawa).

♂. Body-length 7.5–9.5 mm. Body black in ground colour, and rather densely covered with whitish grey or pale grey pollen, which is usually more or less tinged with brown or yellow. Mesonotum rather distinctly tinged with brown in pollinosity except on humeral calli and notopleural depressions. Abdomen with median vitta rather narrow and sharp; basal and anal sclerites polished. Wings with a brownish yellow tinge, strongly yellow at base; calyptrae yellow.

Frons about as wide as distance between posterior ocelli inclusive; interfrontalia about two-thirds of frons in width, with a pair of strong *if*; parafrontals with 3–5 (usually 3–4) *ori*, and usually with no *ors*, only in 1 specimen from Mt. Senjô with 1 proclinate *ors*; profrons about 1.2–1.6 (usually 1.4–1.5) times as wide as A_3; cheeks more or less higher than profrons-width, with genal setae in a row.

Mesonotum with *pra* about as long as 1st *ia*; *stpl* 1:3 or 2:3. Abdomen with 5th sternite (Figs. 156–158) hardly concave on inner margins of processes; hypopygium and aedeagus as in Figs. 152–155.

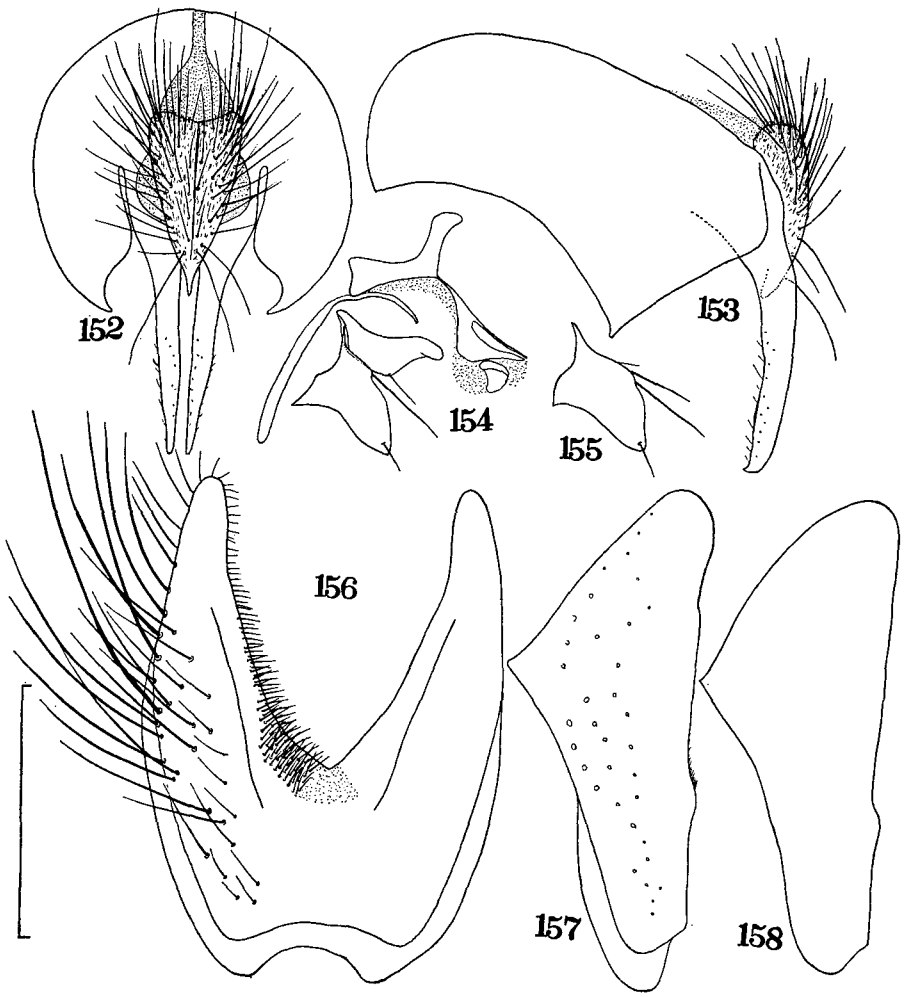
Fore tibia with 2 *ad*, 1 *pd* and 1 *pv*, and with 4 strong apical setae (*d*, *pd*, *p* and *pv*); t_2 with 2–3 (usually 2) *ad*, 2 *pd*, 1 *pv* and often 1 *av*; f_3 with 5–9 strong *pv*, the longest one being longer than height of the femur, usually about 1.4–1.5 times of the height; t_3 with 2–3 (usually 2) *av*, the proximal one displaced a little to anterior

surface, 3–5 *ad*, 3–4 *pd* and 1–2 (usually 1) *pv*. Wings with costal thorns distinct though short; *m-m* oblique and usually more or less sinuate.

♀. More distinctly yellowish pollinose than in male; abdomen with median vitta rather broad and obscure, merging into dark reflections in some lights; 5th tergite densely pollinose like preceding tergites.

Frons more or less wider than distance between posterior ocelli inclusive, about 1.2–1.5 times of the distance; parafrontals with 3–5 (usually 4–5) *ori*, and usually with no *ors*, only in a few cases with 1 proclinate *ors* on one or either side. Mid tibia always with 1 *av*; f_3 with the longest *pv* about twice as long as height of the femur; fore tarsus with 2nd and 3rd segments much broadened.

Distribution. Japan; Kamchatka; Europe; North America.



Figs. 152–158. *Paraprosalpia silvestris* (Fallén), ♂: 152, hypopygium, dorsal view; 153, *ditto*, lateral view; 154, aedeagus; 155, praegonite, variation in setal pattern; 156, 5th sternite (from Mt. Daisetsu), ventral view; 157, *ditto*, lateral view; 158, 5th sternite (from Mt. Yatsugatake), lateral view.

*3. *Paraprosalpia billbergi* (Zetterstedt)
(Figs. 159–163)

Anthomyza billbergi Zetterstedt, 1838:678. *Paraprosalpia* (*Paraprosalpia*) *billbergi*: Hennig, 1966:86.

Material examined. HOKKAIDÔ — Shikotsu-ko, 1♂, 18-v-71; Mt. Soranuma, 1♂, 19-v-68 (S. Umezawa), & 1♀, 17-vi-67; Mt. Daisetsu, 1♂, 7♀♀, 20–21-vii-68.

♂. Body-length 6.6–6.7 mm. Body black in ground colour, and whitish grey in pollinosity. Abdomen with median vitta more or less distinct or obscure; basal and anal sclerites polished. Wings tinged with brown, rather distinctly at base; calyptrae whitish, only a little yellowish marginally.

Frons as wide as or a little narrower than distance between posterior ocelli inclusive; interfrontalia a little wider than anterior ocellus, with a pair of strong *if*; parafrontals with 6–8 *ori* and no *ors*; cheeks with genal setae in about 3 rows.

Mesonotum with 1 strong and 1–2 fine *ph*; *pra* slightly longer than anterior *ntpl*; *stpl* 1:2. Abdomen with 5th sternite and hypopygium as in Figs. 159–163.

Fore tibia with 1 *ad* and 1 *pv*, and with 4 strong apical setae (*ad*, *d*, *p* and *pv*); t_2 with 1–2 *ad*, 2 *pd* and 3–4 *pv*, and in 1 specimen with 1 *av*; f_3 with some *pv*, the longest one as long as or a little longer than height of the femur; t_3 with 2–3 *av*, 4–5 *ad*, 3 *pd* (in 1 specimen with 2 additional ones) and 1–2 *pv*. Wings with costal thorns vestigial; *m-m* oblique and slightly sinuate.

♀. Body-length 4.7–7 mm. More thinly pollinose than in male. Abdomen with 5th tergite pollinose, at most sometimes polished on caudal part.

Frons about twice as wide as distance between posterior ocelli inclusive; interfrontalia about as wide as distance between posterior ocelli inclusive, with *if* weaker than those of male; parafrontals with 2 proclinate and 1 reclinate *ors*; A_3 about 1.3–1.5 times as long as wide.

Mid tibia always with 1 *av*; f_3 with the longest *pv* about twice as long as height of the femur; fore tarsus with 2nd and 3rd segments much broadened.

Distribution. Japan; Europe.

Having compared the present Japanese specimens with 2 British ones (1♂, 1♀) determined as *billbergi* by Ackland I have found no serious differences between them except for the 5th tergite of the female being less polished in the Japanese form.

*4. *Paraprosalpia pilitarsis* (Stein)
(Figs. 164–168)

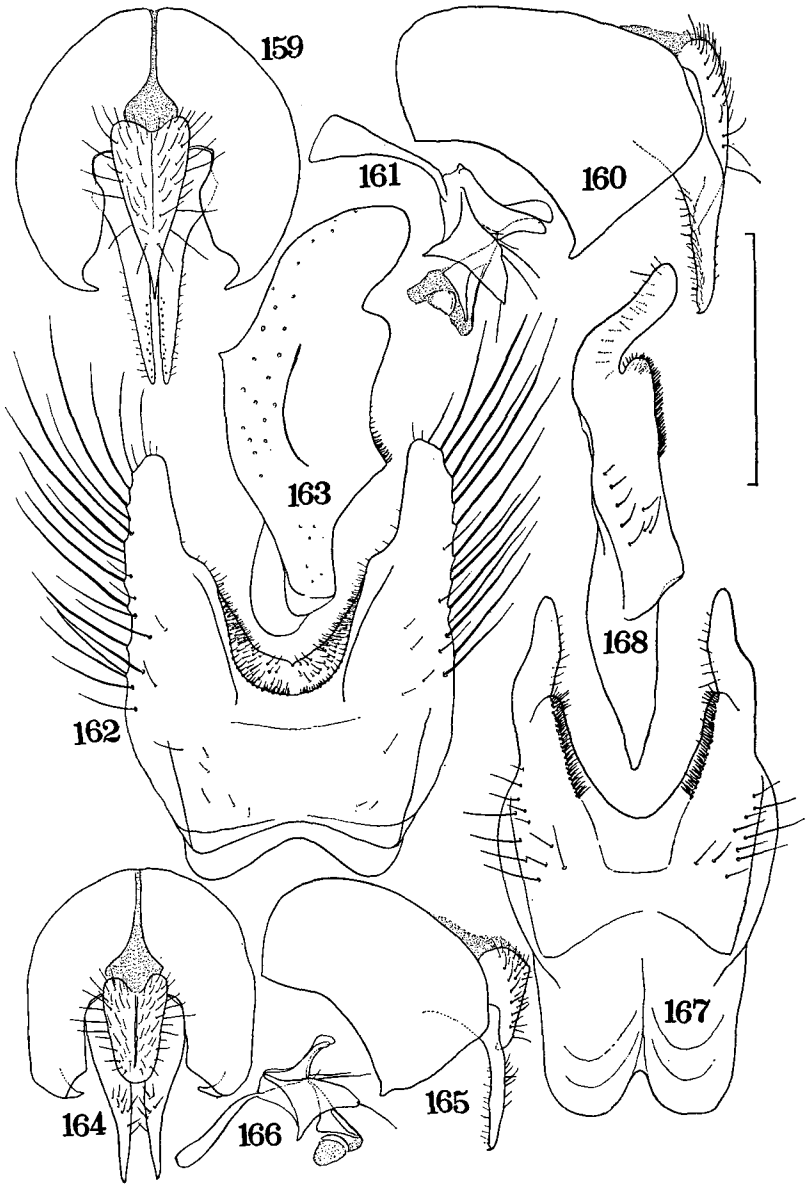
Prosalpia pilitarsis Stein, 1900:313. *Paraprosalpia pilitarsis*: Huckett, 1950:136. *Paraprosalpia* (*Paraprosalpia*) *pilitarsis*: Hennig, 1966:95.

Material examined. HONSHÛ — Mt. Senjô, Nagano-ken, 4♂♂, 10-vii-71.

♂. Body-length 5–5.7 mm. Abdomen pollinose on hypopygium as densely as on preceding segments. Wings tinged with dark brown, strongly at base; calyptrae whitish, at most very faintly yellowish on margin.

Frons as wide as or slightly narrower than A_3 which is about as wide as distance between posterior ocelli inclusive; interfrontalia about half as wide as frons; A_3 about 1.8 times as long as wide; cheeks with genal setae in a few rows.

Mesonotum with 3 pairs of *pre acr*, distance between the rows being as long



Figs. 159–163. *Paraprosalpia billbergi* (Zetterstedt), ♂: 159, hypopygium, dorsal view; 160, *ditto*, lateral view; 161, aedeagus; 162, 5th sternite, ventral view; 163, *ditto*, lateral view.

Figs. 164–168. *Paraprosalpia pilitarsis* (Stein), ♂: 164, hypopygium, dorsal view; 165, *ditto*, lateral view; 166, aedeagus; 167, 5th sternite, ventral view; 168, *ditto*, lateral view.

as or slightly shorter than that between *dc* and *acr*; *pra* as long as or a little longer than posterior *ntpl*; *stpl* 1:2; mesopleura with no distinct anterior *mpl*; prosternum with some setulae on each lateral side. Abdomen somewhat depressed, with 5th sternite and hypopygium as in Figs. 164–168.

Fore tibia with 1 *pv*, and with or without 1 short *ad*, 2 strong apical setae (*d* and *pv*) present; f_2 on basal half with some *pv* more or less longer than height of the femur, and with no distinct *av*; t_2 with 1 *ad*, 1 *pd*, 2–3 (usually 2) *pv* and no *av*; f_3 with a row of *av* becoming longer and stronger towards apex of the femur, the longest one about 1.7–2 times as long as height of the femur, and with no *pv*; t_3 with 2–3 (usually 2) *av*, 2 *ad*, 1 (in 1 specimen 2–3) *pd* and no *pv*; hind tarsus shortened on 2nd, 3rd and 4th segments, and thereon with setae as long as or longer than the segments combined.

♀. Unknown to me. According to Huckett (1950) and Hennig (1966) the female of this species can be distinguished from those of the allied species by the hind femur with no *pv*, by the setulose prosternum, and by the parafacials at the narrowest part not wider than the 3rd antennal segment.

Distribution. Japan; Europe; North America.

12. Genus *Eustalomyia* Kowarz

Eustalomyia Kowarz, 1873:461. Type-species: *Musca hilaris* Fallén, 1823.

Judging from the genital structures of the male this genus may be closely related to *Leucophora* Robineau-Desvoidy as pointed out by Hennig (1967), and it differs from the latter mainly in the characteristic markings on the body, the wider epistoma and the spineless ovipositor. These genera seem to differ in their biology. So far as known, *Eustalomyia* is associated with crabronid wasps and the larvae may live on preys caught by the wasps; on the other hand *Leucophora* is associated with andrenid bees and the larvae live on pollen or honey stored by the bees.

According to Hennig (1967) 8 species belong to *Eustalomyia*, and of them 3 species are endemic in Ethiopia, 1 species is endemic in China, and the rest 4 species are found in Europe (3 of them are found also in North America). The Chinese species is, however, suppressed as a synonym of *vittipes* (Zetterstedt) as discussed hereinafter. In this study have been found from Japan 4 species which are common to Europe.

Key to the species (♂♂ & ♀♀)

1. Arista longly plumose, the longest hairs being slightly shorter or much longer than A_3-width; scutellum bare on dorsal centre; in female *stpl* 1:1; in male t_3 with at most some weaker *pv* apart from 1–3 strong ones. 2
– Arista shortly plumose or minutely pubescent, the longest hairs being distinctly shorter than A_3-width; scutellum setulose on dorsal centre; in female *stpl* 1–2:2–3; in male t_3 with numerous weaker *pv* apart from 1–3 strong ones. 3
2. Palpi yellow; legs at least partly yellow; *pra* at most as long as posterior *ntpl*. ..... 2. *vittipes* (Zetterstedt)
– Palpi black; legs wholly black; *pra* distinctly longer than posterior *ntpl*. ..... 1. *hilaris* (Fallén)
3. Arista shortly plumose, the longest hairs being about 3 times as long as basal diameter of arista; in male t_3 with 5–7 *av*, and with 2–3 strong and 15–20 weaker *pv*; in female t_2 with 1 *ad*. ..... 3. *festiva* (Zetterstedt)
– Arista minutely pubescent, the longest hairs being shorter than basal diameter of arista; in male t_3 with 12–13 *av*, and with 1 strong and about 40 weaker *pv*; in female t_2 with 2–3 *ad*. ..... 4. *histrio* (Zetterstedt)

*1. *Eustalomyia hilaris* (Fallén)
(Figs. 169–173)

Musca hilaris Fallén, 1823:57. *Eustalomyia hilaris*: Hennig, 1967:104.

Material examined. HONSHÛ — Okukinu, Tochigi-ken, 1♀, 23-vii-69 (T. Kocha); Mt. Shiomi, Nagano-ken, 1♂, 15-viii-72 (H. Takizawa); Mt. Chausu, Shizuoka-ken, 1♂, 27-vii-70 (H. Takizawa).

♂. Body-length 9.5 mm. Abdomen with fore marginal bands broad and expanding caudad beside median vitta. Legs black.

Arista with the longest hairs rather distinctly longer than A_3-width; parafrontals with 8 *ori* and no *ors*. Mesonotum with 3 pairs of strong *pre acr*; 1 strong and 1–2 rather distinct *ph*; *pra* a little shorter than anterior *ntpl*; notopleura with no accessory setulae; mesopleura with some (4–8) accessory setulae near *pstg*; *stpl* 1:3; scutellum not setulose on dorsal centre. Fore tibia with apical *ad* rather long and slender; t_3 with 3–4 *av*, 5–6 (of them 2–3 stronger) *ad*, 3 strong and 0–1 weaker *pd*, and 2–3 strong and 1–2 weaker *pv*.

♀. Body-length 8.5 mm. Interfrontalia about as wide as parafrontalia at level of lower reclinate *ors*; parafrontals with 3 strong *ori*; arista with the longest hairs slightly shorter than A_3-width. Mesonotum with 1 strong *ph*; *pra* as long as or a little shorter than anterior *ntpl*. Fore tibia with 2 *ad* and 1 *pv*; t_2 with 1 strong *ad*, and in addition with 0–1 short *ad* in the present specimen; t_3 with no *pv*.

Distribution. Japan; Europe.

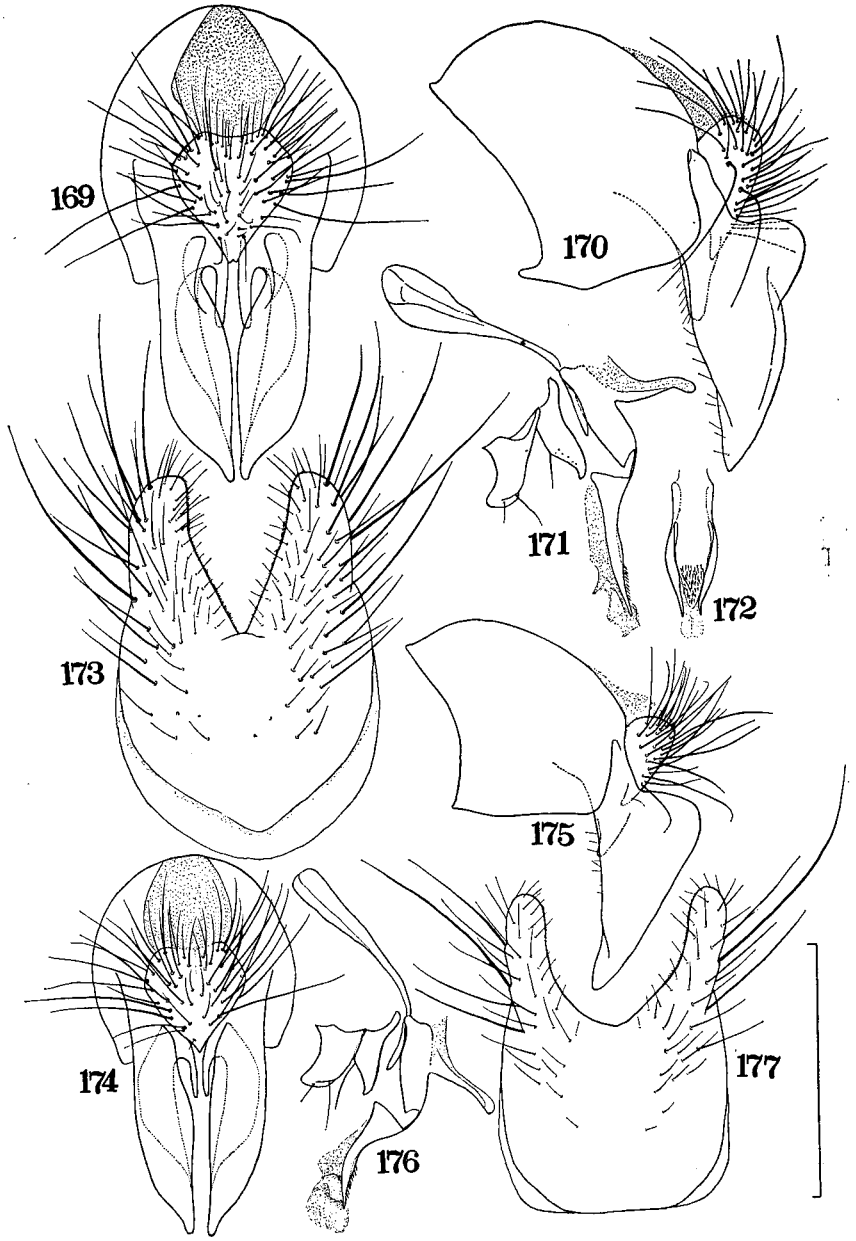
*2. *Eustalomyia vittipes* (Zetterstedt)
(Figs. 174–177)

Anthomyza vittipes Zetterstedt, 1845:1649. *Eustalomyia lepraota* Séguy, 1928:153, syn. nov. *Eustalomyia lepraota*: Hennig, 1967:106. *Eustalomyia vittipes*: Hennig, 1967: 107.

Material examined. HOKKAIDÔ — Nopporo, 1♂, 9-vi-67; Mt. Soranuma, 2♀♀, 30-viii-67 (K. Kusigemati); Mt. Apoi, 1♀, 21-vi-59 (S. Ueda); Tokachi-Iwanai, 1♀, 29-vi-73 (T. Hattori). HONSHÛ — Mt. Zaô, Yamagata-ken, 1♂, 8-ix-66; Nippara, Tôkyô-to, 1♀, 19-vii-71 (H. Takizawa); Mt. Mitô, Tôkyô-to, 2♂♂, 27-v-68 (H. Takizawa); Mt. Mitake, Tôkyô-to, 1♀, 26-v-67; Yashajin-tôge, Yamanashi-ken, 1♂, 6-vi-67 (T. Kocha).

♂. Body-length 7.2–9.6 mm. Interfrontalia and cheeks brownish to black in ground colour; palpi yellow. Abdomen with fore marginal bands broad and more or less expanding caudad beside median vitta, the latter is narrow and not very sharp. Legs variously darkened; trochanters yellowish; f_1 blackish on dorsal and posterior surfaces, yellowish or blackish on anterior surface, and more or less yellowish on apical and basal parts; f_2 and f_3 largely yellow and partly darkened on dorsal surface of apical fourth to third, or largely darkened and only at basal and apical parts yellow; t_1 yellow; t_2 and t_3 yellowish to dark brownish.

Arista with hairs much longer than A_3-width; frons about 1.4–1.6 times as wide as distance between posterior ocelli inclusive; interfrontalia narrower than anterior ocellus; parafrontals with 5–7 *ori*, and with 1 vestigial *ors* near anterior ocellus. Mesonotum with 6–8 pairs of *pre acr*, of which about 3 pairs are com-



Figs. 169–173. *Eustalomyia hilaris* (Fallén), ♂: 169, hypopygium, dorsal view; 170, *ditto*, lateral view; 171, aedeagus; 172, distiphallus, dorsal view; 173, 5th sternite, ventral view.

Figs. 174–177. *Eustalomyia vittipes* (Zetterstedt), ♂: 174, hypopygium, dorsal view; 175, *ditto*, lateral view; 176, aedeagus; 177, 5th sternite, ventral view.

posed of setae rather stronger than those of the remaining pairs; 1 *ph* present; *pra* lacking in 1 specimen from Mt. Mitô, but usually present and as long as or a little shorter than posterior *ntpl*; notopleura with no accessory setulae; mesopleura sometimes with 1 or a few accessory setulae near *pstg*; *stpl* 1:3 or 1:4; scutellum not setulose on dorsal centre. Fore tibia with apical *ad* more or less developed; t_3 with 3–4 *av*, 4–6 *ad*, 3–4 strong and a few or some weak *pd*, and 1 or a few strong and some weaker *pv*.

♀. Body-length 6.1–8.4 mm. Eyes most narrowly separated at vertex by a distance as long as 0.31–0.36 times of head-width; interfrontalia as wide as or distinctly narrower than parafrontalia at level of lower reclinate *ors* (Table 1); parafrontals with 3–4 strong *ori*. *Stpl* 1:1. Mid tibia with 1 *ad*, 1 *pd* and 3 *p–pv*; t_3 with no *pv*.

Distribution. Japan; China; Europe; North America.

According to the redescription of *lepraota* Séguy based on the holotype (♀) and given by Hennig (1967) there are no significant differences between *lepraota* and *vittipes* except for the interfrontal width. Hennig (l.c., p. 106) states: "Bei v i t t i p e s bleibt die Mittelstrieme an der schmalsten Stelle nur sehr wenig hinter der Breite einer Orbite zurück, während bei l e p r a o t a die einzelne Orbite hier etwas 1 1/2 mal so breit ist die Mittelstrieme." He has given also the following comments: — "...Danach bestehen zwischen diesen beiden Arten, wenigstens im weiblichen Geschlecht, nur ganz geringfügige Unterschiede. Mir scheint es daher zweifelhaft, ob l e p r a o t a als eine von v i t t i p e s verschiedene Art angesehen werden kann, zumal diese über die ganze holarktische Region verbreitet ist." In the present specimens the interfrontal width shows a graded series of variations as shown in Table 1. It is the opinion here adopted that *lepraota* should be suppressed as a synonym of *vittipes*.

Table 1. Some female characters of *Eustalomyia vittipes*.

Specimen No.	Locality	Width of Pf to width of If	Colour of If	Body-length (mm)
1	Mt. Apoi	1.5	Dark brownish	6.1
2	Tokachi-Iwanai	1.3	Dark brownish	8.4
3	Mt. Soranuma	1.5	Blackish	6.3
4	ditto	1.3	Blackish	6.6
5	Nippara	1	Blackish	7.6
6	Mt. Mitaka	1.2	Blackish	6.5

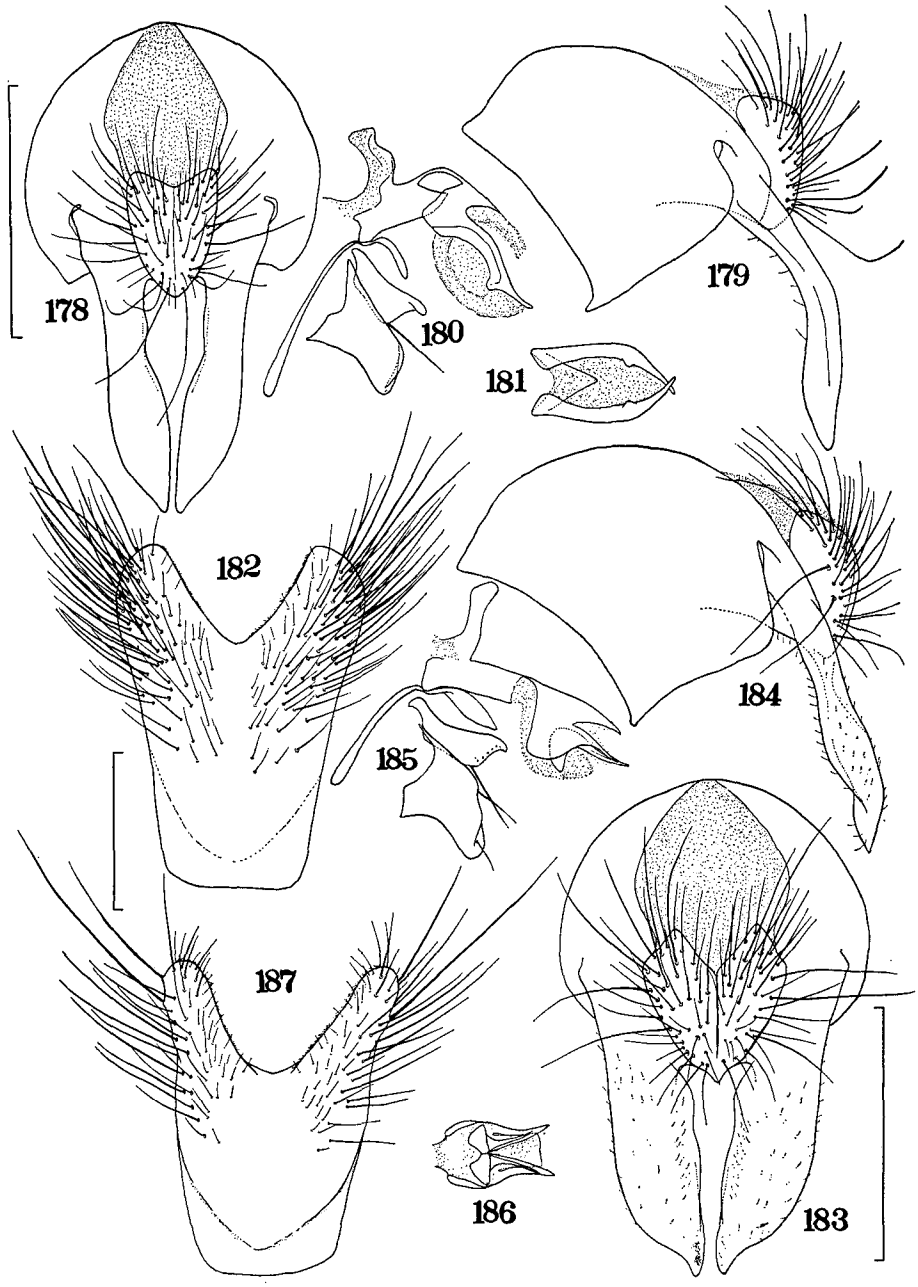
Pf: Parafrontalia; If: Interfrontalia.

*3. *Eustalomyia festiva* (Zetterstedt)
(Figs. 178–182)

Aricia festiva Zetterstedt, 1845:1424. *Eustalomyia festiva*: Hennig, 1967:103.

Material examined. HOKKAIDÔ — Jôzankei, 1♀, 4-ix-67 (M. Suzuki), & 1♀, 3-ix-69; Otoineppu, 1♀, 15-viii-72 (Sk. Yamane); Sôunkyô, 1♂, 6-viii-60 (S. Ueda), & 1♂, 7-viii-60 (S. Takagi); Horoka, 1♂, 13-vii-59 (S. Takagi).

♂. Body-length 9.1–10.7 mm. Abdomen with fore marginal bands narrow and not expanding caudad beside median vitta, and with hind marginal bands more



Figs. 178–182. *Eustalomyia festiva* (Zetterstedt), ♂: 178, hypopygium, dorsal view; 179, *ditto*, lateral view; 180, aedeagus; 181, distiphallus, ventral view; 182, 5th sternite, ventral view.

Figs. 183–187. *Eustalomyia histrio* (Zetterstedt), ♂: 183, hypopygium, dorsal view; 184, *ditto*, lateral view; 185, aedeagus; 186, distiphallus, ventral view; 187, 5th sternite, ventral view.

or less broader than fore marginal ones. Legs blackish, at most slightly yellowish on femora apically.

Aristal hairs not longer than A_3-width, at most about 3 times as long as basal diameter of arista; parafrontals contiguous to each other, with 6–9 *ori* and no *ors*. Mesonotum with many (9–14) pairs of *pre acr*, of which 3–4 pairs are composed of rather strong setae; 1 strong and 1–2 rather distinct *ph* present; *pra* about as long as anterior *ntpl*; notopleura with no accessory setulae; mesopleura with 1–5 accessory setulae near *pstg*; *stpl* 2:3 or 2:4; scutellum densely setulose on whole dorsal surface. Hind tibia with 5–7 *av*, 3–4 long, 2–4 shorter and some fine *ad*, 4–7 *pd*, and 2–3 strong and many (about 15–20) weaker *pv*.

♀. Interfrontalia narrowest at level of proclinate *ors*, and at this part wider than parafrontalia. Hind tibia with no *pv*.

Distribution. Japan; Europe; North America.

*4. *Eustalomyia histrio* (Zetterstedt)
(Figs. 183–187)

Anthomyza histrio Zetterstedt, 1838:676. *Eustalomyia histrio*: Hennig, 1967:105.

Material examined. HOKKAIDÔ — Sapporo, 1♂, 23-v-61 (T. Kumata); Mt. Soranuma, 1♀, 1-viii-68; Mt. Apoi, 1♀, 21-vi-59 (K. Kamijo).

♂. Body-length 10.2 mm. Abdomen with fore marginal bands narrow and not expanding caudad beside median vitta, and with hind marginal bands broader than fore marginal ones. Legs blackish, at most slightly yellowish on femora apically.

Arista minutely pubescent; parafrontals contiguous to each other, with 8–9 *ori* and no *ors*. Mesonotum with 7 strong and 5 finer *pre acr*, which are irregularly paired, the rows being narrowly separated from each other; 1 strong and 2 rather distinct *ph* present; *pra* about as long as anterior *ntpl*; notopleura with 2 accessory setulae; mesopleura with many (9) accessory setulae around *pstg*; *stpl* 2:3 or 2:4; scutellum densely setulose on whole dorsal surface. Fore tibia with apical *p* strong although more or less shorter than apical *pd*; t_3 with 12–13 *av*, 3–4 long and 3–4 short *ad*, 4 long and 3 short *pd*, and 1 strong and numerous (about 40) weaker *pv*.

♀. Body-length 9.7–10 mm. Interfrontalia nearly parallel-sided, and nearly twice as wide as parafrontalia at level of lower reclinate *ors*; parafrontals with 4 *ori*. Notopleura with or without 1–3 accessory setulae; mesopleura with about 10–15 accessory setulae around *pstg*; *stpl* 2:2 or 2:3. Mid tibia with 2 strong and 0–1 weaker *ad*, 2–3 *pd* and 4–5 *p–pv*; t_3 with no *pv*.

Distribution. Japan; Europe; North America.

13. Genus *Leucophora* Robineau-Desvoidy

Leucophora Robineau-Desvoidy, 1830:562. Type-species: *Leucophora cinerea* Robineau-Desvoidy, 1830.

According to Hennig (1967) 19 species of this genus are distributed in the Palaearctic region. From Japan will be recorded the following 7 species.

Key to the species (♂♂)

1. Arista plumose, the longest hairs being longer than A_3-width; A_3 more than twice as long as wide. ..... 1. *grisella* Hennig
– Arista shortly or minutely pubescent, the longest hairs being at most about as long as basal diameter of arista; A_3 less than twice as long as wide. 2
2. Mid tibia with *av* or *v*, if without any then t_3 with apical *pd* strong. 3
– Mid tibia without *av* or *v*; t_3 with apical *pd* weak or vestigial. 6
3. Mid tibia with *av*, if without it t_3 with apical *pd* strong; interfrontalia with *if*. ..... 5. *unilineata* (Zetterstedt)
– Mid tibia with *v*; t_3 with apical *pd* weak or vestigial; interfrontalia without *if*. .. 4
4. *Pra* shorter than posterior *ntpl*; cheeks with genal setae in 1 row. ..... 6. *unistriata* (Zetterstedt)
– *Pra* longer than posterior *ntpl*; cheeks with genal setae in 2 rows even if the upper row being composed of only a few setae. 5
5. Notopleura with some accessory setulae; t_1 with 1 distinct *ad* and 1 strong *pv*; f_3 with strong *pv*. ..... 2. *personata* (Collin)
– Notopleura with no accessory setulae; t_1 with 1 minute *ad* and 2 strong *pv*; f_3 without strong *pv*. ..... 4. *obtusa* (Zetterstedt)
6. Prosternum with a pair of setae; parafrontals with 1 *ors*; haustellum slender and about as long as palpi. ..... 3. *sericea* Robineau-Desvoidy
– Prosternum with no setae; parafrontals with no *ors*; haustellum normal and shorter than palpi. ..... 7. *sponsa* (Meigen)

*1. *Leucophora grisella* Hennig
(Figs. 188–190)

Musca grisea Fallén, 1823:57, nec Fabricius, 1805. *Leucophora grisella* Hennig, 1967: 120.

Material examined. HONSHÛ — Mt. Bandai, Fukushima-ken, 1♀, 28-vii-71; Sai-ko, Yamanashi-ken, 1♂, 9-vi-67 (T. Kocha); Mt. Hodaka, Nagano-ken, 1♂, 3-viii-70.

♂. Body-length 7.3–8.1 mm. A_3 about 2.1–2.9 times as long as wide; arista plumose, the longest hairs about 1.3–1.4 times as long as A_3-width; interfrontalia with fine *if*; parafrontals with 1 proclinate *ors*. Mesonotum with *pra* lacking; scutellum bare on dorsal centre. Fore tibia with 1 short *ad* and 1–2 strong *pv*, and with strong apical *pd*, in the specimen from Sai-ko 1 strong *pd* being present on the right t_1 at apical third; t_2 with neither *av* nor *v*; t_3 with 3–4 *av*, 3–4 *ad*, 3–4 *pd* and 3–4 *pv*. Wings with costa haired on ventral surface.

♀. Body-length 6.3 mm. Frons about 0.35 times as wide as head; interfrontalia with *if* invisible in the present specimen; parafrontals with 2 proclinate and 1 reclinate *ors*. Hind tibia with no *pv*.

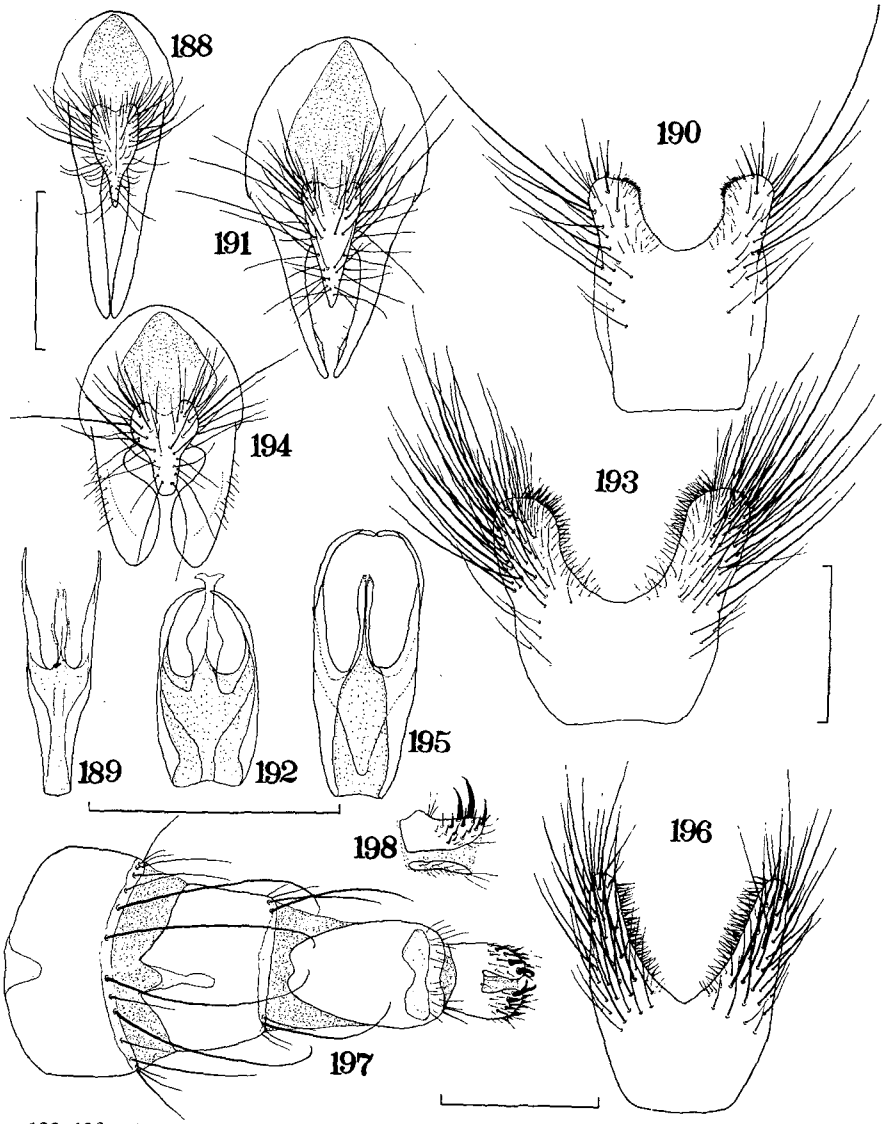
Distribution. Japan; Europe.

*2. *Leucophora personata* (Collin)
(Figs. 191–193)

Hylephila personata Collin, 1921:318. *Leucophora personata*: Hennig, 1967:125.

Material examined. HOKKAIDÔ — Eniwa, 1♂, 12-vi-68.

♂. Body-length 7.5 mm. Frons a little wider than distance between posterior ocelli inclusive; interfrontalia about 1.5 times as wide as anterior ocellus,



Figs. 188–190. *Leucophora grisella* Hennig, ♂: 188, hypopygium, dorsal view; 189, distiphallus, ventral view; 190, 5th sternite, ventral view.

Figs. 191–193. *Leucophora personata* (Collin), ♂: 191, hypopygium, dorsal view; 192, distiphallus, ventral view; 193, 5th sternite, ventral view.

Figs. 194–196. *Leucophora sericea* Robineau-Desvoidy, ♂: 194, hypopygium, dorsal view; 195, distiphallus, ventral view; 196, 5th sternite, ventral view.

Figs. 197 & 198. *Leucophora sericea* Robineau-Desvoidy, ♀: 197, ovipositor, dorsal view; 198, *ditto* (terminal segment), lateral view.

without *if*; parafrontals with 1 proclinate *ors*; arista minutely pubescent. Mesonotum with *pra* about as long as anterior *ntpl*; notopleura with some (4–5) accessory setulae; scutellum rather densely setulose on dorsal surface. Abdomen slightly

less than twice as long as wide. Mid femur with 1 strong *av* near basal fourth; t_2 with 1 strong *v* slightly displaced to anteroventral surface; f_3 on basal two-thirds with 6–7 *pv* somewhat weaker than *av*; t_3 with apical *pd* short and fine. Wings with costa bare ventrally.

♀. Unknown to me. According to Collin (1921) the female of this species can be distinguished from that of *L. unistriata* (Zetterstedt) by the following aspects: — "Pre-alar bristle strong though only about half the length of supra-alar. Postical cross-vein oblique. The middle four bristles on hind-margin of last visible abdominal segment much further from the margin than the others."

Distribution. Japan; Europe.

*3. *Leucophora sericea* Ronbineau-Desvoidy
(Figs. 194–198)

Musca buccata Fallén, 1824:65, nec Scopoli, 1763. *Leucophora sericea* Robineau-Desvoidy, 1830:563. *Leucophora sericea*: Hennig, 1967:127.

Material examined. HOKKAIDÔ — Mt. Apoi, 1♀, 28-vi-67; Obihiro, 1♂, 15-vii-66; Kunneppu, 1♀, 25-vii-66; Notoro-ko, 1♂, 24-vii-66; Abashiri, 1♂, 25-vii-62 (S. Takagi).

♂. Body-length 6.7–7.5 mm. Strongly tinged with yellow in pollinosity; abdomen with median vitta much narrowing caudad and on each tergite interrupted or nearly so at hind margin.

Frons more or less narrower than distance between posterior ocelli inclusive; interfrontalia with a pair of fine *if* or with a single one; parafrontals with 1 proclinate *ors*; cheeks with genal setae fine; aristal pubescence distinct though short; haustellum slender.

Mesonotum with 2nd *ph* more or less distinct; *pra* as long as or a little longer than posterior *ntpl*; mesopleura with 1 or a few strong anterior *mpl*; prosternum with a pair of setae; scutellum rather densely setulose dorsally.

Mid tibia without *av* or *v*; f_2 with no strong *av*; f_3 with no *pv* except for a few ones near base and apex.

♀. Mesonotum with 2nd *ph* fine; *pra* shorter than posterior *ntpl*; *stpl* 1:1.

Distribution. Japan; Manchuria; Tibet; Europe.

*4. *Leucophora obtusa* (Zetterstedt)
(Figs. 199–201)

Anthomyza obtusa Zetterstedt, 1838:682. *Hylephila obtusa*: Collin, 1921:315. *Leucophora obtusa*: Huckett, 1940:350; Hennig, 1967:124.

Material examined. HONSHÛ — Mt. Tanzawa, Kanagawa-ken, 1♂, 29-iv-70 (H. Takizawa).

♂. Body-length 6.4 mm. Palpi yellowish basally and dark brownish apically. Abdomen with narrow and sharp median vitta.

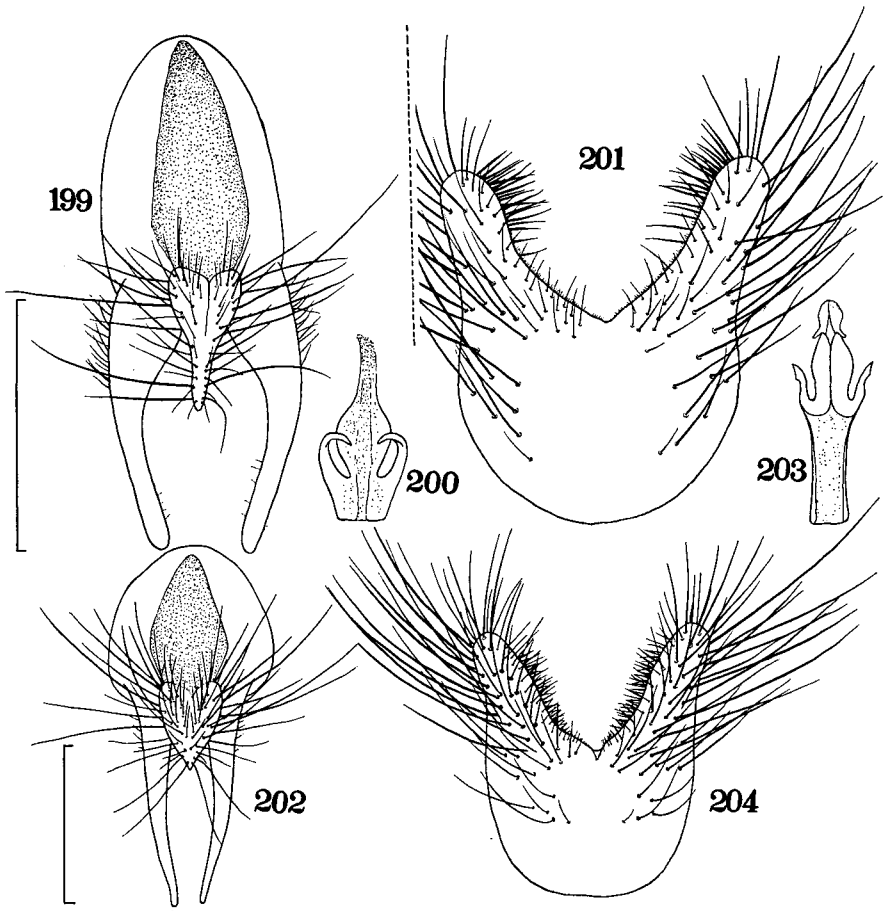
Parafrontals with 1 proclinate *ors*; interfrontalia without *if*; cheeks with genal setae long and in 2 rows. Thorax hairy; 1 strong and 2 rather strong *ph* present; 3 pairs of *pre acr* being composed of strong setae; *pra* more or less longer than posterior *ntpl*, yet weaker than the latter; mesopleura with no distinct anterior *mpl*; *stpl* 1:2; scutellum setulose on dorsal surface except basally.

Abdomen hairy; 1st sternite densely setulose.

Fore tibia with 2 *pv*, and with 1 *ad* which is very minute and only a little stronger than accessory setulae, apical *pd* being vestigial; f_2 on posteroventral surface with a row of slender setae and with many hair-like setulae; t_2 with 1 *v*, 1 *ad*, 1 *p* and 1 *pv*; f_3 with a row of slender *av* and a row of rather long hair-like *pv*.

♀. Unknown to me. According to Hennig (1967) the female of this species differs from those of allied species in having the 1st abdominal sternite setulose and the fore tibia with a distinct apical *ad*.

Distribution. Japan; Europe; North America.



Figs. 199–201. *Leucophora obtusa* (Zetterstedt), ♂: 199, hypopygium, dorsal view; 200, distiphallus, ventral view; 201, 5th sternite, ventral view.

Figs. 202–204. *Leucophora unilineata* (Zetterstedt), ♂: 202, hypopygium, dorsal view; 203, distiphallus, ventral view; 204, 5th sternite, ventral view.

*5. *Leucophora unilineata* (Zetterstedt)
(Figs. 202–204)

Anthomyza unilineata Zetterstedt, 1838:675. *Hylephila unilineata*: Collin, 1921:313. *Leucophora unilineata*: Huckett, 1940:348; Hennig, 1967:133.

Material examined. HOKKAIDÔ — Sapporo, 38♂♂, 5♀♀, 14-iv–15-v-59–70 (S. Sakagami, S. Takagi, S. Ueda & M. Suwa).

♂. Body-length 5.8–8.8 mm. Body hairy, more densely in larger specimens, and whitish grey in pollinosity. Mesonotum with median vitta brownish pollinose. Abdomen with median vitta moderate in width and brownish pollinose; tergites more or less brownish in pollinosity on fore margins.

Frons as wide as distance between posterior ocelli inclusive, or nearly so; interfrontalia a little wider than anterior ocellus, with a pair of slender *if*; parafrontals with many (7–14) long *ori* and usually with 1 slender *ors*; A_3 about 1.4–1.6 times as long as wide; arista minutely pubescent; profrons twice or slightly more as wide as A_3; cheeks about 2.2–2.7 times as high as A_3-width, with genal setae in a few rows.

Mesonotum with 2nd *ph* well developed or fine; *pra* longer than posterior *ntpl*, sometimes nearly as long as anterior one; a few distinct and some or many finer *pre acr* present and irregularly paired, the strongest one often as long as or longer than *pra* though less stout than the latter; notopleura with no accessory setulae; mesopleura with no distinct anterior *mpl*; *stpl* 1:2; prosternum with no setulae; scutellum densely setulose on dorsal surface. Abdomen with marginal setae strong.

Fore tibia with 1–4 (usually 2–3) *pv* and no *ad*, apical *pd* being strong; t_2 with 1 *ad*, 1 *pd*, 2–5 (usually 3–4) *p–pv* and 1–2 (usually 1) *av*, the latter sometimes lacking; f_3 with a row of strong *av* longer than height of the femur, and with a row of fine and slender *pv*; t_3 with some (4–7) *av*, the distal one being strongest though not longest, 3–5 *ad*, 3–6 *pd* and many (7–15) slender *pv*, apical *pd* being strong. Wings with costa not haired ventrally beyond outlet of subcosta.

♀. Body-length 6.6–8.2 mm. More brownish pollinose and less densely haired than in male. Frons about twice as wide as distance between posterior ocelli inclusive; interfrontalia about half of frons in width, with *if* fine. Mesonotum with 2nd *ph* fine and like accessory setula; *stpl* 1:1. Fore tibia with 1 *pv* and usually with 1 short *ad*; t_2 with 1–2 *av*, 1 *ad*, 1 *pd*, 1 *p* and 0–1 *pv*; f_3 with no *pv* except for a few preapical ones; t_3 with *av* less in number (2–4) than those of male and with no *pv*.

Distribution. Japan; Kamchatka; Europe; North America.

This species is variable in size and in the hairing of the body, and sometimes very similar to *obtusa* in general appearance. However, it can be readily distinguished from that species by the presence of *if*, the strong apical *pd* on the fore tibia, and the strong apical *pd* on the hind tibia.

*6. *Leucophora unistriata* (Zetterstedt)
(Figs. 205–207)

Anthomyza unistriata Zetterstedt, 1838:677. *Hylephila unistriata*: Collin, 1921:319. *Leucophora unistriata*: Huckett, 1940:352; Hennig, 1967:134.

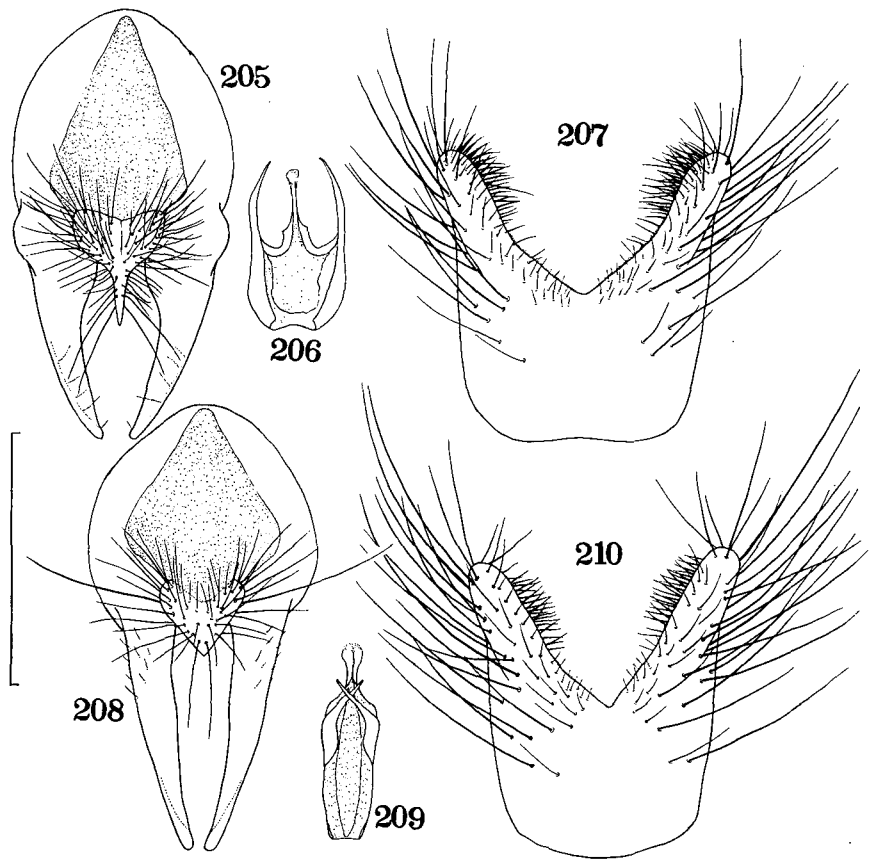
Material examined. HOKKAIDÔ — Sapporo, 7♀♀, 20-v–8-vi-60 (S. Sakagami); 1♀, 12-v-68 (T. Kocha); Nopporo, 1♀, 3-vi-73; Jôzankei, 1♂, 10-vi-66; Shikotsu-ko, 7♂♂, 1♀, 18-v-71.

♂. Body-length 5–6.5 mm. Pale greyish in pollinosity. Abdomen usually brownish pollinose on fore margin of each tergite. A_2 often reddish brown apically.

Frons about twice as wide as anterior ocellus; interfrontalia without *if*; parafrontals with 8–11 *ori*, of which the uppermost one is sometimes situated from the next one at a distance longer than that between the lower ones, so that it might be referred to *ors*; cheeks with genal setae in a row. Mesonotum with *pra* much shorter than posterior *ntpl* and often indistinguishable from accessory setulae; prosternum usually bare, but in 2 specimens of the present ones with a pair of setae.

Fore tibia with 1 *pv* and with or without 1 minute *ad*; f_2 with a few short and strong *av* on basal third and with a row of long *pv*; t_2 with 1 strong *v*; t_3 with 3–8 (usually 5–6) *av*, 3–5 (usually 3–4) *ad*, 3–5 (usually 3–4) *pd* and 4–8 (usually 5–7) *pv*; t_1 and t_3 with apical *pd* weak or vestigial.

♀. Body-length 4.7–5.6 mm. More brownish yellow in pollinosity. Frons more or less wider than distance between posterior ocelli inclusive; interfrontalia as wide as or a little wider than anterior ocellus. Prosternum with no setae; *stpl* 1:1. Abdomen with 1st sternite bare in 1 specimen, yet in the others with a few or some setulae on each lateral side. Fore tibia always with 1 distinct *ad*; t_3 with no *pv*.



Figs. 205–207. *Leucophora unistriata* (Zetterstedt), ♂: 205, hypopygium, dorsal view; 206, distiphallus, ventral view; 207, 5th sternite, ventral view.

Figs. 208–210. *Leucophora sponsa* (Meigen), ♂: 208, hypopygium, dorsal view; 209, distiphallus, ventral view; 210, 5th sternite, ventral view.

Distribution. Japan; China; Manchuria; Europe; North America.

According to Huckett (1940) and Hennig (1967) the female of this species has the 1st abdominal sternite which is not setulose, but the female of the Japanese form has the sternite setulose except in 1 specimen from Sapporo. Nevertheless, the present female specimens may be identified with *unistriata* by the following characters: — Interfrontalia without *if*; cheeks with genal setae in a row; *pra* fine and like accessory setula; 5th tergite with marginal setae in a straight line; t_2 with 1 strong *v*.

*7. *Leucophora sponsa* (Meigen)
(Figs. 208–210)

Anthomyia sponsa Meigen, 1826: 147. *Hylephila sponsa*: Collin, 1921:322. *Leucophora sponsa*: Hennig, 1967:131.

Material examined. HOKKAIDÔ — Sapporo, 2♂♂, 5–8-v-68, 1♂, 21-v-69, & 1♂, 15-v-70; Jôzankei, 4♂♂, 2-v-68; Shikotsu-ko, 2♂♂, 18-v-71. HONSHÛ — Kyôto, 1♂, 2-iv-68.

♂. Body-length 5–7.5 mm. Whitish grey and somewhat bluish in pollinosity. Mesonotum with median vitta brownish pollinose; scutellum brownish pollinose at least on apical part. Abdomen with median vitta moderate in width and brownish pollinose; tergites brownish pollinose on fore and hind margins.

Frons as wide as distance between posterior ocelli inclusive, or nearly so; interfrontalia as wide as or a little wider than anterior ocellus, and with *if*; parafrontals with 6–9 *ori* and no *ors*; cheeks with genal setae in a few rows. Mesonotum with *pra* as long as or a little longer than posterior *ntpl*. Abdomen with marginal setae strong.

Fore tibia with 1–2 *pv* and 1 vestigial *ad*; t_2 with 1 *ad*, 1 *pd* and 2–4 *p–pv*, and with neither *av* nor *v*; t_3 with 3–5 strong and often a few or some fine *av*, 3–6 (usually 4–5) *ad*, 3–4 *pd* and 7–11 *pv*, and usually with 1 strong *p* near basal third.

♀. Unknown to me. Frons very wide and about one-fourth as wide as head (after Collin, 1921).

Distribution. Japan; Europe.

14. Genus *Hylemya* Robineau-Desvoidy

Hylemya Robineau-Desvoidy, 1830:550. Type-species: *Hylemya strenua* Robineau-Desvoidy, 1830.

Hylemyza Schnabl & Dziedzicki, 1911:94, as subgenus of *Hylemyia*. Type-species: (*Anthomyza lasciva* Zetterstedt, 1838) = *Anthomyia partita* Meigen, 1826.

Following Ackland (1967) and Hennig (1968–1969) I use the name of *Hylemya* for the restricted species-group defined by the following characters: — Arista plumose, the longest hairs being at least as long as A_3-width; interfrontalia with *if*; parafrontals without *ors* in male; mesonotum with *ph* not duplicated; mesopleura with a well developed anterior *mpl*; *stpl* 2:2 or 2:3; hypopygium of male with surstyli simple and with praegonites and distiphallus not reduced; t_3 at least with a few *pv* in male; wings with costa haired on ventral surface; lower calyptra not protruded beyond the upper.

Many species have been described or treated under the name of *Hylemya* (or *Hylemyia*). However, in the sense adopted here this genus is represented only by 10 species, of which 6 species are found in the Palaearctic region, 2 in North America (one common to the Palaearctic region), other 2 in the Oriental region and the rest one in Formosa. The following 2 species will be recorded from Japan for the first time.

Key to the species (♂♂)

1. Mid and hind femora largely yellow and only darkened apically; parafrontals contiguous to each other; occiput bare on upper part below postocular row of setulae; t_1 with apical *pd* vestigial. .....2. *nigrimana* (Meigen)
- Mid and hind femora wholly blackish or dark brownish; parafrontals narrowly separated from each other; occiput distinctly setulose on upper part below postocular row of setulae; t_1 with apical *pd* usually strong.....1. *latifrons* Schnabl

Key to the species (♀♀)

1. Mid and hind femora largely yellow and only darkened apically; ovipositor short; viviparous. .....2. *nigrimana* (Meigen)
- Mid and hind femora wholly blackish or dark brownish; ovipositor long; oviparous. .....1. *latifrons* Schnabl

*1. *Hylemya latifrons* Schnabl
(Figs. 211–214)

Hylemyia (*Hylemyza*) *latifrons* Schnabl, in Schnabl & Dziedzicki, 1911:242. *Hylemyia variabilis* Stein, 1916:155. *Hylemya variabilis*: Ackland, 1967:121. *Hylemya latifrons*: Hennig, 1969:243.

Material examined. HOKKAIDÔ — Sapporo, 1♂, 1♀, 16–18-v-68 (H. Torikura), 2♀♀, 24-v–2-vi-66, 1♂, 14-v-69, 6♂♂, 2♀♀, vii-69, & 5♂♂, 15♀♀, 24-ix–9-x-67–69 (H. Torikura & M. Suwa); Nopporo, 1♂, 14-v-69, 1♀, 8-x-69; Eniwa, 1♀, 27-v-71; Shimamatsu, 1♀, 3-vi-66; Obihiro, 1♀, 15-vii-66; Kunneppu, 1♀, 25-vii-66. HONSHÛ — Mt. Yatsugatake, Nagano-ken, 1♂, 16-vii-70.

♂. Body-length 4.5–6 mm. Abdomen with fore marginal bands usually absent. Legs blackish or dark brownish; t_2 and t_3 sometimes yellowish though more or less darkened.

Head about 1.2–1.4 times as high as long; frons as wide as or a little wider than anterior ocellus; interfrontalia half or at most same width of anterior ocellus; A_3 about 2–2.3 times as long as wide; arista with the longest hairs about 1–1.5 times as long as A_3-width; occiput distinctly setulose on upper part below postocular row of setulae. Fore tibia with apical *pd* usually strong.

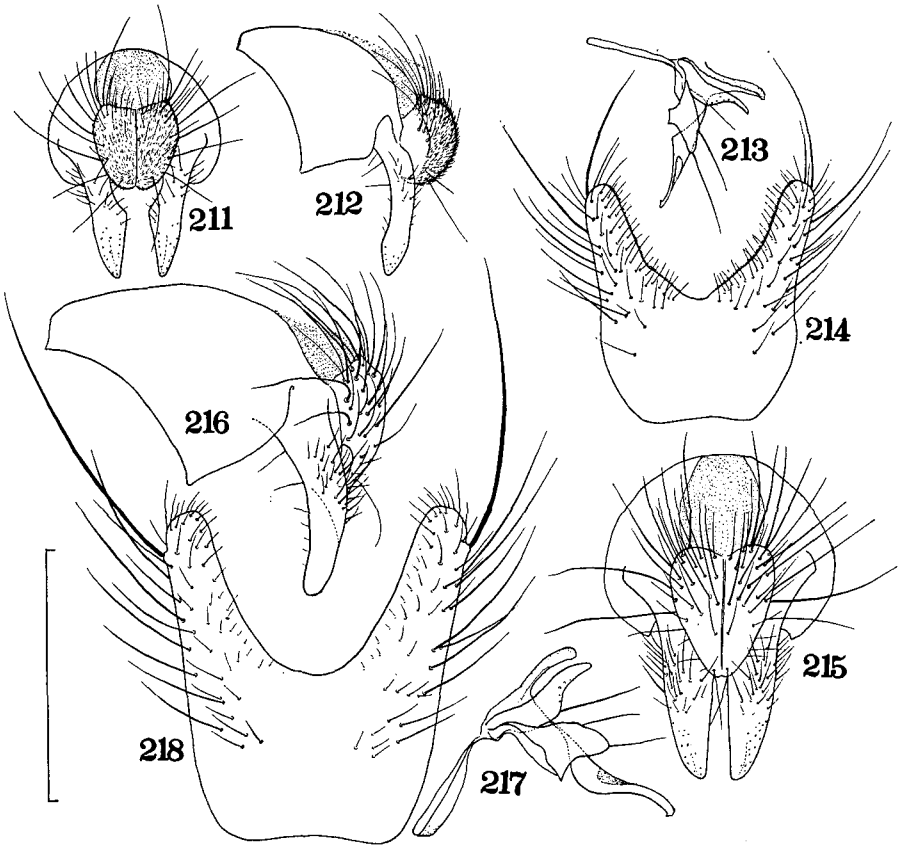
♀. Body-length 4–6 mm. Fore tibia blackish or dark brownish; t_2 and t_3 usually yellowish although more or less darkened at apical and basal parts. Occiput sparsely setulose or nearly bare on upper part below postocular row of setulae. Abdomen with long ovipositor, to which ann egg is often adhering in the specimens examined.

Distribution. Japan; Kamchatka; Manchuria; Europe; North America.

*2. *Hylemya nigrimana* (Meigen)
(Figs. 215–218)

Anthomyia nigrimana Meigen, 1826:132. *Hylemya nigrimana*: Hennig, 1969:244.

Material examined. HOKKAIDÔ — Mt. Apoi, 16♀♀, 10-vii-66, & 2♀♀, 28-vi-67; Mt. Poroshiri, 1♀, 22-vii-67 (T. Kocha). HONSHÛ — Towada, Aomori-ken, 1♂, 16-vi-68 (H. Takizawa); Nikkô, Tochigi-ken, 1♀, 6-v-67 (K. Kusigemati); Mt. Kiso-Komagatake, Nagano-ken, 1♀, 27-vii-70. SHIKOKU — Mt. Tsurugi, 1♂, 16-vii-71; Mt. Mimune, 4♂♂, 1♀, 18-vii-71. KYÛSHÛ — Mt. Kirishima, 3♂♂, 1♀, 11-v-67.



Figs. 211–214. *Hylemya latifrons* Schnabl, ♂: 211, hypopygium, dorsal view; 212, *ditto*, lateral view; 213, aedeagus; 214, 5th sternite, ventral view.
Figs. 215–218. *Hylemya nigrimana* (Meigen), ♂: 215, hypopygium, dorsal view; 216, *ditto*, lateral view; 217, aedeagus; 218, 5th sternite, ventral view.

♂. Body-length 7.5–9 mm. Mesonotum in pollinosity yellowish grey and more or less tinged with brown; median vitta brownish pollinose; scutellum not yellow at any part in ground colour, and yellowish grey in pollinosity, somewhat brownish pollinose at base dorsally, and when viewed from behind with a continuation of mesonotal median vitta. Abdomen in pollinosity pale grey and tinged

with yellow; median vitta narrow and brownish pollinose; tergites without marginal bands; 5th sternite with processes sometimes brownish or yellowish apically; cercal plate brownish or yellowish. Wings rather distinctly tinged with brownish yellow, rather strongly yellow at base; calyptrae pale yellow. Fore femur almost blackish; f_2 and f_3 yellowish, only darkened apically; tibiae yellowish, at most slightly darkened at apex especially on t_1.

Frons very narrow, about half as wide as anterior ocellus; parafrontals broadly contiguous to each other; interfrontalia with a pair of *if* or only a single one; A_3 about 2.2–2.7 times as long as wide; arista with the longest hairs about 1.6–1.8 times as long as A_3-width; occiput not setulose on upper part below postocular row of setulae.

Mesonotum with 3 pairs of *pre acr* and 4–7 pairs of *post acr*; *pra* a little shorter than posterior *ntpl*, about two-thirds to four-fifths of the latter; mesopleura with 1 strong and often 1 rather strong anterior *mpl*. Abdomen conical; 5th sternite (Fig. 218) sparsely setulose along inner margin of each process; surstyli (Figs. 215 & 216) with many short setae.

Fore tibia with 1 *ad* and 1–2 *pv*, apical *pd* being vestigial and indistinguishable from accessory setulae; t_2 with 1 *ad*, 1 *pd*, 1–2 (usually 1) *p* and 1–3 (usually 2) *pv*; t_3 with 2–3 (usually 2) *av*, 4 *ad*, 3 *pd*, and 2–6 *pv* in basal half and 1 short *pv* in apical fourth. Wings with costal thorns strong; *m-m* strongly sinuate.

♀. Body-length 6.2–7.7 mm. Interfrontalia usually reddish brown near lunule; occiput sometimes with a few setulae on upper part below postocular row of setulae. Abdomen with median vitta wider than that of male; ovipositor short.

Distribution. Japan; Europe.

Having compared the 5th sternite and the hypopygium of the present form with those of *H. strenua* figured by Ackland (1967:122), I have failed to find a good difference between them. Nevertheless, by having largely yellowish femora the present form is different from *strenua* and may be identified with *nigrimana*. This species may be also closely related to *H. detracta* (Walker) recorded from Nepal and the East Indies; it may, however, be distinguished from the latter by the *acr* more numerous and the arista with shorter hairs (cf. Ackland, 1967:123).

15. Genus *Lasiomma* Stein

Lasiomma Stein, 1916:168, as subgenus of *Chortophila* Rondani. Type-species: (*Lasiops ctenocnema* Kowarz, 1880)=*Aricia nitidicauda* Zetterstedt, 1855.

In Japan 7 species of the genus are known to occur (Suwa, 1971a). On this occasion another species will be added to the fauna.

Key to the species (♂♂)

1. Hind tibia with apical *pv* longer than height of the tibia. 2
– Hind tibia with apical *pv* shorter than height of the tibia or practically absent... 3
2. Apical *pv* of t_3 distinctly longer than height of the tibia; parafrontals without *ors*. .....4. *todocola* Suwa
– Apical *pv* of t_3 only a little longer than height of the tibia; parafrontals with *ors*. .....3. *abietis* (Huckett)
3. Epistoma more or less projecting forwards beyond frons at lunule; parafrontals

with *ors.* .....5. *morionella* (Zetterstedt)

– Epistoma not projecting forwards beyond frons at lunule; parafrontals without *ors.* 4

4. Interfrontalia with *if* usually absent, if present very fine and vestigial. 5

– Interfrontalia with *if* always present and more or less distinct..... 6

5. A_3 about 1.5–1.6 times as long as wide and distinctly not reaching to epistoma; epistoma situated distinctly behind frons at lunule.....2. *laricicola* (Karl)

– A_3 about 1.7–2 times as long as wide and nearly reaching to epistoma; epistoma situated nearly as far as frons at lunule.....1. *anthracinum* (Czerny)

6. Eyes distinctly haired; f_3 near middle with a few *pv* much longer than height of the femur. .....6. *meadei* (Kowarz)

– Eyes practically bare; f_3 near middle with no *pv* longer than height of the femur... 7

7. Third sternite more than twice as long as wide; cercal plate with a pair of short setulae at apex. .....7. *octoguttatum* (Zetterstedt)

– Third sternite less than twice as long as wide; cercal plate with no setulae at apex. .....8. *japonicum* Suwa

1. *Lasiomma anthracinum* (Czerny)

Chrotophila anthracina Czerny, 1906:251. *Lasiomma anthracinum*: Ackland, 1965a:139; Hennig, 1967:184. *Lasiomma anthracinum*: Suwa, 1971a:30.

Material examined. HOKKAIDÔ — Jôzankei, 6♂♂; Mt. Apoi, 1♂; Shikaribetsu-ko, 2♂♂.

Host plants. *Picea excelsa* (in Europe, after Kangas & Leskinen, 1943); *Picea glauca* & *Tsuga mertensiana* (in North America, after Tripp, 1954 & Huckett, 1953).

Distribution. Japan; Europe; North America.

2. *Lasiomma laricicola* (Karl)

Chortophila (*Thrixina*) *laricicola* Karl, 1928:169. ? *Hylemia laricicola*: Hosoya, 1943: 184. *Lasiomma laricicola*: Ackland, 1965a:139; Hennig, 1967: 186. *Hylemya laricicola*: Yamada et al., 1965:362; Yamada et al., 1972:18. *Lasiomma laricicola*: Suwa, 1971a:30.

Material examined. HOKKAIDÔ — Nopporo, 1♂, 29-iv-65 (T. Kocha), & 1♀, 15-iv-73, emerged from the cones of *Larix* sp.; Kôshunai, 1♂, 15-iv-72, emerged from the cones of *Larix leptolepis*.

♂. Body-length 4.6–5.2 mm. Haustellum thinly pollinose although shining. Mesonotum with *pra* long, about as long as anterior or posterior *ntpl*; *stpl* 1:2 or 2:2, the lower anterior being fine. Fore tibia with 1–3 *pv*; t_3 with 6–8 *av*.

♀. Body-length 5 mm. Frons about 0.4 times as wide as head. Hind tibia with 4 *av*, 6 *ad*, 3–4 *pd* and no *pv*.

Host plants. *Larix europae* (in Europe, after Seitner, 1929); *Larix sibirica* & *Larix dahurica* (in Siberia, after Zonova, 1935); *Larix koreana* (in Korea, after Hosoya, 1943); *Larix leptolepis*, *L. koreana* & *L. dahurica* var. *japonicum* (in Japan, after Yamada et al., 1972).

Distribution. Japan; Korea; Siberia; Europe.

The species recorded from Korea as a pest of the cones of *Larix koreana* by Hosoya (1943) under "*Hylemia laricicola* (Karl) ?" may be referred to the present species. According to Yamada et al. (1965 & 1972) this species is widely distributed in Japan (Hokkadiô and Honshû) and inflicts severe damage on larch cones.

3. *Lasiomma abietis* (Huckett)

Hylemya (Pegohylemia) abietis Huckett, 1953:107. *Lasiomma abietis*: Suwa, 1971a: 30.

Material examined. HOKKAIDÔ — Nopporo, 2♂♂, 1-v-68 (S. Yogo), emerged from the cones of *Abies sachalinensis*.

Host plants. *Abies concolor* (in North America, after Huckett, 1953); *Abies sachalinensis* (in Japan, after Suwa, 1971a).

Distribution. Japan; North America.

4. *Lasiomma todocola* Suwa

Lasiomma todocola Suwa, 1971a:32.

Material examined. HOKKAIDÔ — Nopporo, 2♂♂ (holotype and paratype), 6-v-68 (S. Yogo), emerged from the cones of *Abies sachalinensis*.

Host plants. *Abies sachalinensis* (after Suwa, 1971a).

Distribution. Japan.

5. *Lasiomma morionella* (Zetterstedt)

Anthomyza morionella Zetterstedt, 1838:687. *Lasiomma morionella*: Hennig, 1967:190. *Lasiomma morionella*: Suwa, 1971a:33.

Material examined. HOKKAIDÔ — Mt. Daisetsu, 3♂♂, 28–29-vii-59 (S. Ueda), 2♂♂, 4♀♀, 4-viii-60 (S. Ueda), & 1♀, 21-vii-68.

♂. Body-length 4.3–4.7 mm.

♀. Body-length 4.2–5.3 mm. Body densely covered with brownish grey pollen, which is denser and paler than in male. Haustellum with mentum polished. Mesonotum and abdomen hardly vittate. Wings and calyptrae with a yellowish tinge.

Frons about 0.42–0.45 times as wide as head; parafrontals with 3 outwardly directed *ors*; cheeks with genal setae in 2 rows, setae of the upper row being much weakened and sometimes lacking. Mesonotum with 2nd *ph* well developed or fine; *stpl* 2:2, the lower anterior being always fine and the lower posterior strong or fine.

Fore tibia with or without 1–2 short or rather distinct *ad* and with 1 *pv*; t_2 with 1–2 *ad*, 1–2 (usually 2) *pd* and 2 *pv*; t_3 with 2–3 *av*, 2–4 *ad*, 2–3 *pd*, and only 1 *pv* near apical fifth. Wings with costal thorns more or less stronger than those of male; *m-m* nearly upright and straight.

Distribution. Japan; East Siberia; Scandinavia; North America.

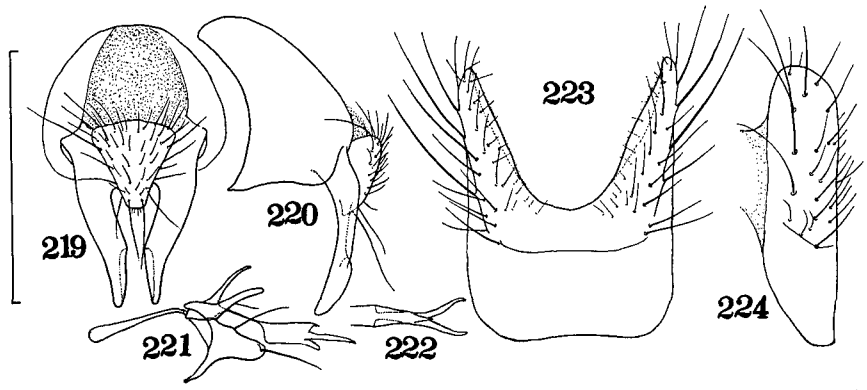
*6. *Lasiomma meadei* (Kowarz)
(Fibs. 219–224)

Lasiops meadei Kowarz, 1880:131. *Lasiomma meadei*: Hennig, 1967:188.

Material examined. HOKKAIDÔ — Sapporo, 12♂♂, 5-v–1-vii-66–70 (S. Ueda, K. Kusigemati, H. Torikura & M. Suwa); Nopporo, 1♂, 2-vi-68; Mt. Soranuma, 1♂, 1-viii-68. HONSHÛ — Mt. Jimba, Tôkyô-to, 1♂, 28-iii-71 (T. Kocha); Mt.

Daibosatsu, Yamanashi-ken, 1♂, 6-viii-69; Mt. Yatsugatake, Nagano-ken, 5♂♂, 16–21-vii-70; Mt. Kiso-Komagatake, Nagano-ken, 3♂♂, 24-vii-70; Rokkô-san, Hyôgo-ken, 2♂♂, 20-v-67. KYÛSHÛ — Kumamoto, 1♂, 24-iv-67; Mt. Kirishima, 1♂, 7-v-67 (H. Takizawa).

♂. Body-length 5–5.8 mm (4 mm in 1 specimen). Haustellum with mentum rather distinctly pollinose. Thorax in pollinosity bluish grey or pale grey and usually more or less tinged with brown; mesonotum with median and sublateral vittae rather broad and distinct. Abdomen thickly bluish grey pollinose, and half-shining in some lights; median vitta moderate or rather broad; fore marginal bands much narrower than median vitta. Wings more or less tinged with brown; calyptrae pale, rather distinctly yellow marginally; halteres dark brownish at base and yellowish at knob.



Figs. 219–224. *Lasiomma meadei* (Kowarz), ♂: 219, hypopygium, dorsal view; 220, *ditto*, lateral view; 221, aedeagus; 222, distiphallus, dorsal view; 223, 5th sternite, ventral view; 224, *ditto*, lateral view.

Eyes more or less distinctly haired; frons usually about half as wide as anterior ocellus, and never wider than the latter; parafrontals contiguous to each other or sometimes not, and with no *ors*; profrons about 0.5–0.8 (usually 0.6) times as wide as A_3; parafacials much narrowed ventrad; cheeks slightly higher than profrons-width.

Mesonotum with 2nd *ph* usually well developed; *pra* a little shorter than posterior *ntpl*; *stpl* 2:3, the lowest posterior being often fine.

Fore tibia with 1–2 (rarely 3) *pv*; t_2 with 1 *ad*, 1 *pd* and 3–6 (usually 3–4) *p-pv*; t_3 with 2–3 *av*, 4–7 (usually 5–7) *ad*, 3–4 *pd*, and in basal half 2–8 (usually 4–7) *pv*, the *pv*-series being nearly in a row.

♀. Unknown to me. After Hennig (1967) hardly distinguishable from the females of the allied species.

Distribution. Japan; Europe.

A subspecies of *L. meadei* was recently described by Hennig (1967: 189) under the name *m. apenninum* on the basis of some specimens (4♂♂) from South Europe. According to the description the subspecies *apenninum* can be distinguished from the nominate form distributed in North Europe by the contiguous parafrontals, the more longly and densely haired eyes and the weaker fore marginal bands on

the abdominal tergites. In Japan the form with contiguous parafrontals has been collected together with the form with separated parafrontals from some localities as shown in Table 2. There are found no other significant differences between the two forms. It should be added that these forms are identical in the fore marginal bands narrower than the median vitta on the abdomen. They cannot be divided into subspecies in Japan.

Table 2. Number of specimens (♂♂) of *L. meadei*, with contiguous or separated parafrontals (Pf).

Locality	Number of ♂♂ with contiguous Pf	Number of ♂♂ with separated Pf
Sapporo	7	5
Nopporo	0	1
Mt. Soranuma	1	0
Mt. Jimba	1	0
Mt. Daibosatsu	1	0
Mt. Yatsugatake	4	1
Mt. Kiso-Komagatake	3	0
Rokkô-san	1	1
Kumamoto	1	0
Mt. Kirishima	1	0
Total	20	8

7. *Lasiomma octoguttatum* (Zetterstedt)

Aricia octoguttata Zetterstedt, 1845:1570. *Aricia moesta* Holmgren, 1872:102. *Lasiomma octoguttatum*: Hennig, 1968:193. *Lasiomma octoguttatum*: Suwa, 1971a: 35.

Material examined. The localities of the present specimens (40♂♂) are as follows. HOKKAIDÔ — Sapporo; Nopporo; Jôzankei; Mt. Soranuma; Mt. Yûbari; Mt. Shokambetsu; Mt. Daisetsu; Rishiri-tô; Eniwa; Shikotsu-ko. HONSHÛ — Mt. Sumon, Niigata-ken; Mt. Yatsugatake & Mt. Senjô, Nagano-ken; Rokkô-san, Hyôgo-ken.

Distribution. Japan; Europe; North America.

8. *Lasiomma japonicum* Suwa

Lasiomma japonicum Suwa, 1971a:36.

Material examined. HOKKAIDÔ — Sapporo, 2♂♂; Nopporo, 4♂♂; Jôzankei, 1♂; Mt. Soranuma, 1♂; Shikotsu-ko, 1♂; Rishiri-tô, 5♂♂ (including the holotype). HONSHÛ — Mt. Hakkôda, Aomori-ken, 3♂♂; Mt. Hayachine, Iwate-ken, 1♂; Mt. Daibosatsu, Yamanashi-ken, 1♂.

Distribution. Japan.

In the original description of this species (Suwa, 1971a) I mentioned as follows: – "This species is closely related to the European species, *Lasiomma nitidicauda* (Zetterstedt), but it is readily distinguished from the latter by the bare eyes." Most species of Anthomyiidae have eyes microscopically more or less haired, and in this sense *L. japonicum* is also haired, although practically bare.

According to Ackland (1967) the Nepalese form of *L. eriophthalmum* (=*nitidicauda*) is different from the European one in having the eyes much less densely haired and with the hairs shorter. Further comparisons are necessary in order to get a definite conclusion concerning these forms.

16. Genus *Egle* Robineau-Desvoidy

Egle Robineau-Desvoidy, 1830:584. Type-species: *Egle parva* Robineau-Desvoidy, 1830.

In agreement with the distributions of *Salix* and *Populus*, known host plants of *Egle*, this genus is almost restricted in the Holarctic region. According to Huckett (1965a & 1965b) and Ackland (1970) are known 15 species, of which 10 species are found in the Palaearctic region, 10 or 11 in the Nearctic region, and 1 endemic in Burma. From Japan will be recorded 5 species, of which one is new to science.

Key to the species (♂♂)

1. Larger in size, body-length about 5–6 mm; mesonotum with 4 strong *post dc*; notopleura with some accessory setulae; t_3 with apical *pd* very long and strong. .....1. *muscaria* (Fabricius)
– Smaller in size, body-length less than 4 mm; mesonotum with 3 strong *post dc*; notopleura with no accessory setulae; t_3 with apical *pd* minute or vestigial. 2
2. Hind femur with *pv* much longer than height of the femur; 5th sternite with some strong setae at outer base of each process. .....2. *longipalpis* (Malloch)
– Hind femur without *pv* longer than height of the femur; 5th sternite with no strong setae. 3
3. Rather densely pollinose and rather shortly setose; epistoma slightly projecting forwards beyond frons at lunule. .....3. *minuta* (Meigen)
– Rather thinly pollinose and rather longly setose; epistoma distinctly projecting forwards beyond frons at lunule. 4
4. Cheeks with 2 rows of genal setae which are curved upwards; mesopleura with 6–7 *pstg* including accessory setulae; cercal plate with apical projection strongly constricted at base. .....4. *parva* Robineau-Desvoidy
– Cheeks with 1 row of genal setae which are curved upwards, below the row with at most 1–2 setae also curved upwards; mesopleura with 3–4 *pstg* including accessory setulae; cercal plate with apical projection hardly constricted at base. .....5. *korpokkur* sp. nov.

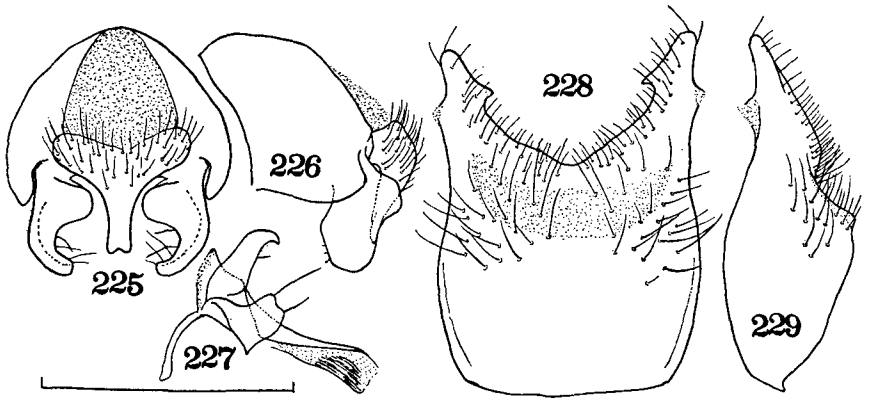
*1. *Egle muscaria* (Fabricius)
(Figs. 225–229)

Stomoxys muscaria Fabricius, 1777: 308. *Hylemyia* (*Egle*) *muscaria*: Huckett, 1928: 73. *Egle muscaria*: Hennig, 1967: 141.

Material examined. HOKKAIDÔ — Sapporo 1♂, 1♀, 22-vi-59 (T. Kumata), & 1♂, 25-iv-69; Jôzankei, 1♂, 3-v-65 (T. Kocha), & 1♂, 2-v-71 (A. Kubota); Nopporo, 2♂♂, 7♀♀, 23-iv-69, & 15♂♂, 7♀♀, 18–24-iv-70; Shikotsu-ko, 1♂, 18-v-71.

♂. Body-length 4.7–6.2 mm. Densely haired. Mesonotum with 4 strong *post dc*; notopleura with some (4–9) accessory setulae; *stpl* 0:2.

♀. Less densely haired than in male. *Stpl* 0:2, if 1:2 the anterior one usually fine.



Figs. 225–229. *Egle muscaria* (Fabricius), ♂: 225, hypopygium, dorsal view; 226, *ditto*, lateral view; 227, aedeagus; 228, 5th sternite, ventral view; 229, *ditto*, lateral view.

Distribution. Japan; Kamchatka; Europe; North America.

*2. *Egle longipalpis* (Malloch)
(Figs. 230–233)

Hylemyia longipalpis Malloch, 1924c: 197. *Egle parva*: Huckett, 1924: 10, nec Robineau-Desvoidy, 1830. *Hylemyia* (*Egle*) *longipalpis*: Huckett, 1928: 79. *Hylemya* (*Egle*) *longipalpis*: Huckett, 1965a: 100; id., 1965b: 854.

Material examined. HOKKAIDÔ — Sapporo, 1♂, 3-v-65 (T. Kocha), & 1♂, 6-v-73 (T. Hattori); Nopporo, 4♂♂, 5-v-70.

♂. Body-length 3.2–3.7 mm. Body rather distinctly covered with whitish grey pollen, which is more or less tinged with blue. Mesonotum darkened when viewed from behind, and hardly vittate. Abdomen with median vitta rather broad and about one-fifth of abdominal width; tergites with rather broad fore marginal bands, and sometimes also with narrow or rather broad hind marginal bands. Haustellum with mentum slightly pollinose. Wings somewhat tinged with dark brownish colour, distinctly at base; calyptrae whitish, slightly yellowish marginally; knobs of halteres more or less darkened.

Head more or less higher than its length; epistoma rather distinctly projecting forwards beyond frons at lunule; frons probably about as wide as anterior ocellus (impossible to be exactly measured due to the poor condition); parafrontals may be nearly contiguous to each other, with 4–5 *ori* and 1 minute *ors*; interfrontalia with or without a pair of fine or rather distinct *if*; A_3 only a little longer than the width; profrons as wide as or slightly wider than A_3; cheeks as high as or slightly less high than A_3-width, with genal setae in a few rows.

Mesonotum with usually 3 pairs of *pre acr* and with no accessory setulae between the rows, which are separated from each other by a distance as long as or somewhat shorter than that between *dc* and *acr*; *ph* duplicated, and a few or some of accessory setulae rather lengthened; notopleura with no accessory setulae; mesopleura with 1 strong and a few finer *pstg*; *stpl* 1:2; scutellum with no accessory setulae dorsally.

Abdomen nearly parallel-sided, about 2.5 times as long as wide; 5th sternite

(Fig. 233) at outer base of each process with some strong setae not reaching to the apex of the process; cercal plate (Fig. 230) much narrowing apicad and bifurcated at apex.

Fore tibia with 2–3 *p-pv*, and with or without 1 *pd*; f_2 on basal half or more with a row of *av*, the longest one being at most only a little longer than height of the femur, and on basal two-thirds with 2 rows of *pv*, the longest one much longer than height of the femur; t_2 with 1–3 (usually 2) *pd*, 1 *p* and 1 *pv*; f_3 with *av* and *pv* more or less irregularly rowed, the longest ones being at least twice as long as height of the femur; t_3 with 4–5 *av*, 5–6 *ad*, and 3–4 long and 1–2 short *pd*, distal one of the *pd* being the longest and about 0.33—0.46 times as long as the tibia, and with some *pv*, which are usually discernible from accessory setulae, apical *d* being very long, about 2.6–3.2 times as long as height of the tibia; fore tarsus with 1st segment distinctly longer than 2nd and 3rd segments combined. Wings with *m-m* nearly straight.

♀. Uncertain to me. According to Huckett (1928 & 1965a) the female of *longipalpis* has a polished haustellum, by which it can be distinguished from the females of the related species. The female specimens (15♀♀) collected together with the present male specimens may be referred to this species by having the haustellum polished or nearly so. However, no other distinct differences have been found between these specimens and some other female specimens of *Egle*.

Distribution. Japan; North America.

This species may be closely related to *E. rhinotmeta* (Pandellé) in having the hind femur with very long *av* and *pv* and having the 5th sternite with some strong setae at outer base of each process. It may, however, be readily distinguished from that species by the quite different cercal plate.

*3. *Egle minuta* (Meigen)
(Figs. 234–237)

Anthomyia minuta Meigen, 1826: 177. *Egle minuta*: Lyneborg, 1965b: 222; Hennig, 1967: 140; Ackland, 1970: 190.

Material examined. Honshû — Saku, Nagano-ken, 1♂, 9-iv-73 (M. Kiuchi).

♂. Body-length 3.3 mm. Body rather densely pollinose. Mesonotum when viewed from behind with rather broad median and broad lateral vittae and in some lights with rather broad sublateral ones. Abdomen with median vitta broad and more or less interrupted at hind margin of tergites.

Interfrontalia with 2 pairs (probably 1 pair in usual) of short and fine *if*; parafrontals with 1 minute *ors*; epistoma somewhat projecting forwards beyond frons at lunule. Mesonotum with *pra* about two-thirds of posterior *ntpl* in length; mesopleura with 1 strong and 1–2 fine *pstg*. Mid tibia with 1 *ad* and 1 *pd*; t_3 with *pv* indiscernible. Wings with costal thorns hardly distinguishable from costal setulae.

♀. There is at hand a female specimen caught in company with the present male specimen. It might be referred to *minuta*. However, because I am unfamiliar with the females of *Egle*, I keep from a definite conclusion concerning this female specimen.

Distribution. Japan; Burma; Europe; ? North America.

*4. *Egle parva* Robineau-Desvoidy
(Figs. 238–241)

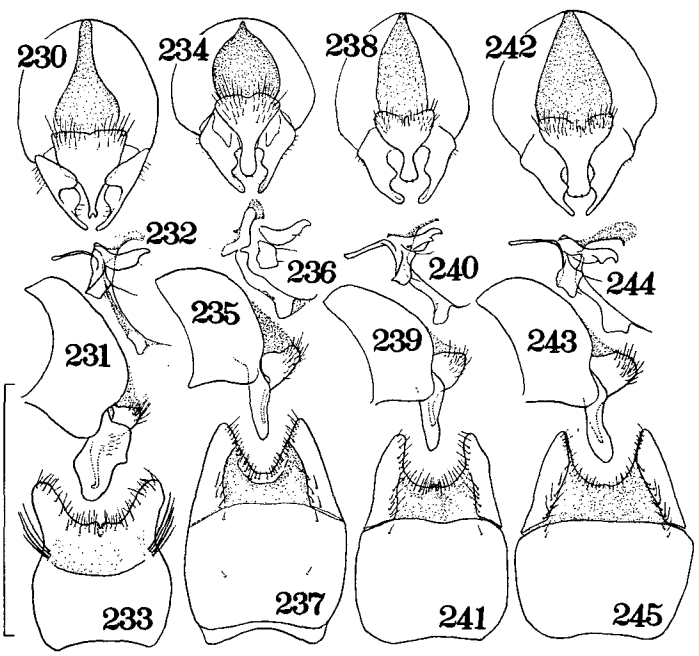
Egle parva Robineau-Desvoidy, 1830: 590. *Egle parva*: Hennig, 1967: 143; Ackland, 1970: 188.

Material examined. HOKKAIDÔ — Jôzankei, 1♂, 2-v-71 (A. Kubota).

♂. Body-length 3.4 mm. Mesopleura with 1 strong and 5–6 fine *pstg*. Abdomen with 5th sternite and hypopygium as in figures. Fore tibia with 1 *pv*; t_2 weakly setose, only 1 *pv* being discernible; t_3 with some fine *pv*, which are hardly distinguishable from accessory setulae.

♀. Unknown to me.

Distribution. Japan; Kamchatka; Europe.



Figs. 230–233. *Egle longipalpis* (Malloch), ♂: 230, hypopygium, dorsal view; 231, *ditto*, lateral view; 232, aedeagus; 233, 5th sternite, ventral view.

Figs. 234–237. *Egle minuta* (Meigen), ♂: 234, hypopygium, dorsal view; 235, *ditto*, lateral view; 236, aedeagus; 237, 5th sternite, ventral view.

Figs. 238–241. *Egle parva* Robineau-Desvoidy, ♂: 238, hypopygium, dorsal view; 239, *ditto*, lateral view; 240, aedeagus; 241, 5th sternite, ventral view.

Figs. 242–245. *Egle korpokkur* sp. nov., ♂: 242, hypopygium, dorsal view; 243, *ditto*, lateral view; 244, aedeagus; 245, 5th sternite, ventral view.

5. *Egle korpokkur* sp. nov.
(Figs. 242–245)

Type-material. HOKKAIDÔ — Nopporo, 3♂♂ (one the holotype), 24-iv-70, & 4♂♂, 13-iv-73; Sapporo, 1♂, 8-v-65 (T. Kocha).

♂. Body-length 3.1–3.7 mm; wing-length 3–3.7 mm. Interfrontalia,

parafacials and cheeks dark brownish in ground colour; antennae and palpi dark brownish or blackish; haustellum with mentum blackish or dark brownish and thinly pollinose. Thorax blackish in ground colour, greyish and more or less brownish in pollinosity, which is not very dense; mesonotum when viewed from behind with broad median and lateral vittae. Abdomen blackish in ground colour, thinly covered with greyish and faintly brownish pollen, and when viewed from behind largely darkened except on hind margin and lateral sides of each tergite. Legs dark brownish. Wings weakly tinged with brown though strongly dark brownish at base; calyptrae mainly pale, yet dark brownish marginally; halteres dark brownish.

Head hardly higher than the length; epistoma distinctly projecting forwards beyond frons at lunule; frons narrower than anterior ocellus; interfrontalia with a pair of fine or somewhat distinct *if*; parafrontals with 4–5 *ori* and 1 minute *ors*; A_3 about 1.3 times as long as wide; arista minutely pubescent; profrons about as wide as A_3; cheeks as high as or somewhat less high than A_3-width, with genal setae in 2 rows, yet the setae of the lower row are fewer in number and usually not curved upwards.

Mesonotum with 2–3 pairs of *pre acr*, distance between the rows being more or less shorter than that to *dc*, and with no accessory setulae between the rows; *ph* duplicated; *pra* about two-thirds as long as posterior *ntpl*; notopleura with no accessory setulae; mesopleura with an anterior *mpl* which is distinguishable from adjacent setulae, and with 3–4 *pstg* including accessory setulae; 1 *prpl* present; *stpl* 1:2, if 1:3 the lowest posterior weak; scutellum with no accessory setulae on dorsal surface.

Abdomen depressed, about twice as long as wide; 5th sternite (Fig. 245) with no strong setae; cercal plate (Fig. 242) with apical projection hardly constricted at base.

Fore tibia with 0–2 (usually 1) *pd* near basal third or fourth and 0–1 (usually 1) *pv* near middle; f_2 on basal half with some *av* shorter than height of the femur, on basal third with a row of *pv* longer than height of the femur, and in addition near base behind the *pv*-row with some *pv*; t_2 with 1(rarely 2) *pd* and 0–2 (usually 1) *pv*; f_3 with a row of *av* becoming longer towards apex of the femur, the longest one being much longer than height of the femur though less than twice as long as the latter; t_3 with 2–5 *av*, 4–6 *ad*, 3–4 *pd* and 2–5 (usually 4–5) *pv*; fore tarsus with 1st segment much longer than 2nd and 3rd segments combined. Wings with costal thorns hardly distinguishable from costal setulae; *m-m* nearly upright and slightly sinuate.

♀. Unknown.

Distribution. Japan.

This species closely resembles *parva* in general appearance, and also resembles *minuta* in hypopygial structures. It may, however, be distinguishable from the two species by the characters mentioned in the key.

17. Genus *Paregle* Schnabl

Paregle Schnabl, 1911: 71, as subgenus of *Hylemyia* (= *Hylemya* Robineau-Desvoidy). Type-species: *Musca radicum* Linné, 1758.

Chionomyia Ringdahl, 1933: 30, as subgenus of *Hylemyia*. Type-species: *Anthomyza vetula* Zetterstedt, 1838. Syn. nov.

As pointed out by Huckett (1924) and Ackland (1967) *Paregle cinerella* does not conform to the concept of *Paregle* defined on the basis of the type-species. The Palaearctic species are divided by Hennig (1967) into two species-groups, namely, the *radicum*-group and the *cinerella*-group. In addition to the hairy body and the depressed abdomen the *radicum*-group has distinct differences from the *cinerella*-group in the genital structures (cf. the figures on pp. 156 & 159 of Hennig, l.c.). It is due to their similarity in the cercal plate and surstyli that the two groups are included in the same genus. Judging from the genital structures and most external characters except for the epistoma, *vetula*, the type-species of *Chionomyia*, may be included in the *radicum*-group.

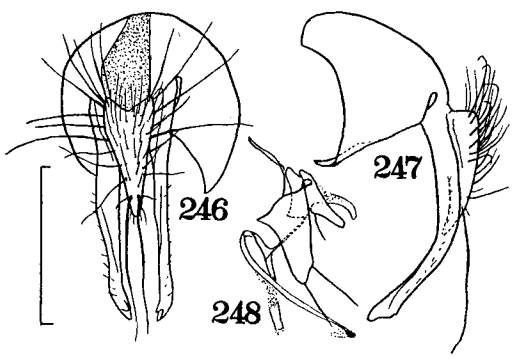
Key to the species (♂♂ & ♀♀)

1. Mesonotum with 3 pairs of *pre acr* being strong, and with no accessory setulae between the rows; mesopleura with at most 1–2 accessory setulae near *pstg*; abdomen conical in male. ..... 3. *cinerella* (Fallén)
– Mesonotum with 1 pair of *pre acr* being strong, and with many accessory setulae between the rows of *pre acr*; mesopleura with many accessory setulae around *pstg*; abdomen depressed in both sexes. 2
2. Epistoma distinctly projecting forwards beyond frons at lunule; notopleura with some accessory setulae. ..... 2. *radicum* (Linné)
– Epistoma at most as far as frons at lunule; notopleura with no accessory setulae. ..... 1. *vetula* (Zetterstedt)

1. *Paregle vetula* (Zetterstedt)
(Figs. 246–248)

Anthomyza vetula Zetterstedt, 1838: 682. *Hylemyia* (*Paregle*) *vetula*: Schnabl & Dziedzicki, 1911: 95. *Hylemyia* (*Chionomyia*) *vetula*: Ringdahl, 1933: 30. *Hylemyia vetula*: Kato, 1950: 1685. *Chionomyia vetula*: Hennig, 1967: 171.

Material examined. HOKKAIDÔ — Sapporo, 3♂♂, 7♀♀, 3-iv–8-v-59–70 (T. Kumata, S. Ueda, T. Kocha & M. Suwa), & 2♀♀, 28–29-x-59 (K. Kamijo & S. Ueda); Nopporo, 3♂♂, 4♀♀, 18–29-iv-65–70 (T. Kocha & M. Suwa); Kenebetsu, 6♂♂, 1♀, 23-x-58 (T. Kumata).



Figs. 246–248. *Paregle vetula* (Zetterstedt), ♂: 246, hypopygium, dorsal view; 247, *ditto*, lateral view; 248, aedeagus.

♂. Body-length 5–6.2 mm. Blackish and shaggy. Epistoma projecting forwards at most as far as frons at lunule; parafrontals with 1 slender *ors*; interfrontalia without *if*. Notopleura with no accessory setulae. Abdomen depressed. Wings usually strongly blackish at base. Mid and hind femora with rows of long *av* and *pv*; t_2 with 1–2 (usually 1) *v* often located a little to anteroventral surface.

♀. Body-length 5.8 mm–7 mm. Body densely covered with brownish grey pollen, and less densely and more shortly setulose than in male. Frons very wide, only a little narrower than half of head-width; interfrontalia with a pair of strong *if*; parafrontals with 4–5 strong *ors*. Wings not so blackish at base.

Distribution. Japan; Manchuria; Europe.

*2. *Paregle radicum* (Linné)
(Figs. 249–252)

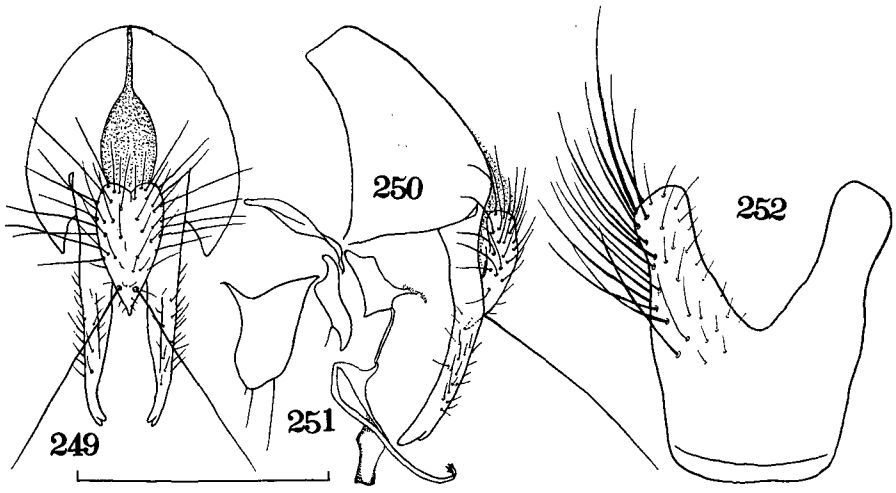
Musca radicum Linné, 1758: 596. *Paregle radicum*: Huckett, 1924: 40; Hennig, 1967: 165.

Material examined. HOKKAIDÔ — Mt. Daisetsu, 2♂♂, 2♀♀, 20–21-vii-68.

♂. Body-length 5–5.5 mm. Mesonotum with 5 vittae along rows of *acr*, *dc* and *ia*, the median one being broad. Abdomen with median vitta sharp and broad; tergites with narrow or broad bands on fore and hind margins.

Epistoma distinctly projecting forwards beyond frons at lunule; frons a little narrower than anterior ocellus; interfrontalia not interrupted though very narrow, with *if* very fine; parafrontals with 1 short *ors*; haustellum rather long and compressed.

Mesonotum with *acr* fine and indistinguishable from fine accessory setulae between the rows except for 1 pair of *pre acr* and the pair of *prsc acr*, which are composed of strong setae; notopleura with some (3–7) accessory setulae; mesopleura



Figs. 249–252. *Paregle radicum* (Linné), ♂: 249, hypopygium, dorsal view; 250, *ditto*, lateral view; 251, aedeagus; 252, 5th sternite, ventral view.

with no strong anterior *mpl*, and with many (*ca.* 15) accessory setulae around *pstg*. Abdomen depressed and long-ovoid.

Fore tibia with apical *pd* and *pv* being weak or vestigial; t_3 with apical *pd* weak. Wings with *m-m* oblique and nearly straight; lower calyptra slightly protruded beyond the upper.

♀. Body more thickly pollinose and less densely setulose than in male; interfrontalia brownish yellow on lower half. Frons about 0.45 times as wide as head; interfrontalia with *if* strong. *Stpl* 1: 1 or 1: 2.

Distribution. Holarctic region; Australia.

3. *Paregle cinerella* (Fallén)

Musca cinerella Fallén, 1825: 77. *Paregle cinerella*: Huckett, 1924: 39. *Paregle cinerella*: Shiraki, 1950: 1685. *Paregle cinerella*: Ackland, 1967: 125; Hennig, 1967: 161.

Material examined. HOKKAIDÔ — Sapporo, 22♂♂, 8♀♀; Jôzankei, 1♀; Notoroko, 2♀♀; Shari, 1♀; Kunneppu, 1♀; Toyotomi, 1♂; Nakasatsunai, 2♀♀. HONSHÛ — Mt. Hayachine, Iwate-ken, 1♂; Gotemba, Shizuoka-ken, 1♂; Mt. Daibosatsu, Yamanashi-ken, 9♂♂, 8♀♀; Mt. Yatsugatake, Nagano-ken, 2♂♂.

Distribution. Holarctic region.

18. Genus *Botanophila* Lioy

Botanophila Lioy, 1864: 990. Type-species: *Anthomyia varicolor* Meigen, 1826.

Collinomyia Ringdahl, 1929: 269, as subgenus of *Hylemyia*. Type-species: *Aricia gemmata* Zetterstedt, 1860.

Euryparia Ringdahl, 1929: 269, as subgenus of *Hylemyia*. Type-species: *Anthomyia varicolor* Meigen, 1826.

This genus is closely related to *Pegohylemyia* Schnabl as discussed by Hennig (1970). Some characters are commonly seen as follows: — The setose prebasal sclerite (6th tergite) is also seen in *Pegohylemyia striolata* (Fallén), and the fleshy and spinose 5th sternite is also seen in *Pegohylemyia spinisternata* sp. nov. and *P. silva* sp. nov. However, *Botanophila* is recognized as distinct from *Pegohylemyia* by having a strong apical *pv* on the hind tibia.

In the course of the present study has been found a single species from Japan.

*1. *Botanophila gemmata* (Zetterstedt)
(Figs. 253–257)

Aricia gemmata Zetterstedt, 1860: 6233. *Hylemyia* (*Collinomyia*) *gemmata*: Ringdahl, 1929: 270. *Botanophila gemmata*: Hennig, 1970: 330.

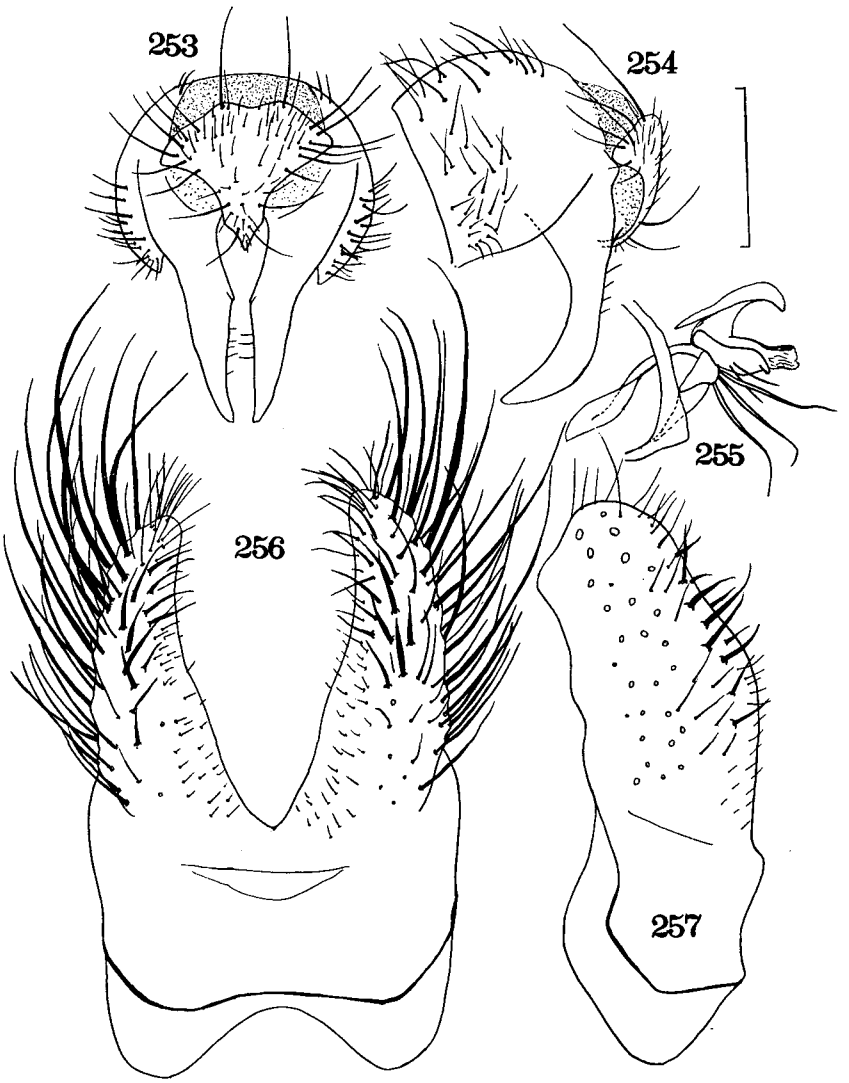
Material examined. HOKKAIDÔ — Jôzankei, 1♂, 2♀♀, 16-vi-66 (M. Miyazaki); Shikaribetsu-ko, 1♂, 1♀, 14-vii-66; Mt. Poroshiri, 1♂, 2♀♀, 21-vii-73 (T. Hattori).

♂. Body-length 8.8–9.2 mm; wing-length 7.3–7.5 mm. Body including legs black in ground colour and densely covered with whitish grey pollen, which is slightly tinged with blue. Abdomen with broad median vitta and rather broad fore marginal bands, the median vitta being interrupted at hind margin of each tergite.

Body rather densely covered with short and fine accessory setulae. Frons

about 1.3–1.6 times as wide as A_3; interfrontalia a little narrower than A_3, and with or without (in the specimen from Jôzankei) a pair of weak *if*, a few or some microscopical setulae being present; parafrontals with 6–7 long *ori* mingled with fine or vestigial ones, and with no *ors*; A_3 twice or a little more as long as wide; arista distinctly swollen at base, with hairs shorter than basal diameter of arista; profrons about 1.6–1.8 times as wide as A_3; cheeks more or less higher than twice of A_3-width; epistoma distinctly behind frons at lunule.

Mesonotum with *ph* not duplicated; *acr* very fine and like accessory setulae; *pra* as long as or a little longer than anterior *ntpl*; mesopleura with 1–2 distinct



Figs. 253–257. *Botanophila gemmata* (Zetterstedt), ♂: 253, hypopygium, dorsal view; 254, *ditto*, lateral view; 255, aedeagus; 256, 5th sternite, ventral view; 257, *ditto*, lateral view.

anterior *mpl*, and with 1 strong and 1–2 weaker *pstg*, which are associated with many (8–11) accessory setulae; *stpl* 1:2; scutellum densely setulose on whole dorsal surface. Abdomen with anal sclerite very small and almost concealed beneath 5th sternite.

Fore tibia with 1–2 *ad* and 1 *pv*; t_2 with 1 weak *ad* near middle and 1 strong *ad* at apical fourth, and with 3 *pd*, 2–3 *pv* and no *av*; t_3 with 2–3 *av*, 3–4 *ad*, 3 strong and usually 1 weaker *pd* (in 1 specimen with a few additional ones) and no *pv*, apical *pd* much shorter and weaker than apical *d*, being about half as long as the latter, apical *pv* well developed and strong. Wings with costal thorns very minute and only a little stronger than costal setulae; costa haired on ventral surface especially from base to near costal thorns; *m-m* oblique and hardly sinuate.

♀. Body-length 8.4–10.7 mm; wing-length 7.2–9 mm. Frons about 0.43–0.44 times as wide as head; interfrontalia usually with weak *if*, which are closely or distantly paired with each other, and with microscopical setulae various in number; parafrontals with 3–5 *ori* and usually 3 *ors*, and with many minute setulae along and outside the setae; profrons and cheeks relatively wider and higher than in male respectively; haustellum with mentum conspicuously enlarged. Thorax with 2 setae on humeral calli as in male.

Fore tibia with 2 *ad* and 1–2 *pv*, and sometimes with 1–2 weak *pd*, apical *p* being well developed and strong; t_2 with 1 *av*, 2 (rarely 3) *ad*, 3–4 *pd* and 2–3 *pv*; f_3 with no strong *pv* except for a few preapical ones; t_3 with 2–4 *av*, 4–5 *ad* and 3–5 *pd*. Wings with costa more distinctly haired on ventral surface than in male.

Distribution. Japan; Sweden.

The specimens at hand agree well with a redescription of *gemmata* given by Hennig (1970) except for a few aspects as follows: — Body larger in size; interfrontalia more or less narrower than A_3 in male; humeral calli with only 2 setae; legs with setae more numerous.

19. Genus *Pegohylemyia* Schnabl

Pegohylemyia Schnabl, 1911: 75, as subgenus of *Hylemyia*. Type-species: (*Musca cinerea* Fallén, 1824, nec Harris, 1776)=*Egeria silvatica* Robineau-Desvoidy, 1830.

Xanthocnemia Karl, 1943: 65, as subgenus of *Hylemyia*. Type-species: *Hylemyia pseudomaculipes* Strobl, 1893.

This genus is a large group in this family. The Palaearctic species were recently revised by Hennig (1970–1972), by whom 70 species were recognized to occur in this region. In Japan only 1 species, *Pegohylemyia pseudomaculipes* (Strobl), has been known to occur (after Hennig, l.c.). On this occasion will be recorded from Japan 28 species, of which 11 species are described as new to science.

Key to the species (♂♂)

1. Prebasal sclerite of hypopygium (6th tergite) with a row of distinct setae on hind margin. ..... 1. *striolata* (Fallén)
– Prebasal sclerite without a row of setae, if with a few or some setae they are not completely rowed and are usually setula-like. 2
2. Fifth sternite (cf. Figs. 356 & 361) with a row of stout setae on each process, the setae becoming longer towards apex of the process. 3

– Fifth sternite otherwise in setal pattern. 4
3. Haustellum with mentum pollinose; hypopygium as in Figs. 353–354. .....
.....23. *silva* sp. nov.
– Haustellum with mentum polished; hypopygium as in Figs. 358–359. .....
.....24. *spinisternata* sp. nov.
4. Fifth sternite (Figs. 343 & 344) with processes long and blade-like, largely devoid of setae except for many short ones on middle half of inner margin and a strong one on outer margin near apex. .....20. *nitiditheca* sp. nov.
– Fifth sternite otherwise in structure. 5
5. Hind tibia with apical *pd* strong, at least about as long as apical *ad*. 6
– Hind tibia with apical *pd* weak, if rather distinct it is shorter than apical *ad*. .. 8
6. Hairy species; cheeks with genal setae numerous in number and arranged in about 5–6 rows. .....25. *askoldica* Schnabl
– Not hairy species; cheeks with genal setae not numerous in number and arranged in 1–2 rows. 7
7. Mid femur with strong *pv* on whole length; cheeks more than 1.5 times as high as A_3-width. .....22. *okai* sp. nov.
– Mid femur with strong *pv* on basal half; cheeks less than 1.5 times as high as A_3-width. .....26. *pseudomaculipes* (Strobl)
8. Mid and hind femora largely yellowish; haustellum with mentum polished. 9
– Mid and hind femora wholly blackish or dark brownish; haustellum with mentum pollinose. 10
9. Body in pollinosity rather thick and more or less tinged with yellow; parafrontals contiguous to each other; 5th sternite and hypopygium as in Figs. 383–386. .....
.....28. *nigrigenis* sp. nov.
– Body in pollinosity rather thin and not tinged with yellow; parafrontals separated from each other by linear interfrontalia; 5th sternite and hypopygium as in Figs. 374–382 .....27. *maculipedella* sp. nov.
10. Mid tibia without *ad*; notopleura with some accessory setulae; 5th sternite and hypopygium as in Figs. 335–339 .....19. *parvicornis* (Malloch)
– Mid tibia with *ad*; notopleura with or without accessory setulae; 5th sternite and hypopygium otherwise in structure. 11
11. Epistoma situated distinctly behind frons at lunule; frons wider than anterior ocellus; profrons wider than A_3. 12
– Otherwise in combination of characters. 16
12. Arista practically bare; *pra* distinctly shorter than posterior *ntpl*. .....
.....21. *isikariana* sp. nov.
– Arista distinctly pubescent although shortly; *pra* at least as long as posterior *ntpl*. 13
13. Abdomen with median vitta very narrow; 5th sternite and hypopygium as in Figs. 330–334. .....18. *sanctimarci* (Czerny)
– Abdomen with median vitta broad; 5th sternite and hypopygium otherwise in structure. 14
14. Fifth sternite (Figs. 290 & 291) with processes very long and narrow, and setose only at base and apex. .....8. *seneciella* (Meade)
– Fifth sternite with processes not so long, and setose from base to apex. 15
15. Larger species, body-length 6–6.3 mm; 5th sternite (Figs. 300 & 301) densely setose along inner margin of each process. .....10. *higuchii* sp. nov.
– Smaller species, body-length 4.4 mm; 5th sternite (Figs. 295 & 296) sparsely setose along inner margin of each process. .....9. *karibae* sp. nov.
16. *Pra* at most as long as posterior *ntpl*. 17
– *Pra* longer than posterior *ntpl*. 23
17. Hind femur with no distinct *pv* except for preapical ones. ..16. *hucketti* (Ringdahl)
– Hind femur with a few or some distinct *pv* apart from preapical ones. 18
18. Mid femur with a few or some distinct *av* on basal half even if short. 19

– Mid femur with no distinct *av.* 22
19. Mesopleura with 1–2 distinct anterior *mpl.* 20
– Mesopleura with no distinct anterior *mpl.* 21
20. Epistoma distinctly projecting forwards beyond frons at lunule; parafrontals usually with a minute *ors*; t_2 usually with *av.* .....5. *angulosa* (Ringdahl)
– Epistoma situated a little behind frons at lunule; parafrontals without *ors*; t_2 without *av.* .....2. *subfuscisquama* Ringdahl
21. Mesonotum with strong *pre acr*, which are longer than *pra*; 5th sternite (Fig. 329) with a dense fringe of stiffish setulae along inner margin of each process. .....17. *macra* Karl
– Mesonotum with only fine *pre acr*, which are shorter than *pra*; 5th sternite (Fig. 274) with a sparse fringe of fine setulae along inner margin of each process. .....4. *rubrigena* Schnabl
22. Epistoma more or less projecting forwards beyond frons at lunule; palpi only a little shorter than fore metatarsus; 5th sternite (Figs. 282) shallowly cleft on caudal margin. .....6. *rectangularis* Ringdahl
– Epistoma more or less behind frons at lunule; palpi much shorter than fore metatarsus; 5th sternite (Fig. 305) deeply cleft on caudal margin..... .....11. *kitayamae* sp. nov.
23. Parafrontals with 1 *ors.* 24
– Parafrontals with no *ors.* 25
24. Mesonotum with 1 pair of strong *pre acr*; epistoma more or less projecting forwards beyond frons at lunule. .....15. *appendiculata* (Malloch)
– Mesonotum with 3 pairs of strong *pre acr*; epistoma projecting forwards at most as far as frons at lunule. .....7. *profuga* (Stein)
25. Epistoma distinctly pojecting forwards beyond frons at lunule.....3. *sansa* sp. nov.
– Epistoma not projecting forwards beyond frons at lunule. 26
26. Profrons and cheeks respectively much wider and higher than A_3-width; haustellum much lengthened. .....14. *sonchi* (Hardy)
– Profrons and cheeks respectively as wide and high as A_3-width; haustellum not so lengthened. 27
27. Palpi yellowish on basal half, and darkened apically; mesonotum mostly blackish when viewed from front; cercal plate (Fig. 306) with apical projections much different in length. .....12. *gnava* (Meigen)
– Palpi blackish, at most dark brownish basally; mesonotum brownish grey when viewed from front; cercal plate (Fig. 310) with apical projections nearly same in length. .....13. *dziedzickii* Séguy

*1. *Pegohylemyia striolata* (Fallén)
(Figs. 258–262)

Musca striolata Fallén, 1824: 71. *Anthomyia discreta* Meigen, 1826: 174. *Pegomyia* (*Anthomyia*) *discreta* var. *fugitiva* Schnabl, in Schnabl & Dziedzicki, 1911: 268. *Pegomyia* (*Anthomyia*) *discreta* var. *arctica* Schnabl, 1915: 20. *Hylemyia quadriseta* Ringdahl, 1926: 115. *Hylemyia discreta* var. *angustifrons* Ringdahl, 1930: 11. *Pegohylemyia striolata*: Hennig, 1970: 417.

Material examined. HOKKAIDÔ — Nopporo, 4♂♂, 26-viii-67; Mt. Soranuma, 1♂, 30-viii-67 (K. Kusigemati); Ônuma, 1♂, 12-ix-66. HONSHÛ — Mt. Senjô, Nagano-ken, 1♂, 10-vii-71; Mt. Shirouma, Nagano-ken, 2♂♂, 5-viii-70.

♂. Body-length 4.5–5.5 mm. Interfrontalia brownish to black in ground colour. Abdomen with broad median vitta and broad fore marginal bands; anal sclerite shining. Wings more or less tinged with dark brown; calyptrae pale yellow, rather distinctly on margin; halteres dark brown at base and yellow at knob.

Frons as wide as or a little wider than anterior ocellus; interfrontalia linear caudad, about half as wide as anterior ocellus, and with 2 pairs of distinct *if*, the setae of the lower pair being stronger than those of the upper; parafrontals with many *ori* of various length; A_3 about 1.6–2 times as long as wide; epistoma slightly projecting forwards beyond frons at lunule.

Mesonotum with 3–4 pairs of fine *pre acr*, the rows being more or less closer together than to *dc*, and often with 1 or a few accessory setulae between the rows; *pra* longer than anterior *ntpl*. Abdomen with prebasal sclerite of hypopygium (6th tergite) setose on hind margin.

Fore tibia with 1 *ad* 1–2 (usually 1) *pv*, the *ad* being short and fine, sometimes indiscernible; t_2 with 1 *ad* (in 2 specimens with 2 *ad* on one body-side), 2 *pd* and 2–3 (usually 2) *pv*; t_3 with 2–3 *av*, 3–5 *ad*, 3–5 (usually 3–4) *pd* and 2–5 *pv*.

♀. Unknown to me.

Distribution. Japan; Kamchatka; Siberia; Europe.

This species is widely distributed in the Palaearctic region and variable in some characters, e.g. in the width of the frons and in the chaetotaxy of the legs. So that it was described under various names as distinct species or varieties. A detailed synonymy of this species was recently given by Hennig (1970), who applied "*striolata* Fallén" to this species as the valid name instead of "*discreta* Meigen" which had been used by many authors up to that time.

The Japanese form agrees better with the form described as *discreta* var. *angustifrons* Ringdahl from Kamchatka rather than with the nominate form from Europe in having the frons less than twice as wide as anterior ocellus and having the mid tibia usually with only 1 *ad*. However, some forms with a such narrow frons, e.g. *quadriseta* Ringdahl and *discreta* var. *fugitiva* Schnabl, are also found in Europe. It is unlikely that these forms are distinct taxa.

*2. *Pegohylemyia subfuscisquama* Ringdahl
(Figs. 263–266)

Hylemyia (*Pegohylemyia*) *subfuscisquama* Ringdahl, 1933: 18. *Pegohylemyia subfuscisquama*: Hennig, 1970: 421.

Material examined. HOKKAIDÔ — Mt. Daisetsu, 1♂, 20-vii-68.

♂. Body-length 5 mm. Wings with a brownish yellow tinge, rather distinctly yellow at base; calyptrae yellowish.

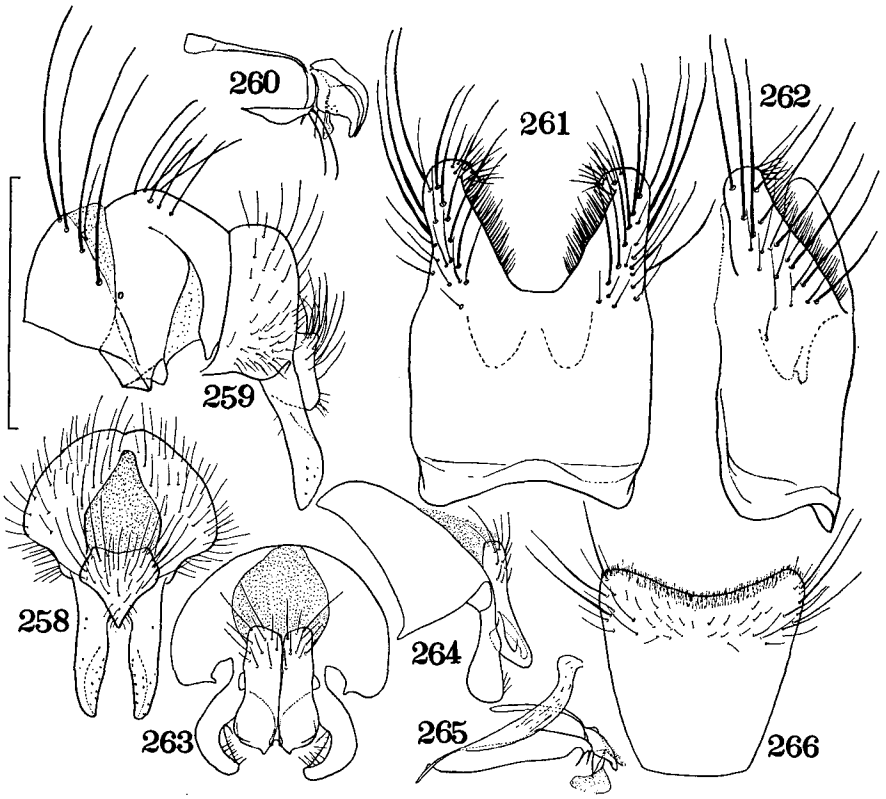
Frons slightly narrower than anterior ocellus; interfrontalia not interrupted though very narrow; parafrontals with many *ori* of various length; cheeks with genal setae in 2 rows; epistoma a little behind frons at lunule; A_3 about 1.5 times as long as wide; aristal pubescence distinct though shorter than basal diameter of arista.

Mesonotum with 2 pairs of rather strong or distinct *pre acr* and 2 pairs of fine ones, and with some accessory setulae between the rows, which are separated from each other by a distance more or less longer than that between *dc* and *acr*; *pra* about as long as posterior *ntpl*.

Fore tibia with 1 fine *ad* and 1 *pv*; t_2 with 1 *ad*, 2 *pd* and 2 *pv*; t_3 with 2 *av*, 7 *ad*, 4 *pd* and 4–6 *pv*, apical *pd* being weak. Wings with costal thorns vestigial.

♀. Unknown.

Distribution. Japan; Europe.



Figs. 258–262. *Pegohylemyia striolata* (Fallén), ♂: 258, hypopygium, dorsal view; 259, *ditto*, lateral view; 260, aedeagus; 261, 5th sternite, ventral view; 262, *ditto*, lateral view.
Figs. 263–266. *Pegohylemyia subfuscisquama* Ringdahl, ♂: 263, hypopygium, dorsal view; 264, *ditto*, lateral view; 265, aedeagus; 266, 5th sternite, ventral view.

3. *Pegohylemyia sansa* sp. nov.
(Figs. 267–270)

Type-material. HONSHŪ — Mt. Kiso-Komagatake, Nagano-Ken, 1♂ (holotype), 27-vii-70.

♂. Body-length 5.1 mm; wing-length 5.2 mm. Interfrontalia orange yellow on lower half and brownish on the upper, with whitish pollen; parafacials and cheeks yellowish, and somewhat darkened along eye-margins, with pale yellowish pollen; antennae and palpi blackish; haustellum with mentum blackish and pollinose; occiput blackish in ground colour and pale greyish in pollinosity, which is more or less tinged with brown and blue. Thorax blackish or dark brownish in ground colour; mesonotum brownish grey pollinose, with median vitta moderate in width and visible from both front and behind. Abdomen dark brownish in ground colour, and more or less brownish yellow in pollinosity; median vitta rather broad and obscurely margined; each tergite with a dark triangular marking based on fore margin of the tergite in some lights. Legs dark brownish. Wings with a brownish yellow tinge, rather distinctly yellow at base; calyptrae yellow; halteres

yellow at knob.

Frons a little more than twice as wide as anterior ocellus; interfrontalia about twice as wide as anterior ocellus, with a pair of *if*, which are somewhat shorter than ocellar setae; parafrontals with about 4 strong and some fine *ori* and no *ors*; A_3 shrunk and cannot be measured, probably less than twice as long as wide; aristal pubescence distinct although shorter than basal diameter of arista; profrons slightly wider than A_2-length; cheeks about as high as A_2-length, with genal setae short and in 2 rows; epistoma rather distinctly projecting forwards beyond frons at lunule; haustellum slender.

Mesonotum with about 4 pairs of *pre acr*, the setae of the middle 2 pairs being rather distinct, and with some accessory setulae between the rows, distance between the rows being about half as long as that between *dc* and *acr*; 2nd *ph* distinguishable from accessory setulae although weak; *pra* slightly longer than posterior *ntpl*; notopleura with no accessory setulae; mesopleura with 2 rather distinct anterior *mpl*, and with 1 long and 1 short *pstg* and about 6 associated setulae; *stpl* 1: 2; scutellum with 7–8 accessory setulae on each lateral side dorsally and bare on dorsal centre.

Abdomen depressed and nearly parallel-sided, slightly more than twice as long as wide; cercal plate (Fig. 267) with 3 long apical projections.

Fore tibia with 1 short *ad* and 1 *pv*; f_2 on basal half with some short *av* and some long *pv*, the longest *pv* distinctly longer than height of the femur; t_2 with 1 *ad*, 2 *pd* and 2 *pv*; f_3 with 6–7 long *av*, the longest one about twice as long as height of the femur, and with 1–2 *pv* in basal and apical fourth respectively, the longest one at basal fourth about 1.5 times as long as height of the femur; t_3 with 3 *av*, 4 *ad*, 4 *pd* and 5 *pv*, apical *pd* being weak. Wings with costal thorns minute; costa sparsely haired ventrally; *m-m* more or less oblique and slightly sinuate.

♀. Unknown.

Distribution. Japan.

In Hennig's key to the Palaearctic species of *Pegohylemyia* based on the male genital structures (Hennig, 1970) the present species runs to *P. gentianae* (Pandellé) by having the cercal plate divided into 3 projections at apex and having the surstyli cleft apically. *P. sansa*, however, can be readily distinguished from *gentianae* by the following aspects: — Cheeks with genal setae in 2 rows; wings with costal thorns minute; f_2 with *av* short; cercal plate with projections all narrow.

*4. *Pegohylemyia rubrigena* Schnabl
(Figs. 271–274)

Hylemyia (*Pegohylemyia*) *rubrigena* Schnabl, 1915: 11. *Pegohylemyia sobrina* Collin, 1931: 86. *Pegohylemyia rubrigena*: Hennig, 1970: 405.

Material examined. HOKKAIDÔ — Mt. Daisetsu, 1♂, 28-vii-59 (S. Ueda), 2♂♂, 4-viii-60 (S. Ueda), & 1♂, 20-vii-68; Rishiri-tô, 3♂♂, 31-vii-69. HONSHÛ — Mt. Kiso-Komagatake, Nagano-ken, 3♂♂, 25–27-vii-70, & 1♂, 29-viii-72 (T. Hattori); Mt. Hodaka, Nagano-ken, 1♂, 3-viii-70; Mt. Shirouma, Nagano-ken, 1♂, 5-viii-70.

♂. Body-length 5–6 mm. Wings tinged with brown, distinctly yellowish at base; calyptrae yellow; halteres dark reddish brown at base, and yellow at knob.

Frons more or less narrower than anterior ocellus; interfrontalia not interrupted although much narrowed caudad; parafrontals with 5–7 strong and some

fine and short *ori* and no *ors*; A_3 1.7–1.8 times, at most twice, as long as wide; aristal pubescence not longer than basal diameter of arista; profrons more or less narrower than A_3; cheeks usually about as high as A_3-width; epistoma slightly projecting forwards beyond frons at lunule.

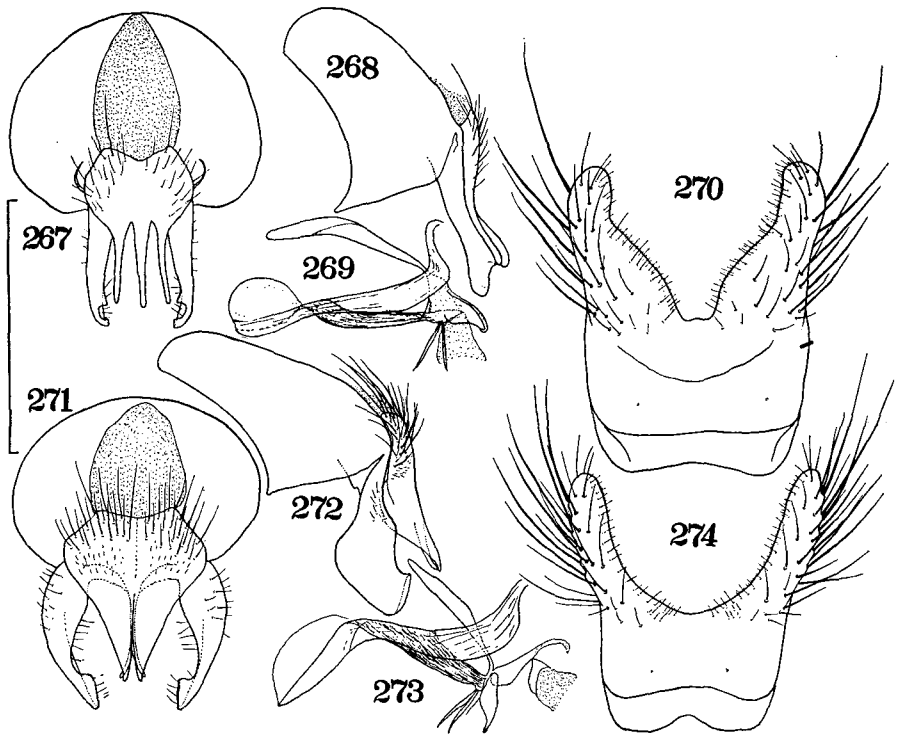
Mesonotum with fine *pre acr* and with many fine accessory setulae between the rows of *acr*, which are separated from each other by a distance longer than that between *dc* and *acr*; *pra* about two-thirds to four-fifths of posterior *ntpl* in length.

Fore tibia with 1 short *ad* and 1 *pv*; t_2 with 1–2 (usually 1) *ad*, 1–2 (usually 2) *pd* and 1–3 (usually 2) *pv*; f_3 with a row of long *av*, the longest one being about 1.5–2 times as long as height of the femur, and on basal half with a few or some *pv*, the longest one about 1.3–1.7 times as long as height of the femur; t_3 with 2–3 *av*, 4–7 (usually 4–5) *ad*, 3–5 *pd* and 2–6 *pv*.

♀. Unknown.

Distribution. Japan; Kamchatka; Siberia; Iceland; Europe; Greenland.

The present specimens agree well with a redescription of *rubrigena* given by Hennig (1970) in main features except in the 3rd antennal segment which is not longer than twice of its own width.



Figs. 267–270. *Pegohylemyia sansa* sp. nov., ♂: 267, hypopygium, dorsal view; 268, *ditto*, lateral view; 269, aedeagus; 270, 5th sternite, ventral view.

Figs. 271–274. *Pegohylemyia rubrigena* Schnabl, ♂: 271, hypopygium, dorsal view; 272, *ditto*, lateral view; 273, aedeagus; 274, 5th sternite, ventral view.

*5. *Pegohylemyia angulosa* (Ringdahl)
(Figs. 275–278)

Hylemyia angulosa Ringdahl, 1930: 9. *Pegohylemyia angulosa*: Hennig, 1970: 354.

Material examined. HOKKAIDÔ — Mt. Daisetsu, 2♀♀, 4-viii-60 (S. Ueda), 2♂♂, 1♀, 26–29-vii-67 (M. Miyazaki & K. Kusigemati), & 1♀, 20-vii-68; Shikaribetsu-ko, 1♂, 14-vii-66; Akkeshi, 6♂♂, 2♀♀, 18–19-vii-66; Daikokujima, 2♂♂, 19-vii-66; Shiretoko, 1♂, 17-viii-69 (H. Takizawa); Kunneppu, 1♀, 25-vii-66; Jôzankei, 1♂, 23-vi-68 (H. Takizawa).

♂. Body-length 5.4–6.3 mm. Interfrontalia yellowish or brownish on lower half or near lunule, sometimes wholly blackish, and with whitish pollen, which is sometimes tinged with yellow; parafacials often more or less brownish in ground colour near lunule, whitish grey and slightly yellowish in pollinosity; cheeks blackish, with pale grey pollen which is often more or less tinged with yellow or brown; occiput bluish grey and more or less brownish in pollinosity; antennae and palpi blackish or dark brownish; haustellum with mentum blackish or dark brownish, and thickly pollinose. Thorax usually rather distinctly brownish yellow in pollinosity; mesonotum when viewed from front becoming darker, and when viewed from behind becoming paler, with rather broad median and broad lateral vittae, and in some lights with narrow paramedian vittae along rows of *dc*. Abdomen densely covered with pale yellowish grey pollen which is more or less tinged with brownish and greenish tone; median vitta narrow and sharp. Wings with a brownish yellow tinge, strongly yellow at base; calyptrae strongly yellow; halteres reddish brown at base and yellow at knob.

Frons usually more or less narrower than anterior ocellus, at most as wide as the latter; interfrontalia linear caudad and not interrupted, with *if* as long as or a little shorter than ocellar setae; parafrontals with 3–4 strong, a few fine and some vestigial *ori*, and usually with 1 vestigial *ors*; A_3 2–2.5 times as long as wide; arista distinctly pubescent, the longest hairs more or less longer than basal diameter of arista; profrons about as wide as A_3; cheeks about 0.7–0.8 times as high as A_3-width, with genal setae short and fine, at most in 2 rows; epistoma distinctly projecting frowards beyond frons at lunule; haustellum with mentum much longer than palpi.

Mesonotum with some pairs of *pre acr*, of which 1–2 pairs are strong, distance between the rows being distinctly longer than that between *dc* and *acr*; about 10 accessory setulae present between the rows of *pre acr*; *pra* more or less shorter than posterior *ntpl*, at most as long as the latter; *stpl* 1:3, the lowest posterior much shorter than the upper although much stronger than accessory setulae.

Fore tibia with 1 distinct *ad* and 1 *pv*; f_2 on basal half with 3–5 distinct *av*, the longest one usually more or less shorter than height of the femur, and on basal half with 4–6 *pv* more or less weaker than *av*, proximal one the longest, being as long as or a little longer than height of the femur; t_2 with 0–2 (usually 1) *av*, 1 *ad*, 2 *pd* and 1–3 (usually 2) *pv*; f_3 with a row of long *av*, the longest one about 1.5–2 times as long as height of the femur, and on basal half with 3–5 *pv* more or less weaker than *av*; t_3 with 3–4 (rarely 5) *av*, 5–6 *ad*, 5–6 *pd* and 3–6 (rarely 2) *pv*. Wings with costal thorns rather long and strong, or short and distinct; costa not haired on ventral surface; *m-m* nearly erect or rather oblique, and more or less sinuate.

♀. Body-length 5.7–6.5 mm. Frons 0.36–0.39 times as wide as head; para-

frontals with 1–2 strong and a few vestigial *ori*, and with 1 proclinate and 2 reclinate *ors*. Mesonotum with *pre acr* finer than in male, the rows being separated from each other by a distance as long as or slightly longer than that between *dc* and *acr*; *stpl* 1:2. Mid femur on middle half with a few *av*, and on basal third with a few *pv*; t_2 with 1–2 (usually 1) *av*; t_3 usually with no *pv*. Wings with costal thorns strong.

Distribution. Japan; Kamchatka.

*6. *Pegohylemyia rectangularis* Ringdahl (Figs. 279–282)

Pegohylemyia rectangularis Ringdahl, 1952: 233. *Pegohylemyia rectangularis*: Ackland, 1969: 278; Hennig, 1970: 401.

Material examined. HOKKAIDÔ — Mt. Daisetsu, 1♂, 29-vii-59 (S. Ueda), 2♂♂, 3♀♀, 4-viii-60 (S. Ueda), 1♂, 26-vii-67 (K. Kusigemati), & 9♂♂, 20–21-vii-68.

♂. Body-length 4.4–5.2 mm. Interfrontalia orange yellow to brown and becoming darker caudad, rarely blackish wholly, and with whitish grey pollen; parafacials and cheeks yellowish to brownish and partly or largely darkened, with whitish grey pollen which is more or less tinged with yellow; antennae and palpi blackish or dark brownish; haustellum with mentum blackish or dark brownish, and distinctly pollinose. Thorax blackish or dark brownish in ground colour and brownish grey in pollinosity; mesonotum faintly vittate, in some lights with rather broad median and narrow paramedian vittae. Abdomen blackish or dark brownish in ground colour and greyish in pollinosity, which is more or less tinged with brown or brownish yellow; median vitta narrow or moderate and not sharp; fore marginal bands absent, or narrow if present. Legs blackish or dark brownish. Wings faintly or rather distinctly tinged with brown, more or less yellowish at base; calyptrae yellowish.

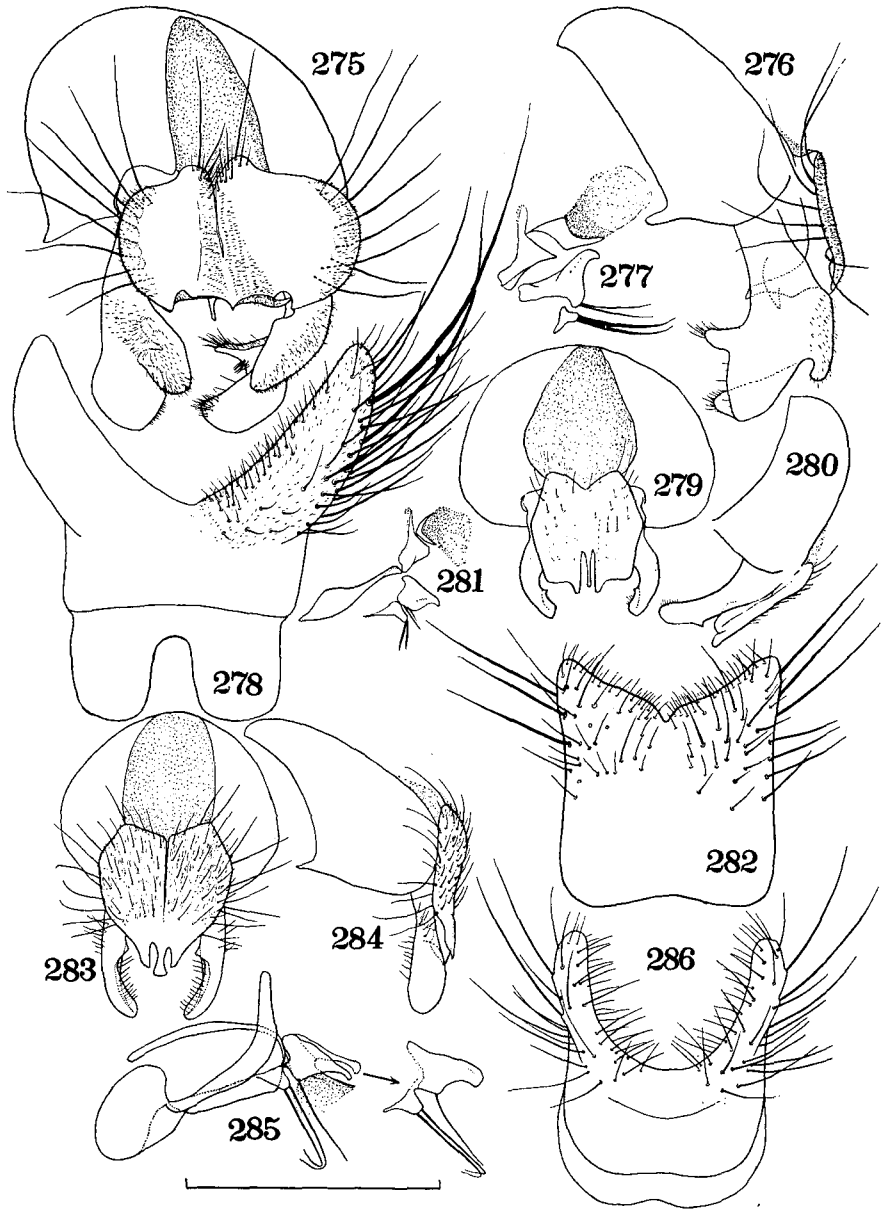
Frons about as wide as anterior ocellus; interfrontalia more or less narrower than anterior ocellus, with *if* more or less shorter than ocellar setae; parafrontals with 6–8 strong and some fine or vestigial *ori*, and with no *ors*; A_3 about 1.5–1.7 times as long as wide; profrons as wide as or slightly wider than A_3; parafacials hardly narrowing ventrad; cheeks about as high as A_3-width, with genal setae in 2 rows; epistoma projecting forwards as far as or slightly beyond frons at lunule; haustellum with mentum more or less longer than palpi.

Mesonotum with some accessory setulae between the rows of *pre acr*, distance between the rows about as long as that between *dc* and *acr*; *pra* about as long as posterior *ntpl*; *stpl* 1:3, the lowest posterior weaker than the uppers.

Fore tibia with or without 1 *pv* and usually with no *ad*, at most with 1 minute *ad* at apical third; f_2 on basal half with some *av*, which are shorter than height of the femur, and on basal half with some *pv* longer than height of the femur; t_2 with 1 (rarely 2) *ad*, 2 (sometimes 1) *pd* and 1–2 (rarely none) *pv*; f_3 with a row of 7–9 long *av*, the longest one about 1.5–2.2 times as long as height of the femur, and on basal half with 3–4 long *pv*, the longest one about 1.3–1.7 times as long as height of the femur; t_3 with 2 (sometimes 1) *av*, 3–5 *ad*, 3–5 (rarely 2) *pd* and 1–6 *pv*. Wings with costal thorns minute; *m-m* slightly oblique and hardly sinuate.

♀. The female of this species has been unknown. On the basis of the present specimens (3♀♀) a brief description will be given as follows: — Interfrontalia

orange yellow, more or less darkened on upper half; parafacials and cheeks largely yellowish, darkened only along eye-margin, and with pale yellowish pollen. Mesonotum and abdomen hardly vittate. Frons about 0.43–0.47 times as wide



Figs. 275–278. *Pegohylemyia angulosa* (Ringdahl), ♂: 275, hypopygium, dorso-lateral view; 276, *ditto*, lateral view; 277, aedeagus; 278, 5th sternite, ventral view.

Figs. 279–282. *Pegohylemyia rectangularis* Ringdahl, ♂: 279, hypopygium, dorsal view; 280, *ditto*, lateral view; 281, aedeagus; 282, 5th sternite, ventral view.

Figs. 283–286. *Pegohylemyia profuga* (Stein), ♂: 283, hypopygium, dorsal view; 284, *ditto*, lateral view; 285, aedeagus; 286, 5th sternite, ventral view.

as head; interfrontalia with *if* strong; parafrontals with 4–5 strong or distinct *ori* mingled with some vestigial setulae, and with 3 (2 on the right body-side of 1 specimen) *ors*, some vestigial setulae being present outside *ors*; cheeks with genal setae short and fine, the upper row with only a few setae. *Stpl* 1:2, the lower posterior less than half of the upper in length. Fore tibia with 1 distinct *ad* and with or without 1 minute *pv*; f_2 on basal half with 1 or a few *av* and a few *pv*, both of which are shorter than height of the femur; t_2 with 1 (2 on the left body-side of 1 specimen) *ad*, 2 *pd* and 1–2 *pv*, and in 1 specimen with 1 minute *av* at apical third; f_3 with about 6 *av* shorter than those of male, and on basal half with a few finer *pv*; t_3 with 2–3 (usually 3) *av*, 4–6 *ad*, 3–4 *pd* and no *pv*. Wings with costal thorns only a little stronger than those of male.

Distribution. Japan; Sweden.

*7. *Pegohylemyia profuga* (Stein)
(Figs. 283–286)

Hylemyia profuga Stein, 1916: 141. *Pegohylemyia profuga*: Ringdahl, 1952: 234; Hennig, 1970: 396. *Hylemya* (*Pegohylemyia*) *profuga*: Huckett, 1965a: 95; id., 1965b: 853.

Material examined. HOKKAIDÔ — Mt. Daisetsu, 2♂♂, 25–26-vii-67 (M. Miyazaki & K. Kusigemati), & 1♂, 21-vii-68. HONSHÛ — Mt. Bandai, Fukushima-ken, 2♂♂, 28-vii-71; Mt. Yatsugatake, Nagano-ken, 1♂, 21-vii-70; Mt. Kiso-Komagatake, Nagano-ken, 1♂, 24-vii-70; Mt. Hodaka, Nagano-ken, 1♂, 3-viii-70.

♂. Body-length 5.4–6.8 mm. Abdomen bluish grey to brownish grey in pollinosity, and with metallic reflections in some lights; median vitta and fore marginal bands sharp and brownish pollinose. Wings distinctly tinged with brownish yellow, at base more yellowish; calyptrae yellow or brownish yellow.

Frons narrower than anterior ocellus; interfrontalia linear caudad, not interrupted; parafrontals with 1 vestigial *ors*; profrons and cheeks respectively about as wide and high as A_3-width; A_3 more or less longer than twice of the width; arista with the longest hairs about twice as long as basal diameter of arista; epistoma more or less behind frons at lunule.

Mesonotum with about 3 pairs of strong *pre acr*, and with a few or some accessory setulae between the rows, distance between the rows being nearly equal to that between *dc* and *acr* and somewhat becoming shorter caudad; 2nd *ph* often rather distinct; *pra* about as long as anterior *ntpl*.

Mid tibia without *av*; t_3 with 2–3 *av*, 4–5 *ad*, 3 *pd* and 3–4 *pv*, apical *pd* being weak. Wings with costal thorns rather strong or distinct; *m-m* oblique and sinuate.

♀. Unknown.

Distribution. Japan; Europe; North America.

The Japanese form is not seriously different from the European form redescribed by Hennig (1970) except for the presence of 1 vestigial *ors*.

*8. *Pegohylemyia seneciella* (Meade)
(Figs. 287–291)

Phorbia seneciella Meade, 1892: 116. *Hylemyia* (*Pegohylemyia*) *furcatipyga* Ringdahl, 1948: 167. *Pegohylemyia gnava*: Ringdahl, 1952: 234, nec Meigen, 1826. *Hylemya*

(*Pegohylemyia*) *seneciella*: Frick & Andres, 1967: 457. *Pegohylemyia seneciella*: Hennig, 1970: 409.

Material examined. HONSHÛ — Mt. Bandai, Fukushima-ken, 1♂, 28-vii-71.

♂. Body-length 5 mm. Parafacials and cheeks with a brownish yellow tinge in pollinosity. Abdomen with median vitta broad and interrupted at hind margin of each tergite; 3rd tergite with narrow fore marginal band. Wings at base and calyptrae yellow.

Frons about 1.5 times as wide as anterior ocellus; interfrontalia about as wide as anterior ocellus, with *if* somewhat longer than ocellar setae; parafrontals without *ors*; A_3 nearly twice as long as wide; arista with the longest hairs a little longer than basal diameter of arista; profrons and cheeks respectively about 1.5 times as wide and high as A_3-width; epistoma distinctly behind frons at lunule.

Mesonotum with a few accessory setulae between the rows of *pre acr*, which are separated from each other by a distance nearly equal to that between *dc* and *acr*; *pra* about as long as posterior *ntpl*. Abdomen long-ovoid, nearly twice as long as wide.

Fore tibia with 1 *pv* and without *ad*; f_2 with no strong *av*, only a row of fine ones, of which proximal ones are longer and stronger than distal ones although distinctly shorter than height of the femur, and with a row of *pv* becoming shorter towards apex of the femur, proximal ones being more or less longer than height of the femur; t_2 with 1 *ad*, 2 *pd* and 2 *pv*, and without *av*; f_3 with a row of alternately long and short *av*, which are respectively becoming longer towards apex of the femur, the longest one about 1.7 times as long as height of the femur, and with a row of *pv*, which are much shorter than height of the femur except for a preapical one more or less longer than the height; t_3 with 3 *av*, 4–5 *ad*, 3 *pd* and 3–5 *pv*, apical *pd* being weak. Wings with costal thorns vestigial and hardly distinguishable from costal setulae; *m-m* not oblique and slightly curved inwards.

♀. Unknown to me. According to Collin (1936) through Hennig (1970) the female of this species can be distinguished from that of the related species *Pegohylemyia jacobaeae* (Hardy) by the ventrally bare costa, the weak apical *pd* on the hind tibia and the *stpl* arranged in 1:2.

Host plants. *Senecio jacobaea* & *Senecio aquaticus* (in Europe, after Meade, 1892 through Hennig, 1970).

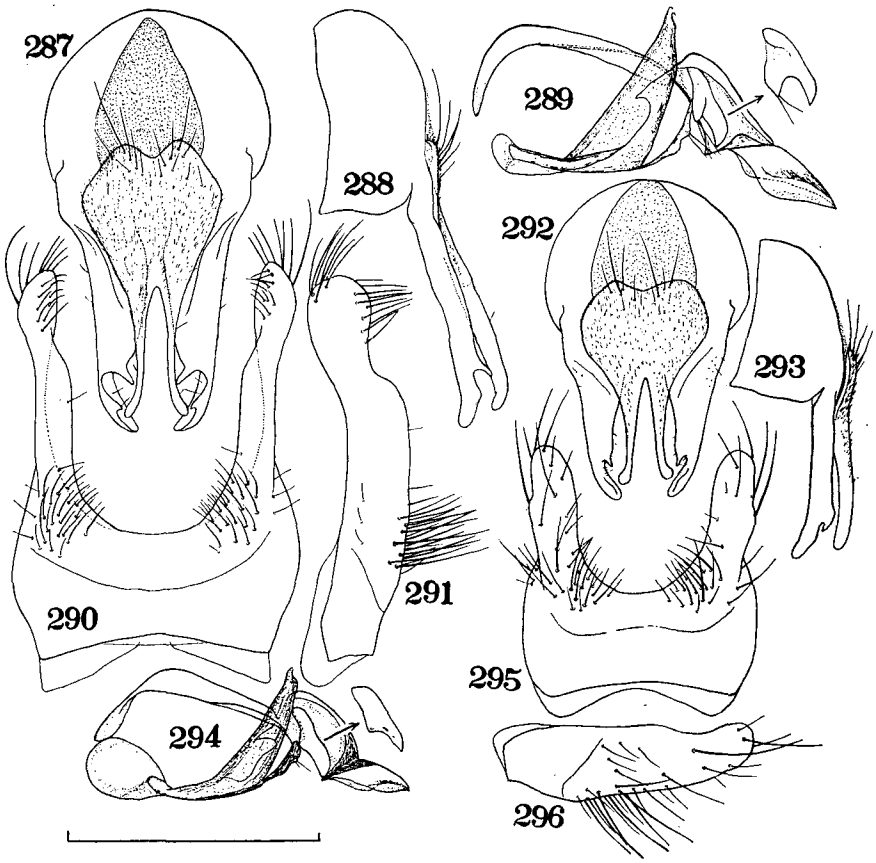
Distribution. Japan; Europe. This species was introduced to North America from France (Frick & Andres, 1967) and to New Zealand from England (Kelsey, 1955 through Hennig, 1970) for the biological control of the tansy ragwort, *Senecio jacobaea*.

The Japanese form is somewhat different from the European one redescribed by Hennig (1970) in having the mid and hind femora with shorter *pv*, yet in other features including the genital structures they agree well with each other.

9. *Pegohylemyia karibae* sp. nov.
(Figs. 292–296)

Type-material. HOKKAIDÔ — Mt. Kariba, 1♂ (holotype), 19–23-vii-72.

♂. Resembling that of *seneciella*. Body-length 4.4 mm; wing-length 4.1 mm. Interfrontalia brownish on lower half and blackish on the upper; parafacials and cheeks dark brownish in ground colour and brownish grey in pollinosity; antennae



Figs. 287–291. *Pegohylemyia seneciella* (Meade), ♂: 287, hypopygium, dorsal view; 288, *ditto*, lateral view; 289, aedeagus; 290, 5th sternite, ventral view; 291, *ditto*, lateral view.

Figs. 292–296. *Pegohylemyia karibae* sp. nov., ♂: 292, hypopygium, dorsal view; 293, *ditto*, lateral view; 294, aedeagus; 295, 5th sternite, ventral view; 296, *ditto*, lateral view.

blackish, on A_2 more or less brownish; palpi dark brownish; haustellum with mentum blackish, and thinly pollinose; occiput blackish in ground colour and more or less tinged with blue and brown in pollinosity. Thorax blackish in ground colour and brownish grey in pollinosity; mesonotum thinly pollinose, when viewed from front and above largely blackish, and when viewed from behind broadly blackish laterally, very faint median vitta being visible in some lights. Abdomen blackish in ground colour and a little brownish in pollinosity; median vitta broad, and interrupted at hind margin of each tergite; narrow fore marginal bands present. Legs dark brownish. Wings distinctly tinged with brown, more or less yellowish at base; calyptrae yellowish, more or less tinged with brown; halteres yellow at knob.

Frons slightly less than twice as wide as anterior ocellus (the measurement may not be exact for a contracted condition of the eyes); interfrontalia more or less

wider than anterior ocellus, with *if* a little shorter than ocellar setae; parafrontals with 5 long and some short and fine *ori*, and no *ors*; A_3 about 1.6 times as long as wide; aristal hairs not longer than basal diameter of arista; profrons about 1.2 times as wide as A_3; cheeks more or less higher than profrons-width, with genal setae in 2 rows; epistoma distinctly behind frons at lunule; haustellum not lengthened.

Mesonotum with 2–3 pairs of *pre acr*, distance between the rows about half as long as that between *dc* and *acr*; no accessory setulae present between the rows of *pre acr*; *ph* not duplicated; *pra* as long as or slightly longer than posterior *ntpl*; mesopleura with 1 distinct anterior *mpl*; and with 2 strong *pstg* and 2 fine associated setulae; *stpl* 1:2; scutellum with only a few accessory setulae on dorsal surface.

Abdomen depressed, about 2.3 times as long as wide, and slowly narrowing caudad; prebasal sclerite with some setulae on hind margin laterally, a few of them being rather long; 5th sternite (Figs. 295 & 296) with processes not so long as in *seneciella* and sparsely setose along inner margins except on bases which are rather densely setose; postgonites (Fig. 294) not bifurcated apically as in *seneciella*.

Fore tibia with 1 *pv* and no *ad*; f_2 with a row of short *av* becoming shorter and finer towards apex of the femur, proximal ones being rather distinct although shorter than height of the femur, and with a row of *pv* which are longer and stronger than *av* although becoming shorter and finer towards apex of the femur; t_2 with 1 *ad* (invisible on the right body-side), 1 *pd* (invisible on the right body-side) and 1 *p–pv*, and with no *av*; f_3 with a row of *av*, the longest one being about 1.5 times as long as height of the femur, and with 3 and 1 *pv* respectively on basal half and near apex, the setae being rather distinct and the longest one near middle is about as long as height of the femur; t_3 with 2 *av*, 3–4 *ad*, 2 *pd* and 1 *pv*, apical *d* being shorter and weaker than apical *av* and only a little longer than height of the tibia, apical *pd* weak. Wings with costal thorns vestigial and indistinguishable from costal setulae; costa bare on ventral surface; *m-m* erect and straight.

♀. Unknown.

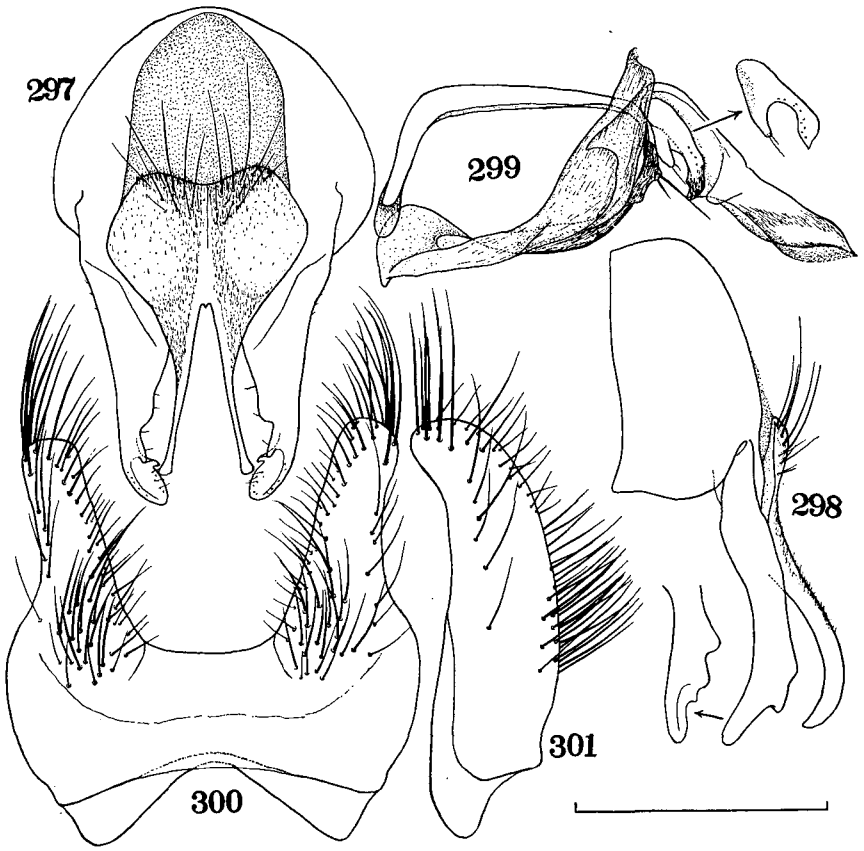
Distribution. Japan.

Judging from the shape of the 5th sternite and hypopygium *P. karibae* is closely related to *P. seneciella* although the characters are different enough to separate it from the latter as distinct.

10. *Pegohylemyia higuchii* sp. nov.
(Figs. 297–301)

Type-material. HOKKAIDÔ — Rebun-tô, 2♂♂ (one the holotype), 21-vii-72 (H. Higuchi); Mt. Kariba, 1♂, 19–23-vii-72.

♂. Body-length 6–6.3 mm; wing-length 5.5–5.7 mm. Body including appendages black or blackish in ground colour. Pollinosity more brownish in the specimens from Rebun-tô, more bluish in the specimen from Mt. Kariba. In the specimens from Rebun-tô: — Interfrontalia whitish grey pollinose; parafacials whitish grey and slightly yellowish in pollinosity; cheeks pale yellowish pollinose; haustellum with mentum thinly pollinose; thorax brownish grey pollinose, darker on mesonotum; mesonotum when viewed from front almost wholly darkened, and when viewed from behind darkened between rows of *acr* and outside rows of *dc* except between *ia* and *sa*; abdomen pale brownish grey pollinose, with median



Figs. 297–301. *Pegohylemyia higuchii* sp. nov., ♂: 297, hypopygium, dorsal view; 298, *ditto*, lateral view; 299, aedeagus; 300, 5th sternite, ventral view; 301, *ditto*, lateral view.

vitta broad and interrupted at hind margin of each tergite; 5th tergite with broad fore marginal band disappearing in low angle of view. In the specimen from Mt. Kariba: — Parafacials and cheeks whitish grey and more or less bluish in pollinosity; thorax in pollinosity bluish grey, on pleura more or less brownish in part; mesonotum when viewed from each of front and behind with broad black vittae between rows of *acr* and between rows of *dc* and *ia*, and narrowly blackish outside *sa*, these markings being brownish pollinose; abdomen in pollinosity bluish grey, and with a brownish tinge near markings and on 5th tergite. Wings strongly tinged with brownish yellow, at base more yellowish; calyptrae yellow, more or less tinged with brown; halteres yellow at knob.

Frons about 1.4–1.7 times as wide as anterior ocellus; interfrontalia as wide as or a little narrower than anterior ocellus, with a pair of strong *if*, which are about as long as ocellar setae, and below this pair of *if* with some irregular pairs of fine setulae; parafrontals with 5–6 strong, some slender and some vestigial *ori*, and without *ors*; A_3 as long as or slightly shorter than twice of the width; arista distinctly pubescent, the longest hairs about as long as basal diameter of arista;

profrons about 1.3–1.4 times as wide as A_3; cheeks as high as or slightly higher than profrons-width, with genal setae strong and in 2–3 rows; epistoma distinctly behind frons at lunule; haustellum not lengthened.

Mesonotum with about 4 pairs of rather distinct or strong *pre acr*, the setae of the 2nd pair being the strongest, about two-thirds as long as 1st *pre dc*, and sparsely (in the specimens from Rebun-tô) or rather densely (in the specimen from Mt. Kariba) setulose between the rows, which are separated from each other by a distance as long as or slightly shorter than that between *dc* and *acr*; *prsc acr* more or less longer and stronger than discal setae on scutellum; *pra* as long as or a little shorter than posterior *ntpl*; notopleura with 1 accessory setula in the paratype from Rebun-tô; mesopleura with 1 strong or distinct anterior *mpl*, and with 1 strong and 1 weak *pstg* and about 10 fine associated setulae; *stpl* 1: 2, if 1: 3 (in the paratype from Rebun-tô) the lowest posterior is fine; scutellum nearly bare on dorsal surface, and with 4–5 setulae between the apical setae.

Abdomen long-ovoid, depressed on basal half and half-depressed on caudal half, about as long as thorax, and about 1.7–1.9 times as long as wide; 5th sternite (Figs. 300 & 301) with processes densely setose along inner margin as well as at base; cercal plate with 2 long apical projections, between which a small protuberance is present (Fig. 297), the long apical projections being distinctly sinuate in profile (Fig. 298); postgonites (Fig. 299) bifurcated apically.

Fore tibia with 1 short *ad* and 1 *pv*, apical *ad* rather strong; f_2 with no distinct *av* and on basal half to two-thirds with some (4–7) distinct or strong *pv*, the longest one distinctly longer than height of the femur; t_2 with 1 *ad*, 2 *pd* and 2–3 (usually 2) *pv*; f_3 with a row of about 6–10 strong *av* on apical two-thirds to whole length, the longest one about 1.5 times as long as height of the femur, and with a row of short *pv* apart from 1–2 long preapical ones; t_3 with 2–4 *av*, 4–6 *ad*, 3–4 *pd* and 2–4 *pv*, apical *pd* being weak. Wings with costal thorns minute and hardly distinguishable from costal setulae; costa bare ventrally; *m-m* slightly or hardly oblique and nearly straight.

♀. Unknown.

Distribution. Japan.

Although the present species is more densely setulose and more stout than *seneciella* and *karibae*, they may be included in the same species-group on the basis of the 5th sternite and hypopygium.

11. *Pegohylemyia kitayamae* sp. nov.
(Figs. 302–305)

Type-material. Honshû — Kitayama, Kyôto-fu, 2♂♂ (one the holotype), 2-iv-68.

♂. Body-length 4.7–4.8 mm; wing-length 4.7–5 mm. Interfrontalia largely yellow and thinly covered with whitish pollen; parafacials and cheeks yellowish, with whitish pollen; antennae blackish; palpi dark brownish; haustellum with mentum dark brownish, with greyish pollen; occiput dark brownish or blackish in ground colour, with greyish pollen. Thorax on pleura dark brownish in ground colour and rather thinly greyish pollinose; mesonotum blackish in ground colour and very thinly greyish pollinose, hardly vittate, at most very faint median vitta being visible in some lights. Abdomen dark brownish in ground colour, thinly

covered with pale greyish pollen, and half-shining in some lights; median vitta moderate in width and rather obscure; tergites with faint fore marginal bands. Legs dark brownish. Wings tinged with brown, more or less yellowish at base; calyptrae pale yellow, with brownish fringe; halteres yellow at knob.

Frons as wide as or a little narrower than anterior ocellus; interfrontalia linear caudad, with a pair of slender *if*, which are about as long as ocellar setae; parafrontals with 5–7 long and slender *ori* mingled with a few or some short and fine setulae, and without *ors*; A_3 about 1.5 times as long as wide; arista nearly bare; profrons as wide as or slightly narrower than A_3; cheeks somewhat less high than A_3-width, with genal setae in 2 rows; face distinctly concave near epistoma; epistoma slightly or rather distinctly behind frons at lunule; occiput swollen on lower part; palpi shorter than A_2 and A_3 combined, and somewhat broadening apicad; haustellum more or less lengthened, distinctly longer than palpi.

Mesonotum with 5 pairs of fine *pre acr*, distance between the rows about two-thirds of that between *dc* and *acr*; only 1–2 accessory setulae present between the rows of *pre acr*; *pra* a little shorter than posterior *ntpl*; notopleura with 1–2 accessory setulae above anterior *ntpl*; mesopleura without distinct anterior *mpl*, and with 2 strong *pstg* and a few fine associated setulae; *stpl* 1:2; scutellum nearly bare dorsally.

Abdomen depressed, nearly parallel-sided, and only a little less than twice as long as wide; prebasal sclerite with 1 or a few setae; 5th sternite and hypopygium as in Figs. 302–305.

Fore tibia with 1 vestigial *ad* and 1 short and fine *pv*; f_2 on basal third with some *av* and *pv* respectively shorter and longer than height of the femur; t_2 with 1 *ad*, 2 *pd* and 2 *pv*; f_3 with a row of *av* becoming longer and stronger towards apex of the femur, the longest one being much longer than height of the femur, and on basal half to two-thirds with some *pv* more or less longer than height of the femur; t_3 with 1–2 *av*, 4–6 *ad*, 3–5 *pd* and 4–7 *pv*. Wings with costal thorns practically absent; costa bare on ventral surface, and rather distinctly broadened at part meeting with R_1; R_1 on dorsal surface near costa with 1 (on the left) or 3 (on the right) minute setulae in the paratype; *m-m* nearly erect and faintly sinuate.

♀. Unknown.

Distribution. Japan.

At first sight the present species resembles *Pegohylemyia dziedzickii* Séguy, from which it can, however, be readily distinguished by the shorter *pra* and the more or less heart-shaped 5th sternite.

*12. *Pegohylemyia gnava* (Meigen)
(Figs. 306–309)

Anthomyia gnava Meigen, 1826: 164. *Pegohylemyia gnava*: Hennig, 1970: 374.

Material examined. HOKKAIDÔ — Mt. Daisetsu, 1♂, 23-vii-68; Mt. Soranuma, 1♂, 1-viii-68. HONSHÛ — Mt. Daibosatsu, Yamanashi-ken, 2♂♂, 6-viii-69.

♂. Body-length 4.6–5.3 mm. Interfrontalia orange yellow on lower half and dark brownish on the upper, with whitish pollen; parafacials largely yellowish in ground colour and whitish yellow in pollinosity; cheeks yellowish or dark brownish in ground colour and more or less yellowish grey in pollinosity; palpi yellowish or brownish yellow at least on basal half and darkened apically. Mesonotum very

thinly covered with brownish grey or pale grey pollen, which is visible only in some lights, when viewed from behind the pollinosity is discernible before the suture along dark median vitta and along the suture, and is discernible behind the suture along rows of *dc* and on hind margin of mesonotum. Abdomen rather densely covered with greyish pollen which is more or less tinged with yellowish brown; median vitta broad and interrupted at hind margin of each tergite; 3rd to 5th tergites along median vitta obscurely darkened, the marking being broader cephalad and making a triangle with median vitta.

Frons about 1.5 times as wide as anterior ocellus; interfrontalia about as wide as anterior ocellus; A_3 as long as or slightly less than twice of the width; arista with hairs as long as or a little longer than basal diameter of arista; epistoma more or less behind frons at lunule.

Mesonotum with *pre acr*-rows separated from each other by a distance about two-thirds or half of that between *dc* and *acr*; *pra* about as long as anterior *ntpl*; notopleura with 1–2 accessory setulae in 3 specimens of the 4 examined ones.

Mid femur near base with 1–2 *av* as long as or a little longer than height of the femur and with 2–4 *pv* more or less longer than height of the femur.

♀. Unknown to me.

Host plants. *Lactuca sativa* (in Europe, after Wille, 1930 through Hennig, 1970).

Distribution. Japan; Europe.

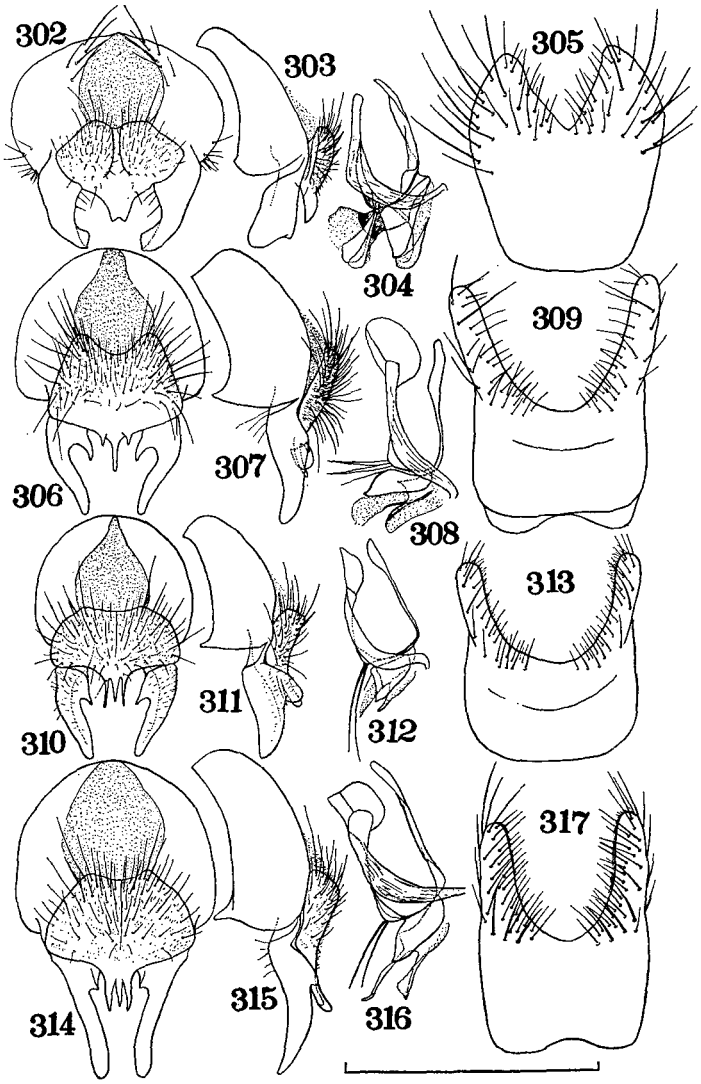
The present specimens agree well with a redescription of *gnava* from Europe given by Hennig (1970) except in the wider frons, and they should be identified with that species. Hennig (l.c.) has also mentioned about a specimen (♂) from Manchuria as follows: "Im Museum Stuttgart befindet sich 1 ♂ aus der Mandschurei ..., das sich von europäischen Exemplaren im 5. Abdominalsternit nicht erkennbar, im Hypopygium nur durch die schlankeren Surstyli ... unterscheidet. An äusseren Merkmalen können nur die aschgraue, nicht braune Bestäubung des Mesonotum und die etwas breitere Stirn genannt werden: der Abstand der Augenränder entspricht in der oberen Stirnhälfte etwas der doppelten Breite des vorderen Ozellus.", and ".....lässt sich zur Zeit kaum entscheided, ob das Tier zu einer ostasiatischen Subspecies oder einer eigenen (mit g n a v a dann aber auf jeden Fall nächstverwandten) Art gehört." The discovery of the Japanese form identical with the European one in the surstyli may suggest that the Manchurian form is distinct from *gnava* although it seems to be closely related to the latter.

*13. *Pegohylemyia dziedzickii* Séguy
(Figs. 310–313)

Hylemyia (*Pegohylemyia*) *brunnescens*: Schnabl & Dziedzicki, 1911: 99, nec Zetterstedt, 1845. *Pegohylemyia dziedzickii* Séguy, 1932: 75, pro *brunnescens* Zetterstedt sensu Schnabl & Dziedzicki, 1911.

Material examined. HOKKAIDÔ — Nopporo, 1 ♂, 9-vi-67. HONSHÛ — Mt. Yatsugatake, Nagano-ken, 2♂♂, 2-vi-67 (T. Kocha).

♂. Closely resembling that of *gnava*. Body-length 4.3–4.4 mm. Interfrontalia brownish near lunule or yellowish on lower half and blackish on the upper, with whitish pollen; parafacials dark brownish or largely yellowish, with whitish grey pollen more or less tinged with yellow; cheeks dark brownish in ground colour



Figs. 302–305. *Pegohylemyia kitayamae* sp. nov., ♂: 302, hypopygium, dorsal view; 303, *ditto*, lateral view; 304, aedeagus; 305, 5th sternite, ventral view.

Figs. 306–309. *Pegohylemyia gnava* (Meigen), ♂: 306, hypopygium, dorsal view; 307, *ditto*, lateral view; 308, aedeagus; 309, 5th sternite, ventral view.

Figs. 310–313. *Pegohylemyia dziedzickii* Séguy, ♂: 310, hypopygium, dorssal view; 311, *ditto*, lateral view; 312, aedeagus; 313, 5th sternite, ventral view.

Figs. 314–317. *Pegohylemyia sonchi* (Hardy), ♂: 314, hypopygium, dorsal view; 315, *ditto*, lateral view; 316, aedeagus; 317, 5th sternite, ventral view.

and more or less dullish grey in pollinosity; antennae blackish; palpi dark brownish or blackish. Mesonotum rather distinctly, though thinly, covered with pollen which is weakly or strongly tinged with brown, and with median vitta rather broad and continuous to scutellum. Abdomen in pollinosity a little tinged with yellow

or brown and blue also; median vitta moderate or rather broad and interrupted at hind margin of each tergite.

Frons as wide as or a little narrower than anterior ocellus. Mesonotum with *pre acr*-rows separated from each other by a distance nearly equal to that between *dc* and *acr*; notopleura with 2–4 accessory setulae in 2 specimens of the 3 examined ones. Cercal plate (Fig. 310) with 3 apical projections, which are not so different from each other in length. Mid femur with no distinct *av*, at most near base with a few or some fine ones shorter than height of the femur.

♀. Unknown.

Distribution. Japan; Europe.

According to Hennig (1970) the type-specimen of *dziedzickii* is missing. Comparing the genital structures of the specimens at hand with those of *dziedzickii* figured by Schnabl & Dziedzicki (1911) as *brunnescens* Zetterstedt I have come to the conclusion that the Japanese specimens should be identified with the present species. Although Hennig (l.c.) suppressed *dziedzickii* as a synonym of *gnava*, the former may be distinctly separated from the latter by the cercal plate with the apical projections of nearly same length.

*14. *Pegohylemyia sonchi* (Hardy)
(Figs. 314–317)

Anthomyia sonchi Hardy, 1872: 209. *Chortophila lineata* Stein, 1914: 53. *Pegohylemyia lineata*: Ringdahl, 1952: 235. *Pegohylemyia sonchi*: Hennig, 1970: 415.

Material examined. HOKKAIDÔ — Shiretoko, 1 ♂, 21-viii-68 (H. Torikura).

♂. Body-length 5.9 mm. Haustellum with mentum pollinose. Mesonotum thickly covered with pale brownish grey pollen, when viewed from behind with some blackish markings as follows: — Before the suture with a spot-like marking behind each humeral callus and a wedge-shaped one between rows of *acr*, and behind the suture with a wedge-shaped marking between *dc* and *acr* and a larger one between *dc* and *ia*, the median and paramedian markings touching the suture. Abdomen thickly covered with pale yellowish pollen, and when viewed from behind with sharp and narrow median vitta, which is interrupted at hind margin of each tergite; tergites brownish pollinose near median vitta, and without fore marginal band.

Frons about 1.7 times as wide as anterior ocellus; interfrontalia slightly wider than anterior ocellus; A_3 slightly longer than twice the width; arista with the longest hairs about as long as basal diameter of arista; profrons and cheeks respectively about 1.8 times as wide and high as A_3-width; cheeks with genal setae in 2 rows; epistoma about as far as frons at lunule; palpi slender, distinctly longer than A_2 and A_3 combined; haustellum slender, with mentum slightly longer than palpi.

Mesonotum with *pre acr*-rows separated from each other by a distance about half of that between *dc* and *acr*; *pra* about as long as anterior *ntpl*. Abdomen rather elongate, about 2.5 times as long as wide, and becoming a little narrower caudad.

♀. Unknown to me.

Host plants. *Sonchus oleraceus* (in Europe, after Hardy, 1872 through Hennig, 1970).

Distribution. Japan; Europe.

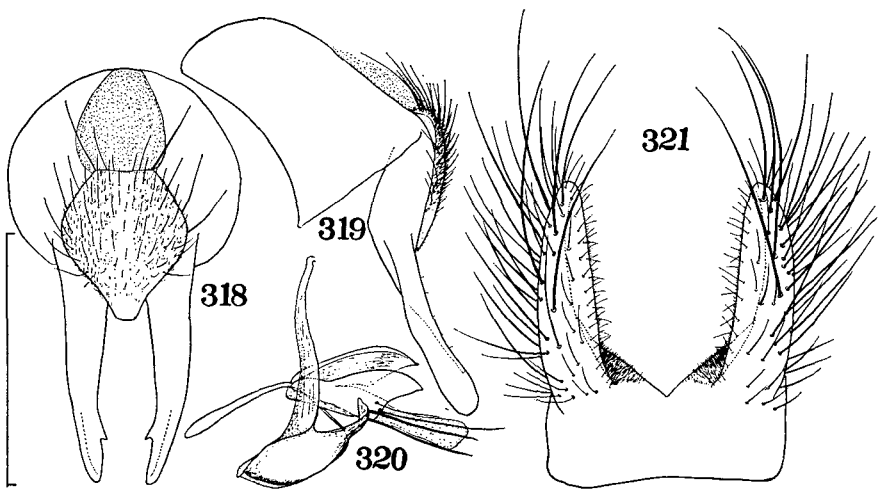
According to Hennig (1970: 346, in a key of *Pegohylemyia*) the parafacials of *sonchi* are somewhat narrower than A_3. On the other hand the parafacials of the present specimen are evidently wider, even at the narrowest part about 1.6 times as wide as A_3. So that the identification of the specimen with *sonchi* is quite tentative.

*15. *Pegohylemyia appendiculata* (Malloch)
(Figs. 318–321)

Hylemyia appendiculata Malloch, 1920d: 281. *Hylemya ringdahl* Drew, 1963: 247, pro *appendiculata* Malloch, 1920. *Hylemya* (*Pegohylemyia*) *ringdahli* Huckett, 1965a: 96, pro *ringdahl* Drew, 1963, unjust. emend.; id., 1965b: 853.

Material examined. HOKKAIDÔ — Daikoku-jima, 2♂♂, 19-vii-66.

♂. Body-length *ca.* 6 mm. Mesonotum brownish grey pollinose, when viewed from behind with distinct median and lateral vittae, and in some lights with rather obscure paramedian ones along rows of *dc*. Abdomen with narrow and sharp median vitta, and without fore marginal band.



Figs. 318–321. *Pegohylemyia appendiculata* (Malloch), ♂: 318, hypopygium, dorsal view; 319, *ditto*, lateral view; 320, aedeagus; 321, 5th sternite, ventral view.

Frons about as wide as anterior ocellus; parafrontals with 1 fine *ors*; A_3 slightly longer than twice the width; arista with the longest hairs more or less longer than basal diameter of arista; profrons and cheeks about 1.2 times as wide and high as A_3-width respectively; epistoma a little projecting forwards beyond frons at lunule; palpi slender; haustellum with mentum rather distinctly longer than A_2 and A_3 combined.

Mesonotum with 1 pair of strong and some pairs of fine *pre acr*, and with a few accessory setulae between the rows, which are separated from each other by a distance nearly equal to or slightly shorter than that between *dc* and *acr*; *pra*

about as long as anterior *ntpl.*

Fore tibia with 1 *ad* and 1 *pv*, and in addition with 1 shorter *ad* in 1 specimen; f_2 with 5–7 short *av* on basal half or a little more, the longest one about two-thirds as long as height of the femur, and with 5–7 long *pv* on basal half, the longest one about 1.2–1.4 times as long as height of the femur; t_2 with 1–2 *ad*, 2 *pd* and 2 *pv*, and in 1 specimen with 1 *av*; f_3 with a row of long *av*, the longest one about 1.8 times as long as height of the femur, and on basal half to two-thirds with 4–6 *pv*, the longest one about 1.6–1.7 times as long as height of the femur; t_3 with 4–6 *av*, 4–5 *ad*, 3 *pd* and 4–6 *pv*. Wings with costal thorns strong.

♀. Unknown to me.

Distribution. Japan; North America.

The present specimens agree well with the original description of *appendiculata*, and they may be rightly identified with the species. Having read a redescription of *norvegica* Ringdahl, 1952 given by Hennig (1970) I have found that the specimens also agree with *norvegica* except in the epistoma and haustellum, which are as follows in *norvegica*: "Mundrand im Profil hinter dem Vorderrande der Stirn. Rüssel kurz und breit, grau bestäubt." The relationship of *appendiculata* and *norvegica* is, therefore, open for further study.

Drew (1963) suppressed *Pegohylemyia* as a synonym of *Hylemya*. In consequence, *Hylemya appendiculata* Malloch, 1920 (nec *Hylemya appendiculata* (Bigot, 1885)=*H. brassicae* (Bouché, 1883)) was renamed *Hylemya ringdahl* Drew. In the present study *Pegohylemyia* is ranked as a good genus, so that the name *appendiculata* Malloch must be revived.

*16. *Pegohylemyia hucketti* (Ringdahl)
(Figs. 322–325)

Hylemyia hucketti Ringdahl, 1935: 26. *Pegohylemyia hucketti*: Ringdahl, 1952: 234; Hennig, 1970: 377. *Hylemya* (*Pegohylemyia*) *hucketti*: Huckett, 1965a: 95; id., 1965b: 853.

Material examined. HONSHŪ — Mt. Hodaka, Nagano-ken, 2♂♂, 3-viii-70.

♂. Body-length 5.2 mm. Mesonotum brownish grey pollinose, in some lights with paramedian vittae along rows of *dc* apart from median and lateral vittae. Abdomen with median vitta moderate in width and sharp.

Frons a little wider than anterior ocellus; parafrontals with no *ors*; A_3 about twice as long as wide; arista with hairs more or less longer than basal diameter of arista; profrons and cheeks respectively about as wide and high as A_3-width; cheeks with genal setae nearly in a row; epistoma as far as or slightly behind frons at lunule.

Mesonotum with 3 pairs of strong *pre acr*, setae of the middle pair being the strongest, and with 1 or a few accessory setulae between the rows, which are separated from each other by a distance nearly equal to that between *dc* and *acr*; *pra* about half as long as posterior *ntpl.*

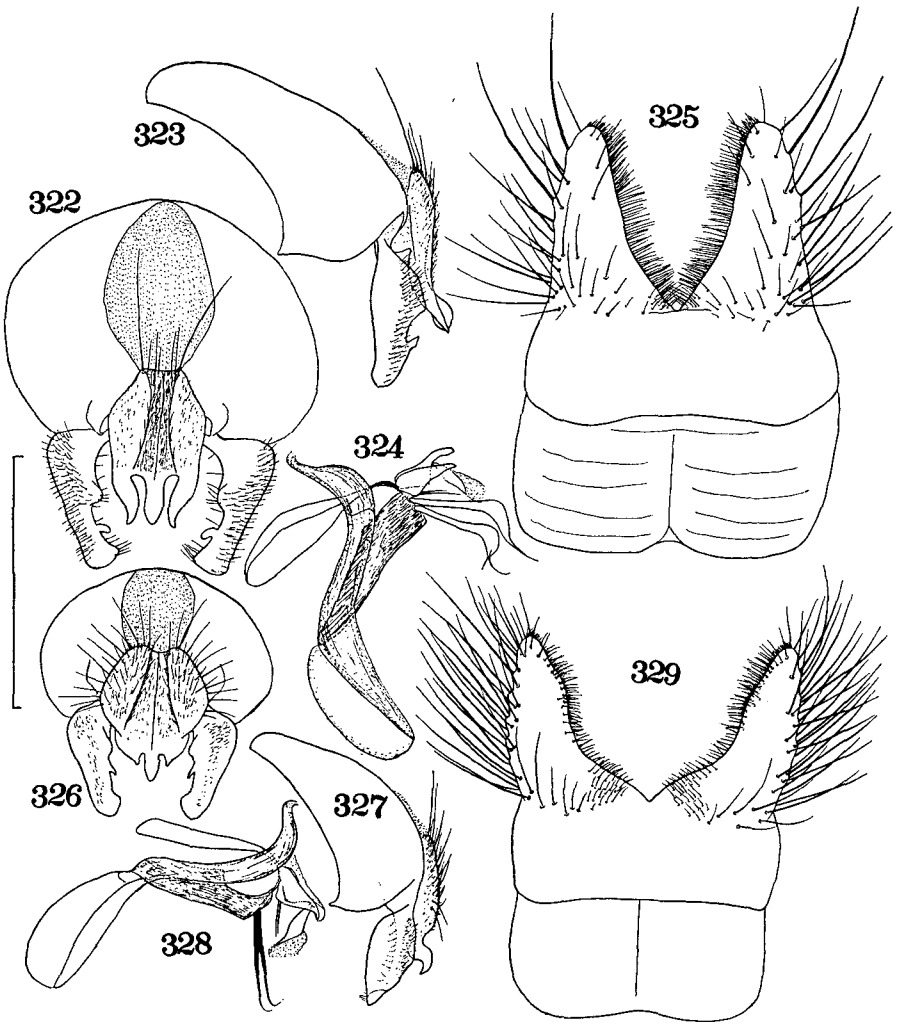
Fore tibia with 1 *ad* and 1 *pv*; f_2 with no distinct *av*, and near base with some *pv* more or less longer than height of the femur; t_2 with 1 *ad*, 2 *pd* and 2 *pv*; f_3 with 6–9 strong *av*, the longest one about 1.5 times as long as height of the femur, and with no distinct *pv* except for preapical one(s); t_3 with 2 *av*, 5 *ad*, 3 *pd* and a few fine *pv*. Wings with costal thorns rather distinct.

♀. Unknown to me.
Distribution. Japan; Europe; North America.

*17. *Pegohylemyia macra* Karl
(Figs. 326–329)

Pegohylemyia macra Karl, 1940: 44. *Pegohylemyia macra*: Hennig, 1970: 385.

Material examined. HONSHŪ — Mt. Hodaka, Nagano-ken, 1♂, 3-viii-70.
♂. Body-length 5 mm. Haustellum with mentum pollinose. Mesonotum



Figs. 322–325. *Pegohylemyia hucketti* (Ringdahl), ♂: 322, hypopygium, dorsal view; 323, *ditto*, lateral view; 324, aedeagus; 325, 5th sternite, ventral view.
Figs. 326–329. *Pegohylemyia macra* Karl, ♂: 326, hypopygium, dorsal view; 327, *ditto*, lateral view; 328, aedeagus; 329, 5th sternite, ventral view.

brownish grey pollinose and obscurely vittate, when viewed from behind with rather broad median vitta. Abdomen bluish grey in pollinosity, which is more or less tinged with pale rose-brown in some lights; median vitta narrow and sharp; tergites with fore marginal bands when viewed from above. Wings with a brownish tinge; calyptrae pale yellow, rather distinctly on margin; halteres dark reddish brown at base, and yellow at knob.

Frons about two-thirds as wide as anterior ocellus; interfrontalia linear caudad; parafrontals with no *ors*; A_3 nearly twice as long as wide; arista with the longest hairs about as long as basal diameter of arista; profrons and cheeks respectively about as wide and high as A_3-width; cheeks with genal setae in 3 rows; epistoma only a little projecting forwards beyond frons at lunule.

Mesonotum with 3 pairs of distinct *pre acr*, setae of the middle pair being strong, and with some (6–7) fine accessory setulae between the rows; distance between the rows of *pre acr* more or less longer than that between *dc* and *acr*; *pra* about half as long as posterior *ntpl*.

Fore tibia with 1 *ad* and 1 *pv*; f_2 on basal half with some *av* and some *pv*, the longest *av* being more or less shorter than height of the femur, and the longest *pv* distinctly longer than height of the femur; t_2 with 1 *ad*, 2 *pd* and 2 *pv*; f_3 with a row of *av*, the longest one about twice as long as height of the femur, and on basal half with some *pv*, the longest one a little less than twice as long as height of the femur; t_3 with 2 strong and 1–2 weak *av*, 6–7 *ad*, 3 *pd* and 3 *pv*. Wings with costal thorns rather short although stronger than costal setulae.

♀. Unknown.

Distribution. Japan; Eastern Turkestan; Finland.

Judging from redescriptions of *Pegohylemyia macra* Karl, 1940 and *Chortophila betarum* Lintner, 1882 respectively given by Hennig (1970) and Huckett (1924) the former is slightly different from the latter in that the median apical projection of the cercal plate is more strongly hook-shaped in profile. This difference, however, may not be enough to separate the two as distinct from each other. As pointed out by Hennig (l.c.) it is possible that *macra* is identical with *betarum*.

*18. *Pegohylemyia sanctimarci* (Czerny)
(Figs. 330–334)

Chortophila sanctimarci Czerny, 1906: 252. *Hylemyia (Pegohylemyia) brevirostris* Ringdahl, 1933: 16. *Pegohylemyia brevirostris*: Ringdahl, 1952: 234. *Pegohylemyia sanctimarci*: Hennig, 1970: 408.

Material examined. HOKKAIDÔ — Sapporo, 1♂, 12-v-68 (T. Kocha).

♂. Body-length 5.4 mm. Rather hairy species. Interfrontalia with a pair of strong *if* and below this pair with some short setulae; parafrontals with 1 fine *ors*; A_3 about twice as long as wide; arista with the longest hairs slightly shorter than basal diameter of arista; epistoma behind frons at lunule.

Mesonotum with 5 pairs of *pre acr*, setae of the 2nd pair being the strongest and nearly as long as 1st *pre dc*, and in the present specimen with 1 accessory setula between the rows, which are much closer together than to *dc*; *pra* about as long as anterior *ntpl*.

Fore tibia with 1 short *ad* and 1 *pv*; f_2 with no strong *av*, and on basal half with 6–8 long *pv*; t_2 with 1 *ad*, 2 *pd* and 2 *pv*; f_3 with a row of long *av* and on basal

half with 3 long *pv*; t_3 with 2 distinct and 1–2 weak *av*, 4 *ad*, 3 *pd* and a few *pv*. Wings with costal thorns hardly distinguishable from costal setulae.

♀. Unknown to me.

Distribution. Japan; Europe.

The present specimen is not seriously different from a redescription of *sanctimarci* given by Hennig (1970) except in the A_3 more than 1.5 times as long as wide and in the *pra* longer than posterior *ntpl*.

*19. *Pegohylemyia parvicornis* (Malloch)
(Figs. 335–339)

Hylemyia parvicornis Malloch, 1920d: 283. *Hylemya* (*Pegohylemyia*) *parvicornis*: Huckett, 1965a: 95; id., 1965b: 853.

Material examined. HONSHÛ — Mt. Yatsugatake, Nagano-ken, 3♂♂, 18–21-vii-70.

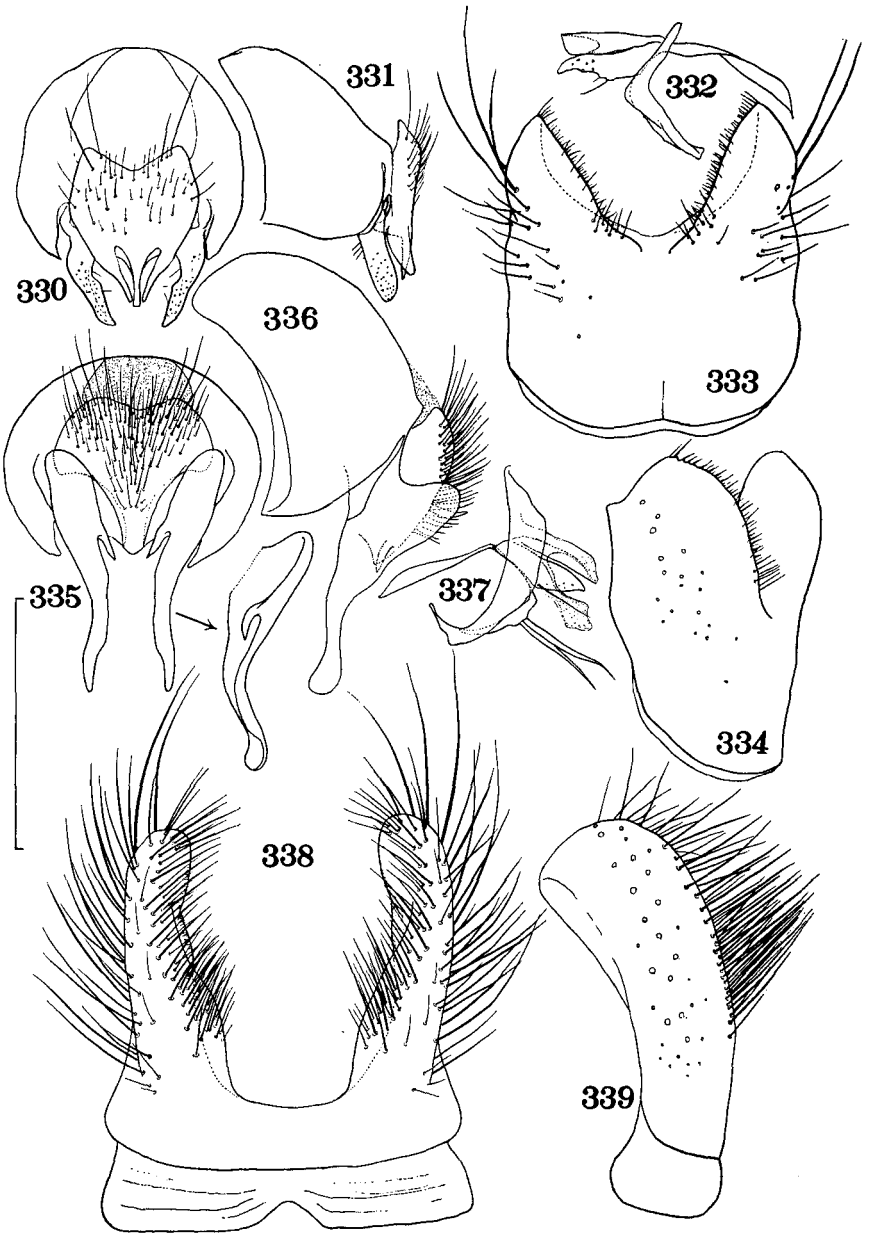
♂. Body-length 5–5.7 mm. Interfrontalia black, with whitish grey pollen; antennae blackish; palpi yellow or brownish yellow, with a darkened apex; haustellum with mentum dark brownish or blackish, and thinly pollinose. Mesonotum brownish pollinose except between *dc* and *acr*, where it is greyish pollinose. Abdomen pale grey in pollinosity, which is tinged with brown, strongly on and near median vitta and on anterior part of each tergite; median vitta rather broad especially on 4th and 5th tergites; fore marginal bands narrow if present. Legs blackish; t_2 more or less brownish; t_3 more or less brownish yellow. Wings with a strong brownish yellow tinge; calyptrae brownish yellow; halteres yellow at knob.

Frons about as wide as anterior ocellus in 1 specimen of good condition; interfrontalia about half as wide as anterior ocellus in that specimen, with a pair of strong *if*; parafrontals with 5–7 strong and some finer *ori*, and with no *ors*; A_3 less than twice (about 1.7–1.8 times) as long as wide; arista minutely pubescent; profrons about as wide as A_3; cheeks as high as or slightly higher than A_3-width, with genal setae in 3 rows; epistoma situated as far as or slightly behind frons at lunule.

Mesonotum rather densely setulose on posthumeral areas and between *ia* and *sa*; 4–5 pairs of *pre acr* present, 1 pair of them being much stronger than the others; some (4–7) accessory setulae present between the rows of *pre acr*, which are separated from each other by a distance nearly equal to that between *dc* and *acr*; *pra* distinct, about two-thirds to four-fifths of posterior *ntpl* in length; notopleura with some (5–7) accessory setulae near anterior *ntpl*; mesopleura with no strong anterior *mpl*, and with 1–2 strong *pstg* and 6–9 associated setulae; *stpl* 1:2; scutellum bare on dorsal centre.

Abdomen depressed except on rather developed hypopygium, and more or less long-ovoid when viewed from above; prebasal sclerite with 3 short marginal setulae in 1 specimen; 5th sternite (Figs. 338 & 339) with processes densely setose along inner and outer margins; surstyli (Figs. 335 & 336) expanded dorsad near cercal plate.

Fore tibia with 1–2 *pv* and no *ad*; f_2 on basal half with some rather distinct *av* although shorter than height of the femur, and on basal two-thirds with a row of rather strong *pv*, most of which are more or less longer than height of the femur;



Figs. 330–334. *Pegohylemyia sanctimarci* (Czerny), ♂ : 330, hypopygium, dorsal view; 331, *ditto*, lateral view; 332, aedeagus; 333, 5th sternite, ventral view; 334, *ditto*, lateral view.

Figs. 335–339. *Pegohylemyia parvicornis* (Malloch), ♂ : 335, hypopygium, dorsal view; 336, *ditto*, lateral view; 337, aedeagus; 338, 5th sternite, ventral view; 339, *ditto*, lateral view.

t_2 with 2 *pd* and 2–4 *p–pv*, and without *ad* or *av*; f_3 with rows of *av* and *pv* becoming longer towards apex of the femur, the setae on basal third being short and fine, the longest *av* near apical third a little less than twice as long as height of the femur, and the longest *pv* more or les longer than height of the femur; t_3 with 2 strong and 0–4 weaker *av*, 4–5 *ad*, 3–4 *pd* and 4–7 *pv*. Wings with costal thorns vestigial and hardly distinguishable from costal setulae; *m-m* more or less oblique and hardly sinuate.

♀. Unknown to me.

Distribution. Japan; North America.

P. parvicornis may closely be related to the European species *Pegohylemyia lineatula* (Karl, 1928) in having the surstyli of the same type. It may, however, be distinguishable from the latter by the more densely setose 5th sternite and the surstyli more strongly expanded dorsad.

20. *Pegohylemyia nitiditheca* sp. nov.
(Figs. 340–344)

Type-material. HOKKAIDÔ — Mt. Soranuma, 1♂ (holotype), 11-vii-67, & 1♂, 24-vii-69; Rishiri-tô, 1♂, 5-viii-65 (T. Kocha); Mt. Yûbari, 5♂♂, 27–28-vii-73 (Sk. Yamane); Mt. Poroshiri, 1♂, 22-vii-67 (T. Kocha), & 8♂♂, 21–24-vii-73 (T. Hattori). HONSHÛ — Mt. Yatsugatake, Nagano-ken, 1♂, 21-vii-70.

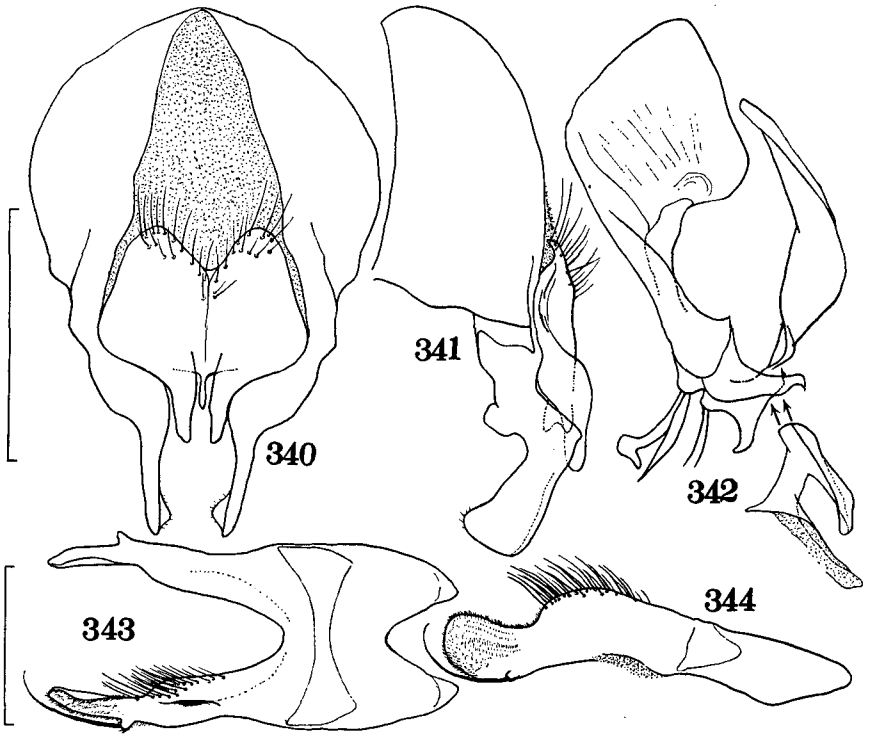
♂. Body-length 6.3–7.8 mm; wing-length 5.3–6.7 mm. Interfrontalia wholly black or slightly brownish near lunule in ground colour, with whitish grey pollen; parafacials and cheeks black in ground colour and silvery grey in pollinosity, which is slightly tinged with yellow especially on cheeks; occiput black in ground colour, with bluish grey pollen which is more or less tinged with brown; antennae blackish; palpi dark brownish or blackish; haustellum with mentum blackish and polished. Thorax black in ground colour, rather thickly covered with greyish pollen which is more or less tinged with brown; mesonotum when viewed from behind with broad median vitta and broad lateral patches shifting according to the point of view. Abdomen black in ground colour, and thickly covered with bluish grey pollen, which is very faintly, though distinctly on 5th tergite, tinged with brown; median vitta narrow or sometimes rather broad; fore marginal bands narrow if present; prebasal and basal sclerites black and polished, at most prebasal one being very faintly pollinose in part; 5th sternite more or less brownish at apex and base of each process. Legs blackish. Wings strongly tinged with yellow, especially at base; calyptrae yellow, strongly on margin; halteres brownish at base and yellow at knob.

Frons narrower than anterior ocellus, usually about half as wide as the latter; interfrontalia with a pair of strong *if*, which are about as long as ocellar setae; parafrontals usually contiguous to each other, with 4 (sometimes 5) strong *ori* mingled with some vestigial setulae, and without *ors*; A_3 about 1.8–2.3 times as long as wide; arista distinctly pubescent although shortly, the longest hairs being about as long as basal diameter of arista; profrons as wide as or a little wider than A_3; cheeks usually somewhat less high than A_3-width, at most as high as the latter, and with genal setae rather short and fine, arranged in 1 (sometimes 2) row; palpi slender, rather distinctly longer than A_2 and A_3 combined; haustellum slender, with mentum much longer than palpi; face strongly concave near epistoma,

which is projecting forwards as far as or a little beyond frons at lunule.

Mesonotum with 3 pairs of strong *pre acr*, and with a few or some accessory setulae along or between the rows, distance between the rows being as long as or a little shorter than that between *dc* and *acr*; *pra* as long as or a little longer than anterior *ntpl*; notopleura with no accessory setulae; mesopleura with 1–2 strong anterior *mpl*, and with 1 strong and 1 weaker *pstg* and 4–6 fine associated setulae; *stpl* 2:3, the lower anterior and lowest posterior being distinct though much shorter than the uppers; scutellum sparsely setulose on dorsal surface.

Abdomen depressed on basal half and half-depressed on caudal half, slightly narrowing caudad, and usually more or less longer than twice the width; 5th sternite and hypopygium as in Figs. 340–344.



Figs. 340–344. *Pegohylemyia nitiditheca* sp. nov., ♂: 340, hypopygium, dorsal view; 341, *ditto*, lateral view; 342, aedeagus; 343, 5th sternite, ventral view; 344, *ditto*, lateral view.

Fore tibia with 1 strong *ad* and 1 *pv*; f_2 with no distinct *av*, and on basal half with some (4–6) rather strong *pv*, the longest one being more or less longer than height of the femur; t_2 with 1 *ad*, 2 (rarely 3) *pd* and 2–3 *pv*; f_3 with a row of 6–9 strong *av* becoming longer towards apex of the femur, the longest one about 1.7–1.9 times as long as height of the femur, on basal two-thirds with some (4–7) *pv* distinctly shorter than height of the femur, and near apex with a few long *pv*; t_3

with 3–4 *av*, 5–6 (usually 5) *ad*, 3 *pd* and 3–7 *pv*. Wings with costal thorns minute (rather strong in 1 specimen); costa haired on ventral surface anteriorly; *m-m* oblique and more or less sinuate.

♀. Unknown.

Distribution. Japan.

Judging from the hypopygium and the aedeagus, and moreover from the long and polished mentum of the haustellum, *P. nitiditheca* is undoubtedly closely related to *Pegohylemyia pseudomaculipes* (Strobl, 1893), from which the present species can, however, readily be distinguished by the characteristic 5th sternite and by t_3 with apical *pd* much shorter and weaker than apical *d*.

21. *Pegohylemyia isikariana* sp. nov.
(Figs. 345–348)

Type-material. HOKKAIDÔ — Ishikari-hama, 4♂♂, 9-vii-68, & 102♂♂ (one the holotype), 55♀♀, 16-v-71.

♂. Body-length 3.3–5 mm; wing-length 3.1–4.3 mm. Interfrontalia, parafacials and cheeks brownish to black in ground colour; interfrontalia whitish grey pollinose; parafacials in pollinosity whitish grey and with or without a trace of yellowish tinge; cheeks whitish grey or dull grey in pollinosity; occiput in ground colour black and in pollinosity bluish grey and more or less brownish; antennae and palpi blackish; haustellum with mentum blackish and pollinose. Thorax black in ground colour and bluish grey in pollinosity, which is faintly tinged with brown in places; mesonotum when viewed from front wholly pollinose, and when viewed from behind with moderate median vitta, with narrow and often faint paramedian vittae along rows of *dc* and with broad lateral patches. Abdomen black in ground colour and bluish grey in pollinosity, which is very faintly tinged with reddish tone in some lights; median vitta broad; fore marginal bands present and often broad. Legs blackish. Wings faintly tinged with brown; calyptrae whitish, slightly yellowish marginally; halteres dark brown at base and yellow at knob.

Frons wider than anterior ocellus, about 1.3–1.5 times as wide as the latter; interfrontalia about two-thrids of anterior ocellus in width, with a pair of strong *if*; parafrontals usually with 3–4 strong and a few fine *ori* mingled with some vestigial setulae, and rarely with 1 vestigial *ors*; A_3 about 1.6–1.8 times as long as wide; arista minutely pubescent; profrons 1.1–1.5 (usually 1.3–1.5) times as wide as A_3; cheeks 1.2–1.5 (usually 1.4–1.5) times as high as A_3-width, with genal setae usually in 2 rows; epistoma distinctly behind frons at lunule; palpi not so long, about as long as A_2 and A_3 combined; haustellum with mentum about as long as palpi.

Mesonotum with usually 3 pairs of distinct *pre acr*, setae of the middle pair being strong, and usually with no accessory setulae between the rows, which are more or less closer together than to *dc*; *pra* short though distinct, half to four-fifths of posterior *ntpl* in length; mesopleura with no distinct anterior *mpl*, and with 1 strong and a few finer *pstg*; *stpl* 1:2; scutellum on dorsal surface very sparsely setulose, bare on centre.

Abdomen depressed, nearly parallel-sided and about 1.8–2.1 times as long as wide; 5th sternite and hypopygium as in Figs. 345–348.

Fore tibia with 1 *ad* and 1 *pv*; f_2 on basal half to two thirds with some rather distinct *av*, which are more or less shorter than height of the femur, at

most about as long as the latter, and on basal half with some distinct *pv*, the longest one being more or less longer than height of the femur; t_2 with 1 *ad*, 2 *pd* and 2 (rarely 3) *pv*; f_3 with a row of long *av*, the longest one about 1.5–1.8 times as long as height of the femur, and on basal half with a few long *pv*; t_3 with 2 (sometimes 3) *av*, 3–5 (usually 4–5) *ad*, 3 *pd* and 2–6 *pv*, apical *pd* being vestigial. Wings with costal thorns distinct, as long as or a little longer than *h*-vein; costa bare ventrally; *m-m* hardly or slightly oblique and hardly or slightly sinuate.

♀. Interfrontalia usually brownish on lower half and blackish on the upper. Abdomen with median vitta very obscure. Head only a little higher than the length, about 1.1 times so; frons about 0.43–0.45 times as wide as head; A_3 usually about 1.5 times as long as wide; profrons usually about 1.5 times as wide as A_3. Mesonotum with *pre acr* weaker than those of male, and usually with 1 or a few accessory setulae between the rows; *stpl* 1:2, the lower posterior much shorter and weaker than the upper. Hind tibia with no *pv*.

Distribution. Japan.

Judging from the shape of the 5th sternite and hypopygium of the male the present species is closely related to *macra* Karl, 1940, from which it can, however, be readily distinguished by the paler pollinosity, the broader parafacials, the higher cheeks and the epistoma distinctly behind frons at lunule.

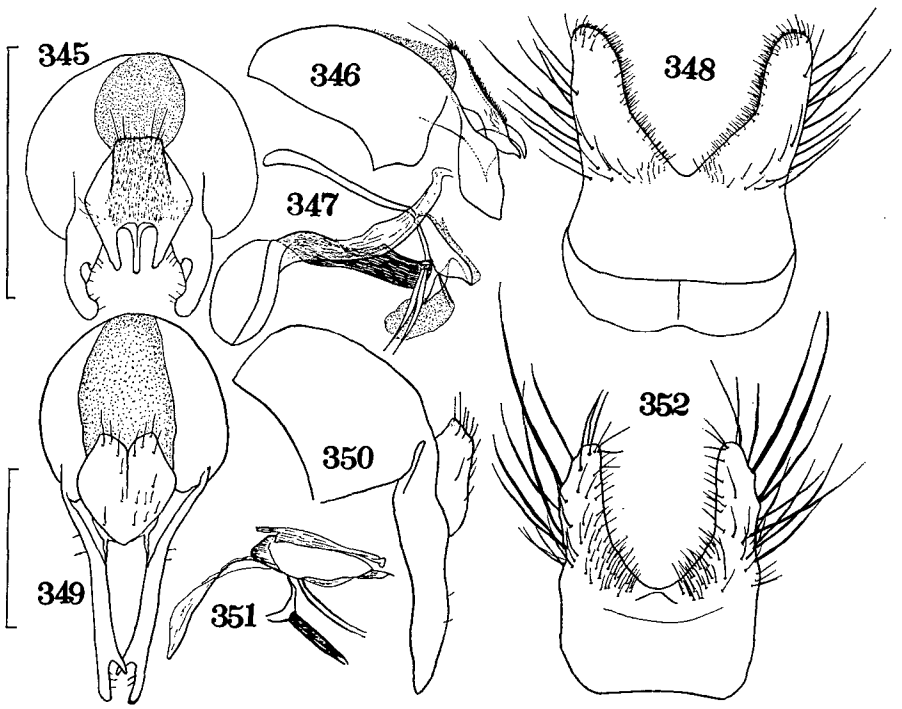
22. *Pegohylemyia okai* sp. nov.
(Figs. 349–352)

Type-material. HOKKAIDÔ — Akkeshi, 42♂♂ (one the holotype), 7♀♀, 18-19-vii-66; Nemuro, 3♂♂, 2♀♀; Shikaribetsu-ko, 1♂; Mt. Daisetsu, 6♂♂, 5♀♀; Rishiri-tô, 1♀; Mt. Yûbari, 1♂, 1♀; Mt. Ashibetsu, 1♂; Mt. Apoi, 1♂; Moshiri, 1♀. HONSHÛ — Mt. Zaô & Mt. Chôkai, Yamagata-ken, 2♂♂, 1♀; Mt. Daibosatsu, Yamanashi-ken, 1♂; Mt. Yatsugatake, Mt. Kiso-Komagatake, Mt. Senjô, Mt. Akaishi, Mt. Shirouma & Mt. Hodaka, Nagano-ken, 18♂♂, 1♀.

♂. Body-length 6.3–7.8 mm; wing-length 5.5–6.5 mm. Interfrontalia black or sometimes brownish in ground colour, with whitish pollen, which is often tinged with yellow although very faintly; parafacials in ground colour black or sometimes brownish, and in pollinosity with a weak or strong brownish or yellowish tinge, often with a golden reflections in some lights; cheeks in ground colour black or sometimes brownish, and in pollinosity weakly or strongly tinged with yellow; occiput blackish in ground colour, and bluish grey in pollinosity, which is more or less tinged with brown or yellow; antennae and palpi blackish; haustellum with mentum blackish and thinly pollinose. Thorax blackish in ground colour, and bluish grey in pollinosity, which is faintly or rather distinctly tinged with brownish yellow on pleura; mesonotum often distinctly tinged with brown in pollinosity, which is dense and does not disappear even when viewed from front, when viewed from behind with median and lateral vittae which are moderate in width, and in some lights with narrow paramedian vittae along rows of *dc*, the vittae being brownish pollinose even in specimens with pale pollen. Abdomen blackish in ground colour, and whitish grey or bluish grey in pollinosity, which is usually tinged with yellow or brown although variable in degree; median vitta and fore marginal bands distinct and moderate in width, the former being interrupted at hind margin of each tergite. Legs blackish although often dark brownish especially

on t_3. Wings with a rather distinct yellowish tinge, strongly yellow at base; calyptrae strongly yellow; halteres yellow at knob.

Frons about 1.2–2 times as wide as anterior ocellus; interfrontalia usually about as wide as anterior ocellus, with a pair of strong *if*, which are usually about as long as ocellar setae; parafrontals with 5–7 strong and some fine *ori*, and with no *ors*; A_3 about 1.9–2.2 times as long as wide; arista distinctly pubescent, with the longest hairs slightly longer than basal diameter of arista; profrons about 1.3–1.6 times as wide as A_3; parafacials at least about as wide as A_3; cheeks about 1.6–1.9 times as high as A_3-width, with genal setae in 2 rows; epistoma more or less behind frons at lunule; palpi slender, about as long as A_2 and A_3 combined; haustellum slender, with mentum usually more or less longer than palpi although distinctly shorter than fore metatarsus and about two-thirds to four-fifths of the latter in length.



Figs. 345–348. *Pegohylemyia isikariana* sp. nov., ♂: 345, hypopygium, dorsal view; 346, *ditto*, lateral view; 347, aedeagus; 348, 5th sternite, ventral view.

Figs. 349–352. *Pegohylemyia okai* sp. nov., ♂: 349, hypopygium, dorsal view; 350, *ditto*, lateral view; 351, aedeagus; 352, 5th sternite, ventral view.

Mesonotum with 1 pair of strong and a few pairs of rather distinct *pre acr*, and often with a few setulae along or between the rows, distance between the rows being usually about as long as that between *dc* and *acr*; *pra* rather distinctly longer than anterior *ntpl*; mesopleura with or without 1 distinct anterior *mpl*, and with 1 strong and 1–2 (usually 1) weaker *pstg* and a few associated setulae; *stpl* 1: 3, the lowest posterior being strong or distinct even if much shorter than the uppers; scutellum

sparsely setulose on dorsal surface laterally. Abdomen depressed except on hypopygium which is more or less developed, nearly parallel-sided, as long as or slightly shorter than head and thorax combined, and about 2.6–3.1 times as long as wide; prebasal sclerite exposed and rarely with a few short setulae; 5th sternite and hypopygium as in Figs. 349–352.

Fore tibia with 1–2 (usually 1) *ad* and 1–2 (usually 1) *pv*; f_2 on basal third with a few or some *av*, which are often rather strong although the longest one is at most about as long as height of the femur, and with a row of strong *pv*, the longest one being about 1.6–2 times as long as height of the femur; t_2 with 1 (rarely 2) *ad*, 2–4 (usually 2) *pd* and 2–4 *pv*, and without *av*; f_3 with a row of long and strong *av*, the longest one being 2–2.6 times as long as height of the femur, and with a row of *pv*, of which some near apical third and often near base are shortened and weakened, the longest seta near middle being about 1.5–2 times as long as height of the femur; t_3 with 3–5 (usually 3–4) *av*, 4–5 *ad*, 3–5 (of them usually 3 are long and strong) *pd* and 2–5 *pv*, apical *pd* being well developed. Wings with costal thorns short, sometimes hardly distinguishable from costal setulae; costa haired on ventral surface rather anteriorly; *m-m* slightly or rather distinctly oblique and nearly straight or a little sinuate.

♀. Body-length 5.5–7.2 mm; wing-length 5.1–6.3 mm. Interfrontalia orange yellow in ground colour, at most blackish or brownish near ocellar triangle, and with whitish or whitish yellow pollen; parafrontals on upper half blackish in ground colour and yellowish grey in pollinosity; parafrontals on lower half and parafacials yellow or orange yellow in ground colour and yellow in pollinosity; cheeks yellow or brown in ground colour and yellow or whitish yellow in pollinosity; occiput blackish in ground colour and pale grey in pollinosity, which is more or less tinged with yellow or brown. Thorax in pollinosity pale grey and more or less yellowish; mesonotum more or less tinged with brown in pollinosity, and very faintly vittate, when viewed from behind with a trace of median and sublateral vittae and lateral patches. Abdomen concolorous with thorax, and with tessellations in some lights; median vitta obscurely appearing when viewed from behind.

Head only a little (about 1.1 times) higher than the length; frons about 0.39–0.43 times as wide as head; interfrontalia about twice as wide as parafrontalia, with some vestigial setulae below the strong *if*; parafrontals with 1 strong, 1–2 strong or distinct and a few or some vestigial *ori*, and with 3 *ors*; cheeks with genal setae very short and fine except for 1 or a few ones near peristomal setae, these fine genal setae being in 1–2 rows.

Mesonotum with some irregular pairs of fine *pre acr*, of which at most 1–2 pairs are composed of rather distinct setae distinguishable from accessory setulae, and with some accessory setulae between the rows; *stpl* 1:2.

Fore tibia with 1 *ad* and 1 *pv*, apical *pv* being well developed and much stronger than that of male; f_2 with no *av*, on basal half with 2–4 *pv*, the longest one being more or less longer than height of the femur, and near apex with a few *pv*; f_3 with 4–7 *av*, the longest one being at most 1.5 times as long as height of the femur, on basal half with 2–4 *pv*, the longest one about as long as height of the femur, and near apex with a few *pv*; t_3 with 1–2 *pv*. Wings with costal thorns strong or distinct.

Distribution. Japan.

In this genus there are found some other species which have a well-developed

apical *pd* on t_3, namely, *askoldica* Schnabl, *pseudomaculipes* (Strobl), *apiciseta* Ringdahl and *jacobaeae* (Hardy), from all of which the present new species is, however, readily distinguishable by the following aspects of the male: — Not hairy; haustellum with mentum pollinose although thinly; arista with the longest hairs at most slightly longer than basal diameter of arista; *pra* longer than anterior *ntpl*; hypopygium different in structure.

23. *Pegohylemyia silva* sp. nov.
(Figs. 5 & 353–357)

Type-material. HONSHÛ — Tsumakoi, Gumma-ken, 1♂, 11-vii-71 (T. Kocha); Mt. Yatsugatake, Nagano-ken, 35♂♂ (one the holotype), 4♀♀, 16–18-vii-70; Mt. Chôgatake, Nagano-ken, 1♂, 30-vii-70; Mt. Hodaka, Nagano-ken, 6♂♂, 3-viii-70; Mt. Shirouma, Nagano-ken, 10♂♂, 1♀, 5-viii-70; Mt. Daibosatsu, Yamanashi-ken, 1♂, 8-ix-70 (H. Takizawa); Mt. Hôô, Yamanashi-ken, 1♂, 5–7-vii-67 (H. Takizawa); Mt. Chausu, Shizuoka-ken, 1♂, 27-vii-70 (H. Takizawa). SHIKOKU — Mt. Tsurugi, 4♂♂, 16-vii-71; Mt. Mimune, 1♂, 18-vii-71; Mt. Ishizuchi, 11♂♂, 4♀♀, 21-vii-71.

♂. Body-length 7.6–10 mm; wing-length 7.1–8.8 mm. Body excluding appendages black in ground colour. Interfrontalia in pollinosity whitish grey and usually with a faint yellowish or brownish tinge; parafacials and cheeks silvery grey in pollinosity, which is hardly or slightly tinged with yellow; antennae and palpi black; haustellum with mentum black and distinctly pollinose. Thorax bluish grey pollinose and half-shining; mesonotum often rather distinctly tinged with brown in pollinosity, when viewed from behind with moderate median vitta and broadly blackened laterally except on humeral calli and on notopleura. Abdomen shining and largely blackish when viewed from front although densely covered with bluish grey pollen, which is of fine texture and sometimes slightly tinged with yellow or brown; median vitta and fore marginal bands usually narrow and sharp, the former being sometimes rather broad and the latter often lacking; prebasal sclerite very thinly pollinose and shining. Femora black, with narrowly yellow apex; tibiae blackish, or sometimes largely yellowish although more or less darkened basally. Wings distinctly tinged with yellow or brownish yellow, at base strongly yellow; calyptrae strongly yellow; halteres yellow, more or less brownish at base.

Frons usually a little wider than anterior ocellus, yet sometimes distinctly wider or slightly narrower than the latter; interfrontalia usually about half as wide as anterior ocellus, at most as wide as the latter, with a pair of strong *if*, sometimes with some minute setulae below this pair; parafrontals with about 6–7 *ori*, of which a few are often more or less weakened, some vestigial setulae being usually mingled with the *ori*, and with no *ors* (only in the specimen from Mt. Hôô with a distinct one); A_3 about 2.2–2.6 times as long as wide; arista longly pubescent or shortly plumose, the longest hairs being usually about 3 times as long as basal diameter of arista, and rarely twice as long as the latter; profrons about 1.3–1.8 (usually 1.4–1.5) times as wide as A_3; cheeks about 1.5–2.2 (usually 1.8–2) times as high as A_3-width, with genal setae in 1–2 rows; epistoma more or less behind frons at lunule, at most as far as the frons; palpi slender, usually about as long as A_2 and A_3 combined, and more or less broadened apically; haustellum

more or less lengthened although not very narrow, with mentum more or less longer than palpi.

Mesonotum with 4–6 pairs of short *pre acr*, and usually with no accessory setulae between the rows, which are separated from each other by a distance usually about half of that between *dc* and *acr*; *pra* longer than anterior *ntpl* and sometimes as long as 1st *post dc*; *stpl* 1:2 or 1:3; mesopleura always with 1 or a few strong anterior *mpl*, and with 1 strong and 1 weak *pstg* (the weak one often hardly distinguishable from associated setulae) and 6–13 associated setulae; scutellum on dorsal surface sparsely setulose laterally and bare on centre.

Abdomen half-depressed, more or less narrowing caudad, and about 2.1–2.4 times as long as wide; discal and marginal setae strong; 5th sternite and hypopygium as in Figs. 353–357.

Fore tibia with 2 (rarely 1 or 3) *ad* and 1 (rarely 2) *pv*, and rarely with 1–2 *pd*; f_2 with no distinct *av*, and on basal half with some (3–7) long and strong *pv*, the longest one being about 1.5 times as long as height of the femur; t_2 with 1 *ad*, 2 (rarely 1 or 3) *pd* and 2–3 (rarely 4) *pv*, and with no *av*; f_3 with a row of 7–10 strong *av*, the longest one about 2–2.5 times as long as height of the femur, and with a row of 7–10 strong *pv*, the row being usually interrupted near apical third, the longest one about 1.7–2.2 times as long as height of the femur; t_3 with 2–5 (usually 3–4) *av*, 3–5 (usually 4) *ad*, 3 (rarely 4) *pd* and 1–6 finer *pv*, apical *pd* being weak although distinct from accessory setulae. Wings with costal thorns rather strong or minute; costa distinctly haired on ventral surface; *m-m* strongly oblique and sinuate.

♀. Interfrontalia reddish brown, more or less darkened on upper half, and with whitish pollen usually a little tinged with yellow; parafrontals on upper half more or less dark brown in ground colour and pale yellow in pollinosity; parafrontals on lower half, parafacials and cheeks in ground colour reddish brown, at most partly darkened on cheeks, and in pollinosity whitish and slightly tinged with yellow especially on cheeks; occiput black in ground colour, with bluish grey pollen, which is tinged with yellow and faintly with brown. Thorax in pollinosity bluish grey and more or less tinged with yellow; mesonotum half-shining in some lights. Abdomen thinly covered with bluish grey pollen sometimes tinged with yellow, and shining, with metallic reflections. Legs blackish; femora with narrowly yellow apex; tibiae at most somewhat brownish.

Head only a little higher than the length, about 1.1 times so; frons about 0.36–0.4 times as wide as head; parafrontals with 3–5 *ori* and 3 (sometimes 2) *ors*. *Stpl* 1:2, if 1:3 the lowest posterior is very weak. Abdomen with accessory setulae decumbent; discal setae indistinguishable from accessory setulae; marginal setae strong though much weaker than those of male.

Fore tibia with 2–4 *ad*, 2 *pd* and 1 (rarely 2) *pv*; f_2 on basal third to half with 3–5 *pv*; t_2 with 1 *av*, 2 *ad*, 2–4 (usually 2) *pd* and 2–3 *pv*; f_3 on basal half with 3–6 *pv* and near apex with a few *pv*; t_3 with *pv* sometimes hardly distinguishable from accessory setulae. Wings with costal thorns strong.

Distribution. Japan.

This species has a strong resemblance to *Pegohylemyia tibetana* Schnable in the shape of hypopygium (cf. Figs. 177 & 178 of Schnabl & Dziedzicki, 1911), yet differs from the latter in the 5th sternite of the male. The original description of *tibetana* reads as follows: — "Das fünfte Bauchsegment lang-viereckig, hinten

etwas breiter, tief und breit fast bis zur Hälfte dreieckig ausgeschnitten; die Lappen sind ziemlich schmal, in der Mitte etwas breiter, die Spitze schmal abgerundet, wenig beborstet." On the other hand the present species has the 5th sternite strongly setose as seen in Figs. 356 & 357. According to Hennig (1970: 336) the type-specimens of *tibetana* have been lost, and he listed only the name of *tibetana* under "Ungedeutete Arten (*Botanophila* oder *Pegohylemyia*)." Although the present specimens are described as distinct from *tibetana*, a further discussion will be necessary when topotypical specimens of the latter are taken. The present species is also closely related to the following new species, *P. spinisternata*, from which it, however, differs mainly in the following aspects: — Body larger in size and more bluish in pollinosity; haustellum with mentum distinctly pollinose; mesonotum more sparsely setulose; *acr* fewer in number and finer; mesopleura always with strong anterior *mpl*; t_1 always with *pd* in female; wings with costa more densely haired on ventral surface; cercal plate of male hypopygium ovoid in outline and with narrower apical projection.

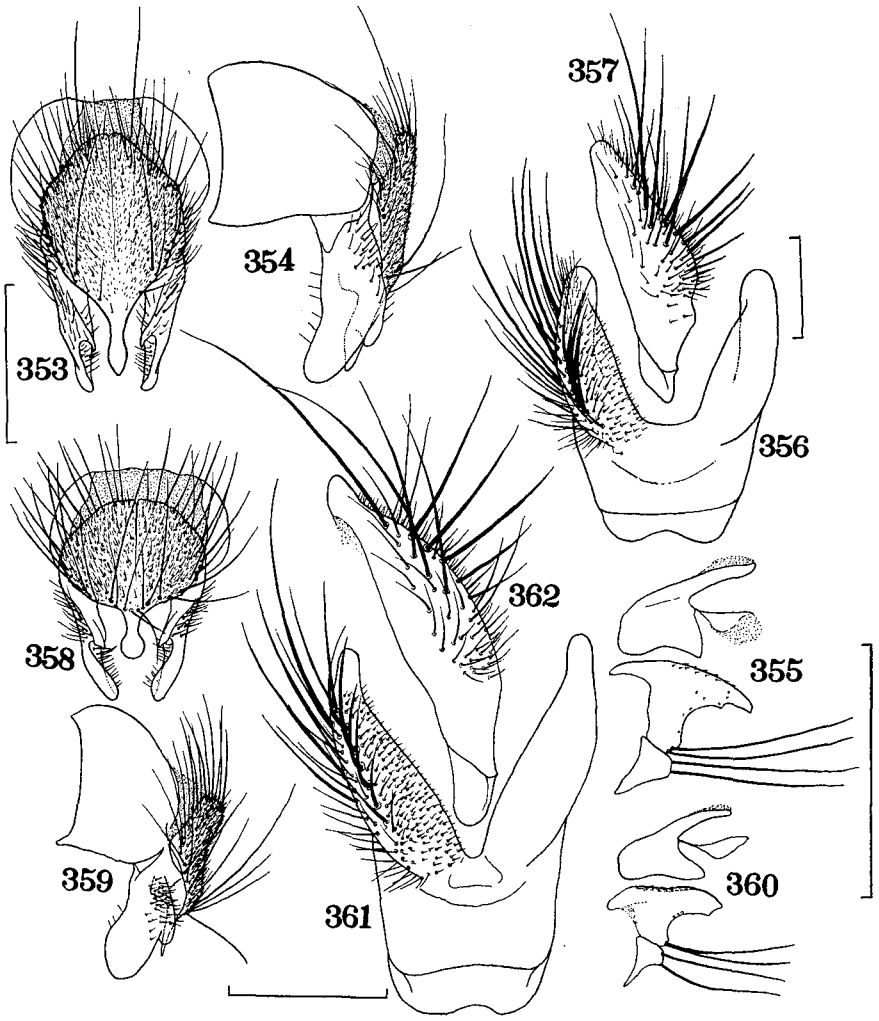
24. *Pegohylemyia spinisternata* sp. nov.
(Figs. 358–362)

Type-material. HOKKAIDÔ – Sapporo, 2♀♀; Mt. Soranuma, 16♂♂ (one the holotype), 4♀♀, 13-viii-66, & 29♂♂, 7♀♀; Shikotsu-ko, 2♂♂, 1♀; Rishiri-tô, 12♂♂, 3♀♀; Toyotomi, 2♂♂; Toikambetsu, 4♂♂, 1♀; Bifuka, 1♂; Moshiri, 2♂♂, 3♀♀; Horokanai, 4♂♂, 1♀; Mt. Daisetsu, 6♂♂, 2♀♀; Mt. Yûbari, 12♂♂, 2♀♀; Mt. Poroshiri, 2♂♂; Mt. Rausu, 2♂♂; Akkeshi, 1♀; Kitami-Esashi, 1♂; Mt. Kariba, 58♂♂, 12♀♀; Mt. Sengen, 7♀♀. HONSHÛ — Mt. Asahi, Yamagata-ken, 1♀; Mt. Bandai, Fukushima-ken, 4♂♂; Masutomi & Mt. Daibosatsu, Yamanashi-ken, 12♂♂, 4♀♀; Mt. Chausu, Shizuoka-ken, 4♂♂; Mt. Shirouma, Mt. Kashimayari, Mt. Hodaka, Mt. Chôgatake, Mt. Kiso-Komagatake, Mt. Yatsugatake & Mt. Senjô, Nagano-ken, 66♂♂, 32♀♀.

♂. Body-length 6–9 mm; wing-length 5.4–7.7 mm. Body excluding appendages black in ground colour, sometimes more or less brownish especially in smaller specimens. Interfrontalia with whitish grey pollen, which is often more or less tinged with yellow; parafacials in pollinosity silvery grey and sometimes slightly tinged with yellow; cheeks silvery grey or whitish grey in pollinosity, which is usually more or less tinged with yellow or brownish yellow; antennae black; palpi blackish; haustellum with mentum blackish and polished, at most faintly pollinose in part. Thorax rather densely covered with bluish grey pollen, which is usually more or less tinged with yellow or brown; mesonotum variously darkened according to the point of view, when viewed from behind with moderate median vitta and broad lateral patches. Abdomen shining in some lights and largely darkened when viewed from front although densely covered with bluish grey pollen, which is sometimes more or less tinged with yellow or brown; prebasal sclerite very faintly pollinose and shining; basal sclerite rather distinctly pollinose except on polished cephalic margin; median vitta and fore marginal bands narrow or moderate and usually sharp, the former being often interrupted at hind margin of each tergite. Femora blackish, at most slightly yellowish at apex especially on f_1; in the specimens collected from Hokkaidô tibiae yellowish although slightly or strongly darkened on t_1 and at base of t_2 and t_3; in the specimens collected from

Honshû tibiae strongly darkened and blackish or dark brownish, only occasionally yellow as in the specimens from Hokkaidô; tarsi blackish. Wings dinstinctly tinged with brownish yellow, at base strongly yellow; calyptrae strongly yellow; halteres brownish at base and yellow at knob.

Head about 1.3 times as high as long; frons more or less wider than anterior ocellus, usually 1.3–1.5 times as wide as the latter; interfrontalia usually half to two-thirds of anterior ocellus in width, with a pair of strong *if*; parafrontals with 5–8 *ori*, and rarely with 1 *ors*; A_3 about 2–2.4 times as long as wide; arista distinctly pubescent, the longest hairs longer than basal diameter of arista, usually



Figs. 353–357. *Pegohylemyia silva* sp. nov., ♂: 353, hypopygium, dorsal view; 354, *ditto*, lateral view; 355, aedeagus; 356, 5th sternite, ventral view; 357, *ditto*, lateral view.

Figs. 358–362. *Pegohylemyia spinisternata* sp. nov., ♂: 358, hypopygium, dorsal view; 359, *ditto*, lateral view; 360, aedeagus; 361, 5th sternite, ventral view; 362, *ditto*, lateral view.

about twice as long as the latter; profrons usually about 1.4–1.5 times as wide as A_3, but in smaller specimens about as wide as the latter; cheeks about 1.5–1.9 (in smaller specimens about 1.3) times as high as A_3-width, with genal setae in 1 or sometimes 2 rows; epistoma more or less behind frons at lunule; palpi slightly longer (in larger specimens) or somewhat shorter (in smaller specimens) than A_2 and A_3 combined; haustellum slender (although not so in smaller specimens), with mentum more or less longer than palpi.

Mesonotum with about 6–10 pairs of short *pre acr*, of which 1–2 pairs are composed of setae rather longer than the others and sometimes strong; distance between the rows of *pre acr* being half to two-thirds of that between *dc* and *acr*, a few or some accessory setulae present between the rows; *pra* much longer than anterior *ntpl*, about as long as 1st *post dc*; notopleura with no accessory setulae; mesopleura with 1 or a few anterior *mpl* rather distinct or not, and with about 10–15 (in larger specimens) or only some (in smaller specimens) accessory setulae around *pstg* (1 strong and 1–2 weaker); *stpl* 1:3, the lowest posterior being well developed or rather weak; scutellum bare on dorsal centre.

Abdomen half-depressed, about 2.3–2.7 times as long as wide, and slowly narrowing caudad; 5th tergite with a complete row of strong discal setae; 5th sternite and hypopygium as in Figs. 358–362.

Fore tibia with 1 or sometimes 2 *ad* and 1 or rarely 2 *pv*; f_2 with no distinct *av* and on basal half with 3–5 strong *pv*, the longest one about 1.4–2 times as long as height of the femur; t_2 with 1 *ad*, 2 *pd* and 2–3 (usually 2) *pv*; f_3 with a row of long and strong *av*, the longest one about 1.8–2.4 times as long as height of the femur, and with a row of *pv* more or less weaker than the *av*; t_3 with 2–4 (usually 3) *av*, 4–5 (usually 4) *ad*, 3 *pd* (sometimes in addition with 1 short *pd*) and 1 or some *pv*, apical *pd* being weak. Wings with costal thorns rather distinct, or minute and only a little stronger than costal setulae; costa haired on ventral surface rather anteriorly; *m-m* oblique and usually sinuate.

♀. Body-length 6–9.7 mm; wing-length 6–8.6 mm. Interfrontalia orange yellow or reddish brown in ground colour, sometimes darkened near ocellar triangle, and with whitish pollen, which is usually tinged with yellow; parafrontals on upper half darkened in ground colour, and yellowish in pollinosity; parafrontals on lower half, parafacials and cheeks in ground colour orange yellow or reddish brown, at most partly darkened, and in pollinosity slightly or rather distinctly tinged with yellow; occiput blackish in ground colour, and bluish grey in pollinosity, which is more or less tinged with yellow and brown. Thorax densely covered with pale yellowish grey pollen; mesonotum when viewed from front with paramedian vittae between *dc* and *acr*, and when viewed from behind with narrow or moderate median and broad lateral vittae. Abdomen very thinly covered with bluish grey pollen and shining. In the specimens from Hokkaidô legs largely yellow; f_1 slightly or largely blackish; f_2 and f_3 at most blackish apically; tibiae darkened at most basally; tarsi blackish. In the specimens from Honshû legs blackish although sometimes yellow as in the specimens from Hokkaidô. Wings more yellowish than in male.

Head only a little (about 1.1 times) higher than the length; frons about 0.35–0.42 times as wide as head; interfrontalia about 2.5 times as wide as parafrontalia; parafrontals with 2–3 (rarely 1) strong *ors*; cheeks with genal setae very short and fine except for 1–2 strong or distinct ones near peristomal setae. *Stpl* 1:2. Ab-

domen with accessory setulae decumbent; discal setae usually indistinguishable from accessory setulae; marginal setae strong.

Fore tibia with 1–3 (usually 2) *ad* and 1–2 (rarely none) *pv*, and with or without 1 (rarely 2) *pd*; f_2 with a few *pv* on basal third; t_2 with 1 *av*, 2 *ad*, 2 *pd* and 2–4 (usually 2) *pv*; f_3 on basal half with 3–5 *pv* and near apex with a few *pv*; t_3 with *pv* sometimes hardly distinguishable from accessory setulae. Wings with costal thorns strong, or minute especially in smaller specimens.

Distribution. Japan.

This species is undoubtedly closely related to the preceding new species, *P. silva*, especially by having the 5th sternite and hypopygium of the same type. However, it can be distinguished from that species by the haustellum with polished mentum and by the rounded cercal plate of the male.

*25. *Pegohylemyia askoldica* Schnabl
(Figs. 363–368)

Hylemyia (*Pegohylemyia*) *askoldica* Schnabl, in Schnabl & Dziedzicki, 1911: 253.

Material examined. HOKKAIDÔ — Sapporo, 137♂♂, 102♀♀, 17-iv–15-v-59–71 (S. Ueda, T. Kocha, M. Suzuki & M. Suwa); Jôzankei, 1♂, 3-v-65 (T. Kocha), & 1♀, 4-v-69; Nopporo, 71♂♂, 65♀♀, 18-iv–17-v-65–70 (T. Kocha & M. Suwa); Shikotsu-ko, 3♀♀, 18-v-71.

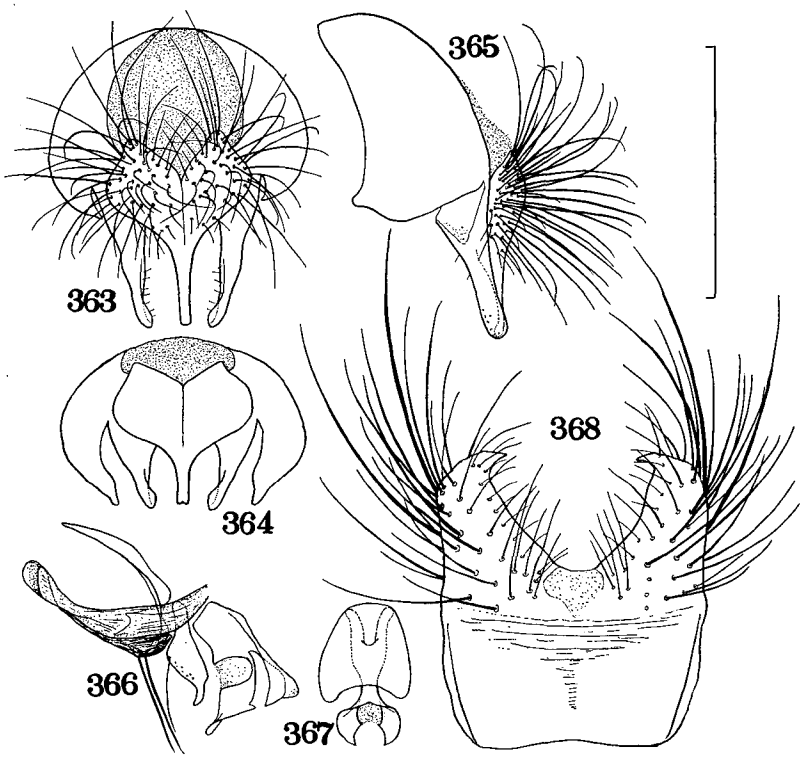
♂. A very hairy species. Body-length 4.5–7.2 mm. Body including appendages black or blackish in ground colour, at most brownish on interfrontalia and cheeks. Parafacials silvery grey in pollinosity; cheeks with whitish grey pollen slightly tinged with yellow. Mesonotum in pollinosity whitish grey and more or less bluish, obscurely vittate along *acr* and *dc* and on lateral sides, the median vitta sometimes and the paramedian vittae always being brownish pollinose; scutellum thinly brownish grey pollinose and almost blackish except when viewed from front in low angle. Abdomen in pollinosity whitish grey and usually more or less bluish, sometimes tinged with yellow slightly; median vitta broad; fore marginal bands very broad, often expanded on anterior two-thirds of each tergites. Legs black or blackish. Wings more or less tinged with brown, at base strongly dark brownish; calyptrae whitish, more or less yellowish on margin, and with fringe sometimes brownish; halteres yellow or reddish yellow at knob.

Head about 1.1–1.2 times as high as long; frons about 1.5 times as wide as anterior ocellus; interfrontalia about half as wide as anterior ocellus, and with or without 1 or a few fine or rather distinct *if*, which are paired or not; parafrontals with numerous slender *ori* in about 2 rows, setae of the inner row being shorter and less numerous than those of the outer, and with no *ors*; A_3 as long as or a little shorter than twice the width; arista practically bare; profrons more or less wider than twice A_3-width; cheeks about twice as high as A_3-width, with numerous genal setae in about 5–6 rows; in much smaller specimens A_3 relatively wider than in larger specimens and consequently A_3 only about 1.5 times as long as wide, and profrons and cheeks less than twice A_3-width in width and height respectively; epistoma projecting forwards as far as frons at lunule, or a little behind the frons; palpi not very long, at most as long as A_2 and A_3 combined; haustellum rather slender.

Mesonotum with 5–7 pairs of slender *pre acr* and with some or many accessory

setulae between the rows, which are somewhat closer together than to *dc*; *pra* about as long as posterior *ntpl*; notopleura with 1 or a few accessory setulae near anterior and posterior *ntpl* respectively; *stpl* 1:2; scutellum on dorsal surface rather densely setulose except on limited centre.

Abdomen depressed, twice or a little more as long as wide, and loosely narrowing caudad; tergites densely covered with long and slender accessory setulae; prebasal sclerite rarely with 1 or a few setulae; basal sclerite densely setulose; 5th sternite and hypopygium as in Figs. 363–368.



Figs. 363–368. *Pegohylemyia askoldica* Schnabl, ♂: 363, hypopygium, dorsal view; 364, *ditto*, dorso-caudal view; 365, *ditto*, lateral view; 366, aedeagus; 367, basi- and distiphlli, dorsal view; 368, 5th sternite, ventral view.

Fore tibia with 1 minute *ad* and 1–3 (usually 1–2) *pv*, and sometimes with 1 *pd*, the *ad* being often indiscernible; f_2 with a row of *av* becoming shorter and finer towards apex of the femur, the longest one being distinctly longer than height of the femur, and with *pv* in 2–3 rows, the longest one being twice or more as long as height of the femur, accessory setulae on basal half of anterior surface rather longer than those on the other parts; t_2 with 1 *ad*, 2–3 (usually 2) *pd* and 1–3 (usually 2) *p–pv*; f_3 with a row of long *av*, the longest one being more than twice as long as height of the femur, and on basal two-thirds with a row of long *pv*, the longest one being 2.5 or more times as long as height of the femur, and on anterior and posterior surfaces with many long setae; t_3 with 1–3 *av*, 3–5 *ad*, 2–3 (usually

3) *pd* (usually in addition with 1 or a few shorter ones) and a few or some finer *pv*, apical *pd* being well developed. Wings with costal thorns minute and hardly distinguishable from costal setulae; costa not haired on ventral surface; *m-m* erect and straight, or slightly sinuate.

♀. Not hairy. Body and legs less densely covered with short and fine accessory setulae, and very thickly covered with pale grey pollen. Interfrontalia brownish in ground colour; parafacials dark brownish in ground colour, and tinged with yellow in pollinosity; cheeks brownish in ground colour, and with a yellowish tinge in pollinosity. Mesonotum very thickly pollinose and not darkened in any lights, with brownish pollinose markings along rows of *dc*, at bases of setae and between rows of *post acr*, the median and paramedian markings being often fused just behind the suture; pleura more or less tinged with brown in pollinosity, especially on mesopleura; scutellum more or less tinged with brown in pollinosity, especially at bases of basal setae. Abdomen very thickly pollinose, and with no markings, at most with tessellations in some lights. Wings more yellowish than in male.

Frons about 0.45 times as wide as head; interfrontalia about twice as wide as parafrontalia, with microscopical setulae various in number and, only occasionally with a pair of short *if*; parafrontals with a few or some strong and some fine *ori* and with 3 (sometimes 2 or rarely 4) outwardly directed *ors*, some minute setulae being present along and near the *ori*; cheeks with genal setae in 3 rows (in 2 rows in smaller specimens); epistoma projecting forwards about as far as frons at lunule.

Mesonotum with *acr* short and fine except for a pair of prescutellar ones, and usually with 1 or a few accessory setulae between the rows; notopleura with 1 or a few accessory setulae.

Fore tibia with 1 distinct *ad* and 1–2 *pv*, and sometimes with 1 *pd*; f_2 on middle half with a few or some *av* and on basal half with some *pv*, the longest *av* and *pv* being more or less longer than height of the femur; t_2 with 1 *ad*, 2–3 *pd* and 1–3 *pv*; f_3 with a row of about 7–8 *av* and on basal half with some *pv*, the longest *av* and *pv* being about 1.3–1.6 times as long as height of the femur; t_3 usually with no *pv*. Wings with costal thorns usually rather strong, or sometimes (in smaller specimens) minute.

Distribution. Japan; Littoral Siberia.

The original description based on a single specimen (♂) from Vladivostok says: — "..., Akrostikalborsten vor der Naht 4–5 Paar, die vordersten sehr lang und stehen näher den Dorsocentralborsten als gegenseitig. ....Hinterleib bedeutend schmäler als Thorax, etwas länger als Kopf und Thorax zusammen,..." However, in the present specimens the *acr* of the 1st pair are more or less closer together than to the 1st *dc* and the abdomen is shorter than the head and thorax combined. Nevertheless, I have come to the conclusion that the specimens examined should be identified with *askoldica* by the following aspects of the male: — Body densely covered with long accessory setulae; parafacials and cheeks broad; 5th sternite and hypopygium agreeing well with those of *askoldica* figured in the original description.

According to Hennig (1970:335) the type-specimen of this species has been lost, and he listed only the name under "Ungedeutete Arten (*Botanophila* oder *Pegohylemyia*)." Judging from the bare prebasal sclerite of hypopygium, the

depressed abdomen and the absence of apical *pv* on t_3, this species belongs to the genus *Pegohylemyia*.

Apart from the specimens given in Material examined there are at hand two intersexual specimens (one from Sapporo, 20-iv-69, and the other from Nopporo, 23-iv-69), which are as follows: — Frons about one-third as wide as head; abdomen interveniently setose and setulose; 5th sternite and hypopygium not differing from those of normal male; other external characters similar to those of normal female.

26. *Pegohylemyia pseudomaculipes* (Strobl) (Figs. 369–373)

Hylemyia pseudomaculipes Strobl, 1893: 249. *Hylemyia* (*Pegohylemyia*) *pseudomaculipes*: Ringdahl, 1933: 27. *Hylemyia* (*Xanthocnemia*) *pseudomaculipes*: Karl, 1943: 66. *Xanthocnemia pseudomaculipes*: Ringdahl, 1959: 257. *Pegohylemyia pseudomaculipes*: Hennig, 1970: 399.

Material examined. HOKKAIDÔ — Soranuma, 1♂; Tomakomai, 1♂; Rishiritô, 2♂♂; Mt. Shokambetsu, 2♂♂; Mt. Kariba, 2♂♂. HONSHÛ — Mt. Hakkôda, Aomori-ken, 3♂♂; Mt. Hayachine, Iwate-ken, 2♂♂; Mt. Kurikoma, Miyagi-ken, 2♂♂; Mt. Bandai, Fukushima-ken, 4♂♂; Mt. Daibosatsu, Yamanashi-ken, 3♂♂; Mt. Yatsugatake, Mt. Senjô, Mt. Kiso-Komagatake, Mt. Hodaka, & Mt. Shirouma, Nagano-ken, 34♂♂. SHIKOKU — Mt. Ishizuchi, 5♂♂.

♂. Body-length 5–7 mm. Interfrontalia usually more or less brownish near lunule; haustellum with mentum polished or sometimes very thinly pollinose. Mesonotum brownish grey or bluish grey in pollinosity. Abdomen bluish grey or pale grey in pollinosity, which is usually more or less tinged with brown; median vitta and fore marginal bands usually narrow and sharp, the former being often rather broad; prebasal sclerite pollinose like the preceding segments. Legs variable in colour; f_1 blackish or dark brownish; f_2 and f_3 yellow or brown, with darkened apex, or sometimes wholly blackish; tibiae darkest on t_1 and lightest on t_3; t_1 brownish or blackish; t_2 and t_3 yellow to blackish.

Frons about as wide as anterior ocellus; interfrontalia linear caudad, half or a little more as wide as anterior ocellus; arista distinctly pubescent, the longest hairs being often twice as long as basal diameter of arista; epistoma situated as far as or slightly behind frons at lunule. Mesonotum with about 3 pairs of *pre acr* and usually with a few accessory setulae between the rows, which are closer together than to *dc*; *pra* as long as or a little longer than anterior *ntpl*. Abdomen about 2.2–2.7 times as long as wide, with 5th sternite and hypopygium as in Figs. 369–373. Fore tibia with 1 *ad* and 1 *pv*; t_2 with 1 *ad*, 2 *pd* and 2 *pv*; t_3 with 2–3 *av*, 4–5 *ad*, 3 *pd* and a few or some *pv*, apical *pd* being well developed. Wings with costal thorns minute; costa haired ventrally.

♀. Uncertain to me. There are at hand many female specimens which are probably separated into two species, *P. pseudomaculipes* and the following *P. maculipedella* sp. nov. A study on the females of the two species will be given in another paper.

Distribution. Japan; Europe.

Japan (Morioka, Iwate-ken) has been recorded as a locality of *P. pseudomaculipes* by Hennig (1970). This species may be widely distributed in Japan together with the following two related species, *P. maculipedella* sp. nov. and *P. nigrigenis*

sp. nov. The specimens taken from Shikoku (Mt. Ishizuchi) are paler in colour than those from other localities as follows: — Mesonotum and abdomen in pollinosity bluish grey and only a little tinged with brown; f_2 and f_3 pale yellow though darkened apically; t_2 and t_3 pale yellow.

27. *Pegohylemyia maculipedella* sp. nov.
(Figs. 374–382)

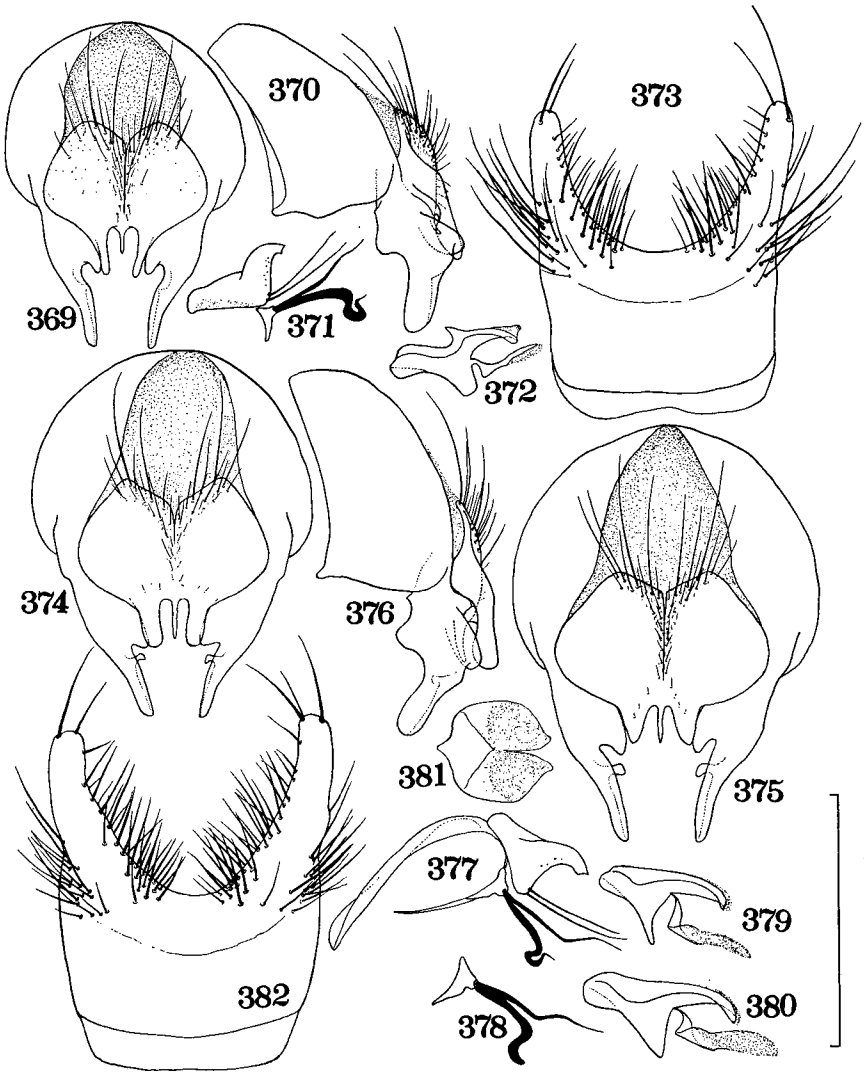
Type-material. HOKKAIDÔ — Mt. Kariba, 1♂, 19–23-vii-72. HONSHÛ — Mt. Hodaka, Nagano-ken, 4♂♂ (one the holotype), 3-viii-70; Mt. Chôgatake, Nagano-ken, 3♂♂, 30-vii-70; Mt. Yatsugatake, Nagano-ken, 2♂♂, 20-vii-70; Mt. Kiso-Komagatake, Nagano-ken, 1♂, 27-vii-70.

♂. Body-length 5.2–6.7 mm; wing-length 4.9–6.2 mm. Interfrontalia black or sometimes narrowly brownish near lunule, with whitish pollen; parafacials and cheeks black in ground colour and silvery white in pollinosity, which is slightly tinged with yellow; occiput black in ground colour, and bluish grey and slightly brownish in pollinosity; antennae and palpi blackish; haustellum with mentum blackish and polished. Thorax black in ground colour and bluish grey in pollinosity; mesonotum rather thinly pollinose and half-shining in some lights, the pollinosity being faintly or hardly tinged with brown; median vitta hardly visible or sometimes rather distinct. Abdomen blackish in ground colour, whitish grey and more or less bluish in pollinosity, and with metallic reflections; median vitta narrow and sharp; fore marginal bands absent except on 2nd tergite, at most median vitta being more or less dilated at anterior part especially on 3rd tergite; 5th sternite and hypopygium more or less brownish in ground colour; prebasal sclerite hardly or thinly pollinose and shining. Femora yellow, with apical fourth to third blackish; f_1 sometimes largely darkened; tibiae yellow, more or less darkened at base and apex; t_1 dark brownish in 1 specimen; tarsi blackish or dark brownish. Wings distinctly tinged with brownish yellow, at base strongly yellow; calyptrae yellowish; halteres yellowish, at base more or less brownish.

Frons about as wide as anterior ocellus; interfrontalia one-third to two-thirds of anterior ocellus in width, and with a pair of strong *if* about as long as ocellar setae; parafrontals with 4–6 strong *ori* mingled with some vestigial setulae, and with no *ors*; A_3 about twice as long as wide; arista distinctly pubescent, the longest hairs being slightly or hardly longer than basal diameter of arista; profrons slightly wider than A_3, at most about 1.2 times as wide as the latter; cheeks about as high as A_3-width, with genal setae in 2 (sometimes 1) rows; epistoma projecting forwards about as far as frons at lunule, at most only a little beyond the frons; haustellum slender.

Mesonotum with about 3–5 pairs of *pre acr*, of which 1 or 2 pairs are composed of strong setae, and sometimes with 1–2 accessory setulae between the rows, which are separated from each other by a distance as long as half to two-thirds of that between *dc* and *acr*; *pra* as long as or longer than anterior *ntpl*; mesopleura with no distinct anterior *mpl*; *stpl* 1:2 or sometimes 2:3 although the lower anterior and the lowest posterior are much shorter and weaker than the uppers; scutellum on dorsal surface at most sparsely setulose laterally

Abdomen depressed and elongated, about 2.5–3.3 (usually about 3) times as long as wide and nearly parallel-sided; 5th sternite and hypopygium as in Figs. 374–382.



Figs. 369–373. *Pegohylemyia pseudomaculipes* (Strobl), ♂: 369, hypopygium, dorsal view; 370, *ditto*, lateral view; 371, prae- and postgonites; 372, basi- and distipahlli; 373, 5th sternite, ventral view.

Figs. 374–382. *Pegohylemyia maculipedella* sp. nov., ♂: 374, hypopygium (from Mt. Hodaka), dorsal view; 375, hypopygium (from Mt. Kariba), dorsal view; 376, hypopygium (from Mt. Hodaka), lateral view; 377, prae- and postgonites (from Mt. Hodaka); 378, praegonite (from Mt. Kariba); 379, basi- and distiphalli (from Mt. Hodaka); 380, basi- and distiphalli (from Mt. Kariba); 381, distiphallus, dorsal view; 382, 5th sternite, ventral view.

Fore tibia with 1 *ad* and 1 (2 in 1 specimen) *pv*; f_2 with no distinct *av*, and on basal third with 3–5 *pv*, the longest one being more or less longer than height of the femur; t_2 with 1 *ad*, 2 *pd* and 2 *pv*; f_3 with 6–9 strong *av*, the longest one about 1.8–2.4 times as long as height of the femur, and with some much finer *pv*

on basal half to two-thirds and on apical fourth to third respectively, the longest one being a little longer than height of the femur; t_3 with 2–4 *av*, 4–5 *ad*, 3 *pd* and 1–8 (usually 3–5) *pv*, apical *pd* being much shorter and weaker than apical *d* and usually very fine. Wings with costal thorns minute; costa haired on ventral surface rather anteriorly; *m-m* erect and straight, at most slightly curved inwards.

♀. Uncertain (see under *pseudomaculipes*).

Distribution. Japan.

It may not be easy to distinguish *P. maculipedella* from the paler form of *P. pseudomaculipes* unless the genital structures are seen. However, the following aspects may be worthy of mention: — Arista more shortly pubescent; f_1 largely yellow in usual cases; f_3 with finer *pv*; t_3 with much shorter and finer apical *pd*.

28. *Pegohylemyia nigrigenis* sp. nov.
(Figs. 383–386)

Type-material. HONSHŪ — Mt. Bandai, Fukushima-ken, 6♂♂ (one the holotype), 2♀♀, 28-vii-71; Mt. Daibosatsu, Yamanashi-ken, 1♂, 2♀♀, 6-viii-69; Mt. Hodaka, Nagano-ken, 1♂, 2♀♀, 1–3-viii-70; Mt. Shirouma, Nagano-ken, 1♂, 5-viii-70; Mt. Kiso-Komagatake, Nagano-ken, 1♂, 1♀, 25–27-vii-70.

♂. Body-length 6.6–7.4 mm; wing-length 6.5–6.8 mm. Interfrontalia brownish yellow to dark brown in ground colour and whitish yellow pollinose; parafacials and cheeks brownish yellow to blackish in ground colour and whitish yellow in pollinosity; occiput blackish in ground colour, bluish grey and more or less brownish in pollinosity; antennae blackish; palpi blackish, sometimes slightly brownish at base; haustellum with mentum blackish and polished. Thorax in ground colour blackish, at most brownish along pleural margins, and rather densely covered with pale yellowish grey pollen, which is slightly tinged with blue; mesonotum more or less tinged with brown in pollinosity, when viewed from front almost darkened, and when viewed from behind with obscure median vitta and lateral patches. Abdomen blackish in ground colour, and rather densely covered with pale yellowish grey pollen, which is more or less tinged with blue; tergites when viewed from front wholly darkened, and when viewed from behind with narrow median vitta, which is not very sharp, and without fore marginal band except on 2nd tergite; prebasal sclerite very thinly pollinose and shining; 5th sternite reddish brown to dark brown. Legs largely yellow; coxae blackish, at most partly brownish; trochanters brownish to yellowish; femora yellow, with blackish apex; tibiae yellow, more or less darkened at base and apex; t_1 sometimes dark yellow or brownish; tarsi blackish. Wings distinctly tinged with brownish yellow, at base strongly yellow; calyptrae strongly yellow; halteres yellow, at base more or less brownish.

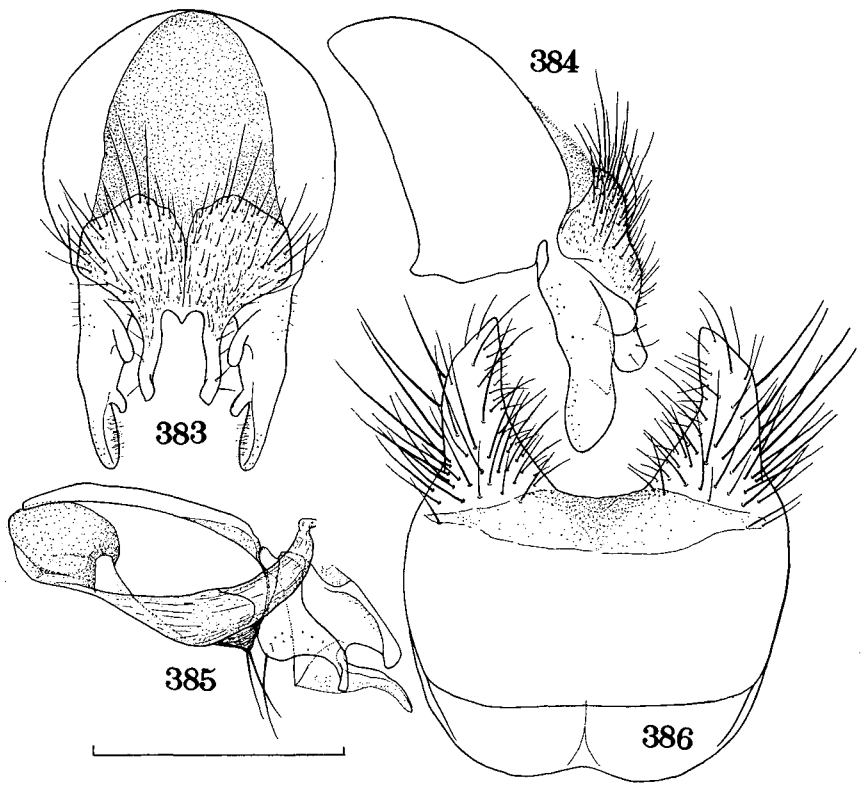
Head about 1.3–1.4 times as high as long; frons narrower than anterior ocellus, usually about half as wide as the latter; interfrontalia interrupted by contiguous parafrontals, with a pair of distinct *if*, which are usually about as long as ocellar setae; parafrontals with 3–5 *ori* mingled with a few or some vestigial setulae, and with no *ors*; A_3 about 2–2.3 (in 1 specimen 1.8) times as long as wide; arista distinctly pubescent, the longest hairs being longer than basal diameter of arista, usually about twice as long as the latter; profrons more or less wider (in 1 specimen slightly narrower) than A_3; cheeks as high as or a little higher than A_3-width, with

genal setae in 2 rows; epistoma more or less behind frons at lunule, at most sometimes projecting forwards about as far as the frons; palpi slender, about as long as A_2 and A_3 combined; haustellum slender, with mentum longer than palpi.

Mesonotum with 3–5 pairs of *pre acr*, setae of the 2nd pair being much stronger than the others and separated from each other by a distance as long as or two-thirds of that between *dc* and *acr*; 1–2 setulae usually present between rows of *pre acr*; *pra* longer than or at least as long as anterior *ntpl*; mesopleura with 1–2 anterior *mpl* which are as fine as or slightly stronger than adjacent accessory setulae, and with 2 *pstg* and 2–8 (usually 4–7) associated setulae; *stpl* 1:3, the lowest posterior being rather strong in 1 specimen, yet usually fine and only a little stronger than accessory setulae; scutellum bare on dorsal centre.

Abdomen depressed except on hypopygium which is half-depressed, about 2.4–2.9 times as long as wide, and nearly parallel-sided; 5th sternite and hypopygium as in Figs. 383–386.

Fore tibia with 1 (sometimes 2) *ad* and 1 (sometimes 2) *pv*, apical *pv* being always strong; f_2 with no distinct *av*, and on basal half with some (usually 4–5) *pv*, the longest one about 1.2–1.4 times as long as height of the femur; t_2 with 1 (rarely 2) *ad*, 2 *pd* and 2–3 *pv*; f_3 with a row of strong *av*, the longest one being about 1.8–2 times as long as height of the femur, and with a complete or incomplete row of



Figs. 383–386. *Pegohylemyia nigrigenis* sp. nov., ♂: 383, hypopygium, dorsal view; 384, *ditto*, lateral view; 385, aedeagus; 386, 5th sternite, ventral view.

weaker *pv*, the longest one of the setae on basal two-thirds being as long as or a little longer than height of the femur, and the longest one of the setae on apical fourth being a little or rather distinctly longer than height of the femur; t_3 with 2–4 (rarely 5) *av*, 4 (rarely 5) *ad*, 3 (sometimes 4) *pd* and 2–7 *pv*, apical *pd* being weak or rather distinct, yet much shorter than apical *d*. Wings with costal thorns minute; costa haired on ventral surface; *m-m* only a little oblique and hardly sinuate.

♀. Body-length 6.2–7.1 mm. More yellowish than in male. Interfrontalia orange yellow on lower half and blackish on the upper in ground colour; parafacials and cheeks orange yellow in ground colour and yellow in pollinosity, which is paler on cheeks; palpi paler than in male, sometimes yellowish at base; occiput in pollinosity bluish grey and more or less yellowish. Thorax in pollinosity more yellowish than in male; mesonotum hardly tinged with brown in pollinosity, and more faintly vittate; scutellum sometimes yellowish in ground colour on ventral surface. Abdomen bluish grey and slightly yellowish in pollinosity, with tessellations in some lights; 6th tergite polished or nearly so. Coxae yellowish, or sometimes brownish and partly blackish; trochanters yellow. Wings yellowish, and hardly tinged with brown.

Head only a little higher than the length, at most about 1.1 times as high as long; frons about 0.36–0.41 times as wide as head; interfrontalia about twice as wide as parafrontalia; parafrontals with 2–3 (usually 2) strong and a few fine or vestigial *ori*, and with 2 *ors*, which are strong and directed outwards; profrons about 1.3–1.4 times as wide as A_3; cheeks with genal setae fewer in number (about 3–4) and much finer than those of male and nearly in 1 row. *Stpl* 1:2.

Mid femur on basal half with a few rather fine *pv*, which are shorter than height of the femur; t_2 with 1 (rarely 2) *ad*, 2–3 *pd* and 2 (rarely 1 or 3) *pv*; f_3 with *av* and *pv* shorter and fewer than in male; t_3 with 1–3 (usually 2) *av*, 4 (rarely 5) *ad*, 3 (rarely 4) *pd* and 1–2 (none in 1 specimen) *pv*.

Distribution. Japan.

Judging from the postgonites and distiphallus of the male, and moreover from the polished mentum of the haustellum and the yellowish legs, the present species is closely related to the preceding two species, *P. pseudomaculipes* and *P. maculipedella*. It can, however, be readily distinguished from them by the following characters of the male: — Body with pollen more dense and more yellowish; frons narrower; parafrontals contiguous to each other; 5th sternite and hypopygium otherwise in structure.

20. Genus *Delia* Robineau-Desvoidy

Delia Robineau-Desvoidy, 1830: 571. Type-species: (*Delia floricola* Robineau-Desvoidy, 1830) = *Anthomyia cardui* Meigen, 1826.

Crinura Schnabl, 1911: 71, as subgenus of *Hylemyia*. Type-species: (*Chortophila cilicrura* Rondani, 1866) = *Anthomyia platura* Meigen, 1826.

Leptohylemyia Schnabl & Dziedzicki, 1911: 94, as subgenus of *Hylemyia*. Type-species: *Musca coarctata* Fallén, 1825.

Flavena Karl, 1928: 147, as subgenus of *Chortophila*. Type-species: *Anthomyza criniventris* Zetterstedt, 1860.

Tricharia Karl. 1928: 160, as subgenus of *Chortophila*. Type-species: (*Chortophila trichodactyla* Rondani, 1866) = *Anthomyia liturata* Meigen, 1838.

Subhylemyia Ringdahl, 1933: 30, as subgenus of *Hylemyia*. Type-species: *Musca longula* Fallén, 1824.

Delia is one of the largest genera in this family. According to Ringdahl (1959) there are recorded in Sweden 48 species, which are referred by him into 3 supposed genera, *Delia*, *Leptohylemyia* and *Subhylemyia*. In North America 105 species are recognized by Huckett (1965a, 1965b, 1966a & 1966b). This genus is important on account of the included pests, too. In Japan some species have been known as pests of agricultural crops (Kato, 1939). In the course of the present study have been found 17 species, of which 7 species are described as new to science.

Key to the species (♂♂)

1. Fore tibia with apical *pv* strong and blunt apically. 2
– Fore tibia with apical *pv* weak, if strong it is not blunt apically. 5
2. Epistoma projecting forwards beyond frons at lunule; haustellum much lengthened; *pra* longer than posterior *ntpl*. .....14. *longitheca* sp. nov.
– Epistoma situated behind frons at lunule; haustellum not so lengthened; *pra* shorter than posterior *ntpl*. 3
3. Mid tibia without *ad*; arista with the longest hairs at least twice as long as basal diameter of arista; abdomen elongate, more than 2.5 times as long as wide. .....15. *conversata* (Tiensuu)
– Mid tibia with *ad*; arista with the longest hairs about as long as basal diameter of arista; abdomen not so elongate, less than 2.5 times as long as wide. 4
4. Hind tibia with more than 20 *pv* on whole length; frons usually narrower than anterior ocellus. .....1. *platura* (Meigen)
– Hind tibia with less than 20 *pv* on basal half to two-thirds; frons usually wider than anterior ocellus. .....3. *antiqua* (Meigen)
5. Abdomen on 3rd tergite caudo-laterally with some conspicuously long setae which are directed caudad and beyond abdomen. .....9. *criniventris* (Zetterstedt)
– Abdomen on 3rd tergite without such long setae. 6
6. *Pra* distinctly longer than posterior *ntpl*. 7
– *Pra* at most as long as posterior *ntpl*. 13
7. Mid tibia with *ad*. 8
– Mid tibia without *ad*. 11
8. Mid tibia with *av*; haustellum with mentum polished; parafrontals with 1 short *ors*. .....7. *lineariventris* (Zetterstedt)
– Mid tibia without *av*; haustellum with mentum pollinose; parafrontals with no *ors*. 9
9. Fore tibia with *ad*; frons distinctly wider than anterior ocellus; wings with costal thorns strong. .....12. *tristriata* (Stein)
– Fore tibia without *ad*; frons at most as wide as anterior ocellus; wings with costal thorns minute. 10
10. Abdomen very thinly pollinose and lustrous, with no markings; arista with the longest hairs more than twice as long as basal diameter of arista; t_3 with apical *pd* weak. .....13. *pilicerca* sp. nov.
– Abdomen densely pollinose and with distinct median vitta and fore marginal bands; arista with the longest hairs shorter than basal diameter of arista; t_3 with apical *pd* strong. .....11. *takizawai* sp. nov.
11. Notopleura with no accessory setulae; arista very minutely pubescent, the longest hairs being much shorter than basal diameter of arista; haustellum with mentum polished. .....8. *karasawana* sp. nov.
– Notopleura with a few or some accessory setulae; arista distinctly pubescent, the longest hairs being about as long as basal diameter of arista; haustellum with

mentum pollinose. 12

12. Hind tibia with less than 10 *pv*; f_3 with a row of short and distinct *pv* on basal two-thirds; 2nd *ph* more or less developed and easily distinguishable from accessory setulae. .....5. *pilipyga* (Villeneuve)

– Hind tibia with more than 10 *pv*; f_3 without a row of distinct *pv*; 2nd *ph* lacking or indistinguishable from accessory setulae. .....4. *floralis* (Fallén)

13. Mid tibia without *ad*; mid metatarsus with dorsal setulae lengthened. ....10. *echinopyga* sp. nov.

– Mid tibia with *ad*; mid metatarsus with dorsal setulae normal. 14

14. Third and 4th sternites with conspicuously long and strong setae on lateral sides (Figs. 391) .....2. *echinata* (Séguy)

– Third and 4th sternites without such long and strong setae. 15

15. Mid tarsus with 2nd segment swollen ventrally; 3rd sternite densely setose on caudal half; arista with the longest hairs at most twice as long as basal diameter of arista. .....6. *nuda* (Strobl)

– Mid tarsus with 2nd segment not swollen ventrally; 3rd sternite not densely setose; arista with the longest hairs at least 3 times as long as basal diameter of arista. 16

16. Mesonotum yellowish in pollinosity; f_3 with no distinct *pv* except for a few ones near apex; t_1 with apical *pv* distinct. .....17. *auricolor* sp. nov.

– Mesonotum brownish in pollinosity; f_3 with a row of distinct *pv* on basal two-thirds; t_1 with apical *pv* weak. .....16. *tenuis* sp. nov.

1. *Delia platura* (Meigen)

Anthomyia platura Meigen, 1826: 171. *Anthomyia cana* Macquart, 1835: 340. *Aricia fusciceps* Zetterstedt, 1845: 1552. *Chortophila cilicrura* Rondani, 1866: 165. *Hylemyia cilicrura*: Harukawa & Kondo, 1930: 449. *Hylemyia* (*Delia*) *fusciceps*: Ringdahl, 1933: 24. *Hylemyia platura*: Hennig, 1938: 282. *Hylemyia platura*: Kato, 1939: 1532. *Hylemya* (*Delia*) *platura*: Huckett, 1971: 33.

Material examined. There are at hand a lot of specimens of both sexes taken from many localities in Japan (Hokkaidô, Honshû, Shikoku & Kyûshû).

Distribution. Cosmopolitan.

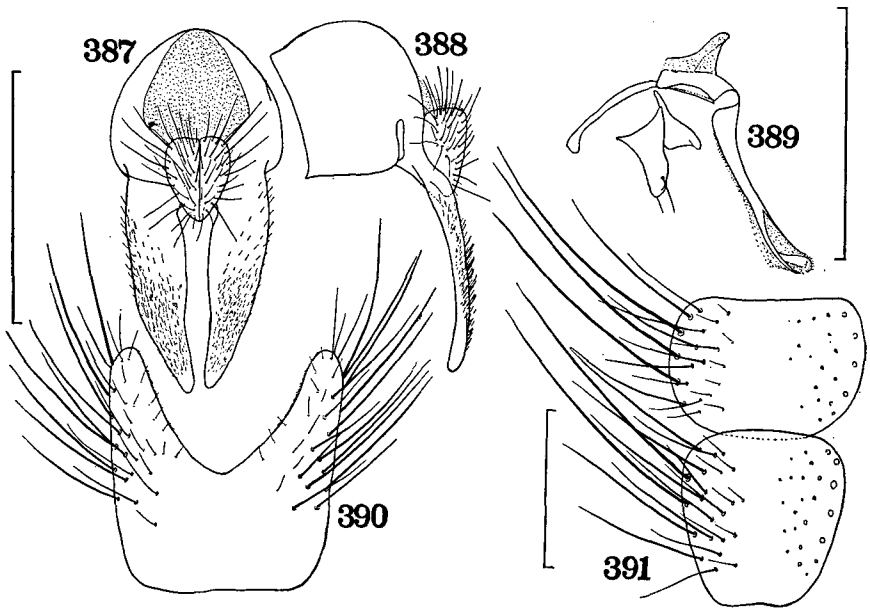
2. *Delia echinata* (Séguy)
(Figs. 387–391)

Chortophila echinata Séguy, 1923b: 360. *Hylemyia scanica* Ringdahl, 1926: 118. *Hylemyia abdena* Hall, 1937: 201. *Hylemyia echinata*: Miles, 1953: 591. *Phorbia* (*Delia*) *echinata*: Sasakawa, 1955: 64. *Hylemyia* sp.: Oku, 1964: 107. *Hylemya* (*Delia*) *echinata*: Huckett, 1971: 26.

Material examined. A lot of specimens have been seen. Their localities are as follows: — HOKKAIDÔ — Sapporo (5♂♂, 5♀♀, ex *Spinacia oleracea*, T. Oku leg.); Nopporo; Shikotsu-ko; Mt. Soranuma; Mt. Shokambetsu; Mt. Daisetsu; Mt. Ashibetsu; Rishiri-tô; Mt. Yûbari; Mt. Apoi; Mt. Poroshiri; Mt. Niseko; Mt. Kariba. HONSHÛ — Towada, Aomori-ken; Mt. Chôkai, Yamagata-ken; Mt. Bandai, Fukushima-ken; Mt. Sumon, Niigata-ken; Takao-san, Kariyose-yama, Jimba-san & Kawanori-yama, Tôkyô-to; Mt. Yatsugatake, Mt. Senjô, Mt. Kiso-Komagatake, Mt. Chôgatake & Mt. Hodaka, Nagano-ken; Minoo (3♂♂, 1♀, ex *Stellaria media*, M. Tsujita leg.), Ôsaka-fu; Rokkô-san & Himeji, Hyôgo-ken. SHIKOKU — Shôdoshima; Mt. Tsurugi. KYÛSHÛ — Hikosan.

♂. Body-length 3.6–5.7 mm. Cheeks with genal setae in 2 rows; occiput with some setulae on upper part below postocular row of setulae. Abdomen with conspicuously long setae on 3rd and 4th sternites (Fig. 391). Fore tibia with 1 *ad* and 1–2 *pv*, apical *pv* being short and less than half as long as apical *d*; t_3 with 2–5 *pv*.

♀. Closely resembling the female of *platura*. However, the following characters may be useful to identify the present species: — Mesonotum often less yellowish in pollinosity and often with 5 distinct vittae between rows of *acr* and along rows of *dc* and *ia*. Occiput with some setulae on upper part below postocular row of setulae; mesonotum with *acr*-rows closer together than in *platura*, often nearly contiguous or lacking near the suture. Fore femur with a few semierect setulae on median plane of anterior surface; t_1 with apical *pd* vestigial; t_2 with *pd* always 1 in number.



Figs. 387–391. *Delia echinata* (Séguy), ♂: 387, hypopygium, dorsal view; 388, *ditto*, lateral view; 389, aedeagus; 390, 5th sternite, ventral view; 391, 3rd (lower) and 4th (upper) sternites, ventral view.

Host plants. *Stellaria media* (in Japan, after Sasakawa, 1955); *Spinacia oleracea* (in Europe, after Miles, 1953; in Japan, after Oku, 1964). The larvae feed on leaves and stems of the hosts. In North America this species has been recorded under the name *Hylemya abdena* as a shoot-feeder of carnation, *Dianthus caryophyllus* (after Doucette, 1941).

Distribution. Japan; Europe; North America.

In England this species has been known as a pest of spinach and given the vernacular name "spinach stem fly" by Miles (1953). Having examined the specimens recorded by Oku (1964) under "*Hylemyia* sp." as a pest of spinach I have found that they are undoubtedly referrable to *echinata*. This species was

recorded for the first time from Japan by Sasakawa (1955) as a feeder of chick weed, *Stellaria media*.

3. *Delia antiqua* (Meigen)

Anthomyia antiqua Meigen, 1826: 166. *Anthomyia antiqua*: Matsumura, 1897: 246. *Chortophila antiqua*: Kuwayama, 1938: 138. *Hylemyia antiqua*: Kato, 1939: 1529; Yokoo, 1940: 188. *Hylemya (Delia) antiqua*: Huckett, 1971: 22.

Material examined. HOKKAIDÔ — Sapporo, 18♂♂, 5♀♀; Nopporo, 4♂♂, 8♀♀; Jôzankei, 1♀; Mt. Soranuma, 2♂♂; Bifuka, 1♀; Kitami, 4♀♀; Rishiri-tô, 1♂.

♂. Mid tibia with 1 or sometimes 2 *pd*.

♀. Fore tibia with 1–2 (usually 1) *ad*, 1 *pv* and sometimes 1 *pd*; t_2 with 1–2 (usually 2) *ad*, 2 *pd* and 2–3 (usually 2) *pv*; t_3 with *pv* sometimes indiscernible.

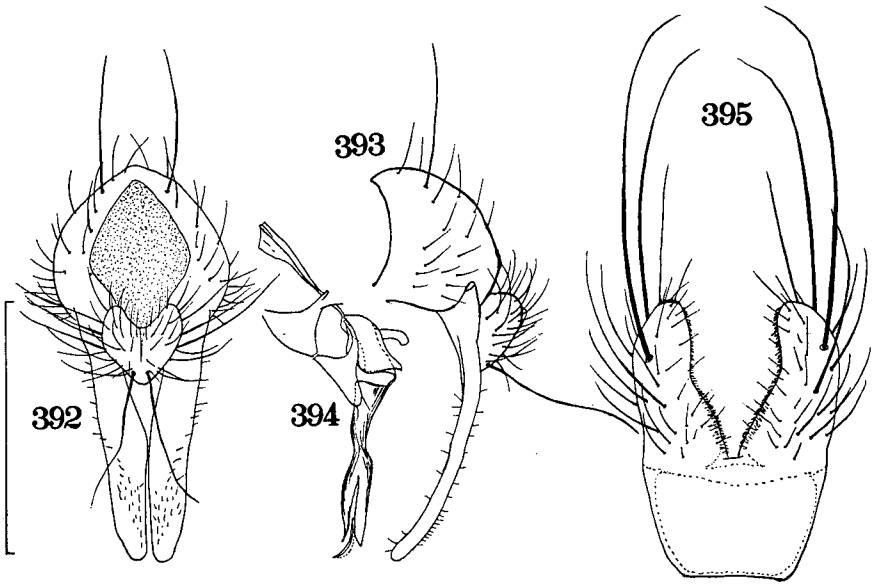
Host plants. *Allium* spp. This species has been known as an important pest of onions and related plants.

Distribution. Japan; Korea; Manchuria; Siberia; Europe; North America.

4. *Delia floralis* (Fallén)
(Figs. 392–395)

Musca floralis Fallén, 1824: 71. *Phorbia brassicae*: Matsumura, 1897: 246, nec Bouché, 1833. *Anthomyia flavopicta* Matsumura, 1915: 55. *Chortophila floralis*: Tomaszewski, 1934: 60. *Hylemyia floralis*: Kato, 1939: 1368; Yokoo, 1940: 194. *Hylemya (Delia) floralis*: Huckett, 1965a: 65.

Material examined. HOKKAIDÔ — Sapporo, 1♂, 4-ix-58 (S. Ueda), 1♂, 2♀♀, 15-iv–5-v-59 (M. Tsutsumi), & 1♂, 1♀, 16–27-vii-59 (M. Tsutsumi); Tomakomai,



Figs. 392–395. *Delia floralis* (Fallén), ♂: 392, hypopygium, dorsal view; 393, *ditto*, lateral view; 394, aedeagus; 395, 5th sternite, ventral view.

1♂, 20-viii-57 (S. Takagi); Shibetsu, 1♂, 7-viii-68 (H. Torikura). SAKHALIN — Ôtomari, 1♂, 1♀, 28-vii-14 (S. Isshiki).

Host plants. Cruciferous plants.

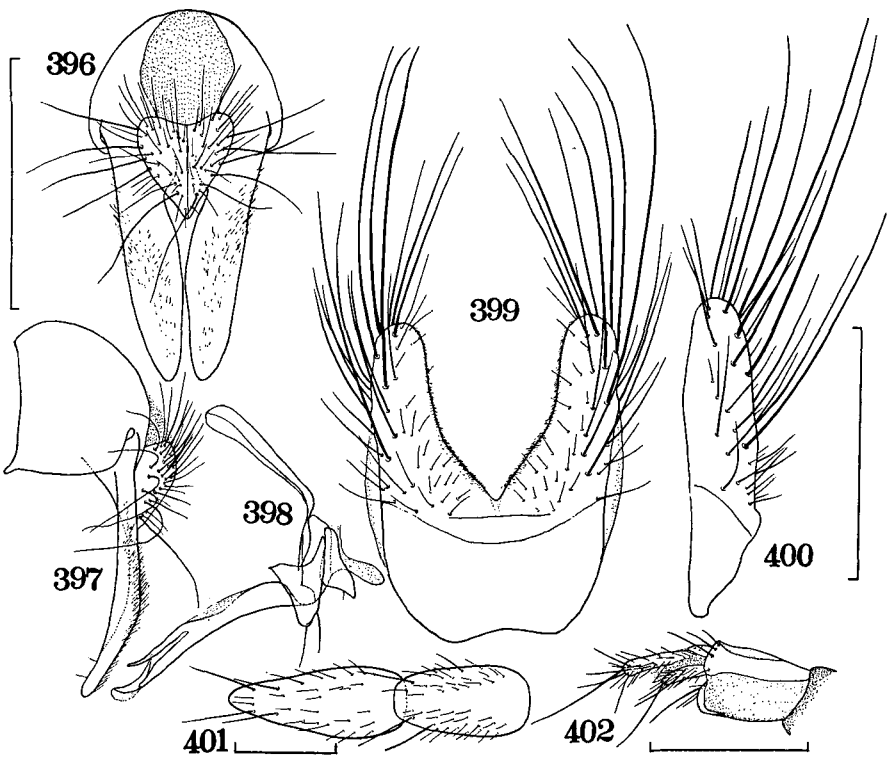
Distribution. Japan; Sakhalin; Korea; Manchuria; Siberia; Europe; North America.

5. *Delia pilipyga* (Villeneuve)
(Figs. 15, 16 & 396–402)

Chortophila pilipyga Villeneuve, 1917: 440. *Hylemyia pilipyga*: Séguy, 1923a: 99. *Chortophila gnava*: Kuwayama, 1938: 138, nec Meigen, 1826. *Hylemyia pilipyga*: Kato, 1939: 1371. *Hylemya pilipyga*: Kuwayama, 1967: 127.

Material examined. HOKKAIDÔ — Nemuro, 1♂, 11-vii-38 (S. Kuwayama), & 1♀, 28-viii-38 (? S. Kuwayama), ex *Brassica campestris napus* var. *pekinensis*; Toyotomi, 1♂, 10-vii-68. MANCHURIA — Katsuyama, 1♂, 9-vii-38 (T. Akiyama), ex *Raphanus sativus* var. *acanthiformis*.

♂. Body-length 5.2–5.9 mm. Frons about twice as wide as anterior ocellus; interfrontalia about as wide as anterior ocellus, with a pair of distinct *if*; parafrontals with 6–8 strong *ori*, in 1 specimen (from Toyotomi) with 1 vestigial *ors*;



Figs. 396–400. *Delia pilipyga* (Villeneuve), ♂: 396, hypopygium, dorsal view; 397, *ditto*, lateral view; 398, aedeagus; 399, 5th sternite, ventral view; 400, *ditto*, lateral view.

Figs. 401 & 402. *Delia pilipyga* (Villeneuve), ♀: 401, 4th (right) and 5th (left) sternites, ventral view; 402, ovipositor, lateral view.

A_3 about 1.5 times as long as wide; arista distinctly pubescent, the longest hairs being about as long as basal diameter of arista; profrons about 1.3 times as wide as A_3; cheeks about 1.5 times as high as A_3-width, with genal setae in 2 rows; occiput setulose on upper part below postocular row of setulae.

Mesonotum with some pairs of *pre acr*, of which about 3 pairs are composed of distinct setae, and with no accessory setulae between the rows; distance between the rows of *pre acr* about half as long as that between *dc* and *acr*; *pra* more or less longer than anterior *ntpl*; notopleura with 5–6 accessory setulae; *stpl* 1:2. Abdomen as long as or a little longer than twice the width, with 5th sternite and hypopygium as in Figs. 396–400.

Fore tibia with 1 *pv* and no *ad*, apical *pv* distinct, yet much shorter than apical *d*, about half as long as the latter; f_2 with no distinct *av*, and on basal half to two-thirds with 4–7 *pv*; t_2 with 1 *pd* and 2–3 *pv*; f_3 on apical two-thirds with 5–7 *av*, and on basal half or a little more with a row of about 10 short *pv*; t_3 with 3–5 *av*, 4–5 *ad*, 3–4 *pd* and 6–8 *pv*. Wings with costal thorns short although distinguishable from costal setulae; *m-m* slightly oblique and slightly sinuate.

♀. Only 1 female specimen has been seen by myself. Abdomen when viewed from behind with obscure median vitta, which is triangulate on each of 2nd to 4th tergites, and with tessellations in some lights.

Frons about 0.4 times as wide as head; parafrontals with 5 *ori* and 3 *ors*; occiput with a few setulae on upper part below postocular row of setulae. Mesonotum with *acr* distinguishable from accessory setulae although fine; notopleura with 1–3 accessory setulae; *stpl* 1:1.

Fore tibia with 1 *ad* and 3 *pv*, apical *pd* being vestigial as in male; t_2 with 1 *ad*, 2 *pd* and 2–3 *pv*; f_3 with no *pv* except on preapical part; t_3 with 4–5 *av*, 5 *ad*, 4 *pd* and 2 short and fine *pv*. Wings with costal thorns rather distinct; costa haired on ventral surface although rather sparsely.

Host plants. Cruciferous plants. According to Kato (1939) the eggs are laid on young leaves or leaf-stalks near the roots of the crops, and the hatched larvae feed into the roots.

Distribution. Japan; Kurile Is.; Manchuria; Europe.

The female of this species closely resembles that of *floralis*, from which it may, however, be distinguishable by the following aspects: — Abdomen with median vitta present though not sharp, and in some lights with tessellations; mesonotum with *acr* distinguishable from accessory setulae although fine; t_1 with apical *pd* vestigial; t_2 with 2 *pd*.

*6. *Delia nuda* (Strobl)
(Figs. 403–406)

Hylemyia nuda Strobl, 1899: 48. *Hylemyia* (*Delia*) *nuda*: Schnabl, 1911: 71; Schnabl & Dziedzicki, 1911: 97. *Delia nuda*: Ringdahl, 1959: 282.

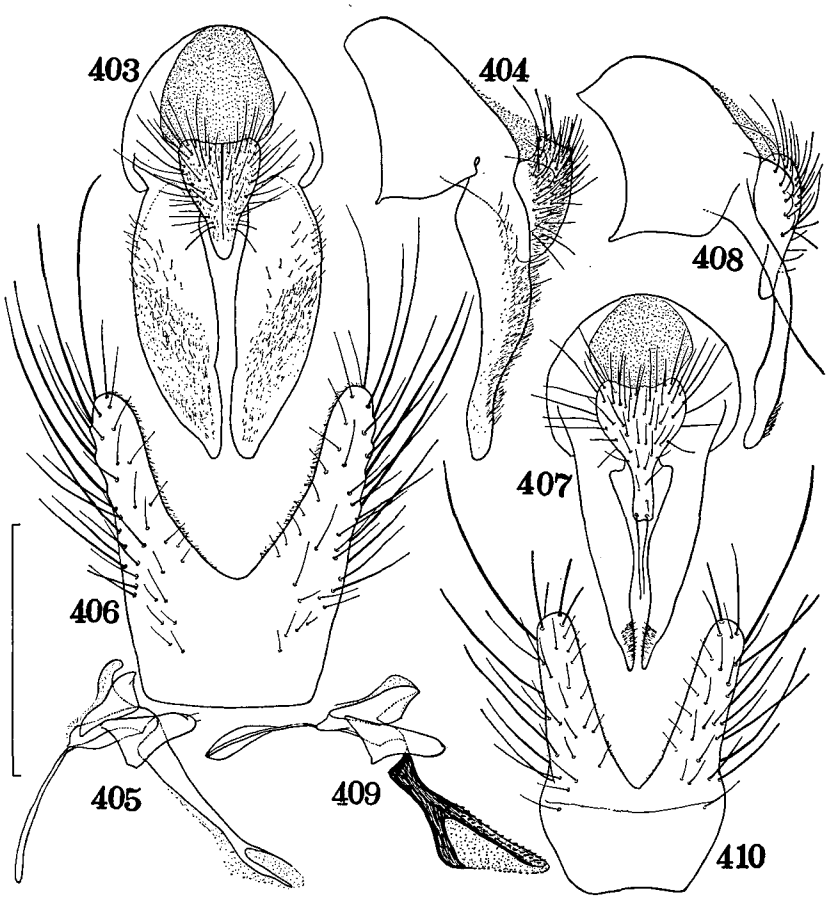
Material examined. HOKKAIDÔ — Rishiri-tô, 2♂♂, 31-vii-69; Toyotomi, 1♂, 10-viii-65 (T. Kocha), 1♂, 11–13-vii-68 (H. Takizawa), & 1♂, 10-vii-68; Mombetsu, 1♂, 26-vii-66; Mt. Kariba, 5♂♂, 1♀, 19–23-vii-72. HONSHÛ — Towada, Aomori-ken, 4♂♂, 16–19-vi-68 (H. Takizawa); Mt. Hayachine, Iwate-ken, 2♂♂, 5♀♀, 11-viii-69; Mt. Chôkai, Yamagata-ken, 5♂♂, 9-viii-70; Yahiko-san, Niigata-ken, 1♂, 21-v-66 (H. Takizawa).

♂. Body-length 6–7 mm. Mesonotum with median vitta distinct and brownish pollinose. Occiput setulose on upper part below postocular row of setulae. Mesonotum with *pra* shorter than posterior *ntpl* although distinct. Abdomen with 3rd sternite densely setose on caudal half; 5th sternite and hypopygium as figured. Fore tibia with apical *pv* much shorter and weaker than apical *d*, at most half as long as the latter; t_2 with 1 *ad*, 1 *pd* and 2–3 *pv*; f_3 with no *pv* except for a few ones near apex; mid tarsus with 2nd segment swollen ventrally.

♀. Fore tibia with apical *pd* distinct or strong and with apical *pv* strong; mid tarsus with 2nd segment normal. Wings with costal thorns well developed.

Distribution. Japan; Europe.

This species has a closely related species in Sweden, *Delia fasciventris* Ringdahl, 1933, which is also densely setose on the caudal half of the 3rd sternite of the male. The present Japanese specimens are referred to *nuda* by the swollen 2nd segment of the male mid tarsus and by the broader surstyli of the male hypopygium.



Figs. 403–406. *Delia nuda* (Strobl), ♂: 403, hypopygium, dorsal view; 404, *ditto*, lateral view; 405, aedeagus; 406, 5th sternite, ventral view.

Figs. 407–410. *Delia lineariventris* (Zetterstedt), ♂: 407, hypopygium, dorsal view; 408, *ditto*, lateral view; 409, aedeagus; 410, 5th sternite, ventral view.

*7. *Delia lineariventris* (Zetterstedt)
(Figs. 407–410)

Aricia lineariventris Zetterstedt, 1845:1541. *Hylemyia* (*Crinura*) *lineariventris*: Schnabl & Dziedzicki, 1911:96. *Delia lineariventris*: Ringdahl, 1959:289. *Hylemya* (*Delia*) *lineariventris*: Huckett, 1965a:67.

Material examined. HONSHÛ — Mt. Senjô, Nagano-ken, 3♂♂, 10-vii-71.

♂. Body-length 4.2–5.5 mm. Haustellum with mentum blackish and polished. Thorax and abdomen densely covered with whitish grey pollen, which is more or less tinged with blue; mesonotum somewhat tinged with brown in pollinosity; abdomen with broad median vitta and broad fore marginal bands. Wings rather distinctly tinged with brown; calyptrae whitish.

Frons a little wider than twice anterior ocellus-width; interfrontalia more or less wider than anterior ocellus. Mesonotum with 2–3 irregular pairs of *pre acr*, the rows being nearly contiguous to each other; *pra* as long as or a little longer than anterior *ntpl*. Abdomen elongate, about 2.6–2.9 times as long as wide, and with 5th sternite and hypopygium as in Figs. 407–410.

Fore tibia without *ad*, apical *pv* being strong; t_2 with 1–2 *av*, 1 *ad*, 1 *pd* and 2–3 *pv*; f_3 with no *pv* except for a few ones near apex. Wings with costal thorns well developed and distinctly longer than *h*-vein.

♀. Unknown to me.

Distribution. Japan; Europe; North America.

Judging from the distiphallus which are strongly chitinized and armed with many spinules this species may be related to the *coarctata*-group (*Leptohylemyia* auctt.).

8. *Delia karasawana* sp. nov.
(Figs. 411–414)

Type-material. HONSHÛ — Mt. Hodaka, Nagano-ken, 1♂ (holotype), 3-viii-70; Mt. Yatsugatake, Nagano-ken, 1♂, 20-vii-70.

♂. Body-length 6.3 mm; wing-length 5.4–5.8 mm. Interfrontalia wholly black or slightly reddish near lunule in ground colour, with pale grey pollen; parafacials and cheeks wholly or largely blackish in ground colour and more or less tinged with dark yellow in pollinosity; occiput in ground colour black, and in pollinosity bluish grey and more or less brownish; antennae and palpi blackish; haustellum with mentum blackish and polished. Thorax blackish in ground colour, and densely pollinose; pleura in pollinosity dull yellowish grey in the holotype, or bluish grey and partly brownish in the paratype; mesonotum brownish grey pollinose, with narrow paramedian vittae between *dc* and *acr*, the vittae being distinctly visible when viewed from front, yet rather obscurely (in the holotype) or hardly (in the paratype) visible when viewed from behind owing to darkening of the area between the vittae, and with sublateral vittae and lateral patches, which are distinct when viewed from behind, yet more or less weakened when viewed from front. Abdomen blackish in ground colour, and densely covered with pale grey pollen, which is faintly tinged with brown (in the holotype) or rather distinctly tinged with blue (in the paratype); median vitta sharp and not very narrow; fore marginal bands distinct. Legs blackish. Wings with a rather weak (in the holotype) or rather strong (in the paratype) brownish tinge, at base more

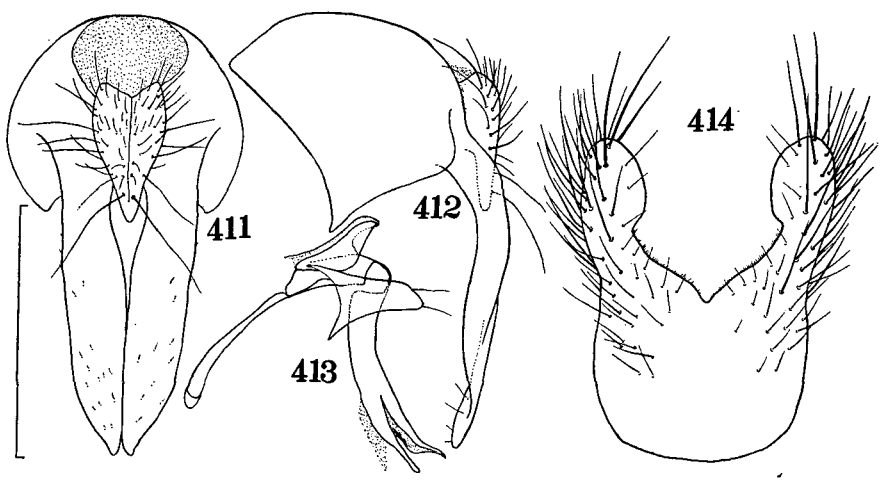
or less yellowish; calyptrae strongly yellow; halteres reddish brown at base and yellow at knob.

Head about 1.25 times as high as long; frons about as wide as anterior ocellus; interfrontalia not interrupted, with a pair of distinct *if*, which are about as long as secondary ocellar setae; parafrontals with 4–5 strong and a few fine or vestigial *ori* (in the holotype) or 6–8 strong and 1 fine *ori* (in the paratype), and with no *ors*; A_3 about 1.6–1.7 times as long as wide; arista minutely pubescent, the longest hairs being much shorter than basal diameter of arista; profrons as wide as or only a little wider than A_3; parafacials broadly maintained ventrad, at the narrowest part only a little narrower than profrons; cheeks about 1.2–1.3 times as high as A_3-width, with genal setae in 1 (in the holotype) or 2 (in the paratype) rows; epistoma as far as or only a little behind frons at lunule; occiput with a few setulae on upper part below postocular row of setulae; palpi shorter than A_2 and A_3 combined; haustellum with mentum more or less longer than A_2 and A_3 combined.

Mesonotum with 2 pairs of strong and a few pairs of fine *pre acr*, of which the strongest one is about as long as and much weaker than posterior *ntpl* (in the holotype), or about as long as and slightly weaker than anterior *ntpl*; distance between the rows of *pre acr* as long as or a little longer than half of that between *dc* and *acr*; 2nd *ph* developed although shorter and weaker than the 1st; *pra* slightly or rather distinctly longer than anterior *ntpl*; notopleura with no accessory setulae; mesopleura with no distinct anterior *mpl*, and with 1 strong and 1 weaker *pstg* (the weaker one is like associated setula in the holotype) and 3 associated fine setulae; *stpl* 1:3, the lowest posterior being shorter and weaker than the uppers; scutellum on dorsal surface sparsely setulose laterally and bare centrally.

Abdomen depressed except on slightly swollen hypopygium, about 2.3 times as long as wide, and loosely narrowing caudad; 5th sternite and hypopygium as in Figs. 411–414.

Fore tibia with 1 (2 in the paratype on one body-side) *pv* and no *ad*, apical *pv* being strong; f_2 with no distinct *av* and on basal half with 6–8 *pv*, the longest one about 1.4–1.5 times as long as height of the femur; t_2 with 2 (in the holotype)



Figs. 411–414. *Delia karasawana* sp. nov., ♂: 411, hypopygium, dorsal view; 412, *ditto*, lateral view; 413, aedeagus; 414, 5th sternite, ventral view.

or 3 (in the paratype) *pd* and 2 (in the holotype) or 3 (in the paratype) *pv*, and without *av* or *ad*; f_3 with a row of *av* becoming longer towards apex of the femur, setae on basal third being weakened and indistinguishable from adjacent setulae in the paratype, the longest one about 1.5 times as long as height of the femur, on basal two-thirds with a row of short *pv*, which are rather distinct in the holotype, yet much weakened and mostly indistinguishable from accessory setulae in the paratype, and on apical fourth with some strong *pv*, the longest one about 1.3–1.4 times as long as height of the femur; t_3 with 5–8 *av*, 5–6 strong and a few fine (in the holotype) or 7–8 strong (in the paratype) *ad* (not uniform in length), 6–7 *pd* (not uniform in length) and numerous (20–25) *pv* irregularly rowed and becoming shorter towards apex of the tibia. Wings with costal thorns vestigial and hardly distinguishable from costal setulae; costa bare ventrally; *m-m* more or less oblique and slightly or hardly sinuate.

♀. Unknown.

Distribution. Japan.

From *floralis* and *platura*, or from any other known species which have numerous *pv* on t_3, the present new species is readily distinguished by the polished haustellar mentum, the duplicated *ph*, the long *pra* and the absence of *av* and *ad* on t_2.

*9. *Delia criniventris* (Zetterstedt)
(Figs. 415–419)

Anthomyza criniventris Zetterstedt, 1860:6268. *Hylemyia criniventris*: Séguy, 1923a: 94. *Delia criniventris*: Ringdahl, 1959:281.

Material examined. HOKKAIDÔ — Sarobetsu, 1♂, 18-viii-69 (T. Nakashima).

♂. Body-length 6 mm. Legs blackish or dark brownish. Frons more or less wider than anterior ocellus; interfrontalia about half as wide as anterior ocellus, with a pair of strong *if*, and in the present specimen with a pair of additional *if* above the strong *if*; A_3 about twice as long as wide; arista distinctly pubescent, the longest hairs being about twice as long as basal diameter of arista; profrons about as wide as A_3-width; cheeks about 1.2 times as high as A_3-width; epistoma behind frons at lunule; occiput with some setulae on upper part below postocular row of setulae.

Mesonotum with 3 pairs of *pre acr*, the rows being more or less closer together than to *dc*; *ph* not duplicated; *pra* more or less shorter than posterior *ntpl*; *stpl* 1:2.

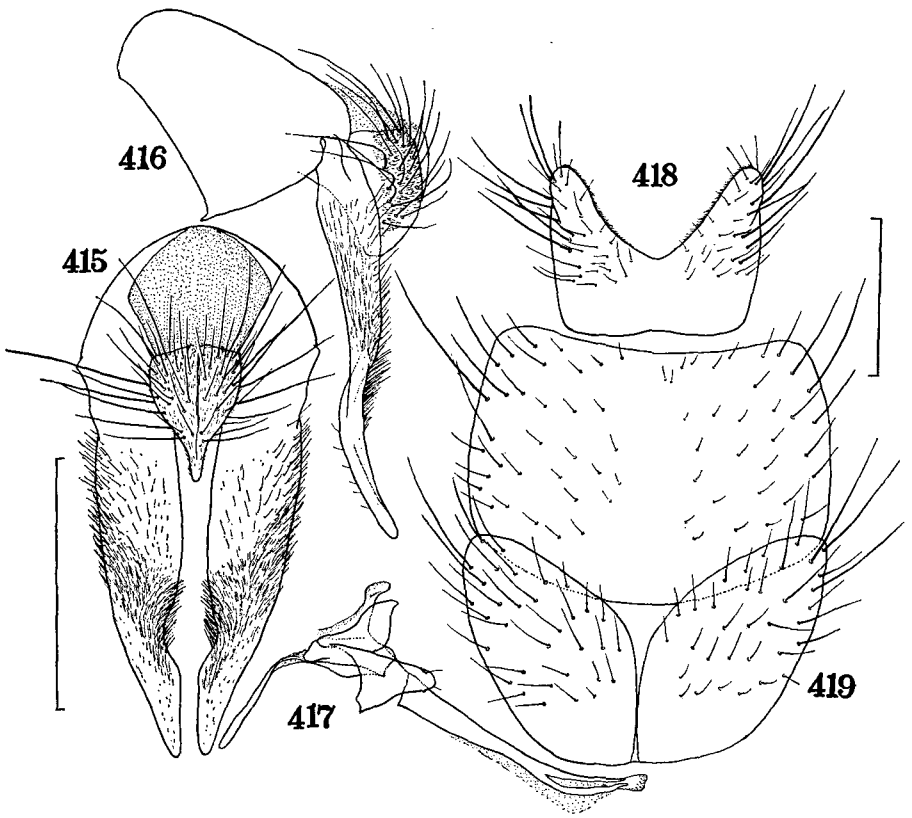
Abdomen on 3rd tergite caudo-laterally with 4 or 7 conspicuously long setae, which are prolonged caudad beyond abdominal terminalia; prebasal sclerite with a row of distinct setae on hind margin; 3rd to 5th sternites and hypopygium as in Figs. 415–419.

Fore tibia with 1 *ad* and 2 *pv*, apical *pv* lacking; t_2 with 1 *ad*, 1 *pd* and 2 *pv*, apical *d* being short; f_3 with no *pv* except for a few ones near apex; t_3 with 2 *av*, 4 *ad*, 3 *pd* and 1–2 *pv*; mid tarsus with 2nd segment swollen at base ventrally; fore tarsus with 1st segment about as long as 2nd to 4th segments combined; mid tarsus with 1st segment only a little shorter than 2nd to 4th segments combined; hind tarsus with 1st segment about as long as 2nd to 4th segments combined.

♀. Unknown to me.

Distribution. Japan; Europe.

Having compared the present specimen with an authentic European one (♂, Estonia) determined as *criniventris* by Elberg I have found some differences between them. The European specimen has the following aspects: — Legs more or less yellowish on t_3; profrons a little wider than A_3; cheeks about 1.5 times as high as A_3-width; abdomen with more than 10 conspicuously long setae on each lateral side of 3rd tergite; 3rd sternite not divided into plates and with some long setae caudo-laterally; prebasal sclerite with no setae; t_3 with 3 *av*; mid tarsus with 2nd segment only a little swollen at base ventrally; fore tarsus with 1st segment more or less longer than 2nd to 4th segments combined; mid tarsus with 1st segment about as long as 2nd to 4th segments combined; hind tarsus with 1st segment slightly shorter than 2nd to 4th segments combined. The divided 3rd sternite and the setose prebasal sclerite of the Japanese specimen at hand are remarkable and may be enough to separate the Japanese form from *criniventris* as a good species, provided their conditions are normal. Due to the lack of sufficient material it is at present uncertain to me whether the Japanese form is a mere aberrant form of *criniventris* or a distinct species. The present identification is, therefore, tentative.

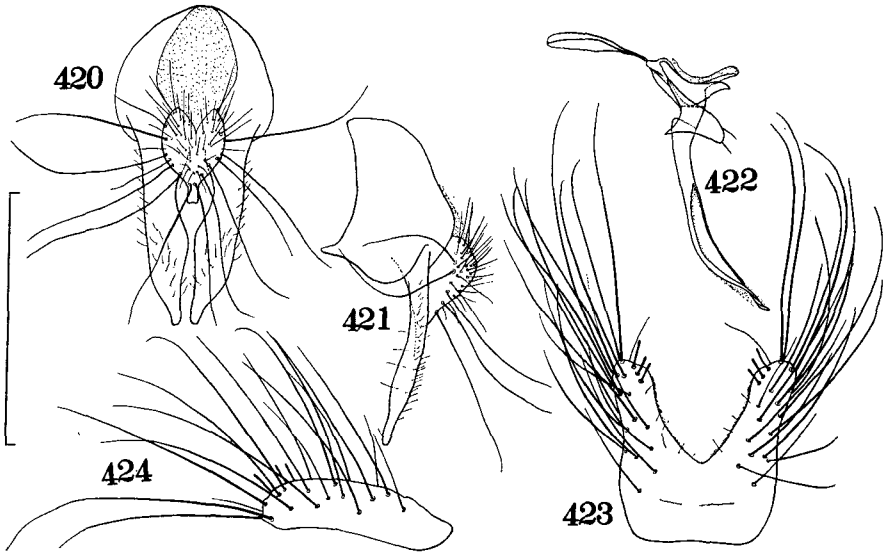


Figs. 415–419. *Delia criniventris* (Zetterstedt), ♂: 415, hypopygium, dorsal view; 416, *ditto*, lateral view; 417, aedeagus; 418, 5th sternite, ventral view; 419, 3rd (lower) and 4th (upper) sternites, ventral view.

10. *Delia echinopyga* sp. nov.
(Figs. 420–424)

Type-material. HOKKAIDÔ — Sapporo, 1 ♂ (holotype), 8-v-68, & 1 ♂, 15-v-70.

♂. Body-length 3.6–3.9 mm; wing-length 3.3–3.5 mm. Interfrontalia in ground colour brownish and darker caudad, with whitish pollen; parafacials and cheeks dark brownish in ground colour and whitish grey in pollinosity; antennae and palpi blackish; haustellum with mentum blackish and pollinose. Thorax blackish or dark brownish in ground colour and pale grey in pollinosity, which is very faintly tinged with brown; mesonotum when viewed from behind with rather distinct median vitta and lateral patches and in some lights with paramedian vittae along rows of *dc*. Abdomen blackish or dark brownish in ground colour, thinly bluish grey pollinose; median vitta broad and not sharp; fore marginal bands narrow and faint. Legs dark brownish. Wings with a tinge brownish, strongly at base; calyptrae pale, and very faintly tinged with reddish yellow; halteres dark brownish at base, and pale yellow at knob.



Figs. 420–424. *Delia echinopyga* sp. nov., ♂: 420, hypopygium, dorsal view; 421, *ditto*, lateral view; 422, aedeagus; 423, 5th sternite, ventral view; 424, *ditto*, lateral view.

Frons about as wide as anterior ocellus; interfrontalia linear caudad, about as wide as parafrontalia, and with a pair of fine or rather distinct *if*; parafrontals with 3–4 *ori* and no *ors*; A_3 about 1.5–1.6 times as long as wide; arista minutely pubescent, with hairs much shorter than basal diameter of arista; profrons slightly narrower than A_3; cheeks about as high as A_3-width, with genal setae in 1 row; epistoma behind frons at lunule; occiput with no setulae on upper part below postocular row of setulae.

Mesonotum with 3 pairs of *pre acr*, the middle pair being strong, and with no accessory setulae between the rows, which are separated from each other by a

distance about half of that between *dc* and *acr*; 2nd *ph* more or less longer than accessory setulae though fine; *pra* about as long as posterior *ntpl*; notopleura with no accessory setulae; mesopleura with no distinct anterior *mpl*, and with 1 strong and 1 weaker *pstg* (the weaker one is indistinguishable from associated setulae in the paratype) and 1 (in the holotype) or 3–4 (in the paratype) associated setulae; *stpl* 1: 2; scutellum with no accessory setulae on dorsal surface.

Abdomen depressed, nearly parallel-sided, and about 2.6 times as long as wide; 5th sternite and hypopygium as in Figs. 420–424.

Fore tibia with 1 *pv* and no *ad*, and with only 1 strong apical seta (*d*); f_2 near base with some (4–5) short and rather fine *av*, and on basal two-thirds with a row of about 10 strong *pv*, the longest one about 1.5 times as long as height of the femur; t_2 with 2 *pd* and 2 *pv*, and without *av* or *ad*; f_3 with a row of *av* becoming longer towards apex of the femur, the longest one about 1.5 times as long as height of the femur, and with no distinct *pv* except for a few ones near apex; t_3 with 3–4 *av*, 4–5 *ad*, 3 *pd* and 2–5 *pv*, apical *pd* being distinct or rather strong, about as long as apical *ad*; mid metatarsus with some long setulae on dorsal surface. Wings with costal thorns minute, and distinctly (in the holotype) or hardly (in the paratype) distinguishable from costal setulae; costa bare ventrally; *m-m* slightly or hardly oblique and nearly straight.

♀. Unknown.

Distribution. Japan.

At first sight this species resembles the following *Delia takizawai* sp. nov., from which it can, however, be readily distinguished by the 5th sternite with many conspicuously long setae and by the absence of *ad* on t_2.

11. *Delia takizawai* sp. nov.
(Figs. 425–428)

Type-material. HOKKAIDÔ — Sapporo, 1♂ (holotype), 15-v-70, & 53♂♂, 4♀♀, 8-v–19-vi-59–70 (S. Takagi, S. Ueda & M. Suwa); Nopporo, 47♂♂, 18♀♀, 6-v–2-vi-66–70; Jôzankei, 3♂♂, 10-vi-66; Mt. Soranuma, 2♂♂, 27-v-66; Shikotsu-ko, 8♂♂, 1♀, 18-v-71; Eniwa, 2♂♂, 25-v-66, & 3♂♂, 27-v-71; Yamabe, 1♂, 25-v-68 (M. Suzuki); Mt. Shokambetsu, 1♂, 1-vii-71. HONSHÛ — Takao-san, Tôkyô-to, 1♂, 4-iv-69, & 1♂, 11-v-71 (T. Kocha); Mitake-san, Tôkyô-to, 1♂, 4-v-68 (H. Takizawa); Mt. Tanzawa, Kanagawa-ken, 3♂♂, 29-iv-70 (H. Takizawa). KYÛSHÛ — Fukuoka, 1♂, 2♀♀, 17-iv-67.

♂. Body-length 3.5–4.4 mm; wing-length 3.1–3.7 mm. Interfrontalia brownish to blackish in ground colour and whitish grey in pollinosity; parafacials blackish or sometimes brownish in ground colour, and silvery white in pollinosity; cheeks blackish or sometimes brownish in ground colour, with whitish grey pollen; antennae and palpi blackish; haustellum with mentum blackish and pollinose. Thorax in ground colour blackish, and in pollinosity bluish grey and usually more or less tinged with brown especially on mesonotum; mesonotum with brownish pollinose vittae between rows of *acr* and along rows of *dc* and *ia*, and when viewed from behind with dark vittae between rows of *acr* and along rows of *dc* and with dark patches on lateral sides, these markings being usually distinct; scutellum largely brownish pollinose. Abdomen blackish in ground colour, and bluish grey in pollinosity except on hypopygium which is brownish pollinose; median vitta broad and

sharp, brownish pollinose; fore marginal bands narrow or rather broad and sharp, brownish pollinose. Legs dark brownish to blackish. Wings with a dark brownish tinge, at base blackish; calyptrae whitish, at most very faintly tinged with yellow or brown on margin; halteres yellow at knob.

Frons usually about as wide as anterior ocellus; interfrontalia linear caudad, with *if* fine or rather distinct; parafrontals with 3–5 *ori* and no *ors*; A_3 about 1.5–1.8 times as long as wide; arista minutely pubescent; profrons as wide as or a little narrower than A_3; parafacials narrowing ventrad; cheeks as high as or slightly higher than A_3-width, with genal setae in 1 row; epistoma behind frons at lunule; occiput bare on upper part below postocular row of setulae; palpi and haustellum not lengthened.

Mesonotum usually with 2–3 pairs of *pre acr*, setae of the 2nd pair being strong, and with no accessory setulae between the rows, which are more or less closer together than to *dc*; 2nd *ph* fine, usually indistinguishable from accessory setulae; *pra* at least as long as posterior *ntpl*, sometimes longer than anterior *ntpl*; notopleura with no accessory setulae; mesopleura with no distinct anterior *mpl*, and with 1 strong and 1–2 (rarely 3) fine *pstg*; *stpl* 1:2 or 1:3; scutellum with no accessory setulae on dorsal surface.

Abdomen depressed except on rather developed hypopygium, about 1.9–2.3 times as long as wide, and loosely narrowing caudad; prebasal sclerite exposed and with no setae or setulae; 5th sternite (Fig. 428) on each process with 3–4 blunt setae at inner margin near apex and with 1 pointed seta at apex; cercal plate (Fig. 425) with more than 10 conspicuously long setae on apical half.

Fore tibia with 1 *pv* and no *ad*, and with strong apical *pd* and rather strong apical *pv*; f_2 on basal half with some rather distinct *av*, which are shorter than height of the femur, and on basal two-thirds with a row of distinct *pv*, the longest one being as long as or a little longer than height of the femur; t_2 with 1 *ad*, 2 *pd* and 2–4 (usually 2) *pv*; f_3 on apical two-thirds with a row of about 10 *av* becoming longer towards apex of the femur, the longest one about 1.5 times as long as height of the femur, and on middle half with some (4–7) *pv* which are much shorter than height of the femur although not very weak; t_3 with 3–7 (usually 3–4) *av*, 4–5 *ad*, 3–4 (usually 3) *pd* and 4–10 *pv*, apical *pd* being strong. Wings with costal thorns minute though distinguishable from costal setulae; costa not haired on ventral surface; *m-m* nearly erect and hardly sinuate.

♀. Body covered with pollen less bluish than in male; abdomen with median vitta obscure. Wings paler than in male, not blackish at base.

Frons more or less wider than one-third head-width; interfrontalia twice or a little more as wide as parafrontalia, with *if* strong; parafrontals with 2–3 *ori* and 3 *ors*. *Stpl* 1:2. Fore tibia with 1 *ad* and 1 *pv*; f_2 with no *av* and a few *pv* near base; t_2 with 1 (rarely 2) *av*; f_3 with 5–6 *av* on apical half and with no *pv* except near apex; t_3 usually with no *pv*. Wings with costal thorns distinct.

Distribution. Japan.

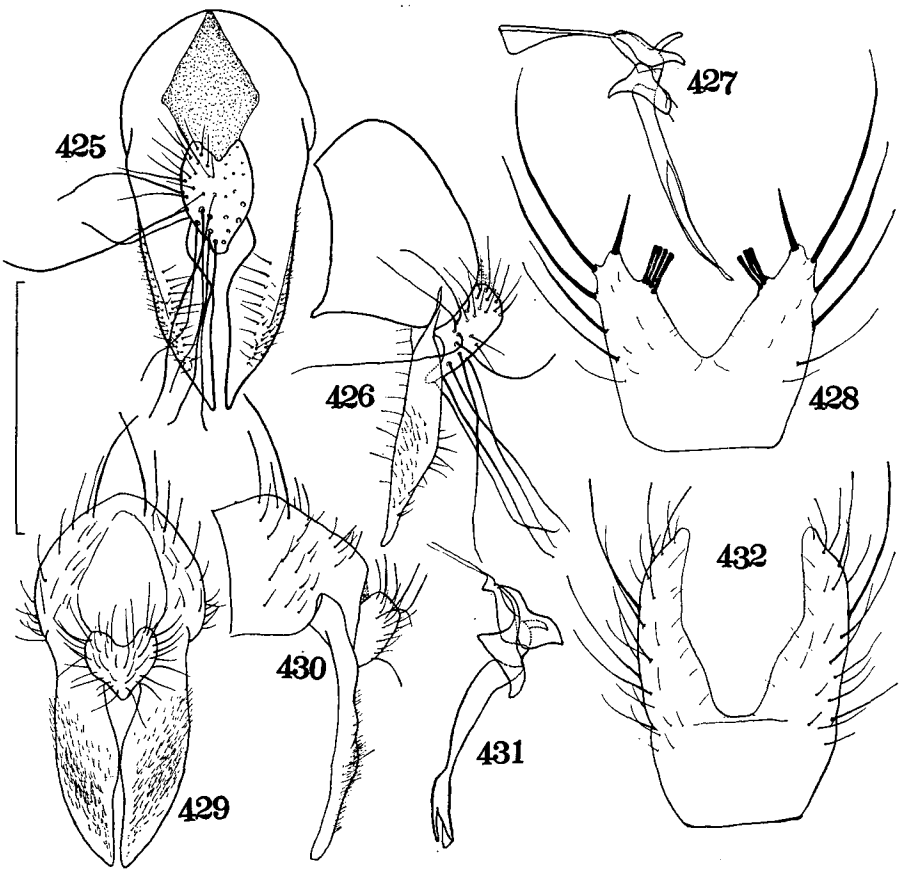
In having blunt setae on the male 5th sternite and having conspicuously long setae on the cercal plate of the male hypopygium this new species may closely be related to the North American *Delia frontulenta* (Huckett, 1929) and *Delia canadensis* (Huckett, 1929), from which it can, however, be readily distinguished by the smaller body, shorter aristal hairs, longer *pra* and presence of a strong seta at apex of each process of the male 5th sternite. The Nepalese *Delia coei* Ackland,

1967 has the 5th sternite of the male similar to that of *takizawai*; however, the former is readily distinguishable from the latter by the strong and blunt apical *pv* on the male t_1 and presence of numerous *av* and *pv* on the male t_3. Judging from the hypopygium of the male *D. coei* may be closer to *Delia longitheca* sp. nov. described hereinafter rather than to the present species.

*12. *Delia tristriata* (Stein)
(Figs. 429–432)

Hylemyia tristriata Stein, 1900:310. *Hylemyia* (*Delia*) *tristriata*: Tiensuu, 1935:26. *Delia tristriata*: Ringdahl, 1959:289.

Material examined. HOKKAIDÔ — Sapporo, 1♂, 27-v-59 (S. Ueda); Eniwa, 46♂♂, 11♀♀, 25-v-66, & 72♂♂, 19♀♀, 27-v-71; Mt. Apoi, 1♂, 28-vi-67; Kushiro, 1♂, 16-vii-66; Shari, 7♂♂, 21-viii-68 (H. Torikura); Toyotomi, 1♂, 20-vi-61 (Y. Nishijima).



Figs. 425–428. *Delia takizawai* sp. nov., ♂: 425, hypopygium, dorsal view; 426, *ditto*, lateral view; 427, aedeagus; 428, 5th sternite, ventral view.
Figs. 429–432. *Delia tristriata* (Stein), ♂: 429, hypopygium, dorsal view; 430, *ditto*, lateral view; 431, aedeagus; 432, 5th sternite, ventral view.

♂. Body-length 4.3–5.8 mm. Mesonotum with median vitta and lateral patches moderate or broad, and often with paramedian vittae along rows of *pre dc*.

Frons about 1.5–2 times as wide as anterior ocellus; arista distinctly pubescent, the longest hairs being twice or a little more as long as basal diameter of arista; occiput usually with a few or some setulae on upper part below postocular row of setulae. Mesonotum with *pra* at least as long as anterior *ntpl*; notopleura usually with one to some accessory setulae. Abdomen on anterior half of 3rd sternite with many long setae directed caudo-ventrad.

Fore tibia with 1 *ad* and 1–3 (usually 1) *pv*, apical *pv* being distinct or rather strong; f_3 with no *pv* except near apex. Wings with costal thorns strong.

♀. Fore tibia with 3 strong apical setae (*d*, *pd* and *pv*); t_2 with 1 *av*, 1–2 *ad*, 1–2 *pd* and 2–3 (usually 2) *pv*; t_3 with no *pv*. Wings with costal thorns very strong; costal setulae prominent and semierect.

Distribution. Japan; Europe.

Having compared the present Japanese specimens with an authentic European one (♂, Estonia) determined as *tristriata* by Elberg I have found no serious differences except in the wings, which are more darkened in the European form.

13. *Delia pilicerca* sp. nov.
(Figs. 433–436)

Type-material. HONSHŪ — Mt. Daibosatsu, Yamanashi-ken, 1♂ (holotype), 4♀♀, 6-viii-69.

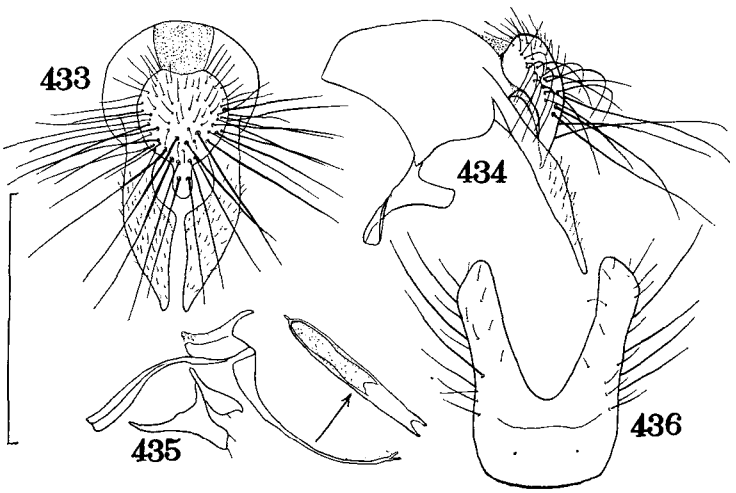
♂. Body-length 4.4 mm; wing-length 4.2 mm. Body including appendages black or blackish in ground colour. Interfrontalia and cheeks whitish grey pollinose; parafacials silvery grey pollinose; haustellum with mentum pollinose. Thorax on pleura and humeral calli with whitish grey and a little bluish pollen; mesonotum rather thinly brownish grey pollinose and shining in some lights, when viewed from behind with median vitta broadening caudad and with broad lateral patches. Abdomen very thinly whitish grey pollinose and lustrous, hardly vittate. Wings strongly tinged with brown, darker basad; calyptrae pale yellow; halteres reddish brown at base, yellowish at knob.

Frons about as wide as anterior ocellus; interfrontalia about one-third as wide as frons, with a pair of rather fine *if*; parafrontals with 4 *ori* and no *ors*; A_3 about 2.2 times as long as wide; arista distinctly pubescent, the longest hairs being more than twice as long as basal diameter of arista; profrons slightly wider than A_3; cheeks slightly higher than A_3-width, with genal setae in a row; epistoma behind frons at lunule; occiput with no setulae on upper part below postocular row of setulae; palpi shorter than A_2 and A_3 combined; haustellum with mentum about as long as palpi.

Mesonotum very sparsely setulose; 2 pairs of *pre acr* present, setae of the 2nd pair being strong, 2 accessory setulae being present between the rows, which are more or less closer together than to *dc*; 3 pairs of fine *post acr* present, at most *prsc acr* of them being rather distinct; *pra* more or less longer than anterior *ntpl*; notopleura with no accessory setulae; mesopleura with no distinct anterior *mpl*, and with 1 strong *pstg* and 4 fine associated setulae; *stpl* 1:2; scutellum with no accessory setulae on dorsal surface. Abdomen depressed, nearly parallel-sided,

and a little longer than twice the width.

Fore tibia with 1 *pv* and no *ad*, apical *pv* being strong and pointed apically; f_2 with no distinct *av*, and near base with 2 *pv* slightly longer than height of the femur; t_2 with 1 *ad*, 2 *pd* and 1 *pv*, and with no *av*; f_3 with a row of *av* becoming longer towards apex of the femur, proximal ones being fine, the longest one about 1.5 times as long as height of the femur, and with no *pv* except 1–2 preapical ones; t_3 with 2–3 *av*, 4–5 *ad*, 3 *pd* and 5–6 *pv*, apical *pd* being weak. Wings with costal thorns minute and hardly distinguishable from costal setulae; *m-m* nearly erect and straight.



Figs. 433–436. *Delia pilicerca* sp. nov., ♂: 433, hypopygium, dorsal view; 434, *ditto*, lateral view; 435, aedeagus; 436, 5th sternite, ventral view.

♀. Body-length 4.7–5.3 mm; wing-length 4.1–4.7 mm. Interfrontalia brownish on lower part and darkening caudad, blackish near ocellar triangle; parafacials and cheeks dark brownish in ground colour; palpi dark brownish. Legs dark brownish. Wings tinged with pale yellow on basal half and clouded on apical half.

Frons about one-third as wide as head; interfrontalia with *if* distinct; parafrontals with 2–3 *ori*, and with 1 proclinate and 1–2 reclinate *ors*, the upper reclinate being shorter than the lower and vestigial or strong; profrons about 1.2–1.3 times as wide as A_3. Mesonotum with a few or some pairs of fine *pre acr*; mesopleura with 1 strong *pstg* and 0–2 fine associated setulae. Abdomen long-ovoid, with marginal setae not very strong.

Fore tibia with 1 *ad* and 1 *pv*, apical *pd* being rather distinct to strong; f_2 with 1–2 fine *pv* near base; t_2 with 1–2 (usually 1) *av*, 1 *ad*, 2 *pd* and 2–3 (usually 2) *pv*; f_3 on apical half to two-thirds with 4–6 *av*; t_3 with no *pv*. Wings with costal setulae rather prominent and semierect, and with costal thorns more or less stronger than the costal setulae.

Distribution. Japan.

This species runs out in a key to the North American species of *Delia* given

by Huckett (1965a) with *Delia augusta* (Huckett, 1965), from which it can, however, be readily distinguished by the following aspects: — Arista with longer hairs; t_1 with apical *pv* not blunt; wings of the male with minute costal thorns; 5th sternite and hypopygium of the male different in shape.

14. *Delia longitheca* sp. nov.
(Figs. 9 & 437–440)

Type-material. HOKKAIDÔ — Mt. Soranuma, 40♂♂ (one the holotype, 17-vi-67), 25♀♀; Sapporo, 11♀♀; Jôzankei, 1♂; Shikotsu-ko, 3♂♂, 6♀♀; Rebun-tô, 1♀; Rishiri-tô, 4♂♂, 1♀; Toyotomi, 2♂♂, 3♀♀; Toikambetsu, 2♀♀; Horokanai, 1♂; Kumaneshiri, 1♀; Mt. Daisetsu, 2♀♀; Mt. Yûbari, 1♂, 1♀; Shikaribetsu-ko, 1♂, 3♀♀; Kushiro, 1♂; Akkeshi, 1♂, 1♀; Nemuro, 2♂♂, 1♀; Mt. Rausu, 2♂♂, 3♀♀; Abashiri, 1♂; Mt. Kariba, 4♂♂, 4♀♀; Mt. Sengen, 1♀. HONSHÛ — Mt. Hakkôda, Aomori-ken, 1♂; Mt. Hayachine, Iwate-ken, 11♂♂, 3♀♀; Mt. Chôkai, Mt. Asahi & Mt. Zaô, Yamagata-ken, 5♂♂, 7♀♀; Sado, Mt. Sumon & Mt. Naeba, Niigata-ken, 6♂♂, 4♀♀; Mt. Bandai, Fukushima-ken, 12♂♂, 6♀♀; Tairampyô, Gumma-ken, 1♂, 1♀; Mt. Mitake & Mt. Kawanori, Tôkyô-to, 4♂♂, 2♀♀; Nikkô, Tochigi-ken, 16♀♀; Masutomi & Mt. Daibosatsu, Yamanashi-ken, 6♂♂, 8♀♀; Mt. Yatsugatake, Mt. Kiso-Komagatake, Mt. Senjô, Mt. Hodaka & Mt. Chôgatake, Nagano-ken, 52♂♂, 31♀♀. SHIKOKU — Mt. Mimune, 15♂♂, 5♀♀; Mt. Ishizuchi, 5♂♂, 1♀. KYÛSHÛ — Mt. Kirishima, 2♂♂.

♂. Body-length 5.7–8.7 mm; wing-length 5.3–7.5 mm. Interfrontalia in ground colour brownish or yellowish near lunule or on lower half, sometimes wholly brownish or blackish, and with whitish pollen; parafacials and cheeks in ground colour black, sometimes partly or wholly brownish or orange yellow, and in pollinosity silvery grey to whitish yellow; occiput in ground colour black, in pollinosity bluish grey and more or less tinged with brown; antennae blackish; palpi blackish or dark brownish, often more or less brownish at base; haustellum with mentum blackish and distinctly pollinose. Thorax blackish in ground colour and pale greyish or bluish grey in pollinosity, which is dense and more or less tinged with brown or brownish yellow on pleura, and rather thin and rather distinctly tinged with brown on mesonotum, or sometimes mainly bluish grey and hardly tinged with brown except on vittae on mesonotum; mesonotum variously darkened according to the point of view, with moderate or rather broad median and broad lateral vittae, which are distinct when viewed from behind, more or less obscured when viewed from front, and brownish pollinose in some lights; scutellum brownish pollinose dorsally. Abdomen blackish in ground colour and bluish grey in pollinosity, which is usually more or less tinged with brown or yellow; median vitta moderate in width, more or less dilated anteriorly on each tergite and often triangulate; fore marginal bands narrow and sharp, sometimes lacking; these markings brownish pollinose; hypopygium rather thinly brownish grey pollinose. Legs blackish or sometimes dark brownish. Wings with a brownish yellow tinge, strongly yellow at base; calyptrae yellow; halteres yellow at knob.

Head about 1.2–1.25 times as high as long; frons more or less wider or sometimes slightly narrower than anterior ocellus; interfrontalia slightly or distinctly narrower than anterior ocellus, yet not interrupted, with *if* fine; parafrontals with 3–6 strong *ori* and no *ors*; A_3 about 1.9–2.4 times as long as wide; arista distinctly

pubescent, the longest hairs being twice or a little more as long as basal diameter of arista; profrons slightly or distinctly wider than A_3, usually about 1.3–1.4 times so; parafacials slightly narrowing ventrad, at the narrowest part usually more or less wider than A_3; cheeks slightly less high than profrons-width, with genal setae in 2 (sometimes 1) rows; face distinctly concave near epistoma, which is more or less projecting forwards beyond frons at lunule; occiput bare on upper part below postocular row of setulae; palpi slender, about as long as A_2 and A_3 combined; haustellum slender, with mentum much longer than palpi.

Mesonotum very sparsely setulose, and with 1 to some fine *pre acr* and/or 1–2 (rarely 3) strong ones, or without any *pre acr*, if present the setae are regularly or irregularly paired and the rows are much closer together than to *dc*; apart from strong *prsc acr* 1 or a few *post acr* present, usually weak and regularly or irregularly paired; notopleura with no accessory setulae; mesopleura with no distinct anterior *mpl*, and with 1 strong and 1 weaker *pstg* and a few or some fine associated setulae; *stpl* 1:3, the lowest posterior being indistinguishable from accessory setulae in smaller specimens; scutellum on dorsal surface hardly setulose, at most with a few setulae near lateral margin; *pra* more or less longer than anterior *ntpl*.

Abdomen depressed, nearly parallel-sided and about 2.3–2.7 times as long as wide; prebasal sclerite exposed and bare; 5th sternite (Fig. 440) on each process with 2 (sometimes 1 or 3) blunt setae at inner margin and 1 more or less blunt seta at apex; hypopygium and aedeagus as in Figs. 437–439.

Fore tibia with 1 *pv* and no *ad*, apical *pd* being vestigial, apical *pv* strong and blunt apically; f_2 with no distinct *av*, and on basal half to two-thirds with some strong *pv*, the longest one being about 1.3–1.8 times as long as height of the femur; t_2 with 1 (sometimes none) *av*, 1 (often none and sometimes 2) *ad*, 1 (sometimes 2 or none) *pd* and 2 (sometimes 1) *pv*; f_3 except near base with some strong *av*, the longest one being about 1.3–1.8 times as long as height of the femur, and apart from a few strong preapical and 1 weak basal *pv*, near middle usually with 1 or a few *pv* which are rather strong although at most as long as height of the femur; t_3 with some to about 10 *av*, 3–4 strong, some weaker and often some fine *ad*, 3–4 strong and some weaker *pd* and about 10 (sometimes about 5) *pv*, apical *pd* being weak; mid metatarsus with dorsal setulae variable in length from one extreme like accessory setulae to the other, in which they are much lengthened and as long as half of the metatarsus. Wings with costal thorns rather strong or minute; *m-m* oblique and more or less sinuate; costa very sparsely haired ventrally.

♀. Interfrontalia yellow or brown on lower part and blackish on the upper; parafacials and cheeks in ground colour yellow or brown, sometimes partly and rarely wholly blackish, and in pollinosity yellow, paler on cheeks. Thorax densely covered with yellowish grey pollen, which is hardly or slightly tinged with brown; mesonotum not darkened in any lights, with brownish pollinose vittae between rows of *acr* and along rows of *dc* and *ia*, the median vitta being always distinct, yet the paramedian and lateral ones are sometimes faint or indiscernible. Abdomen rather thinly covered with greyish pollen, which is more or less tinged with brown or yellow, hardly vittate, and with dark reflections in some lights. Wings more yellowish than in male.

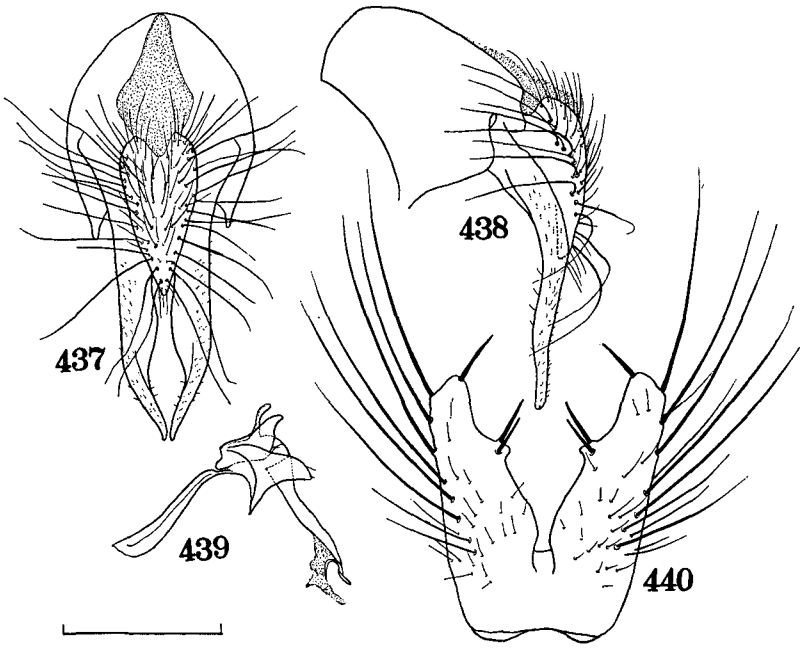
Head only a little higher than the length, about 1.1 times so; frons as wide as or slightly wider than one-third head-width; parafrontals with 2–4 *ori* and 3 (sometimes 2) *ors*; cheeks with genal setae fewer and weaker than in male and usually

in a row. Thorax with *stpl* 1:2.

Fore tibia with 1–2 (usually 2) *ad*, 1–2 (usually 1) *pd* and 1 *pv*, apical *pv* being strong and pointed apically; f_2 often with 1 or a few strong *av* near base; t_2 with 1 *av*, 2 *ad*, 2 *pd* and 2 *pv*; f_3 with setae fewer and shorter than in male; t_3 with *pv* weaker than in male. Wings with costal thorns strong; costal setulae prominent; *m-m* slightly oblique and hardly or rather distinctly sinuate.

Distribution. Japan.

Judging from the arrangement of spine-like setae on the male 5th sternite, the structure of the male hypopygium and the blunt apical *pv* on t_1 of the male the present species may be closely related to the Nepalese *Delia coei* Ackland, 1967. However, *D. longitheca* can be readily distinguished from the latter by the following aspects: — Body much larger in size; haustellum with mentum slender and distinctly pollinose; *pra* longer than anterior *ntpl*; t_2 with *av* present usually in male and always in female; 5th sternite of the male on each process at apex with only 1 spine-like seta.



Figs. 437–440. *Delia longitheca* sp. nov., ♂: 437, hypopygium, dorsal view; 438, *ditto*, lateral view; 439, aedeagus; 440, 5th sternite, ventral view.

*15. *Delia conversata* (Tiensuu)
(Figs. 441–444)

Hylemyia (*Leptohylemyia*) *conversata* Tiensuu, 1935:23. *Leptohylemyia conversata*: Ringdahl, 1959:275.

Material examined. HOKKAIDÔ — Mt. Soranuma, 1♂, 1-viii-68; Rishiri-tô, 2♂♂, 14-vii-68 (H. Takizawa), & 2♂♂, 31-vii-69; Toyotomi, 3♂♂, 2♀♀, 10-vii-68; Toikambetsu, 3♂♂, 31-vii-66; Kunneppu, 1♀, 25-vii-66; Mt. Rausu, 1♂, 15-viii-69

(H. Takizawa); Kawayu, 1♂, 22-vii-66; Daikoku-jima, 4♂♂, 19-vii-66; Kushiro, 1♂, 1♀, 17-vii-66; Obihiro, 2♂♂, 1♀, 15-vii-66; Mt. Apoi, 1♀, 28-vi-67; Mt. Niseko, 1♂, 5♀♀, 13-ix-66. HONSHÛ — Mt. Chôkai, Yamagata-ken, 32♂♂, 1♀, 9-viii-70; Mt. Hôô, Yamanashi-ken, 1♂, 15-ix-70 (H. Takizawa); Mt. Kiso-Komagatake, Nagano-ken, 20♂♂, 27–29-vii-70; Mt. Shirouma, Nagano-ken, 14♂♂, 5-viii-70; Mt. Kashimayari, Nagano-ken, 1♂, 1♀, 17-viii-69 (T.Kocha); Mt. Hodaka, Nagano-ken, 4♂♂, 26–28-viii-67 (H. Higuchi), & 7♂♂, 3-viii-70.

♂. Body-length 4.3–5.8 mm. Thorax in pollinosity bluish grey or pale brownish grey on pleura, and brownish on mesonotum and scutellum. Abdomen in pollinosity pale grey and more or less tinged with brown or yellow, with distinct median vitta and fore marginal bands. Legs blackish. Wings tinged with brown or brownish yellow; calyptrae whitish, with a faint yellowish tinge.

Frons usually more or less narrower than anterior ocellus; interfrontalia linear caudad; A_3 about 1.8–2 times as long as wide; arista with the longest hairs about 2–3 times as long as basal diameter of arista; profrons usually more or less narrower than A_3; cheeks a little higher than A_3-width. Mesonotum with some *pre acr*, of which a few are strong and irregularly paired, the rows being much closer together than to *dc* and often nearly contiguous to each other; *pra* shorter than posterior *ntpl*. Abdomen with 5th sternite and hypopygium as in Figs. 441–444; cercal plate with blunt apex.

Fore tibia with 1 *pv* and no *ad*, apical *pv* being very strong, blunt apically and curved upwards; f_2 on basal half with some *pv*; t_2 usually with 1 *pd*, 2 *pv* and no *ad*; f_3 with no *pv* except for 1–2 ones near apex; t_3 with 1–2 *av*, 3–5 *ad*, 3 *pd* and 1–3 (sometimes none) *pv*; mid metatarsus with some dorsal setulae more or less longer than accessory setulae. Wings with costal thorns short although distinguishable from costal setulae.

♀. Thorax and abdomen pale yellowish grey in pollinosity; abdomen with no markings. Fore tibia with 1 *ad*, 1 (sometimes 2 or none) *pd* and 1–2 *pv*, and with apical *pd* and *pv* strong and not blunt apically; t_2 with 1 *av*, 1 *ad*, 2 *pd* and 2 *pv*; t_3 with 2–3 *av*, 4–5 (usually 4) *ad*, 2–4 (usually 3) *pd* and no *pv*. Wings with costal thorns distinct or strong; costal setulae prominent.

Distribution. Japan; Scandinavia.

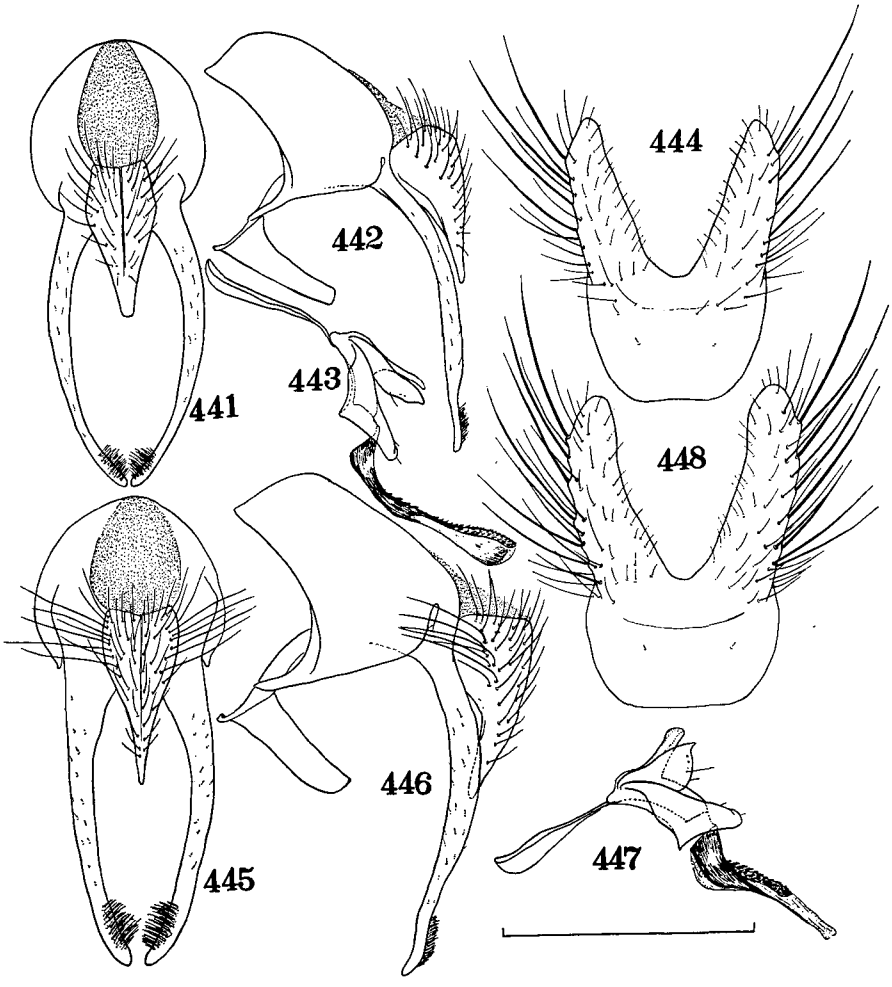
16. *Delia tenuis* sp. nov.
(Figs. 445–448)

Type-material. HOKKAIDÔ — Kitami-Esashi, 9♂♂ (one the holotype), 29-vii-69; Sarobetsu, 1♂, 10-viii-65 (T. Kocha), & 7♂♂, 12-vii-68; Moshiri, 1♂, 2-viii-66; Obihiro, 1♂, 15-vii-66.

♂. Body-length 5.4–6.5 mm; wing-length 4.9–5.8 mm. Interfrontalia in ground colour blackish, or often brownish on lower part; parafacials in ground colour blackish, often more or less brownish near lunule, and in pollinosity more or less tinged with yellow; cheeks in ground colour blackish or dark brownish; haustellum with mentum pollinose. Thorax in ground colour blackish, and in pollinosity on pleura greyish and faintly tinged with brown or yellow; mesonotum in pollinosity brownish grey and more or less yellowish, with 3 brownish pollinose vittae along rows of *acr* and *dc* though obscure or indiscernible in darker pollinose specimens, these vittae being darkened in some lights; scutellum in pollinosity

brownish yellow. Abdomen in ground colour blackish, and in pollinosity yellowish grey, with golden reflections in some lights; median vitta distinct only at anterior part on each tergite, and very narrowly prolonged caudad on 4th and 5th tergites; besides on 2nd tergite narrow fore marginal band often present on 5th tergite. Legs blackish. Wings with a yellowish tinge; calyptrae pale or rather distinctly yellowish; halteres yellow at knob.

Head about 1.3–1.4 times as high as long; frons more or less wider than anterior ocellus; interfrontalia as wide as or a little narrower than anterior ocellus, with *if* about as long as postocular setulae or ocellar setae; parafrontals with 3–5 *ori* and no *ors*; A_3 about twice as long as wide; arista shortly plumose, the longest hairs being 3–4 times as long as basal diameter of arista; profrons more or less



Figs. 441–444. *Delia conversata* (Tiensuu), ♂: 441, hypopygium, dorsal view; 442, *ditto*, lateral view; 443, aedeagus; 444, 5th sternite, ventral view.

Figs. 445–448. *Delia tenuis* sp. nov., ♂: 445, hypopygium, dorsal view; 446, *ditto*, lateral view; 447, aedeagus; 448, 5th sternite, ventral view.

wider than A_3; cheeks a little higher than profrons-width, with genal setae usually in 1 row; epistoma behind frons at lunule; occiput on upper part below postocular row of setulae usually bare, at most with 1 or a few setulae; haustellum not lengthened.

Mesonotum with a few strong and a few weak or fine *pre acr*, which are irregularly paired, the rows being nearly contiguous to each other; *pra* half to two-thirds of posterior *ntpl* in length; *stpl* 1:2, if 2:3 the lower anterior and the lowest posterior being fine; scutellum bare on dorsal centre. Abdomen depressed and nearly parallel-sided, about 2.5–3 times as long as wide; 5th sternite and hypopygium as in Figs. 445–448; cercal plate narrowly prolonged apicad; distiphallus short, strongly chitinized and armed with many spinules on dorsal side.

Fore tibia with 1–2 *pv*, and usually with no *ad* nor *pd*, apical *pv* being weak; f_2 on basal half with some (6–7 in the holotype) long *pv*, the longest one about 1.3–1.8 (in the holotype 1.8) times as long as height of the femur; t_2 with 1 *ad*, 2 *pd* and 2 *pv*; f_3 with a row of 10 or more long *av*, the longest one being 1.6–1.8 times as long as height of the femur, and on basal two-thirds with a row of 6–9 *pv* which are weaker than *av* although longer than height of the femur; t_3 with 1 or a few (1 in the holotype) *av*, 4–6 *ad*, 3–4 strong and often 1 or a few weak *pd* and 0–6 (usually 1–2) *pv*; mid metatarsus with dorsal setulae not lengthened. Wings with costal thorns rather distinct; costa very scatteringly haired on ventral surface; *m-m* hardly or slightly sinuate.

♀. Unknown.

Distribution. Japan.

This species can be readily distinguished from the preceding *conversata* by the much weaker apical *pv* on t_1 and the presence of some *pv* apart from preapical ones on f_3. Judging from the genital structures of the male this species may be closely related to the Scandinavian *D. tenuiventris* (Zetterstedt, 1860), whose genital structures are figured by Ringdahl (1959: Figs. 36 & 89, under *Leptohylemyia*). However, a few distinct differences can be seen between the two: — In *tenuiventris* surstyli in profile strongly curved near apex of cercal plate, and distiphallus rather longer and nearly straight in profile; on the other hand, in *tenuis* surstyli in profile are loosely curved near apex of cercal plate, and distiphallus is rather shorter and more or less sinuate in profile.

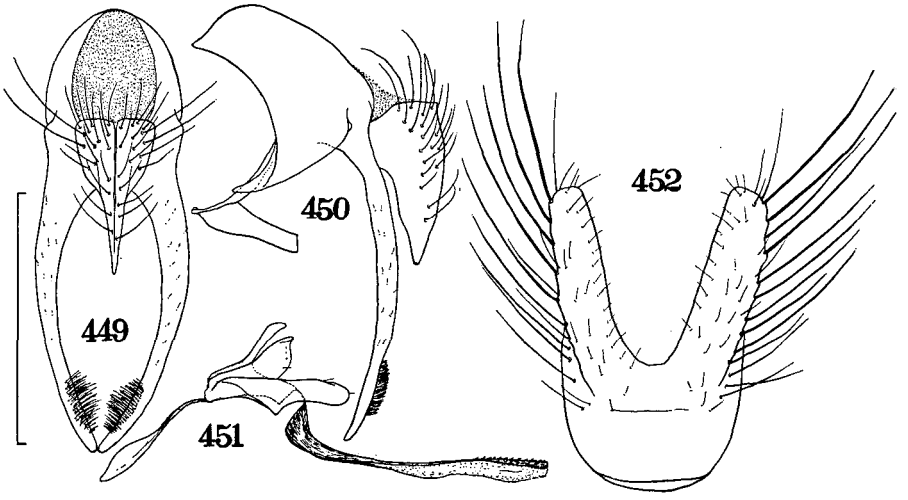
17. *Delia auricolor* sp. nov.
(Figs. 449–452)

Type-material. HONSHŪ — Mt. Daibosatsu, Yamanashi-ken, 77♂♂ (one the holotype), 34♀♀, 6-viii-69; Okukinu, Tochigi-ken, 1♂, 22-vii-69 (H. Takizawa); Mt. Kiso-Komagatake, Nagano-ken, 1♂, 25-vii-70; Mt. Shirouma, Nagano-ken, 1♂, 5-viii-70; Mt. Hodaka, Nagano-ken, 1♂, 3-viii-70.

♂. Body-length 4–5.6 mm; wing-length 4–4.9 mm. Interfrontalia in ground colour blackish or sometimes brownish; parafacials and cheeks in ground colour black or dark brown, and in pollinosity whitish grey and more or less tinged with yellow; antennae and palpi blackish or dark brownish; haustellum with mentum blackish or dark brownish and distinctly pollinose. Thorax blackish in ground colour and rather densely pollinose; pleura more or less tinged with yellow in pollinosity; mesonotum in pollinosity yellow or yellowish grey and sometimes

slightly tinged with brown, with narrow brownish pollinose vittae along rows of *dc* and often also medially, and not darkened in any lights, at most with faint dark median vitta and lateral patches when viewed from behind. Abdomen in ground colour blackish, and in pollinosity yellowish grey, with golden reflections in some lights; median vitta more or less dilated anteriorly on each tergite and usually not interrupted, at most interrupted at hind margin of 2nd tergite; fore marginal bands absent. Legs blackish or dark brownish. Wings with a yellowish tinge; calyptrae pale yellow; halteres pale yellow, at base more or less brownish.

Head about 1.3–1.4 times as high as long; frons usually more or less narrower than anterior ocellus, at most as wide as the latter; interfrontalia not interrupted though very narrow, with *if* fine; parafrontals with 3–5 *ori* and rarely with 1 vestigial *ors*; A_3 about 2–2.2 times as long as wide; arista shortly plumose, the longest hairs being nearly 4 times as long as basal diameter of arista; profrons as wide as or a little narrower than A_3; cheeks as high as or a little higher than A_3-width, with genal setae in 1 row; epistoma behind frons at lunule; occiput bare on upper part below postocular row of setulae; palpi and haustellum not lengthened.



Figs. 449–452. *Delia auricolor* sp. nov., ♂: 449, hypopygium, dorsal view; 450, *ditto*, lateral view; 451, aedeagus; 452, 5th sternite, ventral view.

Mesonotum very sparsely setulose, with a single or sometimes 2 strong *pre acr* and with a few pairs of *post acr* including a pair of *prsc* ones; *pra* shorter and weaker than posterior *ntpl*, half to two-thirds as long as the latter; mesopleura with no distinct anterior *mpl*, and with 1 strong and 0–2 fine *pstg*; *stpl* 1:3, the lowest posterior being weak; scutellum not setulose on dorsal surface. Abdomen depressed and nearly parallel-sided, about 2.7–2.9 times as long as wide; 5th sternite and hypopygium as in Figs. 449–452; cercal plate narrowly prolonged apicad; distiphallus very long and armed with spinules on apical third of dorsal side.

Fore tibia with 1 *ad* and 1 *pv*, apical *pv* being rather strong and more or less curved upwards though not blunt; f_2 near base with 1–2 *pv* longer than height of the femur; t_2 with 1 *ad*, 2 *pd* and 2 *pv*; f_3 with a row of 7 to about 10 *av*, the longest

one being 1.5 times or slightly more as long as height of the femur, and except for a few preapical ones with no *pv*, only occasionally with 1 or a few fine ones near middle; t_3 with 1 or a few *av*, 3–4 *ad*, 3 *pd* and 1 to some fine *pv*; mid metatarsus with dorsal setulae not lengthened. Wings with costal thorns minute and only a little stronger than costal setulae; costa hardly haired ventrally; *m-m* nearly erect and slightly curved inwards.

♀. Interfrontalia yellow or brown on lower half in ground colour. Abdomen densely yellowish grey pollinose and with no markings. Head about 1.1–1.2 times as high as long; frons about 0.4 times as wide as head; interfrontalia with *if* strong; parafrontals with a few *ori* and 3 (sometimes 2) *ors*; profrons and cheeks respectively in width and height nearly equal to or a little more than A_3-width. *Stpl* 1:2. Fore tibia sometimes with 1 *pd*; t_2 with or without 1 *av*; f_3 with 4–6 *av*; t_3 with no *pv*. Wings with costal thorns rather distinct, yet not so strong as in *conversata*.

Distribution. Japan.

Judging from the genital structures of the male this species may be closely related to the North American species, *Delia angustitarsis* (Malloch, 1920), from which it is, however, distinctly different in the colour pattern of the body and in the chaetotaxy of the legs.

21. Genus *Paradelia* Ringdahl

Paradelia Ringdahl, 1933:33, as subgenus of *Hylemyia*. Type-species: *Pegomyia lundbeckii* Ringdahl, 1918.

Pegomyiella Ringdahl, 1938:191, as subgenus of *Pegomyia*. Type-species: *Anthomyza lunatifrons* Zetterstedt, 1846.

This genus is represented by 2 species distributed in the Holarctic region. On this occasion will be recorded 1 species out of the two for the first time from Japan.

*1. *Paradelia lunatifrons* (Zetterstedt) (Figs. 453–457)

Anthomyza lunatifrons Zetterstedt, 1846:1708. *Pegomyia* (*Pegomyiella*) *lunatifrons*: Ringdahl, 1938:212. *Paradelia lunatifrons*: Hennig, 1972:442.

Material examined. HOKKAIDÔ — Mt. Muine, 2♂♂, 3-ix-72 (S. Aoki).

♂. Body-length 4.5–4.8 mm. Head including appendages blackish in ground colour, at most narrowly brownish on parafacials near lunule; haustellum with mentum polished. Thorax blackish in ground colour; mesonotum brownish pollinose. Abdomen in ground colour dark brownish and with blackish bands on hind margins of tergites, and in pollinosity brownish grey, with very narrow and interrupted median vitta. Legs dark brownish, at most narrowly yellowish on t_1 basally. Wings with a brownish yellow tinge; calyptrae brownish yellow; halteres yellow at knob.

Frons much narrower than anterior ocellus; parafrontals broadly contiguous to each other, with 2 strong and 0–2 fine *ori*; interfrontalia with *if* not strong though distinct; A_3 about twice as long as wide; arista minutely, and yet distinctly pubescent; profrons about two-thirds as wide as A_3; cheeks about as high as A_3-width; epistoma behind frons at lunule.

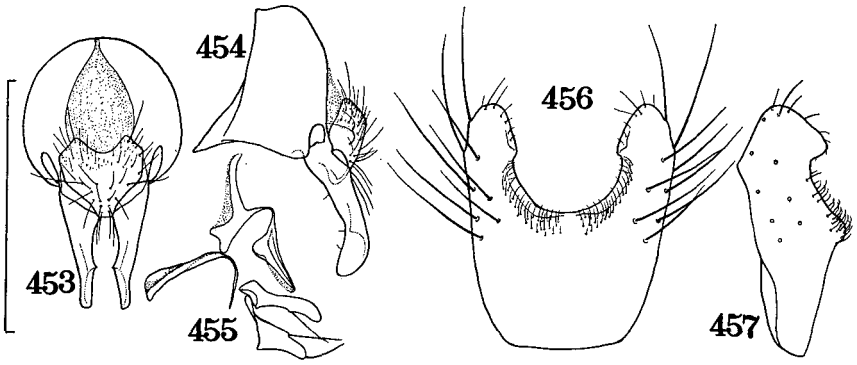
Mesonotum with 2–3 pairs of *pre acr* and with no setulae between the rows,

which are separated by a distance nearly equal to that between *dc* and *acr*; *pra* short, about half of posterior *ntpl* in length; *stpl* 1:2. Abdomen depressed only at base, elongate and 3.1–3.5 times as long as wide; 5th sternite and hypopygium as in Figs. 453–457.

Fore tibia with 1 short *ad* and with no *pv*; t_2 with 1 *pd* and with or without 1 *p–pv*; f_3 with a row of *av* becoming longer towards apex of the femur; t_3 with 1 *av*, 2 *ad* and 2 *pd*, the distal one of the *pd* being much longer than the other and about one-third of the tibial length. Wings with costal thorns minute and only a little stronger than costal setulae; *m-m* semierect and nearly straight.

♀. Unknown to me.

Distribution. Japan; Kamchatka; Europe; North America.



Figs. 453–457. *Paradelia lunatifrons* (Zetterstedt), ♂: 453, hypopygium, dorsal view; 454, *ditto*, lateral view; 455, aedeagus; 456, 5th sternite, ventral view; 457, *ditto*, lateral view.

22. Genus *Pseudonupedia* Ringdahl

Pseudonupedia Ringdahl, 1959:292. Type-species: *Anthomyia intersecta* Meigen, 1826.

This genus is a small group represented by 8 species. In the course of the present study has been found the following species from Japan.

*1. *Pseudonupedia brunneonigra* (Schnabl)
(Figs. 458–462)

Pegomyia (*Anthomyia*) *brunneonigra* Schnabl, in Schnabl & Dziedzicki, 1911:271.
Pseudonupedia brunneonigra: Ringdahl, 1959:293; Hennig, 1972:435.

Material examined. HOKKAIDÔ — Nopporo, 1♂, 17-v-70; Mt. Soranuma, 5♂♂, 11-vii-67; Shikotsu-ko, 1♂, 18-v-71.

♂. Body-length 3.6–4.7 mm. Frons narrower than anterior ocellus; parafrontals broadly contiguous to each other, with 3 *ori*, the middle one being more or less weakened, and usually with 1 vestigial *ors*; interfrontalia with *if* usually lacking, yet in 2 specimens present though fine or vestigial; A_3 about twice as long as wide; profrons two-thirds to three-fourths as wide as A_3; cheeks two-thirds to three-fourths as high as A_3-width, with genal setae in 1 row or nearly so; occiput

setulose on upper part below postocular row of setulae.

Mesonotum with 3 pairs of *pre acr* and with 1 or a few setulae between the rows; *pra* shorter than posterior *ntpl*, about 0.6 times of the latter; *ph* duplicated; notopleura with no accessory setulae; *stpl* 1:2. Abdomen depressed, about twice as long as wide; prebasal sclerite devoid of setulae and fused to basal sclerite; 5th sternite and hypopygium as in Figs. 458–462.

Fore tibia with apical *pv* much weaker than apical *d* although distinct; t_3 with 1 *av*, 3 *ad* and 2 *pd*, and with no *pv*, apical *pd* being vestigial. Wings with costal thorns minute and only a little stronger than costal setulae.

♀. Unknown to me.

Distribution. Japan; Europe.

23. Genus *Nupedia* Karl

Nudaria Karl, 1928:171, nec Haworth, 1809 (Lepidoptera), as subgenus of *Chortophila*. Type-species: (*Anthomyia dissecta* Meigen sensu Karl, 1928 et auctt.)=*Anthomyia infirma* Meigen, 1826.

Nupedia Karl, 1930:174, pro *Nudaria* Karl, 1928, as subgenus of *Chortophila*. Type-species: (*Anthomyia dissecta* auctt.)=*Anthomyia infirma* Meigen, 1826.

As pointed out by Ackland (1967) *Nupedia* may be closely related to *Pegoplata* in the following aspects: — Interfrontalia with *if* present in both sexes; parafrontals with 1 vestigial *ors* in male; haustellum with mentum pollinose; palpi broadening apicad; prebasal sclerite of male hypopygium setose[1]; 5th sternite of male more or less heart-shaped; distiphallus developed and enlarged apically, with teeth or sharp projections; t_3 with 2 *ad* and 2 *pd*. This genus, however, differs from *Pegoplata* in the following characters: — Arista not plumose; abdomen depressed; 5th sternite of male with no tufts of short setae; surstyli more simple.

According to Hennig (1968) 6 species belonging to this genus are distributed in the Palaearctic region. On this occasion the following species is recorded from Japan.

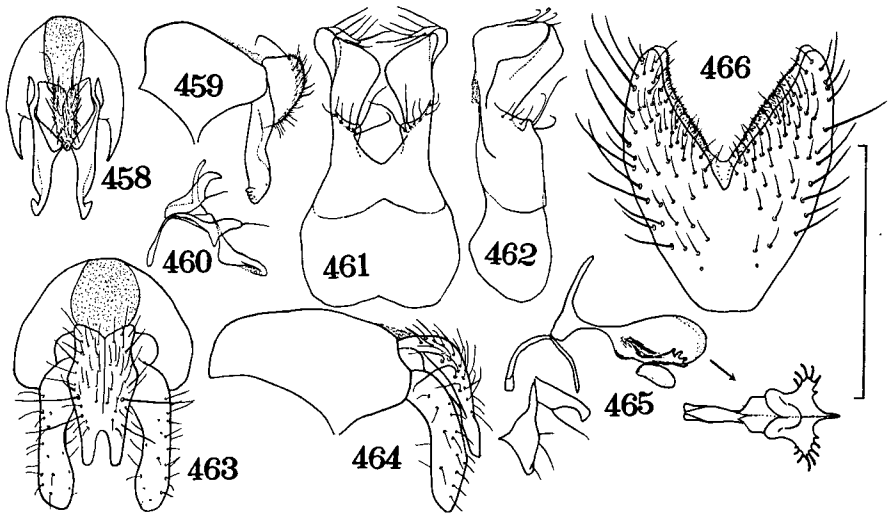
*1. *Nupedia nigroscutellata* (Stein)
(Figs. 463–466)

Chortophila nigroscutellata Stein, 1920:90. *Pegomyia nigroscutellata*: Huckett, 1941: 57. *Nupedia nigroscutellata*: Hennig, 1968:234.

Material examined. HOKKAIDÔ — Sapporo, 1♂, 15-v-59 (S. Momoi), 1♂, 1-v-68 (T. Kocha), 1♂, 2-vi-68 (K. Kusigemati), & 2♂♂, 15-v-70; Nopporo, 7♂♂, 18–25-v-66–70. HONSHÛ — Mt. Yatsugatake, Mt. Kiso-Komagatake, Mt. Chôga-take & Mt. Hodaka, Nagano-ken, 29♂♂, 18-vii–3-viii-70.

♂. Body-length 4.3–5.3 mm. Blackish in ground colour and whitish grey or bluish grey in pollinosity. Mesonotum more or less tinged with brown in pollinosity, and with broad median and lateral vittae, the median one being much broadened caudad; scutellum very faintly covered with brownish pollen, which is visible only when viewed from front in low angle. Abdomen slightly tinged with

1) According to Ackland (1967) *Pegoplata*-species differ from *Nupedia*-ones in the setose prebasal sclerite in the male. However, at least in *nigroscutellata*, which is the only species known to me, the prebasal sclerite is armed with some setae along the hind margin.



Figs. 458–462. *Pseudonupedia brunneonigra* (Schnabl), ♂: 458, hypopygium, dorsal view; 459, *ditto*, lateral view; 460, aedeagus; 461, 5th sternite, ventral view; 462, *ditto*, lateral view.

Figs. 463–466. *Nupedia nigroscutellata* (Stein), ♂: 463, hypopygium, dorsal view; 464, *ditto*, lateral view; 465, aedeagus; 466, 5th sternite, ventral view.

brown in pollinosity; median vitta broad, and interrupted at hind margins of tergites; fore marginal bands present and broad or narrow. Wings with a dark brownish tinge; calyptrae whitish, only a little yellowish marginally.

Parafrontals contiguous to each other or very narrowly separated, with 1 vestigial *ors*; A_3 usually less than twice (about 1.6–1.7 times) as long as wide; profrons two-thirds to three-fourths of A_3 in width; cheeks as high as or slightly higher than profrons-width; occiput bare on upper part below postocular row of setulae; palpi distinctly broadening apicad and blade-like.

Mesonotum with 3 pairs of *pre acr*, distance between the rows being nearly equal to that between *dc* and *acr*, and with some accessory setulae between the rows; *ph* duplicated; *pra* half to two-thirds of posterior *ntpl* in length; *stpl* 1:2 or 1:3. Abdomen with prebasal sclerite of hypopygium exposed and setose marginally.

Fore tibia with 1 *ad*, which is very minute and often indiscernible, and with 1 distinct *pv*; t_2 with 1 *ad*, 1 *pd* and 2 (rarely 1) *p–pv*; t_3 with 1 *av*, 2 *ad* and 2 *pd*, and with 3 strong apical setae (*av*, *ad* and *d*). Wings with costal thorns rather distinct.

♀. Unknown to me. According to Huckett (1941) the female differs most notably from that of allied species in having the ventral *stpl* of caudal pair relatively well developed, being longer than posterior *ntpl*.

Distribution. Japan; Europe; North America.

24. Genus *Pegoplata* Schnabl & Dziedzicki

Pegoplata Schnabl & Dziedzicki, 1911:108, as subgenus of *Pegomyia*. Type-species: (*Pegomyia* (*Pegoplata*) *palpata* Stein sensu Schnabl & Dziedzicki, 1911)=*Hydrophoria palposa* Stein, 1897.

This genus resembles *Hydrophoria* as pointed out by Hennig (1968) in having a plumose arista. The stout body and the large lower calyptra of *palposa* are shared by some members of *Hydrophoria*. Moreover, the surstyli of *virginea* and *palposa* are similar to those of the *frontata*-group of *Hydrophoria* rather than to those of *Nupedia*. Nevertheless, judging from the 5th sternite and distiphallus, *Pegoplata* may be more closely related to the latter. This genus is represented by 3 species, namely *P. virginea* (Meigen), *P. palposa* (Stein) and *P. juvenilis* (Stein), of which *virginea* and *palposa* are distributed in the Palaearctic region and *palposa* and *juvenilis* in the Nearctic region.

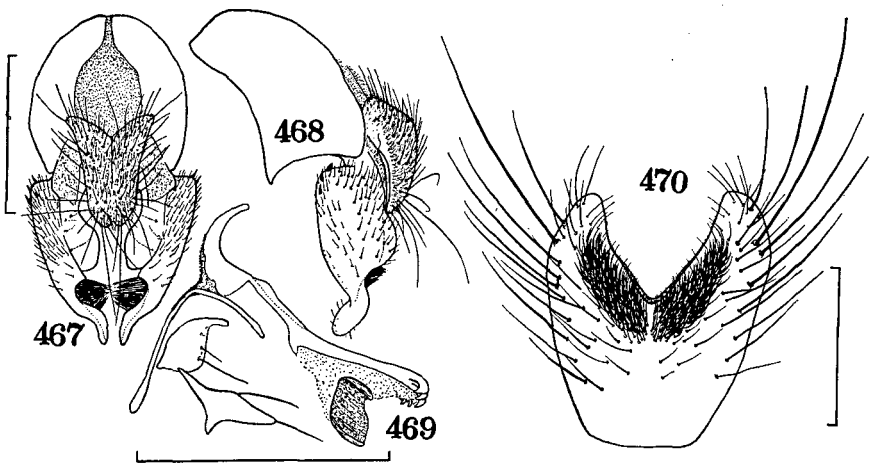
Key to the species (♂♂ & ♀♀)

1. Calyptrae strongly tinged with yellow, the lower one being much protruded beyond the upper. ..... 1. *palposa* (Stein)
– Calyptrae weakly tinged with yellow, the lower one being not protruded beyond the upper. ..... 2. *virginea* (Meigen)

*1. *Pegoplata palposa* (Stein)
(Figs. 467–470)

Hydrophoria palposa Stein, 1897:320. *Pegomyia* (*Pegoplata*) *palpata*: Schnabl & Dziedzicki, 1911:109, nec Stein, 1906. *Hydrophoria orientalis* Huckett, 1924:16. *Pegomyia palposa*: Stein, 1916:130; Huckett, 1941:51. *Pegoplata palposa*: Hennig, 1968:238.

Material examined. HOKKAIDÔ — Mt. Daisetsu, 15♂♂, 1♀, 23-vii-68; Nukabira, 1♂, 12-vii-59 (K. Kamijo); Mt. Apoi, 1♂, 21-vi-59 (S. Ueda). HONSHÛ — Mikuni-tôge, Gumma-ken, 1♂, 7-vi-70 (H. Takizawa); Okukinu, Tochigi-ken, 3♂♂, 23–24-vii-69 (T. Kocha); Mt. Sukai, Tochigi-ken, 5♂♂, 1♀, 4-vii-71 (H. Takizawa); Hatano, Kanagawa-ken, 3♂♂, 29-v-70 (H. Takizawa); Urayama, Saitama-ken, 1♂, 20-vii-71 (H. Takizawa); Mt. Senjô, Nagano-ken, 2♂♂, 10-vii-71. SHIKOKU — Mt. Tsurugi, 1♂, 16-vii-71; Mt. Mimune, 1♂, 1♀, 18-vii-71.



Figs. 467–470. *Pegoplata palposa* (Stein), ♂: 467, hypopygium, dorsal view; 468, *ditto*, lateral view; 469, aedeagus; 470, 5th sternite, ventral view.

♂. Body-length 7–9 mm. Mesonotum almost blackish when viewed from front. Abdomen with metallic reflections in some lights; basal sclerite thinly pollinose although shining. Fore femur faintly yellowish at apex. Wings strongly tinged with yellow; calyptrae yellowish as strongly as wing-base.

Frons much narrower than anterior ocellus; parafrontals broadly contiguous to each other, and with 4–7 *ori* and 1 vestigial *ors*; eyes rather distinctly haired. Mesonotum with *ph* duplicated. Abdomen stout as in *Hydrophoria ambigua*, about 1.8–2 times as long as wide, and densely covered with accessory setulae; 5th sternite and hypopygium as in Figs. 467–470.

Fore tibia with 1 short *ad* at apical third and 1 strong *pv* near middle, and sometimes with 1 additional *pv* at apical fourth or fifth, some accessory setulae in apical third on anterodorsal surface being rather distinct; t_2 with 1 *ad*, 1 *pd*, 1 or sometimes 2 *p* and 1 *pv*; t_3 with 1 or rarely 2–3 *av*, 2 or sometimes 3 *ad* and 2 *pd*, and often with 1 additional *pd*. Wings with costal thorns distinct though short; *m-m* oblique and sinuate; lower calyptra much protruded beyond the upper.

♀. Body-length 7–7.5 mm. Parafrontals with 3 *ori* and 3 *ors*; occiput setulose on upper part below postocular row of setulae. Mesonotum with 2nd *ph* rather distinct or fine; *stpl* 1:2 or 2:2. Fore tibia with *ad* strong. Wings with costal thorns as strong as those of male; *m-m* nearly straight.

Distribution. Japan; Europe; North America.

2. *Pegoplata virginea* (Meigen)

Anthomyia virginea Meigen, 1826:96. *Pegomyia* (*Pegoplata*) *virginea*: Schnabl & Dziedzicki, 1911:109. *Pegomyia virginea*: Kato, 1950:1683. *Pegoplata virginea*: Hennig, 1968: 239.

Material examined. There are at hand a lot of specimens collected from various localities in Hokkaidô, Honshû, Shikoku and Kyûshû.

♂. Body-length 4.7–8 mm. More densely pollinose than in *palposa*. Abdomen with basal sclerite of hypopygium polished. Calyptrae pale or whitish yellow. Fore femur at apex and t_1 at base rather distinctly yellowish.

Body more or less slender; abdomen about 2.2–2.5 times as long as wide. Frons as wide as or slightly wider than anterior ocellus; parafrontals broadly contiguous to each other, with 3–5 *ori* and 1 vestigial *ors*. Mesonotum with 2nd *ph* fine; *stpl* 2:2, the lower anterior being sometimes fine. Lower calyptra not protruded beyond the upper.

Mid tibia with 1 *ad*, 1 *pd*, 1 *p* and 1 *pv*; t_3 with 1 *av*, 2 *ad* and 2 *pd*, apical *pd* being rather strong. Wings with costal thorns short although distinct.

♀. Wings with costal thorns much stronger than those of male and longer than *h*-vein.

Distribution. Japan; Europe.

25. Genus *Hydrophoria* Robineau-Desvoidy

Hydrophoria Robineau-Desvoidy, 1830:503. Type-species: (*Hydrophoria littoralis* Robineau-Desvoidy, 1830)=? *Anthomyia conica* Wiedemann, 1817.

Acroptena Pokorny, 1893:60. Type-species: (*Acroptena simonyi* Pokorny, 1893)= *Anthomyza frontata* Zetterstedt, 1838.

Recently the Palaearctic species of this genus were revised by Hennig (1969), who recognized 32 species and divided them into 3 species-groups (with 3 dubious species), namely the *conica*-group, the *frontata*-group and the *barbiventris*-group. In Japan 3 species have been known to occur (Suwa, 1970b). On this occasion 2 other species will be added to the fauna. Of the 5 species *ruralis* and *montana* belong to the *conica*-group, *frontata* to the *frontata*-group, and *hyalipennis* and *ambigua* to the *barbiventris*-group.

Key to the species (♂♂ & ♀♀)

1. Arista shortly plumose, the longest hairs being shorter than A_3-width; t_2 with *av*; t_3 with 3 or more *pd*. 2
– Arista longly plumose, the longest hairs being longer than A_3-width; t_2 without *av*; t_3 usually with 2 *pd*. 5
2. Male. 3
– Female. 4
3. Fore tibia with apical *ad* longer, about as long as apical *d*; notopleura with 1–7 accessory setulae near posterior *ntpl*; t_3 with no *pv*. .....4. *ambigua* (Fallén)
– Fore tibia with apical *ad* shorter, less than half as long as apical *d*; notopleura with no accessory setulae; t_3 with 1 *pv*. .....5. *hyalipennis* (Zetterstedt)
4. Hypopleura with a few hair-like setulae on upper border; parafrontals broader, about half as wide as interfrontalia at level of *if*, and near *ors* with many distinct accessory setulae. .....3. *frontata* (Zetterstedt)
– Hypopleura with no setulae; parafrontals narrower, about one-third as wide as interfrontalia at level of *if*, and near *ors* with at most only a few minute accessory setulae. .....5. *hyalipennis* (Zetterstedt)
5. Darker in colour, abdomen blackish in ground colour, at most faintly yellow basally in female; t_3 usually with some *p*; each process of male 5th sternite swollen apically, and with a row of setulae on apical half; surstyli of male hypopygium nearly straight in profile; ovipositor longer and with sternites more slender. .....2. *montana* Suwa
– Lighter in colour, abdomen usually yellowish in ground colour basally; t_3 with or without *p*; each process of male 5th sternite not swollen apically, and with a row of setulae on basal half; surstyli of male hypopygium sinuate in profile; ovipositor shorter and with sternites less slender. .....1. *ruralis* (Meigen)

1. *Hydrophoria ruralis* (Meigen)

Anthomyia ruralis Meigen, 1826:101. *Hydrophoria ruralis*: Stein, 1918:178; Kato, 1950:1682; Suwa, 1970b:248. *Hydrophoria ruralis*: Hennig, 1969:287.

Material examined. There have been examined a lot of specimens collected from various localities in Hokkaidô, Honshû, Shikoku and Kyûshû.

Distribution. Palaearctic region. In North America there is a closely related species, *H. subpellucida* Malloch, 1918, which was treated as a synonym of *ruralis* by Huckett (1944) and Hennig (1969) and later recognized as a good species by Huckett (1965b & 1971).

2. *Hydrophoria montana* Suwa

Hydrophoria montana Suwa, 1970b:248.

Material examined. HONSHÛ — Mt. Kurikoma, Miyagi-ken, 8♂♂; Mt. Zaô,

Yamagata-ken, 1♂; Mt. Bandai, Fukushima-ken, 1♂; Mt. Mitake, 21♂♂ (one the holotype), 12♀♀, Mt. Mitô, 1♂, Mt. Kariyose, 2♂♂, & Takao-san, 2♂♂, Tôkyô-to; Mt. Daibosatsu, Yamanashi-ken, 10♂♂, 1♀; Mt. Shirouma & Mt. Chôgatake, Nagano-ken, 3♂♂, 2♀♀. SHIKOKU — Mt. Tsurugi, 6♂♂.

Distribution. Japan.

This species may be placed between *ruralis* and *conica* in having the external appearance similar to that of *ruralis* and having the hypopygium similar to that of *conica*.

*3. *Hydrophoria frontata* (Zetterstedt)

Anthomyza frontata Zetterstedt, 1838:669. *Acroptena simonyi* Pokorny, 1893:61. *Hydrophoria frontata*: Huckett, 1944:274; Hennig, 1969:277.

Material examined. HONSHÛ — Mt. Akaishi, Shizuoka-ken, 1♀, 25-viii-72 (T. Hattori).

♂. Unknown to me.

♀. Body-length *ca.* 7 mm. Blackish in ground colour. Interfrontalia somewhat brownish near lunule, with pollen pale yellow on lower half and brownish grey on upper half; parafrontals dark brownish pollinose; parafacials and cheeks yellowish grey pollinose; occiput brownish grey pollinose, darker on upper half. Mesonotum brownish grey pollinose, paler on humeral calli and notopleura, and rather obscurely vittate, when viewed from behind with moderate median, narrow paramedian, narrow sublateral and broad lateral vittae. Abdomen pale greyish pollinose, with a trace of yellowish or brownish tinge in the pollinosity, and with tessellations in some lights; median vitta moderate in width, narrowing caudad; fore marginal bands lacking. Legs black. Wings tinged with brown at base; calyptrae pale, on margin rather distinctly yellow; halteres brownish yellow at knob.

Head hardly higher than the length; frons about 0.4 times as wide as head; parafrontals broad, about half as wide as interfrontalia at level of *if*, with 3–4 strong or distinct and some minute *ori* and 4–5 strong *ors*, and outside *ors* with many setae about as strong as secondary ocellar setae; A_3 short and rounded, about 1.3 times as long as wide; arista with the longest hairs about 3 times as long as basal diameter of arista; profrons and cheeks respectively about 1.5 times as wide and high as A_3-width; epistoma projecting forwards as far as frons at lunule and situated at level of eye-bottom; occiput setulose on upper part below postocular row of setulae.

Mesonotum with *acr* fine and hardly distinguishable from accessory setulae situated between the rows; *pra* more or less shorter than posterior *ntpl*; notopleura with no accessory setulae; mesopleura with no distinct anterior *mpl*, and with more than 10 accessory setulae around *pstg*; judging from the sockets of missing setae, *stpl* probably 1:3, the lowest posterior being weaker; hypopleura with a few setulae on upper embossed ridge; scutellum setulose on dorsal surface, yet not so densely as in *ruralis* or *conica* and almost bare on basal centre.

Fore tibia with 1 *ad* and 1 *pv*, apical *ad* and *pd* being rather strong; t_2 with 1 *av*, 1 *ad*, 1 *pd* and 4 *p–pv*, proximal one of the last being rather on posterodorsal surface; t_3 with 6–7 *av*, 5–6 *ad*, 3 strong and some weak *pd* and no *pv*, apical *pd* being distinct and somewhat longer than height of the tibia. Wings with costal

thorns distinct; costa bare ventrally beyond the outlet of subcosta; *m-m* oblique and sinuate.

Distribution. Japan; Siberia; Europe; North America.

The present specimen runs out in a key to the Palaearctic species of *Hydrophoria* given by Hennig (1969) with *frontata, spiniclunis* and *septimalis,* which are hardly distinguishable from each other in the females (after Hennig, l.c.). Among the three *frontata* is widely distributed in the Holarctic region, whereas the remaining two are restricted to some localities in Europe. In this regard the present Japanese specimen may possibly belong to *frontata.*

4. *Hydrophoria ambigua* (Fallén)

Musca ambigua Fallén, 1823:56. *Hydrophoria ambigua*: Huckett, 1944:296; Hennig, 1969:265. *Hydrophoria ambigua*: Suwa, 1970b:247, *pt.*

Material examined. HOKKAIDÔ — Sapporo, 2♂♂, 25-vi-58 (S. Takagi); Nopporo, 1♂, 9-vi-67, & 3♂♂, 9-vi-73; Kushiro, 3♂♂, 16-vii-66.

Distribution. Asia; Europe: North America.

The female specimens which were formerly identified with *ambigua* by Suwa (1970b) may be referred to *hyalipennis* in having the notopleura with no accessory setulae.

*5. *Hydrophoria hyalipennis* (Zetterstedt)

Aricia hyalipennis Zetterstedt, 1855:4720. *Acroptena villosa* Ringdahl, 1918:184. *Hydrophoria hyalipennis*: Hennig,1969:278. *Hydrophoria ambigua*: Suwa, 1970b: 247, *pt.*

Material examined. HOKKAIDÔ — Eniwa, 1♂, 2♀♀, 27-v-71; Sapporo, 2♀♀, 17-vi-66; Nemuro, 1♀, 20-vii-66; Sarobetsu, 2♀♀, 2-viii-61 (G. Kuno) & 11-vii-68 (T. Nakashima).

Distribution. Japan; Europe.

This species is closely related to *ambigua,* from which it may be distinguished by the notopleura with no accessory setulae in both sexes, t_3 with 1 distinct *pv* in the male and the 5th sternite with many long setae in the male. The female specimens at hand are tentatively identified with this species by the absence of accessory setulae on the notopleura. However, further study based on many specimens is necessary for the precise identification of female *hyalipennis* and *ambigua.*

26. Genus *Phorbia* Robineau-Desvoidy

Phorbia Robineau-Desvoidy, 1830:559. Type-species: (*Phorbia musca* Robineau-Desvoidy, 1830)=*Anthomyia sepia* Meigen, 1826.

Chortophila Macquart, 1835:323. Type-species: *Anthomyia sepia* Meigen, 1826.

The Palaearctic species of this genus were recently revised by Hennig (1969), who recognized 21 species in this region. In the course of the present study have been found 4 species, of which two are described as new species.

Key to the species (♂♂)

1. Hind tibia with strong apical *pv*; t_1 with apical *ad* stronger, only a little shorter than apical *d*. .....4. *subgrisea* Ringdahl
– Hind tibia without apical *pv*; t_1 with apical *ad* weaker, much shorter than apical *d*. 2
2. Mid tibia with *av*; cercal plate with a shaggy tuft of numerous long setae almost on whole dorsal surface. .....3. *fascicularis* Tiensuu
– Mid tibia without *av*; cercal plate at most with a loose grouping of long setae near apex. 3
3. Larger in size, body-length 4.7–5.8 mm; interfrontalia with *if* strong; parafrontals with 1 distinct *ors*; 5th sternite densely setose on outer margin and with a patch of short setulae at inner margin near apex of each process. ....1. *kochai* sp. nov.
– Smaller in size, body-length 2.8–4.5 mm; interfrontalia with *if* fine; parafrontals usually with no *ors*; 5th sternite sparsely setose on outer margin and without a patch of setulae at inner margin of each process. ....2. *asymmetrica* sp. nov.

1. *Phorbia kochai* sp. nov.
(Figs. 471–474)

Type-material. HONSHŪ — Mt. Yatsugatake, Nagano-ken, 3♂♂ (one the holotype), 2–4-vi-67 (T. Kocha); Takao-san, Tôkyô-to, 1♂, 11-v-71 (T. Kocha); Mt. Mitô, Tôkyô-to, 1♂, 27-v-68 (H. Takizawa).

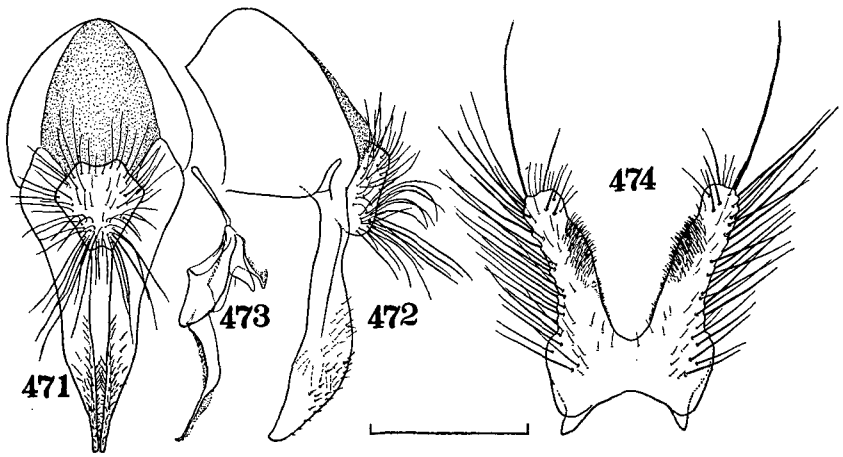
♂. Body-length 4.7–5.8 mm; wing-length 4–4.8 mm. Blackish in ground colour and bluish grey in pollinosity. Interfrontalia blackish or dark brownish, with whitish grey pollen; parafacials and cheeks in ground colour blackish or at most partly brownish, and in pollinosity silvery white and slightly or hardly tinged with yellow; antennae and palpi black; haustellum with mentum blackish and pollinose. Thorax densely pollinose; mesonotum slightly or hardly tinged with brown in pollinosity, with brownish pollinose median vitta, and when viewed from behind hardly vittate, only with dark lateral patches. Abdomen variously dark-reflecting according to the point of view although rather densely pollinose, when viewed from front wholly pollinose and with faintly brownish pollinose median vitta, and when viewed from behind largely blackish except on pollinose lateral sides of 2nd to 4th tergites. Legs black. Wings with a tinge dark brownish, strongly at base; calyptrae whitish, more or less yellowish marginally; halteres yellow at knob.

Frons about twice as wide as anterior ocellus; interfrontalia about as wide as anterior ocellus, with a pair of strong *if*; parafrontals with 4–6 *ori* and 1 rather distinct *ors*; A_3 about 1.5–1.8 times as long as wide; aristal pubescence distinct although minute; profrons more or less wider than A_3; cheeks as high as or a little higher than A_3-width, with genal setae in 2 rows (1 row in 1 specimen).

Mesonotum with 3 (2 in 1 specimen) pairs of *pre acr*, the rows being separated from each other by a distance half to two-thirds of that between *dc* and *acr*; *pra* more or less longer than anterior *ntpl*; *stpl* 2:3, the lower anterior and the lowest posterior being at least distinguishable from accessory setulae; scutellum with no accessory setulae on dorsal surface, and bare on ventral surface, at most only 1 hair being visible in 2 specimens including the holotype. Abdomen 2–2.35 times as long as wide, with 5th sternite and hypopygium as in Figs. 471–474.

Fore tibia with 1 *ad* and 1 *pv*, apical *ad* being distinct and about half as long

as apical *d*; f_2 on basal third with some rather distinct *av* and on middle third with 1 or a few strong *av*, the longest one being about 1.2–1.5 times as long as height of the femur, and on basal half with some strong *pv*, the longest one slightly or distinctly longer than height of the femur; t_2 with 1–2 *ad*, 2–3 *pd* and 2 *pv*; f_3 with a row of strong *av*, the longest one about 1.5–1.8 times as long as height of the femur, and with a row of *pv*, setae near base and apical third being fine, the longest one near middle about 1.3–1.4 times as long as height of the femur; t_3 with 5–6 *av*, 5 strong (not uniform in length) *ad*, 5 *pd* (of them 1–2 being much shorter and weaker than the others) and some (3–6) *pv*, apical *pd* being strong. Wings with costal thorns distinct or rather strong; costa on ventral surface haired rather anteriorly; *m-m* erect and hardly sinuate.



Figs. 471–474. *Phorbia kochai* sp. nov., ♂: 471, hypopygium, dorsal view; 472, *ditto*, lateral view; 473, aedeagus; 474, 5th sternite, ventral view.

♀. Unknown.

Distribution. Japan.

The present species has the hypopygium closely resembling that of the North American *barbicula* Huckett, 1948 in dorsal view and that of the European *juncorum* Ringdahl, 1959 in lateral view. From the two species, however, this species can be readily distinguished by the body larger in size, by t_2 without *av* and by t_3 with setae more numerous.

2. *Phorbia asymmetrica* sp. nov.
(Figs. 475–479)

Type-material. HONSHÛ — Mt. Chôkai, Yamagata-ken, 2♂♂, 9-viii-70; Mt. Kiso-Komagatake, Nagano-ken, 18♂♂ (one the holotype), 26–27-vii-70; Mt. Yatsugatake, Nagano-ken, 1♂, 3-vi-67 (T. Kocha); Mt. Senjô, Nagano-ken, 14♂♂, 10-vii-71; Mt. Hodaka, Nagano-ken, 1♂, 3-viii-70.

♂. Body-length 2.8–4.5 mm; wing-length 2.7–3.9 mm. Body including appendages blackish in ground colour. Haustellum with mentum rather thinly

pollinose. Thorax shining in some lights and rather thinly covered with more or less bluish grey pollen, which is more or less tinged with brown, distinctly on mesonotum. Abdomen shining in some lights and rather thinly covered with brownish grey pollen, when viewed from front wholly pollinose and when viewed from behind very broadly blackish medially. Legs sometimes more or less brownish (probably due to young age of the specimens). Wings tinged with dark brown, strongly at base; calyptrae slightly yellowish marginally; halteres dark reddish brown at base and brownish yellow at knob.

Frons wider than anterior ocellus, about 1.5–2 times as wide as the latter; interfrontalia as wide as or slightly narrower than anterior ocellus, with *if* vestigial or sometimes rather distinct; parafrontals with 5–7 *ori* and rarely with 1 vestigial *ors*; A_3 about 1.5–1.7 times as long as wide; aristal pubescence distinct though minute; profrons and cheeks respectively more or less wider and higher than A_3-width; cheeks with genal setae usually in 2 rows; face rather distinctly concave near epistoma, the latter more or less behind frons at lunule; haustellum rather slender, with mentum more or less longer than palpi.

Mesonotum with a few or some fine *pre acr*, which are irregularly paired or sometimes nearly uniserial, and if arranged in 2 rows the distance is very short, at most one-third of that between *dc* and *acr*; *pra* more or less longer than anterior *ntpl*; *stpl* 1:2; scutellum on dorsal surface with no accessory setulae or nearly so, and on ventral surface rather distinctly haired.

Abdomen half-depressed basally, and usually more or less shorter than twice the width; 5th sternite (Figs. 478 & 479) strongly chitinized and edged on inner margin of each process, which is densely armed with minute setulae inside; cercal plate (Fig. 475) produced distad on left side only; praegonites also asymmetric, the right one being much broader than the left (Fig. 477).

Fore tibia with 1 short *pv* and sometimes with 1 fine *ad*, apical *ad* being rather distinct though much shorter and weaker than apical *d*, apical *pv* vestigial; f_2 on basal half to two-thirds with some *av*, setae on basal third being often very fine, 1 or a few near middle being strong and slightly shorter or longer than height of the femur, and on basal half with 3–5 strong *pv*, the longest one about 1.3–1.5 times as long as height of the femur; t_2 with 1 *ad*, 2 *pd* and 2 *pv*, and without *av*; f_3 with some to about 10 strong *av* becoming longer towards apex of the femur, the longest one about 1.2–1.6 times as long as height of the femur, and on basal half with a few weaker *pv* at most as long as height of the femur; t_3 with a few *av*, 3–4 *ad*, 3–4 *pd* and 1 or a few *pv*, apical *pv* being lacking. Wings with costal thorns minute though distinguishable from costal setulae; costa hardly haired ventrally; *m-m* upright.

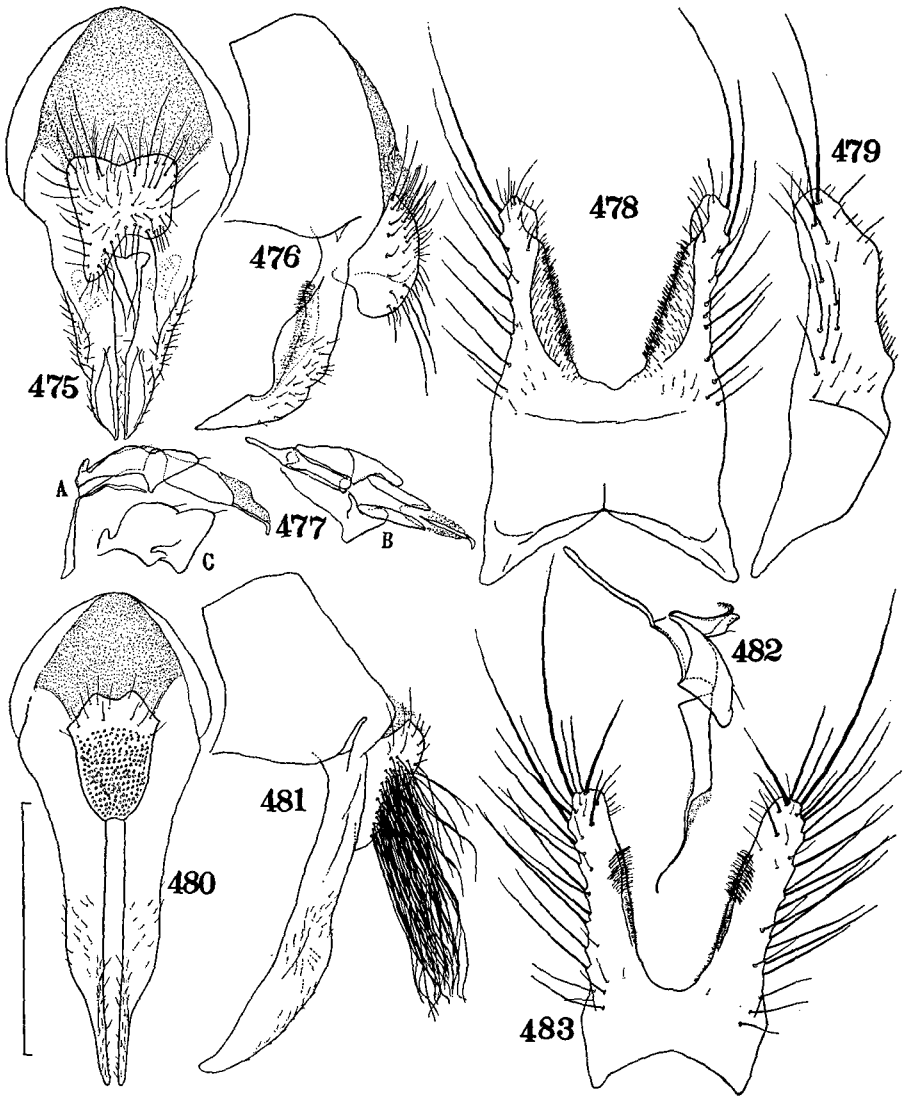
♀. Unknown.

Distribution. Japan.

P. asymmetrica may be closely related to the Nepalese *P. morula* Ackland, 1967 and *P. tysoni* Ackland, 1967. However, the new species is quite distinct from *morula* in the surstyli and the cercal plate, and from *tysoni* in the conspicuously asymmetrical cercal plate.

*3. *Phorbia fascicularis* Tiensuu
(Figs. 480–483)

Phorbia fascicularis Tiensuu, 1935:15. *Phorbia fascicularis*: Hennig, 1969:305.



Figs. 475–479. *Phorbia asymmetrica* sp. nov., ♂: 475, hypopygium, dorsal view; 476, *ditto*, lateral view; 477, aedeagus, A, lateral view, B, ventral view, C, right praegonite; 478, 5th sternite, ventral view; 479, *ditto*, lateral view.

Figs. 480–483. *Phorbia fascicularis* Tiensuu, ♂: 480, hypopygium, dorsal view; 481, *ditto*, lateral view; 482, aedeagus; 483, 5th sternite, ventral view.

Material examined. HONSHÛ — Hannô, Saitama-ken, 1♂, 2-v-68 (H. Takizawa); Mt. Usuki, Tôkyô-to, 1♂, 26-v-67 (T. Kocha); Tôkyô, Tôkyô-to, 1♂, 7-iv-67 (T. Kocha); Mt. Kiso-Komagatake, Nagano-ken, 3♂♂, 25-vii-70; Mt. Senjô, Nagano-ken, 1♂, 10-vii-71.

♂. Body-length 3.6–4.3 mm. Blackish in ground colour and bluish grey in pollinosity. Mesonotum strongly or rather distinctly tinged with brown in pollinosity, not wholly blackish in any lights and hardly vittate, at most with very faint

median, paramedian and lateral vittae when viewed from behind. Abdomen hardly or rather distinctly tinged with brown in pollinosity, when viewed from front wholly pollinose and sometimes with faint brownish median vitta, and when viewed from behind largely blackish except on narrow lateral pollinose areas. Wings tinged with dark brown, strongly at base; calyptrae whitish, more or less tinged with brown marginally; halteres dark brownish at base and yellow or brownish yellow at knob.

Frons wider than anterior ocellus, usually 1.5–2 times as wide as the latter; interfrontalia as wide as anterior ocellus, or sometimes about half of the latter, with *if* fine; parafrontals with 4–5 *ori* and 1 fine *ors*; A_3 about 1.4–1.6 times as long as wide; arista practically bare; profrons as wide as or slightly wider than A_3; cheeks more or less higher than A_3-width.

Mesonotum with *pre acr* usually in 3 pairs, distance between the rows being half to one-third of that between *dc* and *acr*; *pra* about as long as anterior *ntpl*; *stpl* 1:2; scutellum bare ventrally. Abdomen with 5th sternite and hypopygium as in Figs. 480–483.

Fore tibia with 1 *pv* and with or without 1 *ad*; t_2 with 1 *av*, 1 *ad*, 2 *pd* and 2 *pv*; t_3 with 3–4 *av*, 3–4 *ad*, 3 *pd* and 2–6 *pv*. Wings with costal thorns short although distinguishable from costal setulae; *m-m* upright.

♀. Unknown to me.

Distribution. Japan; Europe.

Judging from a redescription of *fascicularis* given by Hennig (1969) the Japanese form agrees well with the European one except in the wider frons.

*4. *Phorbia subgrisea* Ringdahl
(Figs. 484–488)

Phorbia subgrisea Ringdahl, 1930:8. *Phorbia subgrisea*: Hennig, 1969:320.

Material examined. HONSHŪ — Mt. Yatsugatake, Nagano-ken, 1♂, 1♀, 2–3-vi-67 (T. Kocha).

♂. Body-length 6.2 mm. Black in ground colour and whitish grey in pollinosity. A_2 brownish yellow apically. Mesonotum with brownish pollinose median vitta, and when viewed from behind with broad median and sublateral vittae. Abdomen with broad median vitta and with broad fore marginal bands. Wings tinged with brown, strongly at base; calyptrae pale yellow; halteres reddish brown at base and yellow at knob.

Frons about as wide as distance between posterior ocelli inclusive; interfrontalia about one-third as wide as anterior ocellus, with *if* vestigial; parafrontals with 7 *ori* and no *ors*; A_3 short, about 1.4 times as long as wide; profrons and cheeks respectively wider and higher than A_3-width, about 1.6 times; face not concave; epistoma distinctly behind frons at lunule.

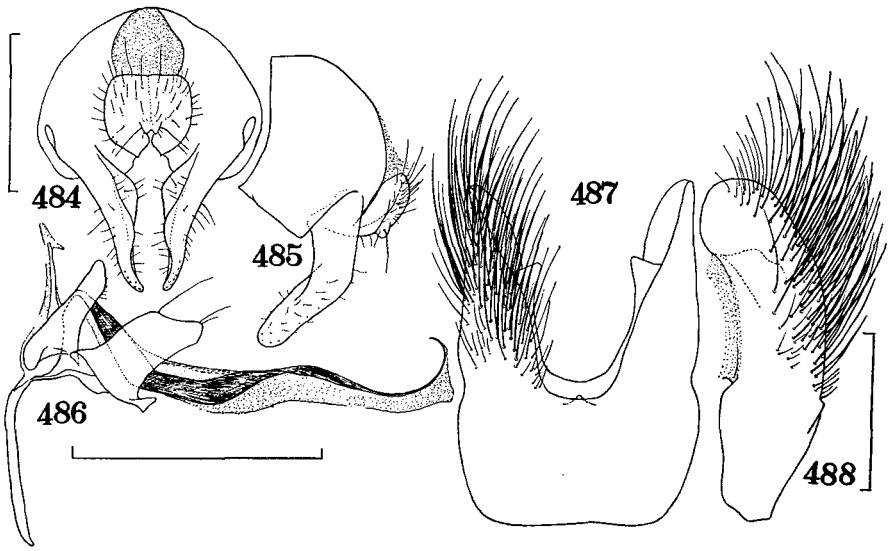
Mesonotum with 3 irregular pairs of *pre acr*, distance between the rows being about one-third of that between *dc* and *acr*; *pra* a little longer than anterior *ntpl*; *stpl* 2:2; scutellum not haired ventrally.

Fore tibia with 1 *ad* and 2 *p–pv*, apical *ad* being strong and only a little shorter than apical *d*; t_2 with 1 *ad*, 1 *pd*, 3–4 *p–pv* and no *av*; f_3 with a row of about 10 *av*, the longest one about 1.5 times as long as height of the femur, and on basal two-thirds with 6 *pv*, the longest one being as long as the longest *av*; t_3 with 3–5 *av*,

3 *ad*, 3–4 *pd* and about 6 *pv*, apical *pv* being strong. Wings with costal thorns short; costa haired ventrally between the base and the outlet of subcosta; *m-m* nearly erect and hardly sinuate.

♀. Interfrontalia about 1.3 times as wide as parafrontalia, with *if* rather distinct, as strong as weaker secondary ocellar setae; parafrontals with 3–4 strong *ori* and 3–4 strong *ors*. Hind tibia with 2–4 *av*, 5 *ad*, 4 *pd* and no *pv*, apical *pv* being strong as in male.

Distribution. Japan; Kamchatka.



Figs. 484–488. *Phorbia subgrisea* Ringdahl, ♂: 484, hypopygium, dorsal view; 485, *ditto*, lateral view; 486, aedeagus; 487, 5th sternite, ventral view; 488, *ditto*, lateral view.

27. Genus *Mycophaga* Rondani

Mycophaga Rondani, 1856:102. Type-species: (*Musca fungorum* Degeer, 1776, nec Scopoli, 1736)=*Coenosia testacea* Gimmerthal, 1834.

This genus is represented by a single species, *M. testacea*, which has been known from Europe. On the basis of the present specimens I will give Japan as a locality of the species.

*1. *Mycophaga testacea* (Gimmerthal)
(Figs. 489–492)

Musca fungorum Degeer, 1776:89, nec Scopoli, 1763. *Coenosia testacea* Gimmerthal, 1834:113. *Mycophaga fungorum*: Schnabl & Dziedzicki, 1911:115; Séguy, 1923a:172. *Mycophaga testacea*: Hennig, 1972:447.

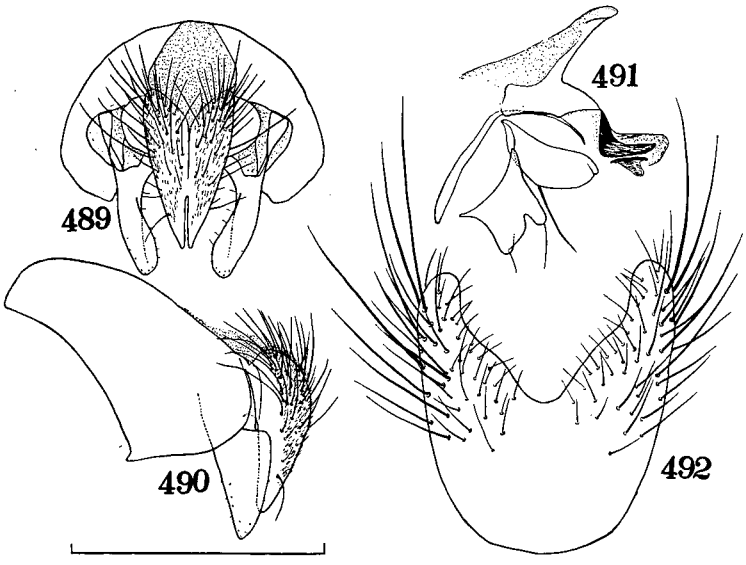
Material examined. HOKKAIDÔ — Sapporo, 1♀, 3-x-67 (K. Kusigemati); Jôzankei, 1♂, 20-vi-67 (K. Kusigemati); Mt. Soranuma, 1♀, 30-viii-67 (K. Kusigemati), & 1♂, 1-viii-68. HONSHÛ — Towada, Aomori-ken, 1♂, 24-viii-66 (K. Kusigemati).

♂. Body-length 6.4–7 mm. Interfrontalia brownish yellow or reddish on lower half or wholly brownish yellow, with whitish grey pollen; parafacials on anterior margin or wholly brownish, with whitish grey pollen which is hardly or slightly tinged with yellow; cheeks brownish in ground colour, with whitish and slightly yellowish pollen; A_3 blackish; A_2 more or less yellowish apically; palpi blackish; haustellum with mentum blackish or dark brownish, with greyish pollen; occiput blackish in ground colour, more or less brownish in pollinosity on upper half. Thorax yellowish in ground colour on humeral calli, ridges of posterior calli, prosternum, vicinities of posterior spiracles and scutellum excluding base and dorsal centre, and blackish on the rest, and in pollinosity pale greyish; mesonotum with brownish median vitta. Abdomen largely yellowish in ground colour, at most with brownish spots on tergites anteriorly, and very thinly whitish pollinose. Coxae, trochanters, femora and tibiae all yellow; tarsi blackish. Wings nearly hyaline, with a faint yellowish suffusion; calyptrae hyaline, on margin more or less yellowish; halteres yellow, at base slightly brownish.

Frons about 0.3 times as wide as head; interfrontalia about 3 times as wide as parafrontalia at level of *if*; parafrontals with 3 *ori* and 3 *ors*; A_3 a little longer than twice the width; arista with the longest hairs longer than A_3-width; profrons more or less narrower than A_3; cheeks about as high as profrons-width, with genal setae in 1 row.

Mesonotum with some accessory setulae between rows of *pre acr*, distance between the rows being about two-thirds of that between *dc* and *acr*; *pra* about half as long as posterior *ntpl*; mesopleura with a strong anterior *mpl*; *stpl* 1:2; scutellum setulose dorsally.

Abdomen conical, less than twice as long as wide, about 1.7–1.9 times so; prebasal sclerite bare, although in 1 specimen with 1 short setula; 5th sternite and hypopygium as in Figs. 489–492.



Figs. 489–492. *Mycophaga testacea* (Gimmerthal), ♂: 489, hypopygium, dorsal view; 490, *ditto*, lateral view; 491, aedeagus; 492, 5th sternite, ventral view.

Fore tibia with 1 *ad* and 1 *pv*; f_2 with 1 *av* near base and 3 *pv* on basal half; t_2 with 1 *ad*, 1 *pd*, 1 *p* and 1 *pv*; f_3 with 5–7 *av* scattered on whole length, 2 *pv* on basal half and 1 *pv* near apex; t_3 with 1 *av*, 3 *ad* and 2 *pd*, apical *pd* being weak. Wings with costal thorns minute; costa haired ventrally; R_{4+5} with 1 or a few short setulae at base on each of dorsal and ventral surfaces; *m-m* oblique and sinuate.

♀. Body-length 8–8.8 mm. Mesonotum with pollen more yellowish than in male. Abdomen with sharp and very narrow dark bands on hind margins of 2nd to 4th tergites. Wings rather distinctly tinged with yellow. Frons about 0.4 times as wide as head; aristal hairs rather shorter than those of male, about as long as A_3-width. Wings with costal thorns stronger than in male, as long as or longer than *h*-vein.

Distribution. Japan; Europe.

The presence of setulae on the vein R_{4+5} in both sexes may be worthy of mention. This character, so far as known to me, is shared by some members of *Emmesomyia*, from which it is, however, separated by the absence of setulae on the pteropleura, by the simple surstyli and by the dissimilar general appearance.

28. Genus *Emmesomyia* Malloch

Emmesomyia Malloch, 1917:114. Type-species: (*Emmesomyia unica* Malloch, 1917) =*Spilogaster socialis* Stein, 1898.

Rhodesina Malloch, 1921:424. Type-species: (*Rhodesina ignobilis* Malloch, 1921)= *Hydrophoria ignobilis* Stein, 1913.

Emmesomyia is closely related to *Pegomya*, especially to the *geniculata*-group of Hennig (1972); from this group it is separated only by the presence of 1 or several setae on the pteropleura. So far as known to me this genus is represented by 19 species, of which 12 species are distributed only in the Ethiopian region (after Séguy, 1937 & Emden, 1941), other 2 species (*apicalis* and *socialis*) only in the Nearctic region (after Huckett, 1965b), other 2 species (*socia* and *villica*) in the Palaearctic region (after Hennig, 1972) and 4 species (*dorsalis*, *kempi*, *ovata* and *socia*) in the Oriental region (after Ackland, in litt.). In the course of the present study have been found from Japan 4 species, of which two are recognized as new to science.

Key to the species (♂♂)

1. Legs with tarsi yellowish. 2
– Legs with tarsi blackish or dark brownish. 3
2. Fifth sternite (Figs. 505 & 506) with processes much broadened apically and expanded ventrad. .....2. *villica* (Meigen)
– Fifth sternite (Figs. 497–500) with processes not broadened apically and not expanded ventrad. .....1. *flavitarsis* sp. nov.
3. Surstyli (Fig. 507) notched at inner base of outer projection; praegonites (Fig. 510) with dorsal lobe broader; postgonites (Fig. 510) bi-lobed apically. .....3. *socia* (Fallén)
– Surstyli (Fig. 513) not notched at outer projection; praegonites (Fig. 516) with dorsal lobe narrower; postgonites (Fig. 516) uni-lobed apically. .....4. *oriens* sp. nov.

1. *Emmesomyia flavitarsis* sp. nov.
(Figs. 493–500)

Type-material. HOKKAIDÔ — Sapporo, 1♂, 1-vii-66, & 1♂, 8-viii-66. HONSHÛ — Mt. Kariyose, Tôkyô-to, 1♂ (holotype), 16-v-68 (H. Takizawa); Mt. Mitake, Tôkyô-to, 1♂, 26-v-67.

♂. Body-length 5.4–6.6 mm; wing-length 5.4–6.1 mm. Body blackish in ground colour. Haustellum with mentum blackish and thinly pollinose. Mesonotum when viewed from front largely blackish and when viewed from behind wholly pollinose and not vittate, at most weakly darkened laterally, the pollinosity being slightly or rather distinctly tinged with brown. Abdomen in pollinosity whitish grey and slightly or hardly tinged with yellow; median vitta rather broad and sharp; fore marginal bands absent. Femora blackish or dark brownish, with yellowish apex; tibiae and tarsi yellow. Wings more or less tinged with yellow; calyptrae pale yellow, rather distinctly on margin; halteres yellowish at knob.

Head about 1.6 times as high as long; frons much narrower than anterior ocellus; parafrontals broadly contiguous to each other, with 3–4 *ori* and 1 microscopical *ors*, the latter being hardly discernible unless carefully examined; A_3 about 2–2.7 times as long as wide although in depressed condition in all of the present specimens; arista with the longest hairs about twice as long as basal diameter of arista; profrons much narrower than A_3; cheeks about as high as profrons-width; occiput bare on upper part below postocular row of setulae.

Mesonotum with 3 pairs of *pre acr*, rather densely setulose between the rows, which are separated from each other by a distance distinctly longer than that between *dc* and *acr*; 2nd *ph* fine, at most only a little stronger than accessory setulae; *pra* about two-thirds as long as posterior *ntpl*; pteropleura with 1 seta; *stpl* 1:2; mesopleura with 1 strong and 1 weaker *pstg* and 3–6 fine associated setulae; scutellum bare on dorsal centre.

Abdomen depressed, long-ovoid and about 1.6–1.9 times as long as wide; prebasal sclerite bare; distiphallus (Fig. 495) minutely serrated on side-projections dorsally.

Fore tibia with 1 *pv*; t_2 with 1 *pd* and 2 *p–pv*; f_3 with a row of strong *av* and on basal two-thirds with 4–5 strong *pv*; t_3 with 1 *av*, 3 *ad* and 2 *pd*. Wings with costal thorns very minute and only a little stronger than costal setulae; costa haired ventrally; R_{4+5} with 1 or a few short setulae at base on ventral surface, and usually also on dorsal surface; *m-m* more or less oblique and slightly or distinctly sinuate; lower calyptra much larger than the upper.

♀. Unknown.

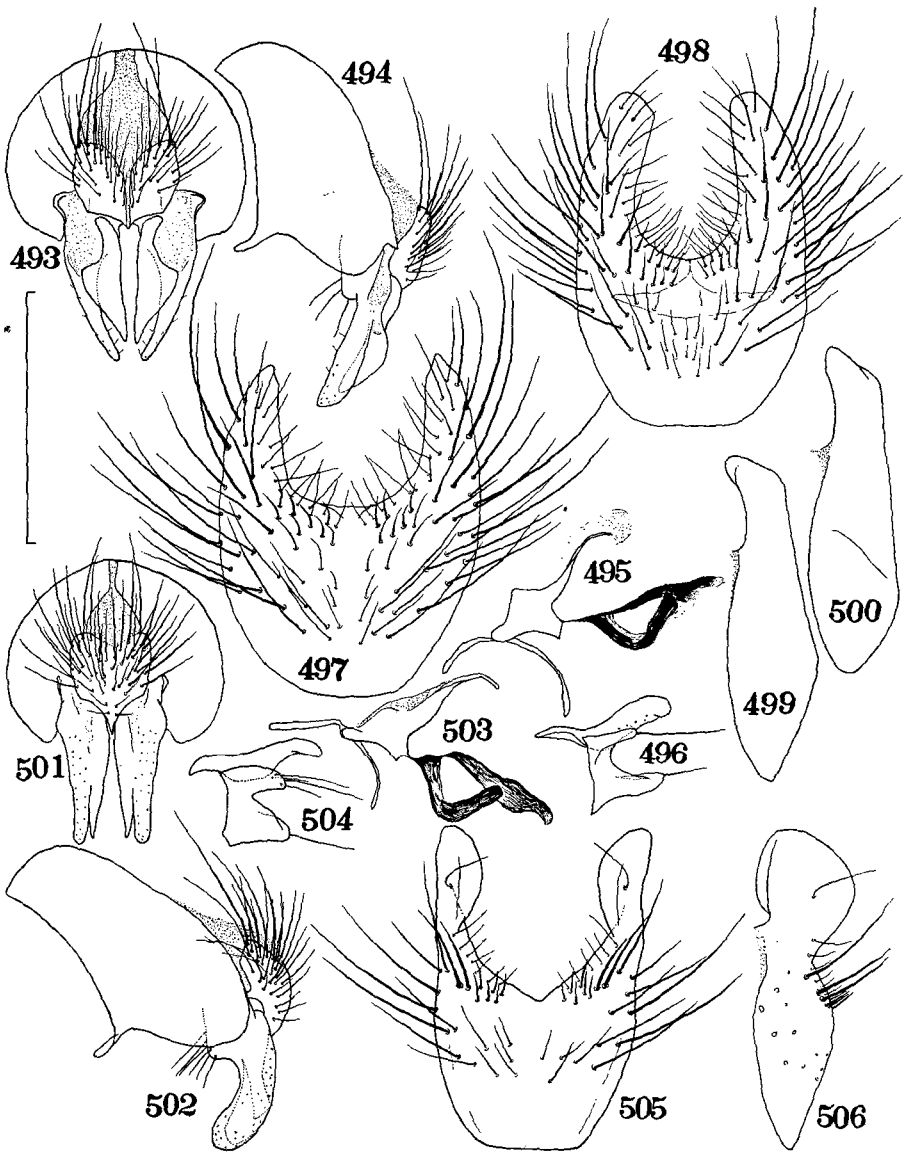
Distribution. Japan.

In general appearance this species closely resembles *E. socia*, from which it is hardly distinguishable unless its genital structures are seen. However, the yellowish tarsi may be useful to distinguish this species from *socia*, at least so far as the Japanese specimens are concerned (see also *E. socia*).

*2. *Emmesomyia villica* (Meigen)
(Figs. 501–506)

Hylemyia villica Meigen, 1838:319. *Emmesomyia villica*: Hennig, 1972:454.

Material examined. HOKKAIDÔ — Sapporo, 1♂, 10-vi-71 (T. Kumata); Eniwa,



Figs. 493–500. *Emmesomyia flavitarsis* sp. nov., ♂ : 493, hypopygium, dorsal view; 494, *ditto*, lateral view; 495, basi- and distiphalli; 496, prae- and postgonites; 497, 5th sternite (from Mt. Kariyose), ventral view; 498, 5th sternite (from Sapporo), ventral view; 499, 5th sternite (from Mt. Kariyose), lateral view; 500, 5th sternite (from Sapporo), lateral view.

Figs. 501–506. *Emmesomyia villica* (Meigen), ♂ : 501, hypopygium, dorsal view; 502, *ditto*, lateral view; 503, basi- and distiphalli; 504, prae- and postgonites; 505, 5th sternite, ventral view; 506, *ditto*, lateral view.

2♂♂, 27-v-71; Bifuka, 2♂♂, 29-vii-66; Sarobetsu, 1♂, 18-viii-68 (T. Nakashima). KYÛSHÛ — Hikosan, 1♂, 18-v-59 (K. Kamijo).

♂. Body-length 5.3–5.8 mm. Mesonotum slightly or distinctly tinged with yellow in pollinosity, and when viewed from behind hardly or faintly vittate. Abdomen usually with a distinct or strong yellowish tinge in pollinosity; median vitta narrow and sharp. Femora blackish, with yellowish apex; tibiae yellow; tarsi yellow although more or less darkened on apical half.

Frons narrower than anterior ocellus; parafrontals broadly contiguous to each other, with 4–5 *ori* and 1 microscopical *ors*, the latter being indiscernible unless carefully examined; arista with the longest hairs about 2–3 times as long as basal diameter of arista.

Mesonotum with *pra* about 0.6 times as long as posterior *ntpl*; pteropleura with 1 seta; mesopleura with 1 strong and 1 weaker *pstg* and 4–10 fine associated setulae. Abdomen long-ovoid and about 1.5–1.7 times as long as wide; 5th sternite and hypopygium as in Figs. 501–506; praegonites with 4 setae on dorsal lobe apically.

♀. Unknown to me.

Distribution. Japan; Manchuria; Europe.

There are found a few serious differences between the Japanese form and the European one: — In the European form, 5th sternite with processes narrowly prolonged and turned ventrad at apex, and praegonites with narrower dorsal lobe and thereon with a single seta (see Hennig, 1972: text-figs. 400 & 403). The Japanese form may possibly represent a different subspecies.

*3. *Emmesomyia socia* (Fallén)
(Figs. 507–512)

Musca socia Fallén, 1825:82. *Emmesomyia socia*: Hennig, 1972:450.

Material examined. SHIKOKU — Mt. Tsurugi, 3♂♂, 16-vii-71.

♂. Body-length 5.7–6.5 mm. Mesonotum more or less tinged with brown in pollinosity, when viewed from behind wholly pollinose and hardly or faintly vittate. Abdomen whitish grey and more or less bluish in pollinosity, which is strongly tinged with brown near median vitta on 3rd and 4th tergites; median vitta sharp and rather narrow. Femora blackish, at most slightly yellowish apically; tibiae yellow; tarsi blackish or dark brownish. Wings distinctly tinged with yellow; calyptrae yellowish, paler basad.

Frons narrower than anterior ocellus; parafrontals with 3–4 *ori* and 1 microscopical *ors*; arista shortly pubescent, the longest hairs being about 1.5–2 times as long as basal diameter of arista.

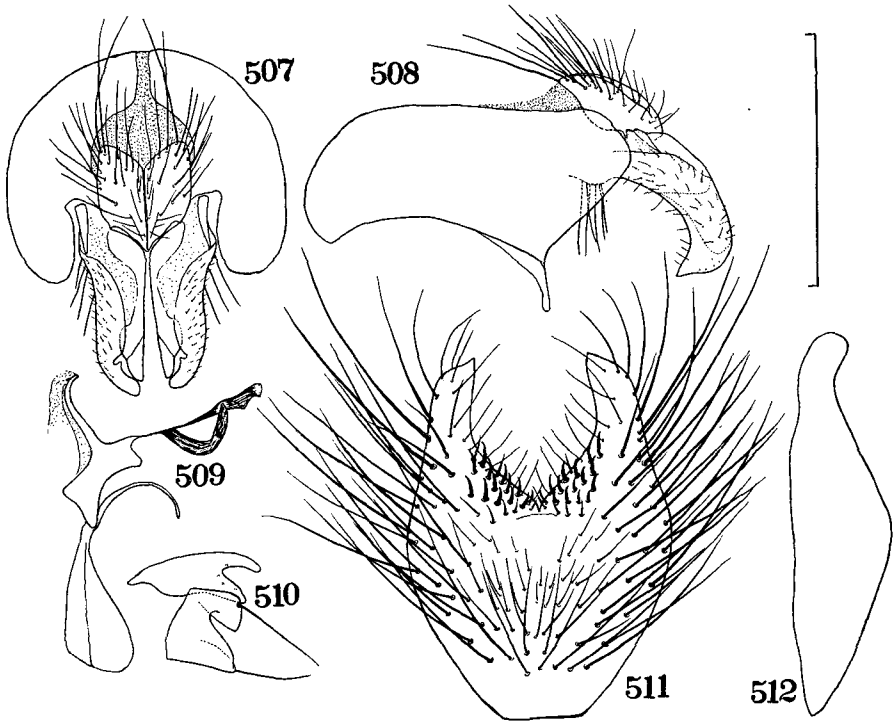
Mesonotum with 2nd *ph* rather developed; *pra* a little shorter than posterior *ntpl*; pteropleura with 1 seta (in 1 specimen with 2 setae on the left body-side); *stpl* 1:2. Abdomen about twice as long as wide, long-ovoid; praegonites (Fig. 510) with dorsal lobe very broad.

♀. Unknown to me.

Distribution. Japan; Taiwan; Manchuria; Europe.

As in the case of *villica* this species also has a distinct difference between the Japanese form and the European one in the genital structure: — In the Japanese form the praegonites with the dorsal lobe large and blunt apically; on the other

hand in the European form the praegonites with the dorsal lobe small and pointed apically (see Hennig, 1972: text-fig. 398).

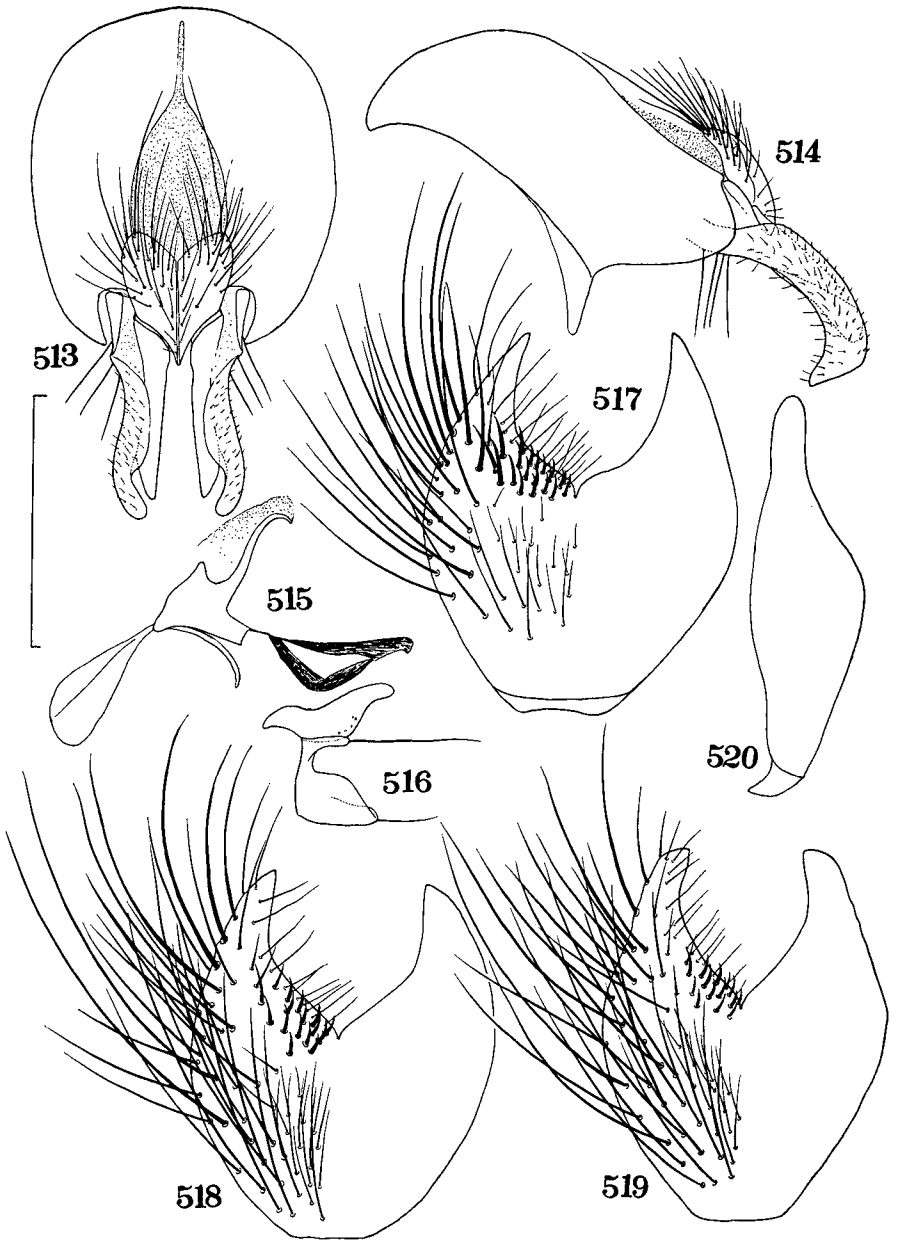


Figs. 507–512. *Emmesomyia socia* (Fallén), ♂: 507, hypopygium, dorsal view; 508, *ditto*, lateral view; 509, basi- and distiphalli; 510, prae- and postgonites; 511, 5th sternite, ventral view; 512, *ditto*, lateral view.

4. *Emmesomyia oriens* sp. nov.
(Figs. 513–520)

Type-material. HONSHÛ — Mt. Kiso-Komagatake, Nagano-ken, 3♂♂ (one the holotype), 27-vii-70; Mt. Kariyose, Tôkyô-to, 1♂, 16-v-68 (H. Takizawa). KYÛSHÛ — Kosugidani, Yaku-shima, 1♂, 1-vi-69 (K. Kusigemati).

♂. Body-length 6.5–7.2 mm; wing-length 6.2–7 mm. Body blackish in ground colour. Interfrontalia with grey pollen; parafacials silvery white in pollinosity; cheeks whitish grey pollinose; antennae and palpi blackish; haustellum with mentum blackish and shining though sparsely pollinose. Thorax in pollinosity bluish grey, on pleura hardly or rather distinctly and on mesonotum faintly or strongly tinged with brown; mesonotum when viewed from front wholly blackish, and when viewed from behind wholly pollinose and not vittate. Abdomen in pollinosity whitish grey and more or less bluish, usually tinged with brown on 3rd to 5th tergites triangularly; median vitta narrow and sharp. Femora blackish, with yellowish apex at least on f_1; tibiae yellow; tarsi blackish or dark brownish. Wings strongly tinged with yellow or brownish yellow; calyptrae yellowish; halteres



Figs. 513–520. *Emmesomyia oriens* sp. nov., ♂: 513, hypopygium, dorsal view; 514, *ditto*, lateral view; 515, basi- and distiphalli; 516, prae- and postgonites; 517, 5th sternite (from Mt. Kiso-Komagatake), ventral view; 518, 5th sternite (from Mt. Kariyose), ventral view; 519, 5th sternite (from Yakushima), ventral view; 520, 5th sternite (from Mt. Kiso-Komagatake), lateral view.

yellow at knob.

Head about 1.6 times as high as long; frons distinctly narrower than anterior ocellus and parafrontals contiguous to each other except in 1 paratype from Mt.

Kariyose, in this paratype frons about as wide as anterior ocellus and parafrontals separated from each other by linear interfrontalia; parafrontals with 4–5 *ori* and 1 microscopical *ors*; A_3 about 2.6–2.8 times as long as wide; arista with the longest hairs about 2–3 times as long as basal diameter of arista; occiput bare on upper part below postocular row of setulae.

Mesonotum with 2nd *ph* rather well developed in the specimens from Mt. Kiso-Komagatake, yet reduced and like accessory setula in the others; *pra* as long as or slightly shorter than posterior *ntpl*; pteropleura with 1 seta; *stpl* 1:2. Abdomen long-ovoid or subparallel-sided, about 1.8–2.3 times as long as wide; 5th sternite and hypopygium as in Figs. 513–520.

Fore tibia with 1 *pv* and with or without 1 minute *ad*; t_2 with 1 *pd* and 2 *p–pv*; f_3 with a row of 7–9 strong *av*, and with 1 rather strong *pv* near base rather ventrally and a few strong *pv* on middle third, some *pv* on apical fourth being rather distinct; t_3 with 1 *av*, 3 (4 in 1 paratype on the right body-side) *ad* and 2 *pd*. Wings with costal thorns very minute though distinguishable from costal setulae; costa haired ventrally; R_{4+5} usually with 1 or a few short setulae at base on each surface; *m-m* strongly oblique and sinuate.

♀. Unknown.

Distribution. Japan.

This species is closely related to the preceding *E. socia*, from which it can be hardly distinguished unless its genital structures are examined. In *oriens*: — Surstyli more or less longer and without a notch at outer projection; basiphallus more broadened on cephalic part, with epiphallus more or less longer; praegonites with dorsal lobe much narrower; postgonites uni-lobed apically.

29. Genus *Pegomya* Robineau-Desvoidy

Pegomya Robineau-Desvoidy, 1830:598. Type-species: *Anthomyia hyoscyami* Panzer, 1809.

In this study the genus *Pegomya* is restricted to the *geniculata-hyoscyami* complex (the *geniculata*-group and the *hyoscyami*-group) of Hennig (1973), who recognized 75 species of the complex in the Palaearctic region. His *connexa*-group of *Pegomya* is transferred to the following genus *Eutrichota*. In the course of the present study have been found 30 species, of which ten are described as new to science. They may be distinguished by the following key.

Key to the species (♂♂)

1. Metathoracic spiracle with some or many setulae. ..... 26. *acklandi* sp. nov.
– Metathoracic spiracle with no setulae. 2
2. Lower calyptra larger than the upper. 3
– Lower calyptra not larger than the upper. 5
3. Metathoracic spiracle larger than knob of haltere; f_2 with the longest *pv* more than twice as long as height of the femur. ..... 19. *spiraculata* sp. nov.
– Metathoracic spiracle smaller than knob of haltere; f_2 with the longest *pv* less than twice as long as height of the femur. 4
4. Occiput with yellowish setulae on ventral region; abdomen largely blackish on caudal half in ground colour. ..... 20. *kusigematii* sp. nov.
– Occiput without yellowish setulae; abdomen largely yellowish all over in ground colour. ..... 21. *winthemi* (Meigen)

5. Hind tibia with only 1 *pd* (practically *d*); t_1 with no *pv*. . . 18. *ruficeps* (Zetterstedt)
– Hind tibia with 2 or more *pd*; t_1 with 1 or more *pv*. 6
6. *Pra* absent; 5th sternite (Fig. 524) with numerous long and strong setae on outer margins. . . . . 6. *criniventris* sp. nov.
– *Pra* present even if short; 5th sternite without so many long and strong setae. . . 7
7. Mesonotum when viewed from behind with 4 sharp vittae apart from lateral patches. 8
– Mesonotum when viewed from behind not with 4 vittae, or hardly vittate. 10
8. Parafrontals separated from each other by narrow interfrontalia; t_1 with apical *p* (practically *pd*) strong; t_3 usually with 1 distinct *p* near basal third. . . . . 9. *quadrivittata* (Karl)
– Parafrontals contiguous to each other; t_1 with both apical *p* and apical *pd* fine and like accessory setulae; t_3 with no *p*. 9
9. Mid and hind femora yellowish, at most darkened apically; profrons at least as wide as A_3. . . . . 14. *esuriens* (Meigen)
– Mid and hind femora blackish or dark brownish; profrons distinctly narrower than A_3. . . . . 7. *albimargo* Pandellé
10. Prebasal sclerite of hypopygium exposed and at least with a row of marginal setae. 11
– Prebasal sclerite of hypopygium partly or wholly concealed beneath 5th tergite and usually bare, at most abnormally with a few setulae. 15
11. Abdomen depressed on basal half; prebasal sclerite of hypopygium hardly setulose except for a row of marginal setae. . . . . 17. *rubivora* (Coquillett)
– Abdomen cylindrical or club-shaped, not depressed basally; prebasal sclerite of hypopygium densely setulose besides a row of marginal setae. 12
12. Hind femur blackish, with a tuft of stiff setulae near base on posterior surface. . . . . 28. *vera* sp. nov.
– Hind femur usually yellow, if blackish without a tuft of setulae. 13
13. Hind tibia with 1 *p*; 5th sternite brownish or yellowish at least on processes. . . . . 27. *orientis* sp. nov.
– Hind tibia with no *p*; 5th sternite wholly blackish. 14
14. Mid tibia with 1 *a*; *stpl* 1:3 or 1:4, at most with a fine additional seta below the anterior one. . . . . 30. *robusta* sp. nov.
– Mid tibia with no *a*; *stpl* 2:3 or 2:4. . . . . 29. *japonica* sp. nov.
15. Fore tibia with strong apical *pd*; t_3 with weak apical *pd*; *ph* not duplicated; *pra* about as long as anterior *ntpl*. . . . . 11. *nigritarsis* (Zetterstedt)
– Otherwise in combination of characters. 16
16. Profrons as wide as or wider than A_3, if narrower then cheeks higher than A_3-width. 17
– Profrons and cheeks respectively narrower and less high than A_3-width. 24
17. *Pra* longer than posterior *ntpl*. 18
– *Pra* shorter than posterior *ntpl*. 19
18. Processes of 5th sternite horn-like and without a tuft of setae at apex. . . . . 15. *nigra* sp. nov.
– Processes of 5th sternite not horn-like and with a tuft of short setae at apex. . . . . 10. *haemorrhoa* (Zetterstedt)
19. Mid tibia with 1 *ad*. 20
– Mid tibia with no *ad*. 22
20. Fore tibia with 1 distinct *ad*; t_3 with apical *pd* strong. . . . . 8. *bicolor* (Wiedemann)
– Fore tibia with no *ad*; t_3 with apical *pd* short and fine. 21
21. Fifth sternite with many short and strong setae at base of each process. . . . . 2. *mixta* Villeneuve
– Fifth sternite without such setae. . . . . 1. *hyoscyami* (Panzer)
22. Femora yellow or brown only at apex, and almost blackish; t_1 with apical *ad* distinct; cheeks much higher than A_3-width. . . . . 3. *falciforcipis* Suwa

– Femora almost yellow except on f_1; t_1 with apical *ad* vestigial; cheeks only a little higher than A_3-width. 23

23. Body larger in size, about 8 mm, and yellowish grey pollinose; mesonotum strongly vittate; wings with costal thorns distinct. .....4. *auricolor* Suwa

– Body smaller in size, about 5 mm, and pale grey pollinose; mesonotum weakly vittate; wings with costal thorns vestigial. .....5. *dulcamarae* Wood

24. Legs wholly blackish. 25

– Legs at least partly yellowish. 26

25. Parafrontals separated from each other by linear interfrontalia; haustellum with mentum rather distinctly pollinose; t_3 with apical *pd* about as strong as apical *d.* .....16. *holosteae* (Hering)

– Parafrontals contiguous to each other; haustellum with mentum hardly pollinose; t_3 with apical *pd* much weaker than apical *d.* .....13. *avida* Hennig

26. *Pra* longer than posterior *ntpl*; tibiae blackish, at most brownish on t_3; palpi wholly black. .....12. *angustiorbitae* sp. nov.

– *Pra* at most as long as posterior *ntpl*; tibiae yellow at least on t_1; palpi yellowish at least basally. 27

27. Mesonotum with rows of *pre acr* separated from each other by a distance longer than that between *dc* and *acr*; 5th sternite with processes not protruded ventrad. .....22. *geniculata* (Bouché)

– Mesonotum with rows of *pre acr* separated from each other by a distance at most as long as that between *dc* and *acr*; 5th sternite with processes protruded ventrad. 28

28. Antennae yellow on two basal segments and at base of A_3; occiput with yellow setulae on ventral region; femora largely yellow; f_3 near middle with 1 *pv* about twice as long as height of the femur. .....23. *pulchripes* (Loew)

– Antennae blackish, at most yellowish on A_2 apically; occiput without yellow setulae; femora largely blackish or dark brownish; f_3 near middle with 0–2 *pv* at most a little longer than height of the femur. 29

29. Hind femur with the longest *av* more than twice as long as height of the femur; t_3 with *ad* as long as one-fourth to one-third of the tibial length. ..25. *pilosa* Stein

– Hind femur with the longest *av* less than twice as long as height of the femur; t_3 without *ad* as long as or longer than one-fourth of the tibial length. .....24. *tenera* (Zetterstedt)

1. *Pegomya hyoscyami* (Panzer)

Anthomyia hyoscyami Panzer, 1809: 13. *Pegomyia hyoscyami*: Bremer, 1929: 134. *Pegomyia hyoscyami* var. *betae*: Kato, 1941: 56, *pt.*, nec Curtis, 1847. *Pegomyia hyoscyami*: d'Aguilar & Missonnier, 1957: 124–131; Chillcott, 1959: 167–170; d'Aguilar & Missonnier, 1962: 95–116. *Pegomya hyoscyami*: Suwa, 1970a: 146–161; id., 1971b: 263; Hennig, 1973: 576, *pt.*

Material examined. There are at hand a lot of specimens taken from various localities in Hokkaidô and Honshû.

Host plants. *Chenopodium album, C. glaucum* & *Spinacia oleracea* (in Japan, after Suwa, 1970a).

Distribution. Asia; North Africa; Europe; North America.

Most of the forms described or treated as varieties or subspecies of *P. hyoscyami* are suppressed as synonyms of the species by Hennig (1973). However, at present I have the opinion that there may be recognized within Hennig's *hyoscyami* at least 3 distinct species, namely, *P. hyoscyami* (Forms A & D of Suwa, 1970a), *P. betae* (Form B of the same) and *P. mixta* (Forms C & E of the same).

2. *Pegomya mixta* Villeneuve

Pegomyia mixta Villeneuve, 1922:51. *Pegomya mixta*: Steyskal, 1970:301. *Pegomya betae*: Suwa, 1970a:146–161, *pt.*, nec Curtis, 1847; id., 1971b:263.

Material examined. There are at hand a lot of specimens collected from Hokkaidô, Honshû and Kyûshû.

Host plants. *Atriplex subcordata, Beta vulgaris, Chenopodium album, C. ficifolium, C. glaucum* & *Spinacia oleracea* (in Japan, after Suwa, 1970a).

Distribution. Japan; North Africa; Europe; North America.

P. mixta might be suppressed as a synonym of *Pegomya tristriata* Stein, 1908 (see Hennig, 1973: 578).

3. *Pegomya falciforcipis* Suwa

Pegomya falciforcipis Suwa, 1971b:267; Hennig, 1973:551.

Material examined. HOKKAIDÔ — Sapporo, 2♂♂ (holotype and paratype); Nopporo, 2♂♂ (paratypes).

Host plants. *Cirsium* sp.

Distribution. Japan.

As pointed out by Hennig (1973) this species may be closely related to the European *Pegomya depressiventris* (Zetterstedt), from which it differs by the following characters: — Frons distinctly wider than anterior ocellus; A_3 less than twice as long as wide; haustellum with mentum pollinose though thinly; 5th sternite with much broader processes; surstyli with much narrower apical projections; epiphallus arising from the base of basiphallus; distiphallus much broader; postgonites with a seta situated near apex.

4. *Pegomya auricolor* Suwa

Pegomya auricolor Suwa, 1971b: 269; Hennig, 1973:529.

Material examined. HOKKAIDÔ — Sapporo, 1♂ (holotype), 2♀♀ (paratypes), ex *Arctium lappa*, as leaf-miner.

Host plants. *Arctium lappa.*

Distribution. Japan.

Through the courtesy of Dr. Steyskal I have been able to see figures of the male 5th sternite and hypopygium of the North American *Pegomya carduorum* Huckett, 1939 produced by him. The male genital structures of *Pegomya terebrans* (Rondani, 1866), which is distributed in Europe and Palestine, are also figured by Hennig (1973: text-fig. 564 and plate-figs. 808, 810 & 942). Judging from these figures *carduorum* and *terebrans* might be conspecific, and *P. auricolor* is closely related to both. This species is, however, distinguishable from the two by the following aspects: — Body longer than 6 mm; A_3 more than 1.5 times as long as wide; cercal plate more prolonged apicad and not bifurcated at apex; surstyli with outer extension less triangulate.

5. *Pegomya dulcamarae* Wood

Pegomyia dulcamarae Wood, 1913:85. *Pegomya dulcamarae*: Ackland, 1965c:21; Suwa, 1971b:264; id., 1971c:320; Hennig, 1973:547.

Material examined. HOKKAIDÔ — Hamatombetsu, 1♂, 1♀; Utanobori, 1♀; Otoshibe, 2♀♀, 17-vii-71 (T. Hanada), ex *Solanum tuberosum*; Otoineppu, 1♀, 10-viii-66 (H. Inouye), ex *Solanum tuberosum*.

Host plants. *Solanum tuberosum* (in Japan, after Suwa, 1971b); *Solanum dulcamara* (in England, after Wood, 1913).

Distribution. Japan; England.

6. *Pegomya criniventris* sp. nov.
(Figs. 521–525)

Type-material. HOKKAIDÔ — Mt. Soranuma, 2♀♀, 30-viii-67 (K. Kusigemati), & 1♀, 1-viii-68; Mt. Yûbari, 1♀, 11-viii-66 (K. Kusigemati); Mt. Daisetsu, 4♂♂, 26-vii-67 (K. Kusigemati); Rishiri-tô, 1♂, 31-vii-69. HONSHÛ — Mt. Bandai, Fukushima-ken, 6♂♂, 5♀♀, 28-vii-71; Mt. Yatsugatake, Nagano-ken, 21♂♂ (one the holotype), 1♀, 20–21-vii-70; Mt. Kiso-Komagatake, Nagano-ken, 3♂♂, 26–27-vii-70.

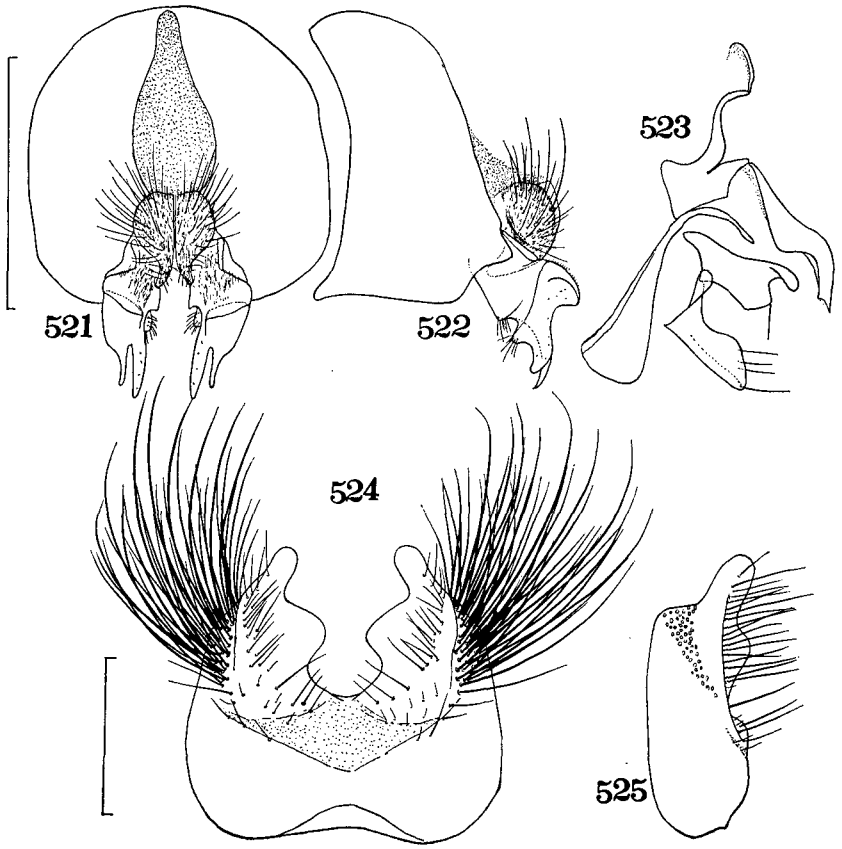
♂. Body-length 6–7 mm; wing-length 6–7 mm. Interfrontalia black, sometimes slightly reddish brown near lunule, with whitish grey pollen; parafacials and cheeks black or sometimes dark brown in ground colour and whitish grey in pollinosity, which is usually more or less tinged with yellow or brown; occiput in ground colour black and in pollinosity bluish grey and a little brownish; antennae and palpi blackish; haustellum with mentum blackish and pollinose. Thorax black in ground colour and bluish grey in pollinosity; mesonotum very faintly vittate, when viewed from front with narrow paramedian vittae between rows of *acr* and *dc*, when viewed from above with lateral patches covering bases of *ia*, and when viewed from behind with median, paramedian and sublateral vittae, the median and paramedian vittae being often confused to each other. Abdomen black in ground colour, and densely covered with pale brownish grey pollen; median vitta narrow and sharp; fore marginal bands lacking; hypopygium concolorous with abdomen; cercal plate yellow; 5th sternite with processes largely yellowish or brownish and rarely blackish. Coxae blackish or partly brownish; trochanters brownish or yellowish; f_1 largely blackish, only brownish or yellowish on apical part ventrally; f_2 and f_3 yellow, slightly darkened apically; t_1 usually yellowish on apical part and blackish on the remaining part; t_2 and t_3 yellow, more or less darkened basally; tarsi blackish. Wings strongly yellow at base; calyptrae strongly yellow; halteres yellow, at base more or less brownish or reddish.

Head about 1.3 times as high as long; frons more or less wider than anterior ocellus; interfrontalia about half as wide as anterior ocellus; parafrontals with 8 to about 10 slender *ori* and usually with 1 vestigial *ors*; A_3 1.7–2 times as long as wide; arista minutely and rather densely pubescent; profrons 1.3–1.6 times as wide as A_3; parafacials broadly maintained ventrad, at the narrowest part more or less wider than A_3; cheeks 1.7–2.1 times as high as A_3-width, with genal setae in a few rows; face rather distinctly concave near epistoma; epistoma distinctly behind frons at lunule; palpi slightly widening apicad; haustellum rather slender.

Mesonotum with a few irregular pairs of rather strong *pre acr*, the rows being much closer together than to *dc*; 2nd *ph* usually developed, often as long as the 1st; *pra* lacking, if present hardly distinguishable from accessory setulae; notopleura with no accessory setulae; mesopleura with no distinct anterior *mpl*; *stpl* 1:2,

sometimes with rather distinct lower anterior one; scutellum setulose on dorsal surface laterally.

Abdomen depressed, nearly parallel-sided on 2nd and 3rd tergites and a little narrowing caudad; prebasal sclerite not setose; 5th sternite (Figs. 524 & 525) strongly chitinized on outer part of each process and thereon with numerous long and strong setae, yet on inner part weakly chitinized and blade-like; hypopygium as in Figs. 521–523.



Figs. 521–525. *Pegomya criniventris* sp. nov., ♂ : 521, hypopygium, dorsal view; 522, *ditto*, lateral view; 523, aedeagus; 524, 5th sternite, ventral view; 525, *ditto*, lateral view.

Fore tibia with 1–2 (usually 1) *pv* and no *ad*, apical *pd* being indistinct; f_2 with no *av*, and on basal half with some *pv*, the longest one being a little longer than height of the femur; t_2 with no *ad*, 1 *pd* and 1–3 (usually 2) *p–pv*, of which the proximal one is often located rather on postero-dorsal surface; f_3 with 7–10 strong *av* except near base, the setae becoming longer towards apex of the femur, the longest one about 1.6–1.8 times as long as height of the femur, and near middle with 1 or a few weaker *pv*, which are more or less shorter than height of the femur; t_3 with 1 strong and often 1–2 weaker *av*, 2–4 *ad* and 2–4 *pd*, and sometimes with 1 *a* near middle, apical *pd* being usually weak. Wings with costal thorns very

minute and indistinguishable from costal setulae; *m-m* more or less oblique and a little or hardly sinuate; lower calyptra smaller than the upper.

♀. Body-length 6.5–7.6 mm. Head in ground colour black on upper half of each parafrontalia and on occiput, and yellow on the remaining part; A_1 usually reddish yellow or brownish; A_2 and A_3 blackish, at most sometimes faintly brownish on A_2 apically; palpi usually yellow basally; haustellum with mentum blackish or dark brownish and distinctly pollinose. Thorax more thickly pollinose than in male. Abdomen concolorous with thorax and not vittate. Coxae largely or sometimes partly yellow; trochanters yellow; femora yellow; tibiae yellow, at most slightly darkened basally.

Head about 1.2 times as high as long; frons about 0.4 times as wide as head; interfrontalia without *if*, only with some scattering microscopical setulae; parafrontals with 4–6 *ori*, and with 3–4 *ors* which are usually directed outwards; A_3 1.6–1.9 times as long as wide; profrons 1.6–1.7 times as wide as A_3; cheeks about twice as high as A_3-width, with genal setae fine and arranged in 2 rows. Mesonotum with 2nd *ph* fine and like accessory setula; *stpl* 1:2, the lower posterior being shorter than the upper though strong; scutellum less densely setulose than in male. Mid tibia with 1 strong *ad*.

Distribution. Japan.

This species runs out in a key to the North American species of *Pegomya* given by Huckett (1965a) with *P. alticola* Huckett, 1939, and may be closely related to that species by the male 5th sternite armed with many long and strong setae and sinuate along inner margin of each process. Having read the original description and other statements on *alticola* given by Huckett (1939, 1941 & 1965a) I have found some differences other than in colour; — In *alticola*: ♂, A_3 about 1.25 times as long as wide; *pre acr* finely developed; f_3 with fine *av*. ♀, interfrontalia with *if*; haustellum with mentum polished; lower posterior *stpl* short and weakly developed; abdomen with marginal setae weakly developed; t_1 with 1 *ad*.

7. *Pegomya albimargo* Pandellé

Anthomyia (*Pegomyia*) *albimargo* Pandellé, 1901:296. *Pegomya albimargo*: Suwa, 1971b:264. *Pegomya albimargo*: Hennig, 1973:517.

Material examined. HOKKAIDÔ — Sapporo, 4♂♂, 11♀♀; Nopporo, 4♂♂, 1♀; Ôno, 2♂♂, 1♀; Mt. Kariba, 1♂, 1♀. HONSHÛ — Mt. Hakkôda, Aomori-ken, 1♂; Mt. Yatsugatake, Nagano-ken, 3♂♂.

Host plants. *Melachium aquaticum, Stellaria media, S. neglecta* & *S. sessiliflora* (in Japan, after Suwa, 1971b). In Europe various plants, most of which belong to Caryophyllaceae, are known as hosts of this species (see Hennig, 1973).

Distribution. Japan; North Africa; Europe.

Judging from a redescription of *albimargo* given by Hennig (1973) and 2 British specimens (♂♂) determined as *albimargo* by Ackland the Japanese form is slightly different from the European one in having a much darker abdomen, which is blackish in ground colour and never yellowish or brownish.

8. *Pegomya bicolor* (Wiedemann)

Anthomyia bicolor Wiedemann, 1817:77. *Pegomyza jynx* Séguy, 1926:44. *Pegomyia*

bicolor sapporensis Kato, 1941: 62. *Pegomya bicolor*: Suwa, 1971b: 262. *Pegomya bicolor jynx*: Hennig, 1973: 535.

Material examined. HOKKAIDÔ — Sapporo, 32♂♂, 30♀♀; Nopporo, 14♂♂, 6♀♀; Jôzankei, 1♂; Eniwa, 2♂♂, 1♀; Hiroshima-mura, 4♀♀; Shimamatsu, 2♂♂, 7♀♀; Shikotsu-ko, 1♂; Mt. Apoi, 1♂; Hamatombetsu, 1♂, 1♀; Akkeshi, 2♀♀; Ôno, 1♂, 3♀♀. HONSHÛ — Shiki, Saitama-ken, 2♂♂; Tôkyô, Tôkyô-to, 4♂♂, 1♀; Kiyosumi-yama, Chiba-ken, 2♂♂, 1♀. KYÛSHÛ — Fukuoka, 2♂♂, 2♀♀.

♂. Body-length 5–7 mm. Antennae usually blackish on all segments, sometimes brownish on A_2 apically or at a more extensive area; palpi blackish; haustellum with mentum blackish and shining though slightly pollinose. Thorax and abdomen black in ground colour and pale or whitish grey in pollinosity. Fore femur largely darkened though yellow at least apically; f_2 and f_3 yellow, at most slightly darkened near apex dorsally; tibiae yellow; tarsi blackish.

Mesonotum with 2nd *ph* usually fine and only distinguishable from accessory setulae, yet in a few specimens it is well developed; mesopleura with or without 1 fine setula near *pstg* (1 strong and 1 weaker). Hind tibia with 1 *av*, 2 long and 0–2 shorter *ad*, and 2 long and 0–2 shorter *pd*, and with no *a*. Wings with costal thorns usually short.

♀. Palpi brownish yellow on basal half in a few specimens, but usually blackish as in male; haustellum with mentum sometimes brownish. Abdomen in ground colour usually black as in male, yet in a few specimens partly or largely yellowish although at least blackish medially and on hind margins of tergites. Fore femur sometimes wholly yellow. Mesonotum with 2nd *ph* always fine; lower anterior *stpl* sometimes very fine.

Host plants. *Rumex* spp. including *R. acetosa*, *R. obtusifolius* & *R. acetosella* (in Japan, after Suwa, 1971b).

Distribution. Holarctic region.

The Japanese form is slightly different from the European one and referred to the *jynx*-form.

9. *Pegomya quadrivittata* Karl

Pegomyia quadrivittata Karl, 1935: 44. *Pegomya setaria*: Suwa, 1971b: 264, nec Meigen, 1826. *Pegomya quadrivittata*: Hennig, 1973: 619.

Material examined. The present specimens (30♂♂, 35♀♀) have been taken from the following localities: — HOKKAIDÔ — Sapporo; Chitose; Hiroshima-mura; Mt. Shokambetsu. HONSHÛ — Tazawa-ko, Akita-ken; Mt. Kurikoma, Miyagi-ken; Urabandai, Fukushima-ken. KYÛSHÛ — Hikosan; Yaku-shima.

Host plants. *Polygonum nepalense*, *P. sieboldi* & *P. thunbergi* (in Japan, after Suwa, 1971b); *Polygonum filiforme* (Sapporo, 1♂, 2♀♀, 25-vi-72).

Distribution. Japan; Taiwan; India, Burma & Ceylon (after Ackland, 1972, in litt.).

By the courtesy of Dr. Steyskal and Mr. Ackland I have noticed that the Japanese form, which was identified with *P. setaria* by myself in 1971, is different from the North American and the European forms of *P. setaria* (Meigen) in some aspects, especially in the genital structures of the male and in the presence of 1 strong *p* on t_3. Furthermore, by the kindness of Mr. Ackland I have examined a male specimen of *setaria* from England and a male specimen of *quadrivittata* from

India, and I have been convinced that the present Japanese form should be referred to *quadrivittata* as pointed out by Ackland (in litt.) and Hennig (1973).

10. *Pegomya haemorrhoa* (Zetterstedt)

Anthomyza haemorrhoa Zetterstedt, 1838:692. *Pegomya haemorrhoa*: Ackland, 1964: 364; Suwa, 1971b:266; Hennig, 1973:569.

Material examined. The specimens examined were taken from the following localities: — HOKKAIDÔ — Sapporo; Mt. Apoi; Mt. Daisetsu; Rishiri-tô; Kamino-kuni. HONSHÛ — Mt. Chôkai, Yamagata-ken; Mt. Hodaka & Mt. Shirouma, Nagano-ken.

Host plants. *Polygonum nakaii, P. sachalinense* & *P. weyrichii* var. *alpinum* (in Japan, after Suwa, 1971b).

Distribution. Japan; Europe; North America.

By the courtesy of Mr. Ackland I have been able to examine 2 European specimens (1♂, 1♀) of *haemorrhoa*. Having examined them and read a redescription of *haemorrhoa* given by Hennig (1973) I have found no remarkable differences between the Japanese form and the European one except in colour of the female abdomen. The European form is yellow on the whole 5th tergite and on the posterior part of the 4th, whereas the Japanese form differs by having yellow at most only on the caudal half of the 5th tergite.

*11. *Pegomya nigritarsis* (Zetterstedt)
(Figs. 526–530)

Anthomyza nigritarsis Zetterstedt, 1838:696. *Pegomyia nigritarsis*: Huckett, 1941:83. *Pegomya nigritarsis*: Hennig, 1973:604.

Material examined. HOKKAIDÔ — Eniwa, 1♂, 27-v-71.

♂. Body-length 6.5 mm. Antennae yellow on two basal segments and blackish on the 3rd; palpi more or less brownish basally and blackish apically; haustellum with mentum blackish and polished. Thorax wholly blackish in ground colour, thickly covered with pale grey pollen. Abdomen pale grey pollinose, with median vitta rather obscurely margined; dorsal surface in ground colour largely blackish on basal half and largely yellowish on caudal half; each tergite yellow in ground colour along hind margin; ventral surface in ground colour yellowish, only partly darkened. Fore femur blackish dorsally; f_2 and f_3 yellow; tibiae yellow. Calyptrae whitish, only a little yellowish marginally.

Mesonotum with 2nd *ph* fine and like accessory setula; *pra* about as long as anterior *ntpl*; mesopleura with a strong anterior *mpl*. Abdomen with 5th sternite and hypopygium as in Figs. 526–530. Fore tibia with 1 *ad* and 2 *pv*, apical *pd* being strong; f_2 with no *av* and on basal half with 4–5 *pv*, of which 2 are strong; t_2 with 1 *ad*, 1 *pd*, 1 *p* and 1 *pv*; f_3 with some *pv*, of which 2 are situated near middle and a few being near apex; t_3 with 2 *av*, 3 *ad* and 2–3 *pd*, apical *pd* being short. Wings with costal thorns minute, only a little stronger than costal setulae.

♀. Unknown to me.

Host plants. In Europe some species belonging to *Rumex*, *Polygonum* and *Oxyria* are known as host plants of this species (see Hennig, 1973).

Distribution. Japan; Europe; North America.

Judging from a redescription of *nigritarsis* given by Hennig (1973) the European form of this species is more yellow in colour on the abdomen than the Japanese one. It should be noted here that this is also the case in *hyoscyami, bicolor* and *albimargo*.

12. *Pegomya angustiorbitae* sp. nov.
(Figs. 531–535)

Type-material. HONSHÛ — Mt. Yatsugatake, Nagano-ken, 3♂♂ (one the holotype), 20–21-vii-70; Mt. Senjô, Nagano-ken, 1♂, 10-vii-71.

♂. Body-length 4.7–5.4 mm; wing-length 4.4–4.9 mm. Head including appendages blackish in ground colour; interfrontalia, parafacials and cheeks whitish grey pollinose; haustellum with mentum polished. Thorax in ground colour black and in pollinosity brownish grey; mesonotum with shifting vittae, when viewed from behind with median vitta before the suture and covering the bases of *pre acr* and with sublateral vittae behind the suture between *dc* and *ia*, and when viewed from lateral with narrow paramedian vittae along rows of *dc*, the median vitta being continuous caudad in some lights. Abdomen black in ground colour and bluish grey in pollinosity, which is of fine texture and shining in some lights; median vitta rather broad, narrowly interrupted at hind margin of each tergite; marginal bands absent. Coxae and trochanters blackish or dark brownish; f_1 blackish, at most slightly brownish basally; f_2 and f_3 on apical third to fourth blackish or dark brownish, and on the remaining part yellow; t_1 and t_2 blackish; t_3 blackish to brownish; tarsi blackish. Wings with a distinct brownish yellow tinge; calyptrae yellowish; halteres brownish or reddish at base and yellowish at knob.

Head about 1.35–1.45 times as high as long; frons about half as wide as anterior ocellus; parafrontals broadly contiguous to each other, with 3–5 *ori*; A_3 a little broadening apicad, and 1.8–2 times as long as wide; arista minutely pubescent; profrons about half as wide as A_3; parafacials still more narrowing ventrad; cheeks about half as high as A_3-width, with genal setae in 1 row; epistoma distinctly behind frons at lunule; palpi somewhat broadened apically.

Mesonotum with 3 pairs of distinct *pre acr*, setae of the middle pair being the strongest, about as long as posterior *ntpl*, and with 1 or a few setulae between the rows, which are separated from each other by a distance as long as or a little shorter than that between *dc* and *acr* at the 1st pair and becoming closer together caudad; 2nd *ph* well developed; *pra* about as long as anterior *ntpl*; *stpl* 1:2; mesopleura with anterior *mpl* fine though distinguishable from accessory setulae, and with only 2 normal *pstg*; scutellum with only a few accessory setulae on dorsal surface laterally.

Abdomen depressed, about twice as long as wide, widest at 3rd tergite and slowly narrowing cephalad and caudad; prebasal sclerite bare; 5th sternite and hypopygium as in Figs. 531–535.

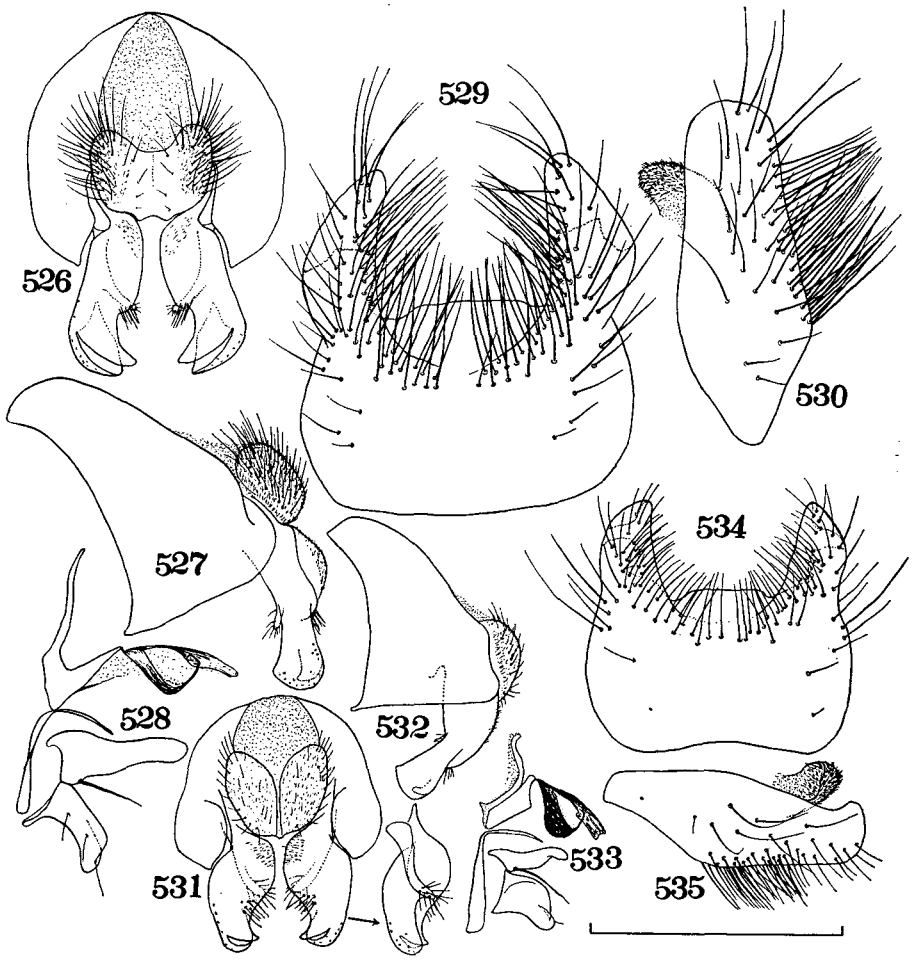
Fore tibia with 1 *ad* and 2 *pv*, apical *pd* being vestigial; f_2 with no *av*, and on basal half with 3–5 *pv*, the longest one being more or less longer than height of the femur; t_2 with 1 *ad*, 1 *pd*, 1 *p* and 1 *pv*; f_3 with 7–8 *av* becoming longer towards apex of the femur, the longest one being 1.5–1.7 times as long as height of the femur, and near middle with 1 or a few *pv* about as long as height of the femur;

t_3 with 2–3 (usually 2) *av*, 2 *ad* and 2 *pd*, apical *pd* being weak. Wings with costal thorns minute, hardly distinguishable from costal setulae or nearly so; *m-m* nearly erect and hardly or slightly sinuate; lower calyptra not larger than the upper.

♀. Unknown.

Distribution. Japan.

Judging from the 5th sternite and hypopygium this species may be closely related to *P. nigritarsis*, from which it can, however, be readily distinguished by the darker colouration, the narrower orbits, the duplicated *ph* and the structures of the 5th sternite and hypopygium different in details.



Figs. 526–530. *Pegomya nigritarsis* (Zetterstedt), ♂: 526, hypopygium, dorsal view; 527, *ditto*, lateral view; 528, aedeagus; 529, 5th sternite, ventral view; 530, *ditto*, lateral view.

Figs. 531–535. *Pegomya angustiorbitae* sp. nov., ♂: 531, hypopygium, dorsal view; 532, *ditto*, lateral view; 533, aedeagus; 534, 5th sternite, ventral view; 535, *ditto*, lateral view.

*13. *Pegomya avida* Hennig
(Figs. 536–539)

Pegomya avida Hennig, 1973:530.

Material examined. HONSHÛ — Mt. Senjô, Nagano-ken, 2♂♂, 10-vii-71.

♂. Body-length 5.3–5.6 mm. Head including appendages, thorax, abdomen and legs all black in ground colour. Interfrontalia whitish grey pollinose; parafacials and cheeks brownish grey pollinose; haustellum with mentum polished. Mesonotum brownish pollinose and very faintly vittate, when viewed from behind with rather broad median vitta, narrow paramedian vittae along rows of *dc* and sublateral patch-like vittae between *dc* and *ia* behind the suture. Abdomen brownish grey in pollinosity, with median vitta rather narrow, interrupted at hind margin of each tergite and more or less dilated anteriorly on each tergite. Wings with a distinct dark brownish tinge; calyptrae dark brownish; halteres dark or reddish brown at base and yellow at knob.

Head about 1.35 times as high as long; frons narrower than anterior ocellus; parafrontals broadly contiguous to each other, with 4 strong and 1 or 2 finer *ori*; A_3 1.6–1.7 times as long as wide; arista minutely pubescent; profrons about 0.7 times as wide as A_3; cheeks about 0.7 times as high as A_3-width, with genal setae in 2 rows; epistoma behind frons at lunule; palpi a little broadened apically.

Mesonotum with 3 pairs of distinct *pre acr* and with or without 4 accessory setulae between the rows, which are more or less closer together than to *dc*; 2nd *ph* well developed; *pra* as long as or a little longer than posterior *ntpl*; mesopleura with 1 or a few slender and distinct anterior *mpl*, and with 1 fine setula above the 2 normal *pstg*; *stpl* 1:2; scutellum with 3–5 accessory setulae on each lateral area of dorsal surface.

Abdomen depressed, nearly parallel-sided and about twice as long as wide; prebasal sclerite bare; 5th sternite and hypopygium as in Figs. 536–539.

Fore tibia with 1–2 *pv* and no *ad*, apical *pd* being vestigial; f_2 with no distinct *av*, and on basal half with some *pv*, the longest one about 1.5 times as long as height of the femur; t_2 with 1 *ad*, 1 *pd*, 1 *p* and 1 *pv*; f_3 with a row of about 10 long *av*, the longest one being 1.7–1.9 times as long as height of the femur, and on basal two-thirds with 6–8 long *pv*, the longest one being 1.7–1.8 times as long as height of the femur; t_3 with 1 *av*, 3 *ad* and 2 *pd*, and with or without 1 short additional *pd*, apical *pd* being weak. Wings with costal thorns minute and only a little stronger than costal setulae; *m-m* nearly erect and straight; lower calyptra not protruded beyond the upper.

♀. Unknown.

Distribution. Japan; Lapland.

As pointed out by Hennig (1973) this species may closely be related to *P. esuriens* on account of its similarity in the distiphallus. However, it can be readily distinguished from that species by the much darker colouration, the stronger *pra* and the much longer setae on the femora. Judging from the original description of *avida* the Japanese form is slightly different from the European one in having A_3 less than twice as long as wide and t_1 with no *ad*.

*14. *Pegomya esuriens* (Meigen)
(Figs. 540–543)

Anthomyia esuriens Meigen, 1826:181. *Pegomyia* (*Pegomyia*) *esuriens*: Ringdahl, 1938: 201. *Pegomya esuriens*: Hennig, 1973:549.

Material examined. HOKKAIDÔ — Sapporo, 1♂, 1-vi-66, & 1♂, 19-vi-69; Hiroshima-mura, 1♂, 11-vi-66, & 4♂♂, 23-vi-67.

♂. Body-length 5.4–6.2 mm; wing-length 4.7–5.5 mm. Antennae more or less brownish on A_2 apically, or wholly blackish; haustellum with mentum blackish or dark brownish, and faintly pollinose. Thorax in pollinosity bluish grey to brownish grey; mesonotum when viewed from behind with 4 sharp vittae between *dc* and *acr* and between *dc* and *ia*; scutellum brownish pollinose at least on dorsal centre. Abdomen in pollinosity bluish grey to pale brownish grey; median vitta narrow and sharp, more or less wedge-shaped on each tergite; 5th sternite more or less brownish on processes at least apically. Femora yellowish, more or less darkened dorsally on f_1 and apically on f_2 and f_3; tibiae yellow. Wings distinctly tinged with brownish yellow; calyptrae brownish yellow.

Frons about as wide as anterior ocellus; parafrontals usually contiguous, with 4–6 strong and 1 or a few fine *ori*, and in 1 specimen with 1 minute *ors* near middle between anterior ocellus and the uppermost *ori*; A_3 about twice as long as wide; cheeks with genal setae in 2 rows.

Mesonotum with 3 pairs of strong *pre acr* and with some fine setulae between the rows; 2nd *ph* rather well developed; *pra* half to two-thirds of posterior *ntpl* in length; *stpl* 1:2, if 1:3 the lowest posterior being much weaker than the uppers.

Fore tibia with 1 *ad* and 1 *pv*; f_2 on basal half with some *pv*, the longest one more or less longer than height of the femur; f_3 with 7–8 *av*, the longest one about 1.5 times as long as height of the femur, and on basal half to two-thirds with some *pv*, the longest one as long as or a little longer than height of the femur; t_3 with 1–2 (usually 1) *av*, 3–6 *ad* and 2–4 *pd*, apical *pd* being weak or somewhat distinct.

♀. Unknown to me.

Host plants. In Europe some plants belonging to *Chenopodium*, *Beta* and *Datura* are recorded as host plants of this species (see Hennig, 1973).

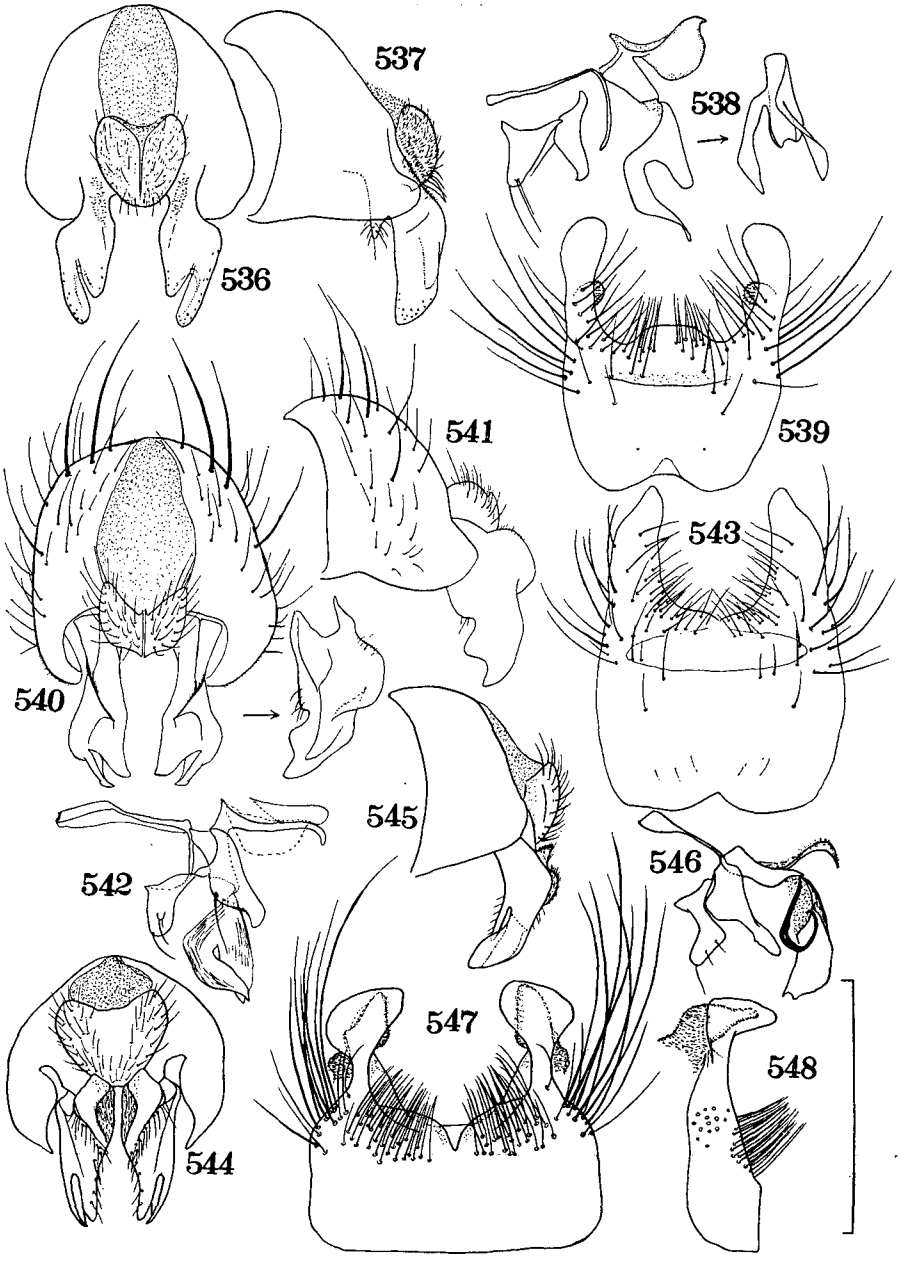
Distribution. Japan; Europe.

At a glance this species much resembles the Japanese form of *P. hyoscyami*, although it can be readily distinguished from the latter by the markings on the mesonotum. Judging from the distiphallus, however, this species is more closely related to the preceding *P. avida* rather than to *hyoscyami*.

15. *Pegomya nigra* sp. nov.
(Figs. 544–548)

Type-material. HONSHÛ — Mt. Yatsugatake, Nagano-ken, 9♂♂ (one the holotype), 19–20-vii-70; Mt. Senjô, Nagano-ken, 1♂, 10-vii-71.

♂. Body-length 4.3–5.2 mm; wing-length 4.3–5 mm. Interfrontalia black or sometimes brownish on lower half in ground colour, and pale brownish grey in pollinosity; parafacials in ground colour black, at most brownish on anterior margin, and in pollinosity pale brownish grey; cheeks black or sometimes brownish in ground colour, and pale brownish grey in pollinosity; occiput in ground colour black, and in pollinosity with a weak bluish tinge; antennae and palpi black;



Figs. 536–539. *Pegomya avida* Hennig; ♂: 536, hypopygium, dorsal view; 537, *ditto*, lateral view; 538, aedeagus; 539, 5th sternite, ventral view.

Figs. 540–543. *Pegomya esuriens* (Meigen), ♂: 540, hypopygium, dorsal view; 541, *ditto*, lateral view; 542, aedeagus; 543, 5th sternite, ventral view.

Figs. 544–548. *Pegomya nigra* sp. nov., ♂: 544, hypopygium, dorsal view; 545, *ditto*, lateral view; 546, aedeagus; 547, 5th sternite, ventral view; 548, *ditto*, lateral view.

haustellum with mentum black and very thinly pollinose. Thorax black in ground colour, rather thinly covered with whitish grey pollen more or less tinged with blue; mesonotum very faintly vittate, when viewed from above in front light with only lateral patches, and when viewed from behind in some lights with median and paramedian vittae. Abdomen in ground colour black, and in pollinosity dull grey and more or less brownish, with median vitta narrow; 5th sternite polished on processes. Legs black. Wings dark brownish tinged, strongly at base.

Head about 1.3 times as high as long; frons as wide as or a little wider than anterior ocellus; interfrontalia linear caudad, half to one-third as wide as anterior ocellus; parafrontals with some strong and some finer *ori*; A_3 1.7–2.1 times as long as wide; arista rather distinctly swollen at base and shortly pubescent, the longest hairs being shorter than basal diameter of arista; profrons usually more or less wider than A_3 (1.2 times in the holotype); cheeks about 1.2–1.6 (in the holotype 1.4) times as high as A_3-width, with genal setae in a few rows; epistoma behind frons at lunule.

Mesonotum with 4–7 (7 in the holotype) *pre acr*, which are regularly or irregularly paired, the rows being much closer together than to *dc* and the distance between the setae of the 1st pair is distinctly shorter than that between *dc* and *acr*, sometimes half of the latter; 2nd *ph* well developed; *pra* more or less longer than anterior *ntpl*; *stpl* 1:2, if 1:3 the lowest posterior much weaker than the uppers; scutellum hardly setulose on dorsal surface.

Abdomen depressed except on caudal part, nearly parallel-sided, and about twice as long as wide; prebasal sclerite bare; 5th sternite and hypopygium as in Figs. 544–548.

Fore tibia with 1 short *ad* and 1 or sometimes 2 *pv*, apical *pd* being vestigial; f_2 with no distinct *av* and on basal half with some *pv*, the longest one being 1.4–1.8 (in the holotype 1.5) times as long as height of the femur; t_2 with 1 *ad*, 1–2 (usually 1) *pd*, 1 *p* and 1–2 (usually 1) *pv*; f_3 on apical two-thirds with 5–8 *av*, the longest one usually twice or a little more as long as height of the femur, and on basal half with 4–5 *pv*, the longest one about 1.5–2 times as long as height of the femur; t_3 with 1–3 *av*, 2 *ad* and 2 *pd*, apical *pd* being fine. Wings with costal thorns minute and hardly distinguishable from costal setulae; *m-m* nearly erect and slightly sinuate; lower calyptra not larger than the upper.

♀. Unknown.

Distribution. Japan.

In the 5th sternite which has a tuft of many setae at inner base of each process and in the distiphallus which is weakly chitinized on the median projection and provided with curled side-projections *P. nigra* is closely related to *haemorrhoa*. However, it is readily distinguished from the latter by the darker colouration, the broader parafacials and cheeks, and the 5th sternite with horn-like processes.

*16. *Pegomya holosteae* (Hering)
(Figs. 549–556)

Hylemyia holosteae Hering, 1924:232. *Pegomyia cerastii* Hering, 1931:546. *Pegomyia globosa* Ringdahl, 1952:172. *Pegomya holosteae*: Hennig, 1973:574.

Material examined. HOKKAIDÔ — Sapporo, 1♂, 15-v-65 (T. Kocha), 1♂, 11-

v-66, & 1♂, 27-v-68; Nopporo, 1♂, 17-v-70. HONSHÛ — Kiyosumi-yama, Chiba-ken, 1♂, 4-iv-71. KYÛSHÛ — Amami-Ôshima, 1♂, 23-iii-70 (H. Takizawa).

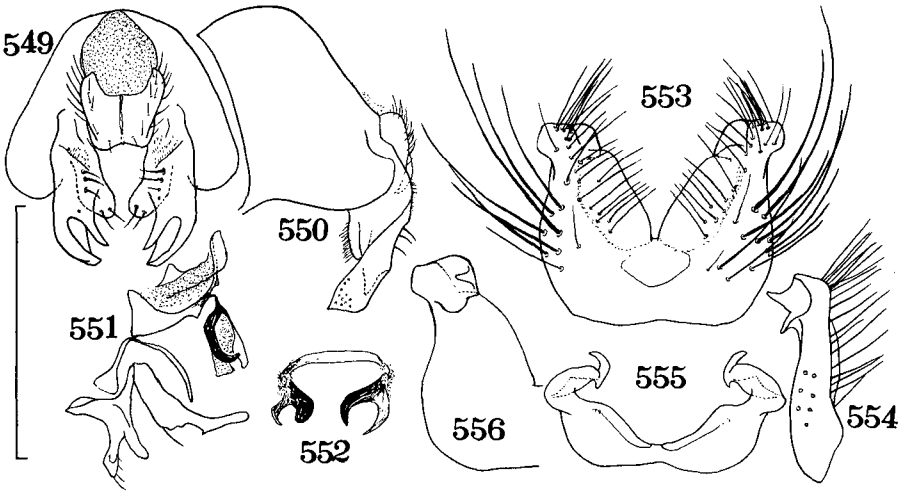
♂. A blackish species; legs black; wings tinged with dark brownish colour. Body-length 4.5–5 mm. Frons as wide as or a little narrower than anterior ocellus; parafrontals not contiguous to each other; A_3 1.6–2 times as long as wide. Mesonotum with 2nd *ph* well developed; *pra* usually more or less shorter than posterior *ntpl*, at most as long as the latter. Abdomen depressed, long-ovoid, and about 1.5–1.8 times as long as wide; prebasal sclerite usually bare, only in 1 specimen with 2 setulae at hind margin; 7th tergite (?, Fig. 552) present just behind hypandrium.

Fore tibia with no distinct *ad*, only a few or some setulae near apex being discernible though very minute, and with 1 distinct *pv*, apical *pd* being vestigial and indistinguishable from accessory setulae, yet apical *p* is rather discernible and distinguishable from accessory setulae; t_2 with 1 *ad*, 1 *pd*, 1 *p* and 0–1 *pv*; t_3 with 2 *av*, 2 strong and 1 weaker *ad* and 2 *pd*, apical *pd* being strong.

♀. Unknown to me.

Host plants. Some species belonging to *Stellaria and Cerastium* (Caryophyllaceae) are known as host plants of this species in Europe (see Hennig, 1973).

Distribution. Japan; Europe.



Figs. 549–556. *Pegomya holosteae* (Hering), ♂: 549, hypopygium, dorsal view; 550, *ditto*, lateral view; 551, aedeagus; 552, 7th tergite (?); 553, 5th sternite, ventral view; 554, *ditto*, lateral view; 555, *ditto*, caudal view; 556, *ditto*, inside view.

*17. *Pegomya rubivora* (Coquillett)
(Figs. 557–561)

Phorbia rubivora Coquillett, 1897:162. *Anthomyia* (*Chortophila*) *dentiens* Pandellé, 1900:268. *Pegomyia rubivora*: Huckett, 1924:47. *Pegomyia dentiens*: Ringdahl, 1959: 247. *Pegomya rubivora*: Hennig, 1973:621.

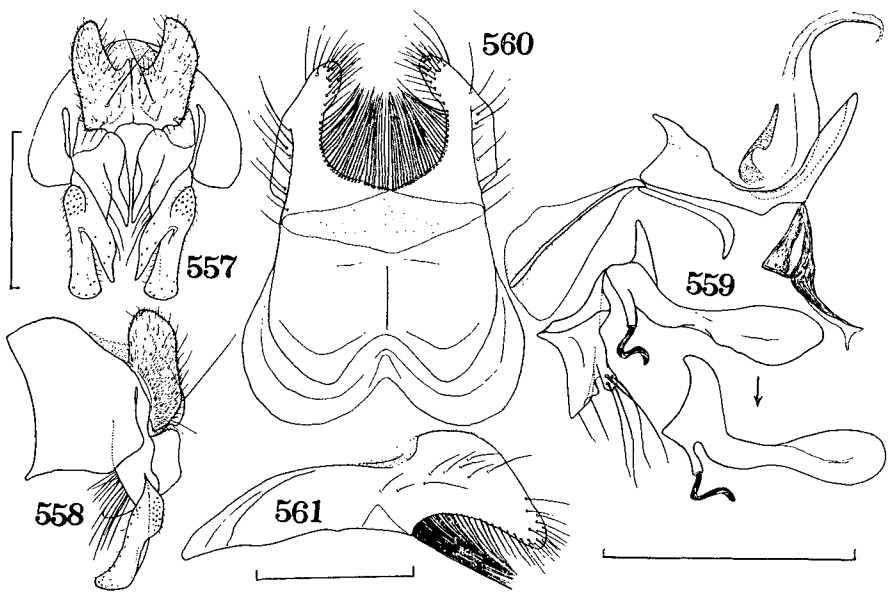
Material examined. HOKKAIDÔ — Sapporo, 1♀, 15-v-59 (S. Ueda), 2♂♂, 1-v-68 (T. Kocha), & 1♀, 27-v-68 (K. Kusigemati); Jôzankei, 1♂, 30-v-65 (T. Kocha), & 1♂, 2-v-68; Mt. Soranuma, 1♂, 27-v-66, 6♂♂, 2♀♀, 17-vi-67, 1♂, 30-vi-68 (T.

Kocha), 2♂♂, 15-vi-68 (M. Suzuki), 1♀, 19-v-68 (S. Umezawa), & 17♂♂, 15-vi-68 (K. Kusigemati); Shikaribetsu-ko, 1♀, 14-vii-66; Mt. Daisetsu, 1♀, 14-vi-60 (K. Kamijo). HONSHŪ — Izugatake, Saitama-ken, 1♂, 28-iv-69 (H. Takizawa).

♂. A blackish species; haustellum with mentum polished; wings with a brownish tinge; calyptrae pale yellow. Body-length 4.7–6.4 mm. Frons about 1.5–2 times as wide as anterior ocellus; parafrontals contiguous to each other; arista slowly narrowing apicad and practically bare. Mesonotum with *ph* duplicated; *pra* as long as anterior or posterior *ntpl*. Abdomen depressed on basal half; prebasal sclerite with a row of strong setae on hind margin and with or without some setulae before the row. Fore tibia with 1 *ad* and 1–3 (usually 1–2) *pv*, apical *pd* being distinct; t_3 with 1 *av*, 3 *ad* and 2–3 (usually 2) long and usually 1 shorter *pd*, apical *pd* being distinct although shorter and weaker than apical *ad*.

♀. Antennae often brownish on A_2 apically although slightly. Frons 0.3–0.34 times as wide as head; parafrontals with 2–3 (usually 2) *ori* and with 1 proclinate and 2 reclinate *ors*. Mesonotum with 2nd *ph* shorter and weaker than the 1st though readily discernible from accessory setulae. Abdomen with ovipositor depressed and strongly chitinized on terminal segment, with no setulae or setae on suranal plate except for a pair of long setae.

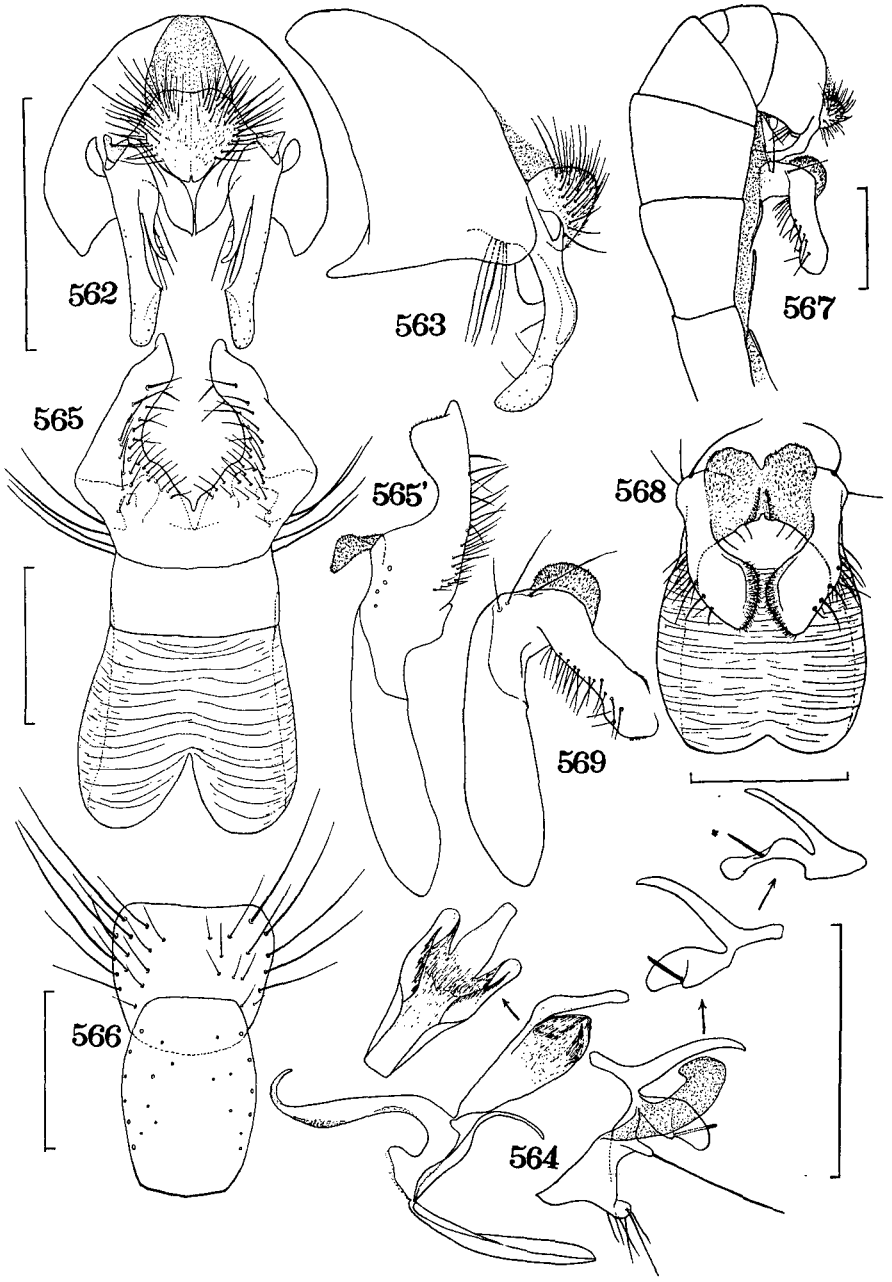
Distribution. Japan; Kamchatka; Europe; North America.



Figs. 557–561. *Pegomya rubivora* (Coquillett), ♂: 557, hypopygium, dorsal view; 558, *ditto*, lateral view; 559, aedeagus; 560, 5th sternite, ventral view; 561, *ditto*, lateral view.

*18 *Pegomya ruficeps* (Zetterstedt)
(Figs. 562–569)

Anthomyza ruficeps Zetterstedt, 1838:698. *Pegomyia solitaria* Stein, 1906:80; Ringdahl, 1938:208; Huckett, 1941:96. *Pegomya ruficeps*: Hennig, 1973:624.



Figs. 562–569. *Pegomya ruficeps* (Zetterstedt), ♂: 562, hypopygium, dorsal view; 563, *ditto*, lateral view; 564, aedeagus; 565, 5th sternite (from Mt. Zaô), ventral view; 565', *ditto*, lateral view; 566, 3rd (lower) and 4th (upper) sternites, ventral view; 567, abdomen (from Mt. Muine), lateral view; 568, 5th sternite (from Mt. Muine), ventral view; 569, *ditto*, lateral view.

Material examined. HOKKAIDÔ — Mt. Muine, 2♂♂, 2♀♀, 3-ix-72 (Sk. Yamane & S. Aoki); Mt. Kariba, 1♂, 19-23-vii-72. HONSHÛ — Mt. Zaô, Yamagata-ken, 1♂, 8-ix-66.

♂. Body-length 5.3–6.4 mm. Antennae blackish, or partly brownish on two basal segments especially at apical margin of the 2nd; palpi yellow or brown and with blackish apex, or wholly blackish; haustellum with mentum blackish and polished. Thorax blackish in ground colour; mesonotum brownish or brownish yellow in pollinosity. Abdomen rather thinly covered with pale grey pollen which is faintly tinged with brown; median vitta narrow and faint if visible; in ground colour yellowish to dark brownish, with a narrow black band on hind margins of 2nd to 4th tergites. Femora dark brownish to blackish; tibiae yellow. Wings and calyptrae distinctly tinged with brown or brownish yellow.

Frons about half as wide as anterior ocellus; parafrontals broadly contiguous to each other; profrons and cheeks distinctly less than A_3-width in width and height respectively. Mesonotum with 2nd *ph* more or less shorter and weaker than the 1st; *pra* about half as long as posterior *ntpl*. Hind tibia with 1 *pd*, which is migrated rather on dorsal surface and practically recognized as *d*, apical *d* being indistinguishable from accessory setulae and practically absent.

♀. Interfrontalia brownish yellow on lower half; legs including coxae and trochanters yellowish, at most darkened on f_1; tarsi blackish. Parafrontals with 2–3 *ori* and 2 *ors*. *Stpl* 1:1.

Distribution. Japan; Kamchatka; Manchuria; Europe; North America.

19. *Pegomya spiraculata* sp. nov.
(Figs. 570–573)

Type-material. HOKKAIDÔ — Kami-no-kuni, 1♂ (holotype), 20-vi-68.

♂. Body-length 7.3 mm; wing-length 6.5 mm. Interfrontalia blackish, with whitish pollen; parafacials in ground colour blackish, only brownish at tip of profrons, and in pollinosity silvery grey; cheeks blackish, with pale grey pollen; occiput in ground colour black and in pollinosity pale grey and faintly brownish, with brownish or yellowish setulae on ventral region; antennae dark brownish, at base of A_3 faintly brownish; arista yellow basally; palpi yellowish, more or less darkened apically; haustellum with mentum dark brownish and polished. Thorax black in ground colour, greyish and slightly brownish in pollinosity; mesonotum rather distinctly tinged with brown in pollinosity, hardly vittate, when viewed from behind in front light with large lateral patches, and in certain view-points with dark shifting reflections. Abdomen thinly covered with dull grey pollen, with rather broad median vitta; in ground colour, 1st tergite largely yellowish, only blackish at bottom of basal concavity and at lateral sides; 2nd tergite yellowish, with rather broad black median vitta and a narrow black hind marginal band; 3rd tergite largely and triangulately blackish, and yellowish laterally to posteriorly, with a narrow black hind marginal band; 4th and 5th tergites blackish; cercal plate reddish. Coxae and trochanters black and dark brownish; f_1 blackish posteriorly and dark brownish anteriorly, with basal and apical parts yellow; f_2 yellow, with apical third blackish; f_3 yellow, with apical fourth blackish; tibiae yellow; tarsi yellow basally and dark brownish apically. Wings with a yellow tinge, stronger basad; calyptrae yellowish; halteres brownish

yellow at base and yellowish at knob.

Head about 1.5 times as high as long; frons very narrow, less than half as wide as anterior ocellus; parafrontals broadly contiguous to each other, with 4 long and slender and a few short and fine *ori*: A_3 (in depressed condition) about 2.3 times as long as wide; arista not swollen at base and lithely narrowing apicad, the longest hairs being about as long as basal diameter of arista; profrons about 0.7 times as wide as A_3; cheeks somewhat less high than A_3-width, with genal setae in 1 row; epistoma behind frons at lunule; palpi more or less broadening apicad and somewhat blade-like.

Thorax comparatively large, in lateral view more or less rounded, and rather densely covered with fine accessory setulae; spiracles large, especially the posterior one being larger than the knob of haltere; 2nd *ph* well developed and slightly longer than the 1st; 3 pairs of strong *pre acr* present, setae of the middle pair being the strongest, about as long as anterior *ntpl*, and widely separated from each other by a distance about 1.3 times as long as that between *dc* and *acr*; rather densely setulose between the rows of *acr* both before and behind the suture; *pra* only a little shorter than anterior *ntpl*; mesopleura with 1 rather distinct anterior *mpl*, and with 1 strong *pstg* and 14–15 associated fine setulae; *stpl* 1:2; scutellum on dorsal surface rather densely setulose except mid-basally, and between apical setae with only 1 setula.

Abdomen depressed, somewhat ovoid and about 1.6 times as long as wide; prebasal sclerite bare; 5th sternite and hypopygium as in Figs. 570–573.

Fore tibia with 1 *pv* and no distinct *ad*, at most on apical third with some minute setulae, apical *pd* being indistinguishable from accessory setulae; f_2 with no *av*, on basal half with 5 long *pv*, the longest one being more than twice as long as height of the femur, and on apical half with a row of fine *pv*; t_2 with 1 *ad*, 1 *pd*, 1 *p* and 1 *pv*; f_3 slightly sinuate vertically, with 7–8 long *av*, the longest one being a little longer than twice the femur-height, at base with 1 slender *pv* and near middle with 2 long *pv*; t_3 with 1 *av*, 3 *ad* and 2 *pd*, apical *pd* being short and fine. Wings with costal thorns minute and hardly distinguishable from costal setulae; *m-m* oblique and strongly sinuate; lower calyptra much larger than the upper.

♀. Unknown.

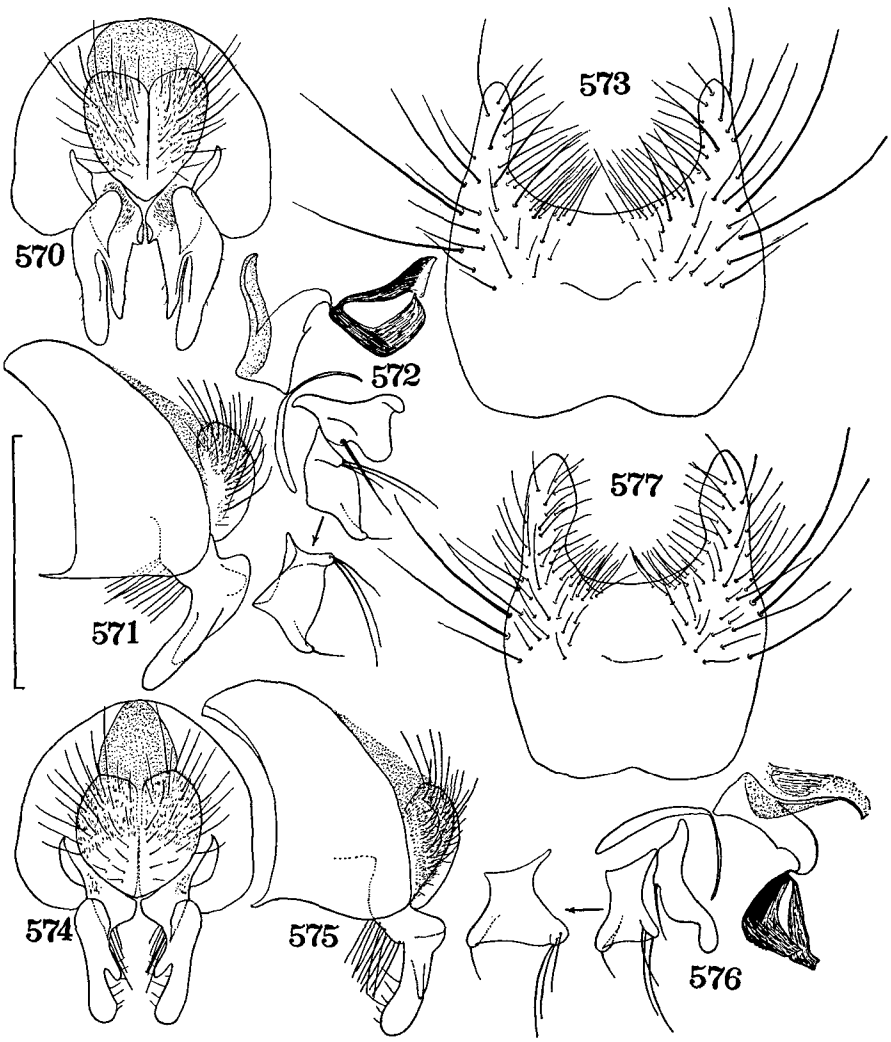
Distribution. Japan.

By the large lower calyptra, the sinuate f_3 and the structures of the prae- and postgonites *P. spiraculata* is closely related to the European *P. transversa* (Fallén), from which it may, however, be distinguishable by the following aspects: — First abdominal tergite with accessory setulae black and not yellow; palpi more or less darkened apically; surstyli in profile distinctly expanded dorsad near apex of cercal plate.

20. *Pegomya kusigematii* sp. nov.
(Figs. 574–577)

Type-material. HOKKAIDÔ — Mt. Soranuma, 1♂ (holotype), 29-viii-65 (K. Kusigemati); Mt. Shokambetsu, 1♂, 1-vii-71.

♂. Body-length 6.3–6.4 mm; wing-length 5.9–6 mm. Interfrontalia blackish or dark brownish, with whitish grey pollen; parafacials and cheeks in ground colour blackish, more or less brownish along facial ridge, and in pollinosity



Figs. 570–573. *Pegomya spiraculata* sp. nov., ♂: 570, hypopygium, dorsal view; 571, *ditto*, lateral view; 572, aedeagus; 573, 5th sternite, ventral view.
Figs. 574–577. *Pegomya kusigematii* sp. nov., ♂: 574, hypopygium, dorsal view; 575, *ditto*, lateral view; 576, aedeagus; 577, 5th sternite, ventral view.

silvery white or whitish grey; occiput black in ground colour and pale grey in pollinosity; A_1 and A_2 yellow; A_3 brownish or blackish yellow, only yellow at base; arista yellow basally; palpi yellow; haustellum with mentum brownish and polished. Thorax in ground colour largely blackish, and partly yellowish on humeral and posterior calli and on scutellum excluding dorsal base, and in pollinosity rather thick, pale grey and with a yellowish tinge; mesonotum hardly vittate, when viewed from front almost blackish and when viewed from behind almost greyish. Abdomen rather thinly whitish grey pollinose, with faint and interrupted median vitta; in ground colour, 1st tergite wholly yellow; 2nd tergite

yellow, with narrow black hind marginal band; 3rd tergite yellow, with dark brownish median vitta and black hind marginal band; 4th and 5th tergites blackish or dark brownish, in the holotype partly yellowish on 4th tergite; 1st to 4th sternites yellow, 4th sternite being partly darkened; 5th sternite brownish; hypopygium blackish or dark brownish except on yellowish anal sclerite. Fore coxa yellow; mid coxa blackish and partly yellow; hind coxa yellow and partly darkened; trochanters yellow; femora, tibiae and tarsi yellow although f_2 and f_3 being darkened apically. Wings strongly tinged with yellow; calyptrae yellow; halteres yellow, at base more or less brownish. Yellow accessory setulae present on ventral region of occiput, lower part of humeral calli, vicinities of *pstg*, basal part of fore coxae and ventral base of abdomen.

Head about 1.7 times as high as long in the holotype; frons very narrow, less than half as wide as anterior ocellus; parafrontals broadly contiguous to each other, with 3–4 slender and 1–2 short and fine *ori*; A_3 long, nearly reaching to epistoma, and about 2.6 times as long as wide in the holotype although in depressed condition; arista lithely narrowing apicad and shortly pubescent, the longest hairs being about as long as basal diameter of arista; profrons about half as wide as A_3; cheeks about half as high as A_3-width, with genal setae in 1 row; epistoma behind frons at lunule; occiput bare on upper part below postocular row of setulae; palpi only a little broadening apicad.

Mesonotum with 3 pairs of distinct *pre acr*, setae of the middle pair being the strongest, about as long as posterior *ntpl* although somewhat weaker than the latter, and widely separated from each other by a distance about 1.4 times as long as that between *dc* and *acr*; densely setulose between the rows of *acr* before the suture and to a little behind the suture; *ph* duplicated, the 2nd being about as long as the 1st; *pra* more or less shorter than posterior *ntpl*; mesopleura with a distinct anterior *mpl*, and with 1 strong *pstg* and 6–9 associated fine setulae; *stpl* 1:2; scutellum on dorsal surface rather densely setulose except on mid-basal part narrowly.

Abdomen depressed, nearly parallel-sided and about twice as long as wide; prebasal sclerite bare; 5th sternite and hypopygium as in Figs. 574–577.

Fore tibia with 1 minute *ad* at apical third and 1 rather weak *pv* near middle, apical *pd* being indistinguishable from accessory setulae and apical *pv* being distinct; f_2 with no distinct *av*, and on basal half with 2–3 *pv* longer than height of the femur; t_2 with 1 short *ad*, 1 *pd* and 2 *p-pv*; f_3 on apical two-thirds with 5–6 *av*, the longest one being about twice as long as height of the femur, near base with 1 *pv* rather on ventral surface, near middle with 1 (2 in the paratype on the left body-side) *pv* more or less longer than height of the femur, and on basal fourth with a row of some distinct *p*; t_3 with 1 *av*, 3 *ad* and 2 *pd*, apical *pd* being vestigial. Wings with costal thorns minute though distinguishable from costal setulae; *m-m* oblique and strongly sinuate; lower calyptra much larger than the upper.

♀. Unknown.

Distribution. Japan.

This species may be placed between the preceding *spiraculata* and the European *transversa*, yet it is distinguished from the former by the smaller spiracles and yellowish accessory setulae on the 1st abdominal tergite and from the latter by the more strongly bent surstyli.

*21. *Pegomya winthemi* (Meigen)
(Figs. 578–581)

Anthomyia winthemi Meigen, 1826:186. *Pegomyia (Pegomyia) winthemi*: Séguy, 1923a: 166. *Pegomyia winthemi*: Huckett, 1941:102. *Pegomya winthemi*: Hennig, 1973:675.

Material examined. HOKKAIDÔ — Sapporo, 12♂♂, 1♀; Nopporo, 6♂♂; Jôzankei, 1♂, 1♀; Mt. Soranuma, 1♂, 1♀; Chitose, 4♂♂; Tomakomai, 1♀; Kôshunai, 2♂♂; Shimamatsu, 1♂; Tôya, 1♀; Rebun-tô, 2♂♂, 1♀; Mt. Apoi, 7♂♂; Kushiro, 1♂, 1♀; Akkeshi, 12♂♂; Kawayu, 9♂♂.

♂. Body-length 4.3–6.2 mm. A_1 and A_2 yellow; A_3 dark brownish, with yellowish base; palpi yellow; haustellum with mentum blackish or dark brownish and shining. Thorax in ground colour blackish except on scutellum, which is more or less yellowish apically. Abdomen in ground colour yellow, often partly darkened, and with black hind marginal bands on tergites. Femora and tibiae yellow, f_1 being more or less darkened; tarsi at base yellowish or brownish, and darker apicad. Wings and calyptrae strongly tinged with brownish yellow.

Head about 1.5–1.6 times as high as long; frons half to two-thirds as wide as anterior ocellus; parafrontals contiguous to each other. Mesonotum with *ph* duplicated, the 2nd being more or less shorter than the 1st; *pra* at most as long as posterior *ntpl*; *stpl* 2:2, the lower anterior being much shorter than the upper though rarely indistinguishable from accessory setulae.

♀. Paler than in male; humeral calli yellow or not in ground colour. Interfrontalia with a pair of strong *if*. Distal segments of mid and hind tarsi much widened and discoid.

Host plants. Mushrooms belonging to *Boletus*, *Inocybe*, *Muscidula*, *Agaricus* and *Armillaria* are recorded as hosts of this species (see Hennig, 1973).

Distribution. Japan; Europe; North America.

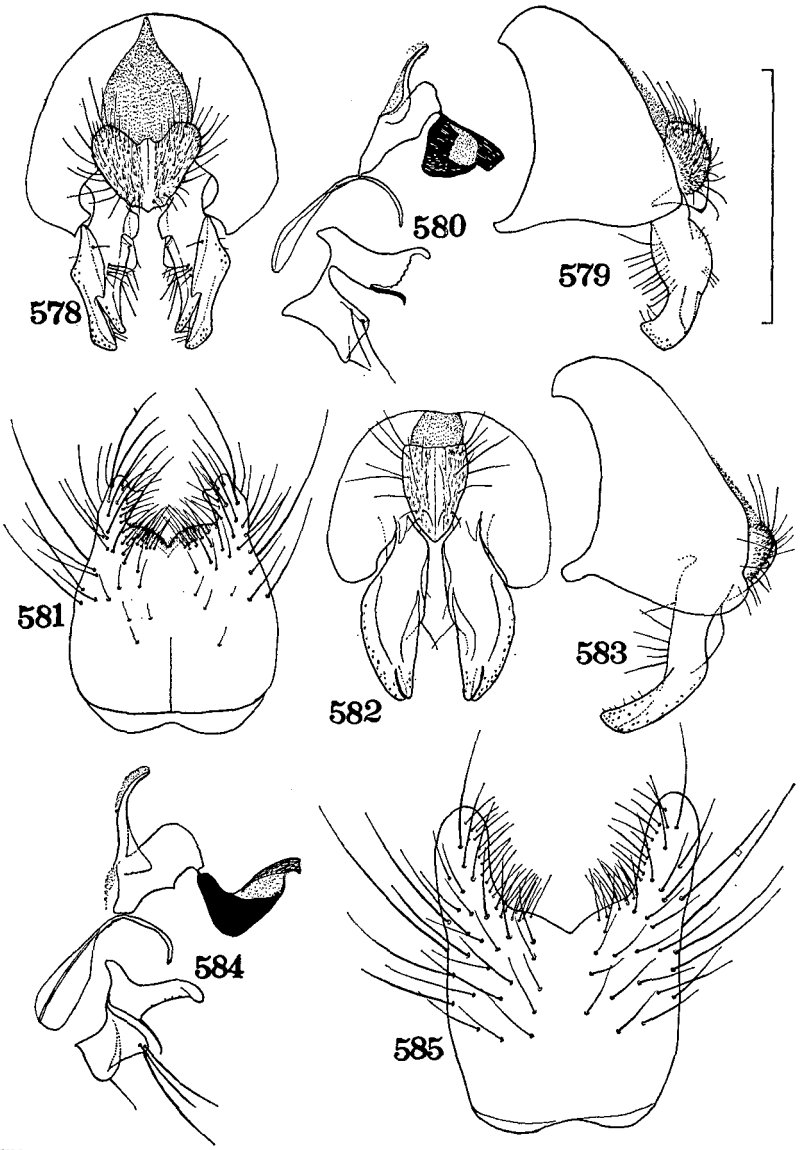
*22. *Pegomya geniculata* (Bouché)
(Figs. 582–585)

Anthomyia geniculata Bouché, 1834:81. *Anthomyia univittata* von Roser, 1840:59. *Pegomyia geniculata*: Huckett, 1924:44; id., 1941:112. *Pegomyia univittata*: Huckett, 1941: 111; Ringdahl, 1959:252. *Pegomya geniculata*: Hennig, 1973:563.

Material examined. A lot of specimens (162♂♂, 4♀♀) have been seen, their localities are as follows: — HOKKAIDÔ — Sapporo; Nopporo; Jôzankei; Mt. Soranuma; Mt. Yûbari; Mt. Shokambetsu; Mt. Daisetsu; Toyotomi; Mt. Apoi; Nukabira; Mt. Kariba. HONSHÛ — Mt. Hakkôda, Aomori-ken; Mt. Bandai, Fukushima-ken; Okukinu, Tochigi-ken; Masutomi, Yamanashi-ken; Mt. Yatsugatake, Mt. Kiso-Komagatake, Mt. Senjô, Mt. Chôgatake & Mt. Shirouma, Nagano-ken.

♂. Body-length 5.6–7.3 mm. A_1 and A_2 yellow; A_3 largely darkened although more or less yellow basally; haustellum with mentum yellow or sometimes brown, and polished. Thorax in ground colour largely blackish, more or less brownish in part on pleura and calli. Abdomen in ground colour dark brown on dorsal surface basally and yellow to brown on ventral surface basally, becoming darker caudad; tergites with black hind marginal bands even if indistinct owing to dark ground colour.

A_3 long, reaching to epistoma or nearly so, and usually more than 2.5 times as long as wide. Mesonotum with *pra* half to two-thirds as long as posterior *ntpl*; *pre acr*-rows widely separated from each other by a distance distinctly longer than that between *dc* and *acr*. Abdomen nearly parallel-sided and about 2.3–2.6 times as long as wide; 5th sternite and hypopygium as in Figs. 582–585. Hind femur with the longest *av* less than twice as long as height of the femur.



Figs. 578–581. *Pegomya winthemi* (Meigen), ♂: 578, hypopygium, dorsal view; 579, *ditto*, lateral view; 580, aedeagus; 581, 5th sternite, ventral view.

Figs. 582–585. *Pegomya geniculata* (Bouché), ♂: 582, hypopygium, dorsal view; 583, *ditto*, lateral view; 584, aedeagus; 585, 5th sternite, ventral view.

♀. Body largely yellow in ground colour. Mesonotum broadly darkened medially. Abdomen with black hind marginal bands on 2nd to 4th tergites. Interfrontalia without *if.*

Distribution. Japan; Europe; North America.

*23. *Pegomya pulchripes* (Loew)
(Figs. 586–590)

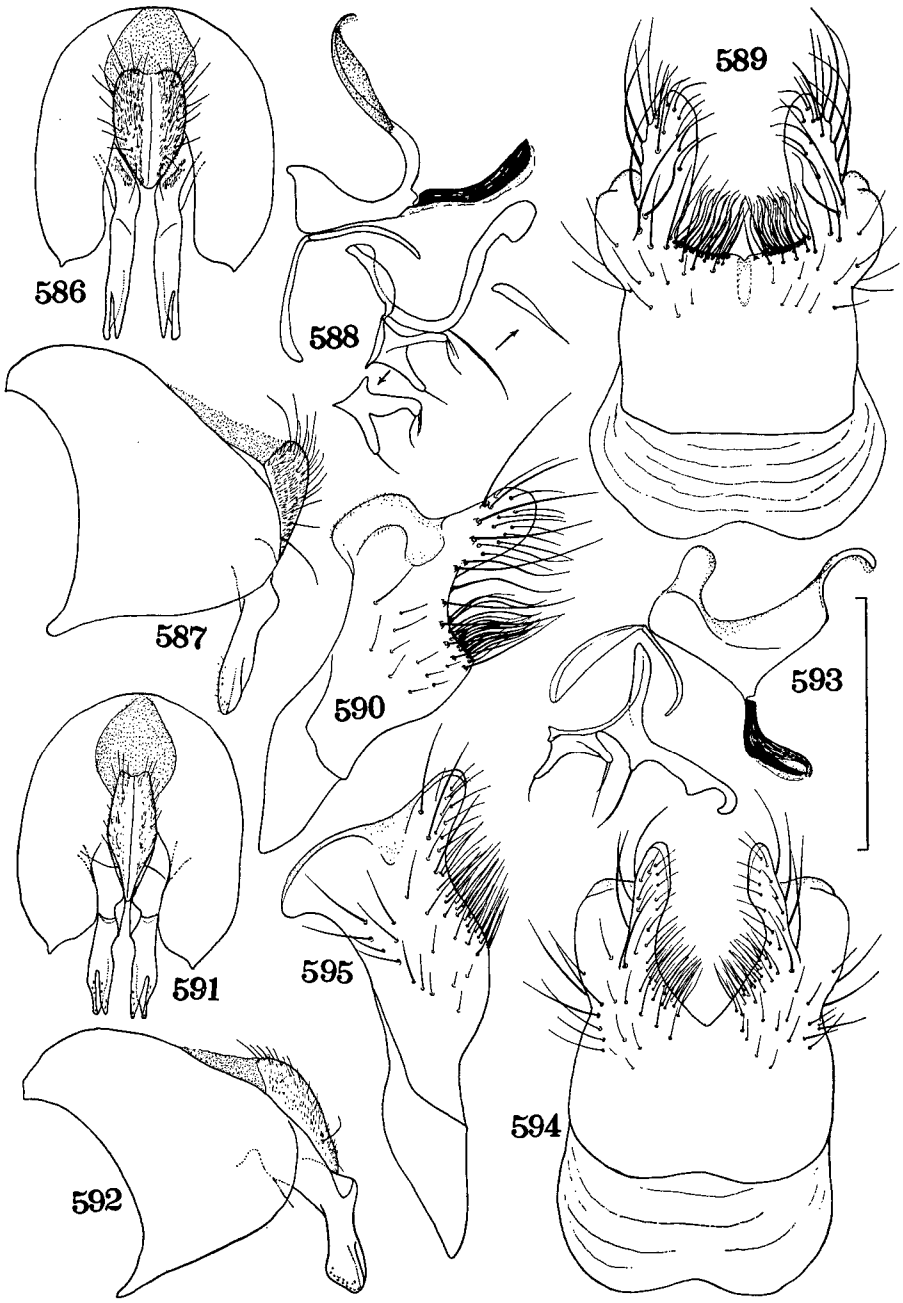
Musca flavipes Fallén, 1825:90, nec de Villers, 1789. *Anthomyia pulchripes* Loew, 1857: 104. *Pegomyia flavipes*: Stein, 1906:69; Karl, 1928:125; Ringdahl, 1959:252. *Pegomya pulchripes*: Hennig, 1973:617.

Material examined. There have been examined a lot of specimens (173♂♂, 14♀♀) collected from the following localities: HOKKAIDÔ — Sapporo; Nopporo; Mt. Soranuma; Shikotsu-ko; Bifuka; Moshiri; Mt. Daisetsu; Mt. Shokambetsu; Rishiri-tô; Mt. Apoi; Kushiro; Akkeshi; Erimo; Shiretoko; Mt. Kariba. HONSHÛ — Mt. Hakkôda, Aomori-ken; Hiraniwa & Mt. Hayachine, Iwate-ken; Mt. Kurikoma, Miyagi-ken; Mt. Zaô, Yamagata-ken; Mt. Bandai & Mt. Adatara, Fukushima-ken; Mt. Daibosatsu, Yamanashi-ken; Mt. Kiso-Komagatake, Mt. Yatsugatake, Mt. Senjô & Mt. Hodaka, Nagano-ken.

♂. Body-length 5.3–6.7 mm. Dark-form (most of the specimens examined, 171♂♂): — Antennae yellow on two basal segements; A_3 blackish, with yellowish base; haustellum with mentum yellow to brown, and polished; interfrontalia, parafacials, cheeks and occiput blackish in ground colour; occiput with yellowish accessory setulae on lower part. Thorax blackish to dark brownish in ground colour. Abdomen in ground colour on dorsal surface dark brownish to blackish or sometimes brownish basally, and on ventral surface yellowish to brown at basal part and darkening caudad; tergites with black hind marginal bands even if indistinct owing to dark ground colour. Legs yellowish; femora darkened apically; tarsi yellowish or brownish at base, darkening apicad. Light-form (only 2♂♂, from Sapporo, 21-v-64, & from Mt. Shokambetsu, 1-vii-71): — In the specimen from Sapporo, body mostly yellow in ground colour, only darkened at the following parts: A_3 blackish, at base faintly yellow; f_2 and f_3 darkened apically; tarsi darkened apically. In the specimen from Mt. Shokambetsu, mesonotum broadly darkened medially; abdomen on dorsal surface largely darkened and on ventral surface partly darkened, with 5th sternite blackish; all femora darkened apically; tarsi brownish, darkening apicad.

Mesonotum with *pre acr*-rows separated from each other by a distance as long as or a little shorter than that between *dc* and *acr*, and with a few or some setulae between the rows; *ph* duplicated though the 2nd one being more or less shorter than the 1st; *pra* about two-thirds of posterior *ntpl* in length. Abdomen about 2–2.5 times as long as wide. Mid tibia with 1 minute *ad*, which is usually hardly distinguishable from accessory setulae, or practically absent; f_3 with long *av*, the longest one being more than twice (usually about 2.5 times) as long as height of the femur, and near middle with 1 long *pv*, which is twice as long as height of the femur or nearly so.

♀. Head in ground colour mostly yellow, only blackish on upper part of frons, upper part of occiput and A_3. Thorax in ground colour yellow, at most sometimes darkened on mesonotum medially. Abdomen in ground colour yellow,



Figs. 586–590. *Pegomya pulchripes* (Loew), ♂ : 586, hypopygium, dorsal view; 587, *ditto*, lateral view; 588, aedeagus; 589, 5th sternite, ventral view; 590, *ditto*, lateral view.
Figs. 591–595. *Pegomya tenera* (Zetterstedt), ♂ : 591, hypopygium, dorsal view; 592, *ditto*, lateral view; 593, aedeagus; 594, 5th sternite, ventral view; 595, *ditto*, lateral view.

with black hind marginal bands on tergites, and sometimes darkened medially. Interfrontalia with *if* absent, if present microscopic and hardly discernible unless carefully examined. Fore and mid tibia with a strong *ad.*

Distribution. Japan; Europe.

*24. *Pegomya tenera* (Zetterstedt)
(Figs. 591–595)

Anthomyza tenera Zetterstedt, 1838:697. *Pegomyia tenera*: Stein, 1906:82; Huckett, 1941:107; Ringdahl, 1959:253. *Pegomyia tenera* var. *obscurior* Collin, 1931:84. *Pegomya tenera*: Hennig, 1973:646.

Material examined. HONSHÛ — Mt. Chôgatake, Nagano-ken, 6♂♂, 30-vii-70; Mt. Hodaka, Nagano-ken, 1♂, 1-viii-70.

♂. Body-length 4.8–5.9 mm. Antennae blackish although more or less yellowish or brownish on A_2 apically; interfrontalia blackish or dark brownish; parafacials, cheeks and occiput blackish in ground colour; palpi yellowish, and faintly or rather distinctly darkened apically; haustellum with mentum blackish or dark brownish and polished. Thorax blackish in ground colour; mesonotum brownish grey pollinose. Abdomen in ground colour of dorsal surface dark brownish on basal half and almost blackish on caudal half, and of ventral surface dark brownish; tergites with black hind marginal bands even if indistinct owing to dark ground colour. Femora dark brownish although more or less yellowish on f_1 apically and basally; tibiae yellowish; tarsi brownish. Wings with a brownish yellow tinge, rather distinctly yellow at base; calyptrae yellowish.

Frons very narrow, one-third to half as wide as anterior ocellus. Mesonotum with *pre acr*-rows separated from each other by a distance as long as or a little shorter than that between *dc* and *acr*, and with a few or some setulae between the rows; *ph* duplicated although the 2nd one being more or less shorter than the 1st; *pra* about two-thirds of posterior *ntpl* in length. Abdomen about 2.2–2.5 times as long as wide. Mid tibia with 1 *ad*, which is short, yet always easily distinguishable from accessory setulae; f_3 with the longest *av* less than twice as long as height of the femur, and near middle with 1–2 *pv*, which are at most only a little longer than height of the femur.

♀. Uncertain to me. There are at hand 5 female specimens which might be referred to *tenera* or *pilosa*, or separated into the two species, yet no reliable differences have been found among them.

Distribution. Japan; Europe; North America.

In having the darker colouration the Japanese form is referred to the *obscurior*-form described as a variety of *tenera* by Collin (1931) from Greenland.

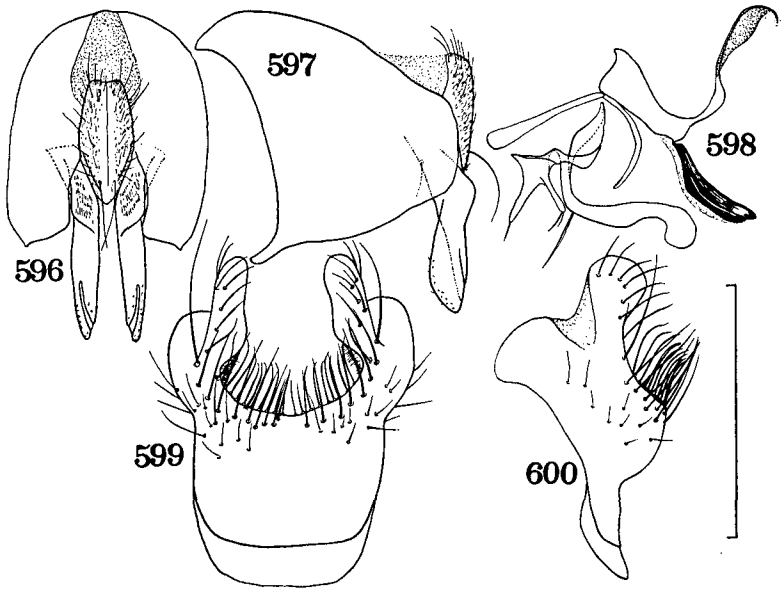
*25. *Pegomya pilosa* Stein
(Figs. 596–600)

Pegomyia pilosa Stein, 1900:322. *Pegomyia* (*Pegomyia*) *pilosa*: Ringdahl, 1938:208. *Pegomya pilosa*: Hennig, 1973:611.

Material examined. HONSHÛ — Mt. Yatsugatake, Nagano-ken, 1♂, 20-vii-70; Mt. Kiso-Komagatake, Nagano-ken, 1♂, 25-vii-70.

♂. Body-length 5.3–5.4 mm. Antennae blackish, at most very faintly brown-

ish on A_2 apically; palpi brownish yellow basally and darkened apically; haustellum with mentum dark brownish and polished; occiput with accessory setulae black. Thorax blackish in ground colour. Abdomen in ground colour blackish dorsally and dark brownish ventrally; hypopygium dark brownish. Coxae dark brownish; trochanters brownish yellow; femora blackish or dark brown, at most slightly paler at base and apex; tibiae yellow or brownish yellow; tarsi brownish or yellowish basally and darkening apicad. Wings with a brownish yellow tinge, rather distinctly yellow at base; calyptrae yellowish.



Figs. 596–600. *Pegomya pilosa* Stein, ♂: 596, hypopygium, dorsal view; 597, *ditto*, lateral view; 598, aedeagus; 599, 5th sternite, ventral view; 600, *ditto*, lateral view.

Frons less than half as wide as anterior ocellus. Mesonotum with *pre acr*-rows more or less closer together than to *dc*, and with a few or some setulae between the rows; *ph* duplicated although the 2nd one being shorter than the 1st; *pra* two-thirds to three-fourths of posterior *ntpl* in length. Fore femur with a row of *p*, of which 3–4 on basal half are longer than *pv* near the *p*; t_1 with or without 1 vestigial *ad*; t_2 with 1 minute *ad* on the left body-side only in 1 specimen; f_3 with the longest *av* about 2.5 times as long as height of the femur, and near middle with or without 1–2 fine *pv*, which are at most only a little longer than height of the femur; t_3 with 1–2 *av*, 3 *ad* (the middle one being the longest and one-fourth to one-third of the tibial length) and 2 *pd* (the distal one being very long, a little longer than one-third of the tibial length), accessory setulae on anterior and anteroventral surfaces being much longer than those on the other surfaces.

♀. Uncertain to me.

Distribution. Japan; Scandinavia.

So far as known to me this species has been known only from Scandinavia except for a questionable record from North America made by Huckett (1941, 1965a

& 1965b). It seems to me that the North American form is not conspecific with *pilosa* (compare Huckett, 1941 with Ringdahl, 1938 and Hennig, 1973). The Japanese form agree well with the Scandinavian form except in the darker colouration. Such a colour difference is seen also in *tenera*

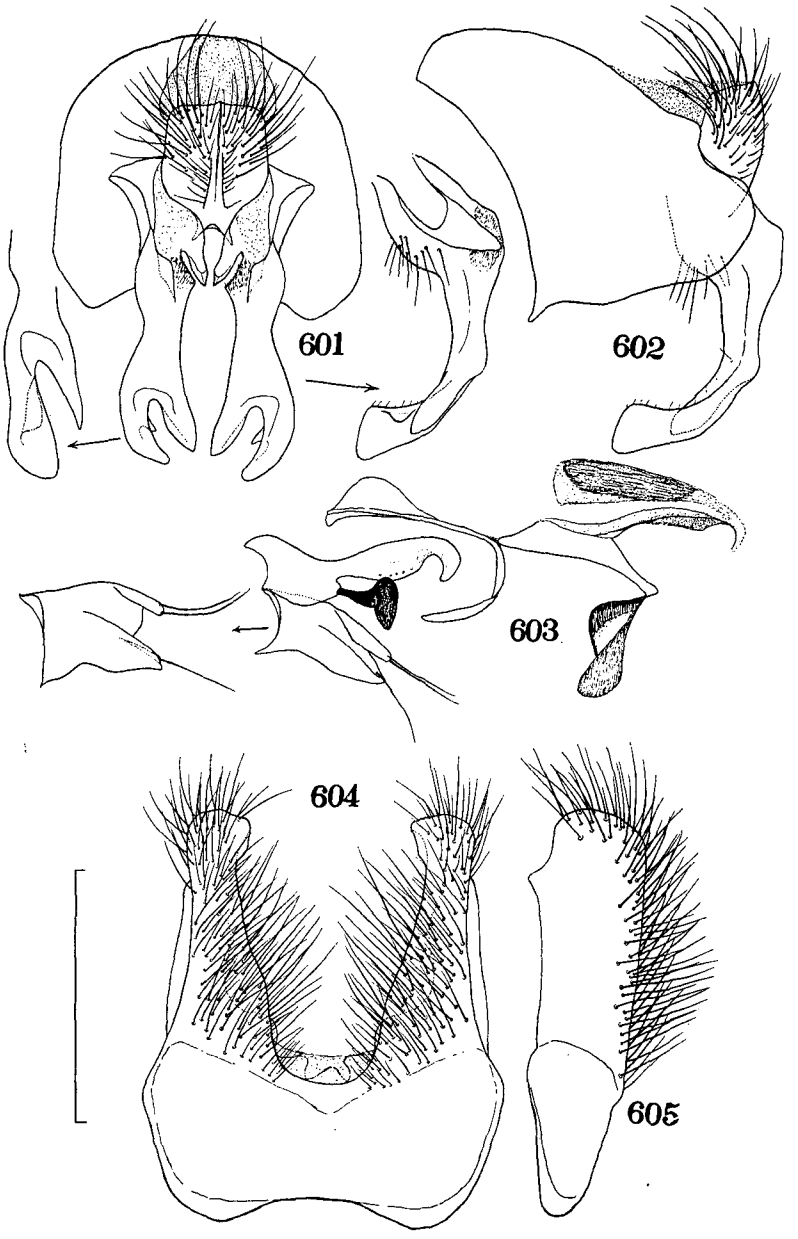
26. *Pegomya acklandi* sp. nov.
(Figs. 601–605)

Type-material. HOKKAIDÔ — Sapporo, 40♂♂ (one the holotype, 7-v-59, S. Ueda leg.), 44♀♀, 28-iv–9-vi-58–71; Jôzankei, 36♂♂, 12♀♀, 2-v–15-vi-65–71; Nopporo, 12♂♂, 15♀♀, 23-iv–9-vi-65–70; Mt. Soranuma, 45♂♂, 28♀♀, 19-v–17-vi-66–68; Zenibako, 2♂♂, 10-vi-66 (T. Kocha); Eniwa, 1♂, 25-v-66; Shikotsu-ko, 1♂, 1♀, 18-v-71; Mt. Shokambetsu, 10♂♂, 2♀♀, 1-vii-71; Mt. Daisetsu, 3♂♂, 4♀♀, 14-vi–24-vii-60–68 (S. Takagi, K. Kamijo, H. Takizawa, M. Miyazaki & M. Suwa); Kami-no-kuni, 1♂, 2♀♀, 20-vi-68; Gabino, 1♂, 4♀♀, 29-v-69 (T. Kocha); Rishiri-tô, 1♀, 14-vii-68 (H. Takizawa); Mt. Kariba, 1♂, 4♀♀, 19–23-vii-72. HONSHÛ — Towada, Aomori-ken, 2♂♂, 16-vi-68 (H. Takizawa); Mt. Tanigawa, Gumma-ken, 1♂, 29-v-72 (H. Takizawa); Mt. Yatsugatake, Nagano-ken, 1♂, 3-vi-67 (T. Kocha); Hakui, Ishikawa-ken, 1♂, 21-iii-62 (N. Okabe); Kyôto, Kyôto-fu, 3♂♂, 23-iv-67 (H. Takizawa). KYÛSHÛ — Hikosan, 1♀, 15-v-67.

♂. Body-length 5.1–7.8 mm; wing-length 5–7.2 mm. Antennae blackish; palpi yellow; haustellum with mentum blackish and polished; interfrontalia blackish or sometimes brownish, with whitish grey pollen; parafacials blackish in ground colour and silvery grey in pollinosity; cheeks in ground colour blackish or sometimes faintly brownish especially near vibrissal angle, and in pollinosity whitish grey and often with a faint yellowish tinge; occiput in ground colour blackish and in pollinosity grey, with bluish and brownish tinges. Thorax in ground colour black, in pollinosity whitish- or bluish-grey, often more or less tinged with brown especially on mesonotum; mesonotum rather obscurely vittate, when viewed from behind with median and sublateral vittae and lateral patches, the median vitta being rather broad anteriorly and narrowing caudad, ending far from hind margin of the mesonotum. Abdomen black in ground colour, rather thickly covered with bluish grey pollen which is sometimes faintly tinged with yellow or brown, and in some lights with black reflections; median vitta usually narrow and sharp, sometimes rather broad and obscure; hypopygium pollinose. Coxae and trochanters blackish; f_1 blackish except for yellow apical third; f_2 and f_3 blackish basally and yellow on the remaining part; tibiae yellow; tarsi yellowish basally and brownish apically. Wings rather strongly tinged with yellow, especially at base; calyptrae strongly yellow; halteres yellow at knob.

Head about 1.4–1.5 times as high as long; frons at most as wide as anterior ocellus; parafrontals broadly contiguous to each other, with 5–7 *ori* and no *ors*; A_3 large, broadening apicad, and twice or slightly less than twice as long as wide; arista slowly narrowing apicad and minutely pubescent; profrons more or less narrower than A_3; parafacials distinctly narrowing ventrad; cheeks about as high as profrons-width, with genal setae in 1 row although usually with a few or some oral setae below the genal setae; epistoma behind frons at lunule; palpi more or less broadening apicad.

Thorax rather densely covered with slender and fine accessory setulae; meso-



Figs. 601–605. *Pegomya acklandi* sp. nov., ♂: 601, hypopygium, dorsal view; 602, *ditto*, lateral view; 603, aedeagus; 604, 5th sternite, ventral view; 605, *ditto*, lateral view.

notum with 2–3 pairs of *pre acr*, setae of the 2nd pair being much stronger than the rest and about as long as anterior *ntpl* though somewhat weaker than the latter; mesonotum rather densely setulose between the rows of *pre acr*, which are separated from each other by a distance as long as or a little shorter than that

between *dc* and *acr*; *ph* duplicated, the 2nd one being about as long as the 1st; *pra* longer than anterior *ntpl*; mesopleura usually with no distinct anterior *mpl*, and with 1 strong and 1 weaker *pstg* and about 7–15 associated fine setulae; *stpl* 1:2; scutellum rather densely setulose dorsally; posterior spiracle with some or many (4–15) upwardly directed setulae on lower edge.

Abdomen ovoid and half-depressed, about 1.3–1.5 times as long as wide and rather densely covered with fine and slender accessory setulae; prebasal sclerite with many setulae; 5th sternite and hypopygium as in Figs. 601–605.

Fore tibia with 1 short *ad* and 2–3 (usually 2) strong *pv*, apical *pd* being fine and indistinguishable from accessory setulae, apical *p* sometimes rather distinct, and apical *pv* strong; f_2 with no distinct *av*, and with a row of *pv* becoming shorter and weaker towards apex of the femur, the longest one being 1.5–2 times as long as height of the femur; t_2 with 1 *ad*, 1 *pd* and 2–4 (usually 3) *p–pv*; f_3 with 6–9 strong *av*, the seta near middle being the longest, twice as long as height of the femur or nearly so, and on middle third with a few or some strong *pv*, the longest one being 1.4–1.8 times as long as height of the femur; t_3 with 1–2 (rarely 3) *av*, 3 (rarely 4) *ad* and 2 (rarely 3) *pd*, apical *pd* being weaker than apical *ad* although more or less distinct. Wings with costal thorns minute and only a little stronger than costal setulae; *m-m* oblique and sinuate; lower calyptra not larger than the upper.

♀. Interfrontalia in ground colour more or less reddish or brownish near lunule, or sometimes wholly blackish. Abdomen not vittate.

Head about 1.3 times as high as long; frons about one-third as wide as head; interfrontalia with a pair of strong *if*; parafrontals with 3 *ors*; palpi dilated and blade-like. Thorax with accessory setulae shorter and sparser than in male; mesopleura often with a distinct anterior *mpl*. Abdomen with accessory setulae and marginal setae shorter than those of male.

Fore tibia with 1 strong *ad*, apical *p* being usually distinct; f_2 with *pv* weaker than in male, setae on apical half being fine except for 1 or 2 strong ones near apex; f_3 near middle with 1 or a few *pv*, which are much weaker than those of male, often fine and shorter than height of the femur. Wings with costal thorns more or less stronger than those of male; *m-m* slightly oblique and sinuate, or distinctly so.

Distribution. Japan.

The present new species can be readily distinguished from any other known species by the setulose metathoracic spiracle, the ovoid and half-depressed abdomen and the setulose prebasal sclerite in the male, and by the setulose metathoracic spiracle and the yellow and blade-like palpi in the female. The genital structures show that this species is more or less related to the Chinese *P. phyllostachys* Fan, 1964.

27. *Pegomya orientis* sp. nov.
(Figs. 606–614)

Type-material. HOKKAIDÔ — Sapporo, 1♂ (holotype), 5-v-68, & 84♂♂, 142♀♀, 17-iv–2-vi-58–69 (S. Takagi, S. Ueda, T. Kumata, M. Miyazaki, K. Kusigemati, T. Kocha, H. Torikura & M. Suwa); Jôzankei, 3♂♂, 5♀♀, 8-v–10-vi-65–66 (T. Kocha & M. Suwa); Nopporo, 11♂♂, 8♀♀, 6-v–2-vi-68–70; Mt. Soranuma, 1♂, 5♀♀, 19-v–

11-vii-67–68 (S. Umezawa & M. Suwa); Eniwa, 7♀♀, 27-v-71; Ebetsu, 1♂, 1♀, 20-v-59 (T. Kumata); Katsurazawa, 1♀, 24-v-59 (T. Kumata); Shimamatsu, 14♀♀, 14-vi-67 (K. Kusigemati); Akkeshi, 2♀♀, 18-vii-66; Shikaribetsu-ko, 2♀♀, 14-vii-66; Shiretoko, 1♀, 10-vii-65 (T. Kumata & I. Miyagi); Mt. Apoi, 1♀, 28-vi-67; Gabino, 1♂, 1♀, 29-v-69 (T. Kocha); Hiroshima-mura, 1♀, 11-vi-66. HONSHÛ — Towada, Aomori-ken, 1♀, 16-vi-68 (H. Takizawa); Sayama, Saitama-ken, 3♀♀, 20-v-68 (H. Takizawa); Tôkyô, 5♂♂, 5♀♀, 7-iv-67 (T. Kocha), & Jimba-yama, 1♂, 28-iii-71 (T. Kocha), Tôkyô-to; Kiyosumi-yama, Chiba-ken, 1♂, 4-iv-71; Mt. Tanzawa, 1♀, 29-iv-70 (H. Torikura), & Hatano, 1♀, 29-v-70 (H. Takizawa), Kanagawa-ken; Mt. Yatsugatake, Nagano-ken, 2♀♀, 1-vi-67 (T. Kocha). SHIKOKU — Shôdo-shima, 1♂, 25-iii-71. KYÛSHÛ — Fukuoka, 1♂, 1♀, 17-iv-67; Hikosan, 1♀, 17-v-67; Kagoshima, 1♀, 15-iv-67 (T. Kocha); Nagasaki, 1♀, 19-iv-67; Kumamoto, 19♀♀, 24-iv-67; Mt. Sobo, 1♂, 12-v-67 (H. Takizawa); Mt. Kujû, 1♂, 15-v-67 (H. Takizawa); Amami-Ôshima, 1♀, 23-iii-70 (H. Takizawa).

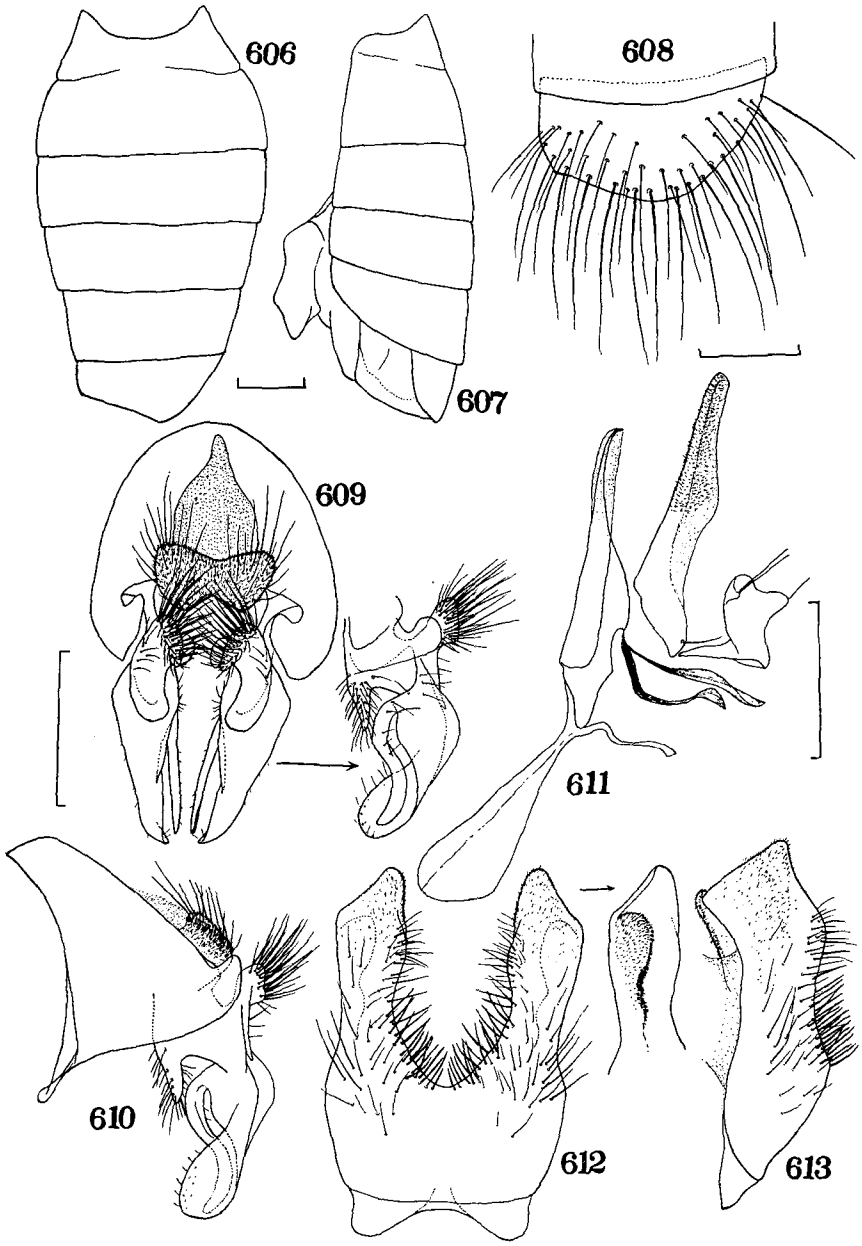
♂. Body-length 4.6–7.8 (7.4 in the holotype) mm; wing-length 4.4–7.3 mm. Interfrontalia blackish or sometimes brownish, with whitish grey pollen; parafacials and cheeks in ground colour blackish or sometimes brownish and in pollinosity silvery grey or pale yellowish grey; occiput black in ground colour and greyish in pollinosity, which is more or less tinged with blue and brown; antennae blackish, at most faintly brownish on A_2 apically; palpi blackish, often brownish on basal half; haustellum with mentum blackish and distinctly pollinose. Thorax black in ground colour and thickly covered with pale grey pollen, which is more or less bluish and usually a little tinged with brown, especially on mesonotum; mesonotum shiftingly vittate, when viewed from behind with long median and short sublateral vittae and before the suture with lateral patches. Abdomen black in ground colour, thickly covered with whitish- or bluish-grey pollen, which is often tinged with brown although faintly; median vitta narrow or moderate and sharp, continuous to prebasal sclerite (6th tergite) and not dilated anteriorly on any tergites except the 2nd one; 5th sternite yellowish or brownish at least on processes. Legs yellowish; f_1 darkened dorsally, or sometimes largely blackish; f_2 and f_3 usually yellow and at most weakly darkened at apex dorsally, yet sometimes largely darkened except at base and apex; tibiae yellow; tarsi yellowish or brownish, darkening apicad. Wings tinged with yellow, rather distinctly at base; calyptrae pale or rather distinctly yellow; halteres brownish at base and yellowish at knob.

Head about 1.3–1.4 times as high as long; frons as wide as or a little wider or narrower than anterior ocellus; parafrontals contiguous to each other, with 4–7 *ori*; A_3 twice or a little more as long as wide, usually about 2.2 times so; arista minutely pubescent; profrons about as wide as A_3; cheeks 1.2–1.4 times as high as A_3-width, with genal setae in 1 or sometimes 2 rows.

Mesonotum with 1 or a few pairs of fine or slender *pre acr*, and usually with no setulae between the rows, which are separated from each other by a distance as long as or somewhat shorter than that between *dc* and *acr*; *post acr* also fine except 1–2 prescutellar pairs; *stpl* 1:3; *ph* duplicated, the 2nd one being about as strong as the 1st; *pra* at least as long as anterior *ntpl*; scutellum bare on dorsal centre.

Abdomen (Figs. 606 & 607) stout; prebasal sclerite (Fig. 608) large and densely setose; 5th sternite and hypopygium as in Figs. 609–613.

Fore tibia with 1–2 (usually 1) short *ad* and 1–2 (usually 1) *pv*; f_2 with no *av*, on basal half with a few or some *pv*, the longest one about 1.2–1.5 times as long



Figs. 606–613. *Pegomya orientis* sp. nov., ♂ : 606, abdomen, dorsal view; 607, *ditto*, lateral view; 608, 6th tergite; 609, hypopygium, dorsal view; 610, *ditto*, lateral view; 611, aedeagus; 612, 5th sternite, ventral view; 613, *ditto*, lateral view.

as height of the femur; t_2 with 1–2 (usually 1) *ad*, 1–2 (usually 1) *pd*, 1 *p* and 1–2 *pv*, and without *a* or *av*; f_3 except near base with 6–9 strong *av*, the longest one being 1.5–1.9 times as long as height of the femur, and usually with no distinct *pv*

except near apex, only sometimes with a few or some ones which are at most slightly longer than height of the femur; t_3 with 1–4 (usually 2–3) *av*, 2–4 (usually 3) *ad*, 3–4 (2 long and 1–2 shorter) *pd* and 1 distinct or rather strong *p*. Wings with costal thorns short or minute; *m-m* oblique and more or less sinuate; lower calyptra not protruded beyond the upper.

♀. Body-length 5–8.2 mm. Interfrontalia brownish or yellowish on lower half and blackish or dark brownish on the upper; cheeks always brownish in ground colour. Thorax and abdomen thickly covered with pale grey pollen and hardly vittate, at most on mesonotum with a brownish pollinose median vitta although this vitta is not very distinct. Fore femur darkened dorsally or wholly yellowish.

Head usually about 1.2 times as high as long; frons about one-third as wide as head; parafrontals with 3–4 *ori* and with 1 proclinate and 1–2 (usually 1) reclinate *ors*. Mesonotum with 1 or a few pairs of very fine or vestigial *pre acr*; *stpl* 1:2 or 1:3. Abdomen with compressed ovipositor as seen in the genus *Phorbia*. Fore tibia with *ad* strong; t_3 sometimes lacking *p* especially in smaller specimens. Wings with costal thorns rather strong; *m-m* nearly erect and hardly sinuate.

Distribution. Japan.

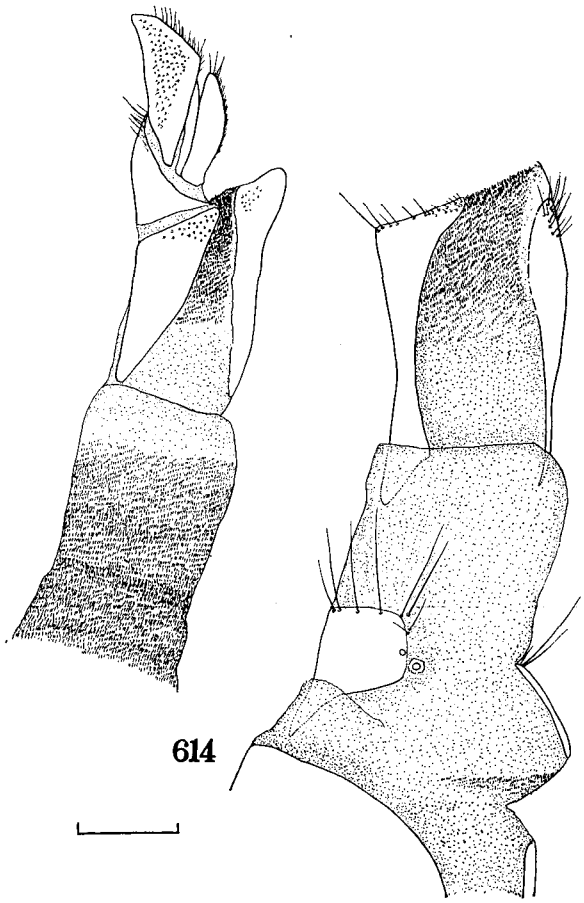


Fig. 614. *Pegomya orientis* sp. nov., ♀: ovipositor, lateral view.

P. orientis is, in reality, very closely related to the Chinese *P. chinensis* Hennig, 1973, from which it can be distinguished only by the longer postgonites and the more sinuate distiphallus. The succeeding 3 new species also have a large and setose prebasal sclerite on the hypopygium and a strongly sinuate projection on the surstyli in the male, and have a compressed ovipositor in the female. Although the female of *chinensis* has not yet been described, it has probably a similar ovipositor. All these species may form a close group, which should be called the *chinensis*-group. The present species can be distinguished from other members of this group by the absence of *a* on t_2, the absence of a tuft of setulae on f_3, the presence of *p* on t_3 and the different structures of the male 5th sternite and hypopygium and the female ovipositor.

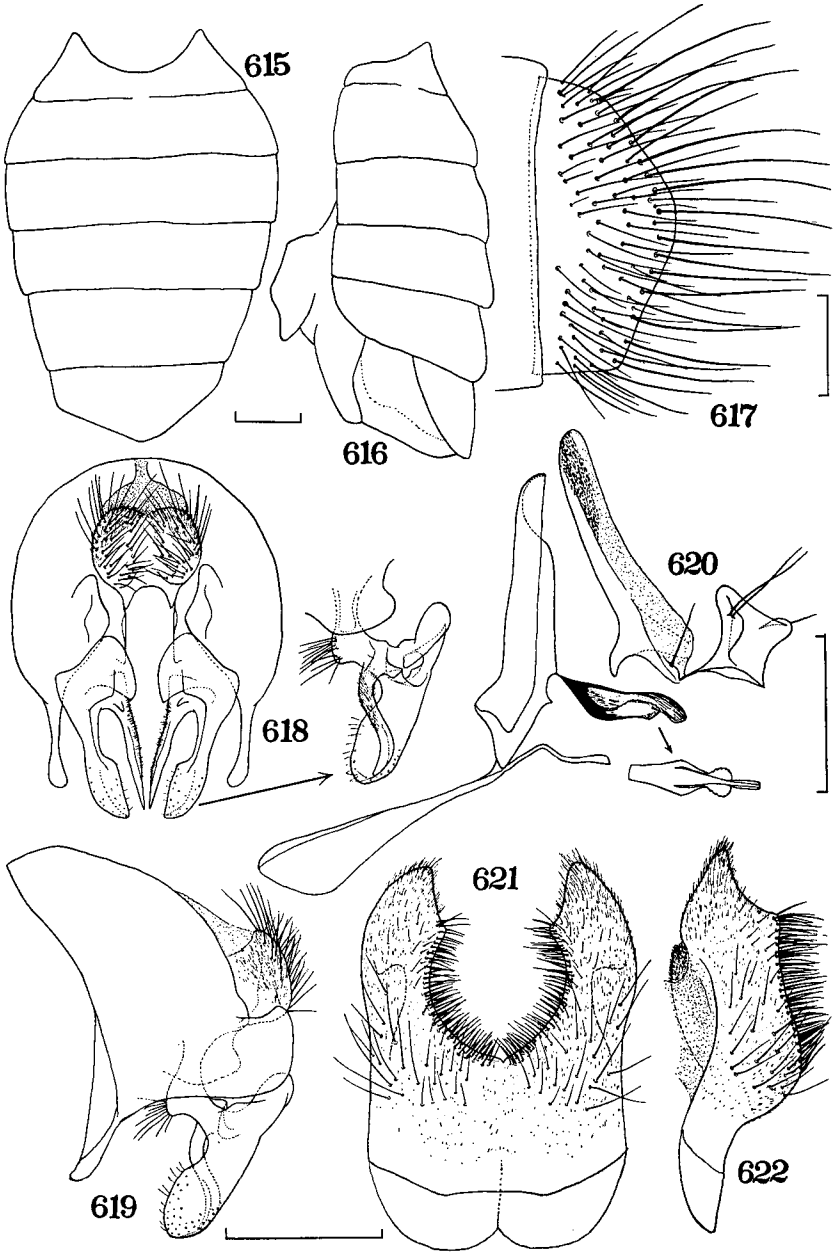
28. *Pegomya vera* sp. nov.
(Figs. 615–623)

Type-material. HOKKAIDÔ — Sapporo, 1♂ (holotype), 6-v-68, & 12♂♂, 22♀♀, 17-iv–6-vii-59–69 (T. Kumata, S. Takagi, S. Ueda, T. Kocha, K. Kusigemati & M. Suwa); Nopporo, 8♂♂, 2♀♀, 23-iv–2-vi-65–72 (T. Kocha & M. Suwa); Jôzankei, 1♀, 30-v-65 (T. Kocha), & 1♀, 2-v-68; Eniwa, 3♀♀, 25-v-66 & 27-v-71; Mt. Soranuma, 5♀♀, 17-vi-67. HONSHÛ — Mt. Tanigawa, Gumma-ken, 1♂, 1♀, 29-v-72 (H. Takizawa); Sayama, Saitama-ken, 1♀, 20-iv-68 (H. Takizawa); Nippara, 1♂, 29-iv-68 (H. Takizawa), & Jimba-yama, 3♂♂, 2♀♀, 28-iii-71 (T. Kocha), Tôkyô-to. KYÛSHÛ — Kagoshima, 1♀, 12-iii-70 (H. Takizawa).

♂. Body-length 6.3–7.6 mm; wing-length 6.1–7.5 mm. Interfrontalia black or sometimes brownish in ground colour, with whitish grey pollen; parafacials and cheeks black or dark brownish in ground colour, and whitish grey or silvery grey in pollinosity, which is usually more or less tinged with yellow; antennae black; palpi blackish; haustellum with mentum blackish and thinly pollinose, at least partly shining. Thorax in ground colour black and in pollinosity pale or bluish grey, usually with a faint brownish tinge; mesonotum rather distinctly tinged with brown in pollinosity, and when viewed from behind with median, paramedian and sublateral vittae and lateral patches, these markings being very shifting according to the point of view. Abdomen in ground colour black and in pollinosity pale or bluish grey and often with a faint yellowish or brownish tinge; median vitta rather broad; 5th sternite black. Coxae and trochanters black; femora black, at most very slightly yellow at apex; tibiae yellow, rarely dark brownish; tarsi blackish. Wings tinged with yellow, rather strongly at base; calyptrae yellow; halteres reddish brown or brownish yellow at base, and yellowish at knob.

Head 1.3–1.4 times as high as long; frons about as wide as anterior ocellus, sometimes a little wider than the latter; parafrontals contiguous to each other or sometimes separated by a very narrow interfrontalia, and with 5–7 *ori*; A_3 2.2–2.4 times as long as wide; arista minutely pubescent; profrons as wide as or slightly wider than A_3; cheeks more or less higher than A_3-width, with genal setae in a few rows.

Thorax rather densely setulose; mesonotum with 1–2 pairs of strong *pre acr* and some pairs of fine and slender ones, and usually setulose between the rows; *ph* duplicated, the 2nd one being as strong as the 1st; *pra* at least as long as anterior *ntpl*; *stpl* 1:3 or 1:4. Abdomen (Figs. 615 & 616) with 5th sternite (Figs. 621 &



Figs. 615–622. *Pegomya vera* sp. nov., ♂: 615, abdomen, dorsal view; 616, *ditto*, lateral view; 617, 6th tergite; 618, hypopygium, dorsal view; 619, *ditto*, lateral view; 620, aedeagus; 621, 5th sternite, ventral view; 622, *ditto*, lateral view.

622) densely tomentose and velvety on processes.

Fore tibia with 1 *ad* and 1 *pv*; f_2 with a row of *pv* becoming shorter and weaker towards apex of the femur, the longest one being 1.4–1.8 times as long as height of

the femur, and with rather long accessory setulae just behind the *pv*-row especially near base; t_2 with 1 *ad*, 1 *pd*, 1–2 (usually 1) *p* and 1–2 (usually 1) *pv*; f_3 swollen near base on posterior surface and thereon with a tuft of stiff setulae; f_3 with 7 to about 10 strong *av*, the longest one about 1.7–2 times as long as height of the femur, and on middle third with some (5–6 in the holotype) strong *pv* shorter than the *av*, at most only a little longer than height of the femur; t_3 with 2 long *pd* on middle half and a few or some shorter ones on apical fourth, and with 1–2 (usually 1) weak *av* and 3 strong *ad*. Wings with costal thorns usually minute and hardly distinguishable from costal setulae; *m-m* more or less oblique and sinuate; lower calyptra not larger than the upper.

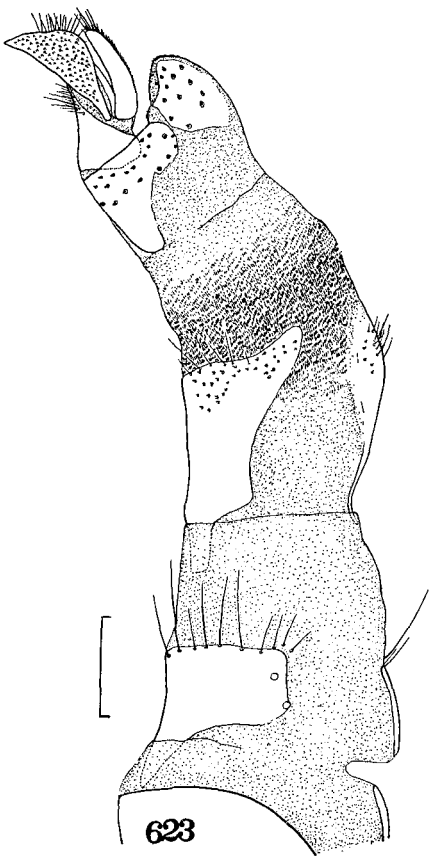
♀. Interfrontalia reddish yellow or brown on lower part in an inverse V-shape. Thorax and abdomen very thickly pollinose and hardly vittate, at most with faint vittae in some lights on mesonotum. Femora blackish as in male.

Head about 1.2 times as high as long; frons about one-third as wide as head; parafrontals with 3–4 *ori* and with 1 proclinate and 2 reclinate *ors*, the upper reclinate *ors* being shorter than the lower. Mesonotum with some pairs of very fine *pre acr*, and not setulose between the rows; *stpl* 1:3. Abdomen with compressed ovipositor (Fig. 623); 7th and 8th segments with minute blunt setulae on tergites and sternites, setulae on 8th segment are stouter than those on 7th segment.

Mid femur only with a few or some slender *pv* on basal half; f_3 without a tuft of setulae, near middle with *pv* only 1 or 2 in number and fine; t_3 with 2 long and 1 shorter *pd*. Wings with costal thorns rather strong; *m-m* nearly erect.

Distribution. Japan.

This species can be readily distinguished from other members of the *chinensis*-group by the tuft of setulae on f_3 in the male, and by the absence of *a* on t_2, by the setal pattern of *stpl* arranged in 1:3, by the presence of 2 reclinate *ors* and by the characters of the ovipositor in the female.



Figs. 623. *Pegomya vera* sp. nov., ♀: ovipositor, lateral view.

29. *Pegomya japonica* sp. nov.
(Figs. 624–632)

Type-material. HOKKAIDÔ — Sapporo, 50♂♂, 20♀♀, 7-v–22-vi-59–69 (T. Kuma-

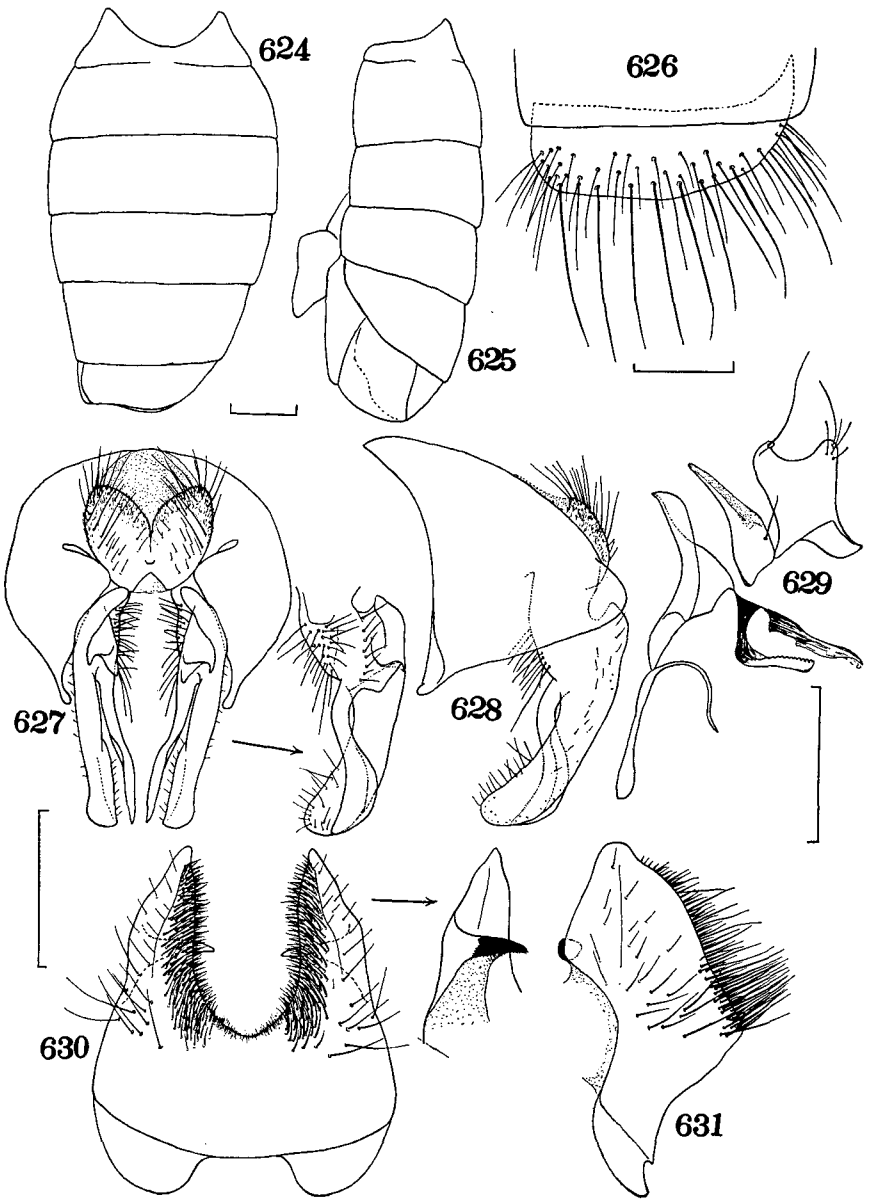
ta, S. Ueda, T. Kocha & M. Suwa); Nopporo, 1♂ (holotype), 18-vi-66, & 27♂♂, 4♀♀, 2–30-vi-66–68; Jôzankei, 2♂♂, 10-vi-66; Mt. Soranuma, 11♂♂, 2♀♀, 15–17-vi-67–68 (K. Kusigemati & M. Suwa); Shimamatsu, 1♂, 7♀♀, 10–14-vi-67–68 (K. Kusigemati); Eniwa, 3♂♂, 27-v-71; Hiroshima-mura, 1♂, 11-vi-66; Mt. Shokambetsu, 1♂, 1-vii-71; Mt. Apoi, 9♀♀, 10-vii-66 & 28-vi-67; Gabino, 2♂♂, 29-v-69 (T. Kocha); Kami-no-kuni, 1♂, 20-vi-68; Tôya, 1♂, 1♀, 13-vi-67 (M. Miyazaki). HONSHÛ — Tsumakoi, Gumma-ken, 1♀, 11-vii-71 (T. Kocha); Sayama, Saitama-ken, 3♀♀, 20-iv-68 (H. Takizawa); Utsunomiya, Tochigi-ken, 3♀♀, 6-v-68 (H. Takizawa); Tôkyô, Tôkyô-to, 1♂, 7-iv-67 (T. Kocha); Zushi, Kanagawa-ken, 1♀, 25-iv-71 (T. Kocha); Amagi, Shizuoka-ken, 2♀♀, 17-v-66 (T. Kocha); Gôkei, Okayama-ken, 1♀, 24-iv-66 (M. Miyazaki); Tachikue-kyô, Shimane-ken, 1♀, 10-v-66 (M. Miyazaki); Sandan-kyô, Hiroshima-ken, 1♂, 30-iv-66 (M. Miyazaki). KYÛSHÛ — Fukuoka, 1♀, 17-iv-67; Kumamoto, 5♀♀, 24-iv-67.

♂. Body-length 5.6–7.8 (7 in the holotype) mm; wing-length 4.9–7.1 mm. Interfrontalia black or dark brownish in ground colour; parafacials and cheeks black in ground colour and silvery grey or whitish grey in pollinosity; antennae blackish, at most brownish on A_2 apically; palpi blackish although more or less brownish yellow basally; haustellum with mentum blackish and thinly pollinose, shining in some lights. Thorax in ground colour black and in pollinosity bluish grey and with a faint brownish tinge on pleura; mesonotum in pollinosity largely brownish or largely bluish grey and with brownish pollinose median and paramedian vittae, when viewed from behind with dark median vitta and lateral patches, the latter being often indistinct. Abdomen black in ground colour and bluish grey in pollinosity; median vitta narrow or rather broad, more or less dilated anteriorly on each tergite; fore marginal bands often present and distinct; these markings brownish pollinose; 5th sternite black, shining on process apically. Fore femur largely blackish or dark brownish and only yellow at base and apex, or sometimes largely yellowish or brownish; f_2 and f_3 brownish or yellowish, often more or less darkened; tibiae yellow; tarsi brownish, darkening apicad. Wings tinged with yellow, distinctly at base; calyptrae yellowish, often with a brownish tinge; halteres brownish or reddish at base, yellowish at knob.

Head about 1.3–1.4 times as high as long; frons as wide as anterior ocellus or nearly so; parafrontals contiguous to each other or nearly so, and with 4–6 *ori*; A_3 2–2.5 times as long as wide; arista minutely pubescent; profrons as wide as or slightly wider than A_3; cheeks about 1.3–1.6 (1.4 in the holotype) times as high as A_3-width, with genal setae in 1–2 rows.

Mesonotum with about 3 pairs of strong *pre acr*, the strongest one being as long as or a little longer than posterior *ntpl* although somewhat weaker than the latter, and usually with a few setulae between the rows; *ph* duplicated; *pra* at least as long as anterior *ntpl*; *stpl* 2:3, sometimes with 1 additional posterior one.

Fore tibia with 1 *ad* and 1 *pv*; f_2 with no *av*, on basal half with some *pv*, the longest one about 1.2–1.6 times as long as height of the femur; t_2 with 1 *ad*, 1 *pd*, 1–2 (usually 1) *p* and 1–2 *pv*; f_3 with 5–8 (6 in the holotype) strong *av*, the longest one being 1.4–2 times as long as height of the femur, and near middle with a few rather strong *pv*, which are somewhat longer or shorter than height of the femur; t_3 with 1–3 (usually 2) *av*, 3 *ad* and 3–4 (proximal 2 being longer) *pd*. Wings with costal thorns rather distinct, if short they are not indistinguishable from costal setulae; *m-m* a little oblique and slightly sinuate; lower calyptra not larger than



Figs. 624–631. *Pegomya japonica* sp. nov., ♂: 624, abdomen, dorsal view; 625, *ditto*, lateral view; 626, 6th tergite; 627, hypopygium, dorsal view; 628, *ditto*, lateral view; 629, aedeagus; 630, 5th sternite, ventral view; 631, *ditto*, lateral view.

the upper.

♀. Body-length 5.2–8 mm. More thickly covered with paler pollen than in male. Interfrontalia near lunule or largely brownish or yellowish in ground colour; cheeks brownish to blackish in ground colour. Abdomen not vittate, at most with tessellations in some lights. All femora wholly yellow in most speci-

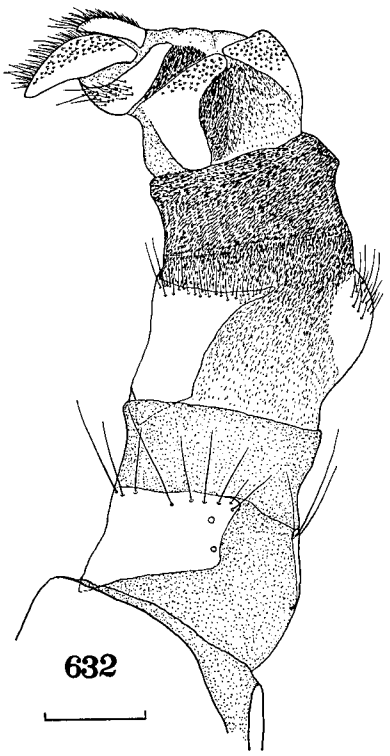


Fig. 632. *Pegomya japonica* sp. nov., ♀: ovipositor, lateral view.

mens, especially in those from Hokkaidô.

Head 1.2–1.3 times as high as long; frons slightly wider than one-third head-width; parafrontals with 2–4 (usually 3) *ori* and 3 *ors*; cheeks with genal setae in 1 row. Mesonotum with a few pairs of distinct *pre acr* and with or without 1–2 setulae between the rows; *stpl* 2:2 or 2:3. Abdomen with compressed ovipositor. Fore tibia sometimes with 2 *pv*; f_2 with a few *pv* near base; f_3 with no distinct *pv* except for basal and preapical ones. Wings with costal thorns strong.

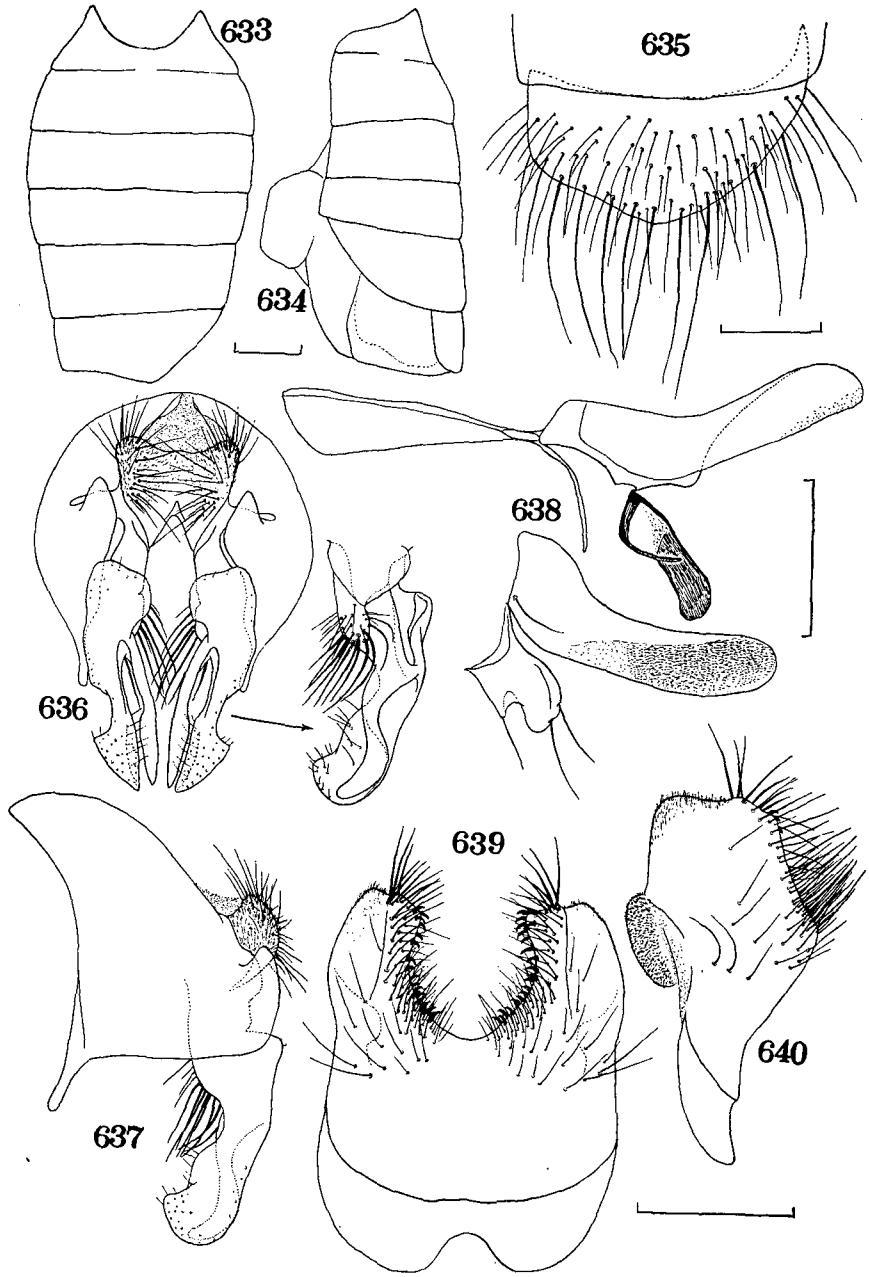
Distribution. Japan.

From other members of the *chinensis*-group the present species can be distinguished in the male by the *stpl* arranged in 2:3 or 2:4 and by the 5th sternite densely armed with short setae along inner margin of each process, and in the female by the *stpl* arranged in 2:2 or 2:3 and by the characters of the ovipositor.

30. *Pegomya robusta* sp. nov.
(Figs. 633–641)

Type-material. HOKKAIDÔ — Sapporo, 1♂ (holotype), 3-v-69, & 38♂♂, 250♀♀, 17-iv–6-vii-58–70 (S. Takagi, T. Kumata, S. Ueda, K. Kusigemati, T. Kocha, N. Ueda, M. Suzuki & M. Suwa); Nopporo, 8♂♂, 40♀♀, 5-v–30-vi-66–70; Jôzankei, 5♂♂, 15♀♀, 2-v–10-vi-65–71 (T. Kocha, S. Umezawa, S. Aoki & M. Suwa); Shikotsu-ko, 2♀♀, 18-v-71; Eniwa, 2♂♂, 11♀♀, 25-v-66 & 27-v-71; Shimamatsu, 1♀, 10-vi-68 (K. Kusigemati); Mt. Soranuma, 1♂, 38♀♀, 19-v–17-vi-67–68 (K. Kusigemati, S. Umezawa & M. Suwa); Hiroshima-mura, 6♀♀, 11-vi-66; Gabino, 1♂, 1♀, 29-v-69 (T. Kocha); Rebun-tô, 1♀, 1-viii-58 (T. Kumata); Rishiri-tô, 2♀♀, 14-vii-68 (H. Takizawa); Moshiri, 2♀♀, 2-viii-66; Mt. Apoi, 1♀, 10-vii-66; Akkeshi, 2♀♀, 18-vii-66; Kawayu, 2♀♀, 1-vii-66 (T. Kumata), & 1♀, 22-vii-66; Tôya, 4♀♀, 13-vi-67 (M. Miyazaki). HONSHÛ — Mt. Tanigawa, Gumma-ken, 3♀♀, 29-v-72 (H. Takizawa); Amagi, Shizuoka-ken, 1♀, 17-v-66 (T. Kocha).

♂. Body-length 5.8–7.4 (6.5 in the holotype) mm; wing-length 5.4–7.1 mm. Interfrontalia, parafacials and cheeks usually black in ground colour; antennae blackish; palpi blackish, sometimes brownish at base; haustellum with mentum blackish and thinly pollinose. Thorax in ground colour black, and in pollinosity pale grey or bluish grey and usually with a brownish tinge especially on mesonotum along rows of setae; mesonotum when viewed from behind with median vitta and



Figs. 633–640. *Pegomya robusta* sp. nov., ♂ : 633, abdomen, dorsal view; 634, *ditto*, lateral view; 635, 6th tergite; 636, hypopygium, dorsal view; 637, *ditto*, lateral view; 638; aedeagus; 639, 5th sternite, ventral view; 640, *ditto*, lateral view.

lateral patches, and in some lights with paramedian vittae, these markings being very shifting according to the point of view. Abdomen in ground colour black, and in pollinosity pale grey or bluish grey and often with a faint brownish or yellowish tinge; median vitta rather broad, often dilated anteriorly on each tergite; 5th sternite black. Fore femur largely blackish, only yellow at base and apex; f_2 and f_3 yellow, at most darkened apically; tibiae yellow; tarsi blackish.

Frons about as wide as anterior ocellus; parafrontals usually contiguous to each other, with 4–6 *ori*; A_3 2–2.4 times as long as wide; arista minutely pubescent; profrons as wide as or a little wider than A_3; cheeks 1.3–1.6 times as high as A_3-width, with genal setae in 1 row.

Mesonotum with 2–4 pairs of *pre acr*, of which 1–2 pairs are strong, the strongest seta being usually as long as or longer than posterior *ntpl*; *ph* duplicated; *pra* at least as long as anterior *ntpl*; *stpl* 1:3 or 1:4, if lower anterior seta present, it is much weaker than the upper.

Fore tibia with 1 short *ad* and 1 strong *pv*; f_2 with no *av*, on basal half with some *pv*, the longest one being 1.5–2 times as long as height of the femur; t_2 with 1 *ad*, 1 *pd*, 1–3 *p* and 1–3 (usually 1–2) *pv*, and with 1 *a*; f_3 with 6–9 strong *av*, the

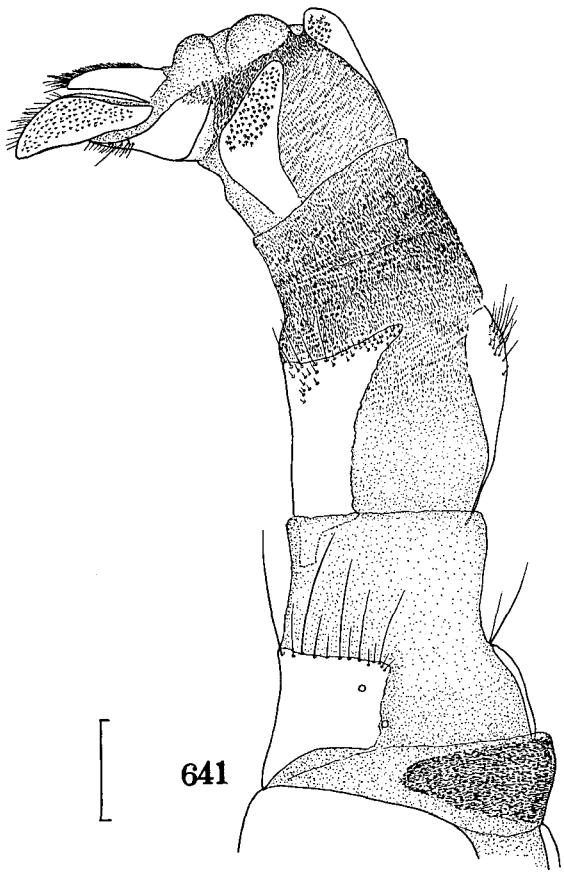


Fig. 641. *Pegomya robusta* sp. nov., ♀: ovipositor, lateral view.

longest one being twice or more as long as height of the femur, and near middle with 2–4 strong *pv*, the longest one being usually 1.5 times or more as long as height of the femur, yet in some smaller specimens only a little longer than the height; t_3 with 2–4 (usually 2–3) *ad* and 2 long and 1–2 shorter *pd*, and with 1 or a few short and weak *av*, which are sometimes very fine and hardly distinguishable from accessory setulae. Wings with costal thorns usually distinct or strong; *m-m* oblique and more or less sinuate; lower calyptra not larger than the upper.

♀. Body-length 5.4–8.1 mm. Interfrontalia brownish or reddish brown at least near lunule in ground colour; parafrontals and cheeks usually blackish or dark brownish in ground colour. Mesonotum hardly vittate. Abdomen rather distinctly tessellated in some lights. Fore femur largely yellowish to largely blackish.

Head about 1.2 times as high as long; frons a little wider than one-third head-width; interfrontalia usually with a pair of vestigial *if*, which are indiscernible unless carefully examined; parafrontals with 2–4 (usually 3) *ori* and 3 *ors*. Mesonotum with *acr* much weaker than those of male; *stpl* 1:2 or sometimes 1:3. Abdomen with compressed ovipositor. Fore tibia with *ad* strong; t_2 with 1 *a*, 1 *ad*, 1 *pd*, 1–2 (usually 1) *p* and 1 (sometimes none) *pv*; f_3 near middle with 0–1 strong *pv*; t_3 sometimes with 1 *a*. Wings with costal thorns strong.

Distribution. Japan.

By having a distinct *a* on t_2 in either sex this species can be readily distinguished from other members of the *chinensis*-group.

30. Genus *Eutrichota* Kowarz

Eutrichota Kowarz, 1893:140. Type-species: *Coenosia inornata* Loew, 1873.

Pegomyza Schnabl & Dziedzicki, 1911:109, as subgenus of *Pegomyia*. Type-species: *Anthomyia praepotens* Wiedemann, 1817. Syn. nov.

Arctopegomyia Ringdahl, 1938:190, as subgenus of *Pegomyia*. Type-species: *Anthomyza tunicata* Zetterstedt, 1846. Syn. nov.

In this study the genus *Eutrichota* is recognized as a group characterized by the following characters: — ♂ & ♀. Interfrontalia without *if*; occiput setulose on upper part below postocular row of setulae; epistoma behind frons at lunule. Mesonotum setulose between the rows of *pre acr*; propleura, pteropleura, hypopleura and prosternum all bare; scutellum haired ventrally. Hind tibia without apical *pv*. ♂. Abdomen conical or cylindrical, sometimes half-depressed; 5th sternite with processes subcylindrical and rounded apically; surstyli stick- or club-shaped and incised apically; distiphallus strongly chitinized, with side-projections well developed.

With disproportionate emphasis on the width of the male frons this genus would be represented by the type-species alone. However, in the definition mentioned above *Pegomyza* and *Arctopegomyia* may be suppressed as synonyms of *Eutrichota*. Hereinafter 7 species will be recorded from Japan.

Key to the species (♂♂)

1. Frons wider than one-third head-width. ..... 1. *inornata* (Loew)
– Frons much narrower than one-third head-width. 2
2. Arista plumose or semi-plumose. 3

– Arista very shortly or minutely pubescent. 5
3. Arista with the longest hairs much longer than A_3-width; hypopygium yellow; all femora yellow. .....2. *praepotens* (Wiedemann)
– Arista with the longest hairs at most as long as A_3-width; hypopygium black; all femora largely blackish or dark brownish. 4
4. Profrons about as wide as A_3; distance between the rows of *pre acr* nearly equal to that between *dc* and *acr*; t_3 with 1 or a few *p*. .....5. *consanguinea* (Tiensuu)
– Profrons more or less narrower than A_3; distance between the rows of *pre acr* dinstinctly longer than that between *dc* and *acr*; t_3 with no *p*. .....6. *socculata* (Zetterstedt)
5. Mid femur with no *av* on apical half; prebasal sclerite usually setose; mesopleura with at least 1 strong anterior *mpl*. .....3. *longimana* (Pokorny)
– Mid femur with 1–2 strong *av* on apical half; prebasal sclerite not setose; mesopleura with no strong anterior *mpl*. 6
6. Palpi blackish; thorax blackish in ground colour; t_3 with no *pv*. .....4. *frigida* (Zetterstedt)
– Palpi yellow; thorax at least partly brownish yellow; t_3 with 1 or a few *pv*. .....7. *labradorensis* (Malloch)

Key to the species (♀♀)

1. Arista plumose or semi-plumose. 2
– Arista shortly or minutely pubescent. 5
2. Mid tibia with *av*; *pra* shorter than anterior *ntpl*. .....1. *inornata* (Loew)
– Mid tibia without *av*; *pra* longer than anterior *ntpl*. 3
3. Arista with the longest hairs much longer than A_3-width; abdomen thickly pollinose and not shining, at most with tessellations in some lights; all femora yellow. .....2. *praepotens* (Wiedemann)
– Arista with the longest hairs at most as long as A_3-width; abdomen thinly pollinose and shining; all femora largely blackish or dark brownish. 4
4. Mid femur with *av*; distance between the rows of *pre acr* nearly equal to that between *dc* and *acr*. .....5. *consanguinea* (Tiensuu)
– Mid femur without *av*; distance between the rows of *pre acr* distinctly longer than that between *dc* and *acr*. .....6. *socculata* (Zetterstedt)
5. Thorax reddish yellow in ground colour; palpi yellow; fore tarsus with 2nd to 4th segments not broader than those of mid tarsus. .....7. *labradorensis* (Malloch)
– Thorax black in ground colour; palpi blackish; fore tarsus with 2nd to 4th segments more or less broader than those of mid tarsus. .....4. *frigida* (Zetterstedt)

*1. *Eutrichota inornata* (Loew)
(Figs. 642–645)

Coenosia inornata Loew, 1873:49. *Eutrichota inornata*: Schnabl & Dziedzicki, 1911: 116; Séguy, 1923a:172. *Eutrichota exomma* Séguy, 1923b:365. *Eutrichota inornata*: Hennig, 1972:455.

Material examined. HOKKAIDÔ — Sapporo, 1♂, 16-v-68 (H. Torikura), 12♂♂, 4♀♀, vii-69, & 1♀, 14-x-67; Ishikari-hama, 1♀, 16-v-71; Hiroshima-mura, 1♀, 11-vi-66; Obihiro, 1♀, 15-vii-66.

♂. Body-length 5.4–6.2 mm; wing-length 4–4.6 mm. Interfrontalia in ground colour usually reddish or brownish yellow near lunule or on lower half and blackish on the upper, and in pollinosity whitish on lower part and brownish yellow around ocellar triangle; A_1 brownish to dark brownish; A_2 yellowish at

apex or a more extensive area; A_3 blackish, sometimes brownish at base. Abdomen with median vitta very faint and often indiscernible, if discernible it is brownish pollinose; 5th sternite sometimes more or less brownish on processes. Legs variable in colour; coxae black or partly yellow; trochanters yellow, sometimes more or less darkened; femora largely or partly darkened, at least yellowish apically; tibiae yellow; tarsi blackish. Wings slightly tinged with yellow; calyptrae whitish.

Frons about 0.4 times as wide as head; interfrontalia twice or a little more as wide as parafrontalia; parafrontals with 2 *ori* and 3 *ors* (1 proclinate and 2 reclinate), the upper reclinate *ors* being about half as long as the lower; A_3 about 2.2–2.4 times as long as wide; arista with the longest hairs about twice as long as A_3-width; cheeks with genal setae strong and arranged in a row.

Mesonotum with 3 pairs of *pre acr*, the rows being closer together than to *dc*; *ph* not duplicated; *pra* more or less longer than posterior *ntpl*; *stpl* 1:2. Abdomen short and stout, more or less shorter than twice the width, with marginal setae very strong; prebasal sclerite usually not setose.

Fore tibia with 1 *ad* and 1 *pv*, and with 3 strong apical setae (*d*, *pd* and *pv*), apical *p* being rather strong though about half as long as apical *pv*; f_2 with 1 *av* near base and 1–2 *av* at or in apical third, and with 3 *pv* on basal half and a few *pv* near apex; t_2 with 1 *av*, 1 *ad*, 1 *pd*, 1 *p* and 1 *pv*, *ad* being very robust; t_3 with 1 *av*, 2–3 (usually 2) *ad*, 2–3 (usually 2) *pd* and no *pv*, apical *pd* being very weak. Wings with costal thorns strong; *m-m* oblique and sinuate.

♀. Body-length 5.4–7.8 mm. Similar to the male except for sexual differences: — Abdomen ovoid when viewed from above; 5th tergite with marginal setae short and fine, only a little stronger than accessory setulae.

Distribution. Japan; Europe.

2. *Eutrichota praepotens* (Wiedemann) comb. nov.
(Figs. 646–649)

Anthomyia praepotens Wiedemann, 1817:83. *Pegomyia* (*Pegoplata*) *praepotens*: Séguy, 1923a:149. *Pegomyza praepotens*: Karl, 1928:122; Hennig, 1972:471. *Pegomyia praepotens*: Kato, 1950:1683.

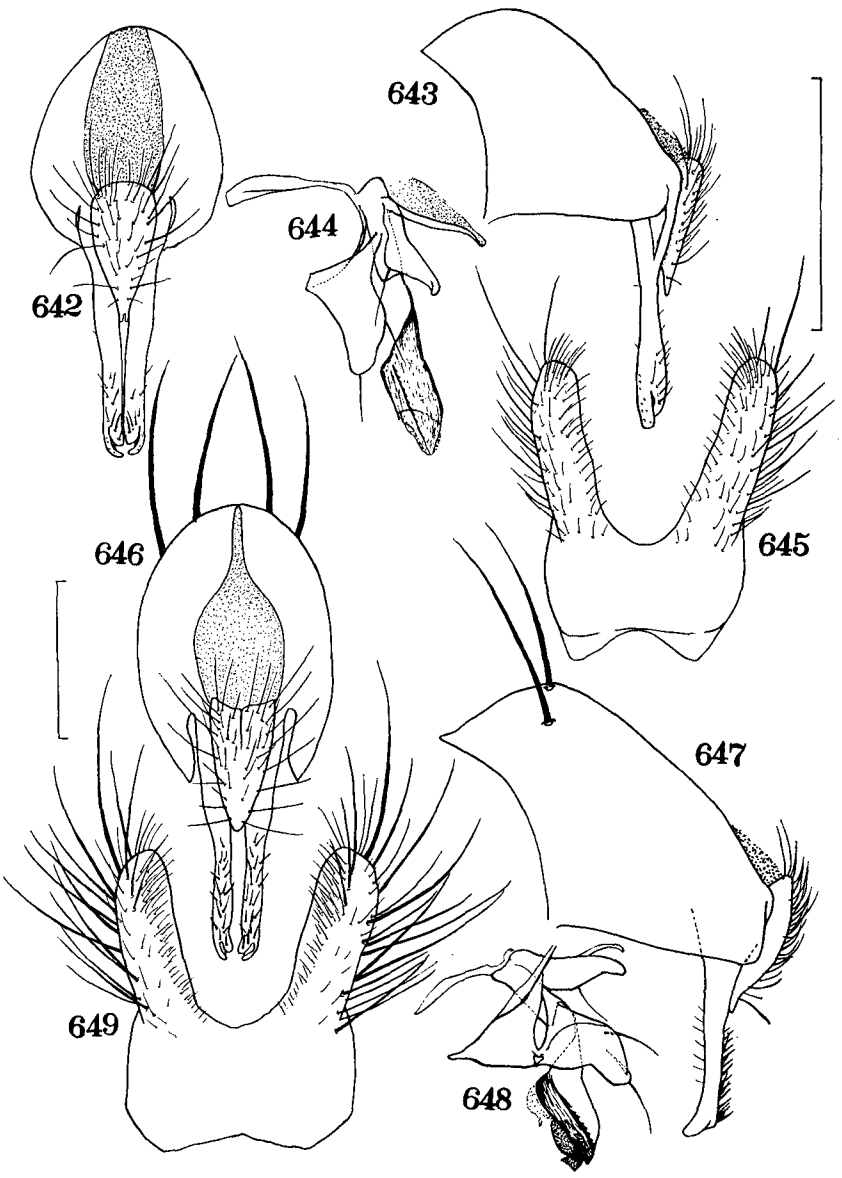
Material examined. HOKKAIDÔ — Sapporo, 1♂, 10-vii-31 (S. Kato); Shimamatsu, 2♂♂, 12–14-vi-67 (K. Kusigemati), & 1♂, 1♀, 15-ix-67 (K. Kusigemati).

♂. Body-length 9–11 mm. A_2 reddish brown or brownish yellow on apical margin. Thorax and abdomen black in ground colour and whitish grey in pollinosity; processes of 5th sternite and hypopygium excluding prebasal sclerite yellow, slightly whitish-pollinose. Femora and tibiae yellow; tarsi blackish.

Frons about 1.5 times as wide as anterior ocellus; parafrontals broadly contiguous to each other; A_3 long, about 2.6–2.9 times as long as wide; arista longly plumose, the longest hairs being much longer than A_3-width. Mesonotum with 2nd *ph* rather distinct although at most about half as long as the 1st one; *pra* longer than anterior *ntpl*; scutellum setulose on whole dorsal surface. Abdomen conical, about 1.7–2 times as long as wide; prebasal sclerite with no setae. Hind tibia with 1 *av*, 2 *ad* and 2 *pd*. Wings with *m-m* oblique and strongly sinuate.

♀. Frons about 0.37 times as wide as head. Fore tarsus with 2nd to 4th segments rather distinctly broadened. Wings with costal thorns very strong.

Distribution. Japan; Europe.



Figs. 642–645. *Eutrichota inornata* (Loew), ♂: 642, hypopygium, dorsal view; 643, *ditto*, lateral view; 644, aedeagus; 645, 5th sternite, ventral view.
Figs. 646–649. *Eutrichota praepotens* (Wiedemann), ♂: 646, hypopygium, dorsal view; 647, *ditto*, lateral view; 648, aedeagus; 649, 5th sternite, ventral view.

*3. *Eutrichota longimana* (Pokorny) comb. nov.
(Figs. 650–653)

Chortophila longimana Pokorny, 1887:405. *Pegomyia longimana*: Huckett, 1941:95. *Pegomyza longimana*: Hennig, 1972:468.

Material examined. HOKKAIDÔ — Sapporo, 21♂♂, 11-v–10-vi-59 (S. Ueda), 1♂, 3-vii-65 (T. Kocha), 5♂♂, 6-vi-68, & 2♂♂, 19-vi-69; Nopporo, 1♂, 14-v-72; Hiroshima-mura, 1♂, 23-vi-67; Mt. Soranuma, 1♂, 27-v-66, 1♂, 17-vi-67, 1♂, 11-vii-67, & 1♂, 15-vi-68 (K. Kusigemati); Eniwa, 2♂♂, 27-v-71; Mt. Shokambetsu, 1♂, 1-vii-71; Mt. Daisetsu, 1♂, 23-vii-68; Akkeshi, 2♂♂, 18-vii-66; Nemuro, 1♂, 20-vii-66; Kawayu, 1♂, 22-vii-66.

♂. Body-length 6–8.7 mm. Antennae blackish, at most sometimes faintly brownish on apical margin of A_2 and at base of A_3. Thorax and abdomen including 5th sternite and hypopygium blackish in ground colour and whitish grey in pollinosity. Femora yellow, f_1 being darkened on dorsal and posterior surfaces; tibiae yellow; tarsi blackish.

Frons about twice as wide as anterior ocellus; parafrontals contiguous to each other; A_3 2–2.2 times as long as wide; arista minutely pubescent. Mesonotum with rows of *pre acr* separated from each other by a distance nearly equal to that between *dc* and *acr*; 2nd *ph* often rather distinct; scutellum setulose on dorsal surface except on centre. Abdomen conical, usually a little longer than twice the width; prebasal sclerite on hind margin with some to about 10 (rarely 1 or a few) setae, of which 1 or a few are sometimes strong.

Fore tibia with apical *pd* fine or sometimes well developed; f_2 often with 1 *av* near base, yet never on apical half, and with 2–4 *pv* on basal half.

♀. Unknown to me.

Distribution. Japan; Europe; North America.

So far as the European and North American forms are concerned, *longimana* is not setose on the prebasal sclerite of the male hypopygium. The Japanese form is different by having a setose prebasal sclerite. It is tentatively referred to the present species.

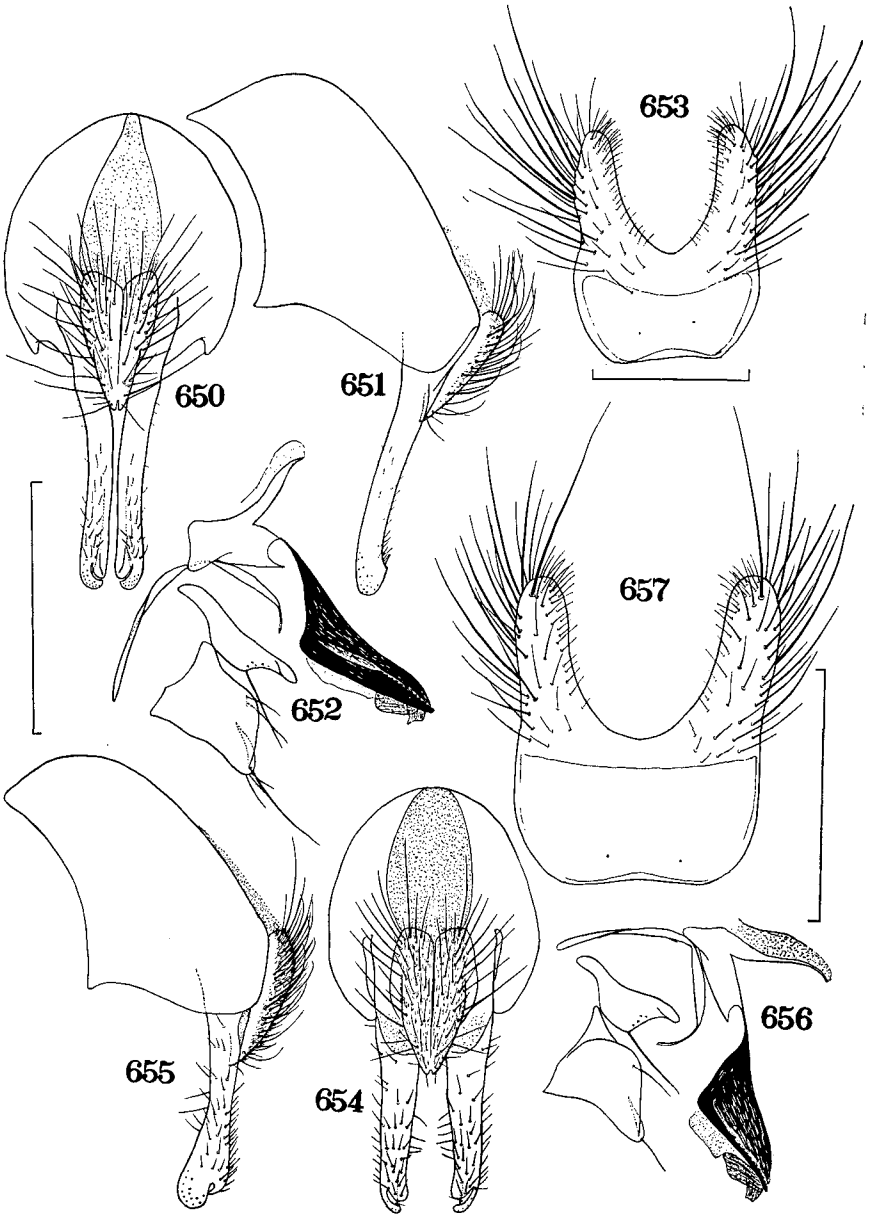
*4. *Eutrichota frigida* (Zetterstedt) comb. nov.
(Figs. 654–657)

Anthomyza frigida Zetterstedt, 1845:1685. *Pegomyia* (*Pegomyza*) *frigida*: Ringdahl, 1938:194. *Pegomyia frigida*: Huckett, 1941:90. *Pegomyza frigida*: Hennig, 1972:467.

Material examined. HOKKAIDÔ — Sapporo, 1♂, 13-viii-68 (K. Kusigemati), & 2♂♂, 6-vi-68; Mt. Muine, 1♀, 8-viii-72 (T. Kumata); Rishiri-tô, 1♂, 31-vii-69; Mt. Daisetsu, 6♂♂, 28–29-vii-59 (S. Ueda).

♂. Body-length 6.5–8.7 mm. Antennae almost blackish, at most more or less brownish on apical margin of A_2 and at base of A_3. Abdomen bluish grey pollinose, and shining black in some lights; median vitta broad; 5th tergite and hypopygium shining black though very thinly pollinose. Fore femur blackish or dark brownish; f_2 and f_3 yellowish, more or less darkened apically; t_1 blackish or dark brownish; t_2 and t_3 yellowish, darker basad; tarsi blackish. Wings distinctly tinged with yellow, strongly at base; calyptrae yellow.

Frons about 1.5–2 times as wide as anterior ocellus; parafrontals broadly contiguous to each other; A_3 longer than twice the width, usually 2.2–2.5 times as long as wide; arista minutely pubescent. Mesonotum with *pre acr*-rows separated from each other by a distance as long as or a little longer than that between *dc* and *acr*. Abdomen conical, with accessory setulae fine; prebasal sclerite without setae or setulae.



Figs. 650–653. *Eutrichota longimana* (Pokorny), ♂: 650, hypopygium, dorsal view; 651, *ditto*, lateral view; 652, aedeagus; 653, 5th sternite, ventral view.
Figs. 654–657. *Eutrichota frigida* (Zetterstedt), ♂: 654, hypopygium, dorsal view; 655, *ditto*, lateral view; 656, aedeagus; 657, 5th sternite, ventral view.

Fore tibia with 1 *ad* and 2 (sometimes 1) *pv*, apical *pd* being strong; f_2 with 1 or sometimes 2 strong *av* near apical third, and sometimes with 1 strong *av* near base; t_3 with apical *pd* not developed.

♀. Abdomen more thinly pollinose and more shining than in male. Fore femur dark brownish on dorsal half and brownish yellow on ventral half. Mid and hind femora with *pv* much weaker than those of male; fore tarsus with 2nd to 4th segments more or less broadened.

Distribution. Japan; Europe; North America.

*5. *Eutrichota consanguinea* (Tiensuu) comb. nov.
(Figs. 658–661)

Pegomyza consanguinea Tiensuu, 1938:27. *Pegomya consanguinea*: Hennig, 1973:506.

Material examined. HOKKAIDÔ — Sapporo, 1♂, 13-viii-66 (T. Kocha); Nopporo, 2♀♀, 9-vi-73; Mt. Soranuma, 1♂, 6♀♀, 17-vi-67, 1♀, 13-viii-66, 1♀, 20-viii-64, & 2♀♀, 4 & 30-viii-67 (K. Kusigemati); Shimamatsu, 1♀, 10-vi-68 (K. Kusigemati); Nukabira, 1♂, 11-vii-61 (I. Miyagi); Toikambetsu, 1♂, 2♀♀, 31-vii-66; Mt. Daisetsu, 1♀, 4-viii-60 (S. Ueda), & 1♀, 17-vii-68. HONSHÛ — Mt. Hakkôda, Aomori-ken, 1♂, 19-viii-66; Mt. Hayachine, Iwate-ken, 1♀, 11-viii-69; Mt. Zaô, Yamagata-ken, 1♂, 1♀, 7-ix-66; Mt. Kiso-Komagatake, Nagano-ken, 2♂♂, 24-vii-70.

♂. Body-length 5.6–7 mm. Antennae blackish, at most brownish on apical margin of A_2; palpi and mentum of haustellum blackish. Thorax black in ground colour and whitish grey and more or less bluish in pollinosity; mesonotum when viewed from front with broad median vitta, which is bifurcated posteriorly, and when viewed from behind with very broad lateral vittae, which are expanded to the rows of *dc*. Abdomen in ground colour black, and in pollinosity whitish grey and with a faint yellowish tinge, shining black in some lights; median vitta narrow or moderate on 2nd and 3rd tergites and broad on 4th and 5th tergites; hypopygium shining black though thinly pollinose; 5th sternite blackish or dark brownish on processes. Fore femur largely blackish or dark brownish, with yellow apex; f_2 and f_3 blackish or dark brownish, at most faintly yellowish apically; tibiae yellow; tarsi blackish. Wings rather distinctly tinged with yellow; calyptrae whitish, with a faint yellowish tinge.

Frons about as wide as distance between posterior ocelli inclusive; parafrontals contiguous to each other or nearly so, with 2–3 *ori*; A_3 2.4–2.7 times as long as wide; arista semi-plumose, the longest hairs being more or less shorter than A_3-width; profrons and cheeks respectively about as wide and high as A_3-width.

Mesonotum with 3–4 pairs of *pre acr*, and rather sparsely setulose between the rows, which are separated from each other by a distance nearly equal to that between *dc* and *acr*; *ph* not duplicated; *pra* as long as or a little longer than anterior *ntpl*; scutellum on dorsal surface rather sparsely setulose laterally and bare centrally. Abdomen cylindrical, about 2.5 times as long as wide; prebasal sclerite with no setae.

Fore tibia with 1 *ad* and 2 (sometimes 3) *pv*, apical *pd* being strong; f_2 with no *av*, only occasionally with 1 weakly developed *av* near apical third, and near base with 2 *pv* shorter than height of the femur; t_2 with 1 *ad*, 1 *pd*, 1–3 (usually 2) *p* and 1–3 *pv*; f_3 with 1-2 *av* near basal fourth and 4–5 *av* on apical half, and with 1 fine *pv* near base and 1 strong *pv* at basal third, these *pv* displaced a little to ventral surface; t_3 with 1 *av*, 3 *ad*, 2 long and 1 shorter *pd*, and 1 strong *p* at basal third, some setulae on posterior surface being more or less longer than accessory setulae, 1–2 of them are usually rather distinct; apical *pd* of t_3 much weaker and shorter

than other apical setae. Wings with costal thorns distinct or strong, as long as or much longer than *h*-vein; *m-m* nearly erect or a little oblique, and weakly sinuate.

♀. Body-length 5.2–7.3 mm. Abdomen more thinly pollinose and more shining than in male. Frons slightly wider than one-third head-width; profrons more or less wider than A_3; cheeks as high as or slightly less high than A_3-width. Abdomen with some strong discal setae on 5th tergite. Fore tibia with 2 *pv*, of which distal one is often absent; f_2 with 1–2 *av* near base and apex respectively; t_2 with 1 *ad*, 1 *pd*, 1–2 (rarely 3) *p* and 1–2 *pv*, the proximal one of *p* being usually located rather on postero-dorsal surface; t_3 with *p* usually lacking; fore tarsus with segments not broadened. Wings with costal thorns strong.

Distribution. Japan; Europe.

Judging from the genital structures of the North American *Pegomyia connexa* Stein, 1920 figured by Huckett (1924), it is very likely that *consanguinea* and *connexa* are conspecific.

*6. *Eutrichota socculata* (Zetterstedt) comb. nov.
(Figs. 662–665)

Anthomyza socculata Zetterstedt, 1845:1683. *Pegomyia* (*Pegomyza*) *schineri* Schnabl, in Schnabl & Dziedzicki, 1911:259. *Pegomyia* (*Pegomyza*) *puella*: Schnabl & Dziedzicki, 1911:259, nec Meigen, 1826. *Pegomyza socculata*: Ringdahl, 1959:238. *Pegomya socculata*: Hennig, 1973:512.

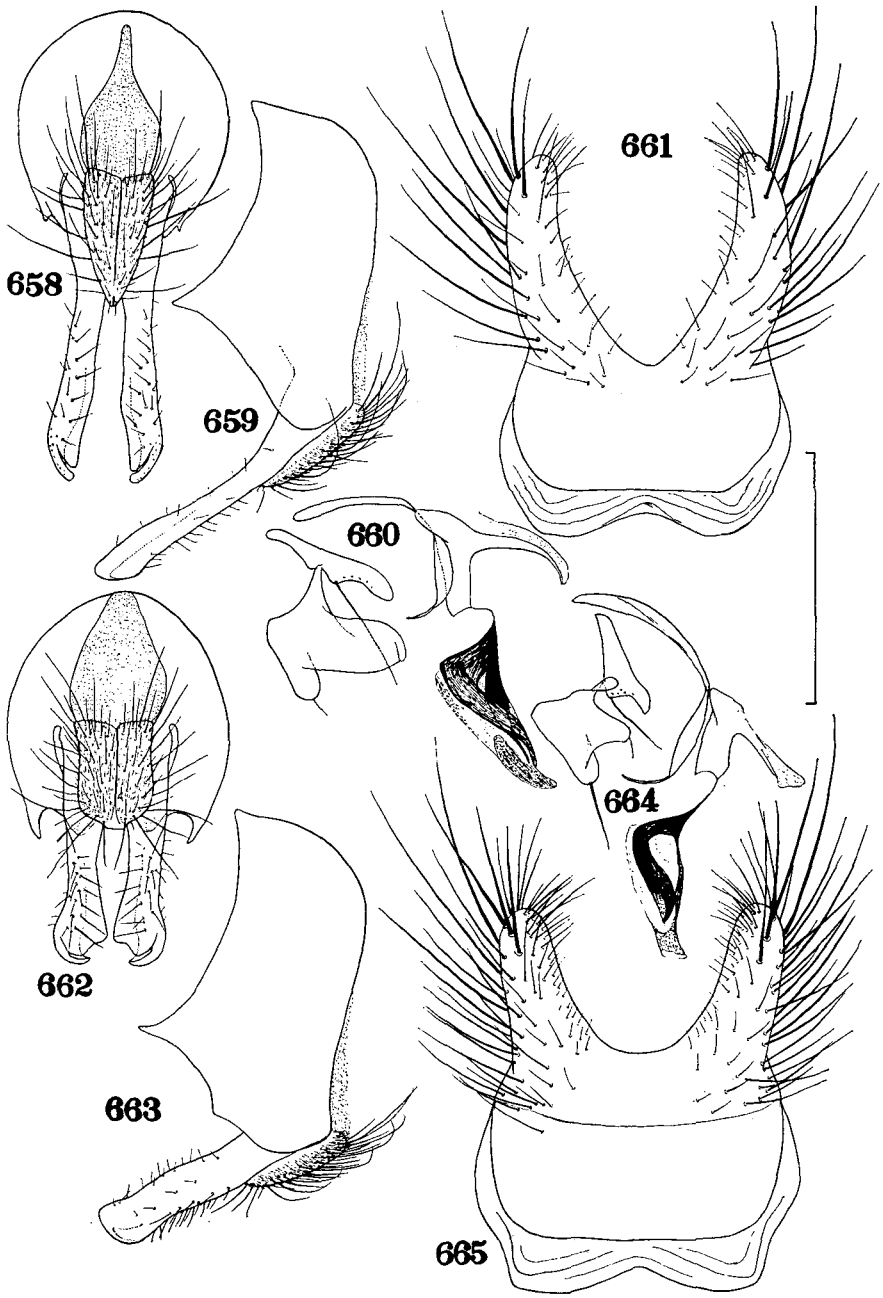
Material examined. HOKKAIDÔ — Sapporo, 1♂, 12-vi-68 (H. Takizawa), & 2♂♂, 20-vi-69; Jôzankei, 1♀, 8-viii-68 (T. Kocha); Nopporo, 1♀, 30-vi-66; Zenibako, 1♀, 20-vii-65 (T. Kocha); Mt. Daisetsu, 3♂♂, 1♀, 23-vii-68.

♂. Body-length 5.4–8.1 mm; wing-length 5–7.2 mm. Antennae blackish, with A_2 more or less yellowish or brownish on apical margin. Mesonotum when viewed from behind broadly blackish outside rows of *dc*; scutellum tinged with brown in pollinosity. Abdomen in pollinosity whitish grey and with a faint brownish yellow tinge; median vitta narrow; 5th tergite and hypopygium shining black though thinly pollinose. Femora almost blackish; f_1 rather distinctly yellow at apex; f_2 and f_3 faintly yellowish or brownish at apex; tibiae yellow; tarsi blackish. Wings rather distinctly tinged with yellow, strongly at base; calyptrae yellowish.

Frons more or less narrower than anterior ocellus; parafrontals broadly contiguous to each other, with 3–4 *ori*; A_3 about 2.5–2.9 times as long as wide; arista plumose, the longest hairs being about as long as A_3-width; profrons and cheeks respectively a little narrower and less high than A_3-width.

Mesonotum rather densely setulose between the rows of *pre acr*, which are separated from each other by a distance distinctly longer than that between *dc* and *acr*; *ph* not duplicated; *pra* longer than anterior *ntpl*; *stpl* 1:2; scutellum on dorsal surface bare mid-basally. Abdomen cylindrical, long-ovoid when viewed from above, and as long as or a little shorter than twice the width; prebasal sclerite with no setae or setulae.

Fore tibia with 1 *ad* and 2 (rarely 1 or 3) *pv*, apical *pd* being strong; f_2 with no *av* and 1 strong *pv* at basal fourth, and with or without 1 fine *pv* at base; t_2 with 1 *ad*, 1 *pd* and 4–5 *p–pv*, of which proximal one is located rather on postero-dorsal



Figs. 658–661. *Eutrichota consanguinea* (Tiensuu), ♂: 658, hypopygium, dorsal view; 659, *ditto*, lateral view; 660, aedeagus; 661, 5th sternite, ventral view.

Figs. 662–665. *Eutrichota socculata* (Zetterstedt), ♂: 662, hypopygium, dorsal view; 663, *ditto*, lateral view; 664, aedeagus; 665, 5th sternite, ventral view.

surface; f_3 with 1 *av* at basal third or fourth and 3–4 *av* on apical half, and with 1 fine *pv* near base and 1 strong *pv* near basal third; t_3 with 1 *av*, 3 *ad*, 2–3 *pd* and no *p*, apical *pd* being weak. Wings with costal thorns minute (in smaller specimens) or rather distinct (in larger specimens); *m-m* oblique and rather distinctly sinuate.

♀. Abdomen more thinly pollinose and more shining than in male, and not vittate. Frons a little wider than one-third head-width; profrons about as wide as A_3. Abdomen with some strong discal setae on 5th tergite. Mid femur, as in male, with no *av*. Wings with costal thorns strong.

Distribution. Japan; Europe.

*7. *Eutrichota labradorensis* (Malloch) comb. nov.
(Figs. 666–669)

Pegomyia labradorensis Malloch, 1920a:176. *Pegomyia labradorensis*: Huckett, 1941: 80. *Pegomya* (*Pegomya*) *labradorensis*: Huckett, 1965a:130.

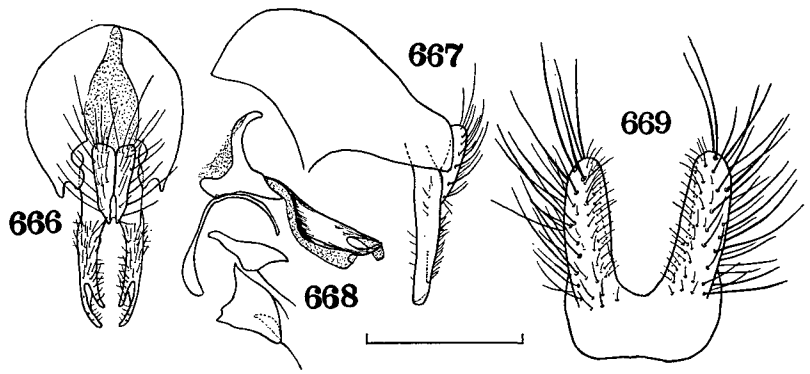
Material examined. HOKKAIDÔ — Mt. Daisetsu, 1♂, 1♀, 8-vii-62 (S. Takagi), 5♂♂, 3♀♀, 26–30-vii-67 (M. Miyazaki & K. Kusigemati), & 10♂♂, 3♀♀, 20–21-vii-68.

♂. Body-length 5.5–8.6 mm. Interfrontalia brownish, sometimes darkened, with whitish pollen; parafacials in ground colour brownish or yellowish near lunule and blackish on the remaining part, and in pollinosity whitish and faintly tinged with yellow; cheeks blackish or dark brownish, with whitish grey pollen; occiput black in ground colour and pale brownish grey pollinose; A_1 and A_2 yellow; A_3 yellow basally and blackish on the rest; palpi yellow; haustellum with mentum yellowish to blackish and whitish grey pollinose. Thorax on pleura blackish in ground colour, at most brownish along confines of pleura and near bases of wings, and in pollinosity pale grey and faintly brownish; metanotum in ground colour reddish yellow with a broad blackish median vitta, or wholly blackish; mesonotum variously darkened in ground colour, in one extremity largely reddish yellow and only with a blackish median vitta broadening caudad, and in the other extremity largely blackish or dark brownish, and only partly brownish on humeral calli in part, near humeral calli and on lateral declivities behind the suture; mesonotum in pollinosity rather thin, and pale grey or sometimes brownish grey; scutellum in ground colour largely or narrowly darkened on dorsal surface, and on the remaining part including ventral surface reddish yellow or brown. Abdomen in ground colour largely blackish, in pollinosity grey and faintly brownish yellow, and with tessellations in some lights; 5th tergite often yellow on hind margin in ground colour; hypopygium and processes of 5th sternite wholly yellow or largely brownish; median vitta distinct, more or less broadening caudad on 3rd to 5th tergites; tergites when viewed from behind with blackish spots at bases of marginal setae. Legs yellowish except for blackish tarsi; fore coxa sometimes partly blackish; mid and hind coxae partly brownish or blackish; trochanters sometimes partly brownish; f_1 darkened dorsally. Wings tinged with yellow, strongly at base; calyptrae yellow; halteres yellow at knob and brownish yellow at base.

Frons as wide as or a little narrower than anterior ocellus; parafrontals broadly contiguous to each other, with 3–4 *ori*; A_3 2.2–2.5 times as long as wide; arista minutely pubescent; profrons usually somewhat narrower than A_3, at most about as wide as the latter; cheeks usually a little higher than A_3-width.

Mesonotum with 3–4 pairs of distinct *pre acr*, the rows being usually closer together than to *dc*; 2nd *ph* very fine and usually like accessory setulae. Abdomen conical, and more or less longer than twice the width; prebasal sclerite bare.

Fore tibia with 1 *ad* and usually 2 *pv*, apical *pd* being strong; f_2 with 1–2 (usually 1) strong *av* near apical third, and with 1 rather fine *pv* near base and 1–4 strong *pv* on basal half to two-thirds, and with or without a few or some rather strong *pv* on apical third; t_2 with 1 *ad*, 1 *pd*, 1–2 *p* and 2–3 *pv*; f_3 with a row of strong *av*, and middle half with some strong *pv*; t_3 with 1–2 *av*, 2–4 (usually 3) *ad*, 3–4 *pd*, and 1 strong *pv* near basal third, and sometimes in addition with 1–2 weaker *pv*; t_3 with apical *pd* weak. Wings with costal thorns distinct or rather strong; *m-m* more or less oblique and a little or rather distinctly sinuate.



Figs. 666–669. *Eutrichota labradorensis* (Malloch), ♂: 666, hypopygium, dorsal view; 667, *ditto*, lateral view; 668, aedeagus; 669, 5th sternite, ventral view.

♀. Head in ground colour largely yellowish, only blackish on ocellar triangle, upper half of parafrontals and upper half of occiput; parafacials and cheeks whitish yellow in pollinosity; haustellum with mentum yellowish or brownish. Thorax in ground colour mostly yellowish, only blackish or darkened on basalares, subalares, postpleura and sometimes metapleura, and thinly covered with whitish pollen, which is slightly tinged with yellow. Abdomen in ground colour blackish except on 5th tergite, which is yellowish or brownish on whole or posterior part, and in pollinosity whitish grey or pale yellowish grey and not vittate, only with tessellations in some lights.

Frons more or less wider than one-third head-width; interfrontalia sometimes with a pair of *if* although vestigial; profrons and cheeks respectively more or less wider and higher than A_3-width. Abdominal 5th tergite with discal setae indistinguishable from accessory setulae or only a little stronger. Mid femur with 1–2 strong *av* near base and 1–2 (usually 1) strong *av* near apical third, and with no strong *pv*, only with a few fine ones on basal half; t_2 with no *av*; f_3 only with a few fine *pv* on basal half apart from 1 or a few rather distinct preapical ones; t_3 usually with no *pv*; fore tarsus with segments not broadened. Wings with costal thorns strong.

Distribution. Japan; North America.

The Japanese form is slightly different from the North American one in the

much darker coloration of the male abdomen which is never largely reddish. This species is closely related to the European *Pegomyia semirufa* Ringdahl, 1932, from which it can be separated only by the absence of a strong *av* on t_2 of the female. As pointed out by Huckett (1941) it is not unlikely that the two species are conspecific.

Species of *Eutrichota* not included in the key:

8. *Eutrichota sylvia* (Séguy) comb. nov.

Pegomyza sylvia Séguy, 1926:43.

This species was described on the basis of a male specimen from Japan (Chûzenji, Tochigi-ken). As no representatives have been examined by myself, it is not included in the present key. According to Hennig (1973: 473) this species should be suppressed as a synonym of *Pegomyza similis* Schnabl, 1911.

Literature

Ackland, D.M. 1965a. Two new British species of Anthomyiidae (Dipt.), with taxonomic notes on related pests of conifers. Ent. Month. Mag. 100: 136–144.

———— 1965b. The identity of *Anthomyia dissecta* Mg. and *A. infirma* Mg. (Dipt., Anthomyiidae). Ent. Month. Mag. 100: 207–209.

———— 1965c. *Pegomya dulcamarae* Wood (Dipt., Anthomyiidae); a redescription, with notes on the puparium. Ent. Month. Mag. 101: 21–24.

———— 1967. Diptera from Nepal. Anthomyiidae. Bull. Brit. Mus. (N.H.) Ent. 20 (4): 107–139.

———— 1969. A redescription of *Pegohylemyia retusa* Ringdahl, including the 3rd instar larva (Dipt., Anthomyiidae). Ent. Medd. 37: 274–279.

———— 1970. Notes on the Palaearctic species of *Egle* R.-D. (Dipt., Anthomyiidae) with descriptions of two new species. Ent. Month. Mag. 105: 185–192.

———— 1971. Anthomyiidae from the U.S.S.R. Stuttg. Beitr. Naturk. 231: 1–8.

d'Aguilar, J. & Missonnier, J. 1957. Différences biologiques et morphologiques entre *Pegomyia betae* Curt. et *P. hyoscyami* Panz. (Dipt. Muscidae). Bull. Soc. Ent. Fr. 62: 124–131.

———— & ———— 1962. Étude morphologique et biologique comparée de deux *Pegomyia* vivant sur la betterave: *P. betae* Curt. et *P. hyoscyami* Panz. (Dipt. Muscidae). Ann. Epiphyties 13: 95–116.

Albuquerque, D. de O. 1959. Contribuição ao conhecimento de *Pegomyia* R.-D., 1830 e *Hylemyia* (*Craspedochaeta*) Macquart, 1850, na América do sul, com descrições de espécies novas (Diptera-Muscidae). Bol. do Mus. Nac. N.S. 210: 1–50.

Bremer, H. 1929. Untersuchungen zur Lebengeshichte und Bekämpfung der Rübenfliege (*Pegomyia hyoscyami* Pz.). 9. Mitteilung. Beitrag zur Epidemiologie der Rübenfliegenkalamität. Arb. biol. Reichsanst. Land- und Forstw. 16: 103–193.

Chillcott, J.G. 1959. The *Pegomyia hyoscyami* (spinach leaf miner) complex in North America (Diptera: Muscidae). Can. Ent. 91: 167–170.

Collin, J.E. 1921. A contribution towards the knowledge of the Anthomyid genera *Hammomyia* and *Hylephila* of Rondani (Diptera). Trans. Ent. Soc. Lond. (1920): 305–326.

———— 1927. On some characters of possible generic importance in the *Hylemyia-Chortophila* group of the Anthomyiidae (Diptera). Ent. Month. Mag. 63: 129–135.

———— 1931. The Oxford University Expedition to Greenland, 1928. — Diptera (Orthor-

rhapha Brachycera and Cyclorrhapha) from Greenland. Ann. Mag. N.H. (10) 7: 67–91.
———— 1943. The British species of *Prosalpia* Pok. (Dipt., Anthomyiidae). Ent. Month. Mag. 79: 83–86.
———— 1947. On the identification of the type of *Anthomyia minuta* Meigen (1826) with consequential changes in the names of three British Anthomyiidae (Diptera). Proc. Roy. Ent. Soc. Lond. (B) 16: 33–34.
———— 1954. The genus *Chiastochaeta* Pokorny (Diptera: Anthomyiidae). Proc. Roy. Ent. Soc. Lond. (B) 23: 95–102.
———— 1955. Genera and species of Anthomyiidae allied to *Chirosia* (Diptera). Journ. Soc. Brit. Ent. 5: 94–100.
———— 1965. Hansted-Reservatets Entomologi. 8. *Pegohylemyia danica* sp. n. (Diptera, Anthomyiidae). Ent. Medd. 30: 199–200.
———— 1966. Notes on some British species of *Pegohylemyia* (Dipt., Anthomyiidae) with descriptions of four new species. Ent. Month. Mag. 102: 181–191.
Coquillett, D.W. 1897. *In* Slingerland, M.V., 1897: The rasberry-cane maggot (*Phorbia rubivora* Coquillett). Can. Ent. 29: 162–163.
Czerny, L. 1906. Zwei neue *Chortophila*-Arten aus Oberösterreich (Dipt.). Wien. Ent. Ztg. 25: 251–254.
Doucette, C.F. 1941. A maggot attacking carnation shoots. Journ. Econ. Ent. 34: 472.
Drew, W.A. 1963. Nearctic genera of Anthomyiini (Muscidae, Diptera) with a list of Nearctic species. Mich. St. Univ. Mus., biol. ser. 2: 193–272.
Emden, F.I. van 1941. Keys to the Muscidae of the Ethiopian region: Scatophaginae, Anthomyiinae, Lispinae, Fanniinae. Bull. Ent. Res. 32: 251–275.
———— 1951. Muscidae. C. — Scatophaginae, Anthomyiinae, Lispinae, Fanniinae and Phaoniinae. Ruwenzori Expedition 1934–5. II-6: 325–710.
Fonseca, E.C.M. d'Assis 1952. A survey of the Swedish species of *Hydrophoria* and *Acroptena* (Dipt., Muscidae) by O. Ringdahl, 1946, Ent. Tidsk. 67: 158–168 (translated from the Swedish). Journ. Soc. Brit. Ent. 4: 75–83.
———— 1956. A review of the British subfamilies and genera of the family Muscidae (Diptera). Trans. Soc. Brit. Ent. 12: 113–128.
Frick, K.E. & Andres, L.A. 1967. Host specificity of the ragwort seed fly. Journ. Econ. Ent. 60: 457–463.
Harukawa, C. & Kondo, S. 1930. [On the seed-corn maggot (*Hylemyia cilicrura* Rondani), I.] Nôgaku-kenkyû 14: 449–469 (in Japanese).
Hendel, F. 1923. Blattminierende Fliegen (4. Beitrag zur Blattminenkunde Europas). Deutsch. Ent. Zeitschr. 1923: 386–400.
———— 1925. Neue europäische Minierfliegen (8. Beitrag zur Blattminenkunde Europas). Konowia 4: 301–309.
Hennig, W. 1938. Zur Nomenklatur pflanzenschädlicher Anthomyiiden. Arb. phys. angew. Ent. Berlin-Dahlem 5: 279–284.
———— 1952. Dipteren von den Kleinen Sunda-Inseln aus der Ausbeute der Sunda-Expedition Rensch. IV. Fam. Muscidae. Beitr. Ent. 2: 55–93.
———— 1953. Übersicht über die europäischen Arten der Gattung *Chiastochaeta* (Diptera: Muscidae). Beitr. Ent. 655–668.
———— 1955. Muscidae. *In* Lindner's Die Fliegen der palaearktischen Region. 63b: 1–48 (cont.).
———— 1966–1973. Anthomyiidae. *In* Lindner's Die Fliegen der palaearktischen Region. 63a: 1–680 (cont.). Pp. 1–96, 1966; 97–192, 1967; 193–240, 1968; 241–328, 1969; 329–424, 1970; 425–472, 1972; 473–680, 1973.
Hering, M. 1924. Minenstudien IV. Zeitschr. Morph. Ökol. Tiere 2: 217–250.
———— 1957. Bestimmungstabellen der Blattminen von Europa. 1:1–648; 2: 649–1185; 3:1–221.
———— 1962. Neue Blattminen-Studien II (Col., Dipt., Lep.). Deutsch. Ent. Zeitschr. N.F. 9: 30–65.
Hori, K. 1960. Comparative anatomy of the internal organs of the calyptrate muscoid flies.

I. Male internal sexual organs of the adult flies. Sci. Rep. Kanazawa Univ. 7: 23–83.
———— 1961. The discovery of *Fucellia apicalis* Kertész, 1908 from the east coast of the Noto Peninsula (Dipt., Muscidae). Ann. Rep. Noto Mar. Lab. Kanazawa Univ. 1: 36–39 (in Japanese).
———— 1967. Comparative anatomy of the internal organs of the calyptrate muscoid flies. V. Consideration on the phylogeny of the Calyptratae. Sci. Rep. Kanazawa Univ. 12: 215–254.
———— & Kurahashi, H. 1969. Notes on the five Japanese species of the genus *Fucellia* Rob.-Desvoidy (Dipt., Anthomyiidae). Sci. Rep. Kanazawa Univ. 14: 237–252.
Hosoya, T. 1943. [Notes on three pest-insects injurious to the cones of *Larix koreana*.] Nippon Ringakkai-Shi 25: 181–196 (in Japanese).
Huckett, H.C. 1921. On the morphology of the ovipositor of certain anthomyian genera. Ann. Ent. Soc. Amer. 14: 290–328.
———— 1924. A systematic study of the Anthomyiinae of New York, with especial reference to the male and female genitalia. Cornell Univ. Agr. Expt. Sta. Mem. 77: 1–91.
———— 1928. Little known anthomyid flies that commonly occur on the catkins of willow (Muscidae, Diptera). Bull. Brookl. Ent. Soc. 23: 70–82, 1 pl.
———— 1929. New Canadian anthomyids belonging to the genus *Hylemyia* Rob.-Desv. (Muscidae, Diptera). Can. Ent. 61: 93–96, 110–119, 136–144, 161–168 & 180–190.
———— 1939. Descriptions of new North American Anthomyiidae belonging to the genus *Pegomyia* Rob.-Dosv. (Diptera). Trans. Amer. Ent. Soc. 65: 1–36, 3 pls.
———— 1940. The North American species of the genera *Leucophora* Robineau-Desvoidy and *Proboscimyia* Bigot (Muscidae, Diptera). Journ. N.Y. Ent. Soc. 48: 335–365.
———— 1941. A revision of the North American species belonging to the genus *Pegomyia* (Diptera: Muscidae). Mem. Amer. Ent. Soc. 10: 1–131, 9 pls.
———— 1944. A revision of the North American species belonging to the genus *Hydrophoria* Robineau-Desvoidy (Diptera: Muscidae). Ann. Ent. Soc. Amer. 37: 261–297.
———— 1946. The subgenera *Craspedochaeta* and *Acrostilpna* in North America, genus *Hylemyia* sens. lat. (Diptera, Muscidae). Bul. Brookl. Ent. Soc. 41: 110–125.
———— 1948. The subgenus *Phorbia* Robineau-Desvoidy in North America, genus *Hylemyia* sens. lat. (Diptera, Muscidae). Bul. Brookl. Ent. Soc. (1947) 42: 109–125.
———— 1949. The subgenus *Pycnoglossa* Coquillett in North America, genus *Hylemyia* sens. lat. (Muscidae, Diptera). Journ. N.Y. Ent. Soc. 57: 51–65.
———— 1950. The genus *Paraprosalpia* (Villeneuve) in North America, (=*Prosalpia* Pokorny preoc.) Muscidae. Bul. Brookl. Ent. Soc. 45: 121–143.
———— 1953. A new species of the anthomyiid genus *Hylemya* Rob.-Desv. from Oregon, reared from fir cones (Muscidae, Diptera). Bul. Brookl. Ent. Soc. 48: 107–110.
———— 1965a. The Muscidae of Northern Canada, Alaska, and Greenland (Diptera). Mem. Ent. Soc. Can. 42: 1–369.
———— 1965b. Subfamilies Fucelliinae and Anthomyiinae. *In* Stone, et al, 1965, A Catalog of the Diptera of America North of Mexico. Pp. 842–869.
———— 1966a. Two new flies from California (Diptera: Anthomyiidae and Muscidae). Pan-Pac. Ent. 42: 33–35.
———— 1966b. New species of Anthomyiidae and Muscidae from California (Diptera). Proc. Calif. Acad. Sci. Ser. 4, 34: 235–305.
———— 1971. The Anthomyiidae from California exclusive of the subfamily Scatophaginae (Diptera). Bul. Calif. Ins. Survey 12: 1–121.
Huie, L.H. 1916. The habits and life-history of *Hylemyia grisea*, Fall., an anthomyiid fly new to the Scottish fauna. Scott. Nat. 49: 13–20.
Kano, R. 1965. *In* Iconographia insectorum japonicorum colore naturali edita. P. 232.
————, Kaneko, K. & Shinonaga, S. 1964. Notes on the medically important flies collected on the Amami-Oshima Islands and Tokara Islands. Kontyû 31: 129–

135 (in Japanese with an English summary).
Karl, O. 1928. Muscidae. Tierw. Deutschl. 13: 1–232.
———— 1930. Ergänzungen und Berichtigungen zu meiner Arbeit über die Musciden (Prof. Dr. Fr. Dahl, Die Tierwelt Deutschlands, Teil 13). Teil II. Zool. Anz. 86: 161–174.
———— 1932. Ditto, Teil III. Ibid. 98: 299–306.
———— 1934. Ditto, Teil IV. Ibid. 107: 90–93.
———— 1935. Aussereuropäische Musciden (Anthomyiden) aus dem Deutschen Entomologischen Institut. Arb. morph. taxon. Ent. Berlin-Dahlem 2: 29–49.
———— 1940. Neue paläarktische Musciden (Anthomyiiden) (Dipt.). Stett. Ent. Ztg. 101: 41–47.
———— 1943. Ergänzungen und Berichtigungen zu meiner Arbeit über die Musciden (Prof. Dr. Fr. Dahl, Die Tierwelt Deutschlands, Teil 13), Teil VI. Stett. Ent. Ztg. 104: 64–77.
Kato, S. 1939. Taxonomic notes on some *Hylemyia* species (Dipt., Muscidae) injurious to agricultural plants in Nippon and Manchoukuo. Botany and Zoology 7: 1367–1376 & 1529–1538.
———— 1941. Taxonomic notes on *Pegomyia hyoscyami* Panzer (Dipt., Muscidae) and its allied species in Nippon. Kontyû 15: 55–68, 2 pls.
———— 1950. *In* Iconographia insectorum japonicorum. Pp. 1682–1685.
Keilin, D. 1924. On the life-history of *Anthomyia procellaris* Rond. and *A. pluvialis* L. inhabiting the nests of birds. Parasitology 16: 150–159.
Kertész, K. 1908. Zwei neue *Fucellia*-Arten. Wien. Ent. Ztg. 17: 23–83.
Kuwayama, S. 1938. [New records of injurious insects to agricultural plants.] Ôyô-Kontyû 1: 138 (in Japanese).
———— 1967. Insect fauna of the Southern Kurile Islands. 225 pp., 6 pls. (in Japanese).
Lyneborg, L. 1965a. The *Fucellia maritima*-group in North Europe, with description of a new species. Ent. Medd. 34: 19–29.
———— 1965b. On Muscidae and Anthomyiidae (Diptera) from Iceland. With descriptions of two new species. Opusc. Ent. 30: 211–226.
Malloch, J.R. 1917. A new genus of Anthomyiidae (Diptera). Bul. Brookl. Ent. Soc. 12: 113–115.
———— 1918. Diptera from the South-western United States. Paper IV. Anthomyiidae. Trans. Amer. Ent. Soc. 44: 263–319, 1 pl.
———— 1920a. Descriptions of new North American Anthomyiidae (Diptera). Trans. Amer. Ent. Soc. 46: 133–196, 3 pls.
———— 1920b. A synopsis of the North American species of the genus *Pegomyia* Robineau-Desvoidy (Diptera, Anthomyiidae). Bul. Brookl. Ent. Soc. 15: 121–127.
———— 1920c. A synoptic revision of the anthomyiid genus *Hydrophoria* Robineau-Desvoidy (Diptera). Can. Ent. 52: 253–257.
———— 1920d. Scientific results of the Katmai Expedition of the National Geographic Society. XII. Descriptions of Diptera of the families Anthomyiidae and Scatophagidae. Ohio Journ. Sci. 20: 267–291.
———— 1921. Exotic Muscaridae (Diptera), II. Ann. Mag. Nat. Hist. (9) 7: 420–430.
———— 1924. Ditto, XIII. Ibid. (9) 14: 257–274.
Matsumura, S. 1897. Gaichû-Kujo-Zensho. 288 pp. (in Japanese).
———— 1915. Dai-Nippon-Gaichû-Zensho (Kô-hen). 308 pp. xcvii, 28 pls. (in Japanese).
Meade, R.H. 1892. Communications. *Phorbia seneciella*. Bull. Seances Ann. Soc. Ent. Fr. 61: cxvi–cxvii.
Miles, M. 1953. Studies of British anthomyiid flies. IV. Biology of the spinach stem fly, *Hylemyia echinata* (Séguy). Bull. Ent. Res. 43: 591–596.
Oku, T. 1964. [On the spinach stem fly, *Hylemyia* sp.] Ann. Rep. Soc. Plant Prot. N. Japan 15: 107 (in Japanese).
Pokorny, E. 1887. III. Beitrag zur Dipterenfauna Tirols. Verh. zool.-bot. Ges. Wien 37: 381–420.

——— 1893. Eine alte und einige neue Gattungen der Anthomyiden. Wien. Ent. Ztg. 12: 53–64.
Ringdahl, O. 1918. Neue nordische Anthomyiden. Ent. Tidsk. 39: 148–194.
——— 1928. Pseudochirosia, eine neue Anthomyiinengattung (Type: *Chirosia fractiseta* Stein). Ent. Tidsk. 49: 22–23.
——— 1929. Übersicht der in Schweden gefundenen *Hylemyia*-arten mit posteroventraler Apikalborste an den Hinterschienen. Ent. Tidsk. 50: 268–273.
——— 1930. Entomologische Ergebnisse der schwedischen Kamtchatka-Expedition 1920–1922. 30. Diptera Brachycera 3. Fam. Muscidae. Ark. Zool. 21A: 1–16.
——— 1932. Einige neue Musciden aus Schweden. Ent. Tidsk. 53: 156–160.
——— 1933. Översikt av i Sverige funna *Hylemyia*-arter. Ent. Tidsk. 54: 1–35.
——— 1937. Neue schwedische Hylemyiinen. Opusc. Ent. 2: 124–129.
——— 1938. Översikt av svenska *Pegomyia*-arter (Diptera: Muscidae). Ent. Tidsk. 59: 190–213.
——— 1948. Neue Musciden aus den österreichischen Alpen. Opusc. Ent. 13: 163–167.
——— 1952. Übersicht der mir bekannten skandinavischen *Pegohylemyia*-Arten (Diptera: Muscidae). Ent. Tidsk. 73: 231–238.
——— 1959. Fam. Muscidae. Svensk Insektfauna, 11–1 (3): 197–334.
Robineau-Desvoidy, J.B. 1830. Essai sur les Myodaires. Mémoires présentés par divers savans à l'Académie Royale des Sciences de l'Institut de France 2: 1–813.
Sasakawa, M. 1955. [Hakobe-moguri-hanabae (new Japanese name).] Kontyû 22: 64 (in Japanese).
Schnabl, J. 1911. Anthomyidae. *In* Becker, T., Kuntze, A., Schnabl, J. & Villeneuve, J., Dipterologische Sammelreise nach Korsika (Dipt.). Deutsch. Ent. Ztschr. 1911: 62–100.
——— & Dziedzicki, H. 1911. Die Anthomyiden. Abh. K. Leop.-Carol. Deutsch. Akad. Naturf. 95: 53–358, 35 pls.
Séguy, E. 1923a. Diptères Anthomyides. Faune de France 6, xi+393 pp.
——— 1923b. Description d'Anthomyiaires nouveaux (Diptères). Ann. Soc. Ent. Fr. 91: 360–368.
——— 1926. Études sur les Anthomyides, 5. Enc. Ent. B, II, Dipt. 3: 41–44.
——— 1929. Étude sur les Diptères a larves commensales ou parasites des oiseaux de l'Europe occidentale. Enc. Ent. B, II, Dipt. 5: 63–82.
——— 1932. Études sur les Anthomyides, 6. Enc. Ent. B, II, Dipt. 6: 71–81.
——— 1934. Contribution a l'étude des mouches phytophages de l'Europe occidentale, II. Enc. Ent. Dipt. 7: 167–264.
——— 1936. Un nouveau Fucellinae asiatique. Bull. Soc. Ent. Fr. Pp. 281–282.
——— 1937. Muscidae. *In* Wytsman's Genera insectorum 205: 1–604, 9 pls.
Shiraki, T. 1950. *In* Iconographia insectorum japonicorum. P. 1685.
Snyder, F.M. 1965. Diptera: Muscidae. Insects of Micronesia 13 (6): 191–327.
Stein, P. 1900. Einige neue Anthomyiden. Ent. Nachr. 26: 305–324.
——— 1906. Die mir bekannten europäischen *Pegomyia*-Arten. Wien. Ent. Ztg. 25: 47–107.
——— 1907. Zur Kenntnis der Dipteren von Central-Asien. II. Cyclorrhapha Schizophora Schizometopa. Die von Roborowsky und Kozlov in der Mongolei und Tibet gesammelten Anthomyiiden. Ann. Mus. Zool., Petersb. 12: 318–372.
——— 1916. Die Anthomyiden Europas. Arch. Naturg. (1915) 81A (10): 1–224.
——— 1918. Zur weitern Kenntnis aussereuropaeischer Anthomyiden. Ann. Mus. Nat. Hung. 16: 147–244.
——— 1920. Nordamerikanische Anthomyiden. 2. Beitrag. Arch. Naturg. (1918) 84A (9): 1–106.
Steyskal, G.C. 1967. *Anthomyia procellaris* Rondani in North America (Diptera, Anthomyiidae). Proc. Ent. Soc. Wash. 69: 240.
——— 1970. The anatomy and taxonomy of the beet leaf miner of Egypt and Cyprus, *Pegomya mixta* (Diptera: Anthomyiidae). Ann. Ent. Soc. Amer. 63: 300–307.

Strobl, G. 1893. Die Anthomyinen Steiermarks. Verh. zool.-bot. Ges. Wien 43: 213–276.

Suwa, M. 1970a. Preliminary notes on beet-flies, *Pegomya* spp. injurious to beet (Diptera: Anthomyiidae). Kontyû 38: 146–161 (in Japanese with an English summary).

———— 1970b. On the Japanese species of the genus *Hydrophoria* Robineau-Desvoidy, with description of a new species (Diptera: Anthomyiidae). Kontyû 38: 246–251.

———— 1971a. Notes on the genus *Lasiomma* Stein in Japan, with descriptions of two new species (Diptera: Anthomyiidae). Kontyû, 39: 28–36.

———— 1971b. Notes on the Japanese leaf-miners of the genus *Pegomya* Robineau-Desvoidy, with descriptions of two new species (Diptera: Anthomyiidae). Kontyû 39: 262–272.

———— 1971c. On a leaf-miner of potato, *Pegomya dulcamarae* Wood, in Japan (Diptera: Anthomyiidae). Kontyû 39: 320–321 (in Japanese).

Tiensuu, L. 1935. Die bisher aus Finnland bekannten Musciden. Acta Soc. pro Fauna et Flora Fenn. 58: 1–56.

———— 1938. Beiträge zur Kenntnis der Musciden (Dipt.) Finnlands. Ann. Ent. Fenn. 4: 21–33.

———— 1939. Beiträge zur Kenntnis der Musciden (Dipt.) Finnlands. Ann. Ent. Fenn. 5: 241–255.

Tomaszewski, W. 1934. Zur Taxonomie der Kohlfliegen *Chortophila brassicae* Bouché und *Ch. floralis* Fallén. Arb. morph. taxon. Ent. Berlin-Dahlem 1: 60–66.

Villeneuve, J. 1917. 2. Descriptions d'Anthomyides nouveaux (Dipt.). *In* Keilin, D., Anthomyides à larves carnivores. Parasitology 9: 438–441.

———— 1922. Descriptions d'Anthomyides nouveaux (Dipt. Musc.). Bull. Mus. Nat. Hist. Paris 28: 509–513.

Wood, J.H. 1913. Four unrecorded British Anthomyiidae; two of them being at the same time new to science. Ent. Month. Mag. 49: 84–87.

Wu, C.F. 1939. Catalogus insectorum sinensium. V: 333–361.

Yamada, F., Kobayashi, K., Yamazaki, S. & Ozawa, T. 1965. Studies on injurious insects to the larch cones. I. On the larch cone maggot (*Hylemya laricicola* Karl). 76 Nippon-Ringakkai-Taikai-Kôenshû, pp. 362–364 (in Japanese).

————, ————, ———— & ———— 1972. Studies on the larch cone maggot, *Hylemya laricicola* Karl (Diptera: Muscidae). Bull. Gov. For. Exp. Sta. 247: 15–68, 6 pls. [in Japanese with an English summary].

Yokoo, T. 1940. [Morphology and distribution of 3 Anthomyiid flies injurious to vegetables in Korea.] Oyô-Dôbutsugaku-Zasshi 12: 187–208 (in Japanese).