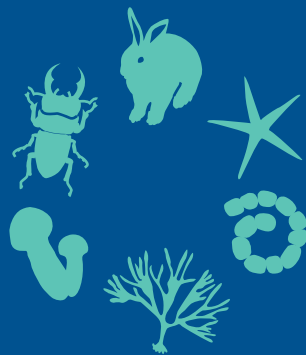


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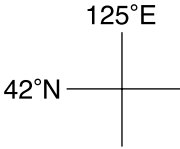
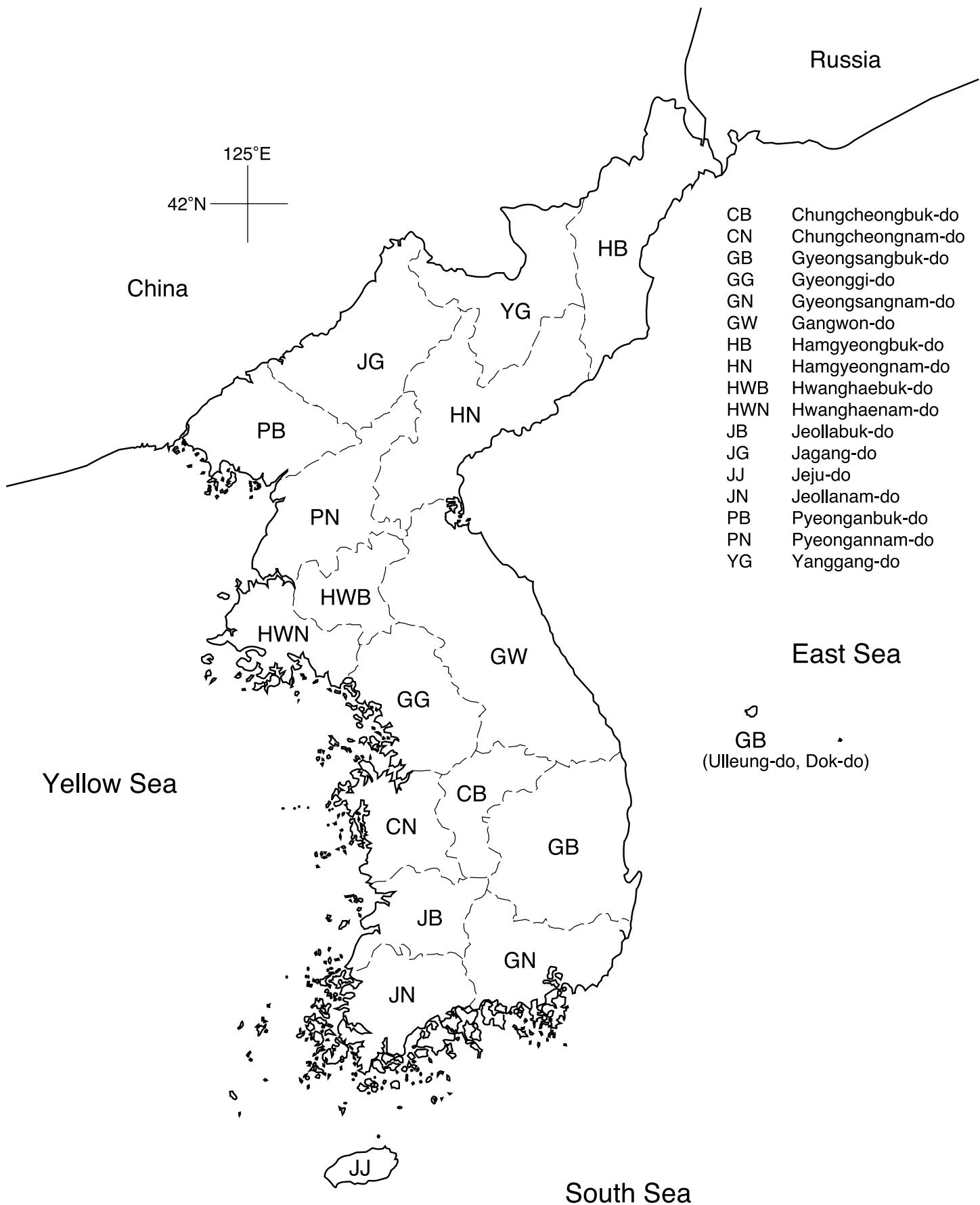
Anthomyiidae

Arthropoda: Insecta: Diptera: Muscoidea




Flora and Fauna of Korea

National Institute of Biological Resources
Ministry of Environment



- CB Chungcheongbuk-do
- CN Chungcheongnam-do
- GB Gyeongsangbuk-do
- GG Gyeonggi-do
- GN Gyeongsangnam-do
- GW Gangwon-do
- HB Hamgyeongbuk-do
- HN Hamgyeongnam-do
- HWB Hwanghaebuk-do
- HWN Hwanghaenam-do
- JB Jeollabuk-do
- JG Jagang-do
- JJ Jeju-do
- JN Jeollanam-do
- PB Pyeonganbuk-do
- PN Pyeongannam-do
- YG Yanggang-do

 GB
 (Ulleung-do, Dok-do)

Insect Fauna of Korea

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Anthomyiidae

Arthropoda: Insecta: Diptera: Muscoidea

2019

National Institute of Biological Resources
Ministry of Environment

Insect Fauna of Korea

Volume 5, Number 4

Anthomyiidae

Arthropoda: Insecta: Diptera: Muscoidea

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Insect Fauna of Korea

Volume 5, Number 4

Anthomyiidae

Arthropoda: Insecta: Diptera: Muscoidea

Sang Jae Suh

Kyungpook National University



The Flora and Fauna of Korea logo was designed to represent six major target groups of the project including vertebrates, invertebrates, insects, algae, fungi, and bacteria.

PREFACE

Biological resources include all organisms and their genetic characteristics. Conservation and utilization of these resources have the capacity to improve human life and to enhance the world. Therefore it is required that the practical and potential values of these organisms are conserved and used wisely. The first step towards this goal is to document our biological diversity and to investigate them in detail. Biological resources increase the competitiveness of a nation through their use as fundamental resources for making highly valued products, such as new lines of cultivar, materials, and drugs.

Many countries in the world are responsible for preserving their biodiversity and using the sustainable ways. The Ministry of Environment (MOE) of Korea has established “CBD-CHM Korea” to share of information of biodiversity.

Each nation in the world is investigating and clearing information of native species within its territory. The National Institute of Biological Resources (NIBR) of MOE has published the ‘Flora and Fauna of Korea’ since 2009 to manage biological resources in comprehensive ways and to enhance national competitiveness by building up the foundation for the sovereignty rights over biological resources. Professional research groups, consisting of professors and other taxonomic experts, have systematically examined 15,545 species of vascular plants, animals and other organisms over the past 10 years and have published their findings in 191 volumes in Korean and 196 volumes in English, and two volumes of monographs covering 216 species of invertebrates. This year, 21 volumes of the Flora and Fauna of Korea in both Korean and English versions including 704 species of vascular plants, invertebrates and insects are additionally published.

The NIBR will continue to publish and research of flora and fauna of Korea that contribute conservation and sustainable use of biological resources. Finally, I would like to express my sincere appreciation to authors who made efforts in writing the manuscripts of *the Flora and Fauna of Korea*.

Prof. Dr. Yeon Jae Bae

President

National Institute of Biological Resources

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Suborder Brachycera Macquart, 1834

Clade Cyclorrhapha Brauer, 1863

Infraorder Schizophora Becher, 1882

Parvorder Calyptratae Robineau-Desvoidy, 1830

Superfamily Muscoidea Latreille, 1802

Family Anthomyiidae Meigen, 1803

Genus *Acklandia* Hennig, 1976

Acklandia koreacola Suh et Kwon, 1985

Acklandia subgrisea (Ringdahl, 1930)

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Anthomyia procellaris Rondani, 1866

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Botanophila seungmoi Suh et Kwon, 1985

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Egle minuta (Meigen, 1826)
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Egle steini Schnabl, 1911
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Emmesomyia grisea (Robineau-Desvoidy, 1830)
Emmesomyia hasegawai Suwa, 1979
Emmesomyia megastigmata Ma, Mou et Fan, 1982
Emmesomyia similata Suwa, 1991
Emmesomyia subvillica Fan, Ma et Mou, 1982
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Phorbia longipilis (Pandellé, 1900)

Phorbia odaeana Suwa, 1983

Phorbia soyosana Suh et Kwon, 1985

Phorbia subfascicularis Suwa, 1994

Phorbia taeguensis Suh et Kwon, 1985

Genus *Strobilomyia* Michelsen, 1988

Strobilomyia laricicola (Karl, 1928)

Strobilomyia oriens (Suwa, 1983)

Strobilomyia viaria (Huckett, 1965)

INTRODUCTION

The anthomyiid flies are widely distributed all over the zoogeographic regions and of them are very common flies. They may be found under various conditions from vegetation in grasslands, forests, live or dead animals, to plant organisms cast up in tidal zone. Most species are phytophagous predominantly, some species such as *Delia antiqua*, *D. floralis*, *Pegomya hyoscamii* species group, *Strobilomyia* spp. etc., are of considerable economic importance and occasionally cause serious damage on several cultivated crops and coniferous trees. Whereas a few species are specialized as parasitoids or saprophagous in their feeding strategy (Suh, 1989).

Some anthomyiid flies are well known as serious pests of agricultural crops and coniferous trees, but the economic importance of the majority of them is unknown at present (Table 1).

The larvae of onion maggot (*Delia antiqua*) are one of the most important vegetable pests, as they cause serious damage by burrowing into the bulbs of onion and garlic (Suwa, 1974; Loosjes, 1976; Park et al., 1985; Suh and Kwon, 1985; Lee et al., 2000). Lee (1956) has already reported that the damage percentages of onion, garlic and spring onion by this pest in Korea were 25%, 20% and 20% respectively.

The seed corn maggot (*Delia platura*) widely infests sprouts of corn, sweet pea and many other agricultural crops or wild vegetation, as well as several *Allium*-vegetables, such as onion, spring onion, and garlic (Hennig, 1976; Suh and Kwon, 1985; Kim and Cho, 1989). In spite of the extensive damage on cultivated crops, they are not considered to be of economic importance as a serious or secondary pest in Korea, mostly owing to the misidentification as in dictated previously.

Table 1. Korean anthomyiid pests injurious to crops and trees

Species	Host	Area	Selected reference
<i>D. antiqua</i>	<i>Allium</i> spp.	Cosmopolitan	Paik, 1963; Woo, 1979; Suh & Kwon, 1985
<i>D. echinata</i>	carnation, spinach <i>Gypsophila</i>	Holarctic	Doucette, 1941; Miles, 1953; Suwa, 1974
<i>D. floralis</i>	radish & other crucifers	Holarctic	Nakayama, 1936; Kato, 1939; Yokoo, 1940
<i>D. platura</i>	bean, allium & many vegetables	Cosmopolitan	Lee, 1963; Suh & Kwon, 1985; Kim & Cho, 1989; Lee et al., 2000
<i>E. longipalpis</i>	<i>Populus</i> & <i>Salix</i> spp.	Holarctic	Pont, 1970; Suwa, 1974; Suh & Kwon, 1985
<i>E. minuta</i>	<i>Populus</i> & <i>Salix</i> spp.	Holarctic	Pont, 1970; Suwa, 1974; Suh & Kwon, 1985
<i>E. ciliata</i>	<i>Populus</i> & <i>Salix</i> spp.	Holarctic	Pont, 1970; Suwa, 1974; Suh & Kwon, 1985
<i>E. parva</i>	<i>Populus</i> & <i>Salix</i> spp.	Transpalaeartic	Pont, 1970; Suwa, 1974; Suh & Kwon, 1985
<i>P. debilis</i>	<i>Salix livida</i>	Holarctic	Tiensuu, 1938; Hennig, 1968
<i>P. cunicularia</i>	Spinach	Transpalaeartic	Suwa, 1970; Michelsen, 1980; Suh & Kwon, 1985
<i>P. rubivora</i>	<i>Rubus</i> spp.	Holarctic	Hennig, 1973
<i>S. laricicola</i>	<i>Larix</i> spp.	Transpalaeartic	Yamada et al., 1972; Michelsen, 1988
<i>S. oriens</i>	<i>Abies sakhalinensis</i>	E.Palaeartic	Suwa, 1983; Michelsen, 1988

The radish maggot (*Delia floralis*), a major pest on cruciferous plants in boreal regions (Hennig, 1976), had caused a lot of injury to cultivated cruciferous crops including radish in northern Korea (Nakayama, 1936; Kato, 1939; Yokoo, 1940).

Species of the *Pegomya hyoscamii* group are known as spinach leaf miners and their larvae occasionally cause serious damage to beet and spinach crops (Crukis, 1847; Fan, 1964; Suwa, 1974; Hennig, 1976; Michelsen, 1980).

In Europe, so-called 'black wheat-flies' are species of *Phorbia*, living as pests on germinating cereal crops (Michelsen, 1986).

Acklandia servadeii is injurious to iris (Hennig, 1969; Suwa, 1974), and *Delia echinata* to carnation (Doucette, 1941; Suwa, 1974; Hennig, 1976) are served as pests in Europe and North America respectively.

The attacks by the cone seed anthomyiids (*Strobilomyia* spp.) often seriously affect normal cone development and seed production of spruce, fir and larch. The pests occur mainly in the boreal and mountain parts of the Holarctic region (Suwa, 1974; Hennig, 1976; Michelsen, 1988). According to Yamada et al. (1972), the damage by the *Strobilomyia laricicola* runs as high as 50–70% of seeds in each cone (Suwa, 1974).

The larvae of *Egle* are reported as borers and seed feeders in catkins of *Salix* and *Populus* in Holarctic region (Ackland, 1969; Suwa, 1974; Suh and Kwon, 1985).

Rarely, other species which occasionally cause significant damage, and even a larger number which feed on plants in cultivated areas or forests with the potential injury at any time to be likely to occur, may threaten our crops at above the economic threshold.

On the other hand, a beneficial species, the ragwort seed fly (*Botanophila seneciella*) feeds on the seeds of weeds such as *Senecio jacobaea*. The fly had been introduced into New Zealand, Australia and North America from Europe, as an excellent natural enemy to control the poisonous weed (Suwa, 1974).

There are to be a few parasitic species on grasshoppers, e.g., *Acridomyia sacharovi*, *Tettigonimyia kumleri* and *Acyglossa pollinose* (Henning, 1966, 1968, 1976).

Therefore, the economic importance of the anthomyiid flies, not only as the serious agricultural and forest pests but also as the effective natural enemies, should be reevaluated world-wide in the near future.

The purpose of the study is to revise and arrange this group taxonomically, to be useful to entomologists as basic information for the management of anthomyiid fly pests. A total of 115 species belonging to 23 genera are treated. Among them, *Eustalomyia festiva* (Zetterstedt, 1845) is reported for the first time in Korea.

MATERIALS AND METHODS

Most specimens examined in this study were obtained from various domestic localities throughout Korea, and are now deposited in the Systematic Entomology Laboratory, Department of Agricultural Biology, Kyungpook National University (KPNU), Daegu. Collections of the Division of Entomology, National Institute of Agricultural Sciences and Technology, RDA, Jeonju (NIAST) and National Institute of Biological Resources, Incheon (NIBR), were also checked.

Numerous field collections have been made throughout Korea, including the crop fields, forests, mountains and seashore areas. All the collected localities are listed here, and the administrative geographical names of the Republic of Korea, but the provinces are abbreviated as follows for convenience.

Observation of the specimens was made either with stereoscopic microscopes (Olympus SZX16, with camera lucida & fiber optics illuminator) or a compound microscope (Olympus BX50, with drawing tube and DP71 photographic system).

For the dissection of genital structures, the removed body parts were cleared with 10% KOH solution in a test tube heated on a hotplate with stirrers for 20–25 minutes.

The classification system adopted and followed is after Michelsen (2011) and Griffiths (2018). The terms for the morphological characters are in accordance with common usage in Diptera and partly after Suwa & Darvas (1998), and some were abbreviated as follows (Table 2).

All the known taxa from Korea are revised and described. Sometimes the descriptions and figures were used, quoted and redescribed from the author's previous articles (Suh & Kwon, 1985; Suh, 1989 etc.), and other related articles by different (Griffiths, 1982–1984; Suwa, 1983, 1984, 1988; Michelsen, 1988 etc.). Diagnoses, keys, synonymic lists, domestic localities, distributional ranges and host information of each species are also arranged here respectively.

Table 2. The terminology used in the chaetotaxy of anthomyiids

Term	Character	Term	Character
<i>a</i>	anterior seta	<i>ori</i>	frontal seta
<i>acr</i>	acrostical seta	<i>ors</i>	fronto-orbital seta
<i>ad</i>	anterodorsal seta	<i>p</i>	posterior seta
<i>anepm</i>	anepimeral seta	<i>pa</i>	postalar seta
<i>anepst</i>	anepisternal seta	<i>pd</i>	posterodorsal seta
<i>av</i>	anteroventral seta	<i>ph</i>	posthumeral seta
<i>dc</i>	dorsocentral seta	<i>pra</i>	prealar seta
<i>ia</i>	intra-alar seta	<i>prepst</i>	proepisternal seta
<i>if</i>	interfrontal seta	<i>prepm</i>	proepimeral seta
<i>kepst</i>	katepisternal seta	<i>pv</i>	posteroventral seta
<i>ntpl</i>	notopleural seta	<i>sa</i>	supra-alar seta

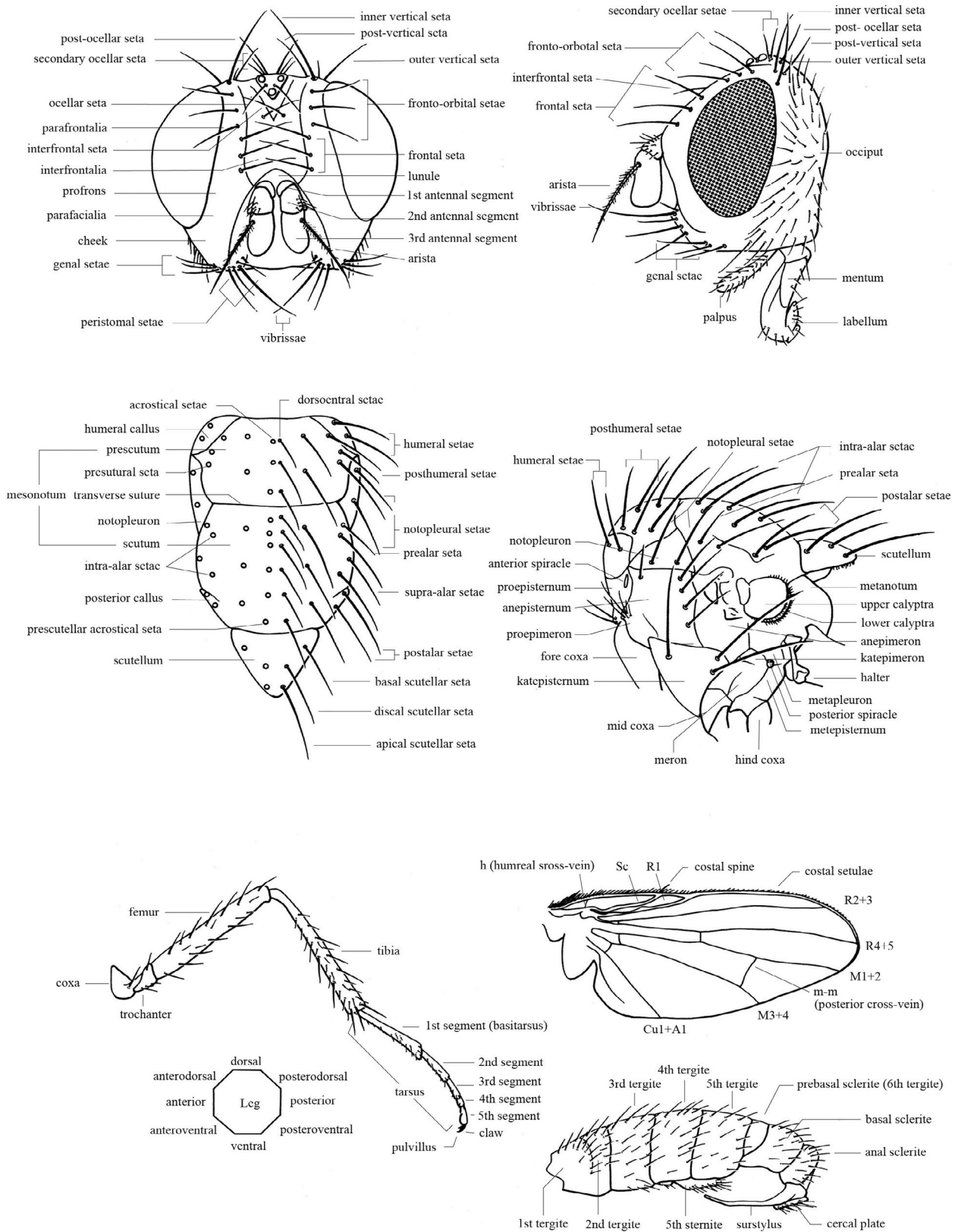


Fig. 1. Generalized morphological terminology in anthomyiids.

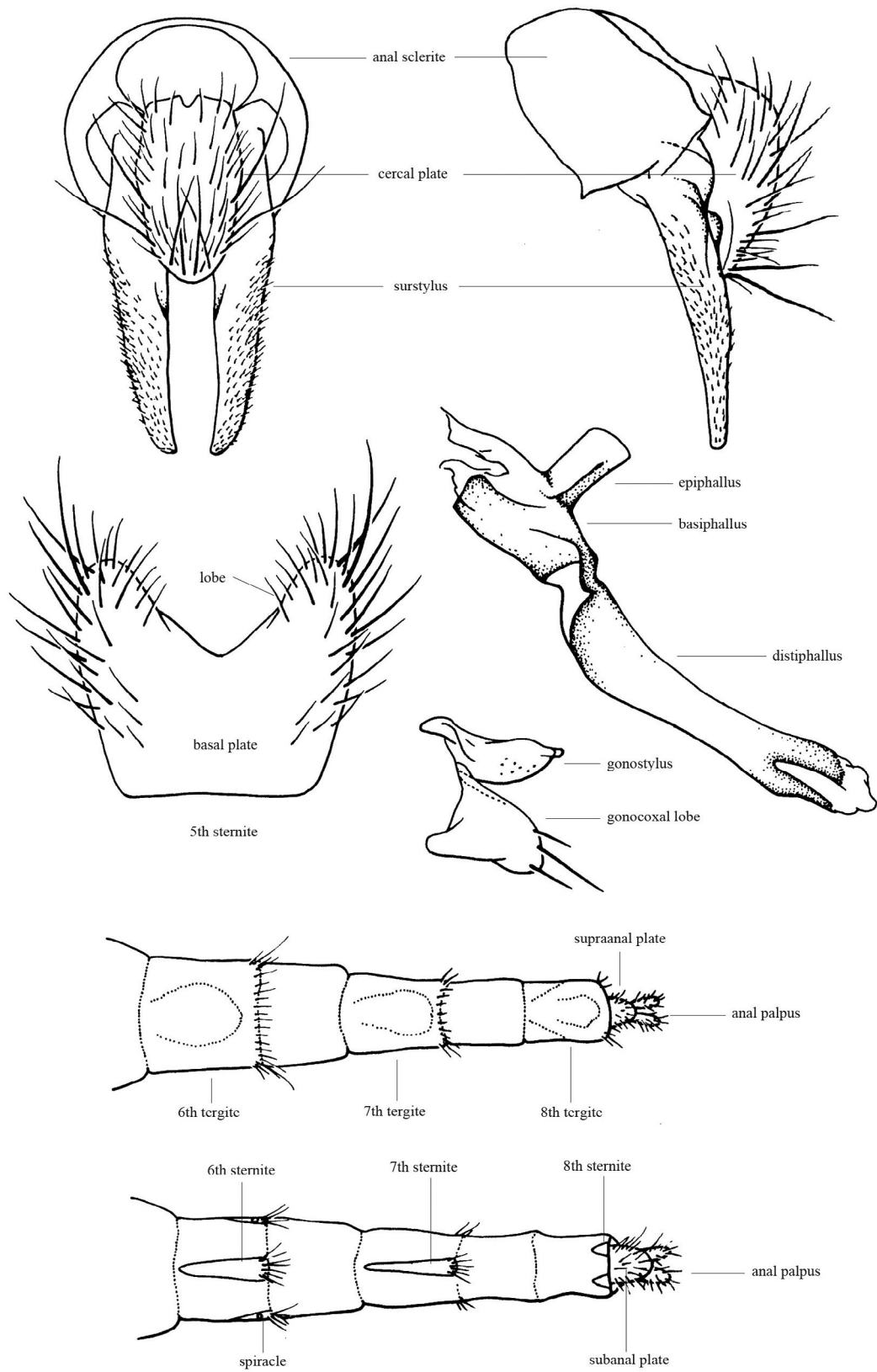


Fig. 2. Male and female terminalias in anthomyiids.

TAXONOMIC NOTES

Class Insecta

Order Diptera Linnaeus, 1758

Suborder Brachycera Macquart, 1834

Clade Cyclorrhapha Brauer, 1863

Infraorder Schizophora Becher, 1882

Parvorder Calyptratae Robineau-Desvoidy, 1830

Superfamily Muscoidea Latreille, 1802

Family Anthomyiidae Meigen, 1803

DIAGNOSIS: Small or moderate in size; notopleuron always with two strong setae, and sometimes with a few or more fine setulae; scutellum on ventral surface sparsely to rather densely setulose; anepimeron bare except in few cases (e.g., in *Emmesomyia*, in which one or more setae always present in the Palaearctic species); katepimeron, meron and metepisternum rarely setulose; anal vein of wing reaches margin of wings (except in *Chelisia*); median vein straight, not curved towards anterior alar margin (Huckett, 1987; Suwa & Darvas, 1998).

Key to genera of Korean Anthomyiidae

1. Costa of wing with spinular setae on ventral surface *Fucellia*
1. Costa of wing without spinular setae on ventral surface 2

2. Proepisternum haired	<i>Anthomyia</i>
2. Proepisternum bare	3
3. Palpus blade-like; fifth sternite of male rather cordate	<i>Pegoplata</i>
3. Palpus usually slender; fifth sternite of male not cordate	4
4. Mesonotum with 3 distinct black vittae; scutellum with black lateral marking	<i>Eustalomyia</i>
4. Mesonotum without 3 distinct black vittae; scutellum without black lateral marking	5
5. Vibrissae separated from each other by a distance shorter than cheek-height	<i>Leucophora</i>
5. Vibrissae separated from each other by a distance longer than cheek-height	6
6. Arista of antenna apparently long plumose	7
6. Arista of antenna shortly pubescent	11
7. Frons slightly narrower than one-third width of head in male	8
7. Frons much narrower than one-third width of head in male	9
8. Interfrontalia with <i>if</i>	<i>Mycophaga</i>
8. Interfrontalia without <i>if</i>	<i>Eutrichota</i>
9. Anepimeron with 1 or a few setae	<i>Emmesomyia</i>
9. Anepimeron entirely bare	10
10. Interfrontalia with distinct <i>if</i>	<i>Hylemya</i>
10. Interfrontalia without <i>if</i> or with very fine <i>if</i>	<i>Hydrophoria</i>
11. In male, abdomen strikingly swollen at caudal half, club-shaped; fifth sternite with a tuft of short setulae at inner margin of each lobe; in female, ovipositor with terminal segment compressed	<i>Phorbia</i>
11. In male, abdomen usually not strikingly swollen at caudal half; fifth sternite without a tuft of short setulae at inner margin of each lobe; in female, ovipositor with terminal segment not compressed	12
12. Third segment of antenna at most a little longer than wide; epistoma projecting forwards beyond tip of profrons	<i>Egle</i>
12. Third segment of antenna longer than wide; epistoma not projecting forwards beyond tip of profrons	13
13. Gonocoxal lobe small and triangular	<i>Botanophila</i>
13. Gonocoxal lobe not triangular	14
14. Scutellum without ventral setulae	15
14. Scutellum with some setulae	16
15. Cercal plate trifurcate at apex	<i>Acklandia</i>
15. Cercal plate unbranched at apex	<i>Chirosia</i>
16. Surstylus simply slender	17
16. Surstylus more complex, showing a various diversity	22
17. In male, fifth sternite strikingly sclerotized and shining, largely lacking setae on inner half of each lobe	<i>Alliopsis</i>

17. In male, fifth sternite weakly sclerotized.....	18
18. Surstylus bifurcate at apex.....	19
18. Surstylus not bifurcate.....	20
19. Anepisternum with at most 1–2 additional setulae near <i>prepm</i>	<i>Adia</i>
19. Anepisternum with 10–20 additional setulae near <i>prepm</i>	<i>Paragle</i>
20. Proepisternum with 9–10 <i>prepst</i>	<i>Calythea</i>
20. Proepisternum with 2–3 <i>prepst</i>	21
21. Anepisternum with distinct anterior <i>anepst</i>	<i>Lasiomma</i>
21. Anepisternum without or with indistinguishable anterior <i>anepst</i>	<i>Delia</i>
22. Interfrontalia without <i>if</i> in male.....	<i>Pegomya</i>
22. Interfrontalia with <i>if</i> in male.....	<i>Strobilomyia</i>

Genus *Acklandia* Hennig, 1976

Acklandia Hennig, 1976: 950, 951. Type-species: *Hylemyia servadeii* Séguy, 1933.

DIAGNOSIS: Frons dichoptic in both sexes, in male frons narrower than one third of head width; in male, *ors* absent; *if* very fine or vestigial; third antennal segment at most slightly longer than the width; epistoma not projecting forward beyond frons; prementum enlarged and thickened; scutellum usually bare on ventral surface; anepisternum with anterodorsal setae; anepimeron and meron bare; lower surface of costa with additional short setulae below the main marginal series of short spinules; fore tibia with well developed apical *ad*; mid tibia without *av*; hind tibia with apical *pv* and easily distinguishable from adjacent setulae; fifth sternite with an additional process at inner margin.

Key to species of Korean *Acklandia*

- | | |
|--|---------------------|
| 1. Scutellum with some setulae on ventral surface..... | <i>A. koreacola</i> |
| 1. Scutellum without setulae on ventral surface..... | <i>A. subgrisea</i> |

1. *Acklandia koreacola* Suh et Kwon, 1985 (Fig. 3)

Acklandia koreacola Suh & Kwon, 1985: 177, 178 (Korea: Daegu); Suh, 1989: 98; Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 302; Kwon et al., 1996: 223; Paek et al., 2010: 241; Han et al., 2014: 141.

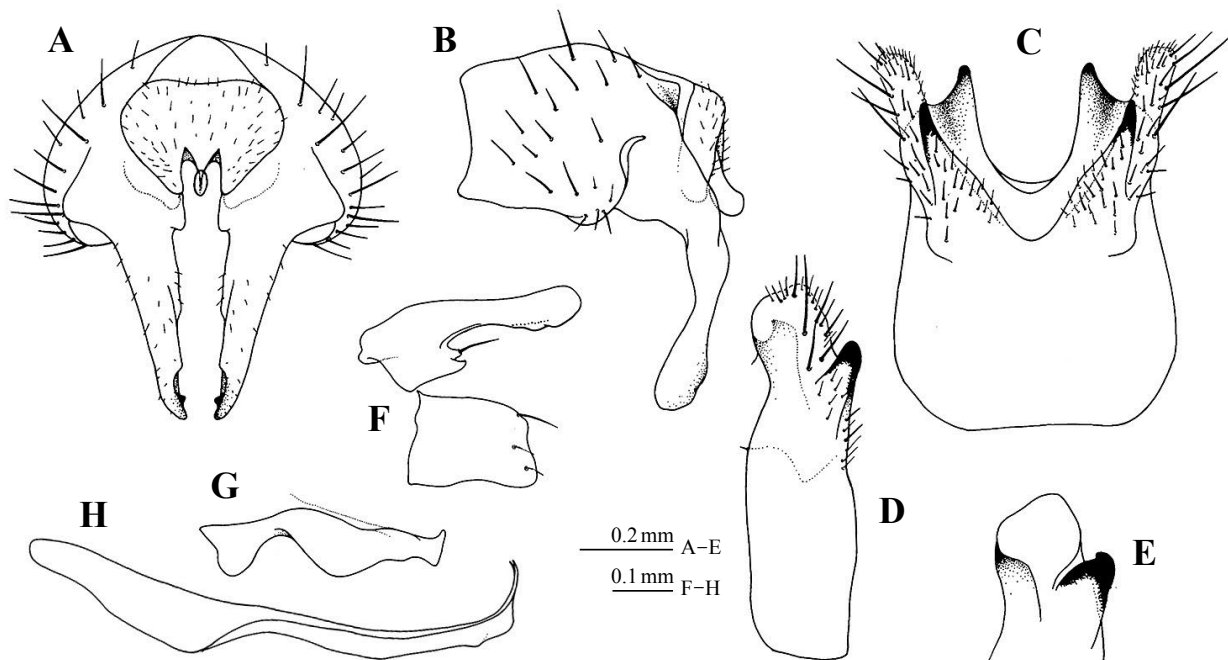


Fig. 3. *Acklandia koreacola* Suh et Kwon, 1985, male. A, B. hypopygium; C–E. fifth sternite; F. gonocoxal lobe and gonostylus; G. ephiphallus and basiphallus; H. distiphallus.

Male. General coloration black with brown grayish pollinose. Head 1.3–1.4 times as high as long in profile; frons about as wide as distance between posterior ocelli exclusive; 7 *ori* and 1 short *if*. Parafacialia and cheek sliver grayish pruinose; profrons much narrower than third antennal segment width. Antenna dark brown; arista minutely pubescent; third antennal segment 1.2–1.3 times as long as wide. Palpus black; haustellum rather stout, with mentum faintly grayish pollinose.

Thorax brown grayish pollinose; mesonotum with obscure median and sublateral vittae; 3 pairs of *pre acr*, lacking additional setulae between the rows. Second *ph* about 0.6–0.7 times as long as first *ph*; *pra* rather longer than anterior *ntpl*. Anepisternum with 1 anterior *anepst*, and 2 *prepm*.

Legs black and grayish pollinose; fore tibia with 1 *ad* and 2 *pv*; mid femur with 4 strong *pv*; mid tibia with 1 *pd*, 5 *p-pv* and short apical *pv*; hind femur with a row of *av* and *pv* respectively; hind tibia with 3 *ad*, 3 *av*, 3 *pd* and 2–3 short *pv*.

Wing pale brownish tinged; m-m slightly sinuate. Calypter whitish; knob of halter reddish yellow.

Length. Body 4.3 mm, wing 4.0 mm.

MATERIAL EXAMINED: [KPNU] <CB> 1 ex., Suribong, 26.iv.2007, SJ Suh; <GB> 1 ex., Daegu, 6.iv.1982, YJ Kwon.

DISTRIBUTION: Korea.

LOCALITY: Central-CB: Suribong; South-GB: Daegu.

2. *Acklandia subgrisea* (Ringdahl, 1930) (Fig. 4)

Phorbia subgrisea Ringdahl, 1930: 8 (Russia: Kamchatka).

Acklandia subgrisea: Hennig, 1976: 950, 951; Suh, 1989: 98, 99; Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 302; Kwon et al., 1996: 223; Paek et al., 2010: 241; Han et al., 2014: 141.

Male. Black in ground color, with thin brownish gray pollen. Head about 1.3–1.4 times as high as long in profile. Frons at narrowest part slightly wider than distance between posterior ocelli inclusive. Interfrontalia dull tinged with brown near lunule, pair of proclinate cruciate fine *if*; parafrontalia brownish gray, with 7–10 *ori*. Parafacialia and cheek black, with brownish gray pollen. Antenna black; third segment about 1.5–1.6 times as long as wide; arista distinctly pubescent. Palpus black and slender. Haustellum black with sparse gray pollen, and stout.

Thorax black in ground color, with gray pollen, and patches of brown pollen, especially on dorsum. Me-

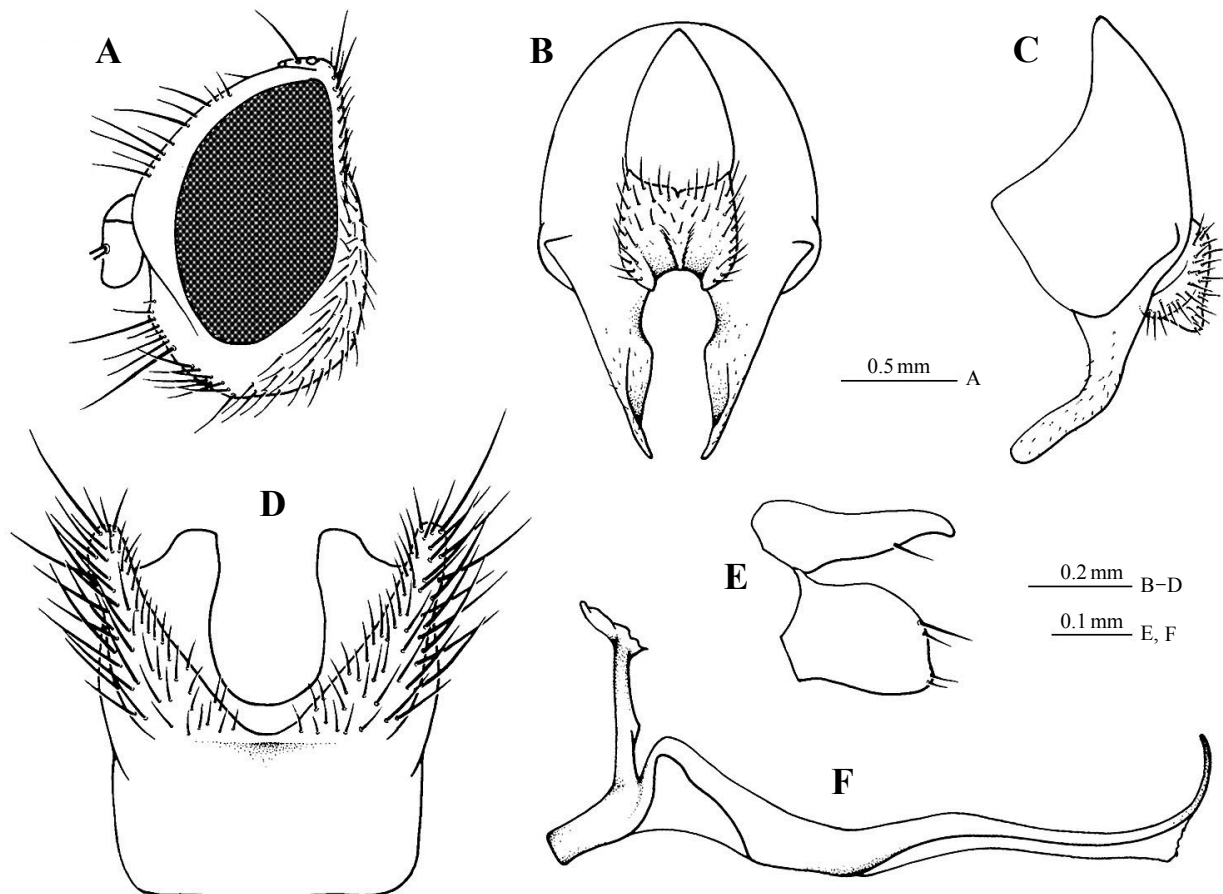


Fig. 4. *Acklandia subgrisea* (Ringdahl, 1930), male. A. head; B, C. hypopygium; D. fifth sternite; E. gonocoxal lobe and gonostylus; F. phallus.

sonotum with 3 pale brownish black longitudinal vittae presuturally in caudal view; 4 pairs of *pre acr*, the distance separating *pre acr* rows about half as wide as distance between *pre acr* and *dc* rows. Second *ph* thin, about 0.7–0.8 times as long as anterior *ntpl*. *Pra* very strong, slightly longer than anterior *ntpl*. Scutellum without setulae on ventral surface. Posterior *ntpl* about 0.8–0.9 times as long as anterior *ntpl*. Proepisternum with 2 *prepst*. Anepisternum with a distinct upper anterior seta, and 2 *prepm*.

Legs black; fore tibia with 1 *ad*, 2 *pv* and 4 apical setae; mid tibia with 1 *ad*, 2 *pd*, 1 *p*, and strong apical *av* and *pv*; hind tibia with 4 *ad*, 2 *av*, 4 *pd*, and apical *av* and *pv*.

Wing faintly brownish tinged, denser basally; costal spine small and much shorter than r-m; m-m nearly straight. Calypter whitish yellow. Knob of halter pale brown.

Abdomen with bluish gray pollen, and black broad median vitta and fore marginal bands.

Length. Body 4.5–5.0 mm, wing 4.3–4.7 mm.

MATERIAL EXAMINED: [KPNU] <GB> 1 ex., Daegu, 17.iv.1987, YJ Kwon; 1 ex., Eungbongsan, 10.v.2007, SJ Suh.

DISTRIBUTION: Korea, Japan (Honshu), China (Heilongjiang), Russia (Kamchatka).

LOCALITY: South-GB: Daegu; Eungbongsan.

Genus *Adia* Robineau-Desvoidy, 1830

Nerina Robineau-Desvoidy, 1830: 557 (preaoccup.). Type species: *Nerina albipennis* Robineau-Desvoidy, 1830 (France: Paris).

Adia Robineau-Desvoidy, 1830: 558. Type-species: *Adia oralis* Robineau-Desvoidy, 1830 (France: Saint-Sauveur).

Scatigle Fan, 1982: 379. Type-species: *Musca cinerella* Fallén, 1825 (Sweden).

DIAGNOSIS: Head dimorphic sexually; in male, eye only narrowly separated; 1 short *ors* present; *if* absent; epistoma not projecting forward beyond frons at lunule; mesonotum usually with 2 rows of *acr*; scutellum with two long marginal pairs of setae and shorter discal pair, and with fine pubescence on ventral surface; proepisternum and meron bare; lower surface of costa additional short setulae below the main marginal series of short spinules; mid tibia with 1 *av*; hind tibia with 1 *av* and 2 *pd*.

3. *Adia cinerella* (Fallén, 1825) (Fig. 5)

Musca cinerella Fallén, 1825: 77 (Sweden).

Adia cinerella: Stein, 1892: 329; Michelsen, 1983: 111; Suh & Kwon, 1985: 189; Fan et al., 1988: 100, 101; Suh, 1989: 99, 100; Suh et al., 1985: 209; Suh et al., 1991: 47; Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 302; Suh & Kwon, 1995: 194; Kwon et al., 1996: 223; An, 1998: 62; Suwa, 2011: 79; Paek et al., 2010: 241; Suwa, 2013: 135; Han et al., 2014: 142.

Paregle cinerella: Schnabl & Dziedzicki, 1911: 95 (Sweden); Suwa, 1981a: 104; Sun et Zhang, 1982: 205, 206; Suwa, 1983b: 31.

Anthomyia pusilla Meigen, 1826: 151.

Nerina albipennis + *N. flavescens* + *Adia oralis* Robineau-Desvoidy, 1830: 558.

Anthomyia trigonomaculata + *A. virescens* Macquart, 1859: 266.

Aricia interruptilinea Zetterstedt, 1860: 232.

Aricia remorata Holmgren, 1883: 171.

Egle trigonigaster + *Chortophila excubans* Pandellé, 1900: 242, 282.

Male. Black in ground color, with thin brownish gray pollen. Head about 1.4–1.5 times as high as long in profile. Frons at narrowest part equal to width of anterior ocellus; parafrontalia broadly contiguous to each other. Interfrontalia dull tinged with brown near lunule; parafrontalia brownish gray with 3 *ori*. Parafacial-

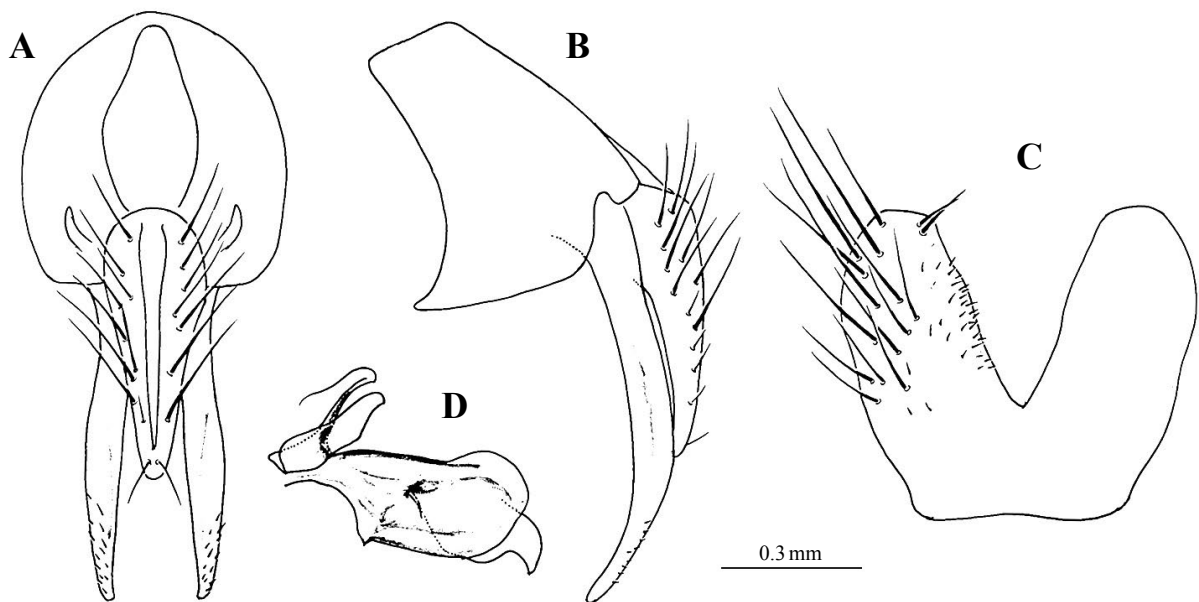


Fig. 5. *Adia cinerella* (Fallén, 1825), male. A, B. hypopygium; C. fifth sternite; D. gonocoxal lobe, gonostylus and phallus.

ia and cheek brownish black with gray pollen. Antenna black; third segment about 1.5–1.6 times as long as wide; arista distinctly pubescent. Palpus and haustellum black with sparse gray pollen.

Thorax black in ground color, with gray pollen, and patches of brown pollen, especially on dorsum. Mesonotum with 3 pale brownish black vittae presuturally in caudal view; 3 pairs of *pre acr*, the distance separating *pre acr* rows about as wide as distance between *pre acr* and *dc* rows. Second *ph* thin, about half as long as anterior *ntpl*. *Pra* about half as long as anterior *ntpl*. Posterior *ntpl* about 0.8–0.9 times as long as anterior *ntpl*. Proepisternum with 2 *prepst*. Anepisternum with a distinct upper anterior seta, and 2 *prepm*.

Legs black; fore tibia with 1 *ad*, 1–2 *pv* and 3 apical setae; mid tibia with 1 *ad*, 1 *av*, 1 *pd*, 3 *pv*, and strong apical *av* and *pv*; hind tibia with 4–5 *ad*, 1 *av*, 3 *pd*, and apical *av*.

Wing hyaline; costal spine small and much shorter than r-m; m-m slightly sinuate. Calypter and knob of halter pale yellow.

Abdomen with bluish gray pollen, and with black narrow median vitta.

Length. Body 4.3–4.5 mm, wing 4.0–4.3 mm.

MATERIAL EXAMINED: [KPNU] <GG> 2 exs., Soyosan, 15.v.1982, YJ Kwon; 1 ex., Kangwhado, 11.v.1982, YJ Kwon; <GW> 22 exs., Seoraksan, 29.vii.1982, YJ Kwon; 3 exs., Odaesan, 5.viii.1983, YJ Kwon; 1 ex., Obongsan, 21.v.1982, YJ Kwon; 1 ex., Inje-eup, 9.vii.1986, YJ Kwon; 4 exs., Odaesan, 5.viii.1983, YJ Kwon; 1 ex., Odaesan, 4.viii.1983, YJ Kwon; <GB> 1 ex., Tansan-myeon, 17.viii.1982, YJ Kwon; 1 ex., Daegu, 12.iv.1984, YJ Kwon; 13 exs., Daegu, 26.iii.1982, YJ Kwon; 5 exs., Daegu, 22.iii.1982, YJ Kwon; 1 ex., Daegu, 4.v.1981, YJ Kwon; 1 ex., Sobaeksan, 15.v.1981, YJ Kwon; 4 exs., Geumosan, 9.viii.1983, TH Jo; 2 exs., Geumosan, 16.viii.1983, TH Jo; 1 ex., Geumosan, 27.iv.1983, SH Park; <GN> 27 exs., Jirisan, 14.vii.1981, YJ Kwon; 2 exs., Keumsan, 29.iii.1982, YJ Kwon; 1 ex., Bangeojin, 10.iv.1982, YJ Kwon; 1 ex., Hwangmaesan, 6.vi.1998, SJ Suh; <JB> 2 exs., Teogyusan, 2.x.1983, YJ Kwon; <JN> 1 ex., Sinjido, 21.vii.1984, YJ Kwon; [NIAS] <GG> 42 exs., Gwanggyosan, 4.vi.1975, JY Shin; 5 exs., Gwangneung, 15.v.1975, JY Shin; 14 exs., Suwon, 28.ix.1976, KT Park; 1 ex., Suwon, 10.vi.1976, JS Park; 4 exs., Suwon, 19.iv.1976, KT Park; 2 exs., Suwon, 6.v.1969, DS Lee; <GB> 2 exs., Sangju, 11.v.1976, KT Park; 34 exs., Yecheon, 10.v.1976, KT Park; <JN> 6 exs., Hongdo, 23.iv.1975, KY Choi; 6 exs., Taeheuksando, 22.iv.1976, KY Choi.

DISTRIBUTION: Korea, Japan (Hokkaido, Honshu, Kyushu), China (whole part), Taiwan, Russia (Kamchatka, Siberia), Algeria, Egypt, Greece, India, Iran, Iraq, Italy, Jordan, Spain, Syria, Turkey, Uzbekistan, India, Nepal, N. America.

LOCALITY: Central-HH: Pyeongseong, Suyangsan; GG: Ganghwado, Gwanggyosan, Gwangneung, Soyosan, Suwon; GW: Inje-eup, Obongsan, Odaesan, Seoraksan; CN: Mallipo; South-GB: Dansan-myeon, Daegu, Geumosan, Jangsa, Sangju, Sobaeksan, Yecheon; GN: Bangeojin, Geumsan, Hwangmaesan, Jirisan; JB: Deogyusan; JN: Hongdo, Sinjido, Daeheuksando; Jeju-JJ: Hallasan.

HOST: The larvae live in animal excrement (cf. Wei et al., 1996).

Genus *Alliopsis* Schnabl et Dziedzicki, 1911

Prosalpia Pokorny, 1893: 54 (nom.praeocc). Type-species: *Prosalpia styriaca* Pokorny, 1893 (Austria).

Alliopsis Schnabl et Dziedzicki, 1911: 92, 93. Type-species: *Aricia glacialis* Zetterstedt, 1845 (Sweden: Kvik-kjokk).

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

Pseudochirosia Ringdahl, 1928: 22. Type-species: *Chirosia fractiseta* Stein, 1908 (Sweden: Mörsil).

Circia Malloch, 1929. Type-species: *Circia tinctipennis* Malloch, 1929 (Canada: Alberta).

Eurydactylomyia Ringdahl, 1932: 16 (as subgenus of *Hylemyia*). Type-species: *Hylemyia (Eurydactylomyia) freyi* Ringdahl, 1932 (Finland: Kusomen).

Colpotomyia Ringdahl, 1932: 31 (as subgenus of *Hylemyia*). Type-species: *Anthomyza laminata* Zetterstedt, 1838 (Sweden: Juckasjärvi).

Prosalpiella Ringdahl, 1932: 31 (as subgenus of *Hylemyia*). Type-species: *Hylemyia benanderi* Ringdahl, 1926 (Sweden).

Alliops Malloch, 1934. Type-species: *Alliopsis obesa* Malloch, 1919 (Canada).

Subprosalpia Ringdahl, 1942: 140 (as subgenus of *Prosalpia*). Type-species: *Anthomyza denticauda* Zetterstedt, 1838 (Finland: Pello).

Rhynchoprospalpia Ringdahl, 1942: 141 (as subgenus of *Prosalpia*). Type-species: *Anthomyza moerens* Zetterstedt, 1838 (Sweden).

Arctoprospalpia Ringdahl, 1942: 144 (as subgenus of *Prosalpia*). Type-species: *Chortophila longipennis* Ringdahl, 1918 (Sweden: Abisko).

Pseudoprospalpia Ringdahl, 1942: 145 (as subgenus of *Prosalpia*). Type-species: *Anthomyia atronitens* Strobl, 1893 (Austria).

Sinoprosa Qian et Fan, 1981: 438. Type-species: *Sinoprosa aertaica* Qian et Fan, 1981 (China: Habahe, Xinjiang).

Analliopsis Fan, 1983: 95 (as subgenus of *Alliopsis*). Type-species: *Alliopsis (Analliopsis) heterophalla* Fan et Wu, 1983 (China: Southeast Xizang).

DIAGNOSIS: Mesonotum with 2 presutural + 3 postsutural pairs of *dc*; additional *ntpl* absent; scutellum with two long marginal pairs and normally shorter discal pair, and with fine pubescence on ventral surface; proepisternum bare; meron normally bare; fore tibia with 3–4 strong apical setae; hind tibia without apical *pv*; distal section of aedeagus usually with forked appearance in lateral view (Griffiths, 1987).

Key to species of Korean *Alliopsis*

1. Cheek with genal setae in 2–3 rows; fore tibia with 1 *ad* *A. billbergi*
1. Cheek with genal setae in row; fore tibia 2 *ad* 2
2. Fore tibia with 3 strong apical setae *A. silvatica*
2. Fore tibia with 4 strong apical setae *A. silvestris*

4. *Alliopsis billbergi* (Zetterstedt, 1838) (Fig. 6)

Anthomyza Billbergi Zetterstedt, 1838: 678 (Sweden: Lycksele).

Prosalpia Billbergi: Schnabl et Dziedzicki, 1911: 93; Ringdahl, 1959: 215, 216; Kwon & Suh, 1982b: 180, 181; Suwa, 1983b: 26.

Alliopsis billbergi: Michelsen, 1985: 42; Suh & Kwon, 1985: 163, 164; Suh et al., 1985: 208; Suh, 1989: 64, 65; Dely-Draskovits, 1993: 15; Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 302; Kwon et al., 1996: 223; Suwa, 1999: 205; Paek et al., 2010: 241; Han et al., 2014: 142.

Paraprosalpia billbergi shanghai Fan, 1983: 221, 227 (Sweden: Lycksele).

Anthomyza aethiops Zetterstedt, 1838: 683 (Sweden: Lycksele).

Anthomyza maculifrons Zetterstedt, 1838: 672 (Norway).

Aricia lepturoides Zetterstedt, 1845: 1515 (Sweden: Stockholm).

Aricia similifrons Zetterstedt, 1845: 1515.

Prosalpia styriaca Pokorny, 1893: 56 (Austria).

Anthomyia (Chortophila) dilaminata Pandellé, 1900: 263 (France: Landes).

Male. Ground color black, with brownish gray pollen. Head about 1.1–1.2 times as high as long in profile. Frons at narrowest part slightly wider than distance between posterior ocelli inclusive. Interfrontalia dull tinged with brown near lunule, pair of proclinate cruciate *if*. Parafrontalia brownish gray with 6–7 *ori*. Profrons and cheek black with gray pollen; profrons about 1.8–1.9 times as wide as width of third antennal segment; cheek at narrowest part about 1.5 times as wide as width of third antennal segment. Antenna black; third segment about 2.0 times as long as wide; arista distinctly pubescent. Palpus and haustellum fuscous and slender.

Thorax black in ground color with brownish gray pollen, and patches of brown pollen especially on dorsum. Mesonotum with paler blackish vittae in caudal view; 3 pairs of *pre acr* and several fine irregular setulae between rows, the distance separating *pre acr* rows as wide as distance between *pre acr* and *dc* rows. Second *ph* thin, and about as long as posterior *ntpl*. *Pra* very strong, and about as long as anterior *ntpl*. Posterior *ntpl* about 0.6 times as long as anterior *ntpl*. Proepisternum with 3 *prepst*. Anepisternum with 3 long

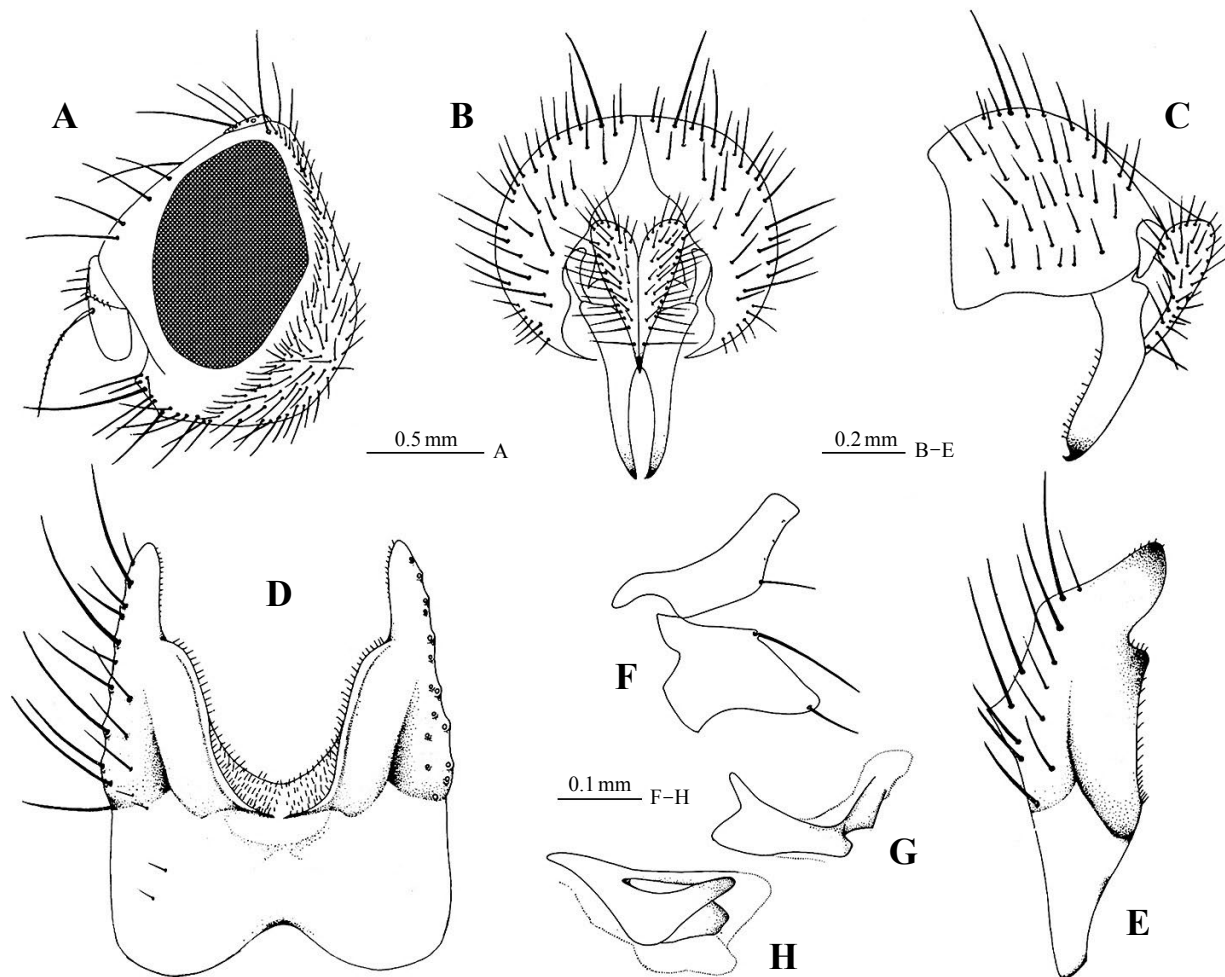


Fig. 6. *Alliopsis billbergi* (Zetterstedt, 1838), male. A. head; B, C. hypopygium; D, E. fifth sternite; F. gonocoxal lobe and gonostylus; G. basiphallus; H. distiphallus.

and some fine *prepm*.

Legs black; fore tibia with 1 *ad*, 1 *pv*, and strong apical *d*; mid tibia with 1 *ad*, 1 *pd*, 2 *pv* and, strong apical *av* and *pv*; hind tibia with 5 *ad*, 2 *av*, 4 *pd* and 1 *pv* and robust apical *av*.

Wing faintly brownish tinged, denser basally; costal spine indistinguishable from anterior setulae. Calypter pale yellow; knob of halter yellowish brown.

Abdomen with brownish gray pollen, and black pale median vitta.

Length. Body 4.5–7.0 mm, wing 4.0–6.0 mm.

MATERIAL EXAMINED: [KPNU] <GB> 2 exs., Daegu, 26.iii.1982, YJ Kwon; 2 exs., Daegu, 30.iii.1984, YJ Kwon; 1 ex., Geumosan, 13.iv.1984, SH Park; 5 exs., Palgongsan, 17.iv.1984, SH Park; 1 ex., Palgongsan, 1.v.1984, TH Jo; [NIAS] <GB> 1 ex., Daegu, 22.iii.1982, YJ Kwon; 1 ex., Daegu, 26.iii.1982, YJ Kwon.

DISTRIBUTION: Korea, Japan (Hokkaido, Honshu), China (Heilongjiang, Shanghai), Europe.

LOCALITY: Central-GW: Odaesan; South-GB: Daegu, Geumosan, Palgongsan.

5. *Alliopsis silvatica* (Suwa, 1974) (Fig. 7A)

Paraprosalpia silvatica Suwa, 1974, Ins. Mats. n.s. 4: 62–64 (Japan: Hokkaido).

Alliopsis silvatica: Suh et al., 1991: 43; Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 302; Kwon et al., 1996: 223; Paek et al., 2010: 241; Suwa, 2013: 139; Han et al., 2014: 142.

Male. Ground color black, with thin grayish pollen. Head about 1.2–1.3 times as high as long in profile. Frons at narrowest part slightly wider than distance between posterior ocelli inclusive. Interfrontalia and parafrontalia dull, with pair of proclinate cruciate *if*, 2 *ors* and 2 *ori*. Parafacialia and cheek black, with gray pollen. Antenna black; third segment about 2.5 times as long as wide; arista distinctly pubescent, the longest hair about as long as basal diameter of arista. Palpus and haustellum black.

Thorax black in ground color, with gray pollen, and patches of brown pollen, especially on dorsum. Mesonotum with 3 pairs of *pre acr* and several fine irregular setulae between rows, the distance separating *pre acr* rows about as wide as half distance between *pre acr* and *dc* rows. Posterior *ntpl* about one third as long as anterior *ntpl*. Proepisternum with 2 *prepst*. Anepisternum with 2 long and some additional *prepm*.

Legs black; fore tibia with 2 *ad* and 1 *pv*; mid tibia with 2 *ad*, 2 *pd*, 1 *pv*; hind tibia with 2–4 *ad*, 2 *av*, 2–4 *pd*, 1 *pv*.

Wing faintly brownish tinged, denser basally; costal spine strong, about as long as humeral crossvein. Calypter and knob of halter brownish yellow.

Abdomen with brownish gray pollen, and with black pale median vitta.

Length. Body 7.0–8.0 mm, wing 5.5–6.0 mm.

DISTRIBUTION: Korea, Japan (Hokkaido, Honshu), China (Heilongjiang, Jilin, Liaoning), Russia (Far East).

LOCALITY: North-HB: Baekdusan, Sobaeksan.

6. *Alliopsis silvestris* (Fallén, 1824) (Fig. 7B)

Musca silvestris Fallén, 1824: 70 (Sweden: Westrogothia).

Alliopsis silvestris: Suh et al., 1991: 43; Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 302; Kwon et al., 1996: 223; Paek et al., 2010: 241; Suwa, 2013: 141; Han et al., 2014: 143.

Anthomyza murina + *A. argyrocephala* Zetterstedt, 1838: 670, 682.

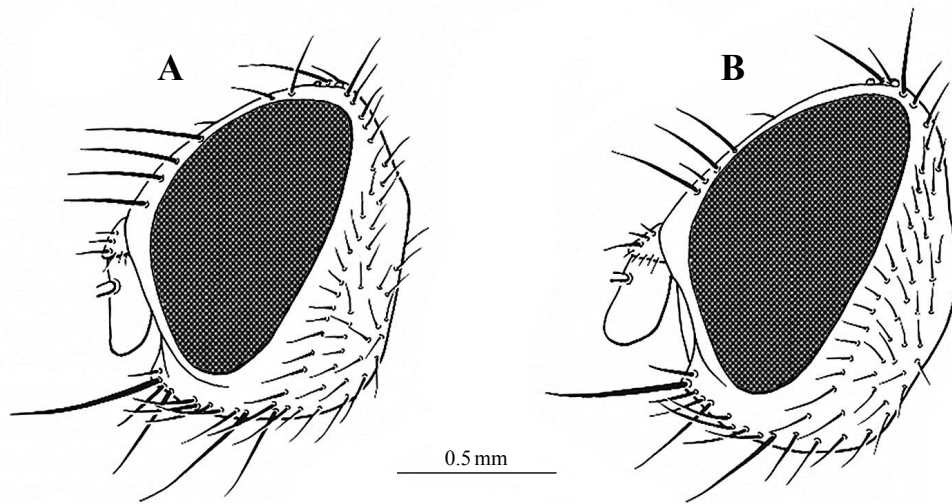


Fig. 7. Female head of *Alliopsis* spp. A. *Alliopsis silvatica* (Suwa, 1974); B. *Alliopsis silvestris* (Fallén, 1824).

Aricia argyrata + *A. decrepita* Zetterstedt, 1845: 1443–1454.

Anthomyia alpina + *A. donuca* + *Eriphia grisea* Walker, 1849: 927–962.

Paraprosalpia hydrophorinae Pokorný, 1893: 59 (Europe).

Male. Ground color black, with thin grayish pollen. Head about 1.2–1.3 times as high as long in profile. Frons at narrowest part slightly wider than distance between posterior ocelli inclusive. Interfrontalia and parafrontalia dull, with a pair of proclinate cruciate *if*, 2 *ors* and 2 *ori*. Parafacialia and cheek black, with gray pollen. Antenna black; third segment about 2.5 times as long as wide; arista distinctly pubescent, the longest hair about as long as basal diameter of arista. Palpus and haustellum black.

Thorax black in ground color, with gray pollen, and patches of brown pollen, especially on dorsum. Mesonotum with 3 pairs of *pre acr* and several fine irregular setulae between rows. Second *ph* strong, about 1.5 times as long as anterior *ntpl*. Posterior *ntpl* about one third as long as anterior *ntpl*.

Legs black; fore tibia with 2 *ad*, 1 *pd* and 1 *pv*; mid tibia with 2 *ad*, 1 *av*, 2 *pd* and 1 *pv*; hind tibia with 3–5 *ad*, 2 *av*, 3–4 *pd* and 1 *pv*.

Wing faintly brownish tinged, denser basally; costal spine indistinguishable from anterior setulae; m-m slightly sinuate. Calypter and knob of halter brownish yellow.

Abdomen with brownish gray pollen, with black narrow median vitta.

Length. Body 5.5–7.0 mm, wing 5.0–6.5 mm.

DISTRIBUTION: Korea, Japan (Hokkaido, Honshu), China (Heilongjiang, Jilin, Liaoning), Russia (Kamchatka, Sakhalin, Ural), Europe, N. America.

LOCALITY: North-HB: Baekdusan, Samjiyeon.

Genus *Anthomyia* Meigen, 1803

- Anthomyia* Meigen, 1803: 281. Type-species: *Musca pluvialis* Linnaeus, 1758 (Europe).
Cerochetus Dumeril, 1806: 282. Type-species: *Musca pluvialis* Linnaeus, 1758 (Europe).
Anthomya: Rafinesque, 1815: 131 (error for *Anthomyia*).
Anthomyza: Zetterstedt, 1838: 661 (emendation).
Craspedochoeta Macquart, 1850: 241. Type-species: *Anthomyia punctipennis* Wiedemann, 1830 (Uruguay).
Cheilisia Rondani, 1856: 101. Type-species: *Coenosia monilis* Meigen, 1826 (not given).
Eriostyla Lioy, 1864. Type-species: *Coenosia dubia* Macquart, 1835 (France).
Craspedochaeta: Marschall, 1873: 326 (error for *Craspedochoeta*).
Ceratochaetus: Bezzi, 1907: 51 (emendation).
Melinia Ringdahl, 1929: 270. Type-species: *Aricia pullula* Zetterstedt, 1745 (Denmark).
Hylemyioide Albuquerque, 1949. Type-species: *Hylemyioide brasiliensis* Albuquerque, 1949 (Brazil: Sao Paulo).
Hylemyioides: Albuquerque, 1952 (emendation).
Hylemyoides: Albuquerque, 1959 (emendation).
Cheilisia: Dely-Draskovits, 1993 (error for *Chelisia*).

DIAGNOSIS: Parafrontalia and genae with transverse stripe visible in lateral view below antennal base; face without keel; arista not angled; palpi not expended; mesonotum with well developed dark markings; scutellum with two long marginal pairs of setae and a shorter discal pair, and with fine pubescence on ventral surface; proepisternum setulosed; anepisternum with 1–2 anterodorsal setae; prosternum and meron bare; additional *ntpl* absent; costa with dense setulae on lower surface; surstylus flattened, and bearing a few ventral spines; distal section of aedeagus extensively sclerotized across its dorsal (Griffiths, 2001).

Key to species of Korean *Anthomyia*

1. Proepisternum without seta *A. mimetica*
1. Proepisternum with setae 2
2. Mesonotum with postsutural dark markings separated into 3 spots in dorsal view, sometimes narrowly fused anteriorly 3
2. Mesonotum with postsutural dark marking broadly fused in a transverse band 4
3. Gonostylus with a more expanded seta; distiphallus with dorsal projection set apart from base by a distance longer than the projection *A. avisignata*
3. Gonostylus with a less expanded seta; distiphallus with dorsal projection set apart from base by a distance not longer than the projection *A. procellaris*

4. Mesonotum with presutural spots expanded to second *pre dc*, and with postsutural band distinctly protruded cephalad at middle5
4. Mesonotum with presutural spots not expanded to second *pre dc*, or entirely lacking, and with postsutural band hardly or never protruded cephalad6
5. Distiphallus with dorsal projection distant from base *A. oculifera*
5. Distiphallus with dorsal projection near base *A. latifasciata*
6. Distiphallus without dorsal projection *A. illocata*
6. Distiphallus with dorsal projection *A. plumiseta*

7. *Anthomyia avisignata* Suwa, 1987 (Fig. 8)

Anthomyia avisignata Suwa, 1987: 10–13, figs. 18–40 (Japan: Hokkaido); Suh et al., 1985: 209; Suh, 1989: 71, 72; Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 302; Suh & Kwon, 1995: 194; Kwon et al., 1996: 223; Wei et al., 1996: 648; Suwa, 1999: 206; Paek et al., 2010: 241; Han et al., 2014: 143.

Anthomyia sp.: Suwa & Park, 1982: 502; Suh & Kwon, 1985: 170.

Male. Black in ground color, with grayish pollen. Head about as high as long in profile. Frons at narrowest part equal to width of anterior ocellus, parafrontalia broadly contiguous to each other. Interfrontalia and parafrontalia dull, with 3 *ori*. Parafacialia and cheek black, with gray pollen. Antenna black; third segment about 2.0 times as long as wide; arista distinctly pubescent, the longest hair slightly longer than basal diameter of arista. Palpus and haustellum black.

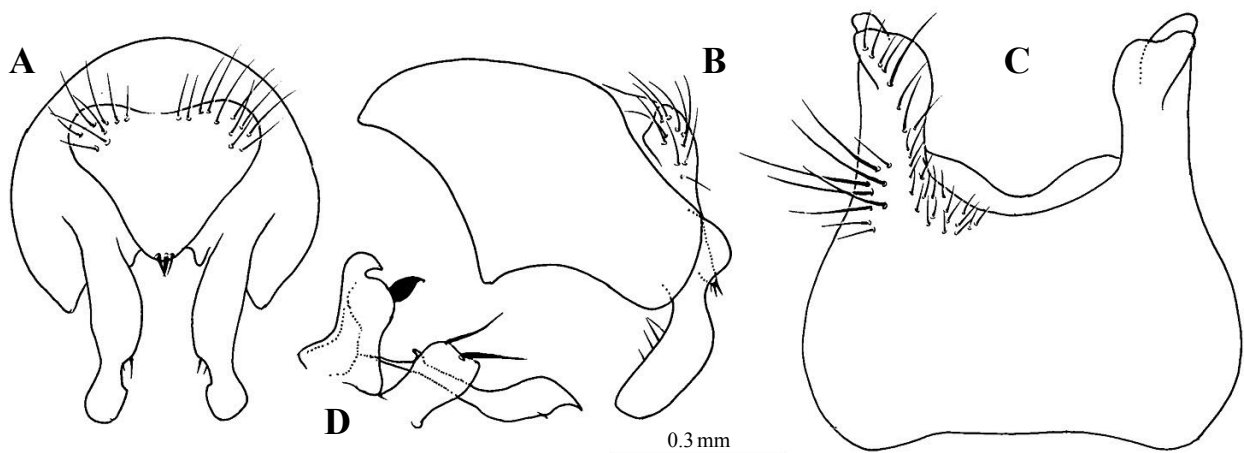


Fig. 8. *Anthomyia avisignata* Suwa, 1987, male. A, B. hypopygium; C. fifth sternite; D. gonocoxal lobe, gonostylus and phallus.

Thorax black in ground color, with gray pollen, and patches of brown pollen, especially on dorsum. Mesonotum with dark markings densely brownish pollinose; two presutural spots moderate to large; postsutural marking shaped 'w' and protruded at middle caudad; scutellar marking broadly fused on anterior half; 3 pairs of *pre acr*, the second longest, the distance separating *pre acr* rows about as wide as distance between *pre acr* and *dc* rows. Second *ph* strong and slightly longer than anterior *ntpl*. Posterior *ntpl* about one third as long as anterior *ntpl*. Proepisternum with 2 *prepst*. Anepisternum with a distinct upper anterior seta and, 1 long and 2 additional *prepm*. *Kepst* 2:2.

Legs black; fore tibia with 1 *pv*; mid tibia with 1 *ad*, 1 *pd*, 2 *pv* and strong apical *av* and *pv*; hind tibia with 5 *ad*, 1 *av*, 2 *pd* and 2 *pv*.

Wing hyaline; costal spine indistinguishable from anterior setulae; m-m slightly sinuate. Calypter and knob of halter whitish yellow.

Abdomen with bluish gray pollen; a black narrow median vitta, black triangular lateral vittae, and black anterior marginal band on each tergite.

Length. Body 4.5–5.0 mm, wing 4.0–4.5 mm.

MATERIAL EXAMINED: [KPNU] <JJ> 5 exs., Gwaneumsa, 17.vi.1973, JS Park; 1 ex., Gwaneumsan, 17.vi.1973, SH Park; [NIASST] <JJ> 1 ex., Gwaneumsa, 17.vi.1973, JS Park.

DISTRIBUTION: Korea, Japan (Hokkaido, Honshu), China (Liaoning), Russia (Maritime Territory).

LOCALITY: Jeju-JJ: Hallasan (= Gwanumsa).

8. *Anthomyia illocata* Walker, 1856 (Fig. 9)

Anthomyia illocata Walker, 1856: 129 (Indonesia: Borneo); Fan, 1965: 38, pl. 1; Park, 1971: 948, pl. 65 (360); Kim, 1975: 248; Suwa, 1981a: 102; Kim & Chang, 1982: 176; Kim et Nam, 1984: 339; Suh & Kwon, 1985: 169; Suh et al., 1985: 209; Suwa, 1987: 35, 36; Park, 1987: 111; Fan et al., 1988: 91; Suh, 1989: 72, 73; Dely-Draskovits, 1993: 21; Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 302; Kwon et al., 1994: 265; Suh & Kwon, 1995: 194; Kwon et al., 1995: 498; Kwon et al., 1996: 223; Wei et al., 1996: 648; Park, 1998: 89; Suwa, 1999: 206; Paek et al., 2010: 241; Han et al., 2014: 142.

Anthomyia bisetosa Thomson, 1868: 555 (China).

Male. Black in ground color, with grayish pollen. Head about 1.3–1.4 times as high as long in profile. Frons at narrowest part narrower than anterior ocellus; parafrontalia broadly contiguous to each other. Interfrontalia and parafrontalia dull, with 2 *ori*. Parafacialia and cheek black, with gray pollen. Antenna black; third segment about 2.3–2.5 times as long as wide; arista distinctly pubescent, the longest hair slightly longer than basal diameter of arista. Palpus and haustellum black.

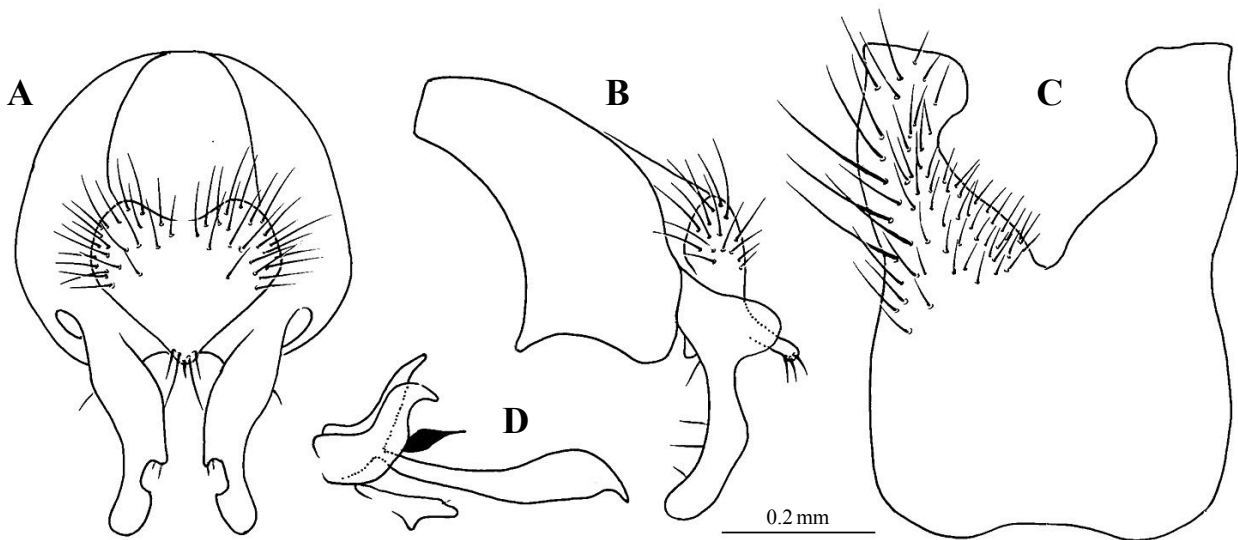


Fig. 9. *Anthomyia illocata* Walker, 1856, male. A, B. hypopygium; C. fifth sternite; D. gonocoxal lobe, gonostylus and phallus.

Thorax black in ground color, with brownish gray pollen, and patches of brown pollen, especially on dorsum. Mesonotum with dark markings densely brownish pollinose; two presutural spots small to degenerate; postsutural marking shaped a transversal band; scutellar transversal band slightly protruding at middle caudad; 3 pairs of *pre acr*, the second longest, the distance separating *pre acr* rows about as wide as distance between *pre acr* and *dc* rows. Second *ph* strong and slightly longer than anterior *ntpl*. Posterior *ntpl* about one third as long as anterior *ntpl*. Proepisternum with 2 *prepst*. Anepisternum with a distinct upper anterior seta and, 2 *prepm*. *Kept* 2:2.

Legs black; fore tibia with 1 *pv*; mid tibia with 1 *ad*, 1 *pd*, 2 *pv* and strong apical *av* and *pv*; hind tibia with 5 *ad*, 1 *av*, 2 *pd* and 2–3 *pv*.

Wing hyaline; costal spine indistinguishable from anterior setulae; m-m slightly sinuate. Calypter and knob of halter whitish yellow.

Abdomen with bluish gray pollen; a black narrow median vitta, black triangular lateral vittae, and black anterior marginal band on each tergite.

Length. Body 5.0–5.5 mm, wing 4.5–5.0 mm.

MATERIAL EXAMINED: [KPNU] <Seoul> 2 exs., Seoul, 25.vii.1982, YJ Kwon; <GB> 11 exs., Ulleungdo, 27.vii–8.viii.1978, JS Park; 1 ex., Gachang Jeongdae, 14.v.1984, TH Jo; 1 ex., Daegu, 20.vii.1982, YJ Kwon; <GN> 2 exs., Jirisan, 13–17.vii.1973, JS Park; 2 exs., Masan, 7.viii.1982, YJ Kwon; <JN> 4 exs., Heuksando, 13.viii.1981, YJ Kwon; 2 exs., Hongdo, 12.viii.1981, YJ Kwon; [NIAST] <GG> 1 ex., Suwon, 1.v.1976, JS Park; <Seoul> 1 ex., Seoul, 25.vii.1982, YJ Kwon; <GB> 1 ex., Daegu, 23.vii.1984, YJ Kwon.

DISTRIBUTION: Korea, Japan (Honshu, Kyushu, Shikoku, Ogasawara Iss.; Nansei Iss.), China (whole part), Philippines, Thailand, Nepal, Sri Lanka, India, Australia, Micronesia (Bahama), Polynesia, Hawaii.

LOCALITY: Central-Seoul: Seoul, Dobongsan; GG: Suwon; GW: Goseong, Seoraksan; South-GB: Daegu, Gachang, Juwangsang, Nayeonsan, Palgongsan, Sangju, Ulleungdo; GN: Jirisan, Masan; JN: Hongdo, Heuksando, Jagaedo; Jeju-JJ: Jeju.

9. *Anthomyia latifasciata* Suwa, 1987 (Fig. 10)

Anthomyia latifasciata Suwa, 1987: 25–29, figs. 52–157, 160–170 (Japan); Suh, 1989: 73, 74; Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 302; Kwon et al., 1994: 265; Suh & Kwon, 1995: 194; Kwon et al., 1996: 223; Suwa, 1999: 206; Paek et al., 2010: 241; Han et al., 2014: 143.

Anthomyia sp. B: Suwa, 1974: 52.

Anthomyia sp.: Suwa, 1981, Kontyû 49: 102.

Male. Ground color black, with grayish pollen. Head about 1.3–1.5 times as high as long in profile. Frons at narrowest part equal to width of anterior ocellus; parafrontalia broadly contiguous to each other. Interfrontalia and parafrontalia dull, with 1 fine *ors* and 7 *ori*. Parafacialia and cheek black, with gray pollen. Antenna black; third segment about 2.5 times as long as wide; arista distinctly pubescent, the longest hair slightly longer than basal diameter of arista. Palpus and haustellum black.

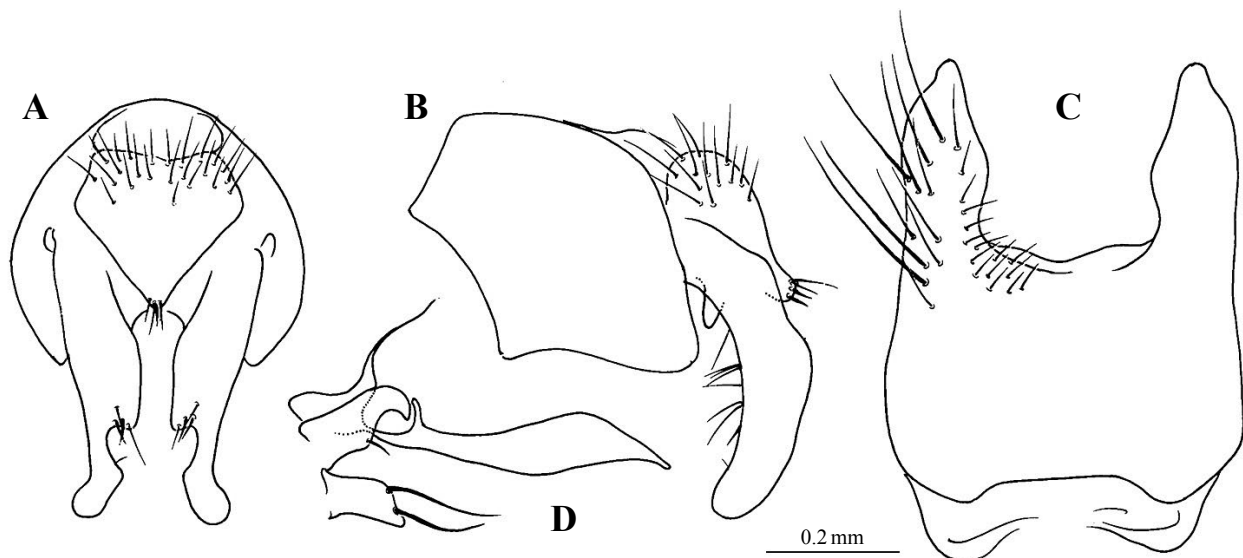


Fig. 10. *Anthomyia latifasciata* Suwa, 1987, male. A, B. hypopygium; C. fifth sternite; D. gonocoxal lobe, gonostylus and phallus.

Thorax black in ground color, with brownish gray pollen, and patches of brown pollen, especially on dorsum. Mesonotum with dark markings densely brownish pollinose; two presutural spots moderate to large; postsutural marking shaped a transversal band, slightly protruded cephalad and caudad at middle; scutellum black, with a gray spot at apex; 3 pairs of *pre acr* and several fine irregular setulae between rows, the second longest, distance separating *pre acr* rows about as wide as distance between *pre acr* and *dc* rows. Second *ph* strong, about 1.3–1.4 times as long as anterior *ntpl*. Posterior *ntpl* about one third as long as anterior *ntpl*. Proepisternum with 2 *prepst*. Anepisternum with a distinct upper anterior seta and, 2 long and 5 fine *prepm*. *Kepst* 2:2.

Legs black; fore tibia with 1 *pv*; mid tibia with 1 *ad*, 1 *pd*, 2 *pv* and strong apical *av* and *pv*; hind tibia with 4–5 *ad*, 1 *av*, 2 *pd* and 5–7 *pv*.

Wing faintly brownish tinged, denser basally; costal spine indistinguishable from anterior setulae; m-m slightly sinuate. Calypter light brown. Knob of halter whitish yellow.

Abdomen with bluish gray pollen; black narrow median vitta, black triangular lateral vittae, and black anterior marginal band on each tergite.

Length. Body 5.5–6.0 mm, wing 4.5–5.8 mm.

MATERIAL EXAMINED: [KPNU] <JJ> 2 exs., Hallasan, 6.viii.1989, YJ Kwon; [NIAST] <JJ> 1 ex., Hallasan, 6.viii.1989, YJ Kwon.

DISTRIBUTION: Korea, Japan (Honshu, Kyushu, Nansei Iss., Shikoku), China (Guizhou).

LOCALITY: South-GB: Palgongsan, Sudosan; Jeju-JJ: Hallasan.

10. *Anthomyia mimetica* (Malloch, 1918) (Fig. 11)

Hylemyia mimetica Malloch, 1918: 313 (USA: New Mexico).

Hylemyia (Melinia) karli Ringdahl, 1929: 272 (Sweden).

Melinia angulata Tiensuu, 1938: 26 (Finland).

Craspedochoeta angulata (nec Tiensuu): Suwa, 1983b: 26; Suh & Kwon, 1985: 168; Suh, 1989: 70; Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 303; Kwon et al., 1996: 224; Suwa, 1999: 216; Paek et al., 2010: 242.

Anthomyia angulata: Dely-Draskovits, 1993: 20; Han et al., 2014: 143.

Male. Black in ground color, with grayish pollen. Head about 1.6–1.7 times as high as long in profile. Frons at narrowest part slightly equal to width of anterior ocellus, parafrontalia broadly contiguous to each other. Interfrontalia and parafrontalia dull, with 1 fine *ors* and 3–4 *ori*. Parafacialia and cheek black, with gray pollen. Antenna black; third segment about 2.0 times as long as wide; arista distinctly pubescent, the

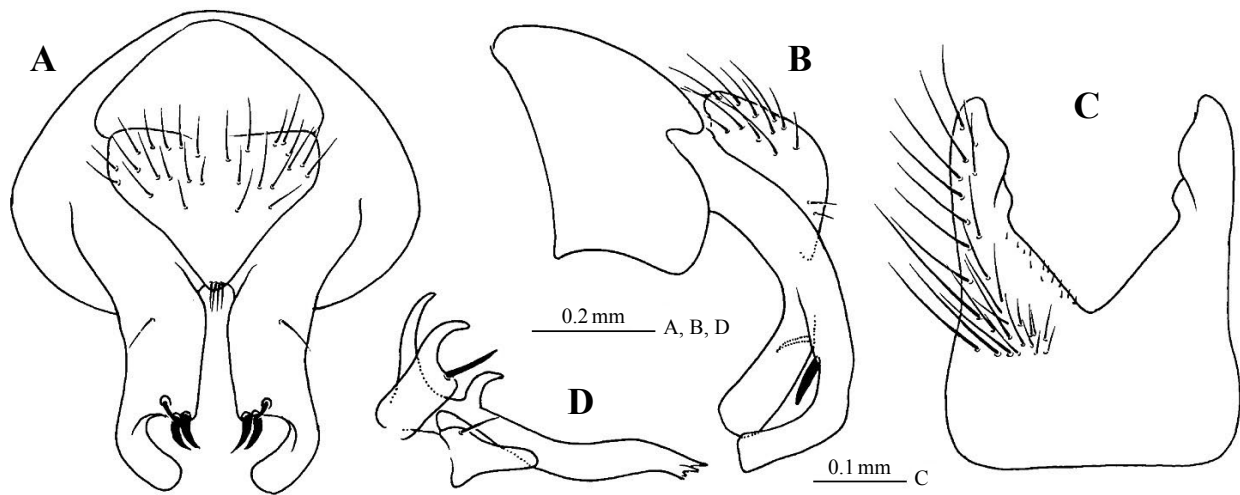


Fig. 11. *Anthomyia mimetica* (Malloch, 1918), male. A, B. hypopygium; C. fifth sternite; D. gonocoxal lobe, gonostylus and phallus.

longest hair slightly longer than basal diameter of arista. Palpus and haustellum black.

Thorax black in ground color, with gray pollen, and patches of brown pollen, especially on dorsum. Mesonotum 3 pale brownish black median vittae presuturally in caudal view; 3 pairs of *pre acr*, the distance separating *pre acr* rows about as wide as distance between *pre acr* and *dc* rows. Second *ph* strong and slightly longer than anterior *ntpl*. Posterior *ntpl* about one third as long as anterior *ntpl*. Proepisternum with 2 *prepst*. Anepisternum with a distinct upper anterior seta and, 2 long and 1 additional *prepm*. *Kepst* 2:2.

Legs black; fore tibia with 1 *pv*; mid tibia with 1 *ad*, 4 *pd*, 3 *pv* and strong apical *av* and apical *pv*; hind tibia with 7–8 *ad*, 7 *av*, 2 *pd* and 10 *pv*.

Wing faintly brownish tinged, denser basally; costal spine indistinguishable from anterior setulae; m-m nearly straight. Calypter and knob of halter whitish yellow.

Length. Body 4.5 mm, wing 3.8 mm.

MATERIAL EXAMINED: [KPNU] <GW> 1 ex., Odaesan, 24.v.1989, YJ Kwon.

DISTRIBUTION: Korea, Japan (Hokkaido), China (Heilongjiang, Liaoning), Finland, N. America.

LOCALITY: Central-GW: Odaesan, Seoraksan; South-GN: Jirisan.

11. *Anthomyia oculifera* Bigot, 1885 (Fig. 12)

Anthomyia oculifera Bigot, 1885: 299 (USA: Baltimore).

Anthomyia koreana Suh & Kwon, 1985: 170, fig. 3 (Korea: Soyosan); Suwa, 1987: 19–24, figs. 98–110,

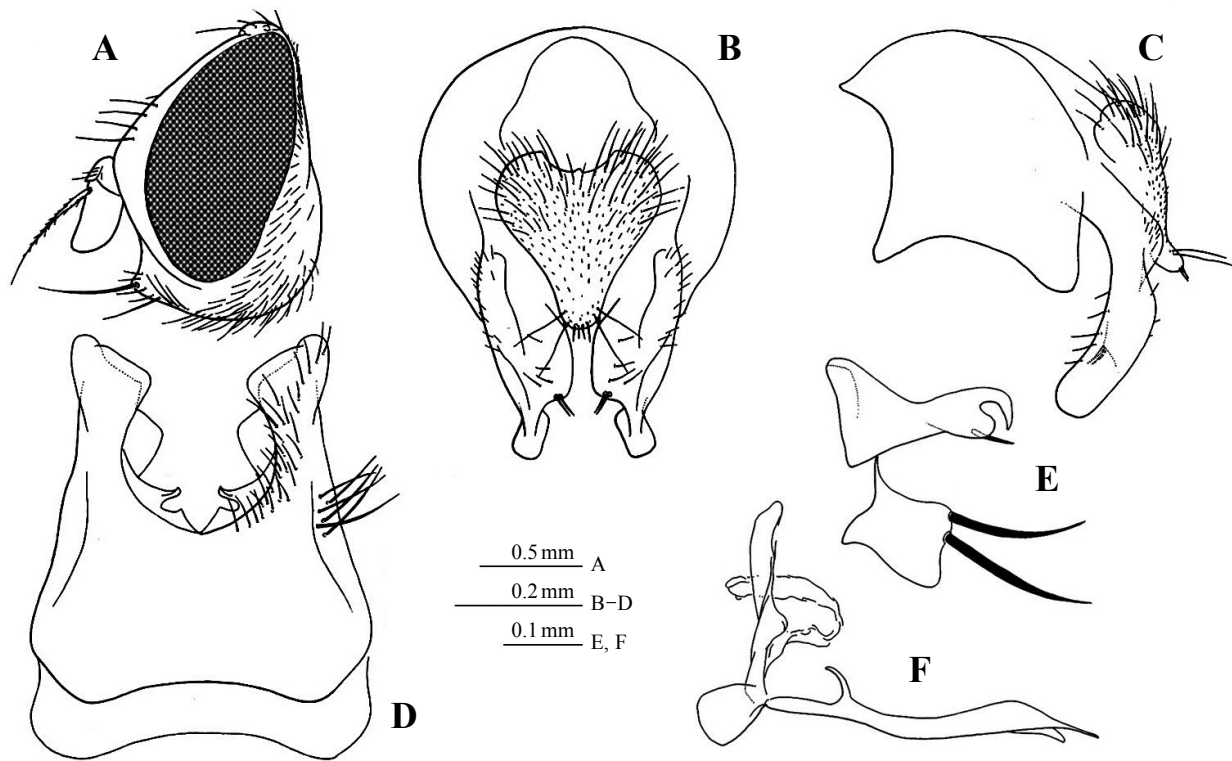


Fig. 12. *Anthomyia oculifera* Bigot, 1885, male. A. head; B, C. hypopygium; D. fifth sternite; E. gonocoxal lobe and gonostylus; F. phallus.

116–137; Suh et al., 1985: 209; Fan et al., 1988: 91, 92; Suh, 1989: 73; Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 302; Kwon et al., 1994: 265; Kwon et al., 1995: 498; Kwon et al., 1996: 223; Wei et al., 1996: 648; Paek et al., 2010: 241; Han et al., 2014: 143.

Male. General coloration black, densely blue grayish pollinose. Head about 1.4 times as high as long in profile; frons slightly narrower than diameter of anterior ocellus; parafrontalia broadly contiguous; interfrontalia dark brown to black; frons with 3–5 *ori*, 1 vestigial *ors*, and 1 fine *if*. Antenna black, with arista shortly pubescent; third antennal segment about 2.1–2.4 times as long as wide. Haustellum moderate, with shining mentum.

Thorax blue grayish pollinose; mesonotum bearing a transverse black band which extends posteriorly from transverse suture to second postsutural *dc* seta, with a pair of large presutural spots; 3 *pre acr*. Anepisternum with a few additional setulae near *prepm*.

Legs black; fore tibia with 1–2 *pv*; mid tibia with 1 *ad*, 1 *pd* and *pv*; hind tibia with 5–7 *ad*, 1 *av*, 3–4 *pd* and 6–8 fine *pv*.

Wing barely yellowish tinged; m-m rather sinuate. Calypter and knob of halter pale yellow.

Abdomen blue grayish pollinose, with black markings fused anteriorly on third, fourth and fifth tergites. Length. Body 4.0–5.9 mm, wing 4.3–5.2 mm.

MATERIAL EXAMINED: [KPNU] <GG> 3 exs., Soyosan, 15.v.1982, YJ Kwon; <CN> 1 ex., Gyeryongsan, 20.v.1984, SH Park; 2 exs., Gyeryongsan, 20.v.1984, SH Park; <GB> 4 exs., Geumosan, 13.iv.1983, TH Jo; 9 exs., Geumosan, 18.v.1983, SH Park; 6 exs., Geumosan, 22.vi.1983, TH Jo; 2 exs., Geumosan, 12.vii.1983, SH Park; 2 exs., Geumosan, 12.vii.1983, TH Jo; 3 exs., Geumosan, 3.viii.1983, TH Jo; 3 exs., Geumosan, 27.vii.1983, TH Jo; 2 exs., Geumosan, 27.vii.1983, SH Park; 3 exs., Geumosan, 20.iv.1983, SH Park; 1 ex., Geumosan, 1.vi.1983, SH Park; 1 ex., Geumosan, 6.iv.1983, TH Jo; 1 ex., Geumosan, 6.v.1984, TH Jo; 1 ex., Palgongsan, 1.v.1984, TH Jo; 4 exs., Palgongsan, 17.iv.1984, SH Park; 1 ex., Pohyeonsan, 5.vi.1983, TH Jo; 1 ex., Daegu, 26.iii.1984, YJ Kwon; 3 exs., Daegu, 30.iii.1984, YJ Kwon; 1 ex., Daegu, 18.iii.1984, YJ Kwon; 1 ex., Palgongsan, 16.v.1986, YJ Kwon; 1 ex., Palgongsan, 7.vi.1984, YJ Kwon; 1 ex., Palgongsan, 30.vi.1986, YJ Kwon; <GN> 1 ex., Jirisan, 13–17.vii.1973, SH Park; 2 exs., Yangsan, 8.vi.1974, SH Park; 1 ex., Yangsan, 9.vi.1974, SH Park; [NIAS] <GB> 1 ex., Daegu, 26.iii.1984, YJ Kwon; 2 exs., Daegu, 30.iii.1984, YJ Kwon; 2 exs., Palgongsan, 16.v.1986, YJ Kwon.

DISTRIBUTION: Korea, China (Liaoning), N. America.

LOCALITY: Central-GW: Odaesan, Seoraksan, Soyosan; CN: Gyeryongsan; South-GB: Bohyeonsan, Daegu, Geumosan, Palgongsan, Ulleungdo; GN: Jirisan, Gayasan, Ssanggye, Yangsan.

12. *Anthomyia plumiseta* Stein, 1918 (Fig. 13)

Anthomyia plumiseta Stein, 1918: 158 (China: Taiwan); Suwa, 1987: 32–35, figs. 183–187, 193–207; Suh et al., 1985: 209; Suh, 1989: 74; Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 302; Kwon et al., 1996: 223; Wei et al., 1996: 648; Suwa, 1999: 207; Paek et al., 2010: 241; Han et al., 2014: 144.

Anthomyia sp. A: Suwa, 1974: 51, 52.

Male. Black in ground color, with grayish pollen. Head about 1.2 times as high as long in profile. Frons at narrowest part equal to width of anterior ocellus; parafrotaia broadly contiguous to each other. Interfrontalia and parafrotaia dull, with 3 *ori*. Parafacialia and cheek black, with gray pollen. Antenna black; third segment about 2.6–2.7 times as long as wide; arista distinctly pubescent, the longest hair slightly longer than basal diameter of arista. Palpus and haustellum black.

Thorax black in ground color, with brownish gray pollen, and patches of brown pollen, especially on dorsum. Mesonotum with dark markings densely brownish pollinose; presutural marking broadly fused on anterior margin of mesonotum; postsutural marking shaped as a transversal band; scutellum mainly black, with or without a small gray spot at apex; 3 pairs of *pre acr*, the second longest, distance separating *pre acr* rows

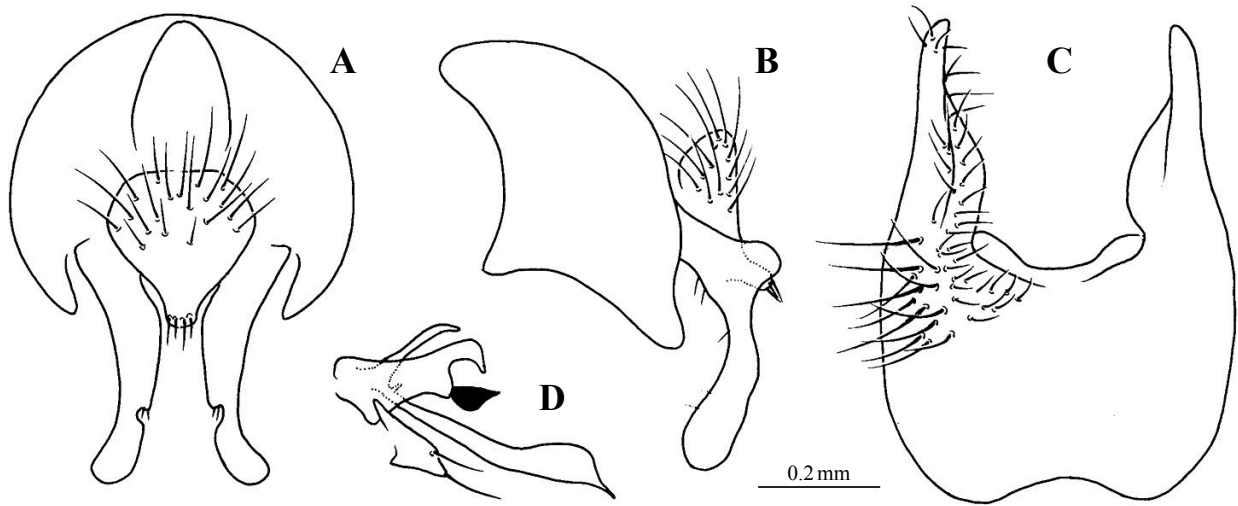


Fig. 13. *Anthomyia plumiseta* Stein, 1918, male. A, B. hypopygium; C. fifth sternite; D. gonocoxal lobe, gonostylus and phallus.

about as wide as distance between *pre acr* and *dc* rows. Second *ph* strong, as long as anterior *ntpl*. Posterior *ntpl* about one third as long as anterior *ntpl*. Proepisternum with 2 *prepst*. Anepisternum with distinct upper anterior seta and, 1 long and 1 fine *prepm*. *Kepst* 2:2.

Legs black; fore tibia with 1 *ad* and 1 *pv*; mid tibia with 1 *ad*, 2 *pd*, 1 *pv* and strong apical *av* and *pv*; hind tibia with 6 *ad*, 1 *av*, 2 *pd* and 2–3 *pv*.

Wing faintly brownish tinged, denser basally; costal spine indistinguishable from anterior setulae; m-m slightly sinuate. Calypter light brown. Knob of halter whitish yellow.

Abdomen with bluish gray pollen; black narrow median vitta, black triangular lateral vittae, and black anterior marginal band on each tergite.

Length. Body 5.0–5.5 mm, wing 4.5–5.0 mm.

MATERIAL EXAMINED: [KPNU] <GB> 1 ex., Juwangsan, 28.vii.1984, YJ Kwon; 2 exs., Ulleungdo, 27.vii–8.viii.1978, JS Park; <GN> 1 ex., Okcheonsa, 27.v.1979, JK Kim; <JN> 1 ex., Hongdo, 11.viii.1981, YJ Kwon; [NIAS] <GB> 1 ex., Ulleungdo, 27.ix.1981, YJ Kwon.

DISTRIBUTION: Korea, Japan (Hokkaido, Honshu, Kyushu, Nansei Iss.), China (Guizhou, Hainan, Yunnan), Taiwan, Russia (Maritime Territory), India, Indonesia (Borneo), Malaysia, Myanmar, Philippines, Sri Lanka.

LOCALITY: Central-GW: Seoraksan; South-GB: Juwangsan, Ulleungdo; GN: Goseong (= Okcheonsa); JN: Hongdo.

13. *Anthomyia procellaris* Rondani, 1866 (Fig. 14)

Anthomyia procellaris Rondani, 1866: 147 (Italy); Suwa, 1987: 14–19, figs. 41–97; Fan et al., 1988: 93; Suh, 1989: 74, 75; Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 302; Kwon et al., 1996: 223; Suwa, 1999: 207; Paek et al., 2010: 241; Han et al., 2014: 144.

Anthomyia pluvialis var. *procellaris*: Tiensuu, 1935: 13, fig. 3b.

Male. Black in ground color, with grayish pollen. Frons at narrowest part equal to width of anterior ocellus; parafrontalia broadly contiguous to each other. Arista pubescent, the longest hair about twice as long as basal diameter of arista.

Thorax black in ground color, with brownish gray pollen, and patches of brown pollen, especially on dorsum. Mesonotum with dark markings densely brownish pollinose; two presutural spots moderate to large;

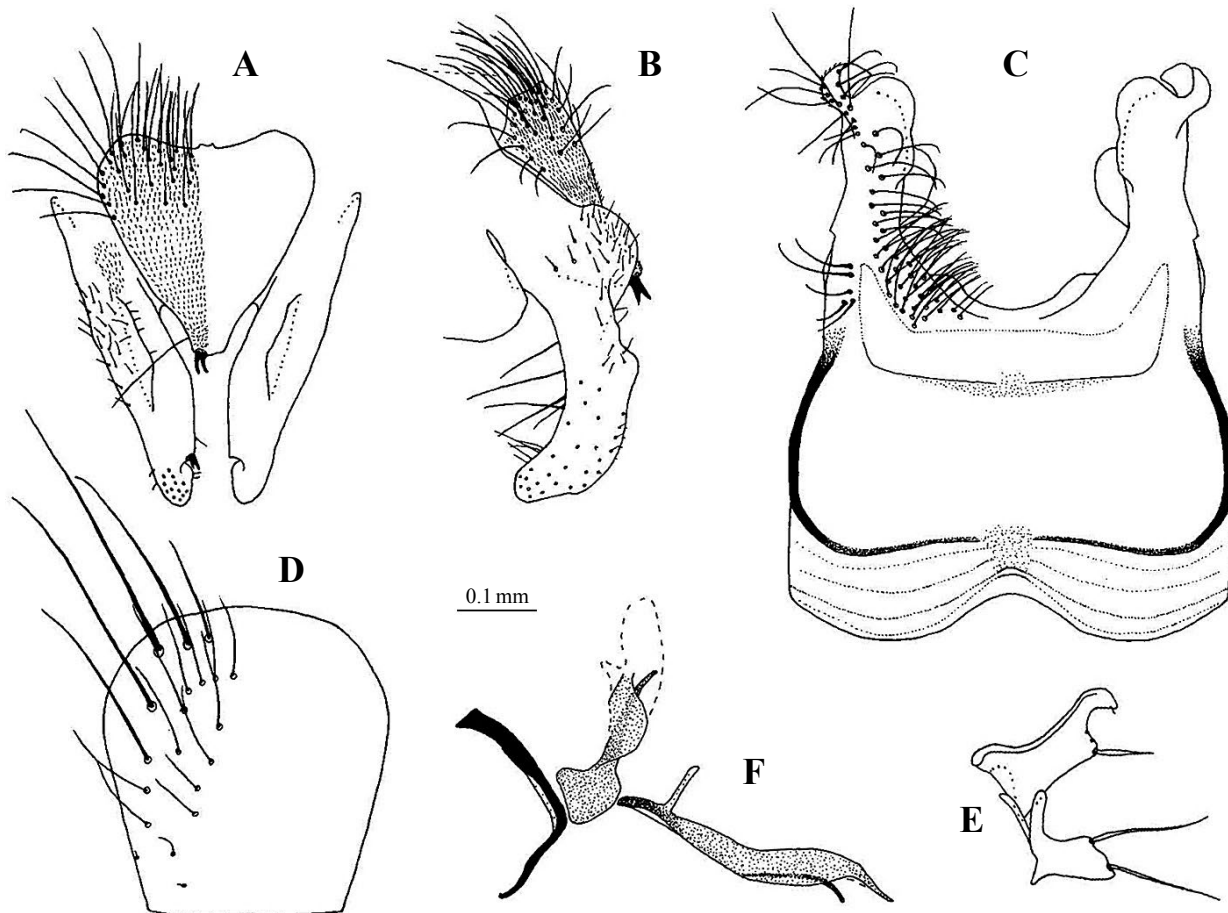


Fig. 14. *Anthomyia procellaris* Rondani, 1866, male (after Griffith). A, B. hypopygium; C. fifth sternite; D. fourth sternite; E. gonocoxal lobe and gonostylus; F. phallus.

postsutural spots usually separated, sometimes fused narrowly on transverse suture; scutellum with two lateral black longitudinal bands along lateral margin; *pra* distinct longer than posterior *ntpl*.

Legs black; fore tibia with 1 *pv*; mid tibia with 1 *ad*, 2 *pd* and 2 *pv*; hind tibia with 5–9 *ad*, 1 *av*, 2 *pd* and 3–9 *pv*.

Length. Body 5.3–5.5 mm, wing 5.1–5.3 mm.

DISTRIBUTION: Korea, Japan (Hokkaido, Honshu), China (Heilongjiang, Liaoning, Shanxi), Europe, Russia (Maritime Territory).

LOCALITY: Central-GW: Seoraksan.

Genus *Botanophila* Lioy, 1864

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

Egeria Robineau-Desvoidy, 1830: 555 (nom. praeocc.). Type-species: *Egeria silvatica* Robineau-Desvoidy, 1830 (France: Saint-Sauveur).

Pegohylemyia Schnabl, 1911: 75. Type-species: *Musca cinerea* Fallén, 1824 (Sweden).

Euryparia Ringdahl, 1919: 269. Type-species: *Anthomyia varicolor* Meigen, 1826 (Germany).

Thrixina Karl, 1928: 165. Type-species: *Anthomyia fugax* Meigen, 1826 (not given).

Collinomyia Ringdahl, 1929: 269. Type-species: *Aricia gemmata* Zetterstedt, 1860 (Sweden: Tärna).

Buccaria Karl, 1932: 304. Type-species: *Buccaria monticolor* Karl, 1932 (Czech).

Monochrotogaster Ringdahl, 1932: 19. Type-species: *Monochrotogaster unicolor* Ringdahl, 1932 (Russia).

Pseudomyopina Ringdahl, 1933: 31. Type-species: *Aricia moriens* Zetterstedt, 1845 (Sweden: Mullfjällen).

Xanthocnemia Karl, 1943: 65. Type-species: *Hylemyia pseudomaculipes* Strobl, 1893 (Austria).

Atrichomyia Karl, 1943: 66. Type-species: *Chortophila (Nudaria) lineatula* Karl, 1928 (Poland).

DIAGNOSIS: Eyes holoptic in male; *if* present; *ors* seta absent; arista pubescent; mid tibia often with 1 *ad*; *pra* usually well developed; scutellum with two long marginal pairs of setae and a shorter discal pair, and with fine pubescence on ventral surface; proepisternum, meron and anepimeron bare; sixth tergite setose; gonocoxal lobe small, and with robust microsetae; distiphallus tiny.

Key to species of Korean *Botanophila*

1. Prebasal sclerite of hypopygium with a row of distinct setae on hind margin *B. striolata*
1. Prebasal sclerite of hypopygium without seta on hind margin 2
2. Eyes dichoptic 3

2. Eyes holoptic	4
3. Frons without <i>if</i>	<i>B. peninsularis</i>
3. Frons with <i>if</i>	<i>B. seungmoi</i>
4. Legs wholly black.....	5
4. Legs at least partly yellow to brown.....	10
5. <i>Ors</i> present; prealar seta shorter than anterior <i>ntpl</i>	<i>B. lobata</i>
5. <i>Ors</i> absent; prealar seta as long as or longer than anterior <i>ntpl</i>	6
6. Notopleuron with some additional setulae.....	7
6. Notopleuron without additional setulae.....	8
7. Frons with 10–15 <i>ori</i> ; second <i>ph</i> strong, as long as anterior <i>ntpl</i>	<i>B. askoldica</i>
7. Frons with usually 4 <i>ori</i> ; second <i>ph</i> weak, shorter than half of anterior <i>ntpl</i>	<i>B. tridentifera</i>
8. Haustellum stout; some accessory setulae present between presutural acrostichal rows.....	<i>B. palgongsana</i>
8. Haustellum slender; accessory setulae absent between presutural acrostichal rows.....	9
9. Frons with 6–7 <i>ori</i>	<i>B. spinisternata</i>
9. Frons with 4–5 <i>ori</i>	<i>B. profuga</i>
10. Mid tibia with 6 <i>ad</i> ; second <i>ph</i> longer than 2/3 of anterior <i>ntpl</i>	<i>B. shirozui</i>
10. Mid tibia with 1 <i>ad</i> ; second <i>ph</i> as long as 1/2 of anterior <i>ntpl</i>	11
11. Mid tibia with 4 <i>pd</i> , and without <i>pv</i>	<i>B. nigrigenesis</i>
11. Mid tibia with 2–3 <i>pd</i> , and 1–2 <i>pv</i>	12
12. Arista more shortly pubescent, the longest hair as long as basal diameter of arista; hind tibia with weak apical <i>pd</i> , much shorter and weaker than apical <i>ad</i>	<i>B. maculipedella</i>
12. Arista shortly pubescent, the longest hair 1.5 times as long as basal diameter of arista; hind tibia with strong apical <i>pd</i> at least about as long as apical <i>ad</i>	<i>B. maculipes</i>

14. *Botanophila askoldica* (Schnabl, 1911) (Fig. 15)

Hylemyia (*Pegohylemyia*) *askoldica* Schnabl, 1911: 253–255, figs. 179, 180, 741 (Russia: Maritime Territory).

Botanophila askoldica: Suh, 1989: 78; Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 302; Kwon et al., 1996: 223; Paek et al., 2010: 241.

Pegohylemyia askoldica: Suwa, 1974: 134–137.

Botanophila ascoidica (sic): Han et al., 2014: 144.

Male. Black in ground color, with thin grayish pollen. Head about 1.1–1.2 times as high as long in profile. Frons at narrowest part equal to width of anterior ocellus. Interfrontalia dull tinged with brown; parafronta-

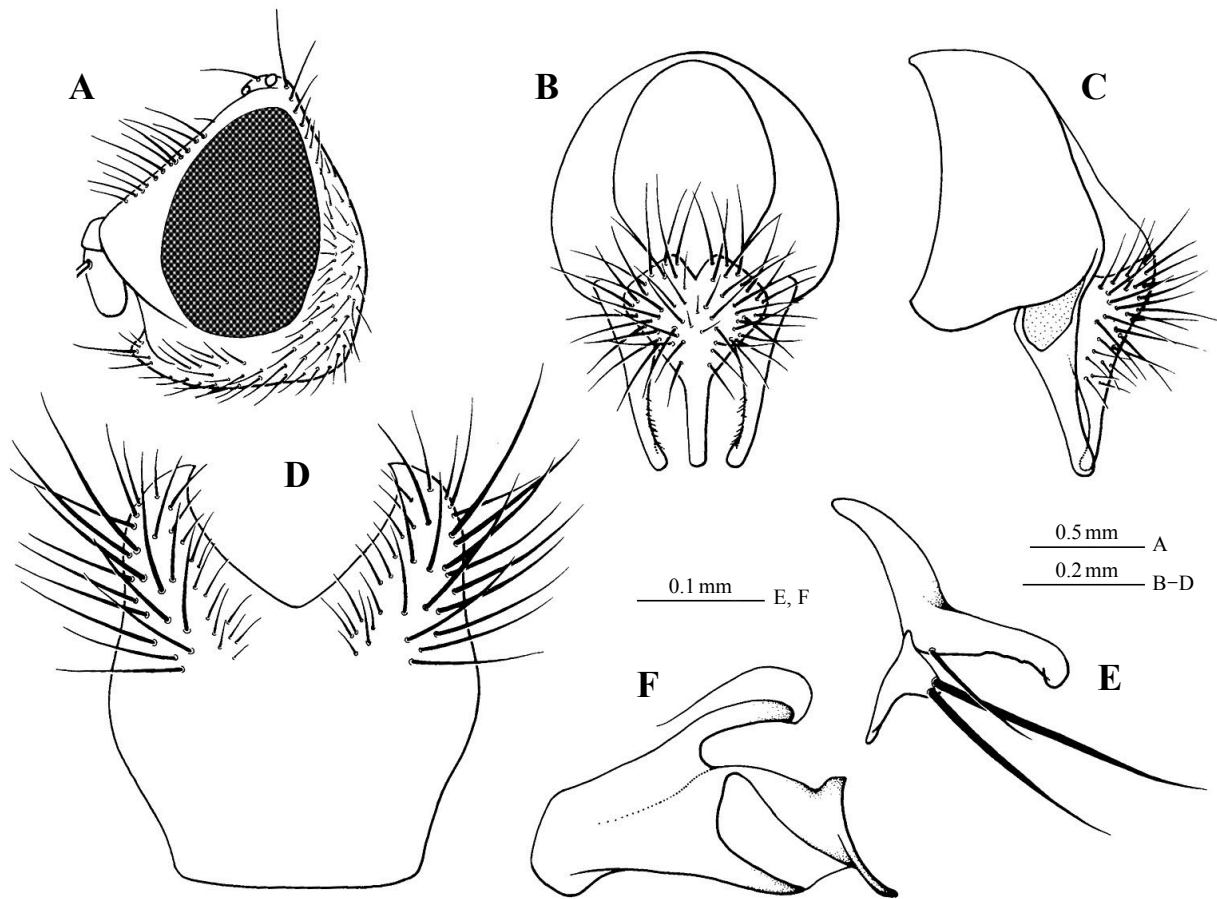


Fig. 15. *Botanophila askoldica* (Schnabl, 1911), male. A. head; B, C. hypopygium; D. fifth sternite; E. gonocoxal lobe and gonostylus; F. phallus.

lia with 1 fine *if* and numerous *ori*. Parafacialia and cheek black, with gray pollen. Antenna black; third segment about twice as long as wide; arista distinctly pubescent. Palpus black. Haustellum black, slender, with sparse gray pollen.

Thorax black in ground color, with bluish gray pollen. Mesonotum with 5 pairs of *pre acr* and several fine irregular setulae between rows, the distance separating *pre acr* rows about as wide as distance between *pre acr* and *dc* rows. Second *ph* strong, about as long as anterior *ntpl*. Posterior *ntpl* about as long as anterior *ntpl*. Notopleuron with few additional setulae. Proepisternum with 2 *prepst*. Anepisternum with 15 *prepm*.

Legs black; fore tibia with 1 *ad* and 1–2 *pv*; mid tibia with 1 *ad*, 2 *pd* and 2 *pv*; hind tibia with 6 *ad*, 3 *av*, 6 *pd* and 4 *pv*.

Wing faintly brownish tinged, denser basally; costal spine indistinguishable from anterior setulae; m-m nearly straight. Calypter and knob of halter whitish yellow.

Abdomen with brownish gray pollen, with black median vitta, broadened on anterior margin of each tergite.

Length. Body 7.5–8.0 mm, wing 4.8–6.5 mm.

MATERIAL EXAMINED: [KPNU] <GW> 11 exs., Odaesan, 24.v.1989, YJ Kwon; [NIAST] <GW> 4 exs., Odaesan, 24.v.1989, YJ Kwon.

DISTRIBUTION: Korea, Japan (Hokkaido), China (Liaoning), Russia (Maritime Territory).

LOCALITY: Central-GW: Odaesan.

15. *Botanophila lobata* (Collin, 1967) (Fig. 16)

Pegohylemyia lobata Collin, 1967: 188 (U.K.); Suwa, 1983b: 31, 32.

Botanophila lobata: Suh & Kwon, 1985: 175; Suwa, 1986: 46; Suh, 1989: 79; Dely-Draskovits, 1993: 27; Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 302; Kwon et al., 1996: 223; An, 1998: 62; Wei et al., 1996: 691; Suwa, 1999: 209; Paek et al., 2010: 241; Han et al., 2014: 144.

Male. Black in ground color, with thin grayish pollen. Head about 1.3–1.4 times as high as long in profile. Frons at narrowest part slightly wider than distance between posterior ocelli exclusive. Interfrontalia and parafrontalia dull, with 1 *if*, 1 fine *ors* and 4 *ori*. Parafacialia and cheek black with gray pollen; parafacialia about half as wide as width of third antennal segment; cheek at narrowest part about half as high as width of third antennal segment. Antenna black; third segment about 1.1–1.2 times as long as wide; arista distinctly pubescent, aristal hairs slightly shorter than basal diameter of arista. Palpus black; haustellum black and stout.

Thorax black in ground color, with gray pollen, and patches of brown pollen, especially on dorsum. Mesonotum with black median vitta presuturally in caudal view, and pale broad lateral vittae; 3 pairs of *pre*

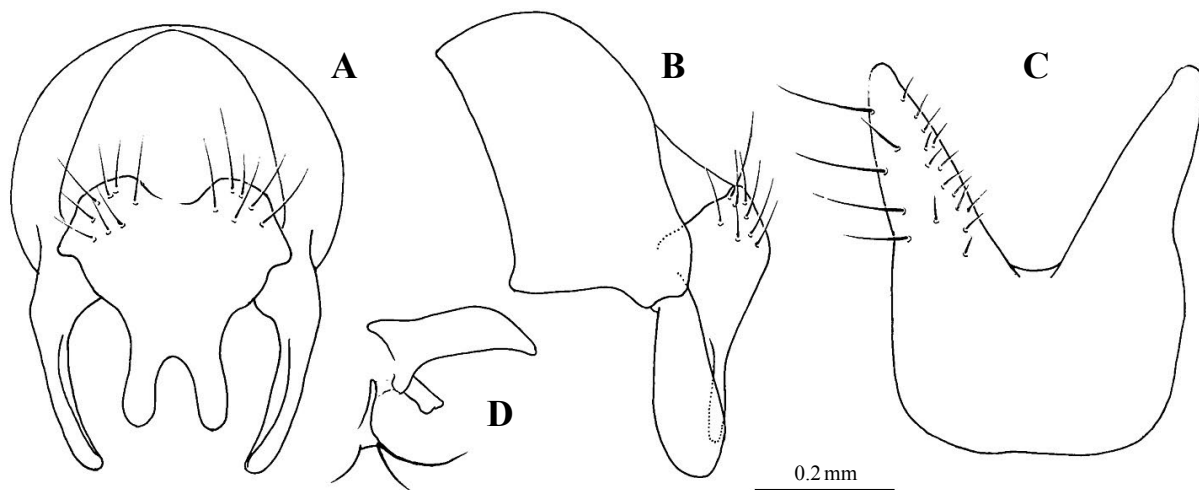


Fig. 16. *Botanophila lobata* (Collin, 1967), male. A, B. hypopygium; C. fifth sternite; D. gonocoxal lobe, gonostylus and phallus.

acr, the distance separating *pre acr* rows about as wide as distance between *pre acr* and *dc* rows. Second *ph* strong, about 1.2–1.3 times as long as posterior *ntpl*. Posterior *ntpl* about 0.8–0.9 times as long as anterior *ntpl*. Proepisternum with 2 *prepst*. Anepisternum with a distinct upper anterior seta and, 2 long and 1 fine *prepm*.

Legs black; fore tibia with 1 strong *pv*; mid tibia with 1 *ad*, 1 *pd*, and robust apical *av* and *pv*; hind tibia with 5 *ad*, 2 *av* and 4–5 *pd*.

Wing hyaline; costal spine indistinguishable from anterior setulae; m-m straight. Calypter whitish yellow; knob of halter yellow.

Abdomen with brownish gray pollen, with black narrow median vitta.

Length. Body 4.5–5.0 mm, wing 3.0–3.5 mm.

MATERIAL EXAMINED: [KPNU] <GB> 9 exs., Sobaeksan, 10.v.1981, YJ Kwon; [NIAST] <GB> 2 exs., Sobaeksan, 10.v.1981, YJ Kwon.

DISTRIBUTION: Korea, Japan (Hokkaido, Honshu), China (Jilin, Liaoning), U.K.

LOCALITY: Central-GW: Seoraksan; South-GB: Sobaeksan.

16. *Botanophila maculipedella* (Suwa, 1974) (Fig. 17)

Pegohylemyia maculipedella Suwa, 1974: 138–140 (Japan); Suwa, 1983b: 32.

Botanophila maculipedella: Suh & Kwon, 1985: 177; Suh, 1989: 78; Dely-Draskovits, 1993: 27; Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 302; Kwon et al., 1996: 223; Suwa, 1999: 209; Han et al., 2014: 144.

Botanophila maculipedela (sic): Paek et al., 2010: 241.

Male. Brown black in ground color, with thin grayish pollen. Head about 1.6 times as high as long in profile. Frons at narrowest part equal to width of anterior ocellus; parafrotaia broadly contiguous to each other. Interfrontalia dull tinged with brown near lunule, a pair of proclinate *if*; parafrotaia with 6–7 *ori*. Parafacialia and cheek black with gray pollen; parafacialia about 0.7–0.8 times as wide as width of third antennal segment; cheek at narrowest part about 1.5 times as high as width of third antennal segment. Antenna black; third segment about 2.3 times as long as wide; arista distinctly pubescent, somewhat shorter than basal diameter of arista. Palpus black with brown tinge; haustellum black with brown tinge and slender.

Thorax brownish black in ground color, with gray pollen, and patches of brown pollen, especially on dorsum. Mesonotum with a black median vitta presuturally in caudal view; 3 pairs of *pre acr* and several fine irregular setulae between rows, the distance separating *pre acr* rows about half distance between *pre acr* and *dc* rows. Second *ph* about half as long as posterior *ntpl*. Posterior *ntpl* slightly longer than anterior *ntpl*. Proepisternum with 2 *prepst*. Anepisternum with 6 *prepm*.

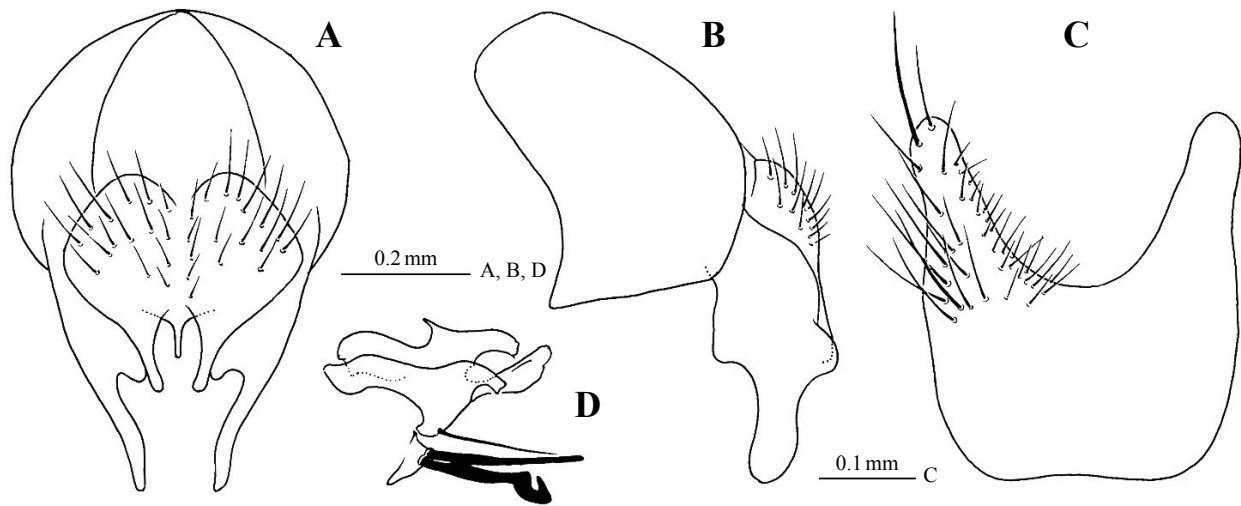


Fig. 17. *Botanophila maculipedella* (Suwa, 1974), male. A, B. hypopygium; C. fifth sternite; D. gonocoxal lobe, gonostylus and phallus.

Legs yellow; fore legs black tinged with amber on tibiae; mid and hind legs with more black knees; fore femur with a series of strong *ad* and *av*, setae much longer than width of femur; fore tibia with 1 *ad* and 1 *pv*; mid femur with a series of strong *ad* and *av* on half basad; mid tibia with 1 *ad*, 2–3 *pd*, 1 *pv* and apical *av* and *pv*; hind femur with series of strong *ad* and *av*, setae much longer than width of femur; hind tibia with 5 *ad*, 2 *av*, 4–5 *pd*, 2 *pv* and apical *av*.

Wing faintly brownish tinged, denser basally; costal spine indistinguishable from anterior setulae; m-m straight. Calypter and knob of halter brown.

Length. Body 5.6–6.0 mm, wing 4.6–5.0 mm.

DISTRIBUTION: Korea, Japan (Hokkaido, Honshu), China (Jilin).

LOCALITY: Central-GW: Odaesan.

17. *Botanophila maculipes* (Zetterstedt, 1845) (Fig. 18)

Anthomyza maculipes Zetterstedt, 1845: 1708 (Sweden: Jämtland).

Botanophila maculipes: Michelsen, 1985: 51; Suh & Kwon, 1985: 176; Suh, 1989: 78, 79; Dely-Draskovits, 1993: 27; Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 302; Kwon et al., 1996: 223; Suwa, 1999: 210; Paek et al., 2010: 241; Han et al., 2014: 144.

Hylemyia pseudomaculipes Strobl, 1893: 249 (Austria).

Hylemyia (Pegohylemyia) pseudomaculipes: Ringdahl, 1933: 27.

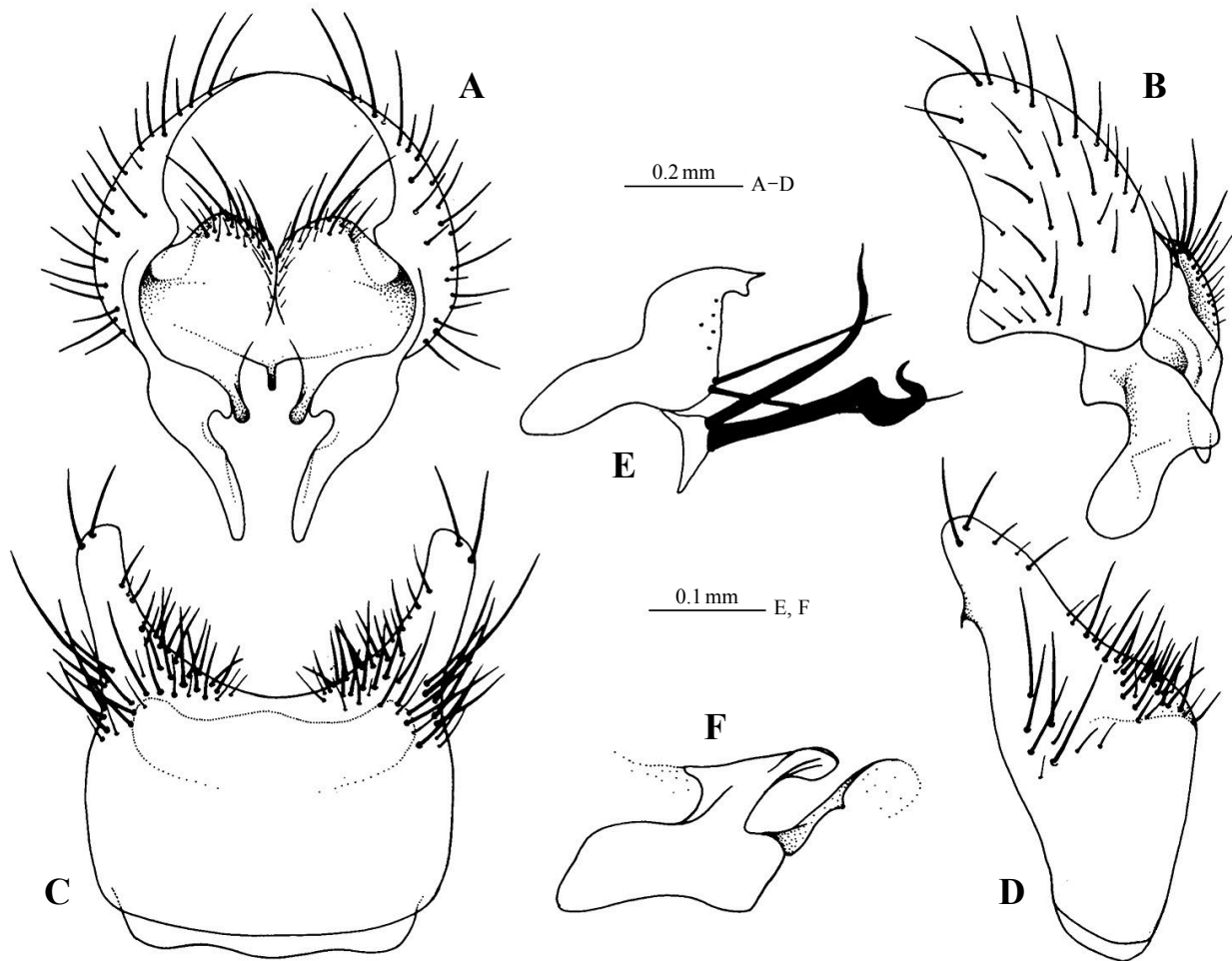


Fig. 18. *Botanophila maculipes* (Zetterstedt, 1845), male. A, B. hypopygium; C, D. fifth sternite; E. gonocoxal lobe and gonostylus; F. phallus.

Hylemyia (Xanthocnemia) pseudomaculipes: Karl, 1943: 66.

Xanthocnemia pseudomaculipes: Ringdahl, 1959: 257.

Pegohylemyia pseudomaculipes: Hennig, 1970: 399, 400, pls. 31 (501), 47 (602), 50 (625); Suwa, 1983b: 32.

Male. Brown black in ground color, with thin grayish pollen. Head about 1.5 times as high as long in profile. Frons at narrowest part equal to width of anterior ocellus; parafrontalia broadly contiguous to each other. Interfrontalia and parafrontalia fuscous, with 1 *if* and 5 *ori*. Parafacialia and cheek black with gray pollen; parafacialia slightly narrower than width of third antennal segment; cheek at narrowest part about 1.2 times as high as width of third antennal segment. Antenna black; third segment about 1.1–1.2 times as long as wide; arista distinctly pubescent, the longest hair slightly shorter than basal diameter of arista. Palpus black with brown tinge; haustellum black with brown tinge and very slender.

Thorax black in ground color, with gray pollen, and patches of brown pollen, especially on dorsum. Mesonotum with a pale median vitta presuturally in caudal view; 3 pairs of *pre acr* and several fine irregular setulae between rows, between *pre acr* rows about equal to that between them and *dc* rows. Second *ph* about 0.8 times as long as posterior *ntpl*. Posterior *ntpl* slightly longer than anterior *ntpl*. Proepisternum with 2 *prepst*. Anepisternum with 5 fine *prepm*.

Legs yellow with more black knees; fore tibia with 1 *ad* and 1 *pv* mid femur with a series of *pv*; mid tibia with 1 *ad*, 2 *pd*, 2 *pv* and apical *av* and *pv*; hind femur with a series of strong *ad*, *av*, *pd* and *pv*, setae much longer than width of femur; hind tibia with 4 *ad*, 1 *av*, 4 *pd*, 3–4 *pv* and strong apical *av*.

Wing hyaline; costal spine indistinguishable from anterior setulae; m-m straight. Calypter and knob of halter yellow.

Abdomen with brownish gray pollen, with black median vitta.

Length. Body 5.5–6.5 mm, wing 5.0–5.5 mm.

MATERIAL EXAMINED: [KPNU] <GW> 3 exs., Seoraksan, 30.v.1984, YJ Kwon; 1 ex., Seoraksan, 19.viii.1989, YJ Kwon; [NIAST] <GW> 1 ex., Seoraksan, 29.vii.1982, YJ Kwon.

DISTRIBUTION: Korea, Japan (Hokkaido, Honshu, Shikoku), China (Sichuan, Xizang), Europe.

LOCALITY: Central-GW: Odaesan, Seoraksan; South-GN: Jirisan.

18. *Botanophila nigrigenis* (Suwa, 1974) (Fig. 19)

Pegohylemyia nigrigenis Suwa, 1974: 140–142 (Japan: Honshû).

Botanophila nigrigenis: Suh et al., 1991: 45; Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 302; Kwon et al., 1996: 223; Paek et al., 2010: 241; Han et al., 2014: 144.

Male. Black in ground color, with thin grayish pollen. Head about 1.4–1.5 times as high as long in profile. Frons at narrowest part narrower than anterior ocellus; parafrofrontalia broadly contiguous to each other. Interfrontalia and parafrofrontalia dull, with 1 *if* and 5–6 *ori*. Parafacialia and cheek black with gray pollen; parafacialia slightly narrower than width of third antennal segment; cheek at narrowest part about 1.2 times as high as width of third antennal segment. Antenna black; third segment about 1.1–1.2 times as long as wide; arista distinctly pubescent, the longest hair somewhat shorter than basal diameter of arista. Palpus black; haustellum black and very slender.

Thorax black in ground color, with brownish gray pollen, and patches of brown pollen, especially on dorsum. Mesonotum with 3–4 pairs of *pre acr* and several fine irregular setulae between rows, between *pre acr* rows about equal to that between them and *dc* rows. Second *ph* about 0.6 times as long as posterior *ntpl*. An-

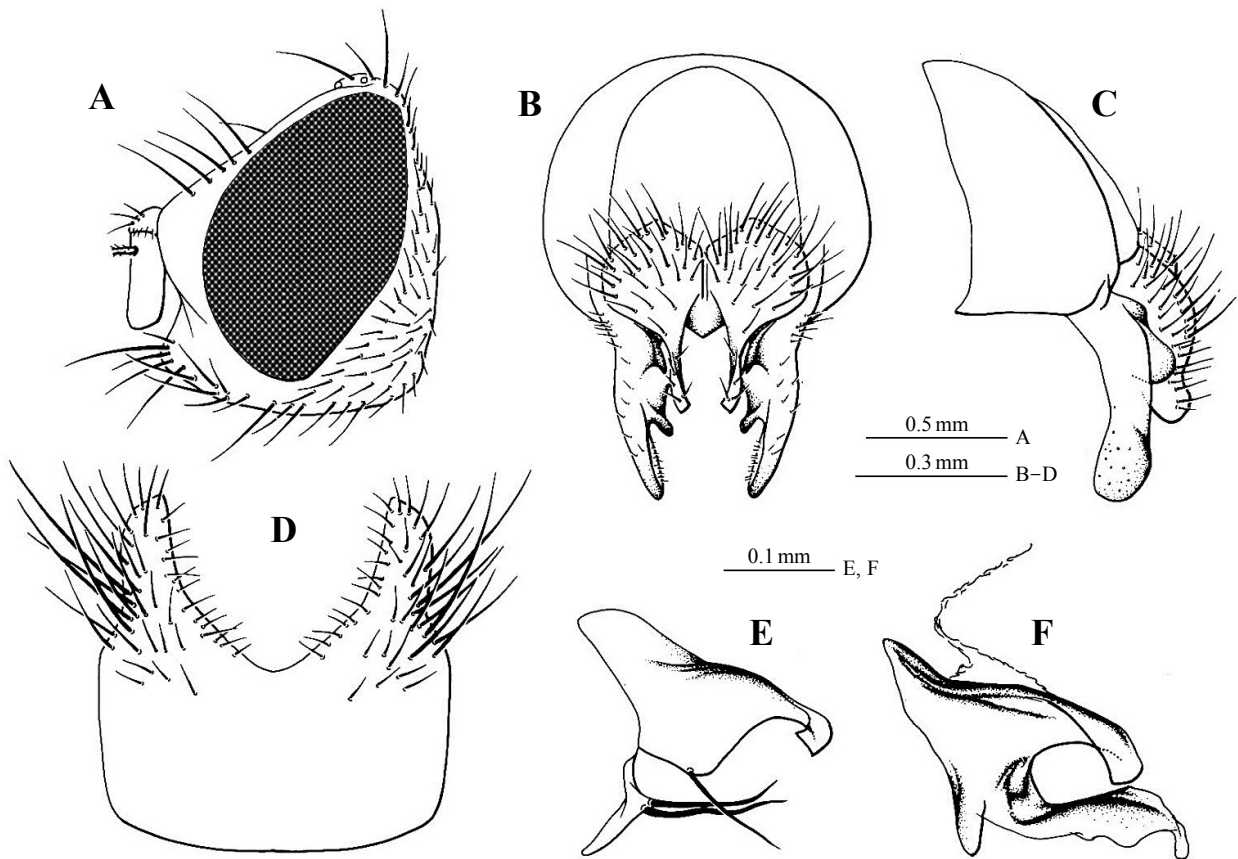


Fig. 19. *Botanophila nigrigenis* (Suwa, 1974), male. A. head; B, C. hypopygium; D. fifth sternite; E. gonocoxal lobe and gonostylus; F. phallus.

terior *ntpl* about 1.3 times as long as posterior *ntpl*. Proepisternum with 2 *prepst*. Anepisternum with 2 long and 4–5 fine *prepm*.

Legs brown with more black knees; fore femur with a series of strong *ad* and *av*, setae much longer than width of femur; fore tibia with 1 *ad* and 1 *pv* mid femur with a series of *pv* on half basad; mid tibia with 1 *ad*, 4 *pd* and apical *av* and *pv*; hind femur with a series of strong *ad*, *av* and *pv*, setae much longer than width of femur; hind tibia with 4 *ad*, 2 *av*, 3–4 *pd* and 5 *pv*.

Wing faintly brownish tinged, denser basally; costal spine indistinguishable from anterior setulae; m-m slightly sinuate. Calypter brown; knob of halter brownish yellow.

Length. Body 7.0 mm, wing 6.0 mm.

DISTRIBUTION: Korea, Japan (Hokkaido, Honshu), China (Jilin, Liaoning).

LOCALITY: North-HB: Paekdusan.

19. *Botanophila palgongsana* Suh et Kwon, 1986 (Fig. 20)

Botanophila palgongsana Suh & Kwon, 1986: 158, 159, fig. 1 (Korea: Palgongsan); Suh, 1989: 80; Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 302; Kwon et al., 1994: 265; Kwon et al., 1996: 223; Paek et al., 2010: 241; Han et al., 2014: 144.

Male. General coloration black, with faintly grayish pruinescence. Head about 1.4 times as long in profile; frons equal to distance between posterior ocelli exclusive; interfrontalia wholly black; 5 strong and some additional *ori*; 1 strong *if*. Parafacialia and cheek grayish pruinose; cheek with 2 genal setae. Antenna blackish; third antennal segment about 1.1–1.2 times as long as wide, arista minutely pubescent.

Thorax and abdomen black, covered with sparsely brown grayish pruinescence; mesonotum with brownish median and somewhat faint sublateral vittae; 3 *pre acr*, the second seta rather longer than two-thirds of *pre dc*; second *ph* indistinguishable from accessory setulae; *pra* little longer than half of posterior *ntpl* in length. Scutellum setulose on ventral surface. Anepisternum lacking distinct anterior *anepst*; 3 *prepm*, but

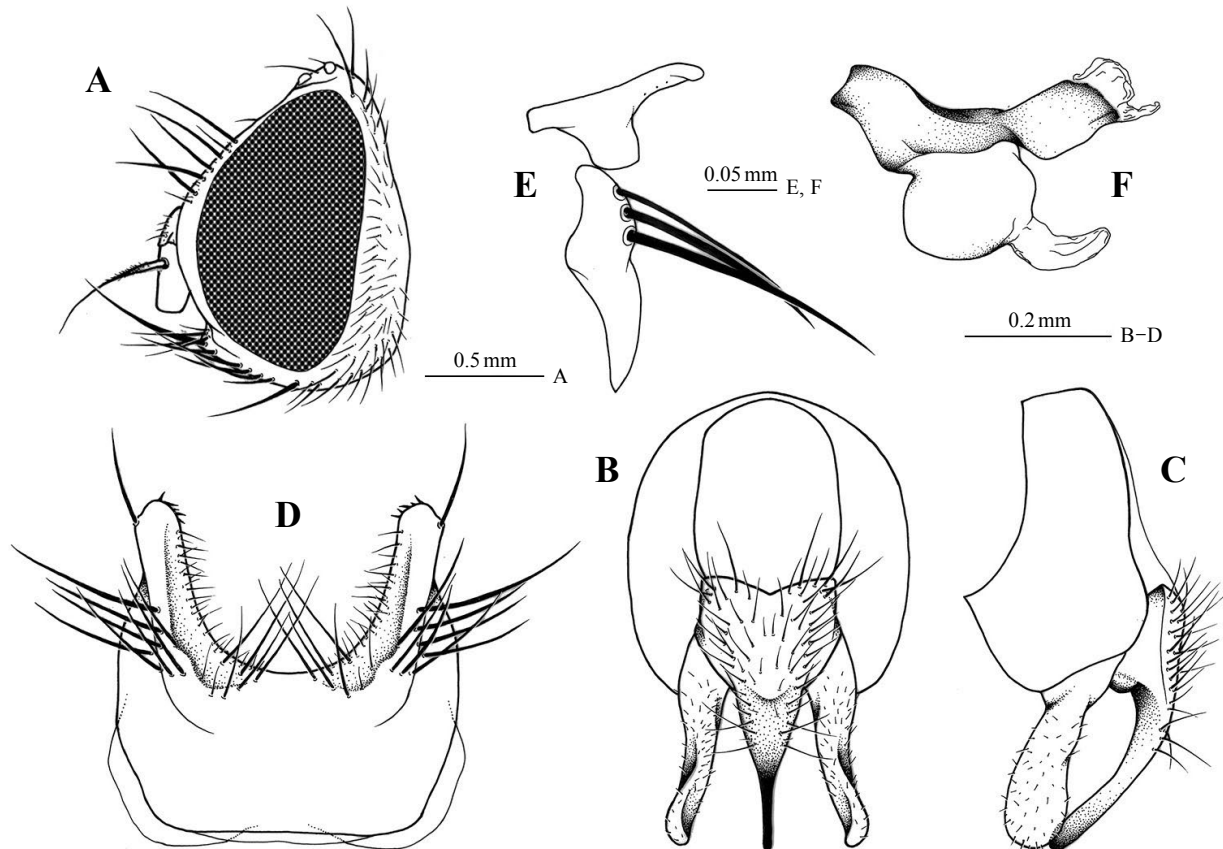


Fig. 20. *Botanophila palgongsana* Suh et Kwon, 1986, male. A. head; B, C. hypopygium; D. fifth sternite; E. gonocoxal lobe and gonostylus; F. phallus.

slightly shorter than *prepst.*

Legs entirely black; fore tibia with 1 *pv*; mid tibia with 1 *ad*; hind tibia with 5 *ad*, 2 *av*, 2–3 *pd* and 2 *pv*.

Wing tinged with brown; m-m nearly straight; Calypter and knob of halter brownish.

Length. Body 4.9 mm, wing 4.1 mm.

MATERIAL EXAMINED: [KPNU] <GB> 1 ex., Palgongsan, 25.v.1986, YJ Kwon.

DISTRIBUTION: Korea.

LOCALITY: South-GB: Palgongsan.

20. *Botanophila peninsularis* Suh et Kwon, 1986 (Fig. 21)

Botanophila peninsularis Suh & Kwon, 1986: 159, 160, fig. 2 (Korea: Jillyang-myeon); Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 302; Kwon et al., 1996: 223; An, 1998: 62; Paek et al., 2010: 241; Han et al., 2014: 145.

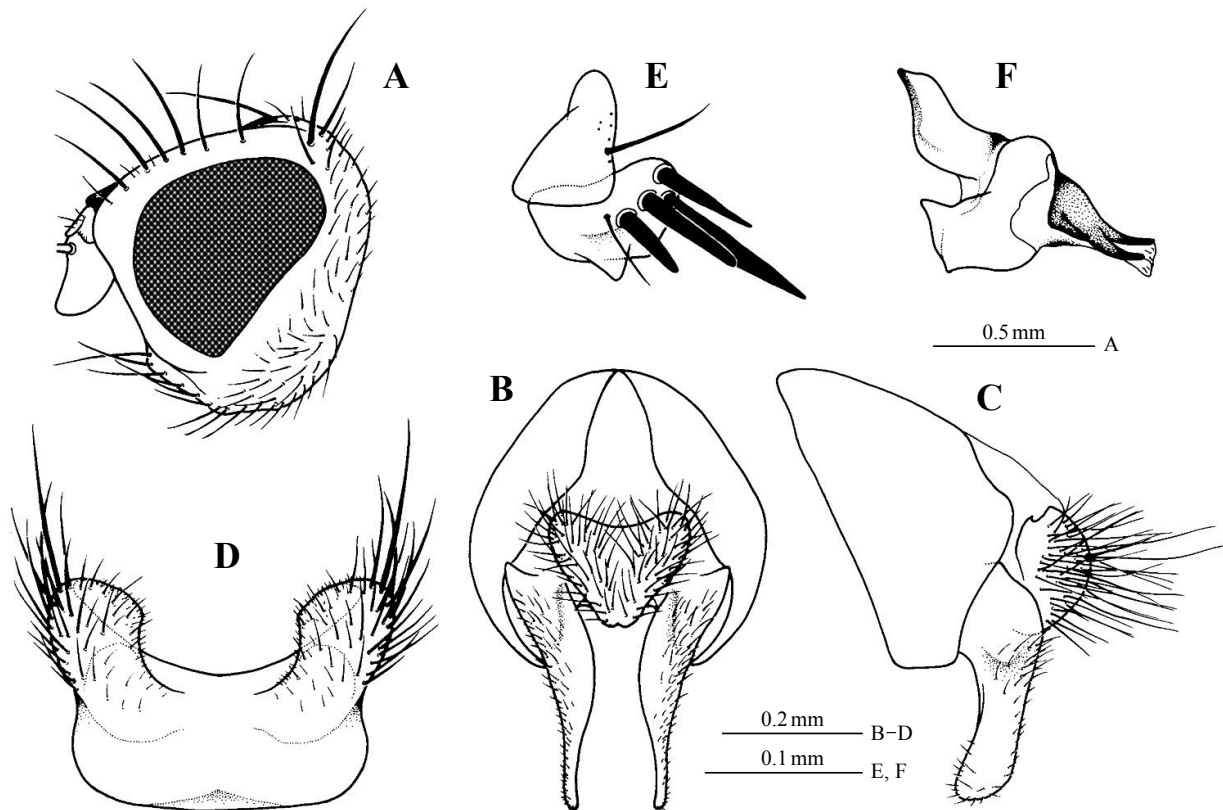


Fig. 21. *Botanophila peninsularis* Suh et Kwon, 1986, male. A. head; B, C. hypopygium; D. fifth sternite; E. gonocoxal lobe and gonostylus; F. phallus.

Male. General coloration black, with faintly brownish pruinescence. Head slightly higher than long in profile; frons broad, about 0.4 times as wide as head-width; interfrontalia dull, becoming dark reddish at base of antenna and especially blackish on each outer margin; orbital area slightly brownish near lunule and blackish on the remaining part in ground color; frons with 6–7 strong and some additional *ori*. Antenna blackish; third antennal segment 1.6–1.7 times as long as wide, with arista minutely pubescent. Palpus blackish; haustellum robust and blackish.

Thorax and abdomen black, and covered with sparsely brownish pruinescence; mesonotum with 5–6 fine *pre acr*; second *ph* very weak and indistinguishable from accessory setulae; *pra* shorter and weaker than posterior *ntpl*. Anepisternum with 1 long and 1 fine *prepm*. *Kepst* 1:1, anterior shorter and weaker than posterior.

Legs blackish; tibiae and tarsi somewhat tinged with brown. Fore tibia with 1 *ad* and 1 *pd*; mid tibia with 1 *ad* and 1 *pd*; hind tibia with 3–5 *ad* and 2–3 *pd*.

Wing distinctly tinged with dark brown; m-m nearly straight. Calypter clear; knob of halter whitish yellow.

Length. Body 3.7–4.0 mm, wing 3.2–3.5 mm.

MATERIAL EXAMINED: [KPNU] <GB> 3 exs., Jillyang-myeon, 7.iv.1986, YJ Kwon; 1 ex., Sobaeksan, 10.v.1985, YJ Kwon; [NIAST] <GB> 1 ex., Jillyang-myeon, 7.iv.1986, YJ Kwon.

DISTRIBUTION: Korea, China (Liaoning).

LOCALITY: South-GB: Jillyang-myeon, Sobaeksan.

21. *Botanophila profuga* (Stein, 1916) (Fig. 22)

Hylemyia profuga Stein, 1916: 141 (Sweden: Jämtland).

Botanophila profuga: Suh et al., 1991: 45, 46; Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 302; Kwon et al., 1996: 223; Paek et al., 2010: 241; Han et al., 2014: 145.

Hylemyia acrostichalis Malloch, 1919: 1913–1918 (USA: Alaska).

Hylemyia tridens Malloch, 1920: 284 (USA: Alaska).

Male. Ground color black, with thin grayish pollen. Head about 1.2–1.5 times as high as long in profile. Frons at narrowest part equal to width of anterior ocellus. Interfrontalia and parafacialia dull, with 1 *if*. Parafacialia and cheek black with brown yellowish tinge; Antenna black; third segment about 1.5 times as long as wide; arista distinctly pubescent, the longest hair slightly shorter than basal diameter of arista.

Thorax black in ground color, with brownish gray pollen, and patches of brown pollen, especially on dorsum. Mesonotum; 3 pairs of *pre acr* and several fine irregular setulae between rows, between *pre acr* rows

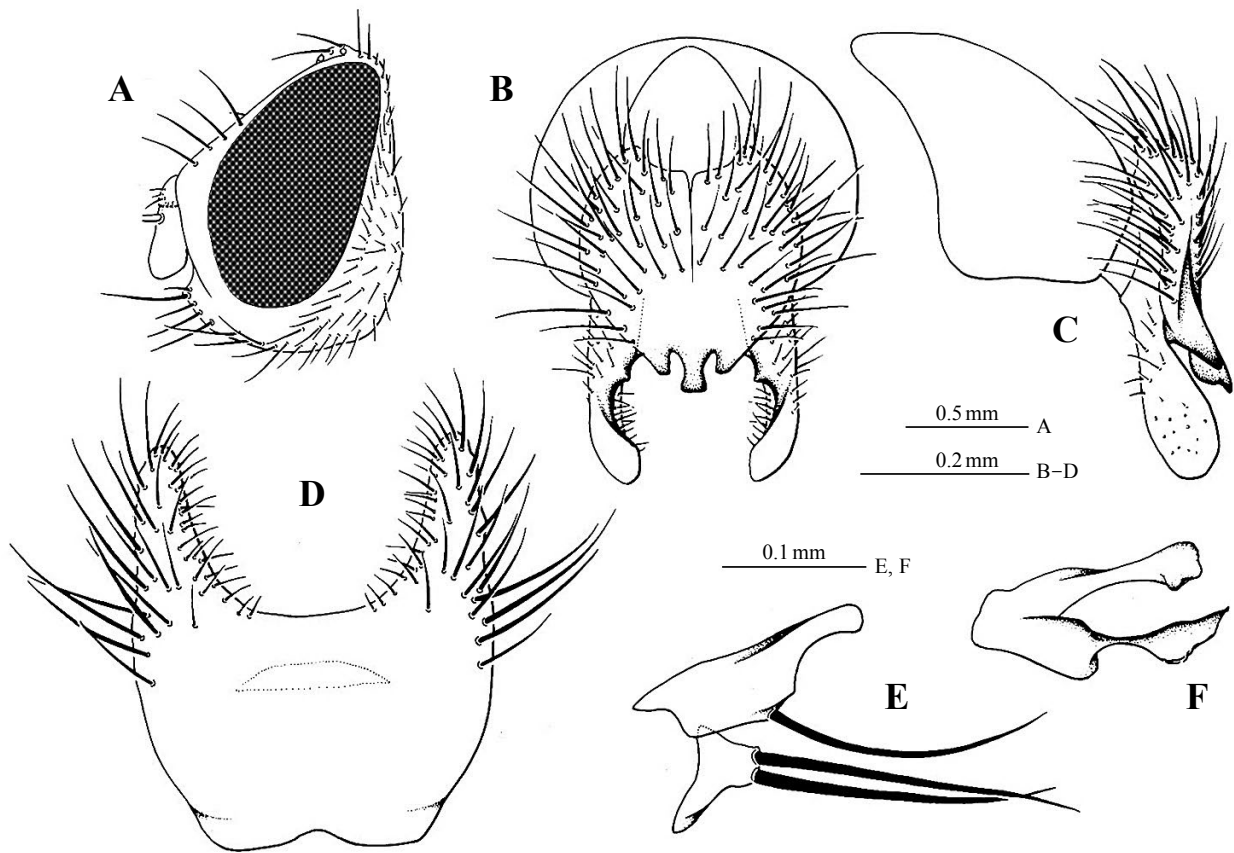


Fig. 22. *Botanophila profuga* (Stein, 1916), male. A. head; B, C. hypopygium; D. fifth sternite; E. gonocoxal lobe and gonostylus; F. phallus.

about equal to that between them and *dc* rows. Second *ph* about as long as posterior *ntpl*.

Legs brown with more black knees; fore tibia with 1 *ad* and 1 *pv*; mid tibia with 1 *ad*, 2 *pd* and 2 *pv*; hind femur with a series of strong *av* and *pv*, setae much longer than width of femur; hind tibia with 4–5 *ad*, 3 *av*, 3 *pd* and 3–5 *pv*.

Wing faintly brownish tinged, denser basally; costal spine indistinguishable from anterior setulae. Calypter and knob of halter brown.

Length. Body 7.0 mm, wing 5.5 mm.

DISTRIBUTION: Korea, Japan (Hokkaido, Honshu), China (Heilongjiang, Liaoning, Qinghai), Europe, N. America.

LOCALITY: North-HB: Sobaeksan.

HOST: The adult is commonly found on the flowers of *Archalica* spp. and *Geranium* spp. (cf. Hennig, 1970).

22. *Botanophila seungmoi* Suh et Kwon, 1985 (Fig. 23)

Botanophila seungmoi Suh & Kwon, 1985: 175, 176 (Korea: Soraksan); Suh, 1989: 80; Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 302; Kwon et al., 1996: 223; Paek et al., 2010: 241; Han et al., 2014: 145.

Male. General coloration black, with brown grayish pollinose. Head 1.2–1.3 times as high as long in profile; frons at narrowest part about equal to distance between posterior ocelli inclusive; parafrontalia widely separated; frons with 5 and a few of additional *ori*, 1 fine *if*. Parafacialia and cheek dark reddish brown; epistoma slightly projecting forwards beyond tip of profrons. Antenna black, with arista shortly pubescent, third antennal segment 1.6 times as long as wide. Palpus and haustellum black, slender, mentum thinly pollinose.

Thorax dull brownish pollinose; mesonotum with obscure brownish median and sublateral vittae; 3 weak *pre acr*, a few additional setulae on between the rows. *Pra* rather shorter than anterior *ntpl*; second *ph* barely distinguished from accessory setulae. *Kept* 1:2 the posterior lower one shorter than the others.

Legs entirely black; fore tibia with 1 *pv*; mid tibia with 1 *ad*, 2 *pd* and 1–2 *pv*; hind tibia with 3–4 *ad*, 2 *av*

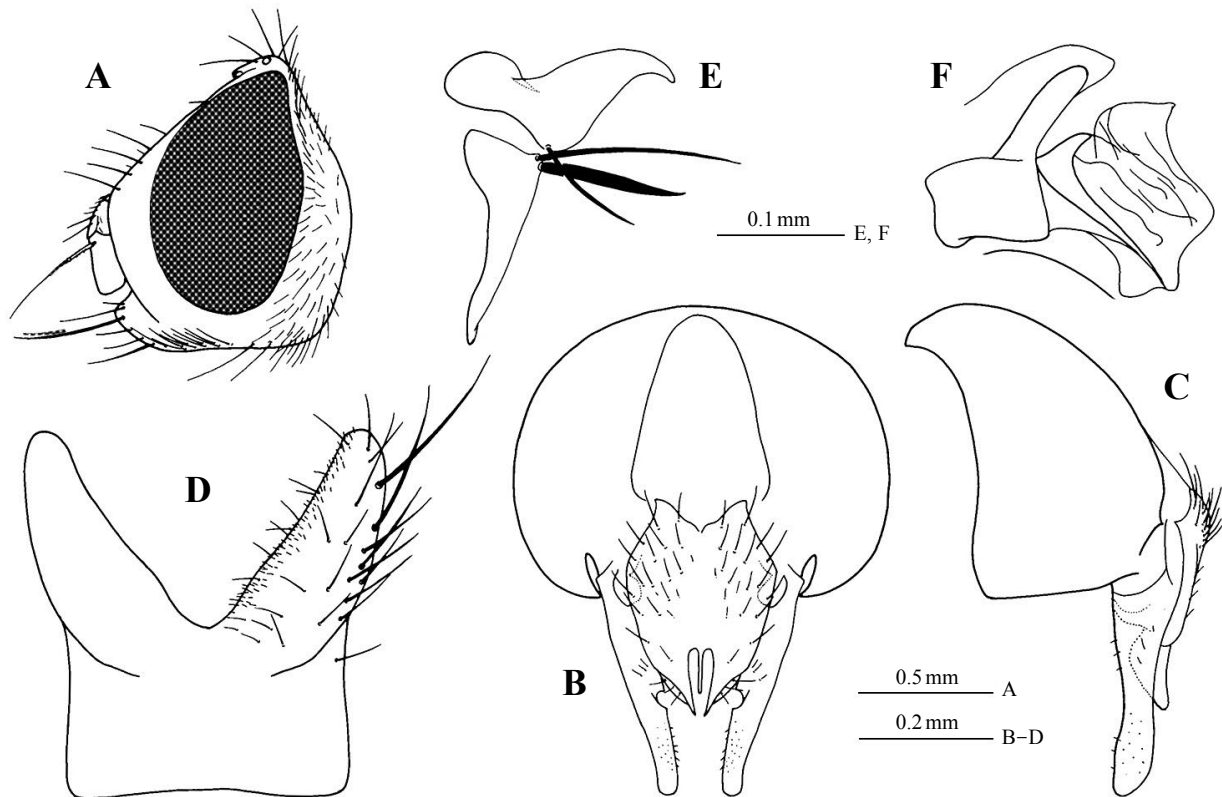


Fig. 23. *Botanophila seungmoi* Suh et Kwon, 1985, male. A. head; B, C. hypopygium; D. fifth sternite; E. gonocoxal lobe and gonostylus; F. phallus.

and 3 *pd*, and no apical *pv*.

Wing brownish tinged and denser basally; m-m nearly straight; Calypter and knob of halter brown.

Abdomen blue grayish pollinose, which slightly tinged with brown; median vitta narrow and dark brown.

Length. Body 5–6.0 mm, wing 6.5–6.7 mm.

Female. Frons a little narrower than half width of head; with 3 *ori*, 2 *ors* and 1 *if*; abdomen without median vitta.

Length. Body 5.6 mm, wing 5.3 mm.

MATERIAL EXAMINED: [KPNU] <GW> 5 exs., Seoraksan, 15.ix.1984, YJ Kwon; [NIAST] <GW> 1 ex., Seoraksan, 15.ix.1984, YJ Kwon.

DISTRIBUTION: Korea.

LOCALITY: Central-GW: Seoraksan.

23. *Botanophila shirozui* (Suwa, 1981) (Fig. 24)

Pegohylemyia shirozui Suwa, 1981a: 104–107 (Japan).

Botanophila shirozui: Suh & Kwon, 1985: 176; Suh, 1989: 80; Suh et al., 1991: 46; Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 302; Suh & Kwon, 1995: 194, 195; Kwon et al., 1996: 223; Wei et al., 1996: 695; Suwa, 2013: 149; Paek et al., 2010: 241; Han et al., 2014: 145.

Male. Black in ground color, with thin grayish pollen. Head about 1.2–1.3 times as high as long in profile. Frons at narrowest part narrower than anterior ocellus; parafrontalia broadly contiguous to each other. Interfrontalia and parafrontalia dull, with 1 strong and a few fine *if* and 4 strong and 1 fine *ori*. Parafacialia and cheek black with gray pollen; parafacialia about 0.8 times as wide as width of third antennal segment; cheek at narrowest part nearly equal to width of third antennal segment. Antenna black; third segment about 2.5 times as long as wide; arista distinctly pubescent, the longest hair slightly shorter than basal diameter of arista. Palpus brown and slender; haustellum black and very slender.

Thorax black in ground color, with brownish gray pollen, and patches of brown pollen, especially on dorsum. Mesonotum with 3–4 pairs of *pre acr* and several fine irregular setulae between rows, the distance separating *pre acr* rows about two third as wide as distance between *pre acr* and *dc* rows. Second *ph* about 0.6 times as long as posterior *ntpl*. Anterior *ntpl* about 1.3 times as long as posterior *ntpl*. Proepisternum with 2 *prepst*. Anepisternum with 4 upper anterior seta and, 2 long and 4 fine *prepm*. *Kepst* 2:3.

Legs black; mid and hind femora more brownish; fore femur with a series of strong *ad* and *av*, setae much longer than width of femur; fore tibia with 1 *ad* and 1–2 *pv*; mid femur with a series of *av* and *pv*; mid tibia with 6 *ad*, 3 *av*, 4 *pd* and 6 *pv*; hind femur with a series of strong *ad* and *av*, setae much longer than width of

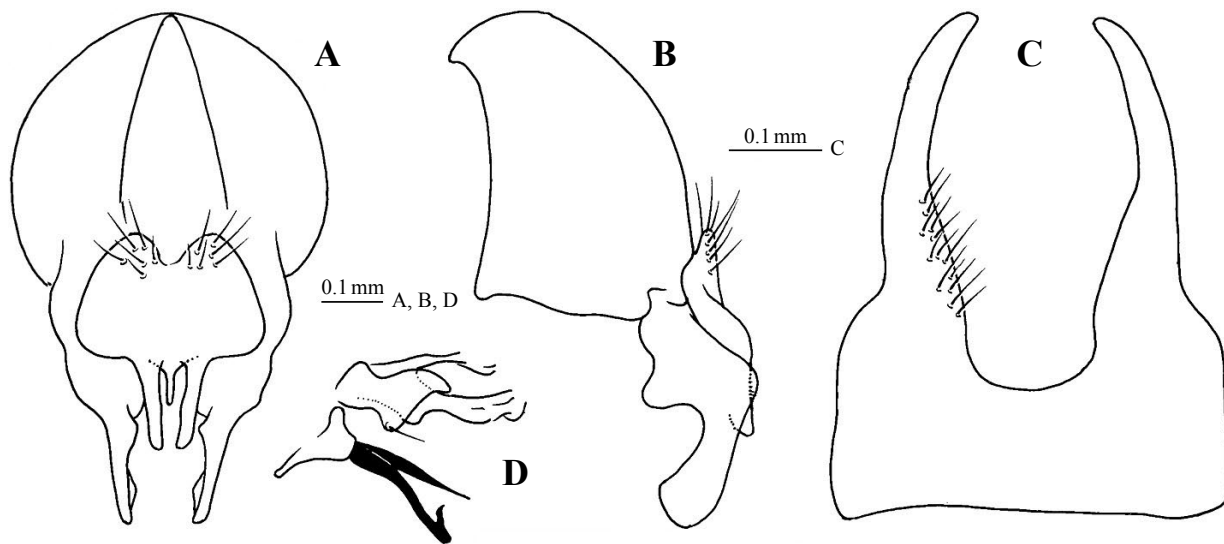


Fig. 24. *Botanophila shirozui* (Suwa, 1981), male. A, B. hypopygium; C. fifth sternite; D. gonocoxal lobe, gonostylus and phallus.

femur; hind tibia with 6 *ad*, 3 *av*, 3 *pd* and 5 *pv* and apical *av*.

Wing faintly brownish tinged, denser basally; costal spine indistinguishable from anterior setulae. Calypter and knob of halter yellowish brown.

Abdomen with brownish gray pollen, and black narrow median vitta; each tergite with a series of robust seta along posterior margin.

Length. Body 7.0–7.5 mm, wing 5.5–6.0 mm.

MATERIAL EXAMINED: [KPNU] <JJ> 16 exs., Seongpanak, 19.vi.1973, SH Park; [NIAST] <JJ> 2 exs., Seongpanak, 19.vi.1973, SH Park.

DISTRIBUTION: Korea, China (Heilongjiang, Liaoning), Russia (Sakhalin).

LOCALITY: North-HB: Onsupjeong, Paekdusan, Samjiyeon, Sobaeksan; Jeju-JJ: Hallasan (= Seongpanak).

24. *Botanophila spinisternata* (Suwa, 1974) (Fig. 25)

Pegohylemyia spinisternata Suwa, 1974: 131–134 (Japan: Hokkaido); Kwon & Suh, 1982d: 3.

Botanophila spinisternata: Suh & Kwon, 1985: 176; Suh, 1989: 81; Dely-Draskovits, 1993: 30; Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 302; Kwon et al., 1996: 223; Suwa, 1999: 212; Paek et al., 2010: 241; Suwa, 2013: 149; Han et al., 2014: 145.

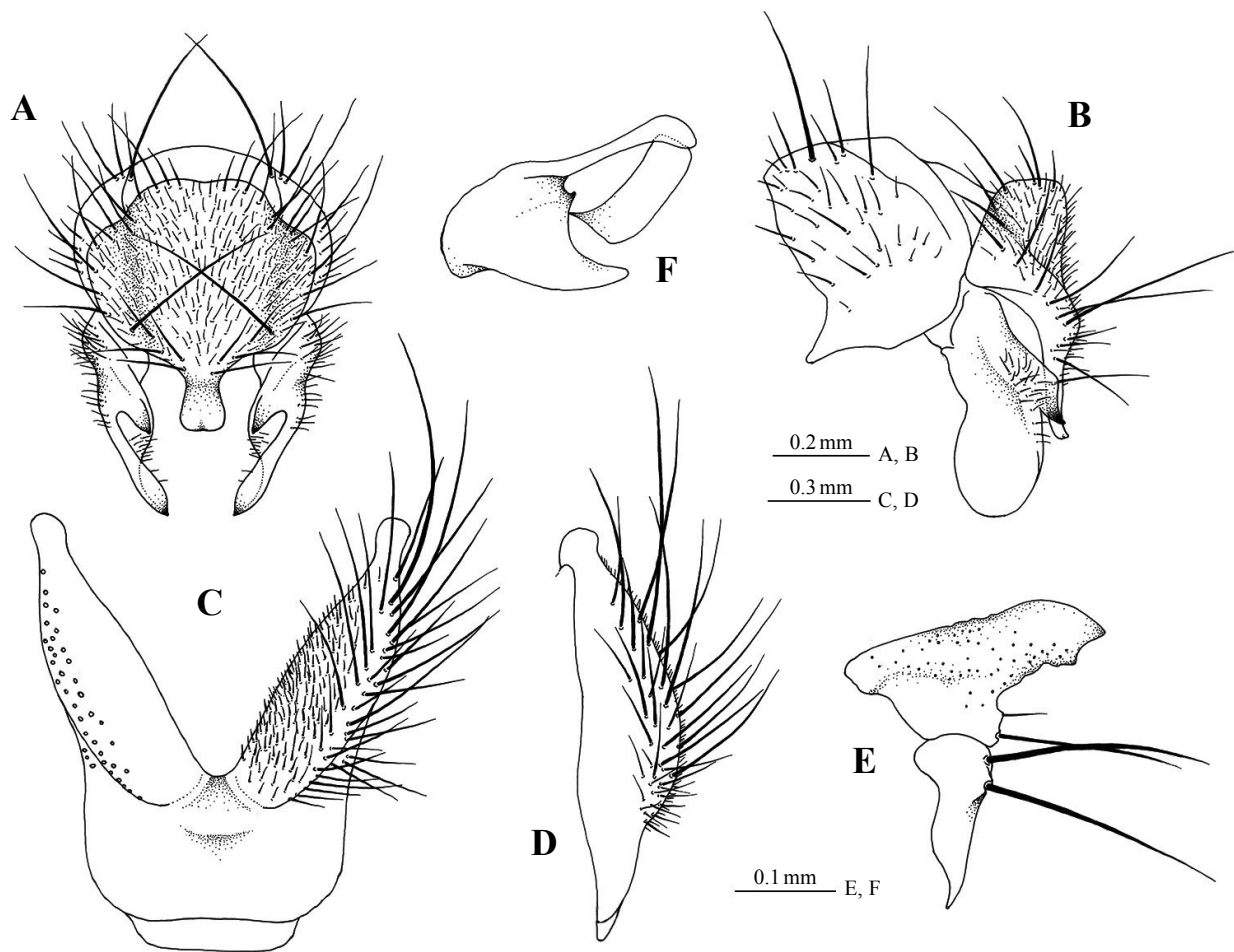


Fig. 25. *Botanophila spinisternata* (Suwa, 1974), male. A, B. hypopygium; C, D. fifth sternite; E. gonocoxal lobe and gonostylus; F. phallus.

Male. Black in ground color, with thin grayish pollen. Head about 1.3–1.4 times as high as long in profile. Frons at narrowest part slightly wider than distance between posterior ocelli exclusive. Interfrontalia and parafrontalia dull, with 1 strong *if* and 6 strong and 1–2 fine *ori*. Parafacialia and cheek black with gray pollen; parafacialia about 0.7–0.8 times as wide as width of third antennal segment; cheek at narrowest part about 0.7–0.8 times as wide as width of third antennal segment. Antenna black; third segment about 2.5 times as long as wide; arista pubescent, the longest hair slightly longer than basal diameter of arista. Palpus and haustellum fuscous and slender.

Thorax black in ground color, with brownish gray pollen, and patches of brown pollen, especially on dorsum. Mesonotum with paler blackish vittae between *pre acr* and *dc* rows in caudal view; 5–6 pairs of *pre acr* and several fine irregular setulae between rows, the distance separating the *pre acr* rows equal to half the distance between *pre acr* and *dc* rows. Second *ph* very short, indistinguishable from accessory setulae.

Anterior *ntpl* about 1.3 times as long as posterior *ntpl*. Proepisternum with 2 *prepst*. Anepisternum with 2 long and 10–12 fine *prepm*.

Legs black; fore femur with a series of strong *ad* and *av*, setae much longer than width of femur; fore tibia with 2 *ad* and 1 *pv*; mid tibia with 1 *ad*, 1 *pd*, 2 *pv* and, strong apical *av* and *pv*; hind femure with a series of strong *ad* and *pv*, setae much longer than width of femur; hind tibia with 4 *ad*, 3 *av*, 3 *pd* and 5–8 *pv* and robust apical *av*.

Wing faintly brownish tinged, denser basally; costal spine indistinguishable from anterior setulae. Calypter and knob of halter yellowish brown.

Length. Body 8.0 mm, wing 6.5 mm.

MATERIAL EXAMINED: [KPNU] <GW> 1 ex., Seoraksan, 30.vii.1982, YJ Kwon.

DISTRIBUTION: Korea, Japan (Hokkaido, Honshu), China (Heilongjiang, Jilin), Russia (Sakhalin).

LOCALITY: Central-GW: Seoraksan.

25. *Botanophila striolata* (Fallén, 1824) (Fig. 26)

Musca striolata Fallén, 1824: 71 (Sweden).

Pegohylemyia striolata: Hennig, 1970: 417–420, pls. 35 (460, 461), 44 (553), 48 (609).

Botanophila striolata: Michelsen, 1983: 118; Suh & Kwon, 1985: 174, 175; Suh, 1989: 81, 82; Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 302; Kwon et al., 1996: 223; An, 1998: 62; Suwa, 1999: 212; Paek et al., 2010: 241; Han et al., 2014: 145.

Anthomyia discreta Meigen, 1826: 174 (not given).

Aricia trapezoides + *A. arrogans* Zetterstedt, 1845: 1554, 1567.

Aricia auctineryis + *A. sulcella* Zetterstedt, 1860: 6240, 6259.

Chortophila sexdentata Bigot, 1885: 227 (France).

Anthomyia (*Chortophila*) *insperata* Pandellé, 1900: 260 (France).

Pegomyia (*Anthomyia*) *discreta* var. *fugitiva* Schnabl, 1911: 268 (not given).

Pegomyia (*Anthomyia*) *discreta* var. *arctica* Schnabl, 1915: 20 (Russia).

Chortophila bompadrei Berri, 1918: 113 (Italy).

Chortophila villeneuvei Séguy, 1923: 135 (France).

Hylemyia quadriseta Ringdahl, 1926: 115 (Sweden).

Hylemyia discreta var. *angustifrons* Ringdahl, 1930: 11 (Russia: Kamchatka).

Male. General coloration black, with grayish pollinosity. Head about 1.3 times as high as long in profile; frons as wide as distance between posterior ocelli exclusive; frons with 7 *ori* and 2 *if*. Parafacialia and cheek

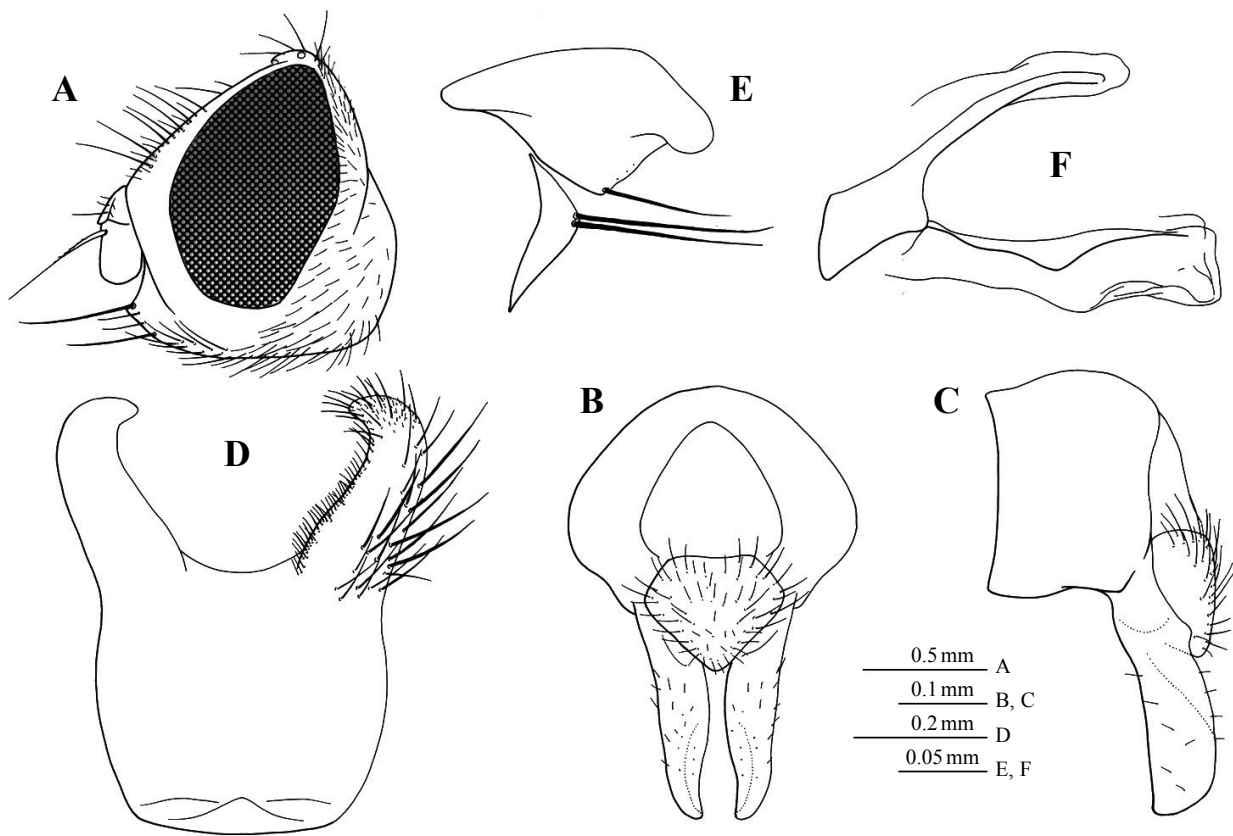


Fig. 26. *Botanophila striolata* (Fallén, 1824), male. A. head; B, C. hypopygium; D. fifth sternite; E. gonocoxal lobe and gonostylus; F. phallus.

bluish gray pruinescent; epistoma slightly protruding forwards beyond tip of profrons. Antenna black, with arista minutely pubescent; third antennal segment 1.6 times as long as wide.

Thorax finely grayish pollinose. Mesonotum with distinct brownish median, sublateral and lateral vittae; 3 fine *pre acr*, a few additional setulae between the rows; *pra* longer than anterior *ntpl*. Scutellum with large brownish shadow on dorsum.

Legs black; fore tibia with 1 *ad* and 1 *pv*; mid tibia with 1 *ad*, 2 *pd* and 2 *pv*; hind tibia with 4 *ad*, 3 *av*, 2 *pd* and 2 *pv*.

Wing dark brownish tinged; m-m nearly straight; Calypter yellowish tinged; knob of halter brownish.

Abdomen with broad median vitta and broad fore marginal bands on each tergite; anal sclerite shining black; prebasal sclerite setose on hind margin.

Length. Body 4.9 mm, wing 4.3 mm.

MATERIAL EXAMINED: [KPNU] <GB> 1 ex., Sobaeksan, 15.v.1981, YJ Kwon.

DISTRIBUTION: Korea, Japan (Hokkaido, Honshu), China (Beijing, Heilongjiang, Liaoning, Neimenggu, Si-

chuan, Xinjiang), Russia (Kamchatka), Nepal, Europe.

LOCALITY: South-GB: Sobaeksan.

26. *Botanophila tridentifera* Suwa, 1986 (Fig. 27)

Botanophila tridentifera Suwa, 1986: 39–41 (Japan); Suh & Kwon, 2008: 316, 317; Paek et al., 2010: 241; Han et al., 2014: 145.

Male. General coloration black, with brownish gray pollinose. Head about 1.2–1.3 times as high as long in profile; frons at narrowest part equal to width of anterior ocellus; interfrontalia dull tinged with brown near lunule, pair of proclinate cruciate *if*; parafrontalia faintly brown with 4 *ori*. Parafacialia and cheek brownish black. Antenna black, with arista minutely pubescent; third antennal segment 1.6–1.8 times as long as wide. Palpus brownish black. Haustellum slightly fuscous, slender, with sparse pollen.

Thorax black in ground color, with gray pollen, and patches of brown pollen, especially on dorsum. Mesonotum with paler grayish median vitta presuturally in caudal view; 3 pairs of *pre acr* and without irregular setulae between rows, distance separating *pre acr* rows about as wide as distance between *pre acr* and *dc* rows. Second *ph* weak, about one third as long as anterior *ntpl*. *Pra* strong, about as long as or slightly shorter than anterior *ntpl*. Notopleuron with a few additional setulae; posterior *ntpl* about as long as or slightly longer than anterior *ntpl*. Proepisternum with 2 *prepst*. Anepisternum with 2 long and 2 additional *prepm*.

Legs black; fore tibia with 1 *ad* and 1 *pv*; mid tibia with 1 *ad*, 1 *pd* and 2 *pv*; hind tibia with 4 *ad*, 3–4 *av*, 3–4 *pd* and 2 weak *pv*.

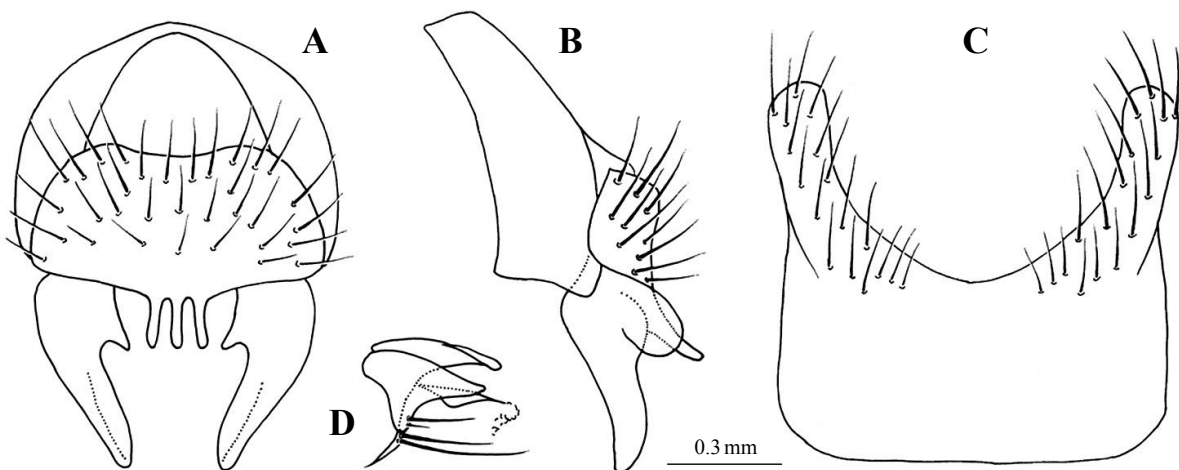


Fig. 27. *Botanophila tridentifera* Suwa, 1986, male. A, B. hypopygium; C. fifth sternite; D. gonocoxal lobe, gonostylus and phallus.

Wing dark brownish tinged; m-m nearly straight; calypter and knob of halter yellowish tinged.
Length. Body 3.8–3.9 mm, wing 3.7–3.9 mm.

MATERIAL EXAMINED: [KPNU] <GB> 1 ex., Choamsa, Sobaeksan, 28.iv.2007, SJ Suh.

DISTRIBUTION: Korea, Japan (Hokkaido, Honshu, Kyushu), China (Henan, Liaoning, Sichuan).

LOCALITY: South-GB: Sobaeksan.

Genus *Calythea* Schnabl et Dziedzicki, 1911

Calythea Schnabl et Dziedzicki, 1911: 274 (as subgenus of *Pegomyia*). Type-species: *Musca albicinata* Fallén, 1825 (Sweden).

Fallacia Stein, 1915: 28. Type-species: *Fallacia limnophorina* Stein, 1915 (Taiwan).

Anthomyiella Malloch, 1920: 174. Type-species: *Anthomyia pratincola* Meigen, 1809 (Germany).

Myiographa Malloch, 1921. Type-species: *Myiographa fascigera* Malloch, 1921 (Thailand).

DIAGNOSIS: *If* present; scutellum with usual two long marginal pairs of setae and shorter discal pair, and with fine pubescence on ventral surface; proepisternum bare; meron setulose; anal vein faint distally; lower calypter enlarged, distinctly larger than the upper; hind tibia without apical *pv*; surstylus with bare or only microtrichous dorsal surface; hypandrium consists of triangular horizontal plate and short vertical arms; aedeagal apodeme slightly bacilliform; ejaculatory apodeme small and slender, 0.3–0.5 times as long as aedeagal apodeme (Griffiths, 1986).

Key to species of Korean *Calythea*

1. Frons much narrower than ocellus, with 11 *ori* *C. nigricans*
1. Frons at narrowest part nearly as wide as distance between posterior ocelli, with 6–9 *ori* *C. paektusana*

27. *Calythea nigricans* (Robineau-Desvoidy, 1830) (Fig. 28)

Anthomyia nigricans Robineau-Desvoidy, 1830: 584 (France: Saint-Sauveur).

Calythea nigricans: Hennig, 1968: 199–201; Suh & Kwon, 1986: 158; Suh, 1989: 65, 66; Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 302; Kwon et al., 1996: 223; An, 1998: 62; Paek et al., 2010: 241; Han et al., 2014: 146.

Musca albicincta Fallén, 1825, Mon. Musc. Svec. 8: 73 (nom.praeocc.).

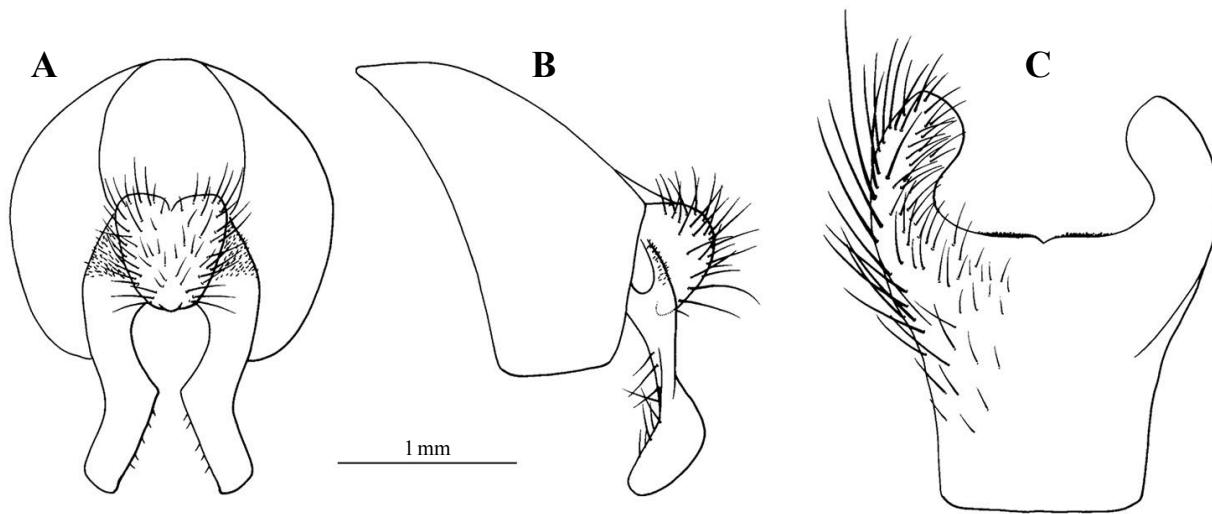


Fig. 28. *Calythea nigricans* (Robineau-Desvoidy, 1830), male. A, B. hypopygium; C. fifth sternite.

Male. Black in ground color, with thin grayish pollen. Head about 1.2–1.3 times as high as long in profile. Frons much narrower than ocellus; parafrontalia broadly contiguous to each other. Interfrontalia and parafrontalia dull, with pair of proclinate cruciate *if*, and 11 *ori*. Parafacialia and cheek black, with gray pollen. Antenna black; third segment about 1.5–1.6 times as long as wide; arista distinctly pubescent, the longest hair slightly shorter than basal diameter of arista. Palpus black, long and slender. Haustellum black, stout, with sparse gray pollen.

Ground color of thorax black, with gray pollen, and patches of brown pollen, especially on dorsum. Mesonotum with 3 pairs of *pre acr*, and several fine irregular setulae between rows. Second *ph* about as long as anterior *ntpl*. Posterior *ntpl* about as long as anterior *ntpl*. Proepisternum with a lot of *prepst*. Anepisternum with numerous *prepm*.

Legs black; fore tibia with 1 *pv*; mid tibia with 1 *ad*, 1 *av*, and strong apical *av*; hind tibia with 2 *ad*, 1 *av* and 1 *pd*.

Wing hyaline; costal spine indistinguishable from anterior setulae; m-m slightly sinuate. Calypter and knob of halter whitish yellow.

Length. Body 5.0 mm, wing 4.0 mm.

MATERIAL EXAMINED: [KPNU] <GB> 1 ex., Sobaeksan, 10.v.1985, YJ Kwon.

DISTRIBUTION: Korea, China (Beijing, Gansu, Liaoning, Sichuan, Shanghai), Algeria, Israel, Pakistan, Syria, Europe, N. America.

LOCALITY: South-GB: Sobaeksan.

28. *Calythea paektusana* Suh, Kwon et Kozánek, 1991 (Fig. 29)

Calythea paektusana Suh, Kwon et Kozánek, 1991: 43, 44 (Korea: Baekdusan); Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 302; Kwon et al., 1996: 223; Paek et al., 2010: 241; Han et al., 2014: 146.

Male. Black in ground color, with thin grayish pollen. Head about 1.4–1.6 times as high as long in profile. Frons at narrowest part nearly as wide as distance between posterior ocelli. Interfrontalia and parafrontalia dull, with pair of proclinate cruciate *if*, and 6–9 strong *ori*. Parafacialia and cheek black, with brownish gray pollen; parafrontal width about 0.7–0.9 times as wide as width of third antennal segment; parafacialia narrowing slightly towards level of lower margin of eye; cheek at narrowest part about 1.3–1.7 times as high as width of third antennal segment. Antenna black; third segment about 2.0–2.4 times as long as wide; arista

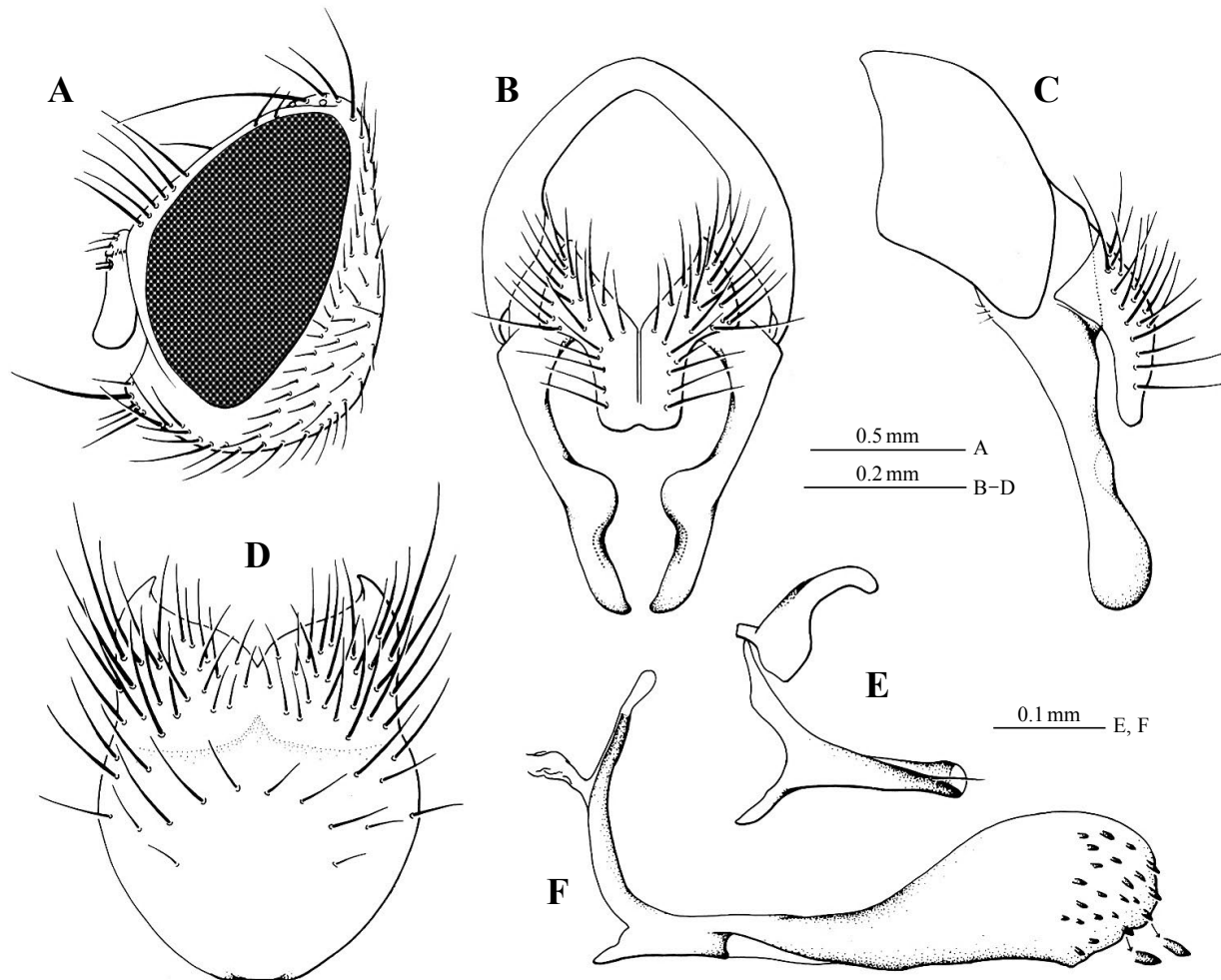


Fig. 29. *Calythea paektusana* Suh, Kwon et Kozánek, 1991, male. A. head; B, C. hypopygium; D. fifth sternite; E. gonocoxal lobe and gonostylus; F. phallus.

shortly plumose, the longest hair about 2.6–3.0 times as long as basal diameter of arista. Palpus black with sparse gray pollen, long and slender.

Thorax black in ground color, with greenish gray pollen, and patches of brown pollen, especially on dorsum; mesonotum with a paler grayish median vitta presuturally in caudal view; 3 pairs of *pre acr*, the second setulae pair longest. Scutellum without ventral setulae. *Pra* strong, as long as or slightly shorter than posterior *ntpl*. Posterior *ntpl* rather longer than anterior *ntpl*. Proepisternum with 4 *prepst*. Anepisternum with distinct upper anterior seta, having 2 long and 8–10 additional *prepm*. *Kepst* 1:2.

Legs black; fore tibia with 1 strong *pv*; mid femur with full series of longish *av* and *pv*; hind tibia with 3 *ad*, 1 *pd*, 3 *av*, and 2–3 *pv*.

Wing faintly brownish tinged, denser basally; costal spine indistinguishable from anterior setulae; m-m nearly straight. Calypter deep yellow to brownish; lower calypter much protruding beyond the upper one. Knob of halter yellow.

Abdomen with greenish gray pollen, and black narrow median vitta.

Length. Body 5.0–5.5 mm, wing 4.5–4.7 mm.

MATERIAL EXAMINED: [KPNU] 4 exs, Baekdusan, HB, N. Korea, 16.viii.1989, M Kozánek.

DISTRIBUTION: Korea.

LOCALITY: North-HB: Baekdusan.

Genus *Chirosia* Rondani, 1856

Chirosia Rondani, 1856: 102. Type-species: *Aricia albitarsis* Zetterstedt, 1845 (Sweden: Gotland).

Pachystoma Lioy, 1864: 910. Type-species: *Anthomyia crassirostris* Meigen, 1826 (Germany).

Rhadina Kowarz, 1893: 144. Type-species: *Chirosia montana* Porkorny, 1893 (Austria).

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

Pogonomyza Schnabl et Dzierzicki, 1911: 99, 100. Type-species: *Musca flavipennis* Fallén, 1823 (Sweden: Westrogothia).

Acrostilpna Ringdahl, 1929: 269. Type-species: *Aricia latipennis* Zetterstedt, 1838 (Norway).

Shakshainia Suwa, 1974: 35, 36. Type-species: *Shakshainia rametoka* Suwa, 1974 (Japan: Hokkaido).

Meliniella Suwa, 1974: 37, 38. Type-species: *Meliniella sikisima* Suwa, 1974 (Japan: Honshu).

DIAGNOSIS: Interfrontalia with *if*; one or more *ors* present; arista pubescent; upper occipital setae present; haustellum robust and stout; scutellum usually bared on ventral surface; additional *ntpl* absent; proepisternum, anepimeron and meron bare; lower surface of costa additional short setulae below main marginal

series of short spinules; lower calypter smaller than upper; mid tibia often with 1 *ad*; hind tibia with 3 *pd*, and apical *av* and *pv*, which easily distinguishable from adjacent setulae even *if* short.

Key to species of Korean *Chirosia*

1. *Pra* longer or as long as posterior *ntpl* 2
1. *Pra* shorter than posterior *ntpl* 6
2. Notopleuron with a few additional setulae *C. bisinuata*
2. Notopleuron without additional setulae 3
3. Hind tibia without apical *av* *C. sobaeksana*
3. Hind tibia with apical *av* 4
4. *If* fine or often vestigial; larger species *C. griseifrons*
4. *If* strong; smaller species 5
5. Fore tarsus wholly black *C. histricina*
5. First and second segments of fore tarsus whitish tinged *C. albitarsis*
6. Arista plumose *C. flavipennis*
6. Arista pubescent 7
7. Frons with 3 *ors* *C. grossicauda*
7. Frons with 1 *ors* 8
8. Eyes markedly separated from each other 9
8. Eyes contiguous 10
9. Frons with 3 *ors* *C. nigripes*
9. Frons with 1 *ors* *C. inspinata*
10. Mid femur with strong *av* *C. cinerosa*
10. Mid femur without strong *av* *C. betuleti*

29. *Chirosia albitarsis* (Zetterstedt, 1845) (Fig. 30)

Aricia albitarsis Zetterstedt, 1845: 1610 (Sweden: Gotland).

Chirosia albitarsis: Hennig, 1966: 56–58, pls. 2 (21), 4 (557), 5 (87); Fan et al., 1988: 56; Suh, 1989: 89, 90; Dely-Draskovits, 1993: 34; Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 302; Kwon et al., 1994: 265; Kwon et al., 1996: 223; Wei et al., 1996: 656; Paek et al., 2010: 241; Han et al., 2014: 146.

Anthomyia albimana Zetterstedt, 1845: 1726 (Sweden: Östergötland).

Anthomyza albimana: Chu et Hsia, 1937: 136.

Chirosia villeneuvei Schnabl, 1911: 84 (France: Corsica).

Chirosia kuntzei Schnabl, 1911: 87 (France: Corsica).

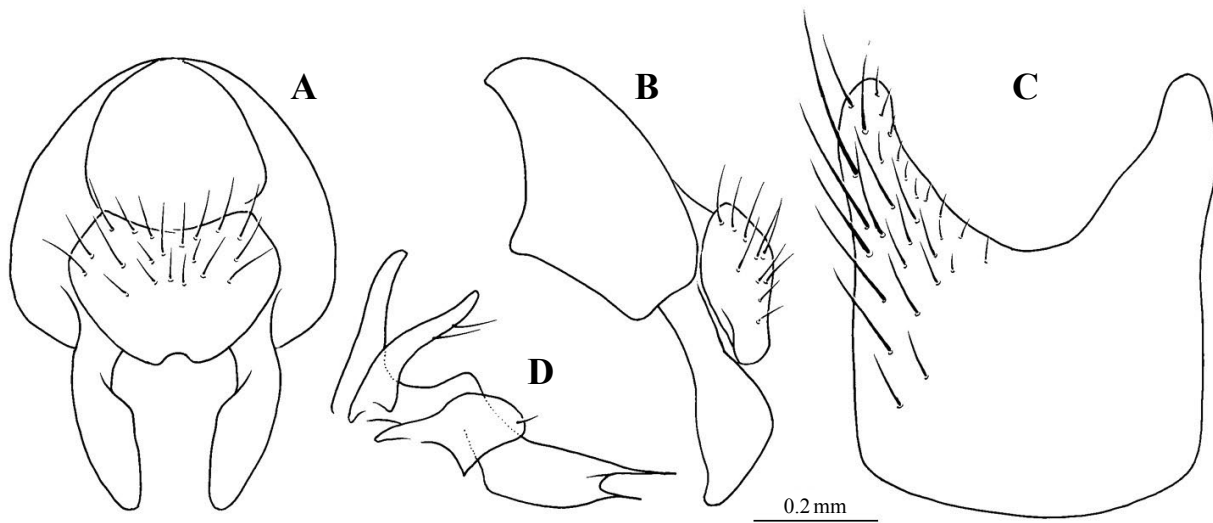


Fig. 30. *Chiroisia albitarsis* (Zetterstedt, 1845), male. A, B. hypopygium; C. fifth sternite; D. gonocoxal lobe, gonostylus and phallus.

Male. Black in ground color, with thin grayish pollen. Head about 1.2–1.3 times as high as long in profile. Frons at narrowest part nearly as wide as distance between posterior ocelli. Interfrontalia dull tinged with brown near lunule, with a pair of proclinate cruciate *if*; parafrontalia with 1 *ors* and 2 *ori*. Parafacialia and cheek brownish black, with gray pollen. Antenna black; third segment about 2.0 times as long as wide; arista distinctly pubescent. Palpus black. Haustellum black and stout.

Thorax black in ground color, with gray pollen, and patches of brown pollen, especially on dorsum. Mesonotum with pale brownish median vittae presuturally in caudal view; 3 pairs of *pre acr*, distance separating *pre acr* rows about one third as wide as distance between *pre acr* and *dc* rows. Scutellum without setulae on under surface. Second *ph* very weak. Proepisternum with 2 *prepst*. Anepisternum with 1 *prepm*.

Legs black; first and second fore tarsi white; fore femur with an extensive series of longer slender *ad* and *av*; fore tibia with 1 *ad* and 1 *pv*; hind femur with a full series of long *av*, *ad* and strong *pv*; hind tibia with 3 *ad*, 3 *av*, 3 *pd* and 1–2 *pv*.

Wing faintly brownish tinged, denser basally; m-m slightly sinuate. Calypter whitish yellow. Knob of halter yellow.

Length. Body 3.6–4.0 mm, wing 3.4–3.5 mm.

MATERIAL EXAMINED: [KPNU] <GB> 2 exs., Palgongsan, 18.vi.1985, YJ Kwon.

DISTRIBUTION: Korea, Japan (Hokkaido, Honshu), China (Guizhou, Xizang), Europe.

LOCALITY: South-GB: Palgongsan.

30. *Chirosia betuleti* (Ringdahl, 1935) (Fig. 31)

Hylemyia (Melinia) betuleti Ringdahl, 1935: 30 (Sweden: Kågeröd).

Melinia betuleti: Ringdahl, 1959: 205.

Chirosia betuleti: Hennig, 1966: 58, 59, pls. 2 (22), 5 (81); Suwa, 1983b: 24; Suh & Kwon, 1985: 183; Suh, 1989: 90; Dely-Draskovits, 1993: 35; Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 302; Kwon et al., 1996: 223; Suwa, 1999: 213; Paek et al., 2010: 241; Han et al., 2014: 146.

Melinia carinata Tiensuu, 1939: 245 (Finland).

Male. Black in ground color, with thin grayish pollen. Head about 1.2 times as high as long in profile. Frons at narrowest part equal to width of anterior ocellus; parafrontalia broadly contiguous to each other. Interfrontalia dull tinged with brown near lunule, with pair of proclinate cruciate *if*; parafrontalia with 1 *ors* and 5 *ori*. Parafacialia and cheek black, with bluish gray pollen. Antenna black; third segment about 1.3–1.4 times as long as wide; arista distinctly pubescent. Palpus black. Haustellum black and stout.

Thorax black in ground color, with bluish gray pollen, and patches of brown pollen, especially on dorsum. Mesonotum with pale brownish median vitta presuturally in caudal view; 3 pairs of *pre acr*, distance separating *pre acr* rows about half as wide as distance between *pre acr* and *dc* rows. Scutellum without setulae on under surface. Second *ph* strong, about 0.7–0.8 times as long as anterior *ntpl*. *Pra* strong. Posterior *ntpl* as long as or slightly longer than anterior *ntpl*. Proepisternum with 2 *prepst*. Anepisternum with distinct upper anterior seta, and 2 *prepm*.

Legs black; fore femur with extensive series of longer slender *ad* and *av*; fore tibia with 1 *pv*; mid tibia

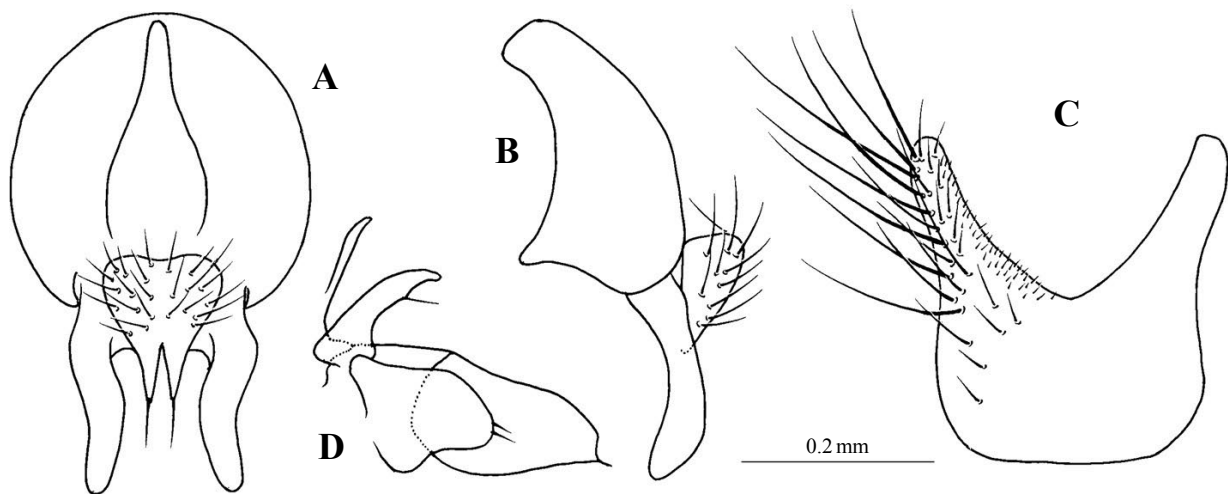


Fig. 31. *Chirosia betuleti* (Ringdahl, 1935), male. A, B. hypopygium; C. fifth sternite; D. gonocoxal lobe, gonostylus and phallus.

with 2 *ad*, 4 *pd*, 4 *pv*, and strong apical *pv*; hind femur with long *ad*, *av* and *pv*; hind tibia with 5 *ad*, 6 *av*, 3 *pd*, and 12 *pv*.

Wing faintly brownish tinged, denser basally; m-m slightly sinuate. Calypter yellow. Knob of halter yellow. Abdomen with bluish gray pollen, with black narrow median vitta.

Length. Body 4.5–5.0 mm, wing 4.2–4.7 mm.

MATERIAL EXAMINED: [KPNU] <GW> 4 exs., Odaesan, 24.v.1989, YJ Kwon.

DISTRIBUTION: Korea, Japan (Hokkaido, Honshu), China (Heilongjiang, Liaoning), Europe.

LOCALITY: Central-GW: Odaesan.

HOST: *Athyrium filix femina* (cf. Hennig, 1966).

31. *Chirosia bisinuata* (Tiensuu, 1939) (Fig. 32)

Melinia bisinuata Tiensuu, 1939: 244 (Japan: Sapporo).

Meliniella bisinuata: Suwa, 1974: 43–45; Suwa, 1983b: 26; Suh & Kwon, 1985: 167; Suh, 1989: 90, 91.

Chirosia bisinuata: Dely-Draskovits, 1993: 35; Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 303; Kwon et al., 1996: 22; Suwa, 1999: 214; Paek et al., 2010: 241; Han et al., 2014: 146.

Male. Black in ground color, with thin grayish pollen. Head about 1.3–1.4 times as high as long in profile. Frons at narrowest part slightly wider than distance between posterior ocelli inclusive. Interfrontalia dull, with pair of proclinate cruciate *if*, parafrontalia with 1 *ors* and 6 *ori*. Parafacialia and cheek black, with blu-

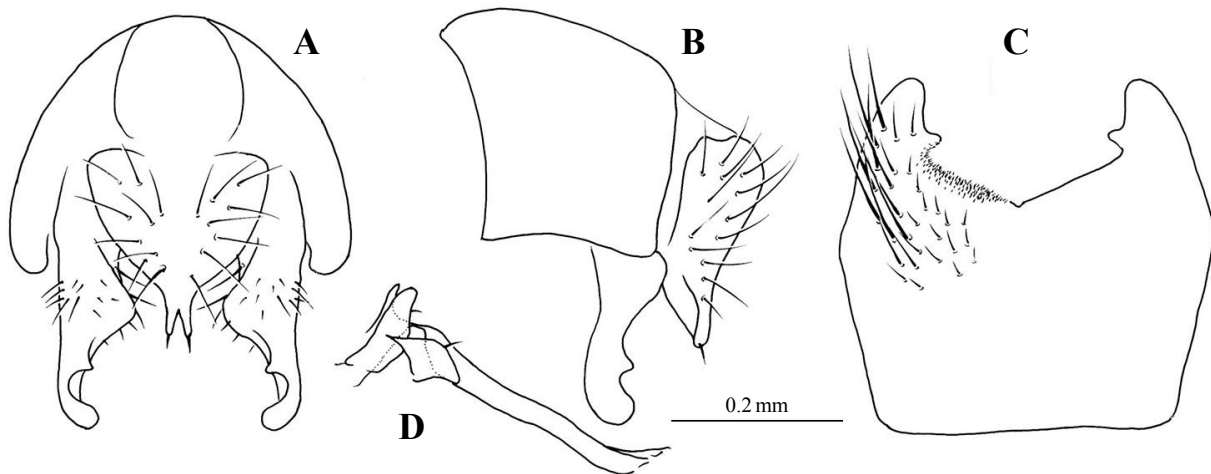


Fig. 32. *Chirosia bisinuata* (Tiensuu, 1939), male. A, B. hypopygium; C. fifth sternite; D. gonocoxal lobe, gonostylus and phallus.

ish gray pollen. Antenna black; third segment about 1.8–1.9 times as long as wide; arista distinctly pubescent. Palpus black. Haustellum brownish black.

Thorax black in ground color, with bluish gray pollen, and patches of brown pollen, especially on dorsum. Mesonotum with pale brownish median vitta presuturally in caudal view; 3 pairs of *pre acr*, distance separating *pre acr* rows about half as wide as distance between *pre acr* and *dc* rows. Scutellum without setulae on under surface. Second *ph* strong, about 0.7–0.8 times as long as anterior *ntpl*. *Pra* strong. Posterior *ntpl* as long as or slightly longer than anterior *ntpl*. Proepisternum with 2 *prepst*. Anepisternum with a distinct upper anterior seta and, 3 long and 1–2 additional *prepm*.

Legs black; fore femur with an extensive series of longer slender *ad* and *av*; fore tibia with 1 *ad* and 1 *pv*; mid tibia with 1 *ad*, 1 *a*, 3 *pd*, and 1 *p*; hind femur with long *ad*, *av* and *pv*; hind tibia with 5 *ad*, 6 *av*, 4 *pd*, 9 *pv*, and apical *av* and *pv*.

Wing faintly brownish tinged, denser basally; m-m slightly sinuate. Calypter pale yellow. Knob of halter yellow.

Length. Body 4.5 mm, wing 4.2 mm.

MATERIAL EXAMINED: [KPNU] 1 ex., Odaesan, 24.v.1999, YJ Kwon.

DISTRIBUTION: Korea, Japan (Hokkaido, Honshu), China (Heilongjiang), Finland, Sweden.

LOCALITY: Central-GW: Odaesan.

32. *Chirosia cinerosa* (Zetterstedt, 1845) (Fig. 33)

Aricia cinerosa Zetterstedt, 1845: 1450 (Denmark: Copenhagen).

Pycnoglossa cinerosa: Hockett, 1949: 59.

Chirosia cinerosa: Collin, 1955: 97; Kwon & Suh, 1982b: 179, 180; Suh & Kwon, 1985: 182, 183; Suh, 1989: 91; Dely-Draskovits, 1993: 35; Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 303; Kwon et al., 1994: 265; Kwon et al., 1996: 223; Suwa, 1999: 214; Paek et al., 2010: 241; Han et al., 2014: 147.

Aricia flavipennis Zetterstedt, 1845: 1451.

Aricia xanthoptera Boheman, 1863: 13 (Sweden).

Pycnoglossa luteipennis Ringdahl, 1937: 126 (Sweden).

Male. Black in ground color, with thin grayish pollen. Head about 1.1–1.2 times as high as long in profile. Frons at narrowest part equal to width of anterior ocellus; parafrontalia broadly contiguous to each other. Interfrontalia fuscous, with pair of proclinate cruciate *if*; parafrontalia with 1 *ors* and 2 *ori*. Parafacialia and cheek black, with gray pollen. Antenna black; third segment about 2.0–2.2 times as long as wide; arista distinctly pubescent. Palpus black. Haustellum grayish black, stout.

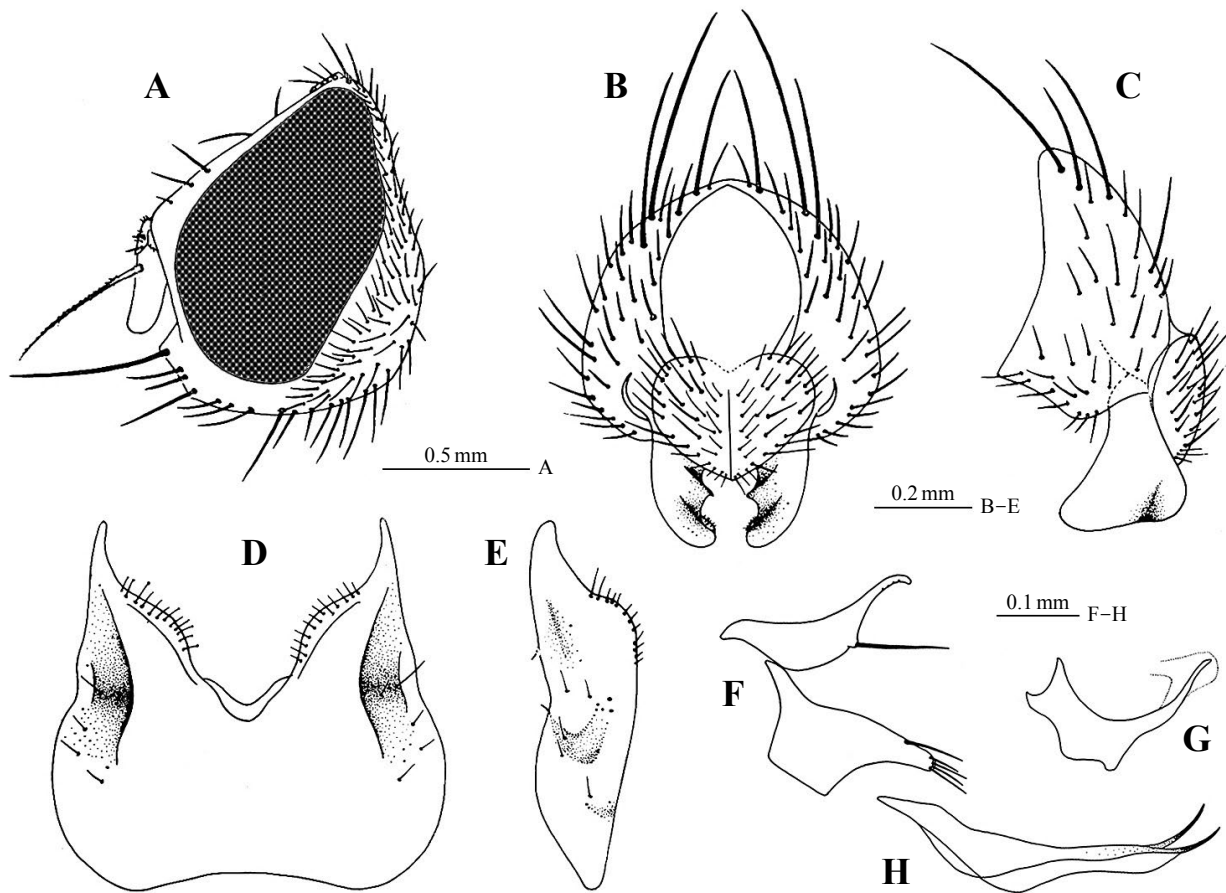


Fig. 33. *Chiroisia cinerosa* (Zetterstedt, 1845), male. A. head; B, C. hypopygium; D, E. fifth sternite; F. gonocoxal lobe and gonostylus; G. ephiphallus and basiphallus; H. distiphallus.

Thorax black in ground color, with brownish gray pollen, and patches of brown pollen, especially on dorsum. Mesonotum with two paler blackish vittae between *dc* rows in caudal view; 3 pairs of *pre acr* and several fine irregular setulae between rows, distance separating *pre acr* rows about as wide as distance between *pre acr* and *dc* rows. Scutellum without setulae on under surface. Second *ph* about 0.5–0.6 times as long as anterior *ntpl*. *Pra* strong. Posterior *ntpl* as long as or slightly longer than anterior *ntpl*. Proepisternum with 2 *prepst*. Anepisternum with 2 *prepm*.

Legs black; fore femur with an extensive series of longer slender *ad* and *av*; fore tibia with 1 *ad*, 1 *pd* and 1 *pv*; mid femur with slender *ad* and *av*; mid tibia with 1 *d*, 3 *pd*, and apical *av* and *pv*; hind femur with long *ad*, *av* and *pv*; hind tibia with 5 *ad*, 3 *av*, 5 *pd*, 8 *pv*.

Wing faintly brownish tinged, denser basally; m-m slightly sinuate. Calypter pale yellow. Knob of halter brown.

Abdomen with bluish gray pollen, and black narrow median vitta.

Length. Body 4.8–5.1 mm, wing 4.3–4.5 mm.

MATERIAL EXAMINED: [KPNU] <GG> 4 exs., Myeongseongsan, 16.v.1982, YJ Kwon; 1 ex., Soyosan, 15.v.1982, YJ Kwon; <GW> 2 exs., Obongsan, 21.v.1982, YJ Kwon; 2 exs., Obongsan, 17.v.1981, YJ Kwon; 1 ex., Obongsan, 20.v.1982, YJ Kwon; 2 exs., Obongsan, 12.v.1985, YJ Kwon; 1 ex., Chiaksan, 22.v.1982, YJ Kwon; 5 exs., Hongcheon-gun, 2.vi.2006, DS Choi; <GB> 2 exs., Sobaeksan, 10.v.1985, YJ Kwon; 2 exs., Palgongsan, 29.v.1985, YJ Kwon; 1 ex., Bohyeonsan, 29.v.1998, YJ Kwon; 1 ex., Bakbongsan, 11.v.2007, SJ Suh; <JB> 1 ex., Deogyusan, 20.v.1999, SJ Suh; [NIBR] <GB> 2 exs., Bohyeonsan, 29.v.1998, YJ Kwon.

DISTRIBUTION: Korea, Japan (Hokkaido, Honshu, Kyusu), China (Heilongjiang, Liaoning), Europe, N. America.

LOCALITY: Central-GG: Myeongseongsan, Soyosan; GW: Chiaksan, Obongsan, Hongcheon; South-GB: Bakbongsan, Bohyeonsan, Palgongsan, Sobaeksan; JB: Deogyusan.

HOST: *Struthiopteris* sp. (cf. Hennig, 1957; Suwa, 1974).

33. *Chirosia flavipennis* (Fallén, 1823) (Fig. 34)

Musca flavipennis Fallén, 1823: 59 (Sweden: Westrogothia).

Chirosia flavipennis: Hennig, 1966: 61; Suh & Kwon, 2008: 1032, 1033; Han et al., 2014: 147.

Anthomyia crassirostris Meigen, 1826: 107.

Male. Black in ground color, with thin grayish pollen. Head about 14–1.5 times as high as long in profile. Frons at narrowest part nearly as wide as distance between posterior ocelli. Interfrontalia dark brown or dark, with a pair of proclinate cruciate *if*; parafrontalia dull with grayish pollen, with 2–3 *ori*, and 1 slender *ors*. Parafacialia and cheek brownish black, with gray pollen; parafrontal width about 0.5–0.6 times as wide as width of third antennal segments; parafacialia narrowing towards level of lower margin of eye; cheek at narrowest part about as high as width of third antennal segment. Antenna black; third segment about 1.5–1.6 times as long as wide; arista distinctly plumose, longest hair about twice as long as basal diameter of arista. Mentum of haustellum brownish black and stout. Palpus black with sparse gray pollen, long and slender.

Thorax black in ground color, with brown pollen; mesonotum with paler brownish median vitta presuturally in caudal view; 5 pairs of *pre acr*, the distance separating *acr* rows about half as wide as distance between *acr* and *dc* rows. Second *ph* strong, about twice as long as anterior *ntpl*; posterior *ntpl* about 0.7–0.8 times as long as anterior *ntpl*; proepisternum sunken, with 1 *prepst*. Anepisternum with 2 *prepm*.

Legs black; fore tibia with 3 *pd* and 1 *pv*; mid tibia with 1 *p*, 3 *pd*, and strong apical *av* and *pv*; hind tibia with 5 *ad*, 7 *av*, 5 *pd*, 7 *pv* and apical *av*.

Wing faintly brownish tinged, denser basally; costal spine strong, about as long as humeral crossvein; m-m nearly straight. Calypter and knob of halter brown.

Abdomen pressed and short, with gray pollen and a black narrow median vitta.

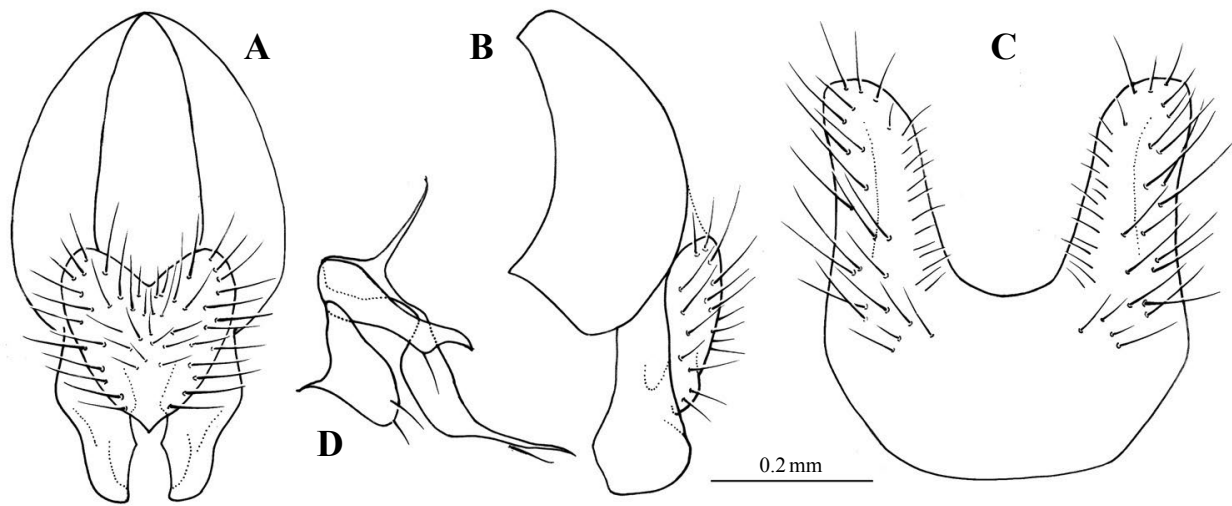


Fig. 34. *Chiroisia flavipennis* (Fallén, 1823), male. A, B. hypopygium; C. fifth sternite; D. gonocoxal lobe, gonostylus and phallus.

Length. Body 4.8–5.0 mm, wing 5.8–5.9 mm.

MATERIAL EXAMINED: [KPNU] <GW> 5 exs., Daebangsan, 28.v.2018, SJ Suh; <JB> 6 exs., Hupo-ri, Gochang-gun, 24.v.2006, SJ Suh.

DISTRIBUTION: Korea, Japan (Hokkaido, Honshu), Russia (Sakhalin), Europe, N. America.

LOCALITY: Central-GW: Daebangsan; South-JB: Gochang.

34. *Chiroisia griseifrons* (Séguy, 1923) (Fig. 35)

Hylemyia griseifrons Séguy, 1923: 361 (France).

Meliniella griseifrons: Kwon & Suh, 1982d: 2; Suwa, 1983b: 26; Suh & Kwon, 1985: 167; Wei et al., 1996: 666.

Chiroisia griseifrons: Hennig, 1976: 931–933, pl. 111 (1187); Suh, 1989: 91, 92; Dely-Draskovits, 1993: 35, 36; Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 303; Kwon et al., 1996: 223; Suwa, 1999: 214; Suwa, 2005: 91; Paek et al., 2010: 241; Han et al., 2014: 147.

Melinia luteipennis Ringdahl, 1950: 189 (Sweden).

Craspedocheta luteipennis (sic): Elvberg, 1970: 465.

Meliniella luteipennis: Suwa, 1979: 3; Kwon & Suh, 1982a: 99, 100.

Chiroisia luteipennis: Dely-Draskovits, 1993: 35, 36.

Meliniella watanabei Suwa, 1974: 45, 46 (Japan: Hokkaido).

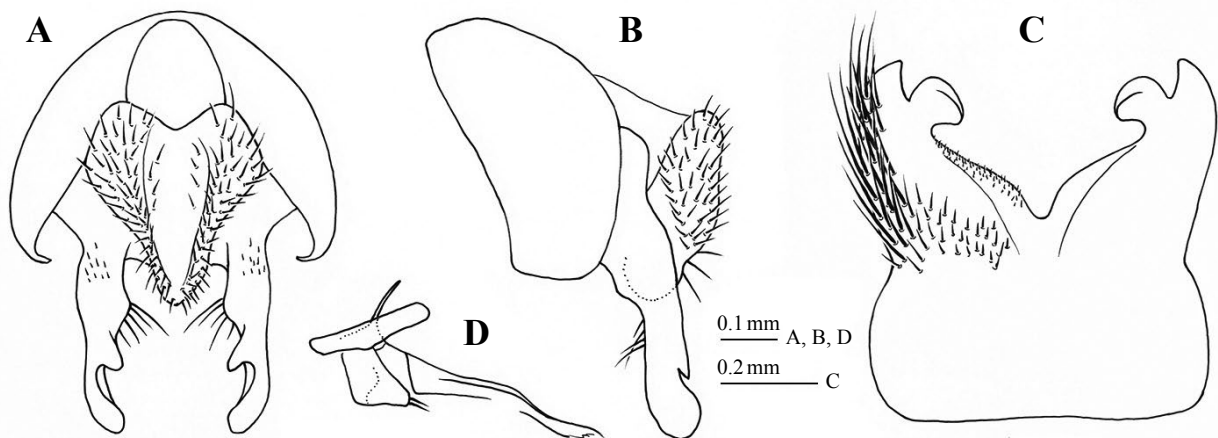


Fig. 35. *Chirosia griseifrons* (Séguy, 1923), male. A, B. hypopygium; C. fifth sternite; D. gonocoxal lobe, gonostylus and phallus.

Male. Black in ground color, with thin grayish pollen. Head about 1.2–1.3 times as high as long in profile. Frons at narrowest part nearly as wide as distance between posterior ocelli inclusive. Interfrontalia fuscous, with 0–1 fine *if*; parafrontalia with 1 weak *ors* and 4–5 *ori*. Parafacialia and cheek black, with gray pollen. Antenna black; third segment about 1.7–1.8 times as long as wide; arista distinctly pubescent. Palpus black. Haustellum brownish black, slender.

Thorax black in ground color, with gray pollen, and patches of brown pollen, especially on dorsum. Mesonotum with 3 paler blackish vittae in caudal view; 5 pairs of *pre acr* and without setulae between rows, distance separating *pre acr* rows about half as wide as distance between *pre acr* and *dc* rows. Scutellum with some setulae on under surface. Second *ph* weak, about 0.5–0.6 times as long as anterior *ntpl*. *Pra* strong, slightly longer than posterior *ntpl*. Posterior *ntpl* slightly longer than anterior *ntpl*. Proepisternum with 2 *prepst*. Anepisternum with 2 long and 2–3 additional *prepm*.

Legs black; fore femur with slender *ad* and *av*; fore tibia with 1 *ad* and 1 *pv*; mid femur with slender 3 *pv* on basal half, and without *av*; mid tibia with 1 *a*, 1 *pd*, 5 *p-pv*, and apical *av* and *pv*; hind femur with long *ad*, *av* and *pv*; hind tibia with 5–6 *ad*, 4 *av*, 4–6 *pd*, 10–12 *pv*, and apical *av* and *pv*.

Wing faintly brownish tinged, denser basally; costal spine strong, about as long as humeral crossvein; m-m slightly sinuate. Calypter pale yellow. Knob of halter yellow.

Abdomen with gray pollen, with black narrow median vitta.

Length. Body 5.7–7.6 mm, wing 4.8–6.0 mm.

MATERIAL EXAMINED: [KPNU-D] <GG> 10 exs., Ganghwado, 8.v.1983, YJ Kwon; 1 ex., Ganghwado, 9.v.1983, YJ Kwon; 3 exs., Ganghwado, 11.v.1982, YJ Kwon; <CN> 1 ex., Seodaesan, 9.vi.2002, SJ Suh; <GB> 4 exs., Palgongsan, 26.v.1985, YJ Kwon; 3 exs., Sobaeksan, 10.v.1985, YJ Kwon; 1 ex., Sobaeksan, 26.v.2005,

SJ Suh; 1 ex., Bakbongsan, 11.v.2007, SJ Suh; <JB> 1 ex., Maisan, 11.v.1980, YJ Kwon.

DISTRIBUTION: Korea, Japan (Hokkaido, Honshu), China (Heilongjiang, Liaoning), Russia (Maritime Territory), Europe.

LOCALITY: Central-GG: Ganghwado; GW: Obongsan, Odaesan, Seoraksan; CN: Seodaesan; South-GB: Bakbongsan, Sobaeksan, Palgongsan; GN: Jirisan; JB: Maisan.

35. *Chirosia grossicauda* Strobl, 1899 (Fig. 36)

Chirosia grossicauda Strobl, 1899: 222 (Spain); Michelsen, 1985: 54; Suh, 1989: 92, 93; Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 303; Kwon et al., 1994: 265; Kwon et al., 1996: 223; Paek et al., 2010: 241; Han et al., 2014: 147.

Chirosia parvicornis (nec Zetterstedt): Stein, 1902: 40.

Nupedia aestiva (nec Meigen): Suh & Kwon, 1986: 158.

Male. Black in ground color, with thin grayish pollen. Head about 1.2–1.3 times as high as long in profile. Frons at narrowest part slightly wider than distance between posterior ocelli inclusive. Interfrontalia dull tinged with brown near lunule, 1–2 pairs of proclinate cruciate *if*; parafrontalia with 3 *ors* and 2 *ori*. Parafacialia and cheek black, with gray pollen. Antenna black; third segment about 1.8–1.9 times as long as wide;

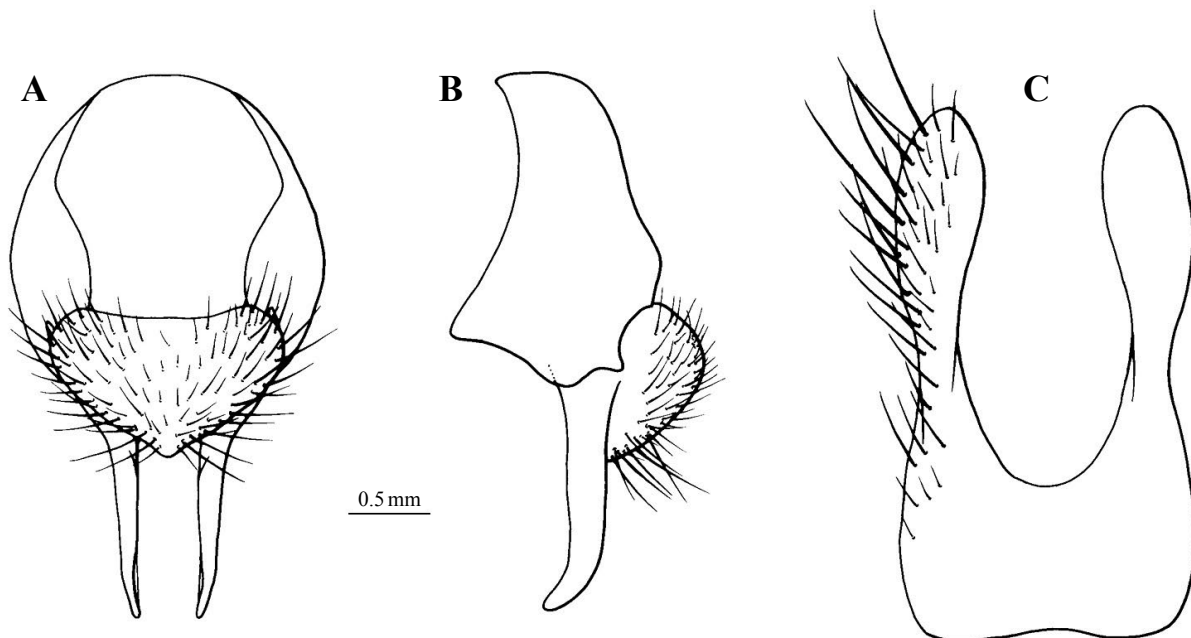


Fig. 36. *Chirosia grossicauda* Strobl, 1899, male. A, B. hypopygium; C. fifth sternite.

arista distinctly pubescent. Palpus black. Haustellum black, and very stout.

Thorax bluish black in ground color, with gray pollen, and patches of brown pollen, especially on dorsum. Mesonotum with paler brownish median vitta presuturally in caudal view; 3 pairs of *pre acr* and without setulae between rows, distance apart of *pre acr* rows closer than to *dc*. Scutellum without setulae on under surface. Second *ph* weak. *Pra* short, about 0.5–0.6 as long as anterior *ntpl*. Posterior *ntpl* slightly longer than anterior *ntpl*. Proepisternum with 1 *prepst*. Anepisternum with 2 *prepm*.

Legs black; fore femur with slender *ad* and *av*; fore tibia with 2 *ad* and 1 *pv*; mid femur with slender *av* on apical half; mid tibia with 1 *ad*, 2 *pd*, 2 *pv*, and apical *av* and *pv*; hind femur with long *ad*, *av* and *pv*; hind tibia with 6 *ad*, 1 *av*, 5 *pd*, 5 *pv*, and apical *av*.

Wing faintly brownish tinged, denser basally; costal spine strong, about as long as humeral crossvein; m-m nearly straight. Calypter pale yellow. Knob of halter brown.

Abdomen bluish black with gray pollen, and a brown narrow median vitta.

Length. Body 3.4–4.3 mm, wing 3.0–4.1 mm.

MATERIAL EXAMINED: [KPNU] <GB> 2 exs., Palgongsan, 26.v.1985, YJ Kwon; <JN> 1 ex., Tolsando, 17.iv.1986, YJ Kwon.

DISTRIBUTION: Korea, Japan (Hokkaido, Honshu), China (Fujian, Liaoning), Europe.

LOCALITY: South-GB: Palgongsan; JN: Dolsando.

HOST: *Pteridium aquilinum* var. *latiusculum* (cf. Suwa, 1999).

36. *Chirosia histicina* (Rondani, 1866) (Fig. 37)

Chortophila histicina Rondani, 1866: 169 (Italy).

Chirosia histicina: Suh & Kwon, 2001: 165; Han et al., 2014: 147.

Anthomyia hystrix Brischke, 1881: 287 (Poland).

Anthomyia (Chortophila) nigronitens Pandellé, 1900: 265 (France: Tarbes).

Pogonomyza proboscidalis Malloch, 1920: 185 (USA: Pennsylvania).

Pycnoglossa setifemur Ringdahl, 1939: 147 (Russia).

Male. Black in ground color, with thin grayish pollen. Head about 1.2–1.3 times as high as long in profile. Frons at narrowest part nearly as wide as distance between posterior ocelli. Interfrontalia dark brown or dark, with a pair of proclinate cruciate *if*; parafrontalia dull with grayish pollen, with 4 strong *ori*, and 1 slender *ors*. Parafacialia and cheek brownish black, with gray pollen; parafrontal width about 0.9 times as wide as width of third antennal segments, parafacialia narrowing slightly towards level of lower margin of eye; cheek at narrowest part about as high as width of third antennal segment, with 3 genal setae; the low-

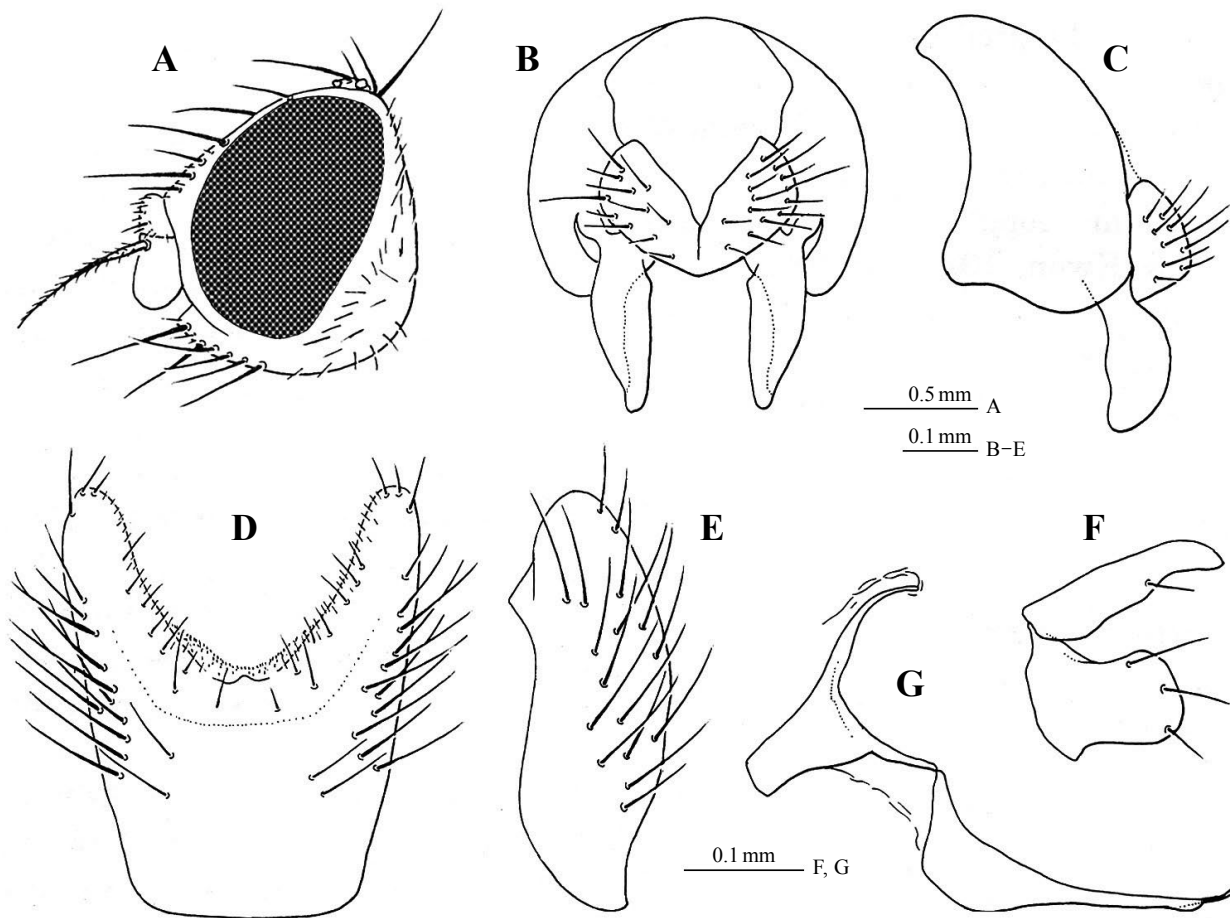


Fig. 37. *Chiroisia histicina* (Rondani, 1866), male. A. head; B, C. hypopygium; D, E. fifth sternite; F. gonocoxal lobe and gonostylus; G. phallus.

est peristomal seta very strong, about 0.8 times as long as vibrissal seta. Antenna black; third segment about 1.4–1.7 times as long as wide; arista shortly pubescent, the longest hair as long as basal diameter of arista. Mentum of haustellum faintly grayish pollinose, about 2.2–2.5 times as long as wide. Palpus black, long and slender, with sparse gray pollen.

Thorax black in ground color, with gray pollen; mesonotum with paler grayish median vitta presuturally in caudal view; 3 pairs of *pre acr*, the second pair longest, *pre acr* rows slightly closer together than to *dc* rows, with several fine irregular setulae between rows; post-acrostical setae slender, becoming longer in front of scutellum. Scutellum without ventral setulae. Second *ph* strong and distinguishable from accessory setulae; *pra* strong, as long as anterior *ntpl*. Posterior *ntpl* as long as or slightly longer than anterior *ntpl*. Proepisternum with 2 *prepst*. Anepisternum with 2 *prepm*. *Kept* 1:2.

Legs black; fore femur with an extensive series of longer slender *av*; fore tibia with 1 *pv*; mid femur with 4 *pv* on basal half; mid tibia with 1 *ad*, 1 *p*, 1 *pd* and 1 *pv*; hind femur with full series of long *av* and 4–5

strong *pv* on basal half; hind tibia with 5–6 *ad*, 4 *av*, 3 long and 2 short *pd*, and 7–8 weak *pv*.

Wing faintly brownish tinged, denser basally; costal spine distinguishable from anterior setulae; m-m nearly straight. Calypter whitish yellow to yellow. Knob of halter whitish yellow.

Abdomen subshiny black; median vitta broad and faint; marginal and discal setae strong, becoming longer laterad. Fifth sternite with some fine setulae on inner margin.

Length. Body 4.3–4.5 mm, wing 4.1–4.2 mm.

MATERIAL EXAMINED: [KPNU] <GB> 1 ex., Bohyeonsan, 11.v.1998, SJ Suh; <JB> 1 ex., Deogyusan, 16.v.1999, SJ Suh.

DISTRIBUTION: Korea, Japan (Honshu, Kyushu), China (Heilongjiang, Liaoning), Europe, N. America.

LOCALITY: South-GB: Bohyeonsan; JB: Deogyusan.

HOST: *Pteridium aquilinum*, *Asplenium*, *Athyrium*, *Blechnum*, *Cystopteris*, *Dryopteris*, *Polypodium*, *Osmunda*, *Polystichum* and *Struthiopteris* (cf. Suwa, 1974).

37. *Chirosia inspinata* Suwa, 1983 (Fig. 38)

Chirosia inspinata Suwa, 1983b: 24–26 (Korea: Jirisan); Suh & Kwon, 1985: 183; Suh, 1989: 93; Dely-Draskovits, 1993: 36; Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 303; Kwon et al., 1996: 223; Paek et al., 2010: 241; Han et al., 2014: 147.

Male. Black in ground color, with thin grayish pollen. Frons at narrowest part slightly wider than distance between posterior ocelli inclusive. Interfrontalia with pair of proclinate cruciate *if*; parafrofrontalia with 2 *ori*, and 1 slender *ors*. Parafacialia width about 0.7–0.8 times as wide as width of third antennal segments, parafacialia narrowing slightly towards level of lower margin of eye; cheek at narrowest part about 0.7–0.8 times as high as width of third antennal segment. Antenna black; third segment about 1.4 times as long as wide; arista shortly pubescent. Mentum of haustellum black and stout.

Thorax black in ground color, with brownish gray pollen. Mesonotum with 3 pale brownish black vittae presuturally in caudal view; 3 pairs of *pre acr*, distance between *pre acr* rows about half as wide as distance between *pre acr* and *dc* rows. Scutellum without setulae on under surface. Second *ph* very weak. *Pra* about half as long as anterior *ntpl*.

Legs black; fore tibia with 1 *ad* and 1–2 *pv*; mid femur with 1 *pv*; mid tibia with 1 *ad*, 2 *pd* and 1–2 *pv*; hind femur with a full series of long *av*, and 0–1 *pv*; hind tibia with 5 *ad*, 4 *pd*, and 2 *pv*.

Wing faintly brownish tinged, denser basally; m-m nearly straight. Calypter whitish pale. Knob of halter reddish brown.

Length. Body 3.3–3.6 mm, wing 3.0–3.2 mm.

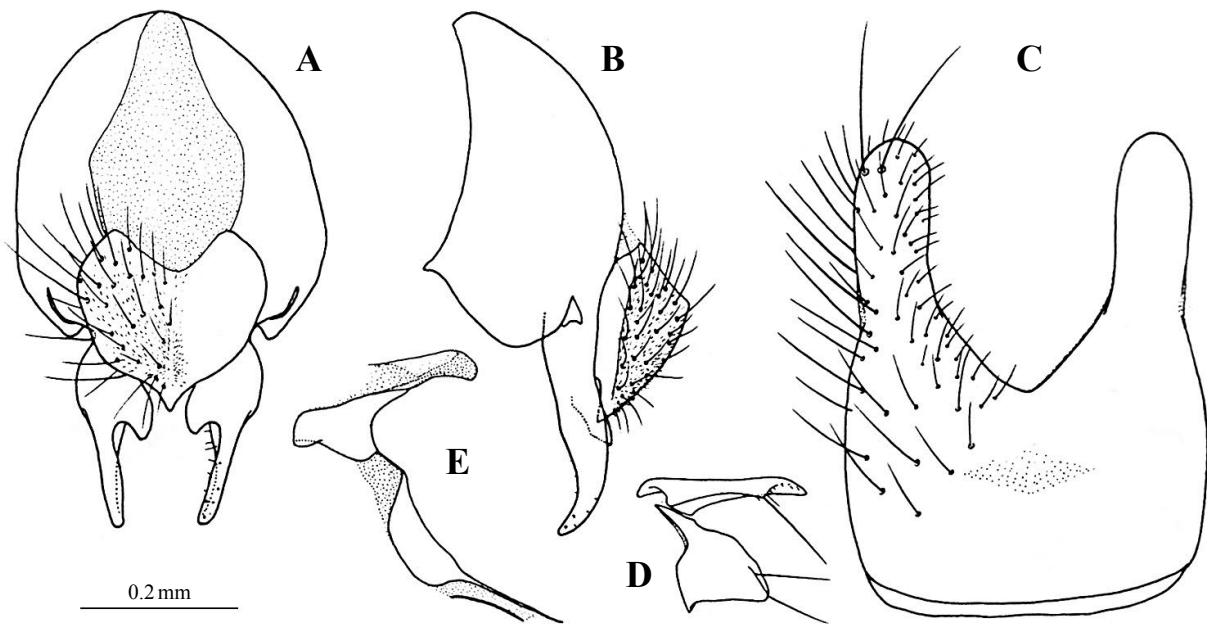


Fig. 38. *Chirosia inspinata* Suwa, 1983, male (after Suwa). A, B. hypopygium; C. fifth sternite; D. gonocoxal lobe and gonostylus; E. phallus.

MATERIAL EXAMINED: [KPNU] <JB> 1 ex., Heungdeok-myeon, Gochang-gun, 24.v.2006, SJ Suh.

DISTRIBUTION: Korea.

LOCALITY: South-GN: Jirisan; JB: Gochang.

38. *Chirosia nigripes* Bezzi, 1895 (Fig. 39)

Chirosia nigripes Bezzi, 1895: 63 (Italy); Suh & Kwon, 1986: 160; Suh, 1989: 93; Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 303; Kwon et al., 1996: 223; Paek et al., 2010: 241; Han et al., 2014: 148.

Chirosia albifrons Tiensuu, 1938: 22 (Finland).

Male. Black in ground color, with thin grayish pollen. Head about 1.2–1.3 times as high as long in profile. Frons at narrowest part nearly as wide as distance between posterior ocelli inclusive. Interfrontalia dark brown or dark, with a pair of proclinate cruciate *if*; parafrontalia dull with grayish pollen, with 3 *ors*, and 2 slender *ori*. Antenna black; third segment about 1.5 times as long as wide; arista short pubescent, the longest hair as long as basal diameter of arista. Palpus black and slender. Haustellum black and stout.

Thorax black in ground color, with bluish gray pollen, and patches of brown pollen, especially on dorsum. Mesonotum with a pale brownish median vitta presuturally in caudal view; 3 pairs of *pre acr*, distance separating *pre acr* rows about half as wide as distance between *pre acr* and *dc* rows. Scutellum without setulae

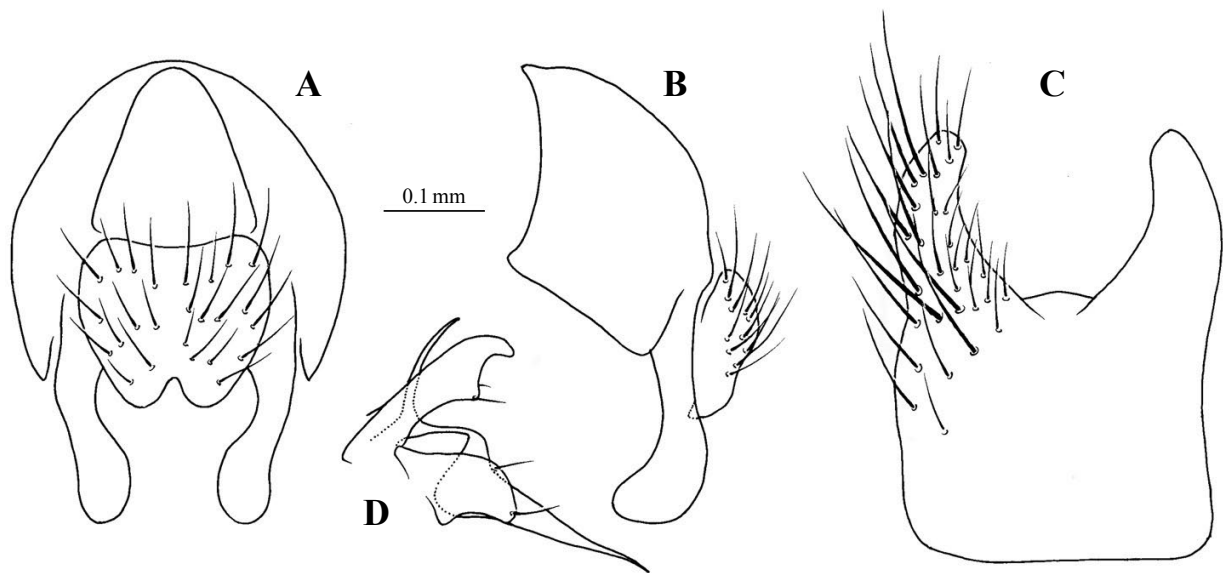


Fig. 39. *Chirosia nigripes* Bezzi, 1895, male. A, B. hypopygium; C. fifth sternite; D. gonocoxal lobe, gonostylus and phallus.

on under surface. Second *ph* weak. *Pra* about half as long as anterior *ntpl*. Posterior *ntpl* rather longer than anterior *ntpl*. Proepisternum with 2 *prepst*. Anepisternum 2 *prepm*.

Legs black; fore femur with an extensive series of longer slender *ad* and *av*; fore tibia with 1 *pv*; mid tibia with 3 *pd*; hind femur with 5 *av*; hind tibia with 4 *ad*, 3 *av*, 4 *pd*, and 3–4 *pv*.

Wing faintly brownish tinged, denser basally; m-m nearly straight. Calypter pale yellow. Knob of halter yellow.

Abdomen with bluish gray pollen, with black narrow median vitta.

Length. Body 3.4–3.5 mm, wing 2.9–3.1 mm.

MATERIAL EXAMINED: [KPNU] <CN> 1 ex., Baegunbong, 27.v.2009, SJ Suh; <JB> 2 exs., Unjangsan, 31.v.1998, SJ Suh; <JN> 1 ex., Dolsando, 17.iv.1986, YJ Kwon.

DISTRIBUTION: Korea, Japan (Hokkaido, Honshu, Kyushu), China (Fujian), Italy.

LOCALITY: Central-CN: Baegunbong; South-JB: Unjangsan; JN: Dolsando.

39. *Chirosia sobaeksana* (Kwon et Suh, 1982) (Fig. 40)

Meliniella iobaeksana (error for *sobaeksana*) Kwon & Suh, 1982c: 187, 188 (Korea: Sobaeksan).

Meliniella sobaeksana: Suh & Kwon, 1985: 168 (emendation *iobaeksana*).

Chirosia sobaeksana: Suh, 1989: 93, 94; Dely-Draskovits, 1993: 36; Ent. Soc. Kor. & Kor. Soc. App. Ent.,

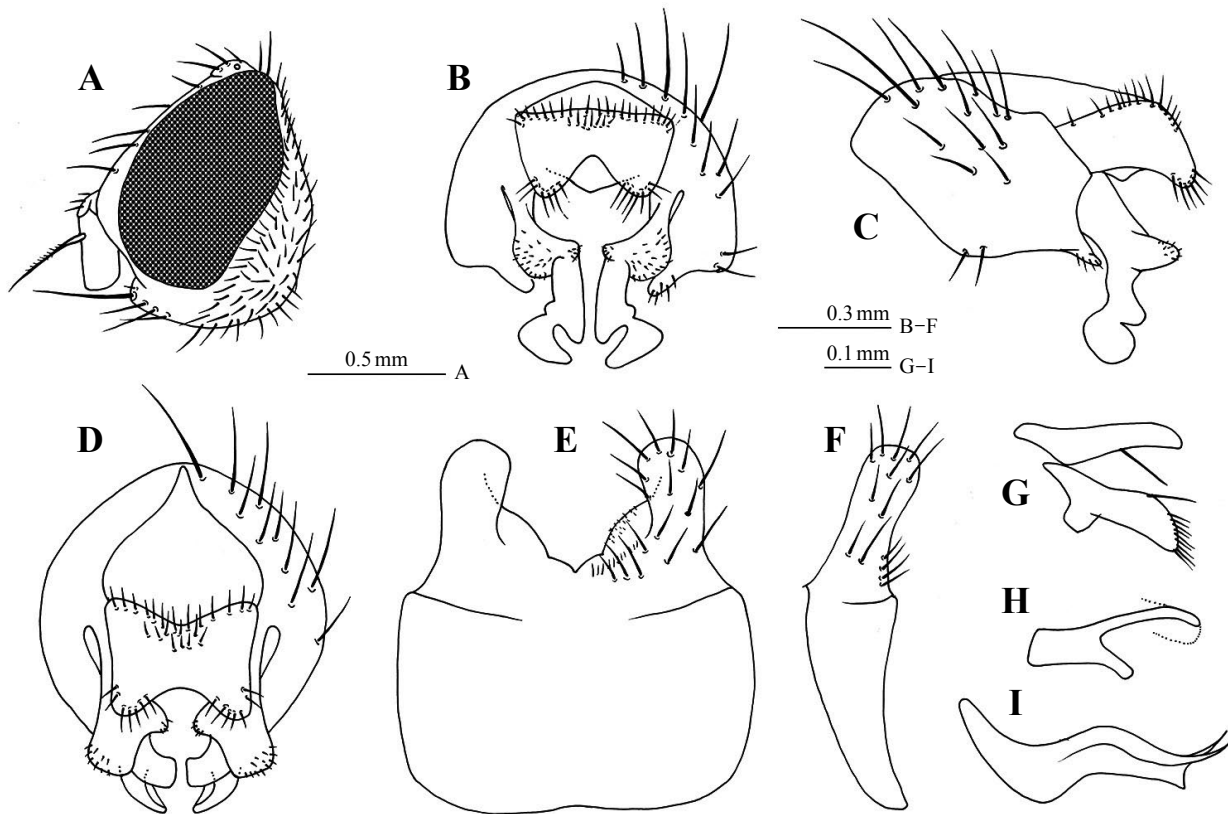


Fig. 40. *Chirosia sobaeksana* (Kwon et Suh, 1982), male. A. head; B–D. hypopygium; E, F. fifth sternite; G. gonocoxal lobe and gonostylus; H. ephiphallus and basiphallus; I. distiphallus.

1994: 303; Kwon et al., 1996: 224; Paek et al., 2010: 241; Han et al., 2014: 148.

Chirosia sobaekana (sic): An, 1998, Res. Bull. Nat. Sci. Mus. 22: 62.

Male. Black in ground color, with thin grayish pollen. Head about 1.1–1.2 times as high as long in profile. Frons at narrowest part nearly as wide as distance between posterior ocelli inclusive. Interfrontalia dark brown or dark, with pair of proclinate cruciate *if*; parafrofrontalia dull with grayish pollen, with 1 *ors*, and 3 *ori*. Antenna black; third segment about 1.2–1.3 times as long as wide; arista shortly pubescent, longest hair as long as basal diameter of arista. Palpus and haustellum black and slender.

Thorax black in ground color, with gray pollen, and patches of brown pollen, especially on dorsum. Mesonotum with 3 pairs of *pre acr*, distance separating *pre acr* rows about half as wide as distance between *pre acr* and *dc* rows. Scutellum without setulae on under surface. Second *ph* weak. *Pra* strong. Proepisternum with 2 *prepst*. Anepisternum 2 *prepm*.

Legs black; hind femur with slender *av* and *pv*; hind tibia with 5 *ad*, 2 *av*, 6 *pd*, and 3 *pv*.

Wing faintly brownish tinged, denser basally; m-m nearly straight. Calypter pale yellow. Knob of halter

yellow.

Length. Body 3.5 mm, wing 3.1 mm.

MATERIAL EXAMINED: [KPNU] <GB> 1 ex., Sobaeksan, 15.v.1981, YJ Kwon.

DISTRIBUTION: Korea.

LOCALITY: South-GB: Sobaeksan.

Genus *Delia* Robineau-Desvoidy, 1830

Delia Robineau-Desvoidy, 1830: 571. Type-species: *Delia floricola* Robineau-Desvoidy, 1830 (France).

Gastrolepta Lioy, 1864: 990. Type-species: *Musca coarctata* Fallén, 1825 (Sweden: Scania).

Trigonostoma Lioy, 1864: 990. Type-species: *Chortophila frontalis* Macquart, 1835 (France).

Eriosischia Lioy, 1864: 991. Type-species: *Chortophila floccosa* Macquart, 1835 (France).

Cimbotoma Lioy, 1864: 994. Type-species: *Delia floricola* Robineau-Desvoidy, 1830 (France).

Leptohylemyia Schnabl et Dziedzicki, 1911: 94 (as subgenus of *Hylemyia*). Type-species: *Musca coarctata* Fallén, 1825 (Sweden: Scania).

Crinura Schnabl et Dziedzicki, 1911: 95, 96 (as subgenus of *Hylemyia*). Type-species: *Anthomyia platura* Meigen, 1926 (not given).

Flavena Karl, 1928: 147 (as subgenus of *Chortophila*). Type-species: *Anthomyza criniventris* Zetterstedt, 1860 (Sweden: Skåne).

Tricharia Karl, 1928: 160 (as subgenus of *Chortophila*). Type-species: *Chortophila trichodactyla* Rondani, 1866 (Italy).

Chortophilina Karl, 1928: 203. Type-species: *Chirosia fallax* Loew, 1873 (not given).

Subdelia Karl, 1943: 65. Type-species: *Musca floralis* Fallén, 1824 (Sweden: Scania).

Bisetaria Karl, 1943: 65. Type-species: *Chortophila quadripila* Stein, 1916 (Sweden).

Leucodelia 1943: 66 (as subgenus of *Hylemyia*). Type-species: *Aricia candens* Zetterstedt, 1845 (Sweden: Scania and Helgolandia).

Monodelia Karl, 1943: 66 (as subgenus of *Hylemyia*). Type-species: *Anthomyia longicauda* Strobl, 1898 (Austria: Kreuzkogel).

Chaetodelia Karl, 1943: 66 (as subgenus of *Hylemyia*). Type-species: *Phorbia exigua* Meade, 1883 (Great Britain: Lancashire).

Atrichodelia Karl, 1943: 66 (as subgenus of *Hylemyia*). Type-species: *Chortophila flavidipennis* Stein, 1916 (Finland: Kittilä).

Trichohylemyia Karl, 1943: 66 (as subgenus of *Hylemyia*). Type-species: *Trichohylemyia testaceifrons* Karl,

1943 (Poland: Pollnow; Austria: Steiermark).

Gymnodelia (error for *Atrichodelia*): Karl, 1943: 67.

DIAGNOSIS: Eyes without evident pubescence; face without prominent keel; arista not angled; scutellum with two long marginal pairs of setae and a shorter discal pair, and with fine pubescence on ventral surface; prosternum, proepisternum and meron bare; fore femur with normal erect setulae on outer surface; hind tibia without apical *pv*; sternite 5 with long process whose outer lateral setae become progressively longer distally; hypandrium absent or small and inconspicuous, with pedestal-like posterior extension; gonostylus and gonocoxal lobe relatively small; inner basal surface of surstylus fused with periandrium (Griffiths, 1991).

Key to species of Korean *Delia*

1. Frons wider, or only little narrower than one-third of head width in male 2
1. Frons much narrower, nearly contiguous in male 4
2. Frons about 0.25 times as wide as head width in male; *pra* absent *D. hystricosternita*
2. Frons 0.3–0.4 times as wide as head width in male; *pra* present 3
3. First *pre acr* shorter than second *pre acr* *D. chirisana*
3. First *pre acr* longer than second *pre acr* *D. expansa*
4. Fore tibia with apical *pv* strong and blunt apically 5
4. Fore tibia with apical *pv* weak, if strong it is not blunt apically 10
5. Epistoma projecting forwards beyond tip of profrons; *pra* much longer than posterior *ntpl*
..... *D. longitheca*
5. Epistoma situated behind frons at lunule; *pra* shorter than posterior *ntpl* 6
6. Mid tibia without *ad* *D. tenuiventris*
6. Mid tibia with *ad* 7
7. Mid basitarsus with some long setae on dorsal surface *D. tumidula*
7. Mid basitarsus without long seta on dorsal surface 8
8. *Pra* as long as posterior *ntpl* *D. seticauda*
8. *Pra* much shorter than posterior *ntpl* 9
9. Hind tibia with more than 20 *pv* on whole length in male; frons usually narrower than anterior ocellus in male *D. platura*
9. Hind tibia with less than 20 *pv* on basal half to two-thirds in male; frons usually wider than anterior ocellus in male *D. antiqua*
10. *Pra* longer than posterior *ntpl* 11
10. *Pra* shorter than posterior *ntpl* 13
11. Mid tibia without *ad* *D. floralis*

11. Mid tibia with *ad* 12
 12. Mid femur with some rather distinct *av*; hind tibia with strong apical *pd* *D. robustiseta*
 12. Mid femur without distinct *av*; hind tibia with weak apical *pd* *D. cyclocerca*
 13. Genal setae in a row; third sternite with numerous slender setae in male *D. coronariae*
 13. Genal setae in 2 rows; third sternite with a few slender setae in male *D. echinata*

40. *Delia antiqua* (Meigen, 1826) (Fig. 41)

Anthomyia antiqua Meigen, 1826: 166 (not given).

Crinura antiqua: Schnabl et Dziedzicki, 1911: 95, 96.

Hylemyia antiqua: Séguy, 1923: 90; Seedl. Stst. Hamg., 1928; Kato, 1939: 1529; Yokoo, 1940: 188; Lee, 1963: 133–135; Paik, 1963: 206, 207; Zool. Soc. Kor., 1968: 184; Kor. Soc. Plant Prot., 1972: 218.

Delia antiqua: Hennig, 1974: 739–743, pls. 90 (1030), 108 (1159); Suwa, 1974: 146; Suwa, 1981a: 102; Suh & Kwon, 1985: 199, 200; Suh et al., 1985: 210; Kor. Soc. Plant Prot., 1986: 247; Fan et al., 1988: 180; Suh, 1989: 110–112; Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 303; Kwon et al., 1994: 265; Suh & Kwon, 1995: 195; Kwon et al., 1995: 499; Kwon et al., 1996: 224; Wei et al., 1996: 713; Suwa, 1999: 217; Paek et al., 2010: 242; Suwa, 2013: 160; Han et al., 2014: 148.

Helemyia sp. (sic): Nakayama, 1936: 228–230.

“Pabore”: Machida et Aoyama, 1930: 321–324.

Hylemia antiqua (sic): Lee et al., 1985: 429.

Hylemyia (Delia) antiqua: Fan, 1965: 48, 49.

Hylemya antiqua (sic): Park et al., 1985: 29–33.

Anthomyia cepearum Meigen, 1830: 166 (not given); Bouché, 1834: 73.

Musca (Anthomyia) liturariae Ratzeburg, 1844: 170 (not given).

Phobia cepetorum Meade, 1883: 218 (not given).

Male. Black in ground color, with thin gray pollen. Head about 1.2–1.3 times as high as long in profile. Frons at narrowest part nearly as wide as distance between posterior ocelli exclusive. Interfrontalia dull tinged with brown, pair of proclinate fine *if*; parafrontalia silvery gray with 4–5 *ori*. Parafacialia and cheek black with gray pollen. Antenna black; third segment about 1.7–1.8 times as long as wide; arista distinctly pubescent, the longest hair about as long as basal diameter of arista. Palpus and haustellum black.

Thorax black in ground color, with brownish gray pollen, and patches of brown pollen, especially on dorsum. Mesonotum with pale brownish black narrow median and broad lateral vittae presuturally in caudal view; 3 pairs of *pre acr*, the distance separating *pre acr* rows about half as wide as distance separating *pre acr* and *dc* rows. Second *ph* indistinguishable from additional setulae. *Pra* short, about 0.4–0.5 times as long

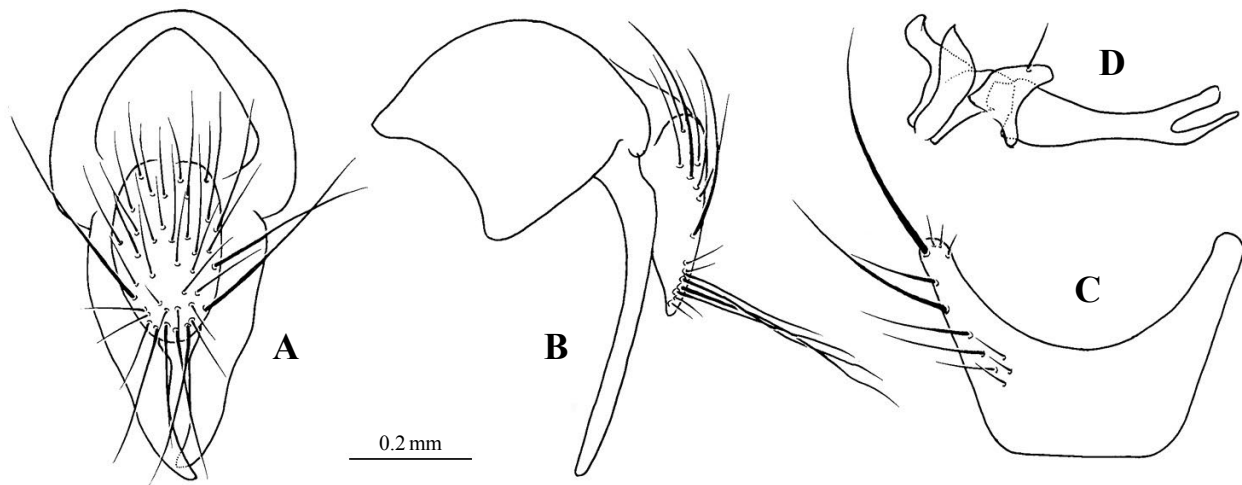


Fig. 41. *Delia antiqua* (Meigen, 1826), male. A, B. hypopygium; C. fifth sternite; D. gonocoxal lobe, gonostylus and phallus.

as anterior *ntpl*. Posterior *ntpl* about 0.8–0.9 times as long as anterior *ntpl*. Proepisternum with 2 *prepst*. Anepisternum with 2 long and 4–5 fine *prepm*.

Legs black; fore tibia with 1 *pv* and strong apical *pv* blunt apically; mid tibia with 1 *ad*, 2 *pd*, 2 *pv*, and strong apical *av* and *pv*; hind tibia with 7 *ad*, 3 *av*, 3 *pd*, 6–7 *pv*, and strong apical *d*, *ad* and *av*.

Wing faintly brownish tinged, denser basally; costal spine small and much shorter than r-m; m-m nearly straight. Calypter pale yellow. Knob of halter yellow.

Abdomen black with brownish gray pollen, with black narrow median vitta.

Length. Body 5.5–5.8 mm, wing 4.9–5.2 mm.

MATERIAL EXAMINED: [KPNU] <GG> 66 exs., Ganghwado, 22.v.1989, SJ Suh; <CB> 52 exs., Tanyang, 31.v.1989, SJ Suh; <GB> 1 ex., Daegu, 12.iv.1984, YJ Kwon; 1 ex., Irweolsan, 28–29.v.1984, TH Jo; 42 exs., Uiseong, 14.iv.1989, SJ Suh; 40 exs., Sinryeong, 12.v.1989, SJ Suh; 11 exs., Sinryeong, 22.v.1989, SJ Suh; <GN> 2 exs., Jinju, 9.iv.1977, MH Lee; [NIAST] <GG> 4 exs., Gwanggyosan, 4.v.1975, JY Shin; 1 ex., Yongin, 17.v.1973, JC Paik; 1 ex., Suwon, 17.v.1973, KY Choi; 2 exs., Suwon, 4.vi.1973, JC Paik; 28 exs., Suwon, 2.vi.1980, KR Choe; 3 exs., Suwon, 31.v.1980, KR Choe; 22 exs., Suwon, 4.vi.1980, CG Yoo; 1 ex., Suwon, 7.vi.1980, KR Choe; 1 ex., Suwon, 30.ix.1976, YY Ha; 3 exs., Suwon, 16.ix.1976, KB Uhm; 1 ex., Suwon, 25.iv.1983, YI Lee; 1 ex., pyeongt'aek, vi.1973, GM Choi; <GW> 5 exs., Taegwalyeong, 25.v.1982, YI Lee; <CB> 1 ex., Tanyang, 17.v.1973, KY Choi; <CN> 22 exs., Yesan, 25.v.1976, CY Hwang; 1 ex., Yesan, 26.v.1976, CY Hwang; 5 exs., Yesan, 25.v.1976, KT Park; <GB> 6 exs., Yecheon, 10.v.1976, KT Park; 1 ex., Sangju, 11.v.1976, KT Park; 4 exs., Daegu, 24.ix.1980, KR Choe; 5 exs., Kyeongsan, 10.ix.1980, CG Yoo; 1 ex., Kyeongsan, 2.vi.1980, CG Yoo; 1 ex., Kyeongsan, 30.ix.1980, CG Yoo; <JN> 4 exs., Chindo, 9.iv.1977,

MH Lee.

DISTRIBUTION: Korea, Japan (Hokkaido, Honshu, Kyushu), China (whole part), Russia (Sakhalin, Siberia), Europe, N. America, Brazil, Colombia, Hawaii.

LOCALITY: North-HB: Gyeongseong; HN: Gapsan, Pungsan; Central-GG: Ganghwado, Gwanggyosan, Pyeongtaek, Suwon, Yongin; GW: Daegwallyeong; CN: Deoksungsan, Yesan; CB: Danyang; South-GB: Bian-myeon, Daegu, Dansan-myeon, Euseong-eup, Gampo, Gyeongsan, Hayang-eup, Ilwolsan, Palgongsan, Sillyeong-myeon, Ulleungdo, Wachon-myeon, Yecheon; GN: Bangeojin, Busan, Chilwon-myeon, Gimhae, Geumsan, Jinju, Tongyeong (= Chungmu); JB: Gyeokpo, Jeongeup, Maisan; JN: Jindo, Wando; Jeju-JJ: Hallasan, Jeju.

HOST: Garlic, onion, spring onion and other *Allium* spp. (cf. Machida & Aoyama, 1930; Nakayaya, 1936; Kato, 1939; Yokoo, 1940; Lee, 1963; Paik, 1963; Suh & Kwon, 1985).

41. *Delia chirisana* Suh et Kwon, 1986 (Fig. 42)

Delia chirisana Suh & Kwon, 1986: 160, 161 (Korea: Jirisan); Suh, 1989: 112; Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 303; Kwon et al., 1996: 224; Paek et al., 2010: 242; Han et al., 2014: 148.

Male. General coloration black with densely brownish pruinescence. Head about 1.1–1.2 times as high as long in profile; frons very broad, a little wider than one third of head width; interfrontalia orange brown on lower half; orbital area slightly brownish near lunule and blackish on the remaining part in ground color; 3–4 *ori*, 2 robust *ors* and 1 long *if*. Antenna blackish; third antennal segment 1.7–1.8 times long as basal diameter of arista. Palpus blackish. Haustellum blackish with grayish pruinescence.

Thorax densely brownish pruinescent; mesonotum distinctly brownish pruinescent, with dark median and sublateral vittae; 3 pairs of *pre acr*, the distance between the second and the third seta nearly twice as wide as that between the first and the second, the second seta strong and rather longer than two-thirds of *pre dc*. Second *ph* indistinguishable from accessory setulae. *Pra* slightly shorter than half of posterior *ntpl*. Scutellum setulose on ventral surface. Notopleuron without additional setulae. Anterior *ntpl* longer than the posterior one. Anepisternum with 1 long and 4–6 additional *prepm*.

Legs wholly blackish and faintly grayish pruinescent; fore tibia with 1 *ad* and 1 *pv*; mid tibia with 1 *ad* and 2 *pd*; hind tibia with 7 *ad*, 3 *av*, 3 *pd* and 15–17 weak *pv*.

Wing hyaline and faintly tinged with brown; m-m slightly or hardly sinuate. Calypter clear, and brownish marginally; knob of halter brownish.

Length. Body 5.1–5.5 mm, wing 4.8–5.2 mm.

MATERIAL EXAMINED: [KPNU] <GN> 1 ex., Jirisan, 28.v.1989, YJ Kwon; 1 ex., Jirisan, 24.vii.1985, YJ

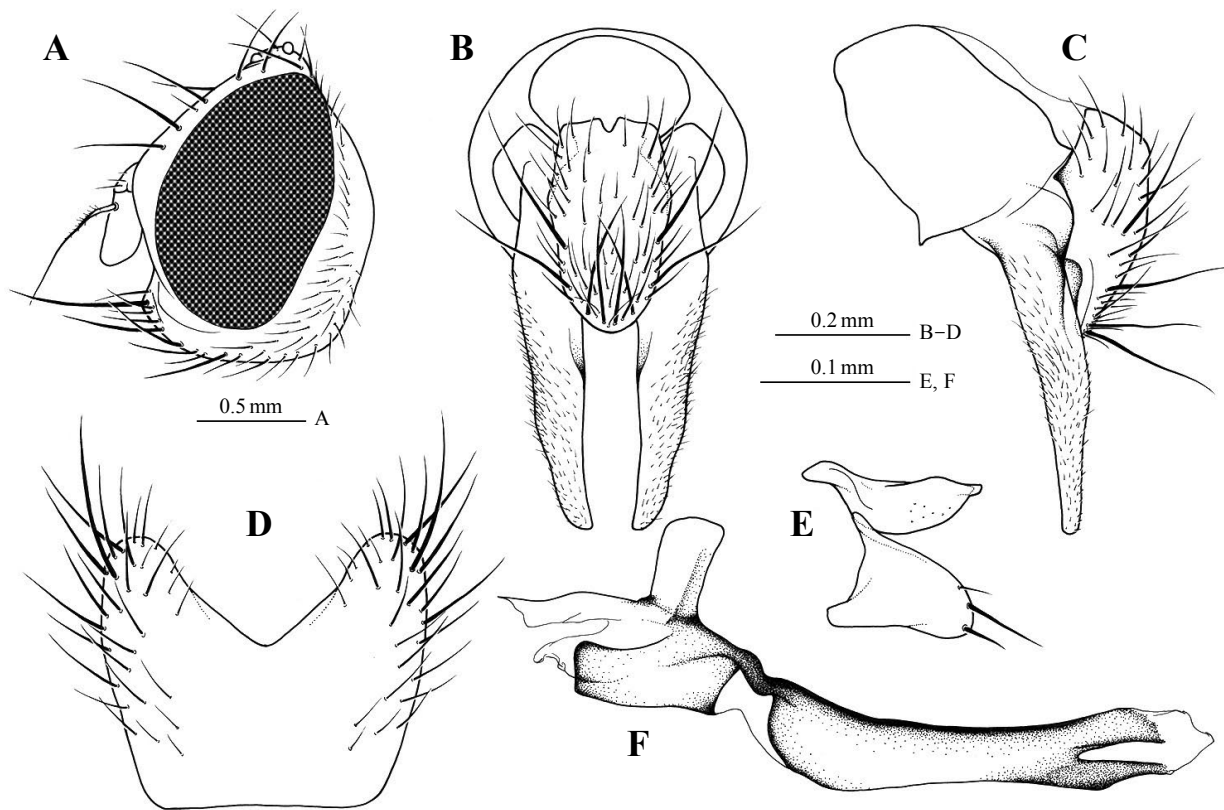


Fig. 42. *Delia chirisana* Suh et Kwon, 1986, male. A. head; B, C. hypopygium; D. fifth sternite; E. gonocoxal lobe and gonostylus; F. phallus.

Kwon; <GB> 1 ex., Wachon, 28.v.1989, YJ Kwon.

DISTRIBUTION: Korea.

LOCALITY: South-GB: Wachon-myeon; GN: Jirisan.

42. *Delia coronariae* (Hendel, 1925) (Fig. 43)

Chortophila coronariae Hendel, 1925: 305 (Poland).

Delia coronariae: Hennig, 1974: 778–781, pls. 88 (1009–1011), 98 (1088), 99 (1173, 1175); Suh & Kwon, 1985: 202; Suh, 1989: 112; Suh et al., 1991: 49; Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 303; Kwon et al., 1994: 265; Kwon et al., 1996: 224; Paek et al., 2010: 242; Han et al., 2014: 148.

Hylemyia (Delia) striatula Karl, 1943: 71 (Poland).

Hylemyia (Delia) nudiventris Ringdahl, 1948: 164 (Auetria).

Delia paludosa Fonseca, 1966: 276 (Great Britain).

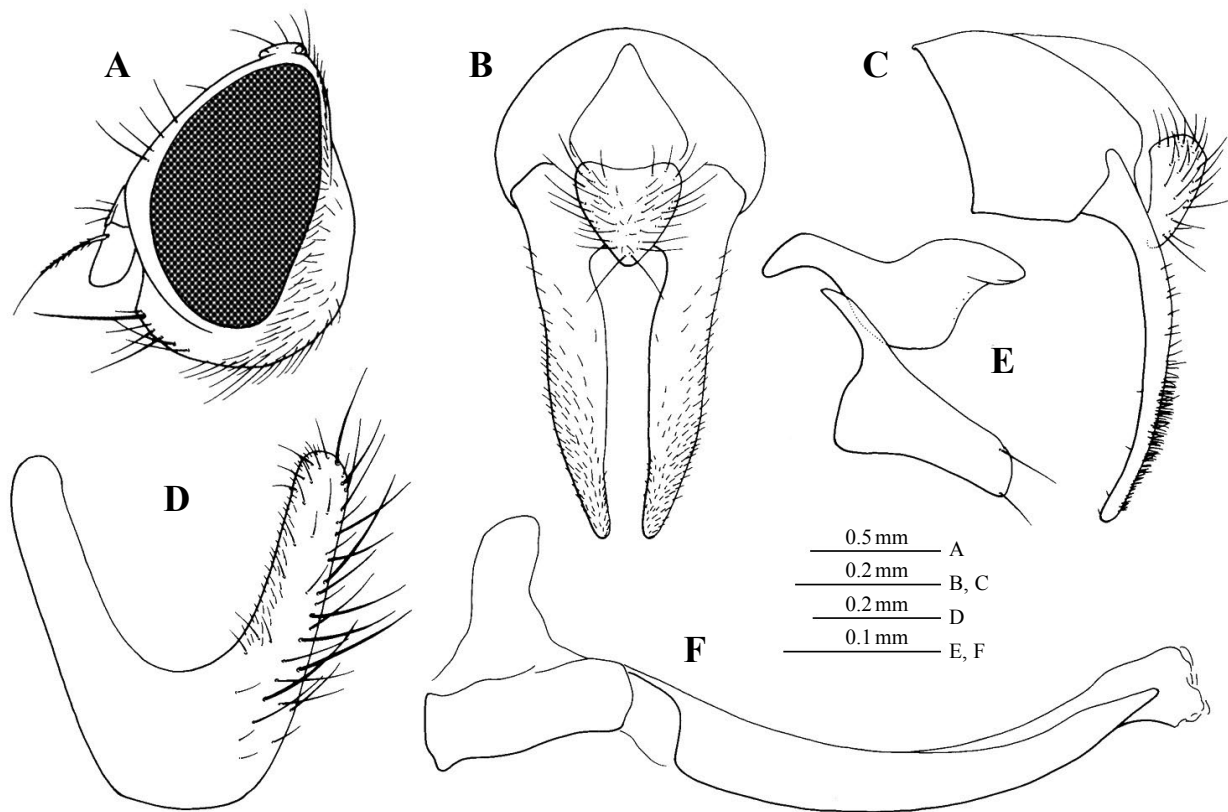


Fig. 43. *Delia coronariae* (Hendel, 1925), male. A. head; B, C. hypopygium; D. fifth sternite; E. gonocoxal lobe and gonostylus; F. phallus.

Male. General coloration dark brownish gray. Head 1.2–1.3 times as high as long in profile; frons about as wide as or slightly wider than diameter of anterior ocellus; interfrontalia reddish brown; 3–5 *ori* and 1 *if*; parafacialia and cheek bluish gray pruinose. Antenna black; third antennal segment 1.7–1.8 times as long as wide; arista shortly pubescent of which the longest hair about equal to basal diameter of arista. Palpus and haustellum black.

Thorax densely brownish gray pollinose, especially deeper on dorsum; mesonotum with rather distinct median and sublateral vitta; 3 pairs of *pre acr*, lacking additional setulae between the rows. Second *ph* fine, usually indistinguishable from accessory setulae. *Pra* about half as long as anterior *ntpl*.

Legs black; fore tibia with 1 *ad*, 1 *pv* and short apical *pv*; mid tibia with 1 *ad*, 1 *pd* and 2 *pv*; hind tibia with 4 *ad*, 2 *av*, 3 *p*, and 0–3 fine *pv*, no apical *pv*.

Wing faintly yellow tinged; m-m hardly sinuate. Calypter and halter brownish.

Abdomen brownish black, some bluish tinged and with dark median vitta; third sternite with numerous slender setae.

Length. Body 4.2–4.6 mm, wing 3.1–3.8 mm.

MATERIAL EXAMINED: [KPNU] <GB> 1 ex., Palgongsan, 7.vi.1981, YJ Kwon; 1 ex., Palgongsan, 3.vi.1984, YJ Kwon; 1 ex., Palgongsan, 23.v.1981, YJ Kwon; 1 ex., Juwangsan, 29.vii.1984, YJ Kwon; 1 ex., Daegu, 26.iii.1984, YJ Kwon; <GN> 1 ex., Wonhyosan, 6.vi.1981, YJ Kwon.

DISTRIBUTION: Korea, China (Heilongjiang, Liaoning), Europe.

LOCALITY: North-HB: Sobaeksan; South-GB: Daegu, Juwangsan, Palgongsan; GN: Wonhyosan.

43. *Delia cyclocerca* Hsue, 1981 (Fig. 44)

Delia cyclocerca Hsue, 1981: 215 (China); Suwa, 1983b: 32–34; Suh & Kwon, 1985: 201; Suh, 1989: 112; Dely-Draskovits, 1993: 42; Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 303; Kwon et al., 1996: 224; Paek et al., 2010: 242.

Delia cyclocera (sic): Han et al., 2014: 148.

Male. Black in ground color, with thin brownish gray pollen. Head about 1.2 times as high as long in profile. Interfrontalia dull tinged with brown, pair of proclinate strong *if*; parafrontalia fuscous gray with 1 *ors* and 4 *ori*. Parafacialia and cheek brownish black with gray pollen. Antenna black; third segment about 2.0–2.1 times as long as wide; arista pubescent, the longest hair about 1.5–2.0 times as long as basal diameter of arista. Palpus and haustellum black.

Thorax black in ground color, with brownish gray pollen, and patches of brown pollen, especially on dor-

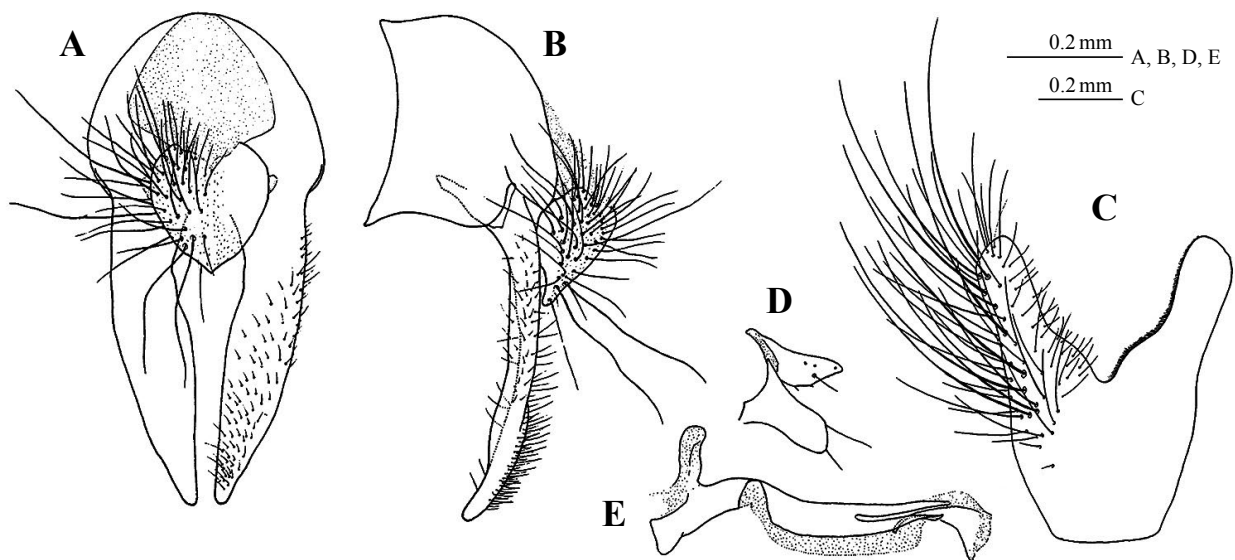


Fig. 44. *Delia cyclocerca* Hsue, 1981, male (after Suwa). A, B. hypopygium; C. fifth sternite; D. gonocoxal lobe and gonostylus; E. phallus.

sum. Mesonotum with brownish black broad median and obscure lateral vittae presuturally in caudal view; 2–3 irregular pairs of *pre acr*, the distance separating *pre acr* rows about as wide as distance between *pre acr* and *dc* rows. Second *ph* indistinguishable from additional setulae. *Pra* absent. Posterior *ntpl* about 0.8–0.9 times as long as anterior *ntpl*. Proepisternum with 2 *prepst*. Anepisternum with 1 long and 1–2 fine *prepm*.

Legs black; fore tibia with 1 *ad*, 1 *pv*; mid tibia with 1–2 *ad*, 1 *pd*, 1–2 *pv*, and strong apical *av* and *pv*; hind tibia with 4–5 *ad*, 2 *av*, 3–4 *pd*, 1 *pv*, and strong apical *av*.

Wing faintly brownish tinged, denser basally; costal spine small and much shorter than r-m; m-m nearly straight. Calypter pale yellow. Knob of halter yellow.

Abdomen black with purple gray pollen, with black narrow median vitta.

Length. Body 3.5–4.9 mm, wing 3.2–4.3 mm.

MATERIAL EXAMINED: [KPNU] <GW> 1 ex., Seoraksan, 30.vi.1984, YJ Kwon; 4 exs., Samyeongsan, 11.v.2003, SJ Suh; <GB> 5 exs., Ilweolsan, 23.v.2007, SJ Suh.

DISTRIBUTION: Korea, China (Liaoning).

LOCALITY: Central-GW: Seoraksan, Samyeongsan; South-GB: Ilweolsan; GN: Jirisan.

44. *Delia echinata* (Séguy, 1923) (Fig. 45)

Chotophila echinata Séguy, 1923: 360 (France: Paris).

Hylemyia (Delia) echinata: Tiensuu, 1935: 24.

Delia cyclocerca Hsue, 1981: 215 (China); Suwa, 1983b: 32–34; Suh & Kwon, 1985: 201; Suh, 1989: 112;

Dely-Draskovits, 1993: 42; Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 303; Kwon et al., 1996: 224; Paek et al., 2010: 242.

Delia cyclocera (sic): Han et al., 2014: 148.

Hylemyia scanica Ringdahl, 1926: 118 (Sweden).

Hylemyia abenda Hall, 1937: 201 (USA: Oregon).

Male. Black in ground color, with thin brownish gray pollen. Head about 1.2–1.3 times as high as long in profile. Frons much narrower than ocellus, parafrontalia broadly contiguous to each other. Interfrontalia dull tinged with brown near lunule, a pair of proclinate fine *if*; parafrontalia with 5–6 *ori*. Parafacialia and cheek brownish black, with gray pollen. Antenna black; third segment about twice as long as wide; arista distinctly pubescent, the longest hair about as long as basal diameter of arista. Palpus black. Haustellum black with sparse gray pollen.

Thorax black in ground color, with gray pollen, and patches of brown pollen, especially on dorsum. Mesonotum with brownish black broad median and narrow submedian vittae presuturally in caudal view; 3 pairs of

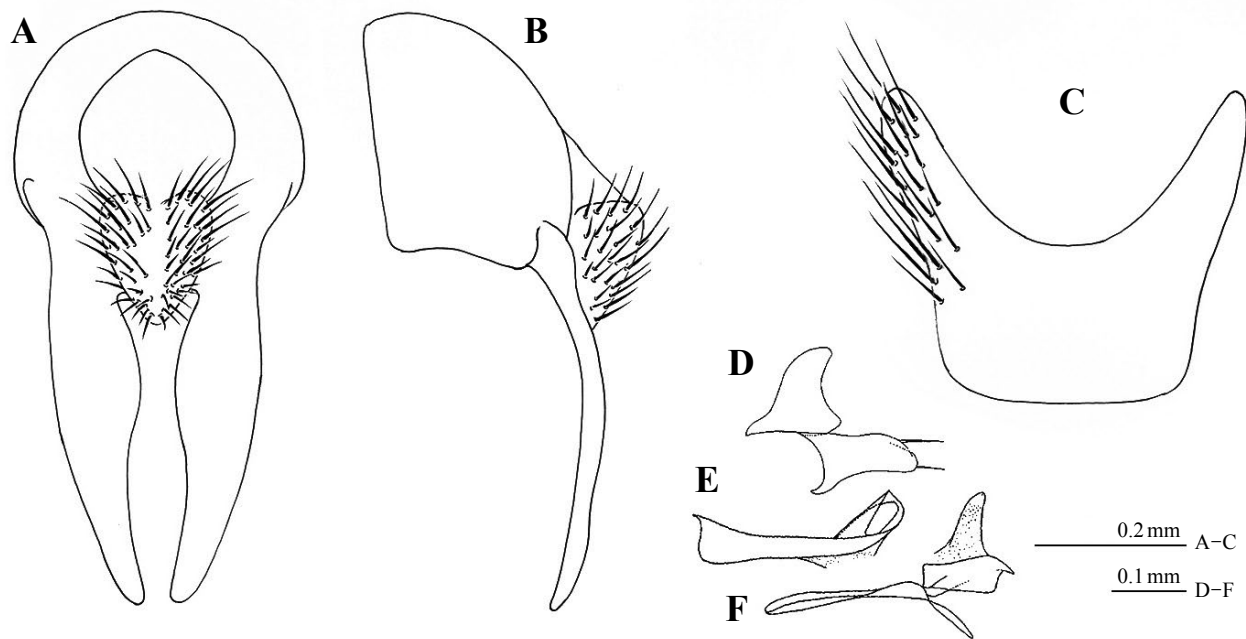


Fig. 45. *Delia echinata* (Séguy, 1923), male. A, B. hypopygium; C. fifth sternite; D. gonocoxal lobe and gonostylus; E. ephiphallus and basiphallus; F. distiphallus.

pre acr, the distance separating *pre acr* rows about as wide as distance between *pre acr* and *dc* rows. Second *ph* indistinguishable from accessory setulae. *Pra* about 0.6–0.7 times as long as anterior *ntpl*. Posterior *ntpl* about 0.8–0.9 times as long as anterior *ntpl*. Proepisternum with 2 *prepst*. Anepisternum with 2 long and 1–5 fine *prepm*.

Legs black; fore tibia with 1 *ad*, 1 *pv*, and short apical *pv*; mid tibia with 1 *ad*, 1 *pd*, 2 *pv*, and strong apical *av* and *pv*; hind tibia with 5–6 *ad*, 3 *av*, 3 *pd*, 4 *pv* and apical *av*.

Wing faintly brownish tinged, denser basally; costal spine indistinguishable from anterior setulae; m-m nearly straight. Calypter and knob of halter pale fuscous.

Abdomen black with bluish gray pollen, with black narrow median vitta; third and fourth sternite with a few slender marginal setae.

Length. Body 4.0–4.5 mm, wing 3.7–4.0 mm.

MATERIAL EXAMINED: [KPNU] <GG> 1 ex., Ganghwado, 11.v.1982, YJ Kwon; 1 ex., Myeongseongsan, 16.v.1982, YJ Kwon; 1 ex., Siheung-shi, 16.xii.1998, YJ Kwon; <GW> 26 exs., Odaesan, 24.v.1989, YJ Kwon; 2 exs., Seoraksan, 19.viii.1989, YJ Kwon; 2 exs., Obongsan, 21.v.1982, YJ Kwon; 2 exs., Seoraksan, 30.vii.1982, YJ Kwon; 4 exs., Seoraksan, 29.vii.1982, YJ Kwon; 2 exs., Duwonbong, 9.v.2000, SJ Suh; 1 ex., Balwangsan, 10.vi.2000, SJ Suh; <CB> 1 ex., Songnisan, 26.iv.2002, SJ Suh; <CN> 2 exs., Teoksungsan, 27.v.1982, YJ Kwon; 1 ex., Teoksungsan, 26.v.1982, YJ Kwon; 1 ex., Seodaesan, 9.vi.2002, SJ Suh; <GB>

18 exs., Daegu, 26.iii.1982, YJ Kwon; 3 exs., Daegu, 22.iii.1982, YJ Kwon; 1 ex., Palgongsan, 23.v.1981, YJ Kwon; 2 exs., Palgongsan, 7.vi.1981, YJ Kwon; 5 exs., Sobaeksan, 15.v.1981, YJ Kwon; 1 ex., Koryeong, 30.iii.1984, YJ Kwon; 1 ex., Daegu, 12.iv.1984, YJ Kwon; 5 exs., Palgongsan, 21.iv.1982, YJ Kwon; 1 ex., Palgongsan, 12.v.1983, YJ Kwon; 1 ex., Palgongsan, 17.iv.1984, SH Park; 1 ex., Geumosan, 13.iv.1983, SH Park; 1 ex., Geumosan, 18.v.1983, SH Park; 2 exs., Geumosan, 20.iv.1983, SH Park; 1 ex., Pohyeonsan, 11.vii.1998, JS Park; 1 ex., Munmyeongsan, 24.v.2007, SJ Suh; 1 ex., Hwangaksan, 23.v.2007, SJ Suh; 1 ex., Sobaeksan, 28.iv.2007, SJ Suh; 1 ex., Songnisan, 1.vi.2002, SJ Suh; 1 ex., Juwangsan, 15.v.1999, SJ Suh; 1 ex., Gayasan, 6.vi.2000, SJ Suh; 1 ex., Gapjangsan, 28.iv.2000, SJ Suh; <GN> 1 ex., Kajisan, 21.v.1980, YJ Kwon; 2 exs., Chilwon-myeon, 17.iv.1982, YJ Kwon; 10 exs., Keumsan, 29.iii.1982, YJ Kwon; 2 exs., Jirisan, 14.v.1981, YJ Kwon; 2 exs., Yehangsan, 29.v.1999, SJ Suh; 1 ex., Odosan, 22.v.2000, SJ Suh; <JB> 5 exs., Unjangsan, 9.v.1998, SJ Suh; <JN> 1 ex., Baekunsan, 5.vi.1999, SJ Suh; <JJ> 1 ex., Hallasan, 23.vii.1981, YJ Kwon; [NIAST] <GG> 3 exs., Suwon, 8.iv.1983, YI Lee; 3 exs., Suwon, 1.iv.1983, YI Lee; 1 ex., Suwon, 20.v.1980, KR Choe; 2 exs., Suwon, 12.iv.1977, SC Han; [NIBR] <GB> 1 ex., Pohyeonsan, 29.v.1998, YJ Kwon; 4 exs., Pohyeonsan, 11.vii.1998, SJ Park; <JB> 5 exs., Unjangsan, 9.v.1998, SJ Suh.

DISTRIBUTION: Korea, Japan (Hokkaido, Honshu, Kyushu, Shikoku), China (Sichuan, Yunnan, Xizang), Russia (Sakhalin), India, Europe, N. America.

LOCALITY: Central-GG: Ganghwado, Myeongseongsan, Siheung, Soyosan, Suwon; GW: Obongsan, Odaesan, Seoraksan, Duwonbong, Balwangsan; CB: Songnisan; CN: Deoksungsan, Seodaesan; South-GB: Bohyeonsan, Daegu, Geumosan, Goryeong, Palgongsan, Sobaeksan, Munmyeongsan, Hwangaksan, Songnisan, Juwangsan, Gayasan, Gapjangsan; GN: Chilwon-myeon, Gajisan, Geumsan, Jirisan, Yehangsan, Odosan; JB: Unjangsan; JN: Baekunsan; Jeju-JJ: Hallasan.

HOST: *Dianthus caryophyllus*, *Spinacia oleacea*, *Stellaria media* (cf. Suwa, 1974), *Gypsophila*.

45. *Delia expansa* Suh et Kwon, 1985 (Fig. 46)

Delia expansa Suh & Kwon, 1985: 196 (Korea: Soraksan); Suh, 1989: 114; Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 303; Kwon et al., 1996: 224; Paek et al., 2010: 242; Han et al., 2014: 149.

Male. General coloration dark bluish brown, head 1.2–1.3 times as high as long in profile; frons very broad, slightly narrower than one-third head-width; interfrontalia blackish on upper half, dark brownish on lower half; 2 *ori*, 3 *ors* and 1 *if*. parafacialia and cheek blue grayish pruinescent, with rufous reflections when view in profile, profrons much narrower than third antennal segment width. Antenna black; third antennal segment about 1.7 times as long as wide; arista pubescent, the longest hair as long as basal diameter of arista.

Thorax brown grayish pollinose; mesonotum especially brownish tinged, with dark median and sublateral vitta; 3 pairs of *pre acr*, a few additional setulae between the rows. Second *ph* indistinguishable from acces-

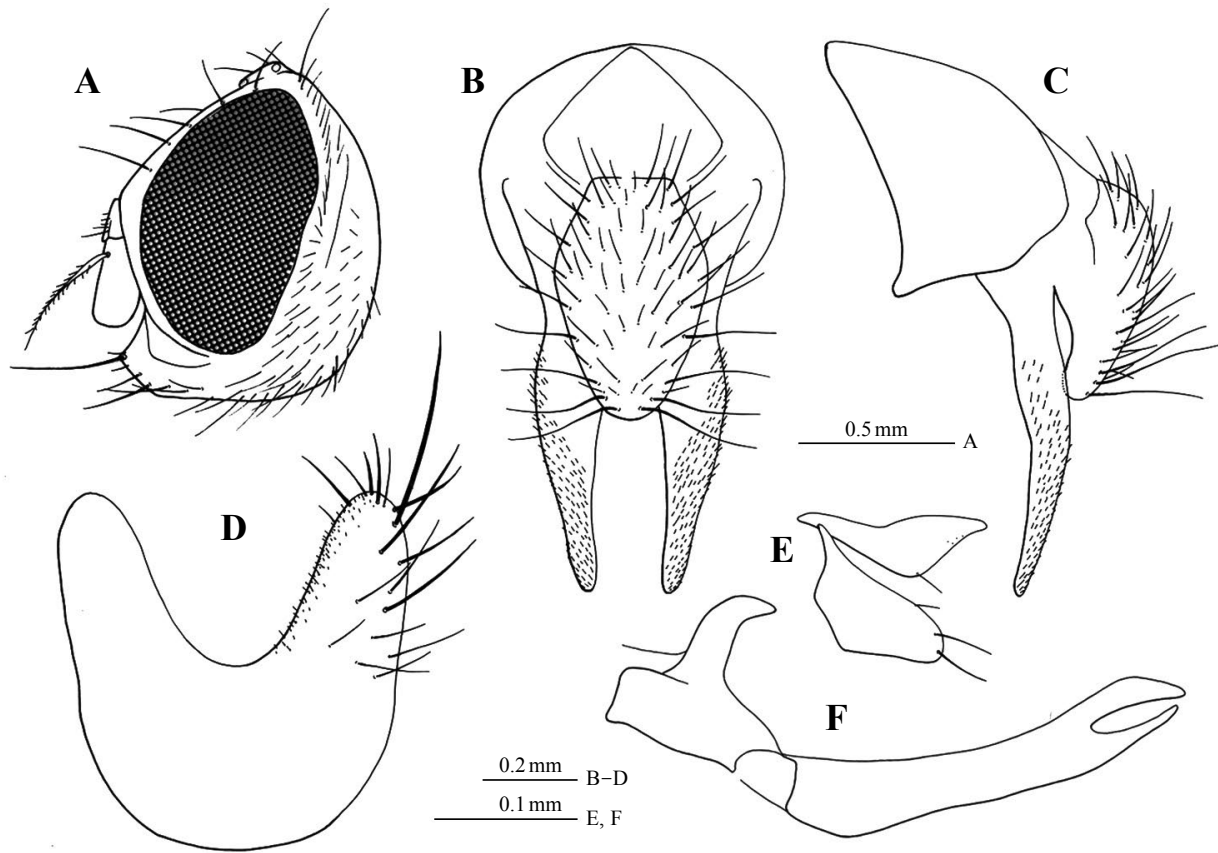


Fig. 46. *Delia expansa* Suh et Kwon, 1985, male. A. head; B, C. hypopygium; D. fifth sternite; E. gonocoxal lobe and gonostylus; F. phallus.

sory setulae; *pra* about half as long as anterior *ntpl*. Anepisternum with 1 strong and 4 fine *prepm*.

Legs wholly blackish and faintly grayish pollinose; fore tibia with 1 *ad*, 1 *pv*, and distinct apical *pv*; mid tibia with 1 *ad*, 2 *pd* and 2 *pv*; hind tibia with 6 *ad*, 2 *av*, 3 *pd*, about 10 short *pv*, and no apical *pv*.

Wing hyaline; m-m hardly sinuate. Calypter and knob of halter yellow.

Length. Body 4.5 mm, Wing 4.1 mm.

MATERIAL EXAMINED: [KPNU] <GW> 1 ex., Seoraksan, 29.vii.1982, YJ Kwon; [NIAST] <GG> 1 ex., Suwon, 9.v.1983, YI Lee.

DISTRIBUTION: Korea.

LOCALITY: Central-GG: Suwon; GW: Seoraksan.

46. *Delia floralis* (Fallén, 1824)

Musca floralis Fallén, 1824: 71 (Sweden: Scania).

Hylemyia floralis: Séguy, 1923: 95, 96; Seedl. Stat. Hamg., 1928; Kye, 1929; Kato, 1939: 1368; Yokoo, 1940: 194; Shiraki, 1958: 855; Lee, 1963: 129; Zool. Soc. Kor., 1968: 184; Kor. Soc. Plant Prot., 1972: 218.

Chortophila floralis: Tomaszewski, 1934: 60.

Hylemyia (Delia) floralis: Tiensuu, 1935: 21; Fan, 1965: 46–48.

Delia floralis: Ringdahl, 1959: 280; Hennig, 1974: 816–819, pls. 87 (1005), 105 (1138); Suwa, 1974: 146, 147; Suwa, 1981a: 102; Suh & Kwon, 1985: 200; Fan et al., 1988: 163, 164; Suh, 1989: 114–116; Dely-Draskovits, 1993: 43; Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 303; Kwon et al., 1996: 224; Wei et al., 1996: 718; Suwa, 1999: 218; Paek et al., 2010: 242; Suwa, 2013: 167; Han et al., 2014: 149.

Anthomyia vacans Pandellé, 1900: 235 (Poland).

Anthomyia flavopicta Matsumura, 1915: 55 (not given); Nakayama, 1936: 226–228.

Hylemyia crucifera Hockett, 1929: 93 (Canada: British Columbia).

Male. Black in ground color, with thin brownish gray pollen. Frons slight broader than anterior ocellus, parafrontalia broadly contiguous to each other. Interfrontalia with pair of proclinate fine *if*; parafrontalia with 1 *ors* and 6 *ori*. Antenna black; third segment about twice as long as wide; arista pubescent, the longest hair about as long as basal diameter of arista. Haustellum with mentum pollinose.

Thorax black in ground color, with gray pollen, and patches of brown pollen, especially on dorsum. Mesonotum with 3 brownish black vittae presuturally in caudal view; 1–2 pairs of *pre acr*. Second *ph* indistinguishable from accessory setulae. *Pra* about as long as anterior *ntpl*. Notopleuron with a few additional *ntpl* setulae.

Legs black; fore tibia with 1 *ad* and 1–2 *p*; mid tibia with 1 *pd*, 2 *p**v*, and strong apical *av* and *p**v*; hind tibia with 5–6 *ad*, 12 *av*, 3–6 *pd*, and 17 *p**v*.

Wing faintly brownish tinged, denser basally. Calypter whitish yellow.

Abdomen black with bluish gray pollen, with black narrow median vitta.

Length. Body 4.0–4.5 mm, wing 3.7–4.0 mm.

DISTRIBUTION: Korea, Japan (Hokkaido, Honshu), China (Hebei, Heilongjiang, Liaoning, Neimenggu, Qinghai, Shanxi, Xinjiang), Russia (Kamchatka, Kurile, Sakhalin), Europe, N. America.

LOCALITY: North-HB: Hamgyeongbuk-do; HN: Hamgyeongnam-do.

HOST: Radish and other cruciferous plants (cf. Key, 1929; Nakayama, 1936; Kato, 1939; Yokoo, 1940; Lee, 1963).

47. *Delia hystricosternita* Hsue, 1981 (Fig. 47)

Delia (Chortophilina) hystricosternita Hsue, 1981: 213 (China).

Delia hystricosternita: Suwa, 1983b: 35–37; Suh & Kwon, 1985: 196; Suh, 1989: 116; Dely-Draskovits, 1993: 44; Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 303; Kwon et al., 1994: 266; Kwon et al., 1996: 224; Wei et al., 1996: 719; Paek et al., 2010: 242; Han et al., 2014: 149.

Male. Ground color black, with thin brownish gray pollen. Head about 1.1–1.2 times as high as long in profile. Frons dichoptic. Interfrontalia dull tinged with brown, pair of proclinate strong *if*; parafrontalia fuscous gray with 1 *ors* and 3 *ori*. Parafacialia and cheek brownish black with gray pollen. Antenna black; third segment about 2.4 times as long as wide; arista pubescent, the longest hair about 1.5 times as long as basal diameter of arista. Palpus black, and haustellum black with sparse gray pollen.

Thorax black in ground color, with brownish gray pollen, and patches of brown pollen, especially on dorsum. Mesonotum with brownish black median and obscure broad lateral vittae presuturally in caudal view; 1–2 irregular pairs of *pre acr*, distance separating *pre acr* rows narrower than distance between *pre acr* and *dc* rows. Second *ph* indistinguishable from additional setulae. *Pra* absent. Posterior *ntpl* about 0.8–0.9 times as long as anterior *ntpl*. Proepisternum with 2 *prepst*. Anepisternum with 2 *prepm*.

Legs black; fore tibia with 1 *ad*, 1 *pv* and short apical *pv*; mid tibia with 2 *ad*, 1 *pd*, 2 *pv*, and strong apical *av* and *pv*; hind tibia with 4 *ad*, 2 *av*, 4 *pd*, 2–3 *pv*, and strong apical *av*.

Wing hyaline; costal spine indistinguishable from anterior setulae; m-m nearly straight. Calypter and knob

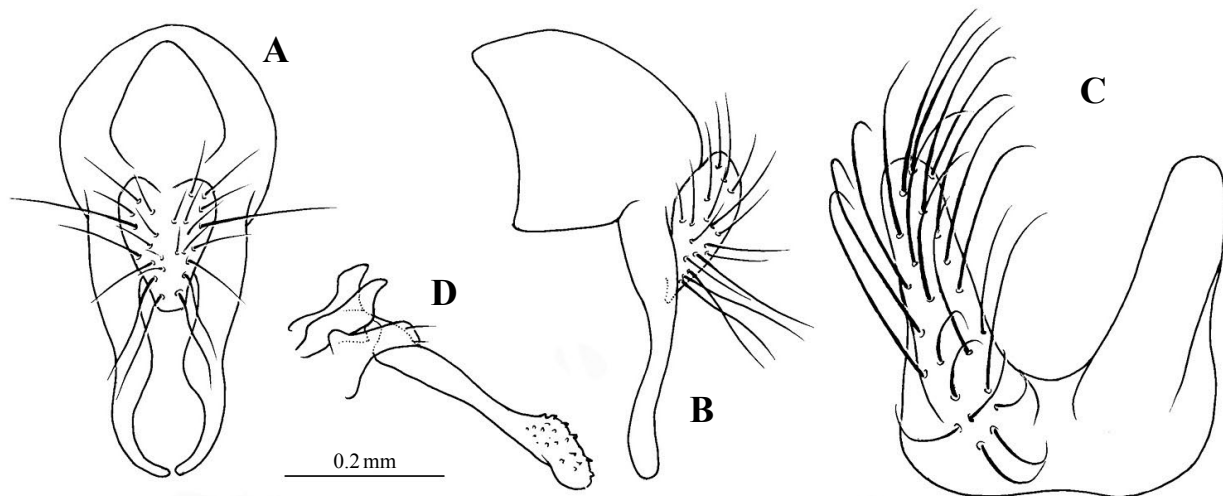


Fig. 47. *Delia hystricosternita* Hsue, 1981, male. A, B. hypopygium; C. fifth sternite; D. gonocoxal lobe, gonostylus and phallus.

of halter pale yellow.

Abdomen black, with purple gray pollen, with black narrow median vitta.

Length. Body 3.5–4.7 mm, wing 3.4–4.2 mm.

MATERIAL EXAMINED: [KPNU] <GW> 1 ex., Samyeongsan, 18.v.2003, SJ Suh; 1 ex., Balwangsang, 12.vi.2000, SJ Suh; <CB> 1 ex., Uhwagyo, Chungjudaem, 27.iv.2007, SJ Suh; <GB> 1 ex., Palgongsan, 12.v.1983, YJ Kwon; 5 exs., Bohyeonsan, 29.v.1998, SJ Suh.

DISTRIBUTION: Korea, China (Heilongjiang, Liaoning).

LOCALITY: Central-GW: Odaesan, Samyeongsan, Seoraksan, Balwangsang; CB: Danyang (=Uhwagyo); South-GB: Bohyeonsan, Palgongsan.

48. *Delia longitheca* Suwa, 1974 (Fig. 48)

Delia longitheca Suwa, 1974: 160–162 (Japan); Suwa, 1981a: 102, 103; Suwa, 1983b: 37; Suh & Kwon, 1985: 196, 197; Suh et al., 1985: 210; Fan et al., 1988: 170; Suh, 1989: 114, 115; Dely-Draskovits, 1993: 45; Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 303; Suh & Kwon, 1995: 195; Kwon et al., 1996: 224; An, 1996: 61; An, 1998: 62; Wei et al., 1996: 720; Suwa, 1999: 217; Paek et al., 2010: 242; Han et al., 2014: 149.

Male. Black in ground color, with brownish gray pollen. Head about 1.2–1.3 times as high as long in profile. Frons at narrowest part nearly as wide as distance between posterior ocelli exclusive. Interfrontalia dull tinged, with brown near lunule, pair of proclinate fine *if*; parafrontalia silvery gray with 5–7 *ori*. Parafacialia and cheek black, with gray pollen. Antenna black; third segment about 2.1–2.2 times as long as wide; arista distinctly pubescent, the longest hair about 1.5–2.0 times as long as basal diameter of arista. Palpus and haustellum black with sparse gray pollen.

Thorax black in ground color, with brownish gray pollen, and patches of brown pollen, especially on dorsum. Mesonotum with pale brownish black narrow median and broad lateral vittae presuturally in caudal view; 1 pairs of *pre acr*, the distance separating *pre acr* rows slightly narrower than distance between *pre acr* and *dc* rows. Second *ph* present, about half as long as anterior *ntpl*. *Pra* strong, much longer than anterior *ntpl*. Posterior *ntpl* about 0.7–0.8 times as long as anterior *ntpl*. Proepisternum with 2 *prepst*. Anepisternum with 2 long and 2–3 fine *prepm*.

Legs black; fore tibia with 1 *pv*, and strong apical *pv* blunt apically; mid tibia with 0–1 *av*, 1–2 *pd*, 2 *pv*, and strong apical *av* and *pv*; hind tibia with 6–8 *ad*, 5–6 *av*, 8 *pd*, 5 *pv*, and strong apical *av*.

Wing faintly brownish tinged, denser basally; costal spine strong, about as long as humeral crossvein;

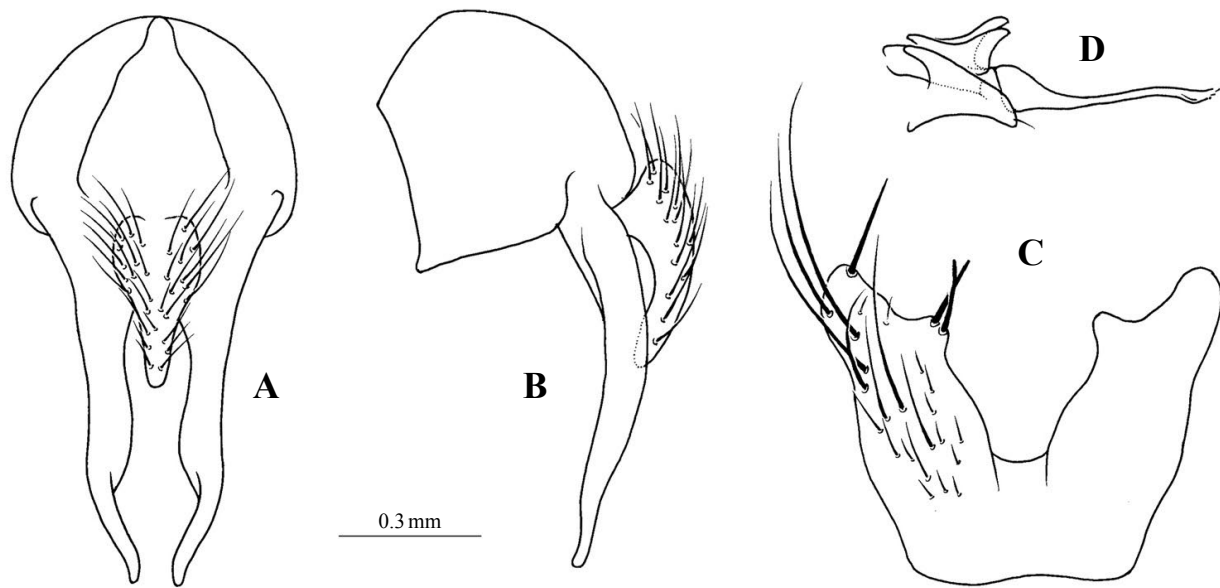


Fig. 48. *Delia longitheca* Suwa, 1974, male. A, B. hypopygium; C. fifth sternite; D. gonocoxal lobe, gonostylus and phallus.

m-m slightly sinuate. Calypter pale yellow. Knob of halter yellow to reddish yellow.

Abdomen black with brownish gray pollen, with black narrow median vitta and fore marginal bands.

Length. Body 5.7–7.5 mm, wing 5.0–6.5 mm.

MATERIAL EXAMINED: [KPNU] <GW> 9 exs., Seoraksan, 29.vii.1982, YJ Kwon; 2 exs., Seoraksan, 30.vi.1984, YJ Kwon; 6 exs., Obongsan, 17.v.1981, YJ Kwon; 1 ex., Obongsan, 18.v.1981, YJ Kwon; 3 exs., Obongsan, 21.v.1982, YJ Kwon; 1 ex., Odaesan, 24.v.1989, YJ Kwon; 1 ex., Balwangsan, 12.vi.2000, SJ Suh; 2 exs., Duwonbong, 10.vi.2000, SJ Suh; 1 ex., Odaesan, 1–3.viii.1980, SH Park; <GB> 1 ex., Sobaeksan, 15.v.1981, YJ Kwon; 1 ex., Irweolsan, 28–29.v.1984, TH Jo; <JB> 4 exs., Nogodan, Jirisan, 8.vi.2002, SJ Suh; <JJ> 3 exs., Chocheon, 9.v.1989, YJ Kwon; 27 exs., Seongpanak, 19.vi.1973, JS Park; 10 exs., Seongpanak, 19.vi.1973, SH Park.

DISTRIBUTION: Korea, Japan (Guizhou, Henan, Hokkaido, Honshu, Kyushu, Shikoku), China (Heilongjiang, Liaoning, Sanxi, Shaanxi, Sichuan, Yunnan), Russia (Kurile).

LOCALITY: Central-GW: Balwangsan, Duwonbong, Obongsan, Odaesan, Seoraksan; South-GB: Irweolsan, Sobaeksan; GN: Gayasan, Jirisan; Jeju-JJ: Hallasan (= Seongpanak), Jocheon.

49. *Delia platura* (Meigen, 1826) (Fig. 49)

Anthomyia platura Meigen, 1826: 171 (Europe).

Phorbia platura: Coquillet, 1901: 150.

Hylemyia platura: Hennig, 1938: 282; Kim, 1961: 27; Lee, 1963: 129–131.

Delia platura: Ringdahl, 1959: 283; Suwa, 1981a: 103; Sun et Zhang, 1982: 206; Suh & Kwon, 1985: 198, 199; Fan et al., 1988: 178, 179; Kim et Cho, 1989: 16–22; Suh, 1989: 117–119; Suh et al., 1985: 210; Suh et al., 1991: 49; Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 305; Kwon et al., 1994: 266; Suh & Kwon, 1995: 195; Kwon et al., 1995: 499, 519; Kwon et al., 1996: 224; Kwon et al., 1996: 250; Kwon et al., 1996: 163; An, 1996: 61; Park, 1998: 89; Kwon et al., 1998: 41; Paek et al., 2010: 242; Suwa, 2013: 170; Han et al., 2014: 149.

Anthromyia brassicae (sic, nec Wiedemann): Zool. Soc. Kor., 1968: 184 (Germany).

Anthomyia diversa Wiedemann, 1830: 436.

Anthomyia cana Macquart, 1835: 340 (France).

Hylemyia (Delia) cana: Fan, 1965: 51.

Aricia fusciceps Zetterstedt, 1845: 1552 (Denmark: Copenhagen).

Anthomyia tyana + *A. sergia* + *A. tinia* + *A. perrima* + *A. viana* + *A. corelia* + *Eriphia marginata* + *Dialyta cupreifrons* Walker, 1849: 945–953, 964, 966.

Hylemyia deceptiva + *H. similis* Fitch, 1856: 533.

Chotophila cilicrura Rondani, 1866: 165 (Italy).

Anthomyia platygaster + *A. lanicrus* Thomson, 1869: 556.

Anthomyia zeas Riley, 1866: 155 (USA: New Jersey).

Anthomyia funesta Kuhn, 1870: 3 (Poland).

Chortophila spinipes + *C. rubifrons* + *Homalomyia rupecula* + *Anthomyia sanctijacobi* Bigot, 1885: 279, 285, 296.

Homalomyia rava + *Phorbia nova-zelandiae* Hutton, 1900: 74, 76.

Male. Black in ground color, with brownish gray pollen. Head about 1.2–1.3 times as high as long in profile. Frons much narrower than anterior ocellus; parafrontalia broadly contiguous to each other. Interfrontalia dull, with pair of proclinate fine *if*; parafrontalia silvery gray with 6–7 *ori*. Parafacialia and cheek black, with gray pollen. Antenna black; third segment about 2.5 times as long as wide; arista distinctly pubescent, the longest hair about as long as basal diameter of arista. Palpus and haustellum black with sparse gray pollen.

Thorax black in ground color, with brownish gray pollen, and patches of brown pollen, especially on dorsum. Mesonotum with brownish black narrow median and pale broad lateral vittae presuturally in caudal view; 3 pairs of *pre acr* and a few additional setulae in rows, distance separating *pre acr* rows about as wide

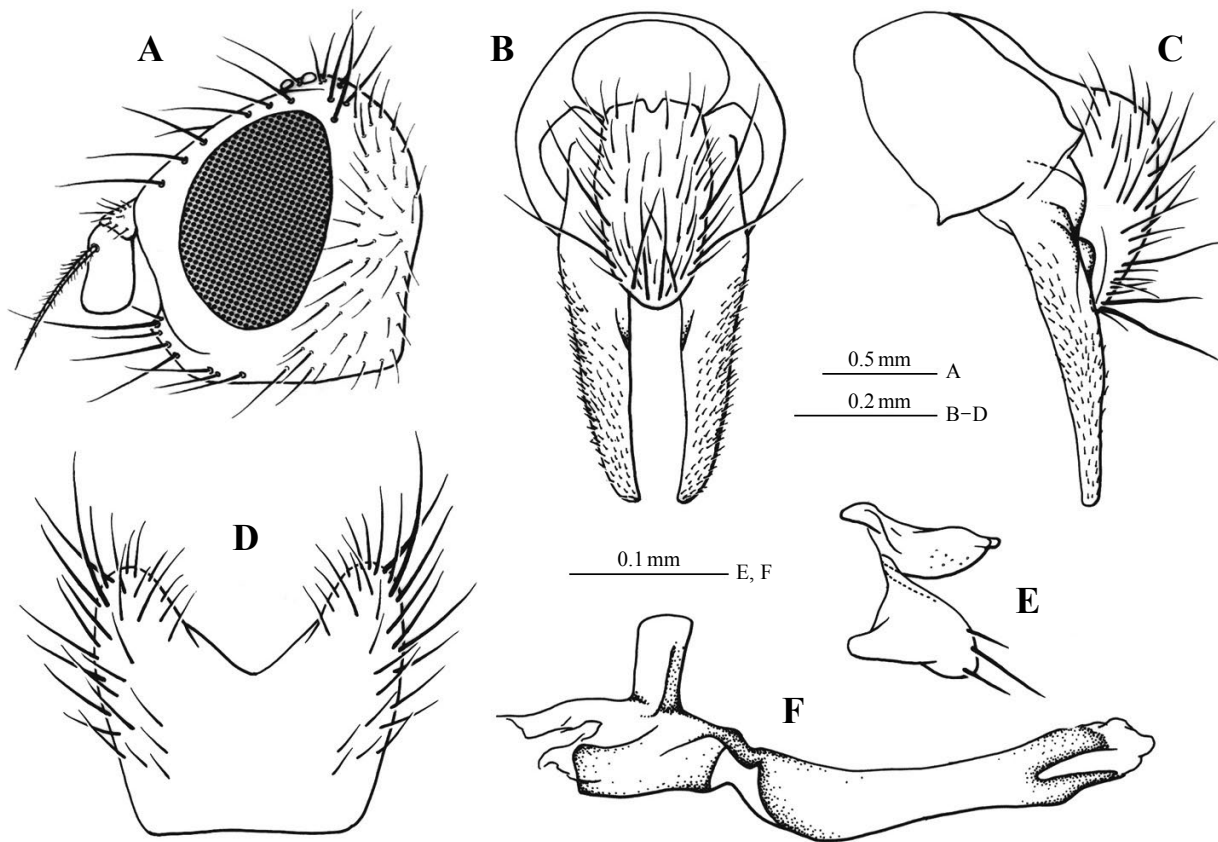


Fig. 49. *Delia platura* (Meigen, 1826), male. A. head; B, C. hypopygium; D. fifth sternite; E. gonocoxal lobe and gonostylus; F. phallus.

as distance between *pre acr* and *dc* rows. Second *ph* indistinguishable from accessory setulae. *Pra* about half as long as anterior *ntpl*. Posterior *ntpl* about 0.7–0.8 times as long as anterior *ntpl*. Proepisternum with 2 *prepst*. Anepisternum with 2 long and 7 fine *prepm*.

Legs black; fore tibia with 1 *pv*, and strong apical *pv* blunt apically; mid tibia with 1 *ad*, 1 *pd*, 2 *pv*, and strong apical *av* and *pv*; hind tibia with 8–10 *ad*, 3–4 *av*, 4–5 *pd*, 27–35 *pv*, and strong apical *av*.

Wing hyaline; costal spine indistinguishable from anterior setulae; m-m slightly sinuate. Calypter pale yellow. Knob of halter yellow.

Abdomen black with brownish gray pollen, with black narrow median vitta and fore marginal bands.

Length. Body 4.2–5.0 mm, wing 4.0–5.0 mm.

MATERIAL EXAMINED: [KPNU] <GG> 4 exs., Soyosan, 15.v.1982, YJ Kwon; 2 exs., Myeonseongsan, 16.v.1982, YJ Kwon; <GW> 9 exs., Obongsan, 17.v.1981, YJ Kwon; 3 exs., Seoraksan, 30.vii.1982, YJ Kwon; 9 exs., Odaesan, 4.viii.1983, YJ Kwon; 1 ex., Chiaksan, 22.v.1982, YJ Kwon; 1 ex., Dutasan, 9.viii.1989, YJ Kwon; 2 exs., Balwangsan, 3.xi.2000, SJ Suh; <CB> 8 exs., Danyang, 31.v.1989, SJ Suh; 5 exs., Woohwagyo,

27.iv.2007, SJ Suh; 1 ex., Kungoal, 23.viii.2006, SJ Suh; 1 ex., Bongwangsan, 22.viii.2006, SJ Suh; 2 exs., Deunggoksan, 5.vi.2006, SJ Suh; <GB> 10 exs., Palgongsan, 28.v.1989, YJ Kwon; 5 exs., 26.v.1981, YJ Kwon; 7 exs., Daegu, 12.vi.1989, YJ Kwon; 1 ex., Sobaeksan, 15.v.1981, YJ Kwon; 2 exs., Bibongsan, 7.v.1999, JY Lee; 1 ex., Juwangsan, 8.v.1999, JY Lee; 2 exs., Balchibong, 6.vi.2006, SJ Suh; 1 ex., Choamsa, 28.iv.2007, SJ Suh; 1 ex., Unmunsan, 10.ix.2005, SJ Suh; 1 ex., Gachangdam, 5.viii.2005, SJ Suh; 1 ex., Poamsan, 4.vi.2006, SJ Suh; <GN> 1 ex., Jirisan, 3.vi.1973, JS Park; 9 exs., Jirisan, 24.vii.1985, YJ Kwon; 8 exs., Geumjeongsan, 26.v.1989, YJ Kwon; 8 exs., Geumsan, 29.iii.1982, YJ Kwon; 13 exs., Bangeojin, 10.iv.1982, YJ Kwon; 4 exs., Yeohangsan, 29.v.1999, SJ Suh; 2 exs., Odosan, 17.vii.2000, SJ Suh; <GB> 3 exs., Deogyusan, 20.v.1999, SJ Suh; 2 exs., Jungju, 13.v.1989, SJ Suh; 4 exs., Sinseonbong, 24.v.2006, SJ Suh; 2 exs., Baeksan, 25.v.2006, SJ Suh; 4 exs., Ugeumsan, 25.v.2006, SJ Suh; 3 exs., Bonghwabong, 23.v.2006, SJ Suh; 4 exs., Cheonhwangsan, 9.v.1999, SJ Suh; 4 exs., Minjujisan, 21.v.2000, SJ Suh; <JN> 2 exs., Baegunsan, 11.ix.1999, SJ Suh; 1 ex., Wando, 12.v.1989, SJ Suh; <JJ> 4 exs., Hallasan, 9.viii.1984, YJ Kwon; 4 exs., Hwasun, 29.v.1992, YJ Kwon; [NIAST] <GG> 23 exs., Suwon, 15.vi.1981, YB Lee; 1 ex., Suwon, 3.v.1983, YI Lee; 1 ex., Suwon, 9.vii.1981, SM Son; 5 exs., Suwon, 12.v.1981, SM Son; 6 exs., Suwon, 11.v.1981, SM Son; 10 exs., Suwon, 31.v.1980, MS Kim; 1 ex., Suwon, 14.ix.1973, JC Paik; 2 exs., Suwon, 21.v.1973, JC Paik; 2 exs., Suwon, 28.iv.1976, KB Uhm; 7 exs., Suwon, 21.iii.1968, DS Lee; 4 exs., Suwon, 4.vii.1980, SM Son; 1 ex., Suwon, 28.ix.1976, KT Park; 3 exs., Suwon, 15.vii.1981, YB Lee; 3 exs., Suwon, 9.v.1983, YI Lee; 2 exs., Suwon, 12.v.1983, YI Lee; 1 ex., Suwon, 8.iv.1983, YI Lee; 3 exs., Suwon, 25.iv.1983, YI Lee; 4 exs., Suwon, 10.vi.1976, JS Park; 1 ex., Suwon, 26.v.1976, JY Shin; 3 exs., Suwon, 3.vii.1983, DJ Im; 1 ex., Suwon, 5.vi.1981, SW Lee; 1 ex., Suwon, 30.v.1983, YC Lee; 13 exs., Yongin, 17.v.1973, JC Paik; <GW> 1 ex., Odaesan, 13.ix.1976, KT Park; 1 ex., Odaesan, 12.ix.1976, KT Park; 1 ex., Odaesan, 12.ix.1976, JS So; <CB> 16 exs., Tanyang, 17.v.1973, KY Choi; 17 exs., Okcheon, 11.v.1973, JC Paik; <GB> 3 exs., Yecheon, 10.v.1976, KT Park; 2 exs., Kyeongsan, 24.ix.1980, CG Yoo; 4 exs., Kyeong-san, 8.ix.1980, CG Yoo; <GN> 3 exs., Namhae, 4.vii.1980, SM Son; 11 exs., Chinju, 9.iv.1977, MH Lee; 3 exs., Jirisan, 17.vii.1976, YY Ha; <JN> 1 ex., Hongdo, 23.iv.1975, KY Choi; 1 ex., Taeheuksando, 22.iv.1975, KY Choi; [NIBR] 10 exs., Pohyeonsan, 29.v.1998, YJ Kwon.

DISTRIBUTION: Korea, Japan (whole part), China (whole part), Russia (Sakhalin), Europe, Cosmopolitan.

LOCALITY: North-HB: Mupo, Baekdusan, Samjiyeon, Sobaeksan; Central-HH: Pyeongseong, Suyangsan; GG: Bukhansan, Dobongsan, Ganghwado, Myeongseongsan, Siheung, Soyosan, Surisan, Suwon, Yongin; GW: Bangtaesan, Chiaksan, Daeamsan, Dutasan, Obongsan, Odaesan, Seoraksan; CB: Danyang, Okcheon; CN: Deoksungsan; South-GB: Chilgok, Dokdo, Gachang, Gampo, Geumosan, Goryeong, Gyeongsan, Haksagan, Hayang-eup, Hwangaksan, Irweolsan, Juwangsan, Naeyeonsan, Yecheon; GN: Bangeojin, Cheonhwangsan, Chilwon-myeon, Gayasan, Geumsan, Goseong (= Baekcheongol, Okcheonsa), Hwangmaesan, Jinju, Jirisan (= Ssanggye), Masan, Myeongseok-myeon, Namhae, Tongyeong (= Chungmu), Wonhyosan; JB: Bongdong-myeon, Gyeokpo, Maisan, Naejangsan, Unjangsan; JN: Bogildo, Duryunsan, Hongdo, Heuksando, Jindo, Jogyesan, Jeopdo, Mudeungsan, Taecheongsan, Wando; Jeju-JJ: Hallasan, Jeju, Jungmun.

Host: Bean, iris, sweet potato (cf. Hennig, 1953, 1976), garlic, onion (cf. Lee, 1963; Suh & Kwon, 1985), spring onion (cf. Lee, 1963; Suh & Kwon, 1985; Kim & Cho, 1988), *Brassica* spp., *Cucumis* spp. *Spinacia* spp. (cf. Hennig, 1976), *Dianthus caryophyllus* (cf. Fenili, 1967), *Silene* sp. (cf. Hering, 1957).

50. *Delia robustiseta* Judin, 1974 (Fig. 50)

Delia robustiseta Judin, 1974, Biol. Nauk. 17: 23, 24 (Russia: Siberia); Kwon & Suh, 1982c, Kor. Journ. Plant Prot. 21: 188, 189; Suh & Kwon, 1985: 201; Suh et al., 1985: 210; Suh, 1989: 119; Dely-Draskovits, 1993: 49; Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 303; Paek et al., 2010: 242; Han et al., 2014: 150.

Delia sunigribasis (nec Fan et Wang): Dely-Draskovits, 1993: 50.

Delia takizawai Suwa, 1974: 155–157 (Japan: Sapporo); Suwa, 1984a, Ins. Mats. n.s. 29: 39–57; Suwa, 1999: 220.

Delia takizawai koreana Suwa, 1983b: 38 (Korea: Odaesan).

Male. Black in ground color, with brownish gray pollen. Head about 1.2–1.3 times as high as long in profile. Frons much narrower than anterior ocellus; parafrofrontalia broadly contiguous to each other. Interfrontalia dull, a pair of proclinate fine *if*; parafrofrontalia silvery gray with 4 *ori*. Parafacialia and cheek black with gray pollen. Antenna black; third segment about 2.1–2.2 times as long as wide; arista distinctly pubescent. Palpus and haustellum black, with sparse gray pollen.

Thorax black in ground color, with brownish gray pollen, and with patches of brown pollen especially on dorsum. Mesonotum with brownish black narrow median, submedian and lateral vittae presuturally in caudal view; 3 pairs of *pre acr*, distance separating *pre acr* rows about as wide as distance between *pre acr* and *dc* rows. Second *ph* thin, slightly shorter than posterior *ntpl*. *Pra* strong, about as long as anterior *ntpl*. Posterior *ntpl* about 0.8 times as long as anterior *ntpl*. Proepisternum with 2 *prepst*. Anepisternum with 2 long and 6 fine *prepm*.

Legs black to brownish black; fore tibia with 1 *pv*; mid tibia with 1 *ad*, 2 *pd*, 2 *pv*, and strong apical *av* and *pv*; hind tibia with 4–5 *ad*, 5 *av*, 3 *pd*, 6–7 *pv*, and strong apical *av*.

Wing faintly brownish tinged, denser basally; costal spine indistinguishable from anterior setulae; m-m nearly straight. Calypter pale yellow. Knob of halter yellow.

Abdomen black with brownish gray pollen, with black narrow median vitta and fore marginal bands.

Length. Body 3.8–4.6 mm, wing 3.7–4.2 mm.

MATERIAL EXAMINED: [KPNU] <GG> 28 exs., Soyosan, 15.v.1982, YJ Kwon; <GW> 2 exs., Gwangdaesan, 6.v.2018, SJ Suh; <CB> 3 exs., Songnisan, 27.iv.2002, SJ Suh; <GB> 1 ex., Sobaeksan, 10.v.1985, YJ Kwon; 2 exs., Palgongsan, 1.v.1984, TH Jo.

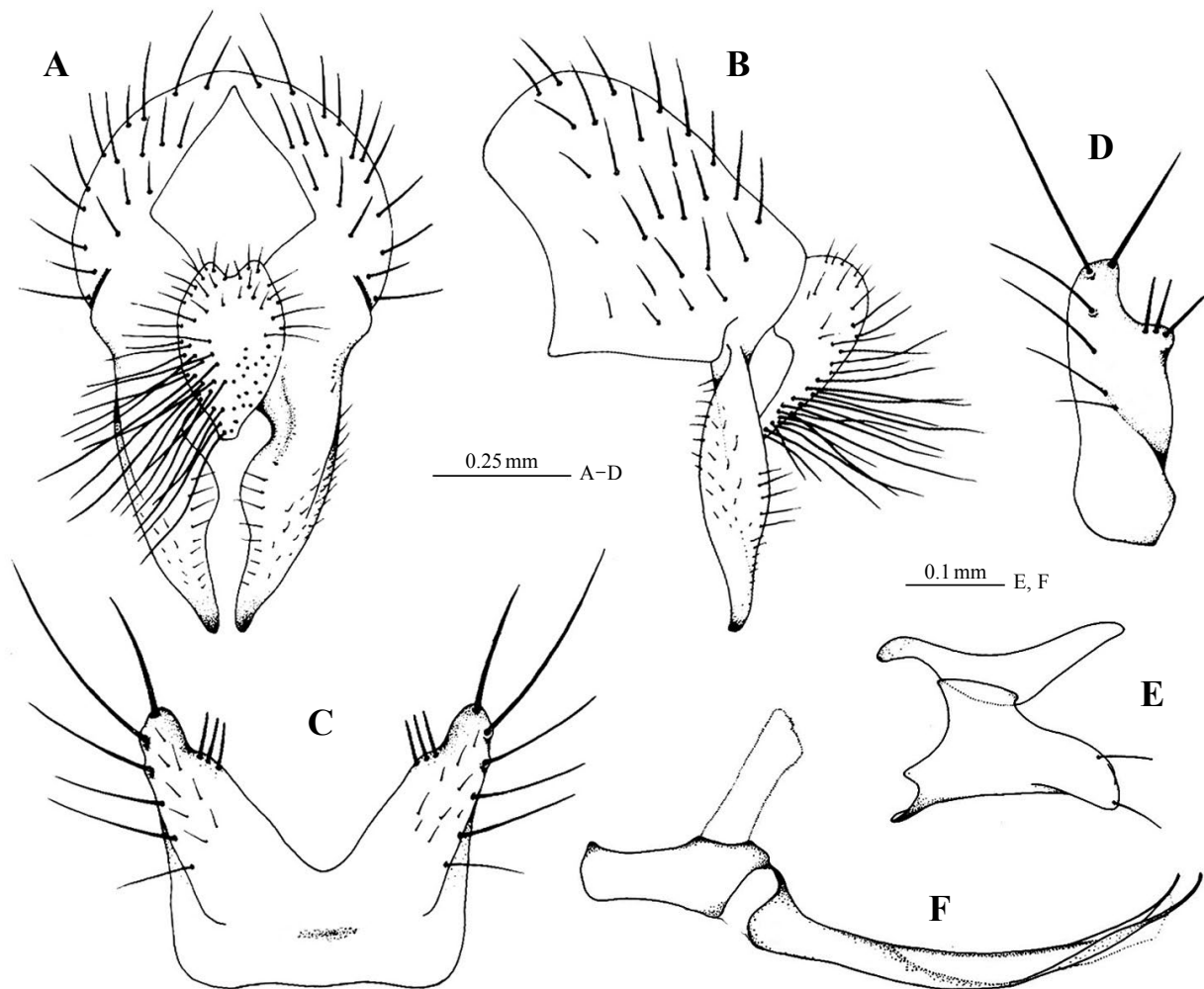


Fig. 50. *Delia robustiseta* Judin, 1974, male. A, B. hypopygium; C, D. fifth sternite; E. gonocoxal lobe and gonostylus; F. phallus.

DISTRIBUTION: Korea, Japan (Hokkaido, Honshu, Kyushu), China (Liaoning), Russia (Kurul, Siberia), Taiwan.

LOCALITY: Central-GG: Soyosan; GW: Obongsan, Odaesan, Gwangdaesan; CB: Songnisan; South-GB: Palgongsan, Sobaeksan.

51. *Delia seticauda* Suwa, 1984 (Fig. 51)

Delia seticauda Suwa, 1984a: 43–45 (Japan: Kyushu); Paek et al., 2010: 242; Han et al., 2014: 151.

Delia secticauda (sic): Suh & Kwon, 1986: 161; Suh, 1989: 119, 120; Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 303; Kwon et al., 1996: 224.

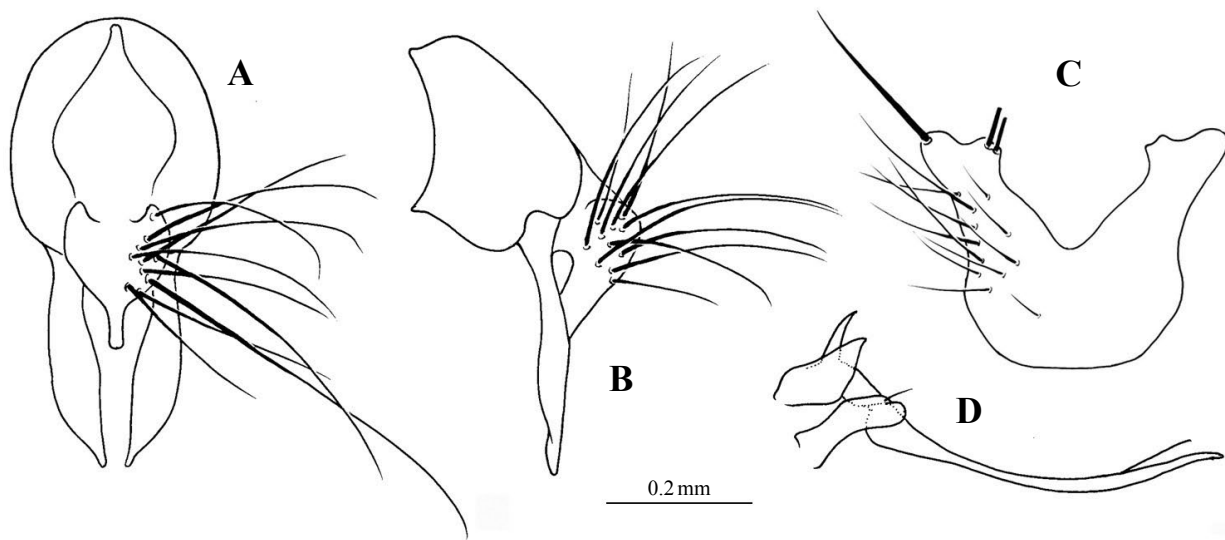


Fig. 51. *Delia seticauda* Suwa, 1984, male. A, B. hypopygium; C. fifth sternite; D. gonocoxal lobe, gonostylus and phallus.

Male. Black in ground color, with gray pollen. Head about 1.2–1.3 times as high as long in profile. Frons at narrowest part nearly as wide as distance between posterior ocelli exclusive. Interfrontalia dull, a pair of proclinate *if*; parafrontalia silvery gray with 4 *ori*. Parafacialia and cheek black with gray pollen. Antenna black; third segment about 2.0–2.1 times as long as wide; arista distinctly pubescent, the longest hair about as long as basal diameter of arista. Palpus and haustellum black with sparse gray pollen.

Thorax black in ground color, with brownish gray pollen, and patches of brown pollen, especially on dorsum. Mesonotum with brownish black narrow median, submedian and obscure broad lateral vittae presurally in caudal view; 3 pairs of *pre acr*, and several fine irregular setulae between rows, distance separating *pre acr* rows slightly narrower than distance between *pre acr* and *dc* rows. Second *ph* indistinguishable from accessory setulae. *Pra* about as long as posterior *ntpl*. Posterior *ntpl* about two third as long as anterior *ntpl*. Proepisternum with 2 *prepst*. Anepisternum with 3 *prepm*.

Legs black to brownish black; fore tibia with 1 *pv*, and strong apical *pv* blunt apically; mid tibia with 1 *ad*, 2 *pd*, 2 *pv*, and strong apical *av* and *pv*; hind tibia with 5–9 *ad*, 6–7 *av*, 3 *pd*, 5–6 *pv*, and strong apical *av*.

Wing faintly brownish tinged, denser basally; costal spine small and much shorter than r-m; m-m nearly straight. Calypter pale yellow. Knob of halter yellow.

Abdomen black with brownish gray pollen, with black narrow median vitta and fore marginal bands.

Length. Body 5.0–5.8 mm, wing 4.2–4.8 mm.

MATERIAL EXAMINED: [KPNU] <GB> 4 exs., Odosan, 16.iv.2000, SJ Suh; 1 ex., Nakdong-myeon, 10.iv.2009, SJ Suh; 2 exs., KNU campus, Daegu, 18.iv.2018, SJ Suh; <JN> 18 exs., Jogyesan, 15.iv.1986, YJ Kwon;

6 exs., Tolsando, 17.iv.1986, YJ Kwon.

DISTRIBUTION: Korea, Japan (Honshu, Kyushu, Nansei Iss.).

LOCALITY: South-GB: Odosan, Nakdong-myeon, Daegu; JN: Dolsando, Jogyesan.

52. *Delia tenuiventris* (Zetterstedt, 1860) (Fig. 52)

Aricia tenuiventris Zetterstedt, 1860: 6205 (Sweden).

Delia tenuiventris: Michelsen, 1985: 58; Suh & Kwon, 1985: 197, 198; Suh, 1989: 120; Suh et al., 1991: 49; Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 303; Kwon et al., 1996: 224; Suwa, 1999: 221; Paek et al., 2010: 242; Suwa, 2013: 171; Han et al., 2014: 151.

Hylemyia angustitarsis Malloch, 1920: 277.

Delia angustitarsis: Hennig, 1974: 733–735, pls. 86 (911), 99 (1095).

Hylemyia (Leptohylemyia) conversata Tiensuu, 1935: 23, 24 (Finland: Kussamo).

Delia conversata: Suwa, 1974: 162, 163.

Male. General coloration dark brownish gray, tinged bluish faintly. Head 1.3–1.4 times as high as long in profile; frons a little narrower than diameter of anterior ocellus; interfrontalia linear caudad; 5 *ori* and 1 *if*. Parafacialia and cheek subshining, dull grayish pruinose. Antenna brownish black to black; third antennal segment 1.9–2.0 times as long as wide; arista pubescent of which the longest hair about 1.5–2.0 times as long as basal diameter of arista.

Thorax blue grayish pollinose; mesonotum somewhat brownish tinged; some *pre acr*, of which a few are strong irregularly paired, the rows much closer together than to *dc* and often nearly convergent with each other; *pra* shorter than posterior *ntpl*.

Legs black; fore tibia with 1 *pv* and strong apical *pv* blunt apically and curved upwards; mid tibia with 1 *pd*, and 2 *pv*, no *ad*; hind tibia with 3–5 *ad*, 1–2 *av*, 3 *pd* and 1–3 *pv*; mid basitarsus with some dorsal setulae, slightly longer than accessory setulae.

Wing tinged with brown; m-m nearly straight. Calypter whitish or tinged with yellow; knob of halter yellowish.

Abdomen pale grayish pollinose, slightly tinged with brown yellow, with distinct median vitta and fore marginal bands.

Length. Body 4.3–5.4 mm, wing 3.8–4.9 mm.

Female. Thorax and abdomen pale yellow grayish pollinose; abdomen without any prominent marking; fore tibia with 1 *ad*, 1 *pd* and 1–2 *pv*; mid tibia with 1 *ad*, 1 *av*, 2 *pd* and 2 *pv*; hind with 4–5 *ad*, 2–3 *av*, 2–4 *pd*, and no *pv*.

Length. Body 4.6–5.7 mm, wing 4.2–5.2 mm.

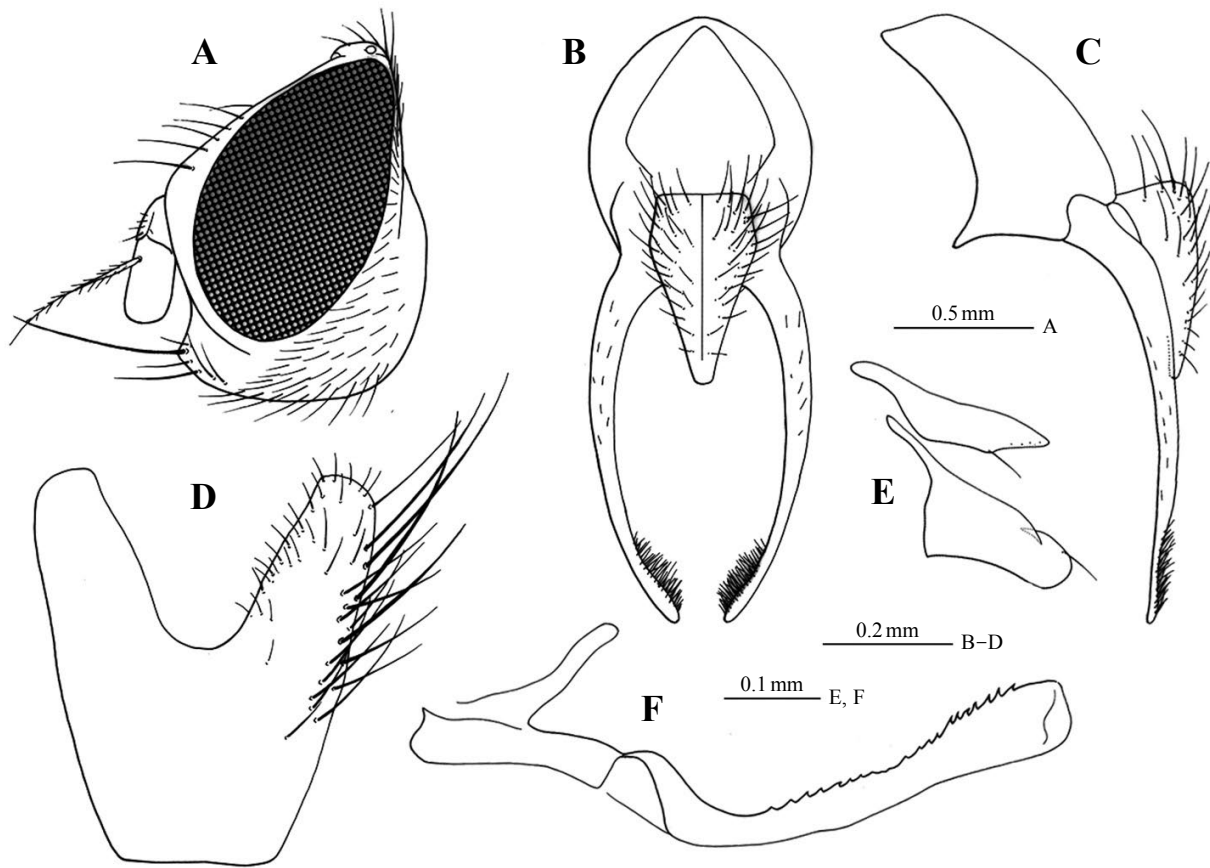


Fig. 52. *Delia tenuiventris* (Zetterstedt, 1860), male. A. head; B, C. hypopygium; D. fifth sternite; E. gonocoxal lobe and gonostylus; F. phallus.

MATERIAL EXAMINED: [KPNU] <GB> 1 ex., Gapjangan, 28.iv.2000, SJ Suh; <GN> 1 ex., Jirisan, 14.v.1981, YJ Kwon; 12 exs., Jirisan, 24.vii.1985, YJ Kwon; 4 exs., Jirisan, 12.viii.1988, YJ Kwon.

DISTRIBUTION: Korea, Japan (Hokkaido, Honshu), China (Heilongjiang, Xinjiang), Russia (Kamchatka, Sakhalin, Siberia), Scandinavia, N. America.

LOCALITY: North-HB: Baekdusan, Mupo, Onsupcheong, Samjiyeon, Sobaeksan; South-GB: Gapjangan; GN: Jirisan.

53. *Delia tumidula* Ringdahl, 1949 (Fig. 53)

Delia tumidula Ringdahl, 1949: 52 (Sweden); Suwa, 1983b: 37, 38; Suh & Kwon, 1985: 198; Suh, 1989: 120, 121; Dely-Draskovits, 1993: 51; Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 303; Kwon et al., 1996: 224; Paek et al., 2010: 242; Han et al., 2014: 151.

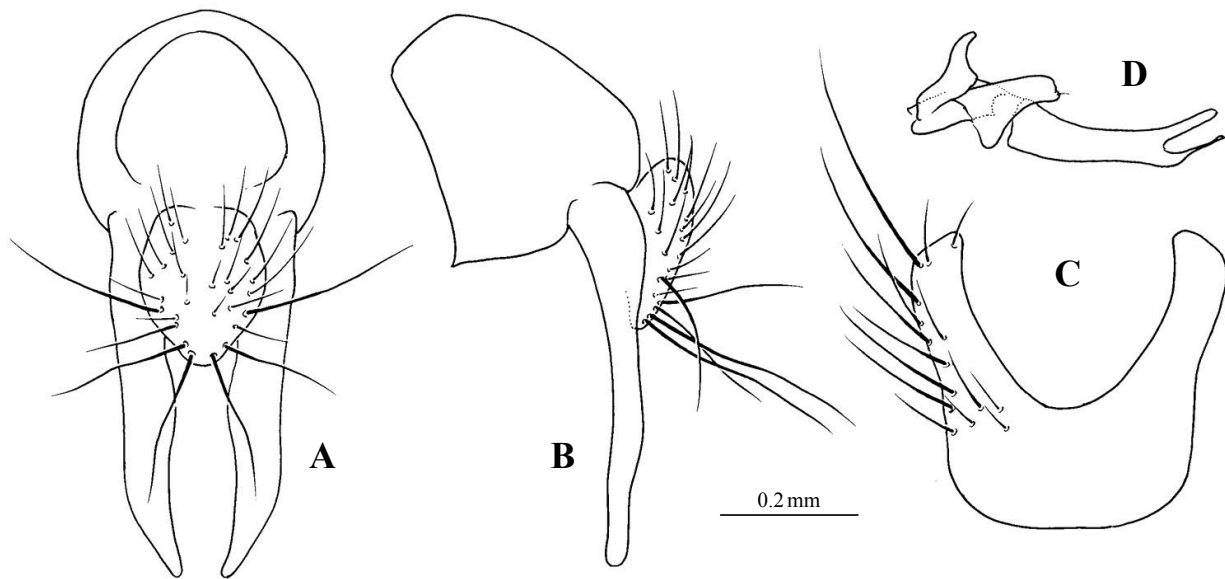


Fig. 53. *Delia tumidula* Ringdahl, 1949, male. A, B. hypopygium; C. fifth sternite; D. gonocoxal lobe, gonostylus and phallus.

Male. Black in ground color, with brownish gray pollen. Head about 1.2–1.3 times as high as long in profile. Frons much narrower than anterior ocellus; parafrontalia broadly contiguous to each other. Interfrontalia dull, a pair of proclinate *if*; parafrontalia silvery gray with 4–6 *ori*. Parafacialia and cheek black with gray pollen. Antenna black; third segment about 1.7–1.8 times as long as wide; arista distinctly pubescent, the longest hair slightly longer than basal diameter of arista. Palpus and haustellum black with sparse gray pollen.

Thorax black in ground color, with brownish gray pollen, and patches of brown pollen, especially on dorsum. Mesonotum with brownish black narrow median and broad lateral vittae presuturally in caudal view; 3 pairs of *pre acr* and several fine irregular setulae between rows, the distance separating *pre acr* rows narrower than distance between *pre acr* and *dc* rows. Second *ph* indistinguishable from accessory setulae. *Pra* about 0.6–0.7 times as long as anterior *ntpl*. Posterior *ntpl* about 1.1–1.2 times as long as anterior *ntpl*. Proepisternum with 2 *prepst*. Anepisternum with 2 long and 9–10 fine *prepm*.

Legs black to brownish black; fore tibia with 1 *pv*, and strong apical *pv* blunt apically; mid tibia with 1 *ad*, 1 *pd*, 2 *pv*, and strong apical *av* and *pv*; hind tibia with 5–6 *ad*, 4 *av*, 3–4 *pd*, 6–10 *pv*, and strong apical *av*.

Wing faintly brownish tinged, denser basally; costal spine indistinguishable from anterior setulae; m-m slightly sinuate. Calypter pale yellow. Knob of halter brownish yellow.

Abdomen black with brownish gray pollen, with black narrow median vitta and fore marginal bands.

Length. Body 4.5–5.5 mm, wing 4.2–5.0 mm.

MATERIAL EXAMINED: [KPNU] <GB> 7 exs., Sobaeksan, 10.v.1985, YJ Kwon.

DISTRIBUTION: Korea, Europe.

LOCALITY: Central-GW: Odaesan; South-GB: Sobaeksan.

Genus *Egle* Robineau-Desvoidy, 1830

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

Xenophorbia Malloch, 1920: 175. Type-species: *Stomoxys muscaria* Fabricius, 1777.

DIAGNOSIS: Frons dimorphic sexually; in male, the eyes only narrowly separated; *ors* very fine or vestigial; *if* present; third antennal segment at most only a little longer than the width; epistoma projecting forward beyond frons at lunule; palpi and haustellum slender; proepisternum, anepimeron and meron bare; lower calypter smaller than upper; mid tibia without *av*; phallapodeme spade-shaped, short and flattened.

Key to species of Korean *Egle*

1. Notopleuron with a few additional setulae *E. ciliata*
1. Notopleuron without additional setulae 2
2. Fifth sternite with some long setae at outer basal margin of each lobe in male 3
2. Fifth sternite without long seta at outer basal margin of each lobe in male 4
3. Hind femur with *av* and *pv* longer than height of femur *E. longipalis*
3. Hind femur with *av* and *pv* scarcely longer than height of femur *E. steini*
4. Epistoma slightly projecting forwards beyond frons at lunule; fore tibia with *pd* *E. minuta*
4. Epistoma distinctly projecting forwards beyond frons at lunule; fore tibia without *pd* *E. parva*

54. *Egle ciliata* (Walker, 1849) (Fig. 54)

Eriphia ciliata Walker, 1849: 961 (North America).

Egle cilata: Barták et al., 1990: 443; Suwa, 1999: 221; Paek et al., 2010: 242; Han et al., 2014: 151.

Corthophila palpella Rondani, 1871: 328 (Italy).

Chortophila (Egle) muscaria (nec. Fabricius): Malloch, 1920: 175.

Hylemyia (Egle) muscaria (nec. Fabricius): Hockett, 1928: 73.

Egle muscaria (nec. Fabricius): Tiensuu, 1935: 14; Suh & Kwon, 1985: 184, 185; Suh, 1989: 96, 97; Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 303; Kwon et al., 1994: 266; Kwon et al., 1996: 224.

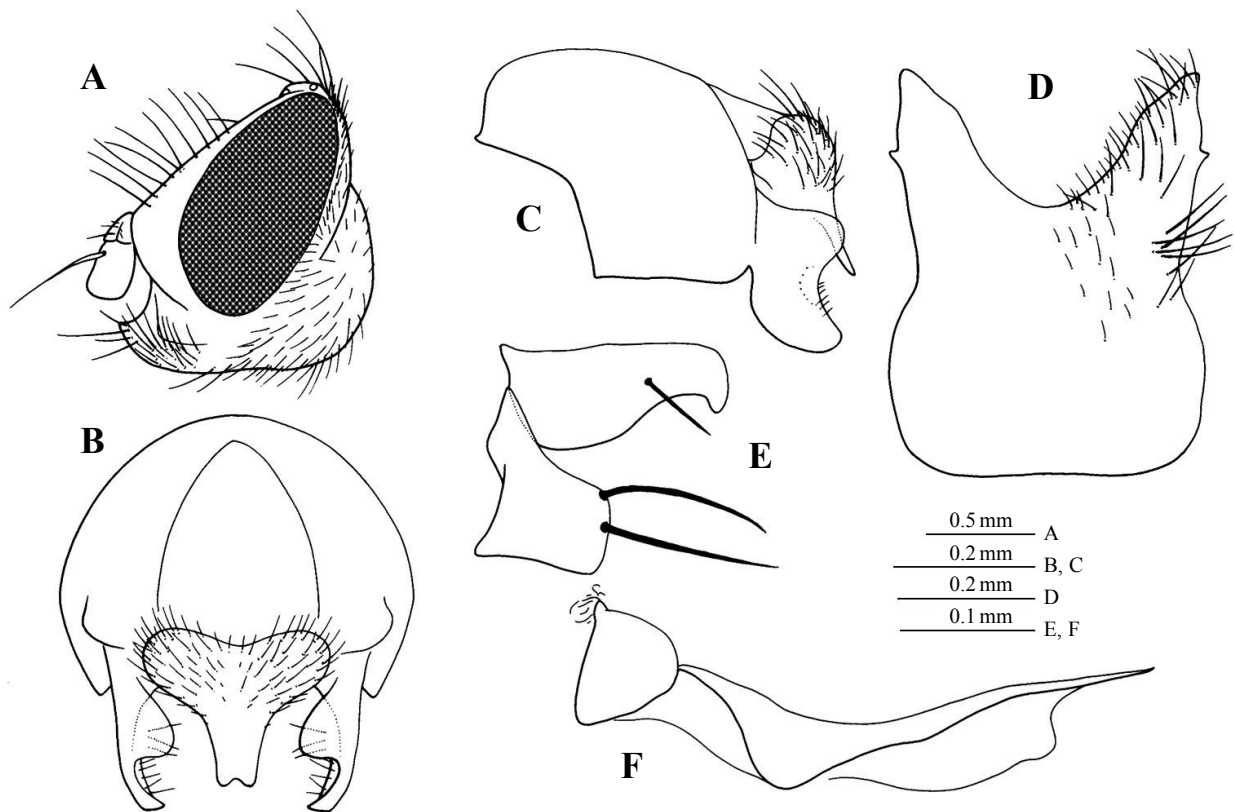


Fig. 54. *Egle ciliata* (Walker, 1849), male. A. head; B, C. hypopygium; D. fifth sternite; E. gonocoxal lobe and gonostylus; F. phallus.

Male. General coloration black, with blue grayish pollinose. Head rather higher than long in profile; frons about as wide as distance between posterior ocelli exclusive; 9–10 *ori* and 1 fine *if*; parafrontalia nearly convergent with each other. Parafacialia and cheek subshining, grayish pruinescent; profrons somewhat wider than third antennal segment width; epistoma projecting forwards beyond tip of profrons. Antenna black; arista minutely pubescent; third antennal segment a little longer than wide. Haustellar mentum blackish and faintly pollinose.

Thorax pale grayish pollinose, slightly tinged with bluish; mesonotum with obscure brownish median and sublateral vittae; 4 strong *post dc*. Second *ph* longer than first *ph*; *pra* slightly shorter than anterior *ntpl*. Notopleuron with some additional setulae. Anepisternum with 1 long and 4–6 additional *prepm*.

Legs black; fore tibia with 2–3 *pd* and 2 *pv*; mid tibia with 2–3 *pd*; hind tibia with 3–6 *ad* and 4 *pd*.

Wing faintly blackish tinged and denser at base; m-m nearly straight. Calypter clear or thinly dark yellowish tinged; knob of halter dark brown.

Length. Body 4.4–5.8 mm, wing 3.6–4.8 mm.

MATERIAL EXAMINED: [KPNU] <CB> 2 exs., Chilseong-myeon, Geosan, 11.iii.2006, SJ Suh; 2 exs., Chilseong-myeon, Geosan, 21.iii.2006, SJ Suh; 1 ex., Chilseong-myeon, Geosan, 25.iii.2006, SJ Suh; <GB> 5 exs., Daegu, 30.iii.1984, YJ Kwon; 2 exs., Daegu, 18.iii.1984, YJ Kwon; 11 exs., Daegu, 26.iii.1984, YJ Kwon; 5 exs., Palgongsan, 29.iii.1986, YJ Kwon; 1 ex., Palgongsan, 2.iv.1986, YJ Kwon; 3 exs., Palgongsan, 30.iii.1984, YJ Kwon; 4 exs., Naeyeonsan, 2.iv.1984, YJ Kwon; 1 ex., Geumosan, 30.iii.1983, TH Jo; 2 exs., Naeyeonsan, 11.iii.2006, SJ Suh; <GN> 2 exs., Gajisan, 25.iii.2001, SJ Suh.

DISTRIBUTION: Korea, Japan (Hokkaido, Honshu, Kyushu), China (Liaoning, Neimenggu), Russia (Kamchatka), Europe, N. America.

LOCALITY: Central-CB: Geosan; South-GB: Daegu, Geumosan, Naeyeonsan, Palgongsan; GN: Gajisan.

HOST: *Salix* spp. (cf. Perris, 1876; Gabler, 1958; Hennig, 1967; Pont, 1970; Suh & Kwon, 1985).

55. *Egle longipalpis* (Malloch, 1924) (Fig. 55)

Hylemyia (Egle) longipalpis Malloch, 1924: 197 (Great Britain: Waterville).

Egle longipalpis: Suwa, 1974: 89, 90; Suh & Kwon, 1985: 185, 186; Suh, 1989: 95, 96; Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 303; Kwon et al., 1994: 266; Kwon et al., 1996: 224; Suwa, 1999: 221; Paek et al., 2010: 242; Han et al., 2014: 151.

Male. General coloration black, with brownish gray pollen. Head slightly higher than long, about 1.1–1.2 times as high as long in profile. Frons slightly narrower than distance between posterior ocelli exclusive; frons with 5 *ori*, 1 minute *ors*, and 1 *if*. Parafacialia and cheek brownish gray pruinose. Profrons slightly narrower than third antennal segment width; epistoma distinctly projecting forwards beyond tip of profrons. Antenna black; arista minutely pubescent; third antennal segment about 1.3–1.4 times as long as wide. Palpus and haustellum fuscous with sparse gray pollen.

Thorax grayish pollinose and tinged with bluish brown; mesonotum with broad median and narrow sublateral vittae; 3 pairs of *pre acr*, the distance separating *pre acr* rows about as wide as distance between *pre acr* and *dc* rows. Second *ph* slightly longer than first *ph*. *Pra* about 0.6–0.7 times as long as anterior *ntpl*. Posterior *ntpl* as long as or slightly shorter than anterior *ntpl*. Notopleuron without accessory setulae. Anepisternum with 3–4 *prepm*. Proepisternum with 1 *prepst*. *Kept* 1:2.

Legs black; fore tibia with 0–1 *pd* and 1–2 *pv*; mid tibia with 2 *pd* and 1 *p*; hind tibia with 7 *ad*, 6 *av* and 4 *pd*.

Wing hyaline; m-m nearly straight. Calypter whitish yellow; knob of halter pale yellow to reddish yellow.

Abdomen with blueish gray pollen; median vitta broad and dilated anteriorly on each tergite, and often triangulate.

Length. Body 3.5–4.0 mm, wing 3.0–3.5 mm.

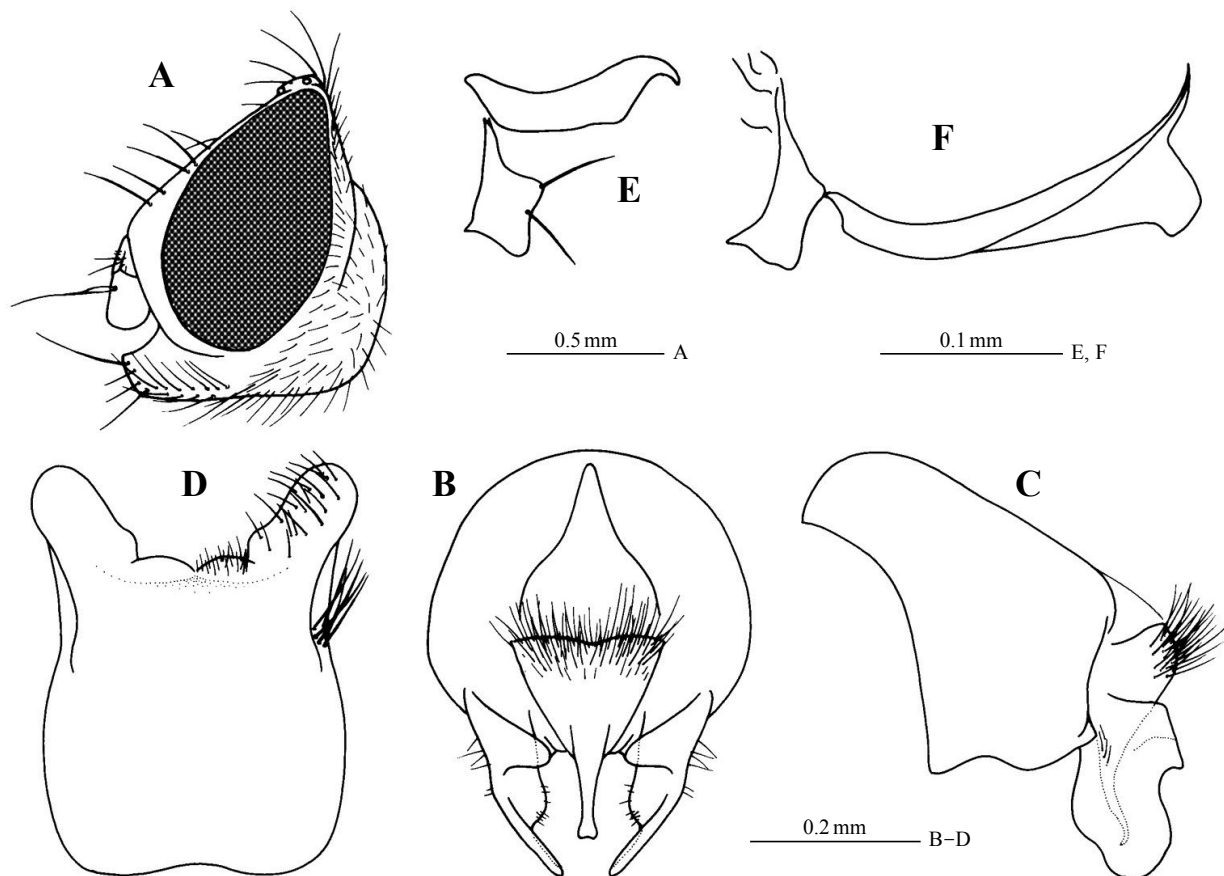


Fig. 55. *Egle longipalpis* (Malloch, 1924), male. A. head; B, C. hypopygium; D. fifth sternite; E. gonocoxal lobe and gonostylus; F. phallus.

MATERIAL EXAMINED: [KPNU] <CB> 1 ex., Cheongcheon-myeon, 25.iii.2006, SJ Suh; <GB> 6 exs., Palgongsan, 7.iv.1984, YJ Kwon; 1 ex., Daegu, 30.iii.1984, YJ Kwon; 1 ex., Daegu, 14.v.1984, YJ Kwon; 1 ex., Mungyeong, 17.iii.2006, SJ Suh.

DISTRIBUTION: Korea, Japan (Hokkaido, Honshu), China (Liaoning), N. America.

LOCALITY: Central-CB: Geosan; South-GB: Daegu, Naeyeonsan, Palgongsan, Mungyeong.

HOST: *Salix* spp. (cf. Suh & Kwon, 1985).

56. *Egle minuta* (Meigen, 1826) (Fig. 56)

Anthomyia minuta Meigen, 1826: 177 (Europe).

Egle minuta: Lyneborg, 1965: 222; Suh et al., 1985: 209, 210; Suh, 1989: 96; Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 303; Kwon et al., 1996: 224; Paek et al., 2010: 242; Han et al., 2014: 151.

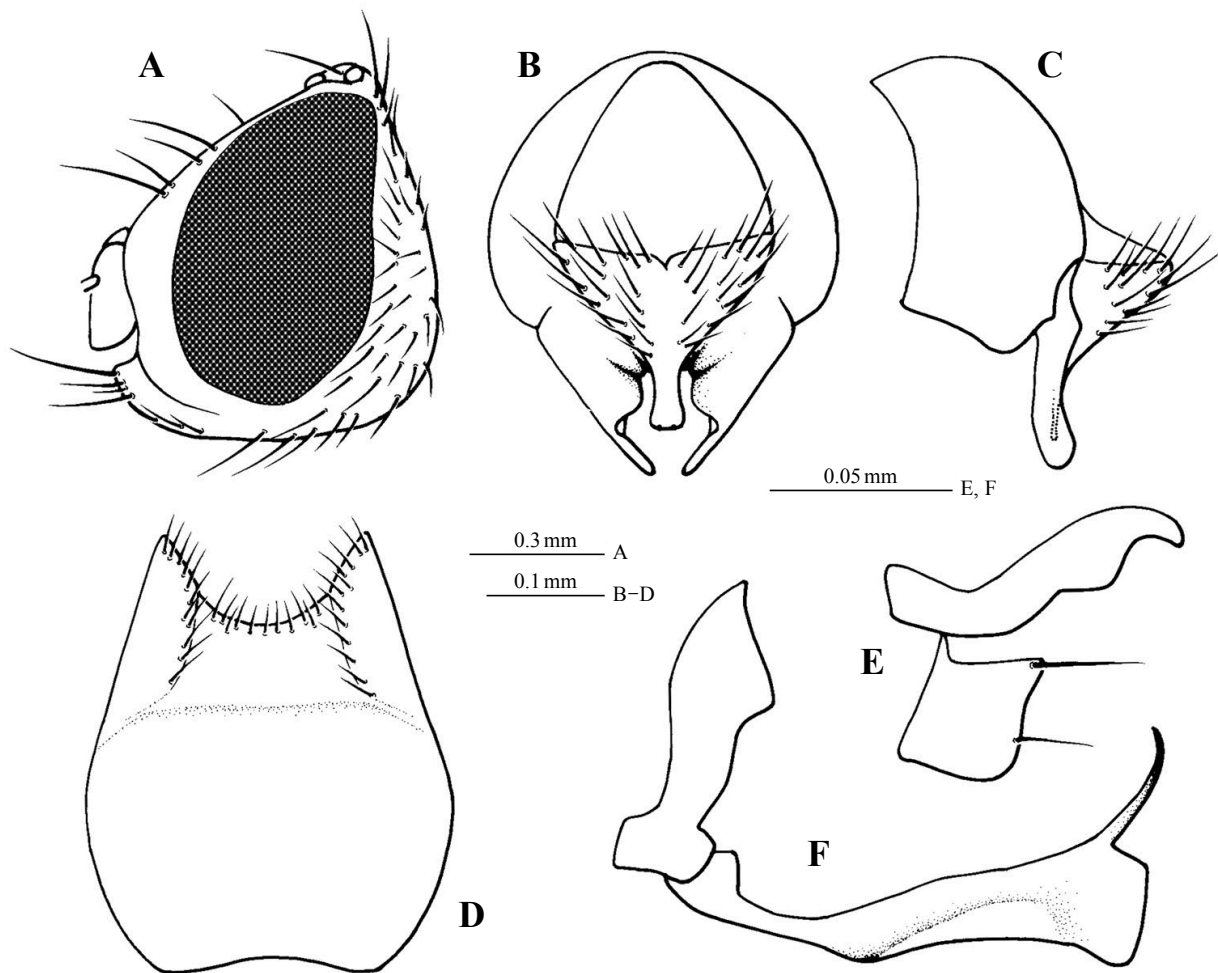


Fig. 56. *Egle minuta* (Meigen, 1826), male. A. head; B, C. hypopygium; D. fifth sternite; E. gonocoxal lobe and gonostylus; F. phallus.

Egle gracilior Zheng & Fan, 1990: 181 (China: Sichuan).

Egle korpokkur Suwa, 1974: 91, 92 (Japan); Suh & Kwon, 1985: 188, 189; Suh, 1989: 95; Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 303; Kwon et al., 1994: 266; Kwon et al., 1996: 224; Suwa, 1999: 221; Paek et al., 2010: 242; Han et al., 2014: 151.

Egle podulparia Suh & Kwon, 1985: 187, 188 (Korea: Naeyonsan); Suh, 1989: 97; Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 303; Kwon et al., 1996: 224; Paek et al., 2010: 242; Han et al., 2014: 152.

Male. General coloration black, with brownish gray pollen. Head slightly higher than long, about 1.2–1.3 times as high as long in profile. Frons at narrowest part of equal to width of anterior ocellus; parafacialia broadly contiguous to each other; frons with 4 *ori*, 1 minute *ors*, and 1 *if*. Parafacialia and cheek brownish gray pruinose. Epistoma slightly projecting forwards beyond tip of profrons. Antenna black; arista minute-

ly pubescent; third antennal segment about 1.7–1.8 times as long as wide.

Thorax grayish pollinose and tinged with bluish brown; mesonotum with broad median and obscure lateral vittae; 3 pairs of *pre acr*, the distance separating *pre acr* rows much narrower than distance between *pre acr* and *dc* rows. Second *ph* about as long as first *ph*. *Pra* about 0.7–0.8 times as long as anterior *ntpl*. Posterior *ntpl* as long as or slightly shorter than anterior *ntpl*. Notopleuron without accessory setulae. Anepisternum with 3 *prepm*. Proepisternum with 1 *prepst*. *Kepst* 1:2.

Legs black; fore tibia with 1–2 *pd* and 1–2 *pv*; mid tibia with 1 *pd* and 1 *p*; hind tibia with 5 *ad*, 4 *av*, 4 *pd* and 5–6 *pv*.

Wing hyaline; m-m nearly straight. Calypter whitish yellow; knob of halter pale yellow to reddish yellow.

Abdomen with blueish gray pollen; median vitta broad and dilated anteriorly on each tergite, and often triangulate.

Length. Body 2.9–3.3 mm, wing 2.6–3.2 mm.

MATERIAL EXAMINED: [KPNU] <CB> 10 exs., Chilseong-myeon, Geosan, 11.iii.2006, SJ Suh; <GB> 21 exs., Naeyeonsan, 2.iv.1984, YJ Kwon; 3 exs., Daegu, 30.iii.1984, YJ Kwon; 4 exs., Palgongsan, 30.iii.1984, YJ Kwon; 1 ex., Geumosan, 30.iii.1983, SH Park; 1 ex., Daegu, 26.iii.1984, YJ Kwon; 10 exs., Mungyeong, 17.iii.2006, SJ Suh; 8 exs., Naeyeonsan, 11.iii.2006, SJ Suh.

DISTRIBUTION: Korea, Japan (Honshu), China (Gansu, Liaoning, Shaxi, Sichuan), Myanmar, Europe, N. America.

LOCALITY: Central-CB: Geosan; South-GB: Daegu, Geumosan, Mungyeong, Naeyeonsan, Palgongsan.

HOST: *Salix* spp. (cf. Lyneborg, 1965; Hennig, 1967; Pont, 1970; Suh et al., 1985).

57. *Egle parva* Robineau-Desvoidy, 1830 (Fig. 57)

Egle parva Robineau-Desvoidy, 1830: 590 (France: Saint Sauveur); Suh & Kwon, 1985: 186, 187; Suh, 1989: 97; Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 303; Kwon et al., 1994: 266; Kwon et al., 1996: 224; Suwa, 1999: 221; Paek et al., 2010: 242; Han et al., 2014: 152.

Male. General coloration black, with blue grayish pollinose. Head slightly higher than long in profile; frons about as wide as diameter of anterior ocellus; 4–5 *ori*, 1 minute *ors* and 1 *if*. Parafacialia and cheek subshining and gray pruinose; profrons much narrower than third antennal segment width; epistoma projecting forwards beyond tip of profrons. Antenna black, with arista minutely pubescent; third antennal segment a little longer than wide. Haustellum and palpus black and slender.

Thorax blue grayish pollinose; mesonotum with broad median and sublateral vittae; 3 *pre acr*, lacking additional setulae between the rows. Second *ph* about as long as first *ph*. Anepisternum with 6–7 *prepm* and

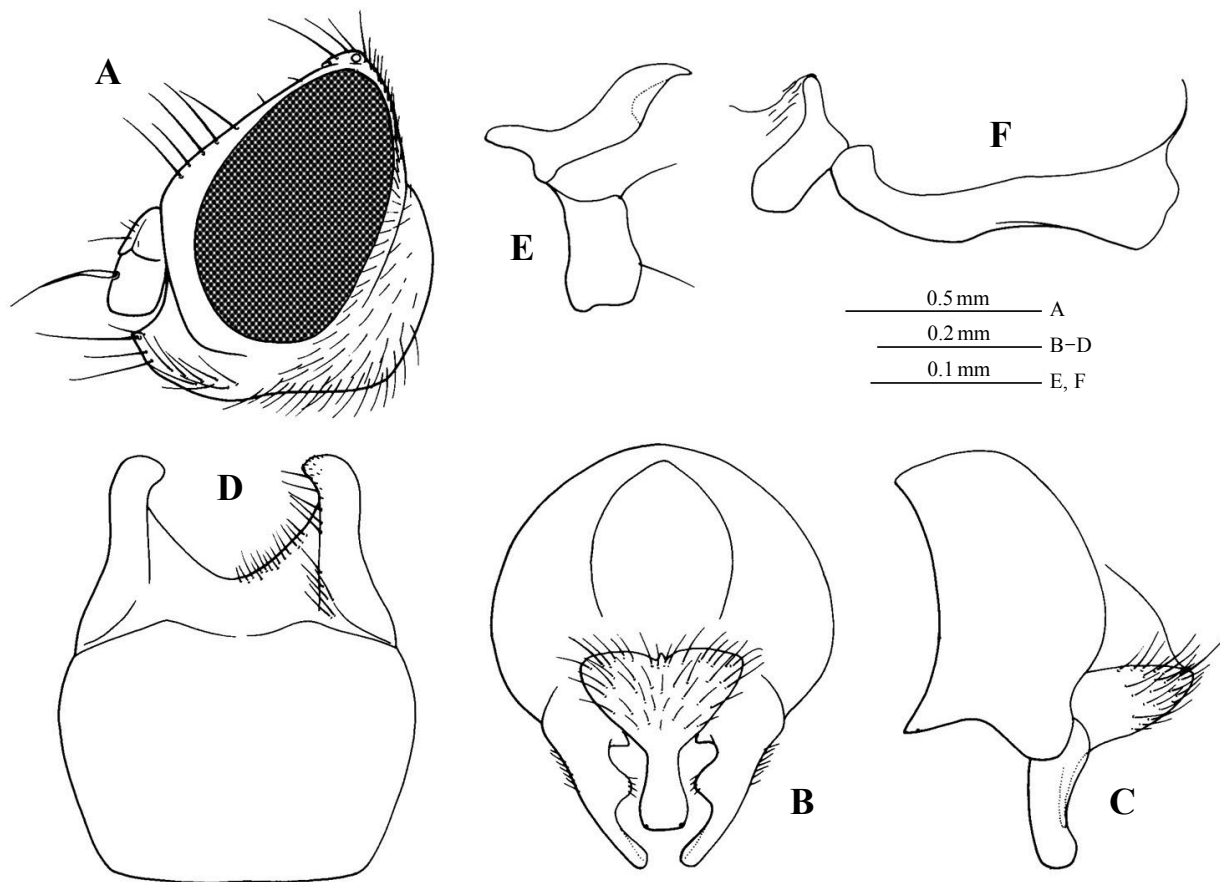


Fig. 57. *Egle parva* Robineau-Desvoidy, 1830, male. A. head; B, C. hypopygium; D. fifth sternite; E. gonocoxal lobe and gonostylus; F. phallus.

1 distinct anterior *anepst.* *Kepst* 1:2.

Legs black; first tarsal segment much longer than second and third segments combined; fore tibia with 1 *pv*; mid tibia with 1 *pd* and 1 *pv*; hind tibia with 5–8 *ad*, 4 *av*, 3–4 *pd* and 6–7 *pv*.

Wing thinly tinged with dark brown, denser at base; m-m slightly sinuate. Calypter whitish; halter dark brown.

Length. Body 2.5–3.4 mm, wing 2.4–3.2 mm.

MATERIAL EXAMINED: [KPNU] <GB> 1 ex., Daegu, 30.iii.1984, YJ Kwon; 4 exs., Daegu, 26.iii.1984, YJ Kwon; 3 exs., Palgongsan, 30.iii.1984, YJ Kwon; 1 ex., Palgongsan, 7.iv.1984, YJ Kwon; 1 ex., Naeyeonsan, 2.iv.1984, YJ Kwon; 1 ex., Naeyeonsan, 11.iii.2006, SJ Suh.

DISTRIBUTION: Korea, Japan (Hokkaido), China (Gansu, Liaoning, Shaanxi, Shanxi), Russia (Kamchatka), Europe.

LOCALITY: South-GB: Daegu, Naeyeonsan, Palgongsan.

Host: *Salix* spp. (cf. Gabler, 1936; Hennig, 1967; Pont, 1970; Suh & Kwon, 1985), *Populus tremula* (cf. Hennig, 1967).

58. *Egle steini* Schnabl, 1911 (Fig. 58)

Egle steini Schnabl, 1911: 105 (Europe); Suh, 1989: 97, 98; Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 303;

Kwon et al., 1994: 266; Kwon et al., 1996: 224; Paek et al., 2010: 242; Han et al., 2014: 152.

Egle polychaeta Griffiths, 2003: 2331 (Canada).

Egle parvaeformis Schnabl, 1911: 105 (not given).

Egle parvaeformis (nec Schnabl): Suh & Kwon, 1985: 186.

Male. General coloration black, with blue grayish pollinose. Head about 1.2–1.3 times as high as long in profile; frons slightly narrower than diameter of anterior ocellus, with 4 *ori*, 1 minute *ors* and 1 *if*. Parafacialia

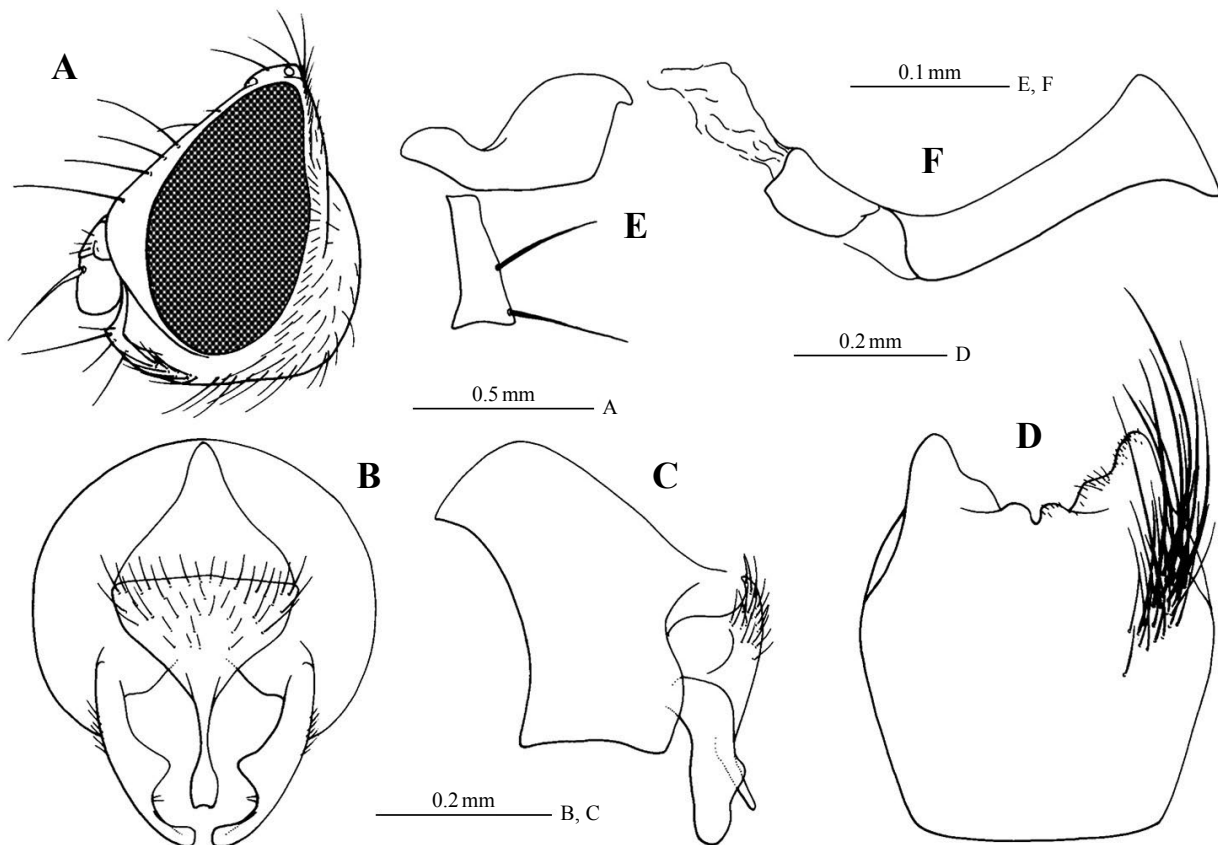


Fig. 58. *Egle steini* Schnabl, 1911, male. A. head; B, C. hypopygium; D. fifth sternite; E. gonocoxal lobe and gonostylus; F. phallus.

and cheek with silvery pruinescence; profrons as wide as third antennal segment width; epistoma scarcely extend to a level beyond tip of profrons. Antenna black, with arista minutely pubescent; third antennal segment only a little longer than wide. Haustellum and palpus black.

Thorax blue grayish pollinose; mesonotum with a broad median vitta and a pair of narrow sublateral vittae along rows of *dc*; 3 pairs of *pre acr*. Second *ph* about as long as first *ph*; *pra* shorter than anterior *ntpl*. Notopleuron without additional setulae.

Legs black; first tarsal segment much longer than second and third segments combined; fore tibia with 1–2 *pd* and 1 *pv*; mid tibia with 2–3 *pd*; hind tibia with 2–5 *ad*, 2 *av*, and 3–4 *pd*.

Wing faintly tinged with dark brown, denser at base; m-m nearly straight. Calypter hyaline or thinly blackish tinged; knob of halter dark brown.

Length. Body 3.1–3.6 mm, wing 2.8–3.2 mm.

MATERIAL EXAMINED: [KPNU] <CB> 1 ex., Chilseong-myeon, Geosan, 11.iii.2006, SJ Suh; <GB> 3 exs., Palgongsan, 29.iii.1986, YJ Kwon; 3 exs., Palgongsan, 30.iii.1984, YJ Kwon; 3 exs., Hayang-eup, 24.iii.1985, YJ Kwon; 5 exs., Naeyeonsan, 2.iv.1984, YJ Kwon; 2 exs., Daegu, 26.iii.1984, YJ Kwon; 4 exs., Daegu, 30.iii.1984, YJ Kwon; <GN> 1 ex., Jirisan, 29.iii.1989, SJ Suh.

DISTRIBUTION: Korea, China (Liaoning), Russia (Kamchatka), Europe, N. America.

LOCALITY: Central-CB: Geosan; South-GB: Daegu, Hayang-eup, Naeyeonsan, Palgongsan; GN: Jirisan.

HOST: *Salix* spp. (cf. Pont, 1970; Suh & Kwon, 1985).

Genus *Emmesomyia* Malloch, 1917

Emmesomyia Malloch, 1917: 114. Type-species: *Emmesomyia unica* Malloch, 1917 (France).

Taeniomyia Stein, 1919: 50. Type-species: *Taeniomyia auricollis* Stein, 1918 (Brazil).

Rhodesina Malloch, 1921: 424. Type-species: *Rhodesina ignobilis* Malloch, 1921 (Zimbabwe).

Neopegomyia Malloch, 1929: 101. Type-species: *Neopegomyia orientalis* Malloch, 1929 (Philippines).

DIAGNOSIS: Head dimorphic sexually; in male, the eye only narrowly separated and without *ors*; mentum rather short, at most 0.4 times as long as head height; *pre acr* strong developed and some irregular additional setulae between rows; *ph* 1 + 1 or 1 + 1 (2); *pra* relatively short; anepimeral seta present; additional *ntpl* setulae absent; scutellum pubescent ventrally; prosternum, proepisternum and meron bare; lower surface of costa additional short setulae below the main marginal series of short spinules; lower calypter enlarged, distinctly larger than the upper; hind tibia without apical *pv*; pregonite broad basally and divided into two processes (Griffiths, 1984).

Key to species of Korean *Emmesomyia*

1. Mid and hind femora wholly yellow *E. megastigmata*
1. Mid and hind femora black or dark brown 2
2. Mid and hind tarsi yellow or brown 3
2. Mid and hind tarsi black or dark brown 4
3. Surstylus in profile with basal projection enlarged *E. suwai*
3. Surstylus in profile without basal projection enlarged *E. subvillica*
4. Gonocoxal lobe with a median finger-like process *E. hasegawai*
4. Gonocoxal lobe without median finger-like process 5
5. Gonostylus bilobed apically *E. grisea*
5. Gonostylus unilobed apically *E. similata*

59. *Emmesomyia grisea* (Robineau-Desvoidy, 1830) (Fig. 59)

Phorbia grisea Robineau-Desvoidy, 1830: 560 (France: Paris).

Chortophila tibialis Macquart, 1835: 326 (France: Paris).

Emmesomyia socia (nec Malloch): Ringdahl, 1959: 24.

Emmesomyia grisea: Michelsen, 1983: 116, 117; Suh & Kwon, 1985: 155; Fan et al., 1988: 376; Suh, 1989: 48; Suwa, 1991: 5–8; Dely-Draskovits, 1993: 53; Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 303; Kwon et al., 1996: 224; Suwa, 1999: 222; Paek et al., 2010: 242; Han et al., 2014: 152.

Emmesomyia sp.: Suwa, 1983b: 42.

Male. Black in ground color, with thin grayish pollen. Head about 1.5 times as high as long in profile. Frons at narrowest part equal to width of anterior ocellus. Interfrontalia and parafrontalia dull, with a pair of proclinate *if*, and 5–6 *ori*. Parafacialia and cheek black, with gray pollen; parafacialia narrowing slightly towards level of lower margin of eye. Antenna black; third segment about 1.4–1.5 times as long as wide; arista distinctly pubescent, the longest hair slightly shorter than basal diameter of arista. Palpus and haustellum black with sparse gray pollen, long and slender.

Thorax black in ground color, with brownish gray pollen, with patches of brown pollen, especially on dorsum. Mesonotum with paler blackish vittae between *pre acr* and *dc* rows in caudal view; 3 pairs of *pre acr*, first setula longest, distance between *pre acr* rows about twice as wide as distance between *pre acr* and *dc* rows. Posterior *ntpl* about as long as anterior *ntpl*. Proepisternum with 3 *prepst*. Anepisternum with 3 long and 2 additional *prepm*. Anepimeron with 1–2 setae.

Legs brownish with more blackish tarsi; fore tibia with 1 *ad* and 1 *pv*; mid tibia with 1 *ad*, 2 *pd*, 2 *pv*, apical *av* and *pv*; hind tibia with 5 *ad*, 3 *av*, 3 *pd* and 2 *pv*, without apical *av* and *pv*.

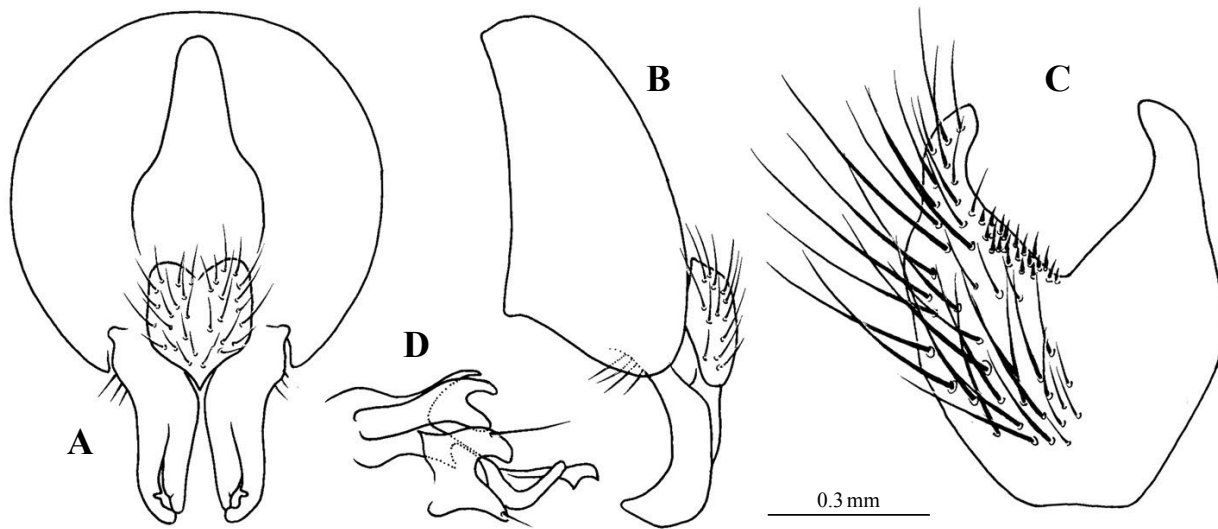


Fig. 59. *Emmesomyia grisea* (Robineau-Desvoidy, 1830), male. A, B. hypopygium; C. fifth sternite; D. gonocoxal lobe, gonostylus and phallus.

Wing faintly brownish tinged, denser basally; costal spine indistinguishable from anterior setulae; m-m nearly straight. Calypter and knob of halter brown.

Abdomen with greenish gray pollen, with black narrow median vitta.

Length. Body 5.5–6.5 mm, wing 4.6–5.5 mm.

MATERIAL EXAMINED: [KPNU] <GW> 5 exs., Odaesan, 24.v.1989, YJ Kwon; 1 ex., Seoraksan, 19.viii.1989, YJ Kwon; <CB> 2 exs., Deunggoksan, 5.vi.2006, SJ Suh; [NIAST] <GW> 2 exs., Odaesan, 24.v.1989, YJ Kwon.

DISTRIBUTION: Korea, Japan (Hokkaido, Honshu, Shikoku, Kyushu), China (Heilongjiang, Zhejiang), Taiwan, India (Kashmir), Europe.

LOCALITY: Central-GW: Odaesan, Seoraksan; CB: Deunggoksan.

60. *Emmesomyia hasegawai* Suwa, 1979 (Fig. 60)

Emmesomyia hasegawai Suwa, 1979, Akitu n.s. 27: 1–6 (Japan); Kwon & Suh, 1982d: 4; Kwon & Suh, 1985: 155; Suh, 1989: 48, 49; Suh et al., 1991: 208; Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 303; Kwon et al., 1994: 266; Suh & Kwon, 1995: 195; Kwon et al., 1996: 224; Wei et al., 1996: 770; Suwa, 1999: 222; Paek et al., 2010: 242; Han et al., 2014: 152.

Emmesomyia koreana Kwon & Suh, 1982a: 100, 101; Dely-Draskovits, 1993: 53.

Emmesomyia hasegauxai (sic): An, 1998: 62.

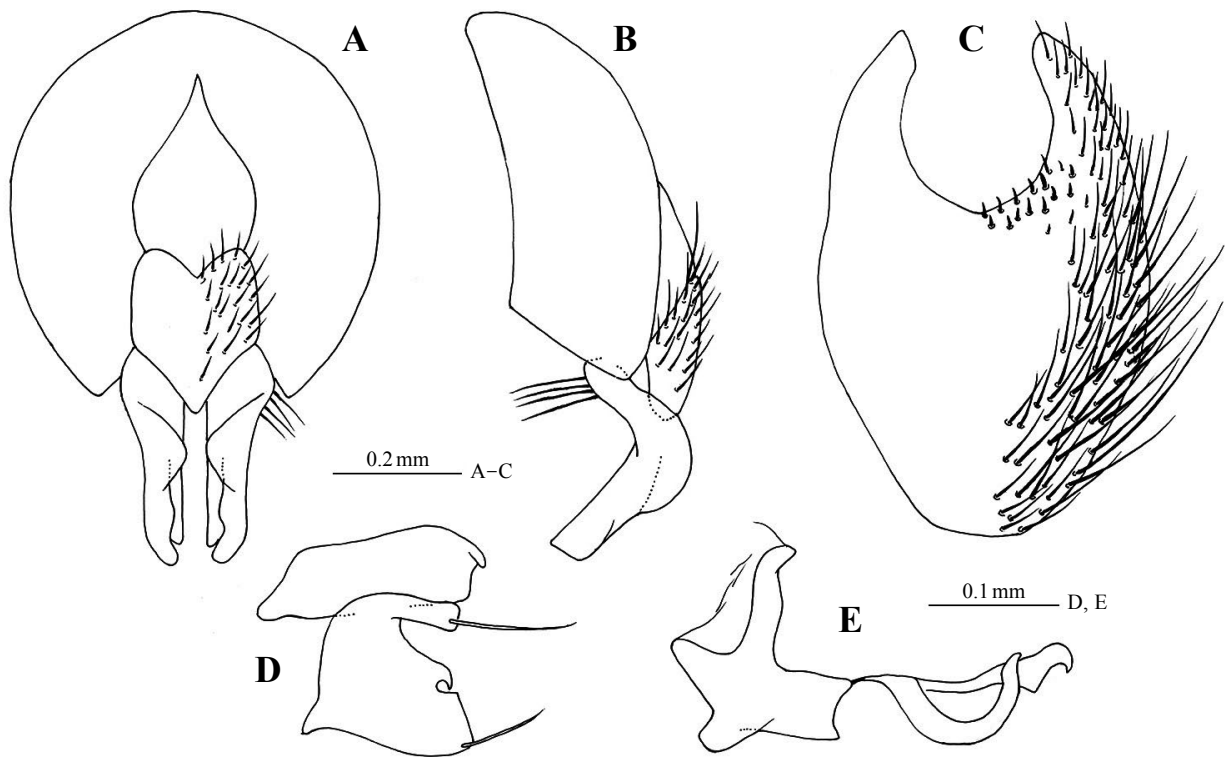


Fig. 60. *Emmesomyia hasegawai* Suwa, 1979, male. A, B. hypopygium; C. fifth sternite; D. gonocoxal lobe and gonostylus; E. phallus.

Male. Black in ground color, with bluish gray pollen. Head about 1.5 times as high as long. Interfrontalia very narrow, slightly dark brown; parafrentalia whitish gray pollinose with 3–4 *ori*. Parafacialia and cheek also whitish gray pollinose with 2–3 genal setae which are short and weakly developed.

Thorax in pollinosity brownish gray; mesonotum with 3 pair of *pre acr*, the second more developed than the others and even nearer to first *ph* than to third. Second *ph* and *pra* short, weakly developed. Anepimeron with 1 seta.

Legs with blackish femora; tibiae light brownish yellow; tarsi dark brown; fore tibia with 1 *pv*; mid tibia with 1 *pd*, and apical *av* and *pv*; hind tibia with 3 *ad*, 1 *av*, 2 *pd* and apical *av*.

Abdomen blackish with sparsely brownish gray pollinose.

Length. Body 5.4–6.2 mm, wing 4.8–5.5 mm.

MATERIAL EXAMINED: [KPNU] <GW> 1 ex., Obongsan, 17.v.1987, YJ Kwon; <GB> 3 exs., Sobaeksan, 15.v.1981, YJ Kwon; 1 ex., Sobaeksan, 6.vi.1986, YJ Kwon; 1 ex., Palgongsan, 11.v.1986, YJ Kwon; 1 ex., Daegu, 23.ix.1985, YJ Kwon; <GN> 1 ex., Gajisan, 4.vii.2001, SJ Suh; <JB> 1 ex., Minjujisan, 15.v.2000, SJ Suh; <JN> 1 ex., Wando, 22.vii.1989, YJ Kwon; 2 exs., Dolsando, 17.iv.1986, YJ Kwon; 1 ex., Jindo, 17.vi.1973, SH Park; <JJ> 11 exs., Seongpanak, 19.vi.1973, JS Park; 10 exs., Gwaneumsa, 17.vi.1973, JS

Park; 1 ex., Hallasan, 18.vi.1973, JS Park; [NIAST] <GB> 1 ex., Palgongsan, 3.vii.1986, YJ Kwon; <JN> 3 exs., Dolsando, 17.iv.1986, YJ Kwon.

DISTRIBUTION: Korea, Japan (Hokkaido, Honshu), China (Liaoning, Jiangsu, Sichuan, Zhejiang).

LOCALITY: Central-GG: Ganghwado; GW: Obongsan; South-GB: Daegu, Palgongsan, Sobaeksan; GN: Gajisan; JN: Dolsando, Wando; Jeju-JJ: Hallasan.

HOST: The larvae live on cow dung (Suwa, 1979).

61. *Emmesomyia megastigmata* Ma, Mou et Fan, 1982 (Fig. 61)

Emmesomyia megastigmata Ma, Mou et Fan, 1982: 225–227 (China); Suh et al., 1991: 201, 202; Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 303; Kwon et al., 1996: 224; Paek et al., 2010: 242; Han et al., 2014: 152.

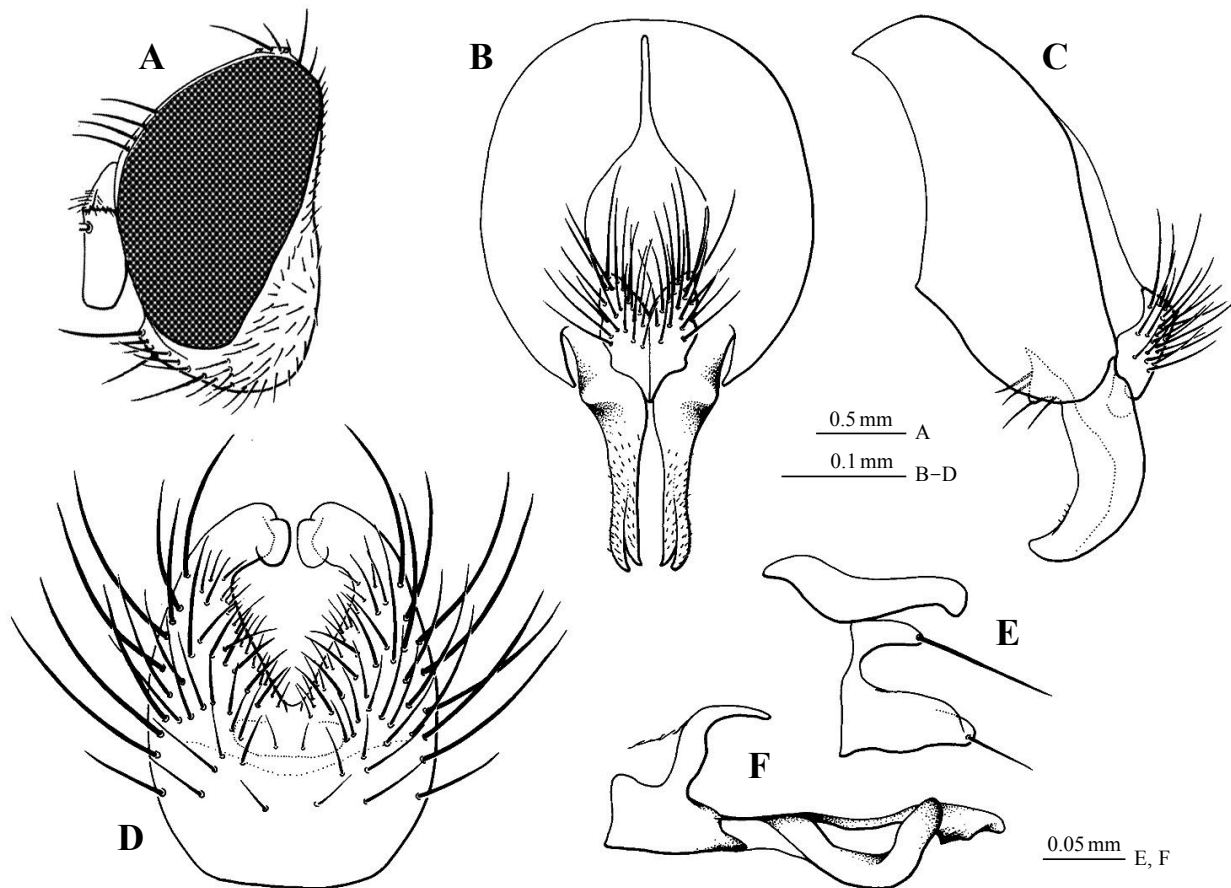


Fig. 61. *Emmesomyia megastigmata* Ma, Mou et Fan, 1982, male. A. head; B, C. hypopygium; D. fifth sternite; E. gonocoxal lobe and gonostylus; F. phallus.

Male. Black in ground color, with bluish gray pollen. Head 1.5–1.6 times as high as long in profile. Frons at narrowest part closely approximated; parafrontalia with 4–5 *ori*; profrons about 0.6–0.7 times as wide as width of third antennal segment. Third antennal segment 2.4–2.8 times as long as wide; arista pubescent, the longest hair 1.5–2.5 times as long as basal diameter of arista.

Pre acr rows with irregular setulae between rows; *pra* strong, as long as or slightly longer than posterior *ntpl*. Anepisternum with 2 distinct upper anterior setae, and having 2 strong and 10–13 additional *prepm*. Anepimeron armed with 2–4 robust setae. *Kepst* 2:2 or 2:3.

Fore tibia with strong 1 *pv*; mid tibia with 1 *pd* and 2 *pv*; hind tibia with 3 *ad*, 1 *av* and 2 *pd*. Wing faintly brown. Calypter yellow to brown; the lower calypter much protruding beyond the upper one. Knob of halter yellow.

Length. Body 5.8–6.0 mm, wing 6.0 mm.

MATERIAL EXAMINED: [KPNU] <GB> 1 ex., Geumosan, 7.x.1983, TH Jo; 1 ex., Geumosan, 15.vi.1983, TH Jo; <GN> 1 ex., Jirisan, 11.viii.1989, YJ Kwon; [NIAST] <GN> 1 ex., Jirisan, 11.viii.1989, YJ Kwon.

DISTRIBUTION: Korea, Japan (Honshu, Kyushu), China (Fujain, Guizou, Hainan, Henan, Liaoning, Sichuan).

LOCALITY: South-GB: Geumosan; GN: Jirisan.

62. *Emmesomyia similata* Suwa, 1991 (Fig. 62)

Emmesomyia similata Suwa, 1991: 10–12 (Kyushu); Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 303; Kwon et al., 1994: 266; Suh & Kwon, 1995: 195; Kwon et al., 1996: 224; Suwa, 1999: 223; Paek et al., 2010: 242; Han et al., 2014: 153.

Emmesomyia oriens (nec Suwa): Suwa et Park, 1982: 502; Suh & Kwon, 1985: 155, 156; Suh, 1989: 49; Suh et al., 1991: 42, 43; Suh et al., 1991: 208; Dely-Draskovits, 1993: 53.

Male. Black in ground color, with thin grayish pollen. Head about 1.3–1.4 times as high as long in profile. Frons at narrowest part equal to width of anterior ocellus. Interfrontalia and parafrontalia dull, with 4 *ori*. Parafacialia and cheek black, with gray pollen; parafacialia narrowing slightly towards level of lower margin of eye. Antenna black; third segment about 1.4–1.5 times as long as wide; arista distinctly pubescent, the longest hair slightly shorter than basal diameter of arista. Palpus brownish black with sparse gray pollen, long and slender. Haustellum brownish black, very stout.

Thorax black in ground color, with gray pollen, and patches of brown pollen, especially on dorsum. Mesonotum with 3 blackish vittae in caudal view; 3 pairs of *pre acr* and some additional setulae between rows, the second setula longest, the distance separating *pre acr* rows slighter narrower than distance between *pre acr* and *dc* rows. Posterior *ntpl* about one third as long as anterior *ntpl*. Proepisternum with 2 *prepst*. Anepis-

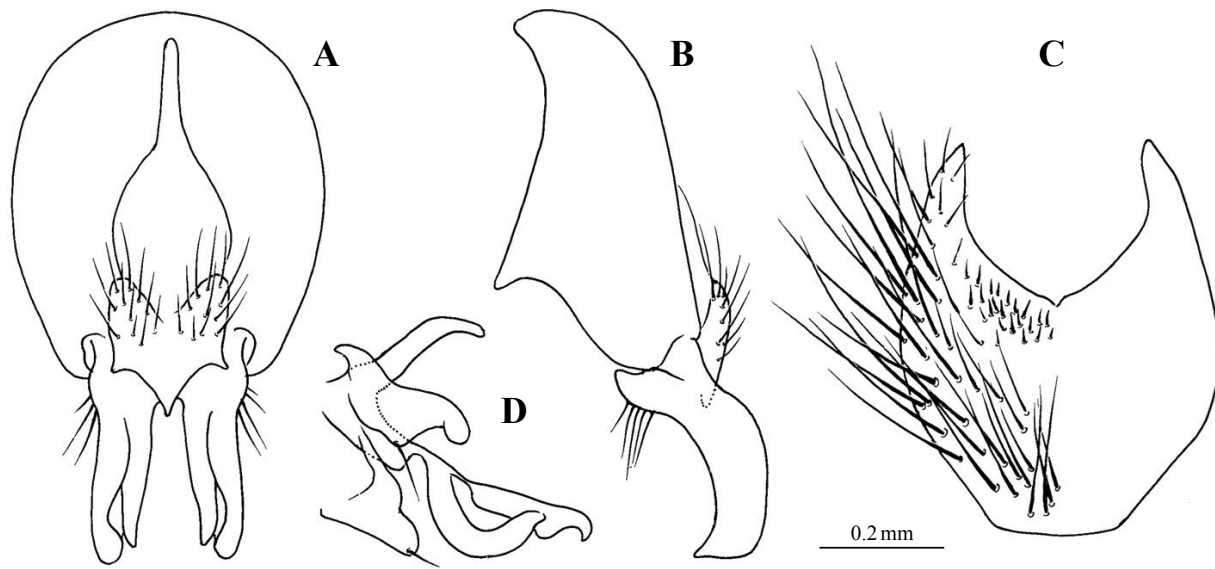


Fig. 62. *Emmesomyia similata* Suwa, 1991, male. A, B. hypopygium; C. fifth sternite; D. gonocoxal lobe, gonostylus and phallus.

ternum with 1 long and some additional *prepm*. Anepimeron armed with 2–3 robust setae.

Legs brownish with more yellowish tibiae; fore tibia with 2 *pv*; mid tibia with 2 *pv*, strong apical *pv*; hind tibia with 3 *ad*, 1 *av*, 2 *pd*, 1 *pv* and apical *av*.

Wing faintly brownish tinged, denser basally; costal spine indistinguishable from anterior setulae; m-m sinuate. Calypter deep yellow to brownish; the lower calypter much protruding beyond the upper one. Knob of halter brown.

Abdomen with greenish gray pollen, with black narrow median vitta.

Length. Body 5.0–5.5 mm, wing 4.8–5.0 mm.

MATERIAL EXAMINED: [KPNU] <CN> 1 ex., Chilgapsan, 28.v.2009, SJ Suh; <GB> 1 ex., Palgongsan, 6.vi.1984, YJ Kwon; <JJ> 6 exs., Seongpanak, 19.vi.1973, JS Park; [NIAST] <GB> 1 ex., Palgongsan, 6.vi.1984, YJ Kwon.

DISTRIBUTION: Korea, Japan (Hokkaido, Honshu, Kyushu, Nansei Iss.), China (Guizhou).

LOCALITY: North-PB: Myohyangsan; Central-HH: Pyeongseong; CN: Chilgapsan; South-GB: Geumosan, Palgongsan; Jeju-JJ: Hallasan (= Soungpanak).

HOST: This species has been reared from cow-dung (cf. Suwa, 1999).

63. *Emmesomyia subvillica* Fan, Ma et Mou, 1982 (Fig. 63)

Emmesomyia subvillica Fan, Ma et Mou, 1982: 227 (China: Jianchang).

Emmesomyia megastigmata (nec Ma, Mou et Fan): Suh et al., 1991: 202, 203; Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 303; Kwon et al., 1996: 224; Paek et al., 2010: 242; Han et al., 2014: 153.

Male. Black in ground color, with bluish gray pollen. Head about 1.5 times as high as long profile. Interfrontalia linear and convergent caudad. Parafrontalia having 3–4 *ori*. Antenna black; third antennal segment about twice as long as wide; arista pubescent, the longest hair about twice as long as basal diameter of arista.

Pre acr with some irregular setulae between rows; *pra* about 0.8–0.9 times as long as posterior *ntpl* which slightly shorter than anterior *ntpl*. Anepisternum with a distinct upper anterior seta, and having 1 strong and 6–8 fine additional *prepm*. Anepimeron with 1 strong seta. *Kepst* 2:3.

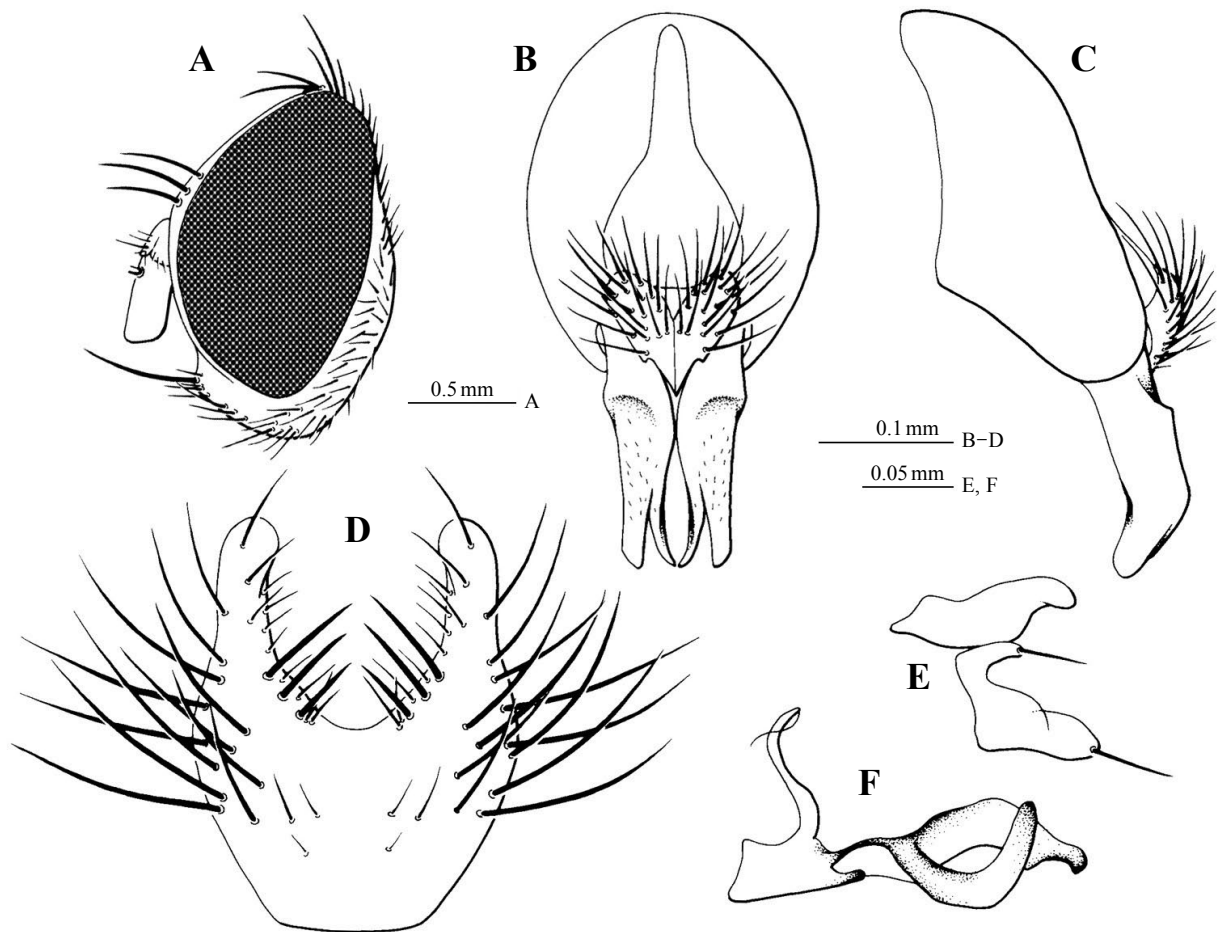


Fig. 63. *Emmesomyia subvillica* Fan, Ma et Mou, 1982, male. A. head; B, C. hypopygium; D. fifth sternite; E. gonocoxal lobe and gonostylus; F. phallus.

Tibiae yellow to brown; fore tibia with 1 *pv*; mid tibia with 1 *pd* and 2 *pv*; hind tibia with 3 *ad*, 1 *av* and 2 *pd*.
Wing faintly brown. Calypter whitish yellow, the lower calypter much protruding beyond the upper one; knob of halter yellow.

Abdomen with a black narrow median vitta.

Length. Body 5.5 mm, wing 5.6 mm.

MATERIAL EXAMINED: [KPNU] <GB> 1 ex., Geumosan, 22.vi.1983, TH Jo; 1 ex., Geumosan, 11.v.1983, TH Jo.

DISTRIBUTION: Korea, China (Guizhou, Liaoning, Shanxi, Sichuan).

LOCALITY: South-GB: Geumosan.

64. *Emmesomyia suwai* Ge et Fan, 1988 (Fig. 64)

Emmesomyia socia suwai Ge et Fan, 1988: 374, 375 (China); Suh et al., 1991: 208.

Emmesomyia suwai: Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 303; Kwon et al., 1994: 266; Suh & Kwon, 1995: 196; Kwon et al., 1996: 224; An, 1998: 62; Paek et al., 2010: 242; Han et al., 2014: 153.

Emmesomyia villica (nec Meigen): Kwon & Suh, 1982d: 3.

Emmesomyia socia (nec Fallén): Kwon & Suh, 1985: 154, 155; Suh, 1989: 49, 50; Dely-Draskovits, 1993: 58.

Male. Black in ground color, with thin grayish pollen. Head about 1.4–1.5 times as high as long in profile. Frons at narrowest part equal to width of anterior ocellus. Interfrontalia and parafrontalia bluish gray, with 4 *ori*. Profrons and cheek black, with gray pollen; parafacialia narrowing slightly towards level of lower margin of eye. Antenna black; third segment about 2.2–2.3 times as long as wide; arista distinctly pubescent, the longest hair slightly shorter than basal diameter of arista. Palpus and mentum brownish black with sparse gray pollen, long and slender.

Thorax black in ground color, with gray pollen, and patches of brown pollen, especially on dorsum. Mesonotum with 3 blackish vittae in caudal view; 3 pairs of *pre acr* and some additional setulae between rows, distance separating *pre acr* rows narrower than to *dc*. Second *ph* about half as long as anterior *ntpl*. *Pra* about 0.6–0.7 times as long as anterior *ntpl*. Posterior *ntpl* about 0.7–0.8 times as long as anterior *ntpl*. Proepisternum with 2 *prepst*. Anepisternum with 2 long and 5 additional *prepm*. Anepimeron with 1 seta.

Legs brownish with more yellowish tibiae; fore tibia with 1 *pv*; mid tibia with 1 *ad*, 2 *pd*, and strong apical *av* and *pv*; hind tibia with 5 *ad*, 1 *av*, 4 *pd* and apical *av*.

Wing faintly brownish tinged, denser basally; costal spine indistinguishable from anterior setulae; m-m

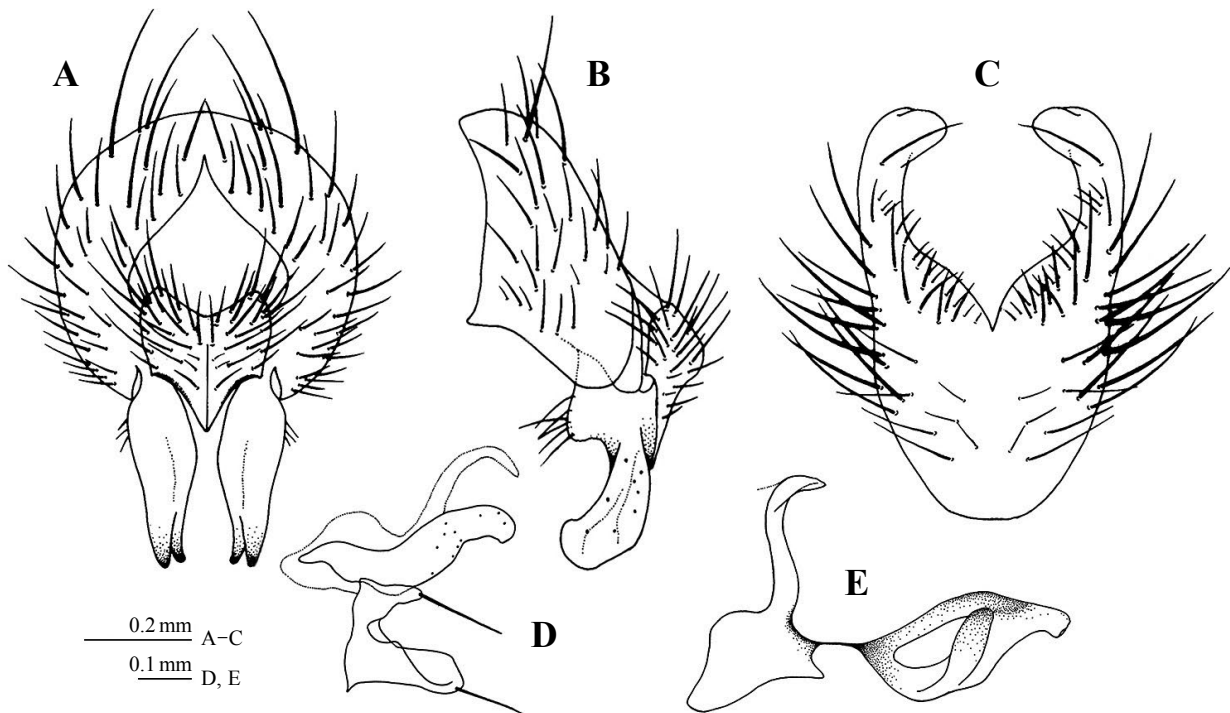


Fig. 64. *Emmesomyia suwai* Ge et Fan, 1988, male. A, B. hypopygium; C. fifth sternite; D. gonocoxal lobe and gonostylus; E. phallus.

sinuate. Calypter and knob of halter pale.

Abdomen with bluish gray pollen, with black narrow median vitta.

Length. Body 5.0–6.7 mm, wing 4.3–5.9 mm.

MATERIAL EXAMINED: [KPNU] <GB> 1 ex., Sobaeksan, 15.v.1981, YJ Kwon; 1 ex., Palgongsan, 7.v.1983, YJ Kwon; <JJ> 1 ex., Gwaneumsa, 17.vi.1973, SH Park; 4 exs., Hallasan, 6.viii.1989, YJ Kwon; [NIAS] <JJ> 2 exs., Hallasan, 6.viii.1989, YJ Kwon.

DISTRIBUTION: Korea, Japan (Hokkaido, Honshu, Kyushu), China (Guizhou, Henan, Heilongjiang, Sichuan, Yunnan), India.

LOCALITY: South-GB: Palgongsan, Sobaeksan; Jeju-JJ: Hallasan.

Genus *Eustalomyia* Kowarz, 1873

Eustalomyia Kowarz, 1873: 461. Type-species: *Musca hilaris* Fallén, 1823 (Sweden: Scania).

Dendrophila Lioy, 1864: 909 (praeoccup.). Type-species: *Musca hilaris* Fallén, 1823 (Sweden: Scania).

DIAGNOSIS: Eyes without evident pubescence; face without keel; arista not angled; mentum 0.3–0.35 times as long as head height; scutum well marked with three black vittae contrasting with surrounding gray pollinosity; scutellum with black lateral markings; scutellum with two long marginal pairs of setae and a shorter discal pair, and with fine pubescence on ventral surface; prosternum and proepisternum bare; lower calypter smaller than the upper; hind tibia without apical *pv*; hypandrium with short pedestal-like posterior extension.

Key to species of Korean *Eustalomyia*

1. Palpus yellow; scutellum bare on dorsal center.....*E. vittipes*
1. Palpus black; scutellum setulose on dorsal center.....2
2. Hind tibia with 7–8 *av*.....*E. festiva*
2. Hind tibia with 12–13 *av*.....*E. histrio*

65. *Eustalomyia festiva* (Zetterstedt, 1845) (Fig. 65)

Aricia festiva Zetterstedt, 1845: 1424 (Sweden).

Male. Black in ground color, with gray pollen. Parafrontalia contiguous to each other, with 8–9 *ori*. Antenna black; third antennal segment about 3.0 times as long as wide; arista minutely plumose. Palpus black.

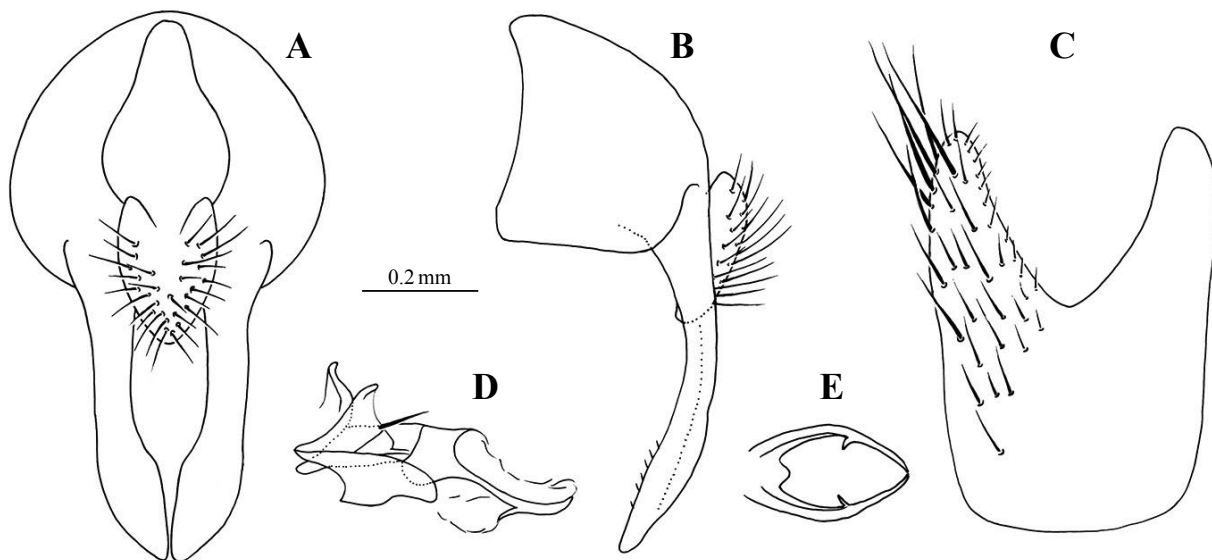


Fig. 65. *Eustalomyia festiva* (Zetterstedt, 1845), male. A, B. hypopygium; C. fifth sternite; D. gonocoxal lobe, gonostylus and phallus; E. distiphallus.

Mesonotum with 2 brownish black vittae. Scutellum densely setulose on whole dorsal surface. 1–2 distinct second *ph* present. *Pra* robust, as long as posterior *ntpl*. Notopleuron without accessory setulae. Anepisternum with 3–5 additional *prepm*. *Kepst* 2:3 or 2:4.

Legs black; fore tibia with strong *p*; mid tibia with 1 *pd*, and 3 *pv*; hind tibia with 4 long and 3–4 short *ad*, 6–7 *av*, 4–5 long and 2–3 short *pd*, and 3–4 strong and 13–18 weak *pv*.

Wing faintly brown. Abdomen with a black median vitta, and a fore marginal band on each segment.

Length. Body 9.4–11.5 mm, wing 8.1–8.8 mm.

MATERIAL EXAMINED: [KPNU] <GB> 8 exs., Pagyedae, Mt. Palgongsan, Jungdae-dong, Daegu, 5.viii.2015, SJ Suh; 1 ex., Hantijae, Mt. Palgongsan, Dongmyeong-myeon, Chilgok-gun, 11.viii.2015, SJ Suh.

DISTRIBUTION: Korea (new record), Japan (Hokkaido), China (Liaoning, Qinghai), Europe, N. America.

LOCALITY: South-GB: Palgongsan.

66. *Eustalomyia histrio* (Zetterstedt, 1838) (Fig. 66)

Anthomyia histrio Zetterstedt, 1838: 676 (Sweden).

Anthomyza histrio Zetterstedt, 1837: 44 (nomen nudum).

Eustalomyia histrio: Schnabl et Dziedzicki, 1911: 104; Suwa, 1984b: 12; Suh, 1989: 103; Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 303; Kwon et al., 1996: 224; Suwa, 1999: 223; Paek et al., 2010: 242; Han et al., 2014: 153.

Anthomyia brixia Walker, 1849: 946 (Canada: Nova Scotia).

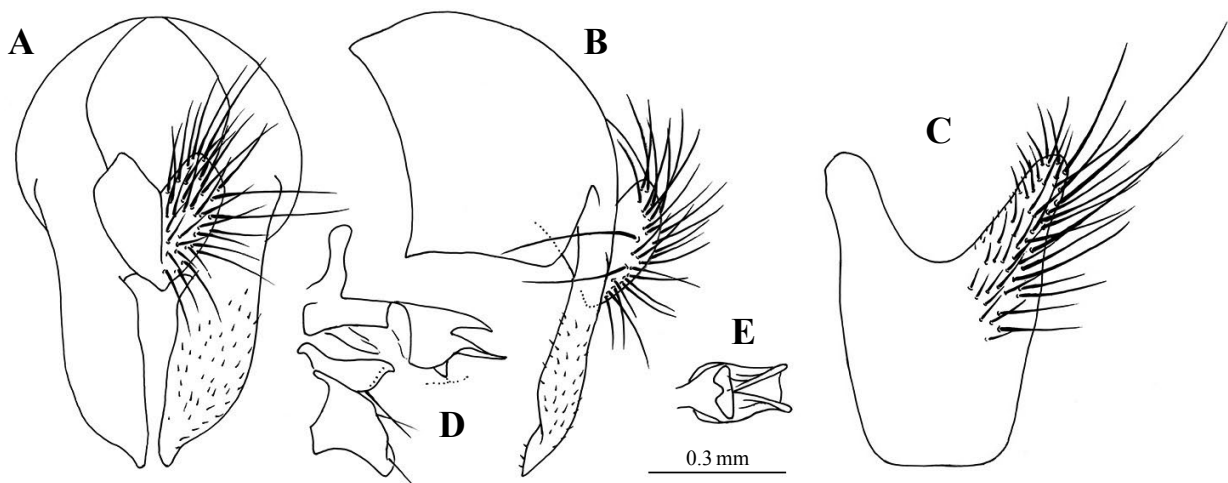


Fig. 66. *Eustalomyia histrio* (Zetterstedt, 1838), male. A, B. hypopygium; C. fifth sternite; D. gonocoxal lobe, gonostylus and phallus; E. distiphallus.

Male. Black in ground color, with gray pollen. Parafrontalia contiguous to each other, with 8–9 *ori*. Antenna black; third antennal segment about 3.0 times as long as wide; arista minutely pubescent. Palpus black.

Mesonotum with 2 brownish black vittae, and having 7 strong and 5 finer irregular pairs of *pre acr*, the distance of *pre acr* rows closer than to *dc*. Scutellum densely setulose on whole dorsal surface. 2 distinct second *ph* present. *Pra* robust, as long as posterior *ntpl*. Notopleuron with 2 additional setulae. Anepisternum with many additional *prepm*. *Kepst* 2:3 or 2:4.

Legs black; fore tibia with strong apical *d* and *pd*; mid tibia with 1 *ad*, 2 *pd*, and 4–5 *pv*; hind tibia with 3–5 long and 3–4 short *ad*, 12–13 *av*, 4 long and 3 short *pd*, and 1 strong and numerous weak *pv*.

Wing faintly brown. Abdomen with a black median vitta, and a fore marginal band on each segment.

Length. Body 10.2 mm.

DISTRIBUTION: Korea, Japan (Hokkaido), Russia (Kamchatka), Europe, N. America.

LOCALITY: Central-GW: Seoraksan.

HOST: The larvae are living in the nests of *Cemonus lugubris*, *Megachile* sp. and *Crabro* sp. (cf. Hennig, 1967).

67. *Eustalomyia vittipes* (Zetterstedt, 1845) (Fig. 67)

Anthomyza vittipes Zetterstedt, 1845: 1649 (Sweden).

Eustalomyia vittipes: Suh et al., 1991: 207, 208; Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 303; Kwon et al., 1996: 224; Paek et al., 2010: 242; Han et al., 2014: 153.

Anthomyza decorata Zetterstedt, 1852: 4323 (Sweden).

Anthomyia arrogans Rondani, 1866: 185 (Italy).

Eustalomyia steini Schroeder, 1924: 189 (USA: Pennsylvania).

Eustalomyia lepraota Séguy, 1928: 153 (China: Shanghi).

Male. Black in ground color, with gray pollen. Head about 1.5 times as high as long in profile. Frons much wider than the distance between posterior ocelli; parafrontalia with 5–6 *ori*. Antenna black; third antennal segment 2.4–2.5 times as long as wide; arista long plumose, the longest setula 1.2–1.3 times as long as width of third antennal segment. Mentum of haustellum stout and dark brown; palpus slender and yellow.

Mesonotum with distinct brown median vitta, with 6–7 pairs of *pre acr*. Scutum and scutellum with black lateral marking. *Pra* robust, 0.7–1.3 times as long as posterior *ntpl*. Anepisternum with 2–3 *prepm*. *Kepst* 1:3 or 2:4.

Legs yellow to dark brown; fore femur with black dorsoposterior stripe; fore tibia with 0–1 *ad* and 1–2 strong *p-pv*; mid tibia with 3–5 *ad*, 3–4 *av*, 3–6 *pd* and 1–7 *pv*. Wing faintly brown; costal spine as long as

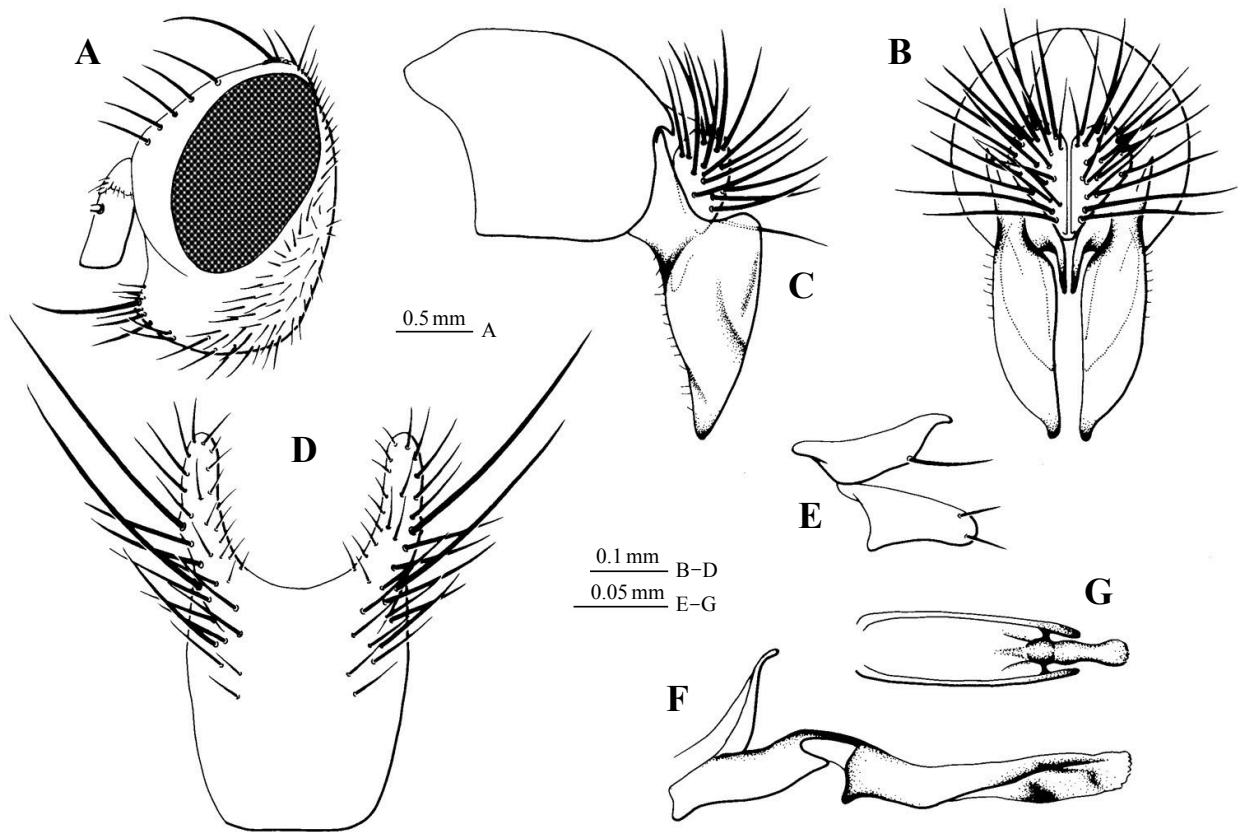


Fig. 67. *Eustalomyia vittipes* (Zetterstedt, 1845), male. A. head; B, C. hypopygium; D. fifth sternite; E. gonocoxal lobe and gonostylus; F. phallus; G. distiphallus.

humeral crossvein. Calypter whitish yellow; knob of halter yellow.

Abdomen with a black median vitta, and a fore marginal band on each segment.

Length. Body 6.0–9.0 mm, wing 5.5–7.0 mm.

MATERIAL EXAMINED: [KPNU] <GB> 4 exs., Geumosan, 22.v.1984, SH Park; 1 ex., Geumosan, 11.vi.1983, SH Park; 2 exs., Geumosan, 12.vii.1983, TH Jo; 1 ex., Geumosan, 12.vii.1983, SH Park; 2 exs., Geumosan, 1.vi.1983, SH Park; 2 exs., Geumosan, 27.vii.1983, SH Park; 1 ex., Geumosan, 25.v.1983, SH Park; 1 ex., Geumosan, 22.vi.1983, TH Jo; 2 exs., Palgongsan, 11.vii.2015, SJ Suh; <GN> 1 ex., Yangsan, 8.vi.1974, SH Park.

DISTRIBUTION: Korea, Japan (Hokkaido, Honshu, Kyushu), China (Heilongjiang, Jiangsu, Liaoning, Qinghai, Shanghai), France, Finland, Germany, Hungary, Italy, Sweden, Russia, N. America.

LOCALITY: South-GB: Geumosan, Palgongsan; GN: Yangsan.

HOST: This species was reared from a nest of a crabronid wasp, *Rhopalum nipponicum* Kohl (cf. Suwa, 1999).

Genus *Eutrichota* Kowarz, 1893

Eutichota Kowarz, 1893: 140. Type-species: *Coenosia inornata* Loew, 1873 (not given).

Eremomyia Stein, 1898: 223. Type-species: *Eremomyia humeralis* Stein, 1898 (USA).

Pegomyza Schnabl et Dziedzicki, 1911: 109 (as subgenus of *Pegomyia*). Type-species: *Anthomyia praepotens* Wiedemann, 1817 (Germany).

Eremomyioides: Malloch, 1921: 76 (emendation).

Hervebazinia Séguy, 1923: 264. Type-species: *Hervebazinia longipes* Séguy, 1923 (France).

Arctopegomyia Ringdahl, 1938: 195 (as subgenus of *Pegomyia*). Type-species: *Anthomyza tunicata* Zetterstedt, 1846 (Sweden).

Parapegomyia Griffiths, 1984: 389. Type-species: *Anthomyza socculata* Zetterstedt, 1845 (Sweden: Jämtland).

DIAGNOSIS: *If* absent in both sex; additional setulae behind vibrissa present; mentum relatively short, 0.3–0.4 times as long a head height; 1 + 2 *ph*; *pra* strong, longer than posterior *ntpl*; lower surface of costa with additional short setulae below the main marginal series of short spinules; lower calypter smaller than the upper; mid femur with a distal *av*; hind tibia without apical *pv*; fifth sternite with densely setulose processes, outer lateral setae progressively increase in length distally; surstylus divided distally into an inner and outer terminal process; hypopygium conical; gonostylus with a strong setula on anteroventral margin (Griffiths, 1984).

Key to species of Korean *Eutrichota*

1. Femora yellow; hypopygium yellow *E. praepotens*
1. Femora dark brown or black; hypopygium black 2
2. Fore tibia with *ad*; distance between the rows of *pre acr* wider than distance between *dc* and *acr*
..... *E. schineri*
2. Fore tibia without *ad*; distance between the rows of *pre acr* subequal to distance between *dc* and *acr*
..... *E. socculata*

68. *Eutrichota praepotens* (Wiedemann, 1817) (Fig. 68)

Anthomyia praepotens Wiedemann, 1817, Zool. Mag. 1: 83 (Germany).

Eutrichota praepotens: Suh et al., 1991: 204, 205; Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 303; Kwon et al., 1996: 224; Paek et al., 2010: 242; Han et al., 2014: 153.

Male. Black in ground color, with gray pollen. Head 1.3–1.4 times as high as long in profile. Frons at

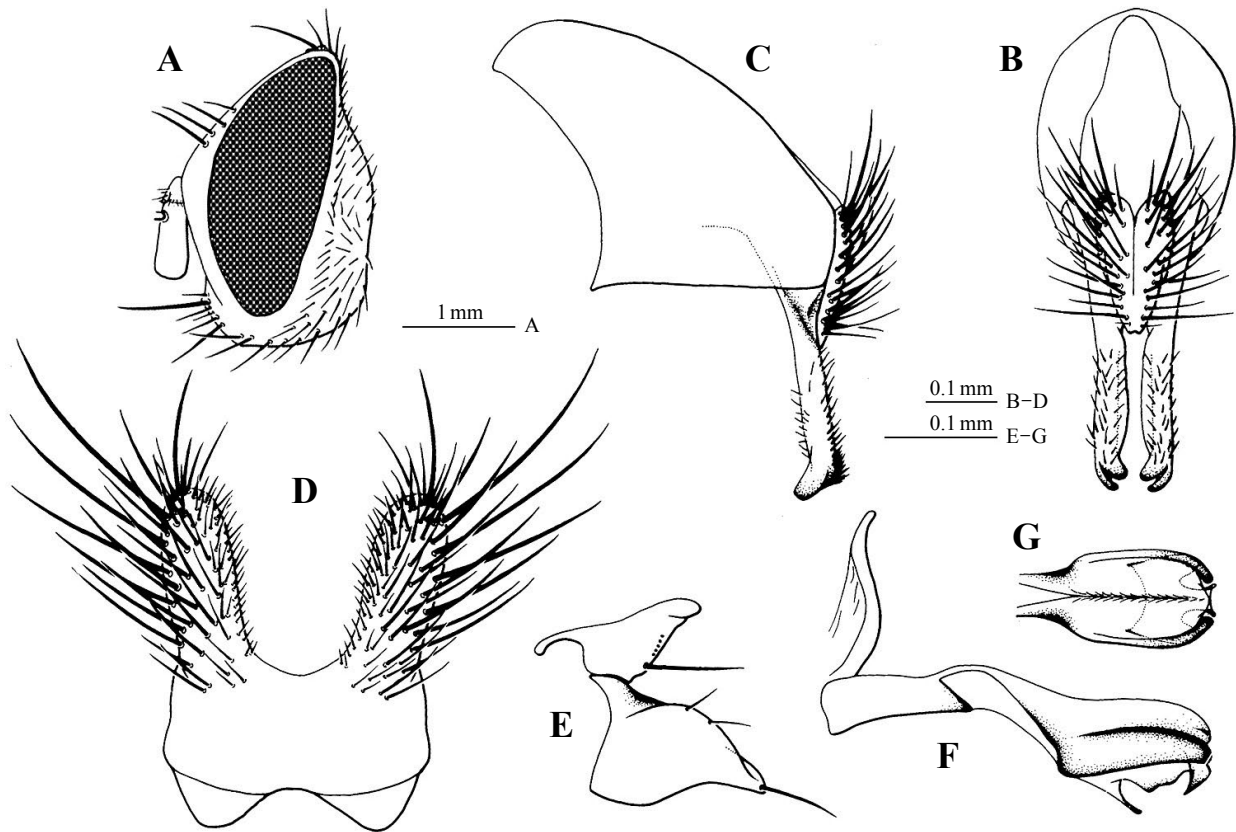


Fig. 68. *Eutrichota praepotens* (Wiedemann, 1817), male. A, B. hypopygium; C, D. fifth sternite; E. gonocoxal lobe and gonostylus; F. phallus; G. distiphallus.

narrowest part nearly as wide as distance between posterior ocelli. Interfrontalia lacking *if*; parafrontalia with 3–4 strong *ori*. Third antennal segment 2.2–2.5 times as long as wide; arista long plumose, the longest setula much longer than width of third antennal segment.

Mesonotum with 3 paler brown vittae; second *ph* about half as long as first *ph*; *pra* slightly longer than anterior seta, and 3 *prepm*. *Kepst* 1:2 or 2:2.

Legs yellow, except fore tarsus; fore tibia with 1 *ad* and 1 *pv*; hind tibia 2 *ad*, 1–2 *av*, 2 *pd* and no apical *pv*.

Wing faintly brown; costal spine as long as humeral crossvein. Calypter whitish yellow. Knob of halter yellow.

Abdomen with a black narrow median vitta.

Length. Body 9.5 mm, wing 10.0 mm.

MATERIAL EXAMINED: [KPNU] <CN> 2 exs., Gyeryongsan, 20.v.1984, SH Park; 1 ex., Gyeryongsan, 20.v.1984, TH Jo; <GB> 2 exs., Geumosan, 15.vi.1983, SH Park; 3 exs., Geumosan, 22.vi.1983, SH Park; 1 ex., Geumosan, 12.vii.1983, TH Jo; 4 exs., Geumosan, 8.vi.1983, SH Park; 1 ex., Geumosan, 18.v.1983, SH Park;

1 ex., Geumosan, 25.v.1983, SH Park; [NIAST] <GB> 1 ex., Geumosan, 8.vi.1983, TH Jo.

DISTRIBUTION: Korea, Japan (Hokkaido, Honshu), China, Russia (Kurland), Austria, Finland, France, Germany, Netherlands, Sweden, Ukraine, UK.

LOCALITY: Central-CN: Gyeryongsan; South-GB: Geumosan.

69. *Eutrichota schineri* (Schnabl, 1911) (Fig. 69)

Pegomyia (*Pegomyza*) *schineri* Schnabl, 1911: 259 (France).

Parapegomyia schineri: Michelsen, 1985: 62; Suh & Kwon, 1985: 161, 162; Suh et al., 1985: 208; Suh, 1989: 61, 62; Dely-Draskovits, 1993: 75; Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 304; Kwon et al., 1996: 224; Paek et al., 2010: 242; Han et al., 2014: 156.

Pegomyza socculata (nec Zetterstedt): Ringdahl, 1938: 174; Hennig, 1973: 512–514, pls. 63 (749), 78 (903, 919).

Eutrichota socculata (nec Zetterstedt): Suwa, 1974: 238–240; Suwa, 2013: 173.

Eutrichota schineri: Suwa, 1999: 224.

Male. General coloration black, brown grayish pollinose. Head 1.2–1.3 times as long as high in profile; frons a little narrower than anterior ocellus, with 3–4 *ori*; parafrontalia broadly convergent; profrons slightly narrower than third antennal segment width. Antenna black, with arista plumose, the longest hair about as third antennal segment width; third antennal segment about 2.5–2.9 times as long as wide.

Thorax brown grayish pollinose; mesonotum with broadly blackish marking outside rows of *dc*; densely setulose between the rows of *pre acr*. Scutellum tinged with brown. Second *ph* weak; *pra* longer than anterior *ntpl*; *kepst* 1:2.

Legs with femora black, tibiae yellow and tarsi black; fore tibia with 1 *ad*, 2 *pv*, and strong apical *pd*; mid tibia with 1 *ad*, 1 *pd* and 4 *p-pv*; hind tibia with 3 *ad*, 1 *av* and 3 *pd*.

Wing rather distinctly tinged with yellow, deeper at base; costal spine minute; m-m rather distinctly sinuate. Calypter yellow. Knob of halter dark brown.

Abdomen white grayish pollinose; median vitta narrow; fifth tergite shining black.

Length. Body 5.2–5.5 mm, wing 4.6–5.0 mm.

Female. Abdomen more thinly pollinose than in male, not vittae; frons a little wider than one-third head-width; profrons about as wide as third antennal segment width; mid tibia without *av*; costal spine strong.

Length. Body 5.3–5.6 mm, wing 4.6–5.0 mm

MATERIAL EXAMINED: [KPNU] <GW> 1 ex., Odaesan, 29.vii.1983, YJ Kwon; 1 ex., Samyeongsan, 11.v.2003, SJ Suh; <GB> 2 exs., Irweolsan, 28–29.v.1984, TH Jo; 1 ex., Geumosan, 15.vi.1983, SH Park; 1 ex., Geumo-

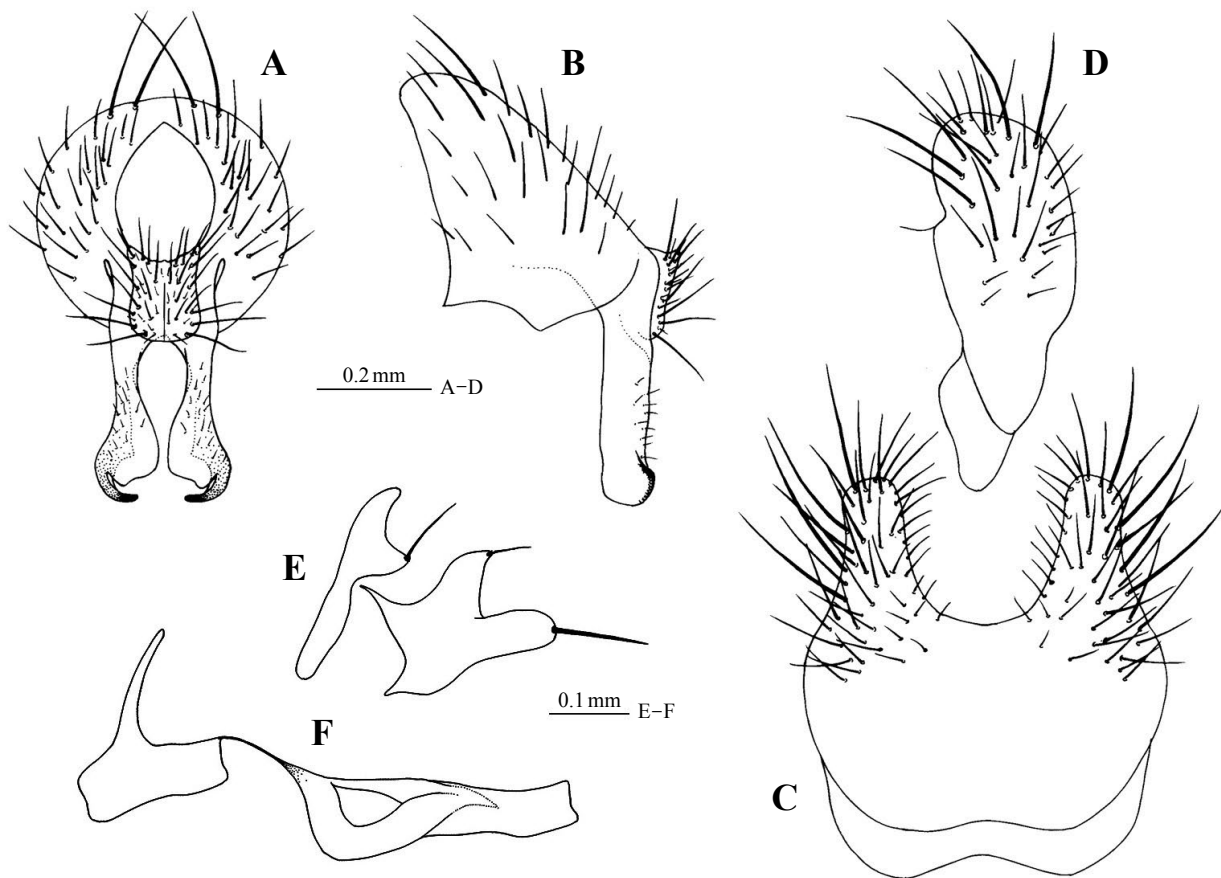


Fig. 69. *Eutrichota schineri* (Schnabl, 1911), Male. A, B. hypopygium; C, D. fifth sternite; E. gonocoxal lobe and gonostylus; F. phallus.

san, 1.vi.1983, TH Jo; 2 exs., Geumosan, 22.vi.1983, TH Jo; 1 ex., Geumosan, 5.vi.1984, SH Park; 2 exs., Geumosan, 12.vii.1983, TH Jo; 1 ex., Geumosan, 11.vi.1983, SH Park; 1 ex., Geumosan, 9.viii.1983, TH Jo; 1 ex., Bohyeonsan, 5.vi.1983, TH Jo; [NIAST] <GW> 1 ex., Odaesan, 29.vii.1983, YJ Kwon.

DISTRIBUTION: Korea, Japan (Hokkaido), China, Europe.

LOCALITY: Central-GW: Odaesan, Samyeongsan; South-GB: Bohyeonsan, Geumosan, Irweolsan.

70. *Eutrichota socculata* (Zetterstedt, 1845) (Fig. 70)

Anthomyza socculata Zetterstedt, 1845: 1683 (Sweden: Jämtland).

Parapegomyia socculata: Michelsen, 1985: 56; Suh & Kwon, 1985: 161; Suh, 1989: 62; Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 304; Kwon et al., 1996: 224; Paek et al., 2010: 242; Han et al., 2014: 156.

Anthomyia egens Meigen, 1826: 181 (not given).

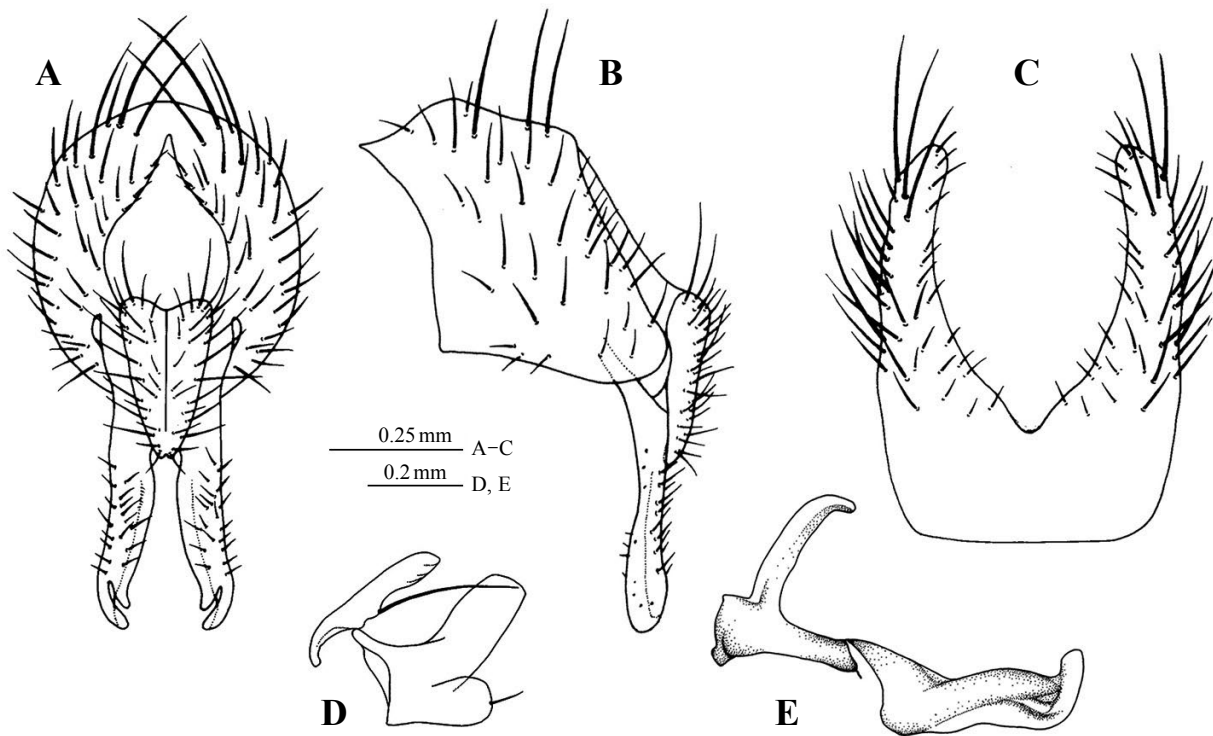


Fig. 70. *Eutrichota socculata* (Zetterstedt, 1845), male. A, B. hypopygium; C. fifth sternite; D. gonocoxal lobe and gonostylus; E. phallus.

Pegomyza consanguinea Tiensuu, 1938: 27 (Finland); Hennig, 1973: 506–508, pls. 60 (725), 62 (744), 63 (748).

Eutrichota consanguinea: Suwa, 1974: 237, 238; Kwon & Suh, 1982d: 5; Suwa, 1983b: 43.

Eutrichota socculata: Suwa, 1999: 225.

Male. Black in ground color, with thin grayish pollen. Head about 1.2–1.3 times as high as long in profile. Frons at narrowest part equal to width of anterior ocellus. Interfrontalia dull tinged with brown; parafrontalia with 4 *ori*. Parafacialia and cheek black, with gray pollen; parafacialia narrowing slightly towards level of lower margin of eye. Antenna black; third segment about 3.0 times as long as wide; arista pubescent, the longest hair about twice as long as basal diameter of arista. Palpus and haustellum black, long and slender.

Thorax black in ground color, with brownish gray pollen, and patches of brown pollen, especially on dorsum. Mesonotum with 5 pairs of *pre acr* and several fine irregular setulae between rows, the distance between *pre acr* rows somewhat wider than distance between *pre acr* and *dc* rows. Posterior *ntpl* as long as or slightly shorter than anterior *ntpl*. Proepisternum with 2 *prepst*. Anepisternum with 2 long and 1 fine *prepm*.

Legs blackish brown, tibiae more brownish; fore tibia with 1 *pv*; mid tibia with 1 *ad*, 2 *pd*, 2 *p*, and strong apical *pv*; hind tibia with 3 *ad*, 1 *av*, and 2 *pd*.

Wing faintly brownish tinged, denser basally; costal spine indistinguishable from anterior setulae; m-m

slightly sinuate. Calypter and knob of halter yellow.

Length. Body 5.5–6.5 mm, wing 4.8–5.5 mm.

MATERIAL EXAMINED: [KPNU] <GG> 1 ex., Ganghwado, 11.v.1982, YJ Kwon; <GW> 3 exs., Obongsan, 17.v.1981, YJ Kwon; 1 ex., Balwangsan, 3.ix.2000, SJ Suh; 2 exs., Samyeongsan, 11.v.2003, SJ Suh; <GB> 1 ex., Juwangsan, 28.vii.1984, YJ Kwon; <GN> 1 ex., Jirisan, 10.viii.1989, YJ Kwon; [NIAST] <GW> 2 exs., Obongsan, 17.v.1981, YJ Kwon.

DISTRIBUTION: Korea, Japan (Hokkaido, Honshu, Kyushu), China (Heilongjiang, Liaoning), Europe, N. America.

LOCALITY: Central-GG: Ganghwado; GW: Obongsan, Balwangsan, Samyeongsan; South-GB: Juwangsan; GN: Jirisan.

Genus *Fucellia* Robineau-Desvoidy, 1841

Fucellia Robineau-Desvoidy, 1841: 269. Type-species: *Fucellia arenaria* Robineau-Desvoidy, 1841 (not given).

Halithea Haliday, 1838: 279 (nom.praeocc.). Type-species: *Scatomyza fucorum* Fallén, 1819 (not given).

Parachortophila Bigot, 1885: 280. Type-species: *Parachortophila modesta* Bigot, 1885 (Morocco).

Fucellina Schnabl et Dziedzicki, 1911: 123. Type-species: *Scatomyza griseola* Fallén, 1819 (Sweden).

Protofucellia Séguy, 1936: 281. Type-species: *Protofucellia syuitimorii* Séguy, 1936 (Japan: Hokkaido).

DIAGNOSIS: Frons wider than one-third of head width in both sexes; a pair of distinct *if* present; 3 *ors* and 2–3 *ori* present; arista pubescent; mesonotum with 2 + 3 *dc*; scutellum usually bare on ventral surface; *pra* weak or absent; additional *ntpl* setulae absent; proepisternum and anepimeron bare; *kepst* 2 + 2 or 1 + 1; hind tibia with 3–6 *pd* and without *pv*; costa with a series of widely spaced coarse setae on ventral surface beyond subcostal break.

Key to species of Korean *Fucellia*

1. Legs entirely black; prebasal sclerite setose in male; mid tibia with a short *pv* in female.....*F. kamtchatica*
1. Legs at least partially yellow; prebasal sclerite bare in male; mid tibia without *pv* in female.....2
2. Palpus black on apical half; wing with a dark brown apical spot in male.....*F. apicalis*
2. Palpus wholly or largely yellow; wing without apical spot in both sexes.....*F. boninensis*

71. *Fucellia apicalis* Kertestz, 1908 (Fig. 71)

Fucellia apicalis Kertestz, 1908: 71 (China: Swatou); Kwon & Suh, 1982c: 185, 186; Suwa, 1983b: 23; Suh & Kwon, 1985: 172; Suh, 1989: 42, 43; Suh et al., 1991: 208; Dely-Draskovits, 1993: 58; Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 302; Suh & Kwon, 1995: 196; Kwon et al., 1995: 498; Kwon et al., 1996: 224; Kwon et al., 1996: 250; Suwa, 1999: 225; Paek et al., 2010: 241; Han et al., 2014: 162.

Male. Ground color black, with thin brownish gray pollen. Head about 1.1–1.2 times as high as long in profile. Frons dichoptic. Interfrontalia dark brown, with a pair of proclinate *if*; parafrontalia brownish gray, with 3 *ors* and 3 *ori*. Profrons and cheek brown with gray pollen; parafacialia narrowing slightly towards level of lower margin of eye; cheek at narrowest part about 0.25 times as high as head height. Antenna black; 3rd segment about 1.5–1.6 times as long as wide; arista distinctly pubescent, the longest hair somewhat shorter than basal diameter of arista. Palpus and haustellum brownish black with sparse gray pollen, long and slender.

Mesonotum and scutellum black in ground color, with brownish gray pollen, and patches of brown pollen, especially on dorsum; mesonotum with 3 paler blackish vittae presuturally in caudal view; 3 pairs of *pre acr*, the distance separating *pre acr* rows closer than to *dc*. Second *ph* about 0.3–0.4 times as long as anterior *ntpl*. *Pra* slightly longer than half of anterior *ntpl*. Posterior *ntpl* about 0.7–0.8 times as long as anterior *ntpl*. Proepisternum with 2 *prepst*. Anepisternum with 3 *prepm*.

Legs black with brownish tibiae; fore tibia with 1 *ad* and 1 *pv*; mid tibia with 1 *ad*, 2 *av*, 1 *pd*, and apical *av* and *pv*; hind tibia with 4 *ad*, 6–7 *av*, 3 *pd* and apical *av*, without apical *pv*.

Wing faintly brownish tinged, denser basally, with a dark brownish spot at apex; costa with spinular setae widely set on ventral surface; m-m nearly straight. Calypter pale yellow. Knob of halter yellow.

Abdomen with gray pollen, with black narrow median vitta.

Length. Body 3.5–5.0 mm, wing 3.5–4.5 mm.

MATERIAL EXAMINED: [KPNU] <GG> 2 exs., Ganghwado, 22.v.1989, YJ Kwon; <GW> 4 exs., Naksan Beach, 31.vii.1982, YJ Kwon; 4 exs., Sokcho, 31.vii.1982, YJ Kwon; <GB> 3 exs., Ulleungdo, 2.vi.1989, YJ Kwon; 11 exs., Yangnam-myeon, 16.vi.1982, YJ Kwon; 5 exs., Hupo, 26.ix.1984, YJ Kwon; <GN> 1 ex., Okcheonsa, 6.vi.1974, SH Park; 1 ex., Yokjido, 19.vi.1981, YJ Kwon; 4 exs., Bangeojin, 10.iv.1982, YJ Kwon; 1 ex., Bangeojin, 29.iii.1981, YJ Kwon; 16 exs., Jinhae, 21.v.2006, SJ Suh; <JB> 1 ex., Byeonsan, 23.v.2006, SJ Suh; <JN> 1 ex., Dolsando, 19.iv.1986, YJ Kwon; <JJ> 3 exs., Seongsanpo, 17.v.1980, YJ Kwon; [NIAS] <GW> 4 exs., Naksan Beach, 31.vii.1982, YJ Kwon; 4 exs., Sokcho, 31.vii.1982, YJ Kwon; <GB> 4 exs., Yangnam-myeon, 16.vi.1982, YJ Kwon; <JN> 4 exs., Daeheuksando, 22.iv.1975, KY Choi.

DISTRIBUTION: Korea, Japan (Hokkaido, Honshu, Kyushu, Shikoku, Bonin), China (Fujian, Jiangsu, Shan-

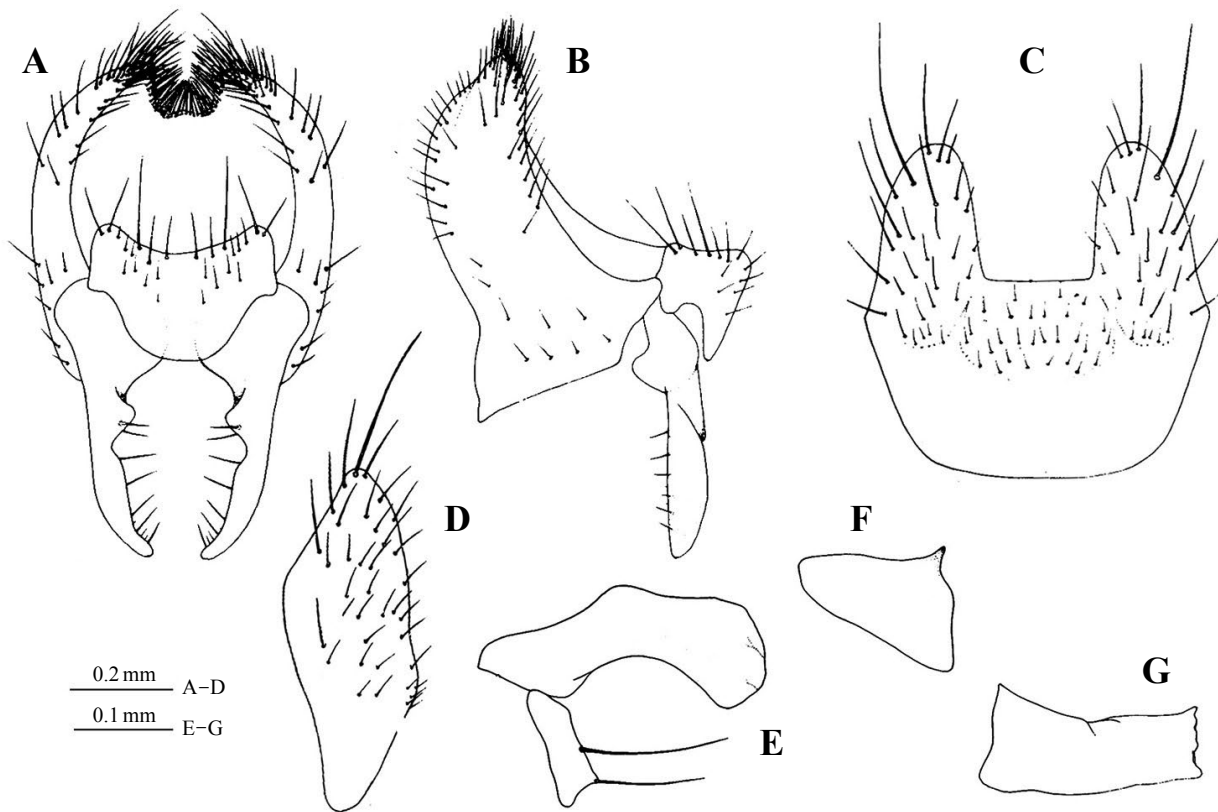


Fig. 71. *Fucellia apicalis* Kertestz, 1908, male. A, B. hypopygium; C, D. fifth sternite; E. gonocoxal lobe and gonostylus; F. ephiphallus and basiphallus; G. distiphallus.

dong, Zhejiang, Guangdong, Shanghai), Russia (Kuril).

LOCALITY: Central-GG: Incheon (= Songdo), Ganghwado; GW: Gyeongpodae, Jumunjin, Naksan Beach, Sokcho; CN: Mallipo; South-GB: Daebo, Donghae-myeon, Gampo, Ganggu-myeon, Guryongpo, Jangsa, Hupo, Pohang, Yangnam-myeon, Ulleungdo; GN: Bangeojin, Goseong (= Okcheonsa), Jangseungpo, Masan, Tongyeong (= Chungmu), Yokjido, Jinhae; JB: Gyeokpo, Byeonsan; JN: Bogildo, Daeheuksando, Dolsando, Jindo, Jeopdo, Sinjido; Jeju-JJ: Marado, Seoguipo, Seongsanpo.

HOST: The adult and the larva are living on animal or plant organisms cast up in the tidal zone, and often infesting marine products.

72. *Fucellia boninensis* Snyder, 1965 (Fig. 72)

Fucellia boninensis Snyder, 1965: 204, 205 (Japan: Bonin); Suwa, 1983b: 23, 24; Suh & Kwon, 1985: 172, 173; Suh, 1989: 43, 44; Dely-Draskovits, 1993: 58; Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 302; Suh &

Kwon, 1995: 196; Kwon et al., 1996: 224; Suwa, 1999: 225; Paek et al., 2010: 241; Han et al., 2014: 162.

Fucellia hypopygialis (nec Ringdahl): Kwon & Suh, 1982d: 1, 2; Dely-Draskovits, 1993: 59.

Male. Black in ground color, with thin brownish gray pollen. Head about 1.1–1.2 times as high as long in profile. Frons dichoptic. Interfrontalia grayish brown tinged with brown near lunule, with a pair of proclinate *if*; parafrontalia brownish gray, with 3 *ors* and 3 *ori*. Profrons and cheek brown with gray pollen; parafacialia narrowing slightly towards level of lower margin of eye; cheek at narrowest part about 0.25 times as high as head height. Antenna black; 3rd segment about 1.5–1.6 times as long as wide; arista distinctly pubescent, the longest hair slightly shorter than basal diameter of arista. Palpus yellow to brown; haustellum brownish black with sparse gray pollen.

Mesonotum and scutellum black in ground color, with brownish gray pollen, and patches of brown pollen, especially on dorsum; mesonotum with 3 paler blackish vittae presuturally in caudal view; 3 pairs of *pre acr*, the distance separating *pre acr* rows about half of distance between *pre acr* and *dc* rows. Second *ph* and *pra* about half of anterior *ntpl*. Posterior *ntpl* about 0.7–0.8 times as long as anterior *ntpl*. Proepisternum with 2 *prepst*. Anepisternum with 2 *prepm*.

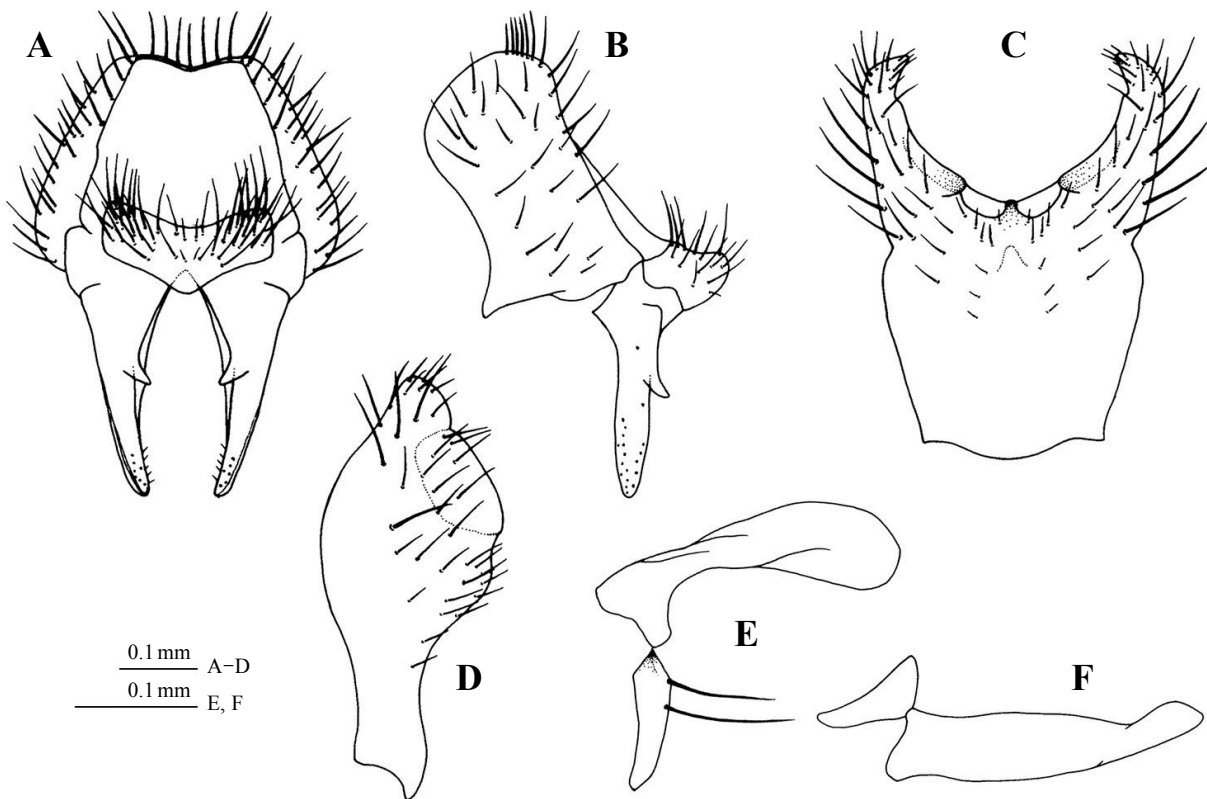


Fig. 72. *Fucellia boninensis* Snyder, 1965, male. A, B. hypopygium; C, D. fifth sternite; E. gonocoxal lobe and gonostylus; F. phallus.

Legs black with brownish black tibiae; fore tibia with 2 *ad* and 2 *pv*; mid tibia with 1 *ad*, 1 *pd*, 2 *pv* and apical *av* and *pv*; hind tibia with 5 *ad*, 5–7 *av*, 4–5 *pd* and apical *av*, without apical *pv*.

Wing faintly brownish tinged, denser basally; costa with spinular setae widely set on ventral surface; m-m nearly straight. Calypter pale yellow. Knob of halter yellow.

Abdomen with purple grayish pollen, with black narrow median vitta.

Length. Body 4.5–5.5 mm, wing 3.8–4.8 mm.

MATERIAL EXAMINED: [KPNU] <GW> 13 exs., Naksan Beach, 31.vii.1982, YJ Kwon; 9 exs., Sokcho-shi, 31.vii.1982, YJ Kwon; <GB> 4 exs., Hupo, 26.ix.1984, YJ Kwon; 1 ex., Yangnam-myeon, 16.vi.1982, YJ Kwon; <GN> 2 exs., Bangeojin, 10.iv.1982, YJ Kwon; 1 ex., Geumsan, 29.iii.1982, YJ Kwon; <JJ> 1 ex., Jejudo, 9.viii.1984, YJ Kwon; [NIAST] <GW> 6 exs., Naksan Beach, 31.vii.1982, YJ Kwon; 2 exs., Sokcho-shi, 31.vii.1982, YJ Kwon; <GB> 2 exs., Hupo, 26.ix.1984, YJ Kwon; <JN> 2 exs., Daeheuksando, 22.iv.1975, KY Choi; [NIBR] <GB> 1 ex., Bohyeonsan, 11.vii.1998, JS Park.

DISTRIBUTION: Korea, Japan (Hokkaido, Honshu, Kyushu, Bonin), China (Hebei), Taiwan.

LOCALITY: Central-GG: Incheon (= Songdo); GW: Gyeongpodae, Jumunjin, Naksan Beach, Sokcho-shi; CN: Mallipo; South-GB: Bohyeonsan, Daebo, Donghae-myeon, Gampo, Ganggu, Guryongpo, Hupo, Jangsa, Pohang, Yangnam-myeon; GN: Geumsan, Masan, Jirisan, Tongyeong (= Chungmu); JB: Gyeokpo; JN: Daeheuksando, Jeopdo, Sinjido; Jeju-JJ: Iho.

HOST: The adult and the larva are living on animal or plant organisms cast up in the tidal zone, and often infesting marine products.

73. *Fucellia kamtchatica* Ringdahl, 1930 (Fig. 73)

Fucellia kamtchatica Ringdahl, 1930: 7 (Russia: Kamchatka); Kwon & Suh, 1981c: 186, 187; Suwa, 1983b: 24; Suh & Kwon, 1985: 171, 172; Suh, 1989: 44; Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 302; Kwon et al., 1996: 224; Suwa, 1999: 225; Paek et al., 2010: 241; Suwa, 2013: 175; Han et al., 2014: 162.

Male. Black in ground color, with thin grayish pollen. Head about 1.3–1.4 times as high as long in profile. Frons at narrowest part slightly than distance between posterior ocelli. Interfrontalia dull tinged with brown near lunule, with a pair of proclinate cruciate *if*; parafacialia dull with 3 *ors* and 3–4 *ori*. Parafacialia and cheek black, with gray pollen; parafacialia narrowing slightly towards level of lower margin of eye. Antenna black; third segment about 1.8–2.0 times as long as wide; arista distinctly pubescent, the longest hair somewhat shorter than basal diameter of arista. Palpus black with sparse brownish gray pollen, long and slender.

Thorax black in ground color, with gray pollen, and patches of brown pollen, especially on dorsum. Mesonotum with a paler blackish median vitta presuturally in caudal view; 3 pairs of *pre acr*, the distance sepa-

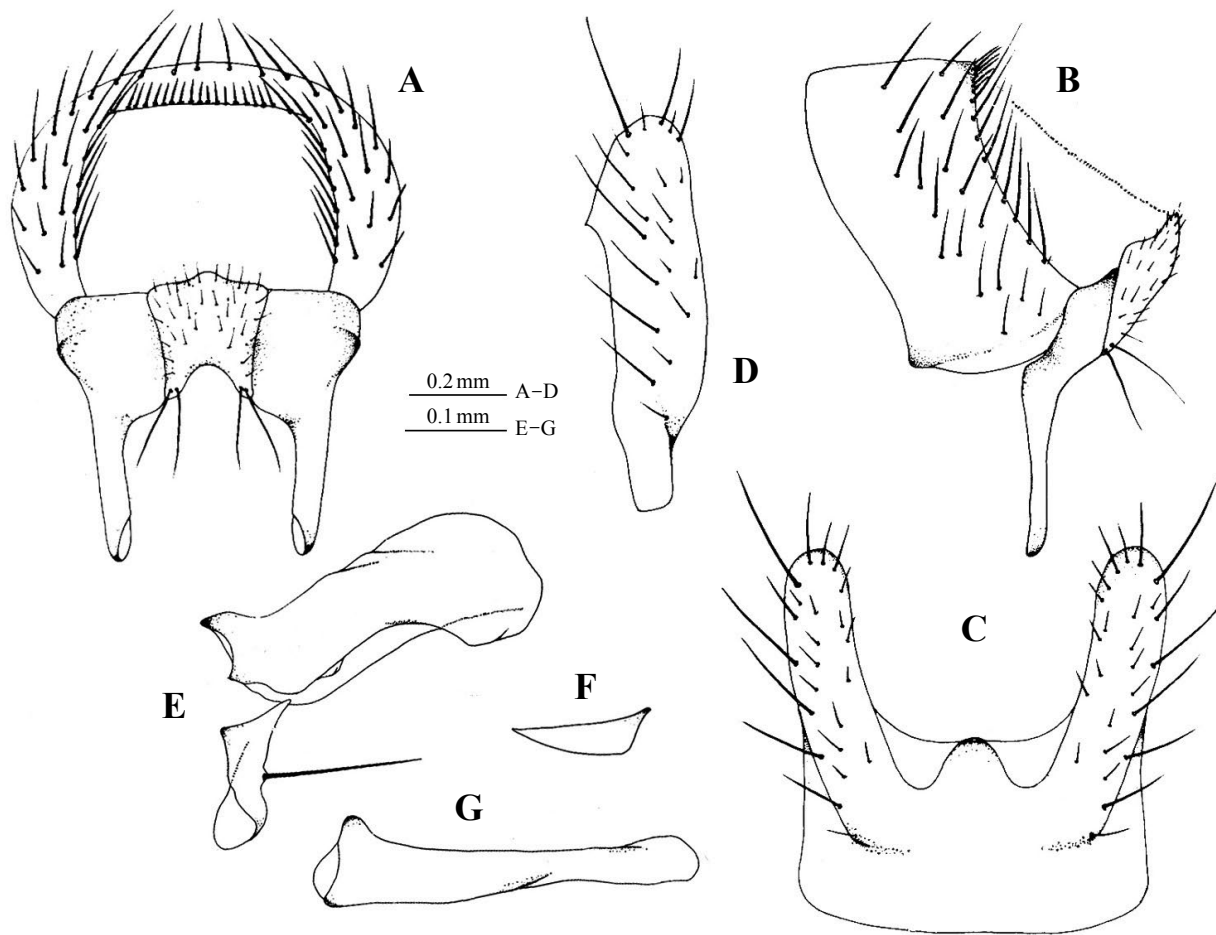


Fig. 73. *Fucellia kamtchatica* Ringdahl, 1930, male. A, B. hypopygium; C, D. fifth sternite; E. gonocoxal lobe and gonostylus; F. ephiphallus and basiphallus; G. distiphallus.

rating *pre acr* rows about as wide as distance between *pre acr* and *dc* rows. Posterior *ntpl* about 0.7–0.8 times as long as anterior *ntpl*. Proepisternum with 2 *prepst*. Anepisternum with 1 long and 2 additional *prepm*.

Legs black without brownish tibia; fore tibia with 1 *ad* and 1 *pd*; mid tibia with 1 *ad*, 2 *pd*, 1 *p*, strong apical *pv*; hind tibia with 5 *ad* and 3 *pd*.

Wing faintly brownish tinged, denser basally; costal spine indistinguishable from anterior setulae; m-m nearly straight. Calypter pale yellow. Knob of halter pale yellow.

Abdomen with greenish gray pollen, with black narrow median vitta.

Length. Body 4.7–6.0 mm, wing 3.8–4.7 mm.

MATERIAL EXAMINED: [KPNU] <GW> 19 exs., Sokcho-shi, 31.vii.1982, YJ Kwon; 1 ex., Naksan Beach, 31.vii.1982, YJ Kwon; <GB> 7 exs., Yangnam-myeon, 16.vi.1981, YJ Kwon; <GN> 1 ex., Jinhae, 3.iii.2006, SJ Suh; [NIAS] <GW> 8 exs., Sokcho-shi, 31.vii.1982, YJ Kwon; <GB> 4 exs., Yangnam-myeon, 16.vi.

1981, YJ Kwon.

DISTRIBUTION: Korea, Japan (Hokkaido, Honshu), China (Liaoning), Russia (Kamchatka, Kuril, Sakhalin), Alaska.

LOCALITY: Central-GW: Jumunjin, Naksan Beach, Sokcho-shi; South-GB: Daebo, Donghae-myeon, Gampo, Ganggu, Guryongpo, Hupo, Jangsa, Pohang, Yangnam-myeon; GN: Jangseungpo, Masan, Tongyeong (= Chungmu), Jinhae; JB: Gyeokpo; JN: Jeopdo, Sinjido.

HOST: The adult and the larva are living on animal or plant organisms cast up in the tidal zone, and often infesting marine products.

Genus *Hydrophoria* Robineau-Desvoidy, 1830

Hydrophoria Robineau-Desvoidy, 1830: 503. Type-species: *Hydrophoria littoralis* Robineau-Desvoidy, 1830 (France: Saint-Sauveur).

Chlœ Robineau-Desvoidy, 1830: 560. Type-species: *Chlœ silvicola* Robineau-Desvoidy, 1830 (France: Saint-Sauveur).

DIAGNOSIS: Eyes without evident pubescence; face without keel; arista not angled; palpi long and slender; labella well developed; mesonotum with the shorter setulae well differentiated from long setae; scutellum with two long marginal pairs of setae and a shorter discal pair, and with fine pubescence on ventral surface; prosternum and proepisternum bare; m-m vein strongly sinuate, joining m1 + 2 obliquely; hind tibia without apical *pv*; sternite 5 with long process whose outer lateral setae become progressively longer distally; hypandrium with short pedestal-like posterior extension; gonocoxal lobe elongate, with 1 seta; phallopodeme short, with slender downcurved epiphallus (Griffiths, 1998).

Key to species of Korean *Hydrophoria*

- 1. Abdomen black in ground color basally *H. montana*
- 1. Abdomen yellow to brown in ground color basally *H. ruralis*

74. *Hydrophoria montana* Suwa, 1970 (Fig. 74)

Hydrophoria montana Suwa, 1970: 248–251 (Japan); Suwa, 1983b: 40; Suh & Kwon, 1985: 191; Suh, 1989: 101, 102; Suh et al., 1991: 47–49; Dely-Draskovits, 1993: 62; Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 303; Kwon et al., 1996: 224; Wei et al., 1996: 672; Suwa, 1999: 226; Paek et al., 2010: 242; Suwa, 2013: 176; Han et al., 2014: 153.

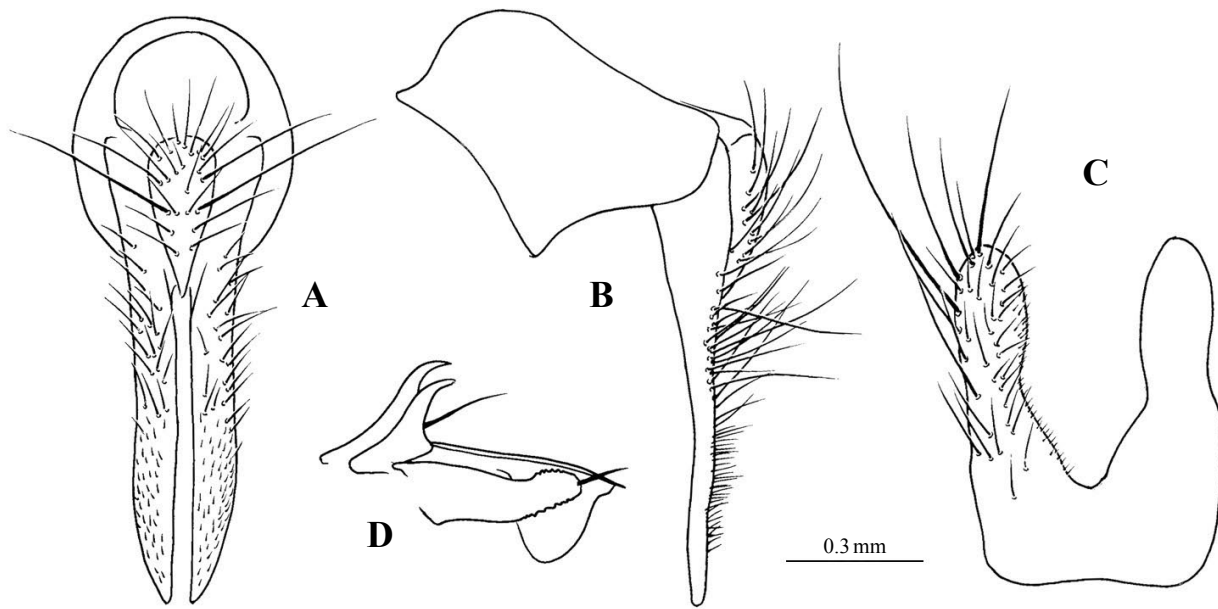


Fig. 74. *Hydrophoria montana* Suwa, 1970, male. A, B. hypopygium; C. fifth sternite; D. gonocoxal lobe, gonostylus and phallus.

Male. Black in ground color, with gray pollen. Head about 1.4–1.5 times as high as long in profile. Frons at narrowest part equal to width of anterior ocellus; parafrontalia broadly contiguous to each other. Interfrontalia dull; parafrontalia silvery gray with 5–6 *ori*. Parafacialia and cheek black with gray pollen. Antenna black; third segment about 2.2–2.3 times as long as wide; arista distinctly plumose. Palpus black; haustellum brownish black and stout.

Thorax black in ground color, with gray pollen, and patches of brown pollen, especially on dorsum. Mesonotum with blackish median and submedian vittae, and broad lateral vitta presuturally in caudal view; 3 pairs of *pre acr* and several fine irregular setulae between rows, the distance separating *pre acr* rows about as wide as distance between *pre acr* and *dc* rows. Second *ph* indistinguishable from additional setulae. *Pra* about half as long as anterior *ntpl*. Posterior *ntpl* about 0.8–0.9 times as long as anterior *ntpl*. Proepisternum with 2 *prepst*. Anepisternum with a distinct upper anterior seta, and 2 long and 2 additional *prepm*.

Legs black, tibiae more brownish; fore tibia with 1 *ad*, 1–2 *pv*, and strong apical *d* and *pv*; mid tibia with 1 *ad*, 1 *pd*, 2 *p*, 1 *pv*, and strong apical *av* and *pv*; hind tibia with 5 *ad*, 1–2 *av*, 2–3 *pd*, 6–8 fine *pv* and apical *av*.

Wing faintly blackish tinged, denser basally; m-m sinuate. Calypter yellow to pale black; the lower calypter slightly protruding beyond the upper one. Knob of halter yellow.

Abdomen with bluish gray pollen, with black narrow median vitta and fore marginal bands.

Length. Body 6.0–8.3 mm, wing 5.5–6.7 mm.

MATERIAL EXAMINED: [KPNU] <GW> 8 exs., Samyeongsan, 11.v.2003, SJ Suh; 2 exs., Duwonbong, 10.vi.

2000, SJ Suh; 1 ex., Hongcheon, 2.vi.2006, SJ Suh; <JN> 1 ex., Duryunsan, 2.x.1983, YJ Kwon.

DISTRIBUTION: Korea, Japan (Hokkaido, Honshu, Shikoku), China (Heilongjiang, Liaoning, Sichuan), Taiwan.

LOCALITY: North-HB: Onsupcheong, Sobaeksan; Central-HH: Suyangsan; GW: Odaesan, Samyeongsan, Duwonbong, Hongcheon; South-JN: Duryunsan.

75. *Hydrophoria ruralis* (Meigen, 1826) (Fig. 75)

Anthomyia ruralis Meigen, 1826: 101 (Europe).

Hydrophoria ruralis: Schnabl et Dziedzicki, 1911: 102; Park, 1967, Kor. Journ. Zool. 10: 9, 10; Suwa, 1981a, Kontyû 49: 103; Suwa, 1983b: 40; Suh & Kwon, 1985: 191; Fan et al., 1988: 111; Suh, 1989: 102, 103; Suh et al., 1991: 49; Suh et al., 1991: 210; Dely-Draskovits, 1993: 62, 63; Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 303; Kwon et al., 1994: 266; Kwon et al., 1996: 224; Wei et al., 1996: 673; Suwa, 1999: 227; Paek et al., 2010: 242; Suwa, 2013: 176; Han et al., 2014: 154.

Hydrophoria (s. str.) *ruralis*: Fan, 1965: 42.

Anthomyia puella Meigen, 1826: 96 (Germany).

Hydrophoria testacea Robineau-Desvoidy: 506 (not given).

Hydrophoria maculata Macquart, 1835: 229 (France).

Anthomyia absens Walker, 1853: 135 (not given).

Hydrophoria anthomyae Rondani, 1866: 141 (Italy).

Anthomyia (*Hylemyia*) *plumosior* Pandellé, 1899: 216 (France; Germany; Italy).

Male. Black in ground color, with gray pollen. Head about 1.4–1.5 times as high as long in profile. Frons at narrowest part equal to width of anterior ocellus; parafrontalia broadly contiguous to each other. Interfrontalia dull; parafrontalia silvery gray with 5 *ori*. Parafacialia and cheek black with gray pollen. Antenna black; third segment about twice as long as wide; arista distinctly plumose. Palpus black; haustellum brownish black and stout.

Thorax black in ground color, with gray pollen, and patches of brown pollen, especially on dorsum. Mesonotum with blackish median and broad lateral vittae presuturally in caudal view; 4 pairs of *pre acr* and several fine irregular setulae between rows, the distance separating *pre acr* rows about as wide as distance between *pre acr* and *dc* rows. Second *ph* indistinguishable from additional setulae. *Pra* about half as long as anterior *ntpl*. Posterior *ntpl* about 0.8–0.9 times as long as anterior *ntpl*. Proepisternum with 2 *prepst*. Anepisternum with a distinct upper anterior seta, and 2 long and 3 additional *prepm*.

Legs black; fore tibia with 2 *ad*, 1–2 *pv*, and strong apical *pv* and *d*; mid tibia with 1 *ad*, 1 *pd*, 4 *pv*, and strong apical *av* and *pv*; hind tibia with 5 *ad*, 2–3 *av*, 2–3 *pd*, 4–7 fine *pv* and apical *av*.

Wing faintly blackish tinged, denser basally; m-m sinuate. Calypter yellow to pale black; the lower calypter

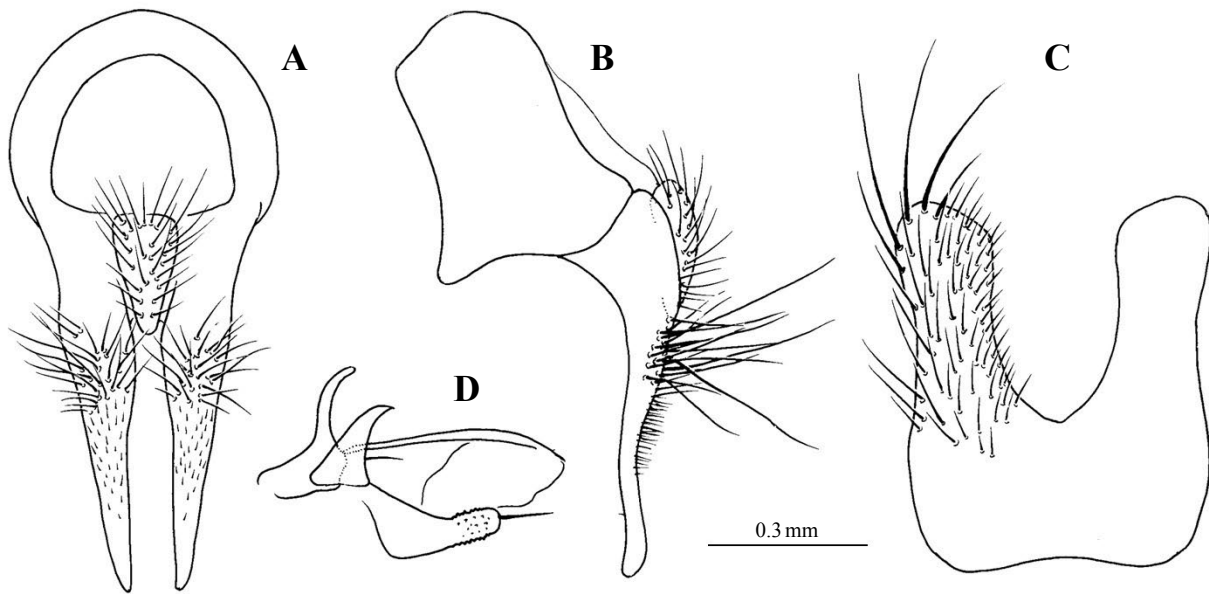


Fig. 75. *Hydrophoria ruralis* (Meigen, 1826), male. A, B. hypopygium; C. fifth sternite; D. gonocoxal lobe, gonostylus and phallus.

slightly protruding beyond the upper one. Knob of halter yellow.

Abdomen black and 1–3 segments brown ventrally, with bluish gray pollen, with black narrow median vitta and fore marginal bands.

Length. Body 4.8–6.9 mm, wing 4.8–6.0 mm.

MATERIAL EXAMINED: [KPNU] <Seoul> 1 ex., Seoul, 15.iv.1974, SM Lee; 1 ex., Seoul, 13.iv.1974, SM Lee; 1 ex., Seoul, 2.v.1974, SM Lee; <GW> 20 exs., Seoraksan, 29.vii.1982, YJ Kwon; 1 ex., Seoraksan, 28.vii.1982, YJ Kwon; 1 ex., Seoraksan, 25.vii.1982, YJ Kwon; 1 ex., Odaesan, 27.vii.1983, YJ Kwon; 1 ex., Obongsan, 20.v.1982, YJ Kwon; 1 ex., Obongsan, 21.v.1982, YJ Kwon; 1 ex., Obongsan, 17.v.1981, YJ Kwon; 1 ex., Balwangsan, 12.vi.2000, SJ Suh; 3 exs., Samyeongsan, 11.v.2003, SJ Suh; <CB> 1 ex., Deunggoksan, 5.vi.2006, SJ Suh; <CN> 3 exs., Seodaesan, 9.vi.2002, SJ Suh; <GB> 20 exs., Hwanghaksan, 28.vi.1982, YJ Kwon; 1 ex., Palgongsan, 22.vi.1980, YJ Kwon; 3 exs., Palgongsan, 6.vi.1985, YJ Kwon; 2 exs., Palgongsan, 6.vi.1985, YJ Kwon; 1 ex., Palgongsan, 29.iv.1982, YJ Kwon; 1 ex., Hayang-eup, 5.vi.1982, YJ Kwon; 2 exs., Wachon, 28.v.1989, YJ Kwon; 1 ex., Wachon, 27.vi.1987, YJ Kwon; 1 ex., Wachon, 26.v.1989, YJ Kwon; 1 ex., Juwangsan, 28.vii.1984, YJ Kwon; 7 exs., Naeyeonsan, 30.iv.1981, SR Sohn; 2 exs., Naeyeonsan, 27.iv.1981, SR Sohn; 4 exs., Naeyeonsan, 4.vi.1981, SH Park; 1 ex., Naeyeonsan, 19.vi.1972, SH Park; <GN> 3 exs., Gayasan, 26.vi.1982, YJ Kwon; 2 exs., Keumsan, 29.iii.1982, YJ Kwon; 22 exs., Okcheonsa, 10.vi.1973, JS Park; 7 exs., Jirisan, 13–17.vii.1973, SH Park; 8 exs., Jirisan, 3.vi.1973, JS Park; 1 ex., Hwangmaesan, 6.vi.1998, SJ Suh; <JB> 1 ex., Naejangsan, 19.vi.1972, SH Park; 1 ex., Unjangsan, 31.v.1998, SJ Suh;

<JN> 5 exs., Chogyesan, 5.vi.1983, YJ Kwon; [NIBR] <GB> 1 ex., Pohyeonsan, 11.v.1998, JO Lee; 2 exs., Hwaaksan, 11.vii.1998, JS Park; <JB> 10 exs., Unjangsan, 31.v.1998, SJ Suh; 1 ex., Unjangsan, 20.vii.1998, SJ Park; <JN> 1 ex., T'aecheongsan, 11.vi.1998, SJ Suh.

DISTRIBUTION: Korea, Japan (Hokkaido, Honshu, Kyushu, Shikoku), China (Anhui, Fujian, Jiangsu, Heilongjiang, Jilin, Liaoning, Neimenggu, Shanxi, Sichuan, Shanghai, Yunnan, Zhejiang), Russia (Maritime Territory, Sakhalin), N. America.

LOCALITY: North-HB: Onsupcheong; Central-Seoul: Seoul; GW: Obongsan, Odaesan, Seoraksan, Balwangsan, Samyeongsan; CB: Woraksan, Deunggoksan; CN: Seodaesan; South-GB: Bohyeonsan, Cheongsong, Gachang, Geumosan, Hayang-eup, Hwaaksan, Hwangaksan, Jangsa, Naeyeonsan, Palgongsan, Wachon; GN: Chilwon-myeon, Cheonggok, Gayasan, Geumsan, Geumjeongsan, Goseong (= Okcheonsa), Hwangmaesan, Jirisan, Myeongseok-myeon, Ssanggye, Wonhyosan, Yangsan; JB: Naejangsan, Unjangsan; JN: Jogyesan, Taecheongsan.

Genus *Hylemya* Robineau-Desvoidy, 1830

Hylemya Robineau-Desvoidy, 1830: 550. Type-species: *Hylemya strenua* Robineau-Desvoidy, 1830 (France: Saint-Sauveur).

Hylemyia (emend): Macquart, 1835: 316.

Musciosoma Lioy, 1864: 908. Type-species: *Musca strigosa* Fabricius, 1794 (Germany: Kiel).

Hylemyza Schnabl & Dziedzicki, 1911: 94 (as subgenus *Hylemyia*). Type-species: *Anthomyza lasciva* Zetterstedt, 1838 (Sweden: Vittangi).

DIAGNOSIS: Eyes without evident pubescence; parafrontalia and genae with transverse stripe visible in lateral view below antennal base in females; face without keel; arista not angled; peristomal margin in lateral view reaching about level of profrons; palpi rather long, not extended; scutellum with two long marginal pairs of setae and a shorter discal pair, and with fine pubescence on ventral surface; proepisternum setulose; anepisternum with 1–2 anterodorsal setae; prosternum and meron bare; additional *ntpl* setulae absent; costa with dense setulae on lower surface; lower calypter expanded, but smaller in area than upper; gonocoxal lobe well developed, with rounded posterodorsal margin; epiphallus down-curved.

76. *Hylemya urbica* Van der Wulp, 1896 (Fig. 76)

Hylemya urbica Van der Wulp, 1896: 120 (Mexico: Mexico City); Suwa, 2013: 179; Han et al., 2014: 154.

Hylemya latifrons Schnable, 1911: 242 (Poland); Suh et al., 1991: 45; Ent. Soc. Kor. & Kor. Soc. App. Ent.,

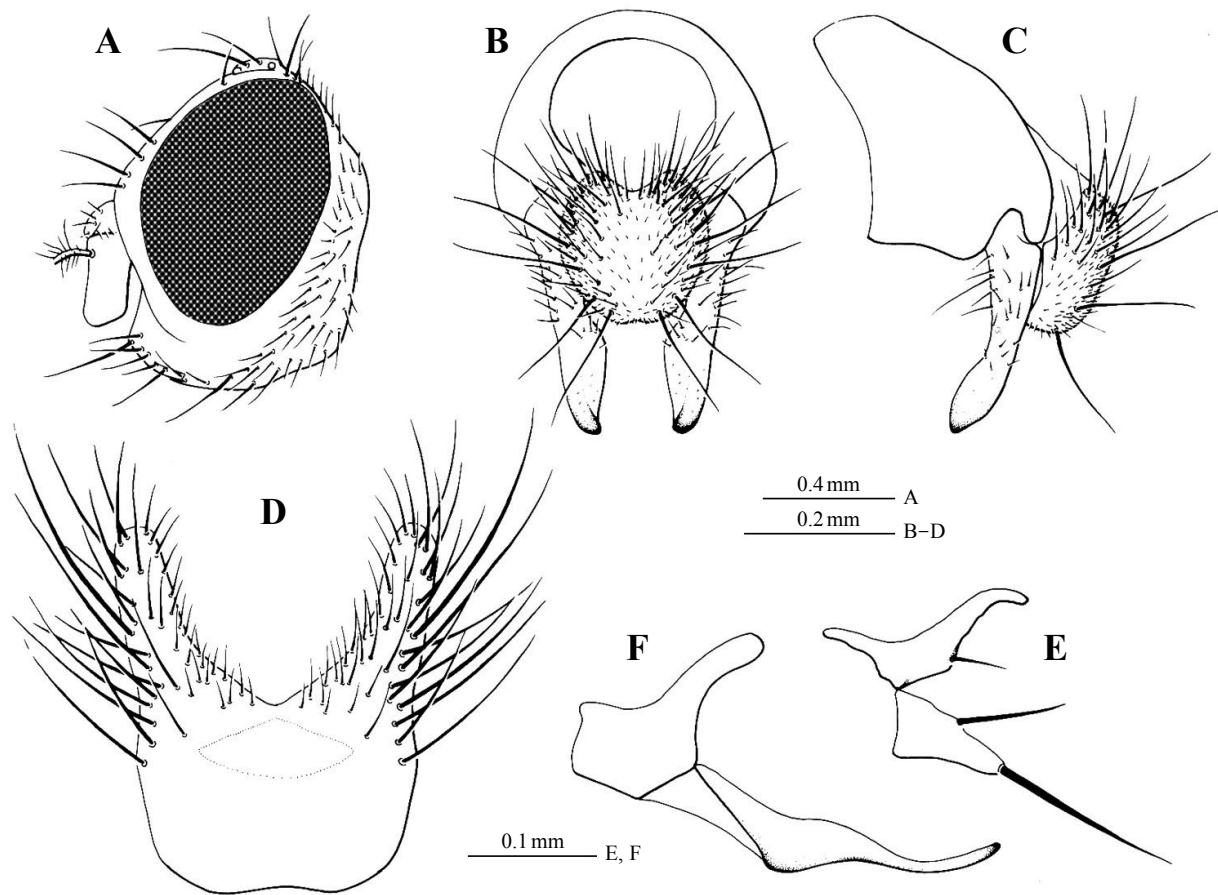


Fig. 76. *Hylemya urbica* Van der Wulp, 1896, male. A. head; B, C. hypopygium; D. fifth sternite; E. gonocoxal lobe and gonostylus; F. phallus.

1994: 303; Kwon et al., 1996: 224; Paek et al., 2010: 242.

Hylemya variabilis Stein, 1916: 155 (Germany).

Male. Black in ground color, with thin grayish pollen. Head about 1.2–1.3 times as high as long in profile. Frons at narrowest part slightly wider than distance between posterior ocelli inclusive. Interfrontalia dull tinged with brown near lunule, a pair of proclinate cruciate *if*; parafrontalia with 1 *ors* and 4 *ori*. Parafacialia and cheek black, with gray pollen. Antenna black; third segment about 2.3–2.4 times as long as wide; arista distinctly plumose, the longest setula about 5.0 times as long as basal diameter of arista. Palpus black. Haustellum black with sparse gray pollen, and stout.

Thorax black in ground color, with gray pollen, and patches of brown pollen, especially on dorsum. Mesonotum with 3 pairs of *pre acr* and several fine irregular setulae between rows, the distance separating *pre acr* rows about as wide as distance between *pre acr* and *dc* rows. Second *ph* strong, about as long as anterior *ntpl*. Posterior *ntpl* about as long as anterior *ntpl*. Proepisternum with 2 *prepst*. Anepisternum with a upper

anterior seta and 2 *prepm*.

Legs black; fore tibia with 1 *ad* and 1 *pv*; mid tibia with 1 *ad*, 1 *pd*, 2 *pv*, and strong apical *av* and *pv*; hind tibia with 4 *ad*, 2 *av*, 3 *pd* and 5 *pv*.

Wing faintly brownish tinged, denser basally; costal spine indistinguishable from anterior setulae; m-m nearly straight. Calypter and knob of halter brown.

Length. Body 5.0 mm, wing 4.3 mm.

MATERIAL EXAMINED: [KPNU] <HB> 1 ex., Mupo, 30 km N of Samjiyeon, HB, 18.viii.1989, M Kozánek.

DISTRIBUTION: Korea, Japan (Hokkaido, Honshu, Kyushu), China (Heilongjiang, Liaoning, Xinjiang), Taiwan, Russia (Kamchatka, Kuril, Sakhalin), Europe, N. America.

LOCALITY: North-HB: Mupo.

Genus *Lasiomma* Stein, 1916

Lasiomma Stein, 1916: 168. Type-species: *Lasiops ctenocnema* Kowarz, 1880 (Czechoslovakia: Marienbad and Asch).

Macrophorbia Malloch, 1920. Type-species: *Macrophorbia houghi* Malloch, 1920 (USA: Massachusetts).

Crinurina Karl, 1928: 185. Type-species: *Aricia pictiventris* Zetterstedt, 1845 (Sweden: Lycksele).

Acrostilpna Ringdahl, 1929: 269. Type-species: *Aricia latipennis* Zetterstedt, 1838 (Norway: Finmark).

Sinohylemya Hsue, 1980: 413. Type-species: *Sinohylemya ctenocnema* Hsue, 1980 (China: Lianing).

DIAGNOSIS: Eyes holoptic in male; *if* present; *ors* fine or absent; arista pubescent; scutellum with two long marginal pairs of setae and a shorter discal pair, and with fine pubescence on ventral surface; proepisternum, meron and anepimeron bare; *ph* 1+2; fore tibia without *ad*; mid tibia often with 1 *ad* and 1 *pd*; hind tibia with 7–10 *ad*, 3 *pd*, and usually without apical *pv*.

Key to species of Korean *Lasiomma*

1. Third antennal segment much shorter than twice width *L. monticola*
1. Third antennal segment longer than twice width 2
2. Hind tibia with 7–8 *ad* 3
2. Hind tibia with 1–2 *ad* 4
3. Hind tibia with 8–10 *pv* *L. divergens*
3. Hind tibia with 5 *pv* *L. picipes*
4. Hind tibia without *av* *L. seminitidium*
4. Hind tibia with *av* *L. japonicum*

77. *Lasiomma divergens* Fan et Zhang, 1982 (Fig. 77)

Lasiomma divergens Fan et Zhang, 1982: 9 (China: Heilongjiang); Suwa, 1983b: 29, 30; Suh & Kwon, 1985: 180, 181; Suh, 1989: 83; Dely-Draskovits, 1993: 67; Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 304; Kwon et al., 1996: 224; Wei et al., 1996: 662; Paek et al., 2010: 242; Han et al., 2014: 154.

Male. Black in ground color, with thin grayish pollen. Head about 1.2–1.3 times as high as long in profile. Frons at narrowest part narrower than anterior ocellus; parafrontalia broadly contiguous to each other. Interfrontalia and parafrontalia dull, with a pair of fine *if* and 5 *ori*. Parafacialia and cheek black, with gray pollen. Antenna black; third segment about 2.5 times as long as wide; arista distinctly pubescent, the longest hair slightly shorter than basal diameter of arista. Palpus and haustellum black.

Thorax black in ground color, with gray pollen, and patches of brown pollen, especially on dorsum. Mesonotum with 3 pairs of *pre acr*, the second the longest, the distance separating *pre acr* rows about as wide as distance between *pre acr* and *dc* rows. Second humeral seta as long as anterior *ntpl*. Posterior *ntpl* as long as or slightly shorter than anterior *ntpl*.

Legs black; fore tibia with 1 *pv*; mid tibia with 1 *ad*, 1 *pd*, 2 *pv* and apical *av* and *pv*; hind tibia with 7 *ad*, 3 *av*, 3 *pd* and 8–10 *pv*.

Wing hyaline; costal spine indistinguishable from anterior setulae; m-m nearly straight. Calypter whitish yellow. Knob of halter brown.

Length. Body 5.5 mm, wing 4.3 mm.

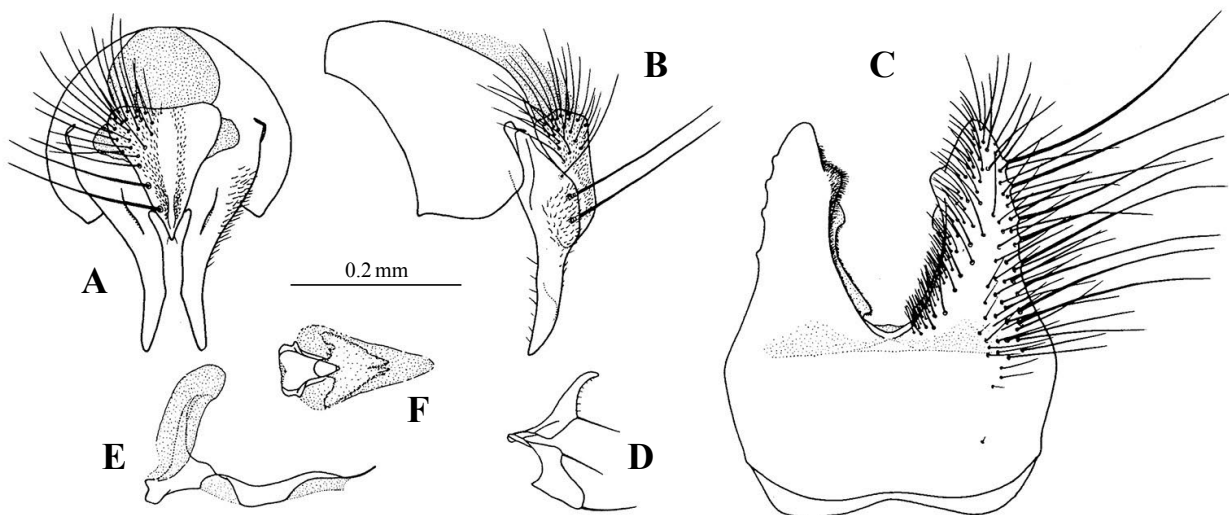


Fig. 77. *Lasiomma divergens* Fan et Zhang, 1982, male (after Suwa). A, B. hypopygium; C. fifth sternite; D. gonocoxal lobe and gonostylus; E, F. phallus.

MATERIAL EXAMINED: [KPNU] <GW> 1 ex., Odaesan, 24.v.1989, YJ Kwon.

DISTRIBUTION: Korea, China (Heilongjiang).

LOCALITY: Central-GW: Odaesan.

78. *Lasiomma japonicum* Suwa, 1971 (Fig. 78)

Lasiomma japonicum Suwa, 1971: 36 (Japan: Hokkaido); Kwon & Suh, 1982d: 3; Suh & Kwon, 1985: 143; Suwa, 1999: 226; Paek et al., 2010: 242; Han et al., 2014: 154.

Lasiomma strigilatum (nec Zetterstedt): Suh, 1989: 85, 86; Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 304; Kwon et al., 1996: 224; Paek et al., 2010: 241; Han et al., 2014: 155.

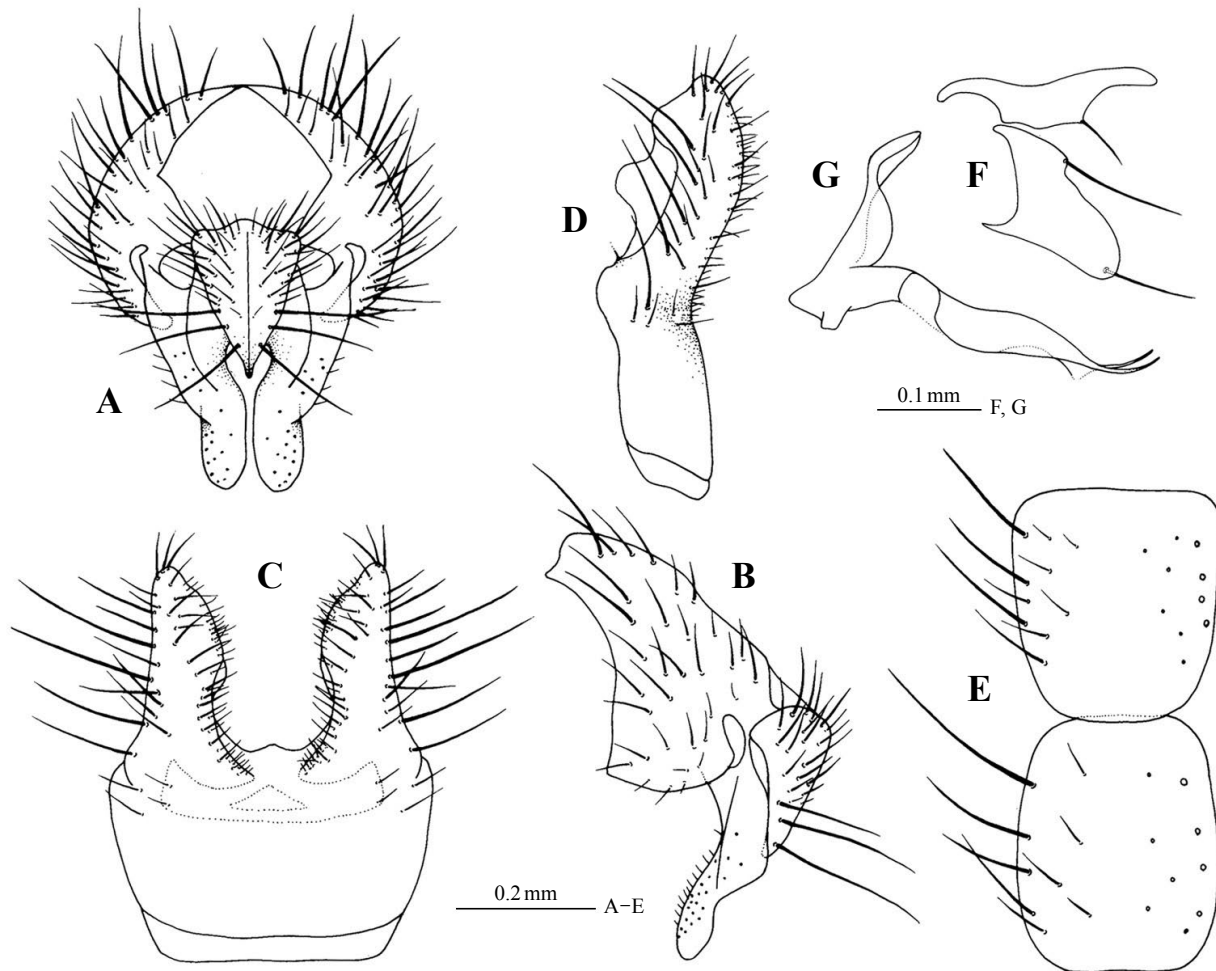


Fig. 78. *Lasiomma japonicum* Suwa, 1971, male. A, B. hypopygium; C, D. fifth sternite; E. third and fourth sternites; F. gonocoxal lobe and gonostylus; G. phallus.

Male. Black in ground color, with thin grayish pollen. Head about 1.4 times as high as long in profile. Frons at narrowest part equal to width of anterior ocellus; parafrontalia broadly contiguous to each other. Interfrontalia and parafrontalia dull, with 1 *if* and 3 *ori*. Parafacialia and cheek black with gray pollen. Antenna black; third segment about 2.5 times as long as wide; arista distinctly pubescent, the longest hair slightly shorter than basal diameter of arista. Palpus and haustellum black.

Thorax black in ground color, with gray pollen, and patches of brown pollen, especially on dorsum. Mesonotum with 3 pairs of *pre acr*, the distance separating *pre acr* rows about two thirds as wide as distance between *pre acr* and *dc* rows. Second humeral seta as long as anterior *ntpl*. Posterior *ntpl* as long as or slightly shorter than anterior *ntpl*. Proepisternum with 2 *prepst*. Anepisternum with a distinct upper anterior seta and, 2 long and 5–7 fine *prepm*.

Legs black; fore tibia with 0–1 *ad* and 1 *pv*; mid tibia with 1 *ad*, 1 *pd*, 2 *pv*, and apical *av* and *pv*; hind tibia with 1 *ad*, 3 *pd* and 12 *pv*.

Wing faintly brownish tinged, denser basally; costal spine indistinguishable from anterior setulae; m-m slightly sinuate. Calypter and knob of halter whitish yellow.

Abdomen with brownish gray pollen, with black broad median vitta.

Length. Body 5.5–5.8 mm, wing 4.0–4.3 mm.

MATERIAL EXAMINED: [KPNU] <GW> 3 exs., Seoraksan, 29.vii.1982, YJ Kwon; <GN> 2 exs., Jirisan, 24.vii.1985, YJ Kwon; 2 exs., Jirisan, 11.viii.1989, YJ Kwon; 1 ex., Jirisan, 12.viii.1988, SJ Suh.

DISTRIBUTION: Korea, Japan (Hokkaido), China (Xizang, Sichuan), Nepal, Europe.

LOCALITY: Central-GW: Odaesan, Seoraksan; South-GN: Jirisan.

79. *Lasiomma monticola* Suh et Kwon, 1985 (Fig. 79)

Lasiomma monticola Suh & Kwon, 1985: 181 (Korea: Palgongsan); Suh, 1989: 84; Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 304; Kwon et al., 1994: 266; Kwon et al., 1996: 224; Suwa, 2005: 100; Paek et al., 2010: 242; Han et al., 2014: 154.

Male. General coloration black, with grayish pollinose. Head about 1.4–1.5 times as high as long in profile, frons 0.6–0.7 times as wide as diameter of anterior ocellus; parafrontalia broadly convergent with each other; frons and parafacialia slightly brownish near lunule, with 3 *ori* and 1 *if*. Cheek dull gray pubescent; profrons a little narrower than half width of third antennal segment in profile; antenna black; third antennal segment about 1.5–1.6 times as long as wide, with arista minutely pubescent, the longest hair approximately equal to basal diameter of arista. Palpus and haustellum black; mentum sparsely grayish pollinose.

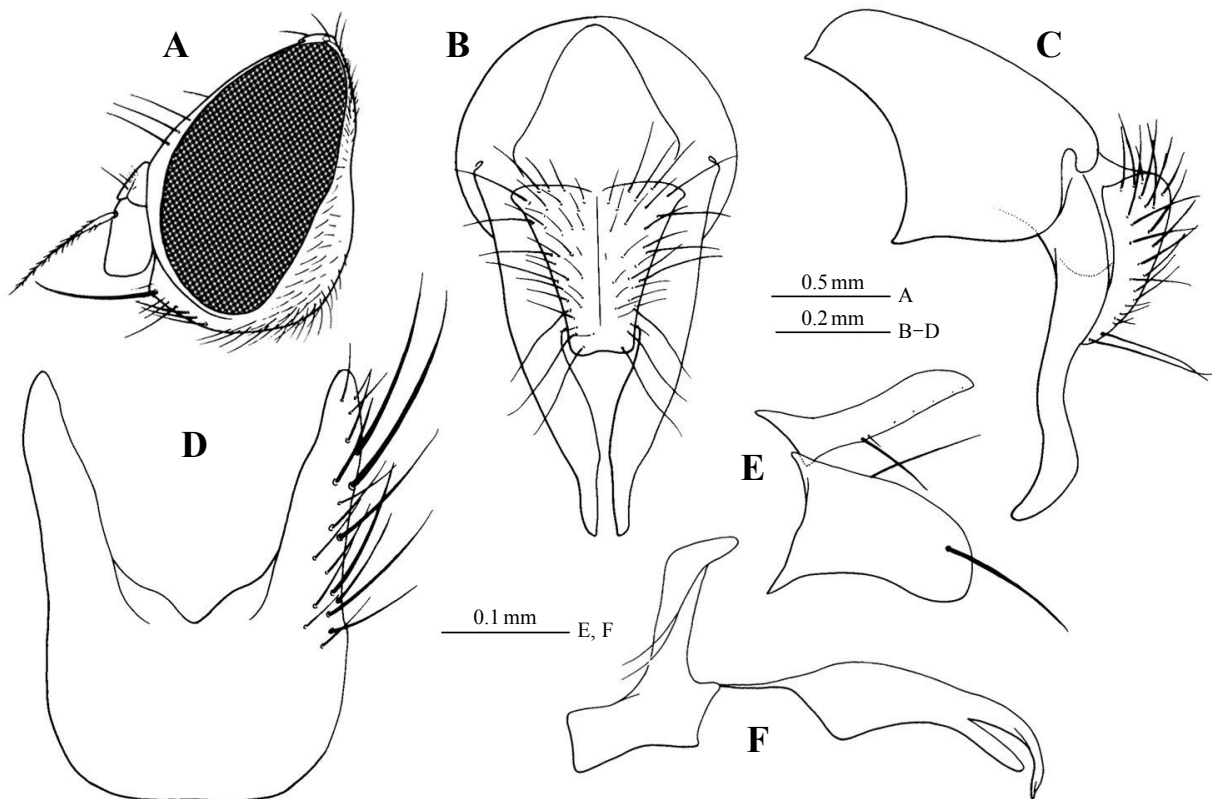


Fig. 79. *Lasiomma monticola* Suh et Kwon, 1985, male. A. head; B, C. hypopygium; D. fifth sternite; E. gonocoxal lobe and gonostylus; F. phallus.

Thorax purple grayish pollinose. Mesonotum bearing distinct brownish median and sublateral vittae; 3 *preacr*, lacking additional setulae between the rows. Scutellum brownish on dorsum. Second *ph* remarkably shorter than first *ph* and *pra* respectively. Anepisternum with 1 anterior *anepst*, 1 long and a few fine *prepm*.

Legs black; fore tibia with 4–5 *ad* and 1 *pv*; mid femur with some slender *pv*, no *av*; mid tibia with 1 *ad*, 1 *pd* and 2 weak *p-pv*; hind femur with a row of robust *av*, and a few *pv* on basal half; hind tibia with 6 *ad*, 2 *av*, 3 *pd* and 3 *pv*.

Wing tinged with dark brown; costal spine weak; m-m slightly bowed inwards at middle. Calypter pale; knob of halter brownish yellow.

Length. Body 6.2–6.3 mm, wing 5.3–5.4 mm.

MATERIAL EXAMINED: [KPNU] <GW> 1 ex., Seoraksan, 30.vi.1984, YJ Kwon; <GB> 1 ex., Palgongsan, 12.v.1983, YJ Kwon; <GN> Jirisan, 10.viii.1989, YJ Kwon.

DISTRIBUTION: Korea, Japan (Hokkaido), China (Heilongjiang, Liaoning).

LOCALITY: Central-GW: Seoraksan; South-GB: Palgongsan; GN: Jirisan.

80. *Lasiomma picipes* (Meigen, 1826) (Fig. 80)

Aricia picipes Meigen, 1826, Syst. Besch. 5: 187 (Europe).

Aricia octoguttata Zetterstedt, 1845: 1570 (Sweden).

Chortophila octoguttata: Séguy, 1923: 132.

Opsolasia octoguttata: Ringdahl, 1959: 273.

Lasiomma octoguttatum: Hennig, 1967: 193–195, pls. 11 (176), 15 (228); Kwon & Suh, 1982b: 181, 182; Suwa, 1983b: 31; Suh & Kwon, 1985: 179; Suh, 1989: 84, 85; Suh et al., 1985: 209; Dely-Draskovits, 1993: 68; Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 304; Kwon et al., 1994: 266; Kwon et al., 1996: 224; Wei et al., 1996: 662; Paek et al., 2010: 242.

Aricia moesta Holmgren, 1872, Forh. Ofv. Svenska Vet. Ak. 29: 102 (Greenland).

Hylemyia spizellae Hockett, 1924, Corn. Univ. Agr. Expt. Sta. Mem. 77: 33 (USA: New York).

Lasiomma octoguttatum pectinicornis Hennig, 1967: 195 (China: Manchuria).

Lasiomma picipes: Suwa, 1999: 228; Han et al., 2014: 155.

Male. Brownish black in ground color, with thin grayish pollen. Head about 1.1–1.3 times as high as long in profile. Frons at narrowest part equal to width of anterior ocellus; parafrontalia broadly contiguous to each other. Interfrontalia and parafrontalia fuscous, with 1 *if* and 4–5 *ori*. Parafacialia tinged with brown; cheek black. Antenna black; third segment about twice as long as wide; arista distinctly pubescent, the longest hair somewhat shorter than basal diameter of arista. Palpus and haustellum black.

Thorax black in ground color, with gray pollen, and patches of brown pollen, especially on dorsum. Mesonotum with paler grayish vittae between *pre acr* and *dc* rows in caudal view; 3 pairs of *pre acr*, the distance separating *pre acr* rows about as wide as distance between *pre acr* and *dc* rows. Second humeral seta as long as anterior *ntpl*. Posterior *ntpl* as long as or slightly shorter than anterior *ntpl*. Proepisternum with 2 *prepst*. Anepisternum with a upper anterior seta, having 2 long and 6 additional *prepm*. *Kepst* 3:3.

Legs black; fore tibia with 1–2 *pv*; mid tibia with 1 *ad*, 1 *pd*, 3 *pv*, and apical *av* and *pv*; hind tibia with 8 *ad*, 2 *av*, 3 *pd*, 5 *pv*, and apical *av* and *pv*.

Wing hyaline; costal spine indistinguishable from anterior setulae; m-m nearly straight. Calypter and knob of halter whitish yellow.

Abdomen with brownish gray pollen; a black narrow median vitta, and black transversal band on anterior margin each tergite.

Length. Body 5.8–6.5 mm, wing 4.3–4.5 mm.

MATERIAL EXAMINED: [KPNU] <GW> 1 ex., Odaesan, 17.v.1981, YJ Kwon; 1 ex., Odaesan, 24.v.1989, YJ Kwon; <GG> 1 ex., Gwangneung, 24.iv.1989, YJ Kwon; <CN> 1 ex., Deoksungsan, 26.v.1982, YJ Kwon;

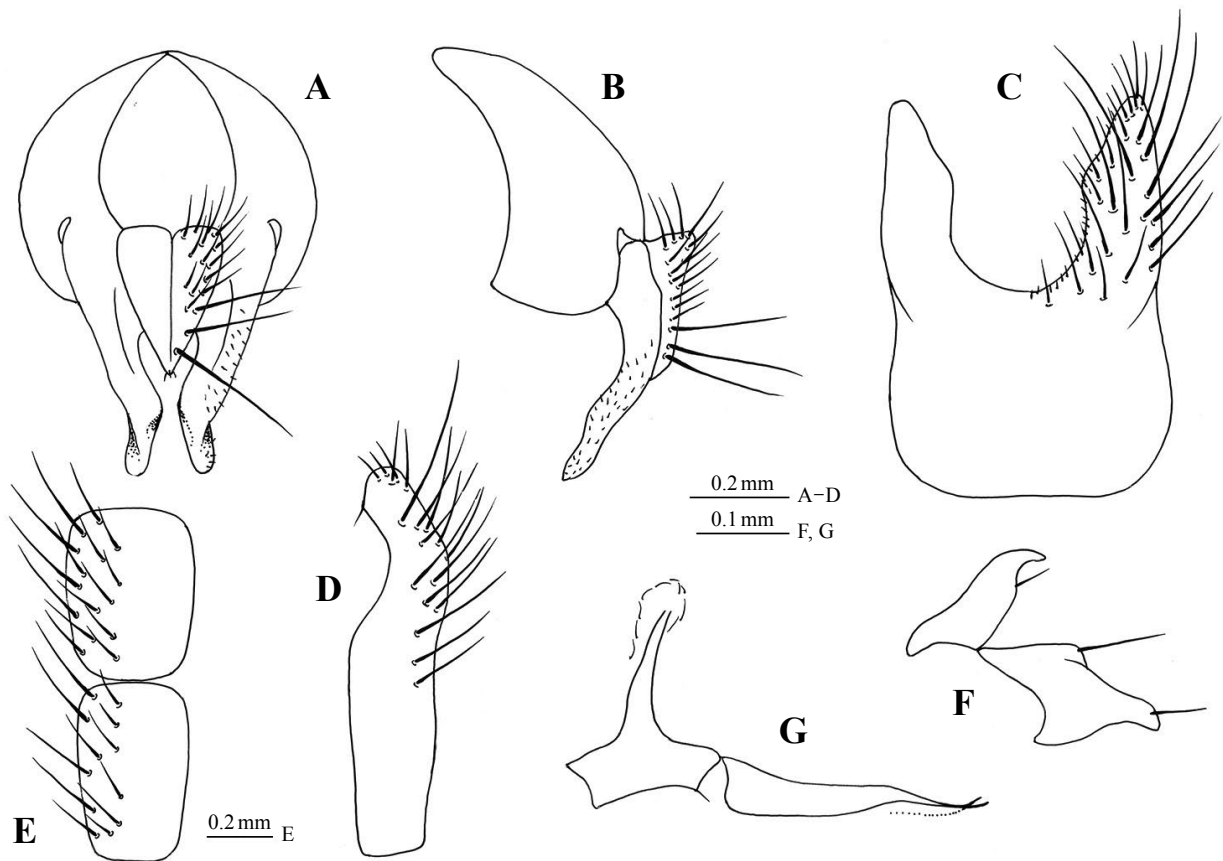


Fig. 80. *Lasiomma picipes* (Meigen, 1826), male. A, B. hypopygium; C, D. fifth sternite; E. third and fourth sternites; F. gonocoxal lobe and gonostylus; G. phallus.

<GB> 3 exs., Palgongsan, 12.v.1983, YJ Kwon; 1 ex., Palgongsan, 26.v.1985, YJ Kwon; 1 ex., Palgongsan, 23.v.1981, YJ Kwon; 2 exs., Geumosan, 8.vi.1983, SH Park; 1 ex., Geumosan, 18.v.1983, SH Park; 1 ex., Geumosan, 27.iv.1983, TH Jo; 1 ex., Geumosan, 11.v.1983, TH Jo; 1 ex., Geumosan, 22.v.1984, TH Jo; 5 exs., Bohyeonsan, 29.v.1998, YJ Kwon; 1 ex., Bohyeonsan, 11.v.1998, JO Lee; <GN> 2 exs., Jirisan, 5.vi.1983, YJ Kwon; [NIAS] <CN> 1 ex., Yesan, 25.v.1976, CY Hwang; <JN> 1 ex., Hongdo, 22.iv.1975, KY Choi; [NIBR] <GB> 2 exs., Bohyeonsan, 29.v.1998, YJ Kwon; 1 ex., Bohyeonsan, 11.v.1998, JO Lee.

DISTRIBUTION: Korea, Japan (Hokkaido, Honshu, Kyushu), China (Shanghai, Liaoning, Xizang), Russia (Kurile), Europe, N. America.

LOCALITY: Central-GG: Gwangneung; GW: Obongsan, Odaesan, Seoraksan; CN: Deoksungsan, Yesan; South-GB: Bohyeonsan, Daegu, Geumosan, Palgongsan; GN: Jirisan; JN: Hongdo.

HOST: The larvae are living in the nest of *Troglodytes troglodytes* (cf. Hennig, 1968).

81. *Lasiomma seminitidum* (Zetterstedt, 1845) (Fig. 81)

Aricia seminitidum Zetterstedt, 1845: 1568 (Sweden: Skåne).

Lasiomma seminitidum: Dely-Draskovits, 1993: 68; Suwa, 1999: 228; Han et al., 2014: 155.

Lasiops meadei + *L. adelpha* + *L. parviceps* Kowarz, 1880: 131–133.

Lasiomma meadei: Hennig, 1967: 188; Kwon & Suh, 1982d: 2, 3; Suwa, 1983b: 30; Suh & Kwon, 1985: 181, 182; Suh et al., 1985: 209; Suh, 1989: 83, 84; Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 304; Kwon et al., 1996: 224; Paek et al., 2010: 242.

Lasiomma meadei apenninum Hennig, 1967: 189 (Italy: Montemonaco).

Male. Black in ground color, with thin grayish pollen. Head about 1.2–1.3 times as high as long in profile. Frons at narrowest part equal to width of anterior ocellus; parafrontalia broadly contiguous to each other.

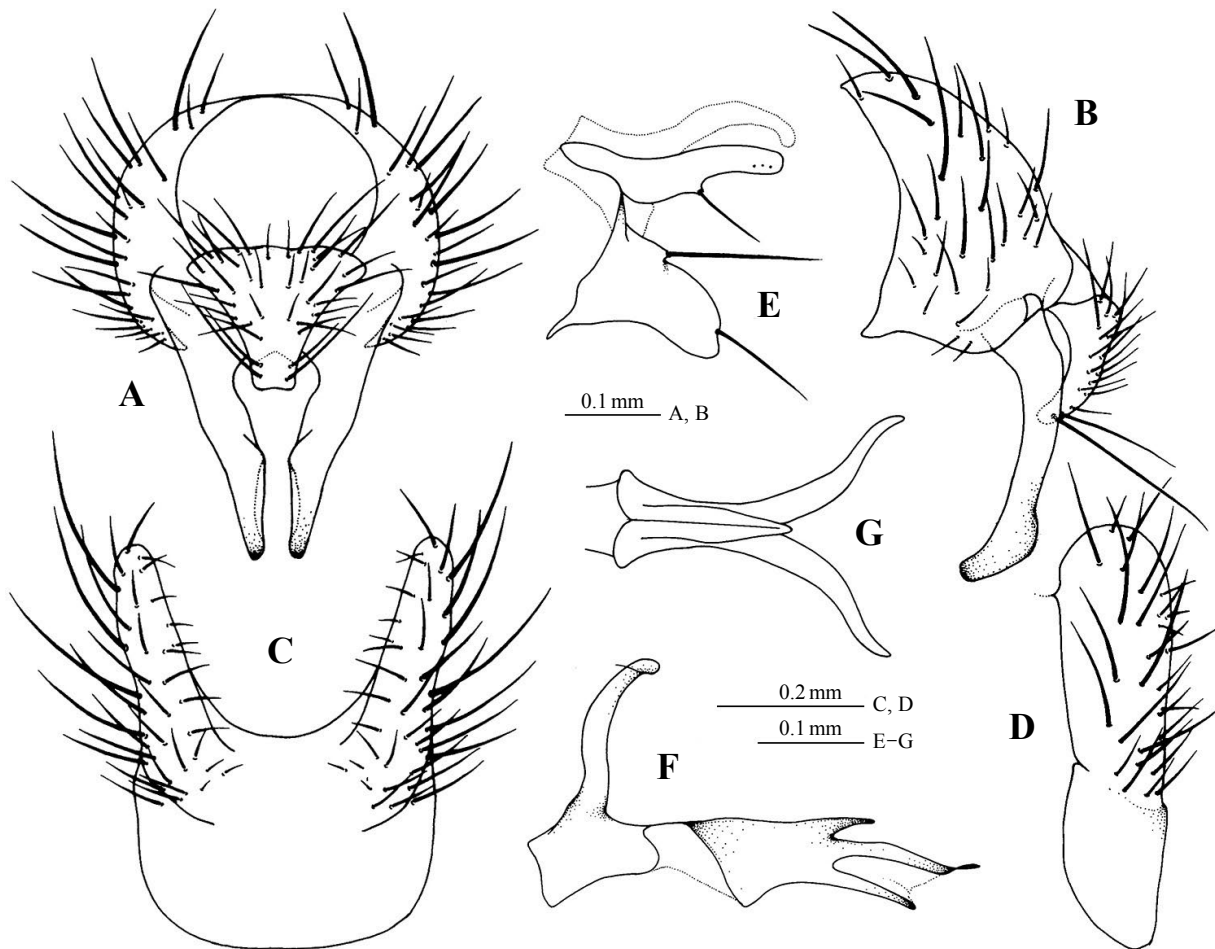


Fig. 81. *Lasiomma seminitidum* (Zetterstedt, 1845), male. A, B. hypopygium; C, D. fifth sternite; E. gonocoxal lobe and gonostylus; F. ephiphallus and basiphallus; G. distiphallus, ventral view.

Interfrontalia and parafrontalia dull, with 1 fine *if* and 3 *ori*. Parafacialia and cheek black with gray pollen. Antenna black; third segment about 2.4 times as long as wide; arista distinctly pubescent, the longest hair somewhat shorter than basal diameter of arista. Palpus and haustellum black.

Thorax black in ground color, with gray pollen, and patches of brown pollen, especially on dorsum. Mesonotum with a paler brownish median vitta presuturally in caudal view; 3 pairs of *pre acr*, the distance separating *pre acr* rows about two third as wide as distance between *pre acr* and *dc* rows. Second humeral seta as long as anterior *ntpl*. Posterior *ntpl* as long as or slightly shorter than anterior *ntpl*. Proepisternum with 2 *prepst*. Anepisternum with 2 *prepm*.

Legs black; fore tibia with 2 *pv*; mid tibia with 1 *ad*, 1 *av*, 1 *pd*, 2 *pv*, and apical *av* and *pv*; hind tibia with 2 *ad*, 5 *av*, 3 *pd* and 3–4 *pv*.

Wing hyaline; costal spine indistinguishable from anterior setulae; m-m nearly straight. Calypter and knob of halter whitish yellow.

Length. Body 4.5–5.5 mm, wing 4.0–4.3 mm.

MATERIAL EXAMINED: [KPNU] <GW> 4 exs., Seoraksan, 29.vii.1982, YJ Kwon; 1 ex., Odaesan, 5.viii.1983, YJ Kwon; <GB> 1 ex., Palgongsan, 17.iv.1984, SH Park; [NIAST] <GG> 1 ex., Suwon, 26.iv.1976, GB Uhm.

DISTRIBUTION: Korea, Japan (Hokkaido, Honshu, Kyushu), China, Europe.

LOCALITY: Central-GG: Suwon; GW: Odaesan, Seoraksan; South-GB: Palgongsan.

HOST: The larva is recorded as developing in bird corpses, human and dog faeces, fermenting poultry manure, fermenting oil cake and minced pork (cf. Hennig, 1967; Suwa, 1999).

Genus *Leucophora* Robineau-Desvoidy, 1830

Leucophora Robineau-Desvoidy, 1830: 562. Type-species: *Leucophora cinerea* Robineau-Desvoidy, 1830 (not given).

Ocromyia Lioy, 1864: 910. Type-species: *Hylemyia pallida* Macquart, 1835 (France).

Nevrorta Lioy, 1864: 910. Type-species: *Musca grisea* Fallén, 1823 (Sweden: Westrogothia).

Hylephila Rondani, 1877: 13. Type-species: *Musca buccata* Fallén, 1824 (Sweden: Scania and Oelania).

Hammomyia Rondani, 1877: 13. Type-species: *Aricia albescens* Zetterstedt, 1845 (Sweden: Östergötland).

Proboscimyia Bigot, 1883. Type-species: *Proboscimyia siphonina* Bigot, 1883 (USA: Rocky Mountains).

Proboscidomyia: Bigot, 1885: 266 (emendation of *Proboscimyia*).

Dolichoglossa Stein, 1898: 230. Type-species: *Dolichoglossa americana* Stein, 1898 (USA: South Dakota).

Dolichogaster: Coquillett, 1902: 136 (error for *Dolichoglossa*).

Ammomyia: Stein, 1916: 163 (emendation of *Hammomyia*).

Neohylemyia Malloch, 1917: 37. Type-species: *Neohylemyia proboscidalis* Malloch, 1917 (USA: Illinois).

Pergandea Aldrich, 1919: 106. Type-species: *Pergandea apivora* Aldrich, 1919 (USA: Missouri).

Pergandia: Aldrich, 1919: 106 (error for *Pergandea*).

Ganperdea: Aldrich, 1921 (new name for *Pergandea*).

Nevrota: Séguéy, 1937: 69 (emendation or error for *Nevrorta*).

DIAGNOSIS: Eyes without evident pubescence; face without keel; arista not angled; vibrissae separated from each others by a distance shorter than that to nearest eye-margin; scutellum with two long marginal pairs of setae and a shorter discal pair, and with fine pubescence on ventral surface; proepisternum and meron bare; hind tibia without apical *pv*; sternite 5 with long process whose outer lateral setae become progressively longer distally; hypandrium with pedestal-like posterior extension; inner basal surface of surstylus fused with periandrium (Griffiths, 1996).

Key to species of Korean *Leucophora*

1. Arista plumose, the longest hair longer than third antennal segment width; *pra* absent..... *L. grisella*
1. Arista minutely pubescent, the longest hair at most about as long as diameter of arista; *pra* present..... 2
2. Mid tibia without *av*..... *L. sponsa*
2. Mid tibia with strong *av*..... 3
3. *Pra* longer than posterior *ntpl*; notopleuron with additional setulae..... *L. personata*
3. *Pra* shorter than posterior *ntpl*; notopleuron without additional setulae..... *L. unistriata*

82. *Leucophora grisella* Hennig, 1967 (Fig. 82)

Leucophora grisella Hennig, 1967: 120, 121, pls. 7 (119), 8 (127) (Europe); Suwa, 1983b: 26; Suh & Kwon, 1985: 192; Suh, 1989: 104, 105; Suh et al., 1985: 210; Dely-Draskovits, 1993: 70; Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 304; Kwon et al., 1996: 224; Suwa, 1999: 229; Paek et al., 2010: 242; Han et al., 2014: 155.

Musca grisea Fallén, 1823, Monogr. Musc. Suec. 6: 57 (nom. praeocc.).

Male. Black in ground color, with thin gray pollen. Head about 1.2–1.3 times as high as long in profile. Frons at narrowest part slightly wider than distance between posterior ocelli inclusive. Interfrontalia dull tinged with brown, a pair of proclinate fine *if*; parafacialia silvery gray with 1 fine and 5 strong *ori*. Parafacialia and cheek black, with gray pollen. Antenna black; third segment about 2.1–2.2 times as long as wide; arista distinctly plumose, the longest hair longer than third antennal segment width. Palpus black, long and slender; haustellum black and stout.

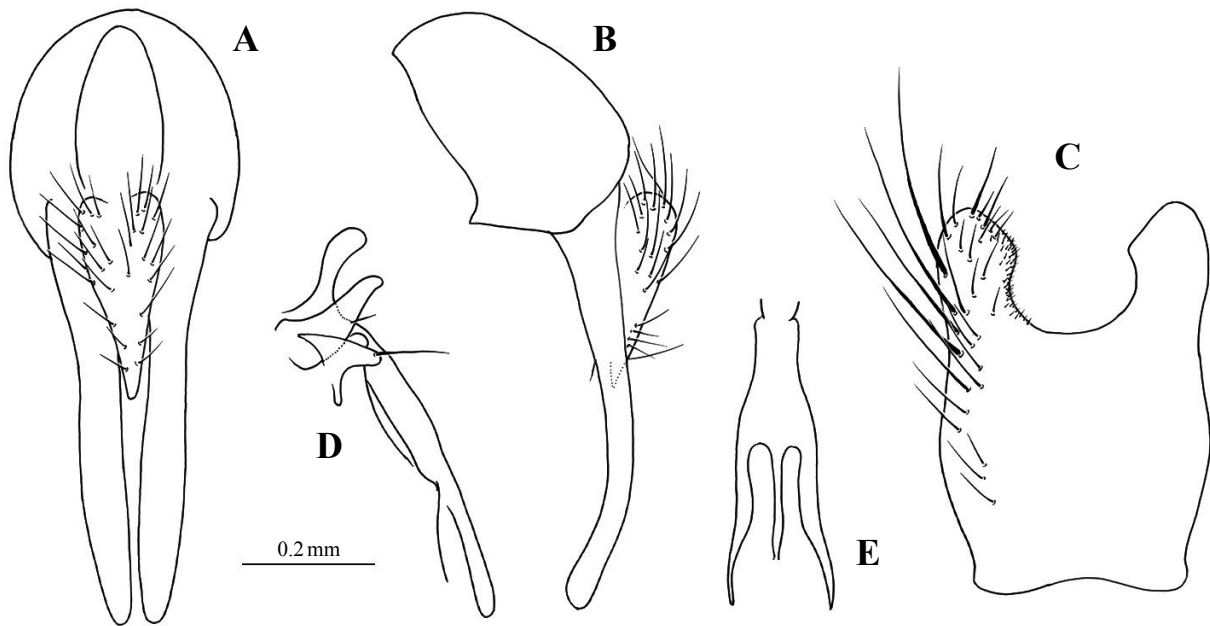


Fig. 82. *Leucophora grisella* Hennig, 1967, male. A, B. hypopygium; C. fifth sternite; D. gonocoxal lobe, gonostylus and phallus; E. distiphallus, ventral view.

Thorax black in ground color, with brownish gray pollen, and patches of brown pollen, especially on dorsum. Mesonotum with brownish black narrow median and broad lateral vittae presuturally in caudal view; 3–4 pairs of *pre acr*, the distance separating *pre acr* rows about half as wide as distance between *pre acr* and *dc* rows. Second *ph* indistinguishable from additional setulae. *Pra* absent. Posterior *ntpl* about 0.7–0.8 times as long as anterior *ntpl*. Proepisternum with 2 *prepst*. Anepisternum with 2 *prepm*.

Legs black, knees more brownish; fore tibia with 1 *pv*, and apical *d* and *pv*; mid tibia with 1 *ad*, 1 *pd*, 2 *pv*, and strong apical *av* and *pv*; hind tibia with 4 *ad*, 4 *av*, 3 *pd*, 2 *pv* and apical *av*.

Wing faintly brownish tinged, denser basally; costal spine small and much shorter than r-m; m-m nearly straight. Calypter whitish yellow. Knob of halter reddish yellow.

Abdomen black with bluish gray pollen, with black narrow median vitta.

Length. Body 5.2 mm, wing 4.8 mm.

MATERIAL EXAMINED: [KPNU] <GB> 1 ex., Irwolsan, 23.v.2007, SJ Suh; <GN> 1 ex., Ssanggye, 28.v.1973, JS Park.

DISTRIBUTION: Korea, Japan (Honshu), China (Gansu, Heilongjiang, Liaoning), Europe.

LOCALITY: Central-GW: Odaesan; South-GB: Irwolsan; GN: Jirisan (= Ssanggye).

HOST: The larvae live in the nest of *Rhophites quinquespinosus*, *Panurgus calcaratus* and *Halictus malachurus* (cf. Hennig, 1967).

83. *Leucophora personata* (Collin, 1922) (Fig. 83)

Hylephila personata Collin, 1922: 318 (U.K.).

Leucophora personata: Hennig, 1967: 125, 126, pls. 7 (114), 8 (125); Kwon & Suh, 1982d: 2; Suh & Kwon, 1985: 193; Suh, 1989: 105; Dely-Draskovits, 1993: 70; Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 304; Kwon et al., 1994: 266; Kwon et al., 1996: 224; Wei et al., 1996: 731; Suwa, 1999: 229; Paek et al., 2010: 242; Han et al., 2014: 155.

Male. Black in ground color, with thin gray pollen. Head about 1.3–1.4 times as high as long in profile. Frons at narrowest part nearly as wide as distance between posterior ocelli exclusive. Interfrontalia dull tinged with brown and contiguous to each other; parafrontalia silvery gray with 2 fine and 9–10 strong *ori*. Parafacialia and cheek brownish black, with gray pollen. Antenna black; third segment about 1.5 times as

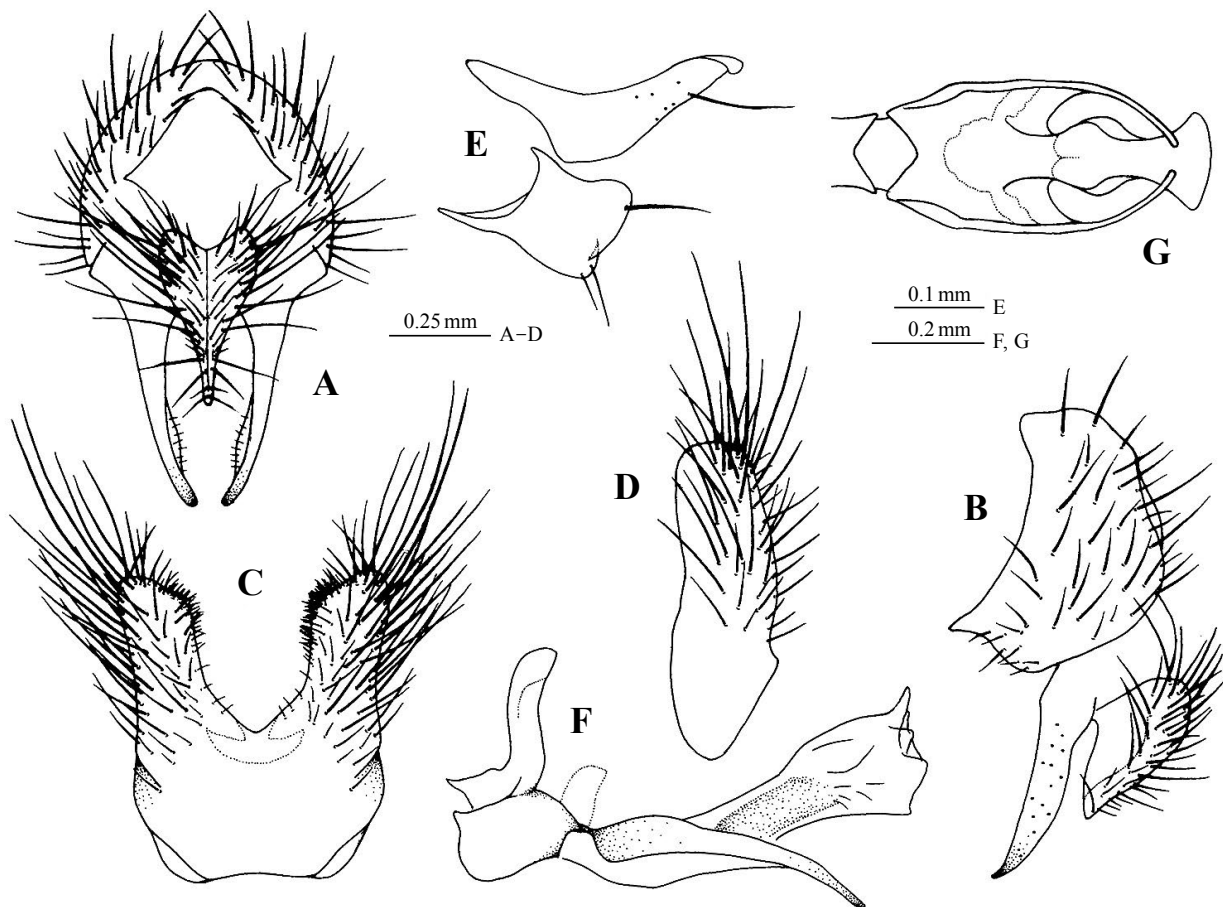


Fig. 83. *Leucophora personata* (Collin, 1922), male. A, B. hypopygium; C, D. fifth sternite; E. gonocoxal lobe and gonostylus; F. phallus; G. distiphallus, ventral view.

long as wide; arista pubescent. Vibrissae separated by a distance shorter than cheek height. Palpus black; haustellum fuscous.

Thorax black in ground color, with brownish gray pollen, and patches of brown pollen, especially on dorsum. Mesonotum with brownish black narrow median and broad lateral vittae presuturally in caudal view; 3–5 pairs of *pre acr*, the distance separating *pre acr* rows about half as wide as distance between *pre acr* and *dc* rows. Second *ph* indistinguishable from additional setulae. *Pra* strong, longer than anterior *ntpl* and slightly shorter than posterior *ntpl*. Posterior *ntpl* about 0.7–0.8 times as long as anterior *ntpl*. Notopleuron with additional *ntpl* setulae. Proepisternum with 2 *prepst*. Anepisternum with 1 long and 4 fine *prepm*.

Legs black, knees more brownish; fore tibia with 1 *ad*, 1 *pv*, and apical *ad*, *d* and *pv*; mid tibia with 1 *ad*, 1 *av*, 1 *pd*, 2 *pv*, and strong apical *av* and *pv*; hind tibia with 5 *ad*, 5 *av*, 3 *pd*, 5 *p-pv*, and strong apical *d* and *av*.

Wing faintly brownish tinged, denser basally; costal spine indistinguishable from anterior setulae; m-m slightly sinuate. Calypter whitish yellow. Knob of halter reddish yellow.

Abdomen black with bluish gray pollen, with black narrow median vitta.

Length. Body 6.5 mm, wing 5.7 mm.

MATERIAL EXAMINED: [KPNU] <GB> 1 ex., Palgongsan, 21.iv.1982, YJ Kwon.

DISTRIBUTION: Korea, Japan (Hokkaido), China (Liaoning, Hebei, Shanghai), Europe.

LOCALITY: South-GB: Palgongsan.

HOST: The larvae live on pollen or honey stored by andrenid bees (cf. Hennig, 1967).

84. *Leucophora sponsa* (Meigen, 1826) (Fig. 84)

Anthomyia sponsa Meigen, 1826: 147 (Europe).

Hylephila sponsa: Schnabl et Dziedzicki, 1911: 91, 92.

Leucophora sponsa: Hennig, 1967: 131, 132, pls. 7 (118, 121), 8 (129); Suwa, 1983b: 26; Suh & Kwon, 1985: 192, 193; Suh et al., 1985: 210; Suh, 1989: 105, 106; Dely-Draskovits, 1993: 71; Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 304; Kwon et al., 1996: 224; Suwa, 1999: 229; Paek et al., 2010: 242; Han et al., 2014: 156.

Male. Black in ground color, with thin gray pollen. Head about 1.2–1.3 times as high as long in profile. Frons at narrowest part nearly as wide as distance between posterior ocelli inclusive. Interfrontalia dull tinged with brown and slightly contiguous to each other; parafrontalia silvery gray with 1 fine and 7 strong *ori*. Parafacialia and cheek brownish black, with gray pollen. Antenna black; third segment about 1.3–1.4

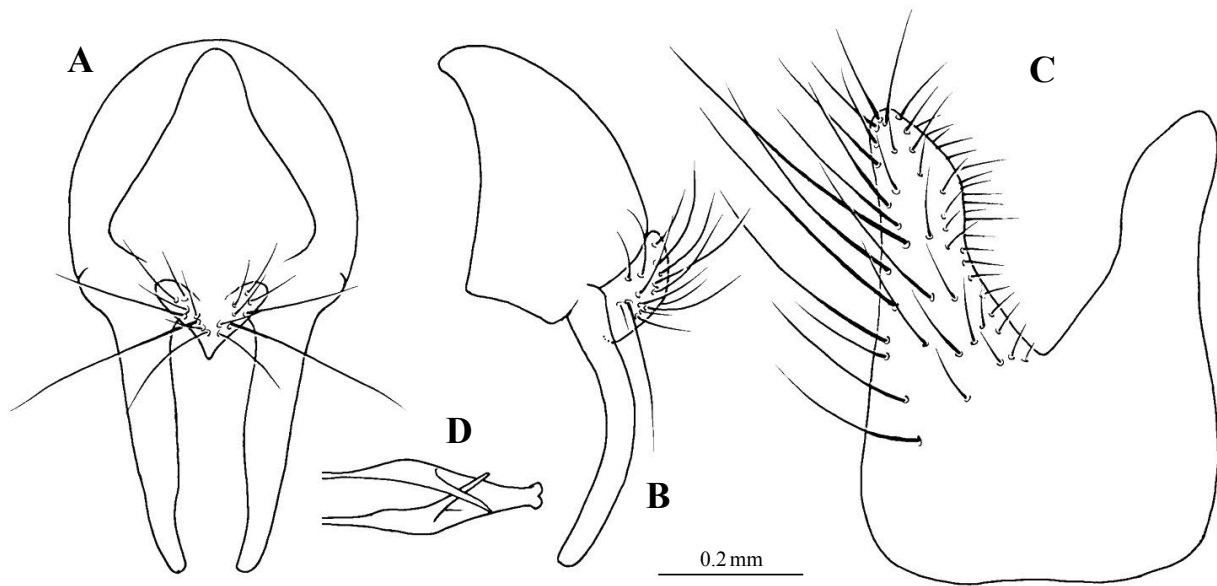


Fig. 84. *Leucophora sponso* (Meigen, 1826), male. A, B. hypopygium; C. fifth sternite; D. distiphallus, ventral view.

times as long as wide; arista pubescent. Vibrissae separated by a distance shorter than cheek height. Palpus and haustellum black.

Thorax black in ground color, with bluish gray pollen, and patches of brown pollen, especially on dorsum. Mesonotum with brownish black narrow median and obscure broad lateral vittae presuturally in caudal view; 3 pairs of *pre acr*, the distance separating *pre acr* rows about half as wide as distance between *pre acr* and *dc* rows. Second *ph* indistinguishable from additional setulae. *Pra* strong, about as long as posterior *ntpl*. Posterior *ntpl* about 0.8–0.9 times as long as anterior *ntpl*. Notopleuron without additional *ntpl* setulae. Proepisternum with 2 *prepst*. Anepisternum with 3 long and 4 fine *prepm*.

Legs black, knees more brownish; fore tibia with 0–1 *ad*, 1 *pv*, and apical *d* and *pv*; mid tibia with 1 *ad*, 1 *pd*, 2 *pv*, and apical *av* and *pv*; hind tibia with 4–5 *ad*, 5–6 *av*, 3–4 *pd*, 7–8 *pv*, and strong apical *d* and *av*.

Wing faintly brownish tinged, denser basally; costal spine indistinguishable from anterior setulae; m-m nearly straight. Calypter whitish yellow. Knob of halter reddish yellow.

Abdomen black with bluish gray pollen, with black narrow median vitta.

Length. Body 5.5–7.1 mm, wing 4.3–6.5 mm.

MATERIAL EXAMINED: [KPNU] <CB> 3 exs., Songnisan, 23.iv.2002, SJ Suh; <GB> 1 ex., Ulleungdo, 7–12.v.1978, SH Park.

DISTRIBUTION: Korea, Japan (Hokkaido, Honshu), China (Heilongjiang, Shanxi), Europe.

LOCALITY: Central-CB: Songnisan; GW: Odaesan, Seoraksan; South-GB: Ulleungdo.

85. *Leucophora unistriata* (Zetterstedt, 1838) (Fig. 85)

Anthomyza unistriata Zetterstedt, 1838: 677 (Finland).

Anthomyza unistriata Zetterstedt, 1837: 44 (nomen nudum).

Hylephila unistriata: Collin, 1921: 319, pl. 110 (11).

Leucophora unistriata: Hockett, 1940: 352; Suwa, 1983b: 26; Suh & Kwon, 1985: 193; Suh et al., 1985: 210; Suh, 1989: 106; Dely-Draskovits, 1993: 71; Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 304; Kwon et al., 1996: 224; Suwa, 1999: 229; Paek et al., 2010: 242; Han et al., 2014: 156.

Hammomyia paludis Johannsen, 1917: 323 (USA: Massachusetts).

Hylephila pleskei Séguy, 1925: 477 (China: Shanghi).

Male. Black in ground color, with thin gray pollen. Head about 1.2–1.3 times as high as long in profile. Frons at narrowest part nearly as wide as distance between posterior ocelli inclusive. Interfrontalia dull tinged with brown and contiguous to each other; parafrontalia silvery gray with 1 minute and 7–8 strong *ori*. Parafacialia and cheek brownish black, with gray pollen. Antenna black; third segment about 1.5 times as long as wide; arista pubescent. Vibrissae separated by a distance shorter than cheek height. Palpus and haustellum brownish black.

Thorax black in ground color, with bluish gray pollen, and patches of brown pollen, especially on dorsum. Mesonotum with brownish black narrow median and obscure broad lateral vittae presuturally in caudal view; 3–5 pairs of *pre acr*, the distance separating *pre acr* rows closer than to *dc*. Second *ph* indistinguish-

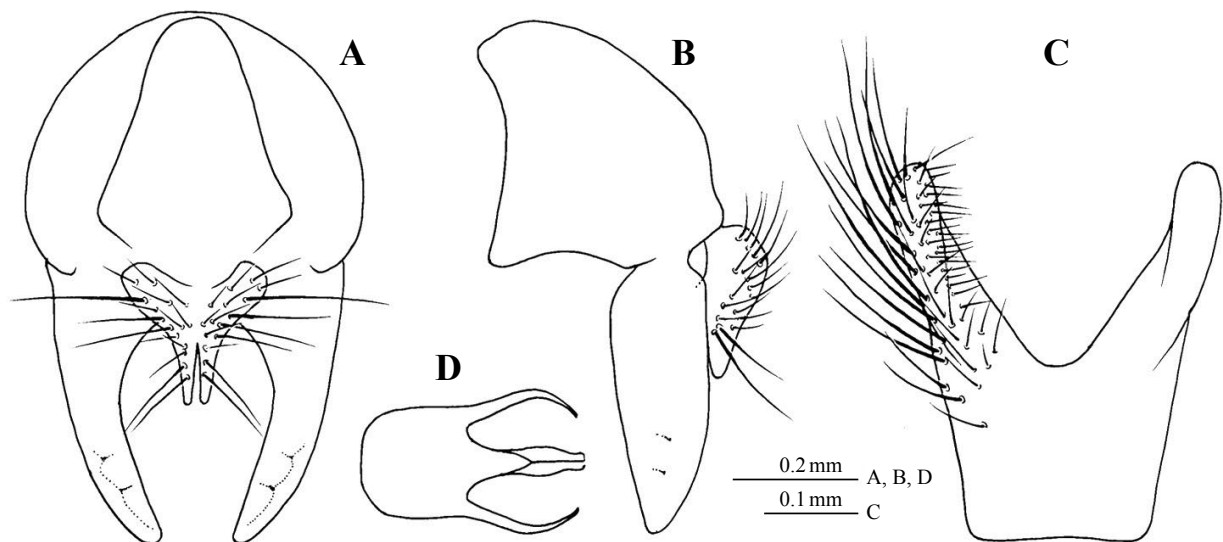


Fig. 85. *Leucophora unistriata* (Zetterstedt, 1838), male. A, B. hypopygium; C. fifth sternite; D. distiphallus, ventral view.

able from additional setulae. *Pra* shorter than posterior *ntpl*, about 0.6–0.7 times as long as posterior *ntpl*. Posterior *ntpl* about 0.7–0.8 times as long as anterior *ntpl*. Notopleuron without additional *ntpl* setulae. Proepisternum with 2 *prepst*. Anepisternum with 2 *prepm*.

Legs black, knees more brownish; fore tibia with 1–2 *pv*, and apical *d* and *pv*; mid tibia with 1 *ad*, 1 *av*, 1 *pd*, 2 *pv*, and apical *av* and *pv*; hind tibia with 3 *ad*, 6 *av*, 3–5 *pd*, 7 *pv*, and strong apical *d* and *av*.

Wing faintly brownish tinged, denser basally; costal spine indistinguishable from anterior setulae; m-m slightly sinuate. Calypter whitish yellow. Knob of halter reddish yellow.

Abdomen black with bluish gray pollen, with black narrow median vitta.

Length. Body 5.3–5.8 mm, wing 4.7–5.5 mm.

MATERIAL EXAMINED: [KPNU] <GB> 3 exs., Palgongsan, 17.iv.1984, SH Park; 2 exs., Palgongsan, 24.iv.1984, TH Jo; 2 exs., Palgongsan, 24.iv.1984, TH Jo; 1 ex., Geumosan, 25.v.1983, SH Park.

DISTRIBUTION: Korea, Japan (Hokkaido, Honshu), China (Heilongjiang, Liaoning, Shanxi, Shanghai), Europe, N. America.

LOCALITY: Central-GW: Odaesan, Seoraksan; South-GB: Geumosan, Palgongsan.

HOST: The larvae live in the nests of Hymenoptera (cf. Hennig, 1967).

Genus *Mycophaga* Rondani, 1856

Mycophaga Rondani, 1856: 102. Type-species: *Coenosia testacea* Gimmerthal, 1834 (not given).

Cosmostyla Lioy, 1864: 910. Type-species: *Hylemyia rufiventris* Macquart, 1835 (France: Bordeaux).

DIAGNOSIS: Male frons wide, slightly narrower than one-third of head width; *if* present; arista plumose; additional *ntpl* setulae absent; scutellum with two marginal pairs of setae and usually a shorter discal pair, and with pubescence on ventral surface; proepisternum, meron and anepimeron bare; lower surface of costa with additional short setulae below the main marginal series of short spinules; R4+5 with one or a few minute setulae at base on each of dorsal and ventral surfaces; lower calypter smaller than the upper; hind tibia with 2 *pd*, and without apical *pv* or hardly distinguishable.

86. *Mycophaga testacea* (Gimmerthal, 1834) (Fig. 86)

Coenosia testacea Gimmerthal, 1834, Bull. Imp. Nat. Mosc. 7: 113 (Europe).

Mycophaga testacea: Hennig, 1972: 447–449, pls. 57 (689), 58 (697), 62 (743); Suwa, 1983b: 42; Suh & Kwon, 1985: 162; Suh et al., 1985: 208; Suh, 1989: 62, 63; Dely-Draskovits, 1993: 72; Ent. Soc. Kor. &

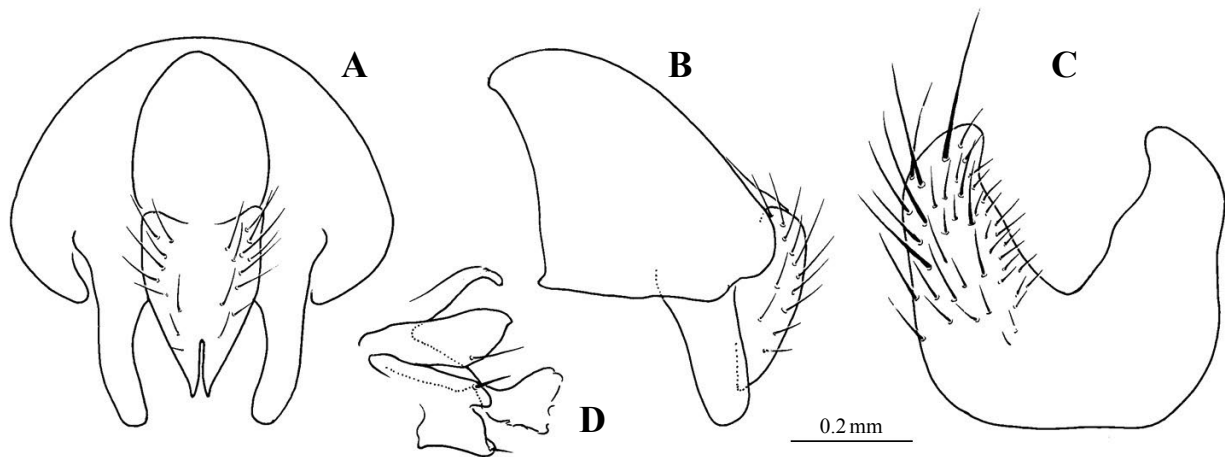


Fig. 86. *Mycophaga testacea* (Gimmerthal, 1834), male. A, B. hypopygium; C. fifth sternite; D. gonocoxal lobe, gonostylus and phallus.

Kor. Soc. App. Ent., 1994: 304; Kwon et al., 1994: 266; Kwon et al., 1996: 224; Suwa, 1999: 230; Paek et al., 2010: 242; Han et al., 2014: 156.

Musca fungorum Degeer, 1776: 18 (nom. praeocc).

Hylemyia rufiventris Macquart, 1835: 320 (France: Bordeaux).

Anthomyia palliditincta Boheman, 1864: 84 (Sweden: Kullen).

Male. Black in ground color, with thin grayish pollen. Head about 1.6 times as high as long in profile. Frons at narrowest part slightly wider than distance between posterior ocelli inclusive. Interfrontalia dull tinged with brown, with a pair of proclinate cruciate *if*, parafrontalia with 3 *ors* setae and 3 *ori*. Parafacialia and cheek black, with gray pollen; parafacialia narrowing slightly towards level of lower margin of eye. Antenna black; third segment about 2.5 times as long as wide; arista pubescent, the longest hair about twice as long as basal diameter of arista. Palpus black, long and slender. Haustellum black with brownish tint, and stout.

Thorax black in ground color, with brownish gray pollen, and patches of brown pollen, especially on dorsum. Mesonotum with 3 paler blackish vittae presuturally in caudal view; 4 pairs of *pre acr* and several fine irregular setulae between rows, the distance separating *pre acr* rows as wide as distance between *pre acr* and *dc* rows. Posterior *ntpl* about one third as long as anterior *ntpl*. Proepisternum with 2 *prepst*. Anepisternum with a upper anterior seta and, 2 long and 2 additional *prepm*.

Legs brown; fore tibia with 1 *ad* and 1 *pv*; mid tibia with 1 *ad*, 1 *pd*, 1 *pv*, and strong apical *pv*; hind tibia with 3 *ad*, 1 *pd* and 2 *pv*.

Wing hyaline; costal spine indistinguishable from anterior setulae; m-m slightly sinuate. Calypter and knob of halter whitish yellow.

Abdomen with brownish gray pollen, with black pale median vitta.

Length. Body 6.5–7.5 mm, wing 5.5–6.0 mm.

MATERIAL EXAMINED: [KPNU] <GW> 1 ex., Soyosan, 15.v.1982, YJ Kwon; <GB> 1 ex., Geumosan, 12.vii.1983, TH Jo; <GN> 1 ex., Jirisan, 10–15.vii.1979, YJ Kwon; [NIAST] <GW> 1 ex., Soyosan, 15.v.1982, YJ Kwon.

DISTRIBUTION: Korea, Japan (Hokkaido, Honshu, Kyushu), China (Sichuan), Europe.

LOCALITY: Central-GW: Soyosan; South-GB: Daegu, Geumosan, Palgongsan; GN: Jirisan.

Genus *Paregle* Schnabl, 1911

Paregle Schnabl, 1911: 95 (as subgenus of *Hylemyia*). Type-species: *Musca radicum* Linnaeus, 1758 (Sweden).

Chionomyia Ringdahl, 1933: 30 (as subgenus of *Hylemyia*). Type-species: *Anthomyza vetula* Zetterstedt, 1838 (Sweden: Vitangi).

Chinomyia: Karl, 1943: 66 (error for *Chionomyia*).

DIAGNOSIS: Head dimorphic sexually; in male, the eyes only narrowly separated; *ors* present in both sexes; numerous *ori* present in male; epistoma not projecting forward beyond frons at lunule; scutellum with two long marginal pairs of setae and shorter discal pair, and with fine pubescence on ventral surface; proepisternum, anepimeron and meron bare; mid tibia with 2 *pd*; hind tibia with some *ad*; cercal plate heart shaped; surstylus with small distal split; sternite 6 and 7 reduced to small posterior plates; gonocoxal lobe enlarged and with inner marginal setae; hypandrium without longitudinal process absent.

Key to species of Korean *Paregle*

1. Frons much narrower than ocellus and broadly contiguous to each other; *ors* absent *P. audacula*
1. Frons at narrowest part approximately equal in width to distance between posterior ocelli; distinct *ors* present *P. vetula*

87. *Paregle audacula* (Harris, 1780) (Fig. 87)

Musca audacula Harris, 1780: 121 (not given).

Paregle audacula: Suh et al., 1991: 46, 47; Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 304; Kwon et al., 1996: 224; Suwa, 2013: 181; Paek et al., 2010: 242; Han et al., 2014: 156.

Musca napobrassicae Bjerckander, 1780: 196 (not given).

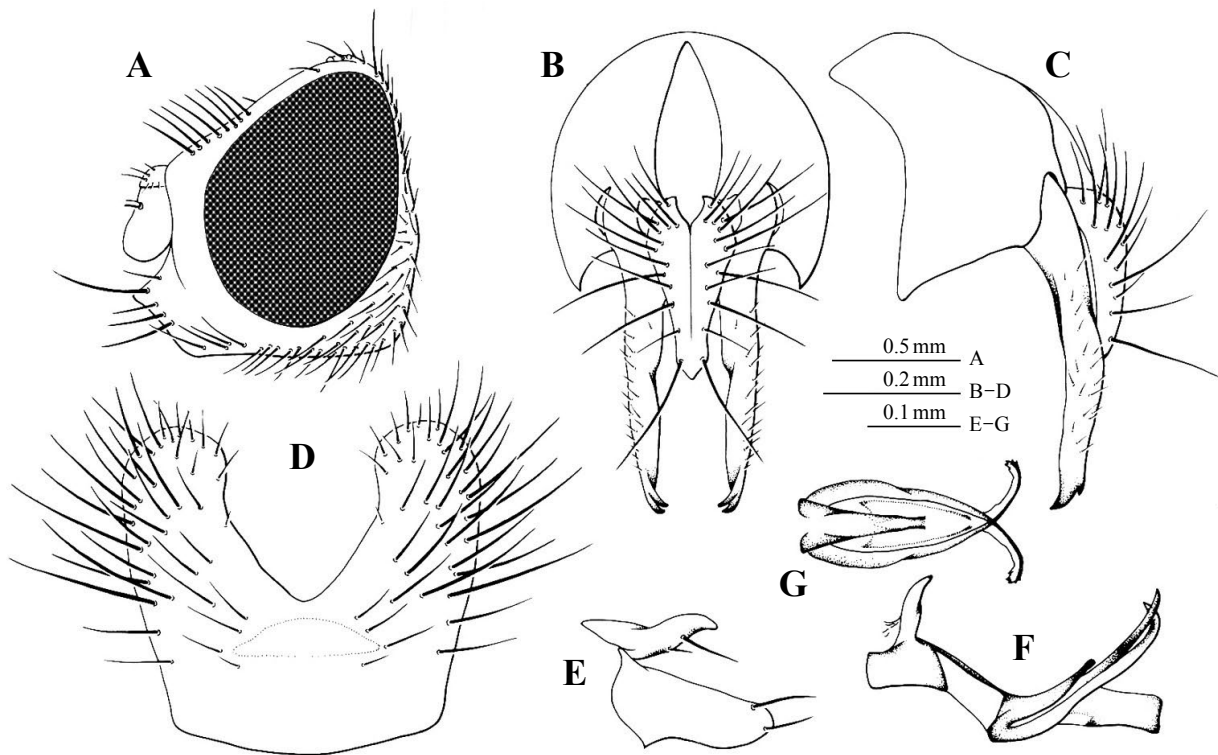


Fig. 87. *Paregle audacula* (Harris, 1780), male. A. head; B, C. hypopygium; D. fifth sternite; E. gonocoxal lobe and gonostylus; F. phallus; G. distiphallus.

Anthomyia stigmatica + *A. spreta* + *A. ruficeps* Meigen, 1826: 167, 171, 177.

Egle vulgaris + *E. ludibunda* + *E. campestris* Robineau-Desvoidy, 1830: 584, 585.

Anthomyia obliqua Macquart, 1835: 342 (France).

Anthomyza canescens Zetterstedt, 1838: 676 (Sweden).

Aricia diadema Holmgren, 1883: 170 (Russia).

Anthomyia (Chortophila) litigata Pandellé, 1900: 274 (Austria).

Musca radicum (nec Linnaeus): Hockett, 1924: 39.

Paregle radicum montalpina Gregor & Povolny, 1964: 244 (Austria).

Male. Black in ground color, with gray pollen. Head about 1.2–1.3 times as high as long in profile. Frons at narrowest part equal to width of anterior ocellus; parafrontalia broadly contiguous to each other. Interfrontalia dull with a pair of fine *if*; parafrontalia silvery gray with 10–12 *ori*. Parafacialia and cheek black with gray pollen. Antenna black; third segment about twice as long as wide; arista distinctly pubescent. Palpus and haustellum black.

Thorax black in ground color, with gray pollen, and patches of brown pollen, especially on dorsum. Mesonotum with 2 pale brownish black median vittae and grayish submedian vitta presuturally in caudal view;

3 pairs of *pre acr* and several fine irregular setulae between rows, the distance separating *pre acr* rows about slightly wider than distance between *pre acr* and *dc* rows. Second *ph* indistinguishable from additional setulae. *Pra* about half as long as anterior *ntpl*. Posterior *ntpl* about 0.8–0.9 times as long as anterior *ntpl*. Proepisternum with 2 *prepst*. Anepisternum with 1 and some additional *prepm*.

Legs black; fore tibia with 1 *ad* and 2 *pv*; mid tibia with 1 *ad*, 1 *av*, 2–3 *pd*, 1–2 *pv*, and strong apical *av* and *pv*; hind tibia with 7 *ad*, 1 *av*, 5 *pd*, and apical *av*.

Wing hyaline; costal spine small and much shorter than r-m; m-m slightly sinuate. Calypter whitish yellow and knob of halter pale yellow.

Abdomen with brownish gray pollen, with black narrow median vitta and subtriangular fore marginal bands.

Length. Body 5.5–5.9 mm, wing 4.8–5.1 mm.

MATERIAL EXAMINED: [KPNU] <HB> 2 exs., Samjiyeon, 15–17.viii.1989, M Kozánek; 5 exs., Paekdusan, 16.viii.1989, M Kozánek; 2 exs., Sobaeksan, 17.viii.1989, M Kozánek; 1 ex., Mupo, 18.viii.1989, M Kozánek; 1 ex., Onseupjeong, 19.viii.1989, M Kozánek.

DISTRIBUTION: Korea, Japan (Hokkaido), China (Gansu, Heilongjiang, Jilin, Liaoning, Qinghai, Shanxi, Sichuan), Russia (European part, Kamchatka, Kuril, Sakhalin, Siberia), Europe, N.Africa, N. America, Australia.

LOCALITY: North-HB: Baekdusan, Mupo, Onsupcheong, Samjiyeon, Sobaeksan.

HOST: The larva lives on the excrements of men or plant roots such as cruciferous plants, wheat, and sprouts of coniferous trees (cf. Hennig, 1967).

88. *Paregle vetula* (Zetterstedt, 1838) (Fig. 88)

Anthomyza vetula Zetterstedt, 1838: 682 (Sweden).

Hylemyia (Paregle) vetula: Schnabl et Dziedzick, 1911: 95.

Hylemyia (Chionomyia) vetula: Ringdahl, 1933: 30.

Chionomyia vetula: Hennig, 1967: 171, 172, pls. 10 (165), 12 (190), 14 (213).

Paregle vetula: Suwa, 1974: 93, 94; Suh & Kwon, 1985: 190; Suh, 1989: 100, 101; Suh et al., 1985: 210; Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 304; Kwon et al., 1994: 266; Kwon et al., 1996: 224; Kwon et al., 1998: 41; Suwa, 1999: 230; Paek et al., 2010: 242.

Aricia naso Zetterstedt, 1845, Dipt. Scand. 4: 1551 (Sweden: Dörarp).

Phaonia gracilis (nec Stein): Han et al., 2014: 160.

Male. General coloration purplish black. Head 1.2–1.3 times as high as long in profile; frons width about equal to distance between posterior ocelli exclusive; parafrontalia separate, with 1 distinct *ori* and 12–14

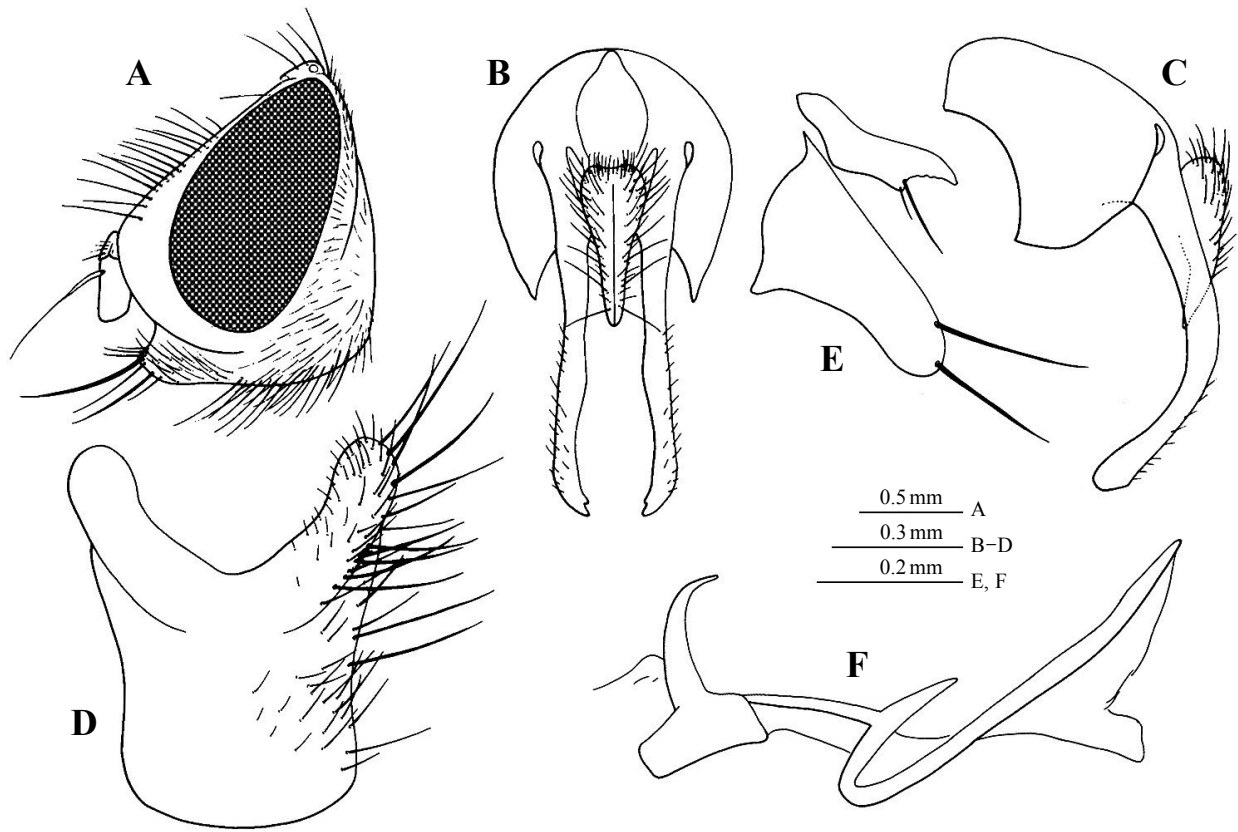


Fig. 88. *Paregle vetula* (Zetterstedt, 1838), male. A. head; B, C. hypopygium; D. fifth sternite; E. gonocoxal lobe and gonostylus; F. phallus.

ori; interfrontalia dull, becoming dark reddish at lunule, without *if*. Profrons and cheek blackish, with some pale brownish reflections; epistoma projecting forwards at most to tip of profrons. Antenna black; arista minutely pubescent; third antennal segment about 1.5–1.8 times as long as wide. Palpus black, long and slender. Haustellum stout, and with brownish tint.

Thorax black in ground color with purplish gray pollen, and patches of brown pollen especially on dorsum. Mesonotum with obscure broad median and lateral vittae in caudal view; 5–6 pairs of *pre acr* and several fine irregular setulae between rows, the distance separating *pre acr* rows wider than distance between *pre acr* and *dc* rows. Second *ph* indistinguishable from additional setulae. *Pra* strong, as long as posterior *ntpl*. Anterior *ntpl* slightly longer than posterior *ntpl*. Proepisternum with 3 *prepst*. Anepisternum with 3 long and some fine *prepm*.

Legs black; fore tibia with 1 *ad* and 3–4 *pd* and 3–7 slender *pv*; mid tibia with 2 *ad*, 1–2 *av*, 3 *pd*, 3 *pv*, and strong apical *av* and *pv*; hind tibia with innumerable setulae.

Wing brown tinged, denser at base; costal spine indistinguishable from anterior setulae; m-m straight. Calypter pale brown. Knob of halter dark brown.

Abdomen with brownish gray pollen; a black narrow median vitta; fore marginal bands present and often subtriangular markings present.

Length. Body 5.5–6.0 mm, wing 5.3–5.5 mm.

MATERIAL EXAMINED: [KPNU] <GG> 6 exs., Soraesan, 16.xii.1998, SJ Suh; <GB> 17 exs., Daegu, 23.ix.1984, YJ Kwon; 5 exs., Daegu, 26.iii.1984, YJ Kwon; 2 exs., Daegu, 6.ii.1985, YJ Kwon; 1 ex., Daegu, 2.ii.1985, YJ Kwon; 2 exs., Daegu, 7.xii.1986, YJ Kwon; 1 ex., Geumosan, 20.iv.1983, SH Park.

DISTRIBUTION: Korea, Japan (Hokkaido, Honshu, Kyushu, Shikoku), China (Beijing, Hebei, Heilongjiang, Henan, Jilin, Liaoning, Neimenggu, Shandong, Shanxi), Europe.

LOCALITY: Central-GG: Soraesan; South-GB: Daegu, Geumosan, Palgongsan.

Genus *Pegomya* Robineau-Desvoidy, 1830

Pegomya Robineau-Desvoidy, 1830: 598. Type-species: *Anthomyia hyoscyami* Panzer, 1809 (not given).

Zabia Robineau-Desvoidy, 1830: 600. Type-species: *Zabia longipes* Robineau-Desvoidy, 1830 (not given).

Phoraea Robineau-Desvoidy, 1830: 600. Type-species: *Phoraea flavescens* Robineau-Desvoidy, 1830 (France: Saint-Sauveur).

Chlorina Robineau-Desvoidy, 1830: 602. Type-species: *Chlorina thoracica* Robineau-Desvoidy, 1830 (France: Saint-Sauveur).

Phyllis Robineau-Desvoidy, 1830: 603. Type-species: *Phyllis brunea* Robineau-Desvoidy, 1830 (France: Saint-Sauveur).

Pegomyia: Macquart, 1835: 350 (emendation).

Carduophila Hendel, 1935: 333. Type-species: *Carduophila fodiens* Hendel, 1925 (Austria).

Chaetopegomyia Ringdahl, 1938: 196 (as subgenus of *Pegomyia*). Type-species: *Anthomyia setaria* Meigen, 1826 (not given).

Petrmyia Albuquerque, 1954: 493. Type-species: *Petrmyia wygodzinskyi* Albuquerque, 1954 (Argentina).

DIAGNOSIS: Head dimorphic sexually; in male, the eye only narrowly separated and *if* normally lacking; mentum rather short, at most 0.4 times as long as head height; *ph* 1 + 2; *pra* relatively short; prosternum, proepisternum, meron and anepimeron bare; additional *ntpl* setulae absent; scutellum with two marginal pairs of setae and usually shorter discal pair, and with pubescence on ventral surface; lower surface of costa additional short setulae below main marginal series of short spinules; lower calypter enlarged, distinctly larger than upper; surstylus and cercal plate with sclerotized connections; hypandrium flattened, with only short vertical arm (Griffiths, 1982).

Key to species of Korean *Pegomya*

1. Lower calypter distinctly protruding beyond the upper one; humeral callus brown..... *P. spiraculata*
1. Lower calypter not protruding beyond the upper one; humeral callus black or dark brown 3
2. Fore tibia without *ad* 2
2. Fore tibia with *ad* 6
3. Legs wholly black *P. holosteae*
3. Legs with yellow to brownish tibiae 4
4. *Pra* absent; fifth sternite with numerous long and strong setae on outer margin of each lobe *P. alticola*
4. *Pra* present; fifth sternite without so many long and strong setae on outer margin of each lobe 5
5. Fifth sternite with many short and strong setae at base of each lobe in male *P. cunicularia*
5. Fifth sternite without short and strong seta at base of each lobe in male *P. exilis*
6. Palpus black 7
6. Palpus yellow 11
7. Legs yellow 8
7. Legs black or dark brown 9
8. Hind tibia with 1 *av* and without *pv* *P. bicolor*
8. Hind tibia with 3 *av* and 1–2 *pv* *P. quadrivittata*
9. Fore tibia without *ad* *P. flavifrons*
9. Fore tibia with *ad* 10
10. Fore tibia with apical *pd* *P. rubivora*
10. Fore tibia without apical *pd* *P. rufina*
11. First and second antennal segments black; *Pra* strong, as long as posterior *ntpl* *P. winthemi*
11. First and second antennal segments brown; *Pra* much shorter than posterior *ntpl* *P. pulchripes*

89. *Pegomya alticola* (Huckett, 1939) (Fig. 89)

Pegomya alticola Huckett, 1939: 25 (USA); Han et al., 2014: 157.

Pegomya criniventris Suwa, 1974: 193–195 (Japan); Kwon & Suh, 1982d: 4; Suh & Kwon, 1985: 157; Suh, 1989: 42, 43; Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 304; Kwon et al., 1996: 224; Paek et al., 2010: 242.

Male. Brownish black in ground color, with thin grayish pollen. Head about 1.2–1.3 times as high as long in profile. Frons at narrowest part nearly as wide as distance between posterior ocelli. Interfrontalia and parafrontalia grayish black, with pair of fine *if* and 7 *ori*. Profrons grayish black, about 1.8–1.9 times as

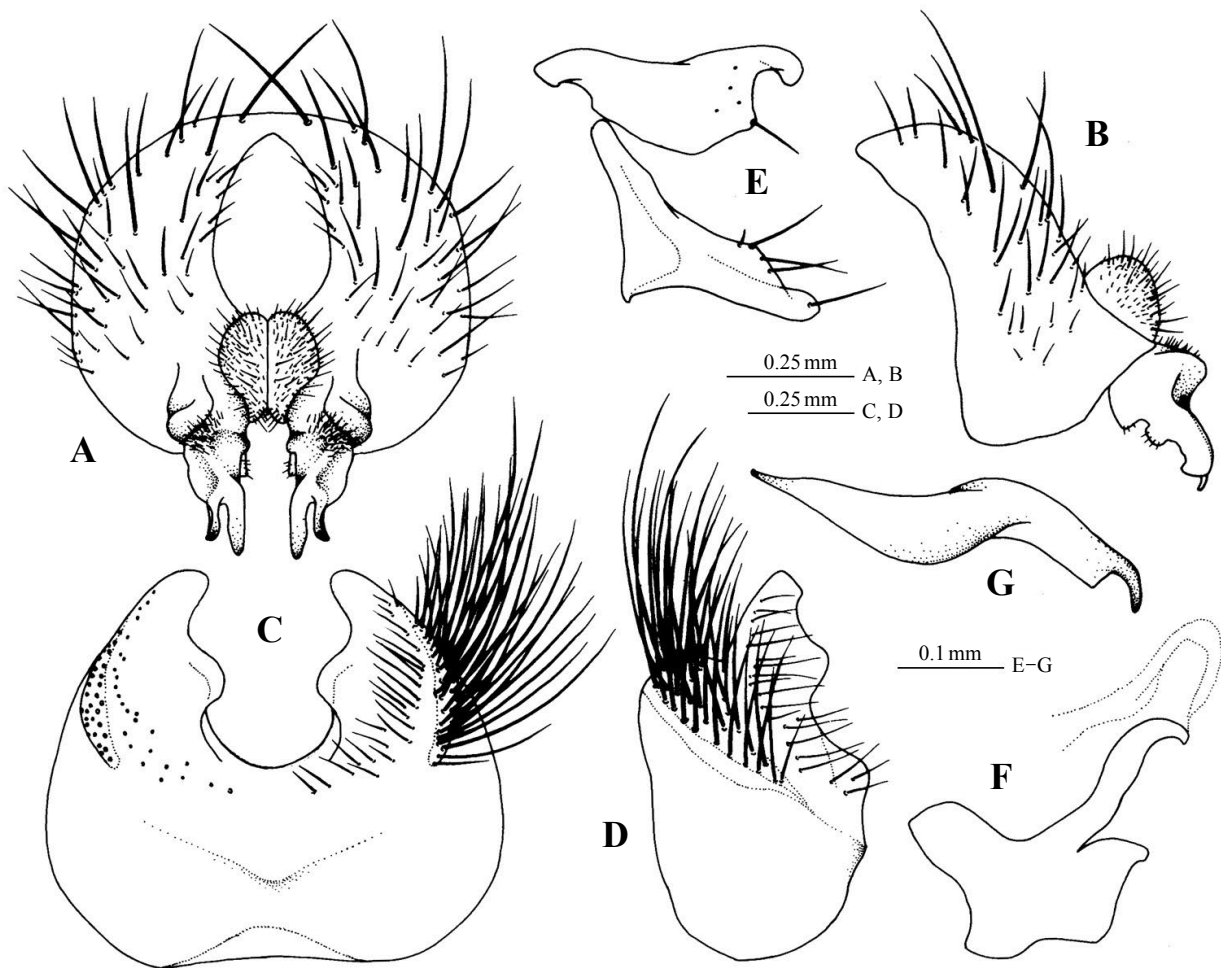


Fig. 89. *Pegomya alticola* (Huckett, 1939), male. A, B. hypopygium; C, D. fifth sternite; E. gonocoxal lobe and gonostylus; F. ephiphallus and basiphallus; G. distiphallus.

wide as the width of third antennal segment. Parafacialia and cheek grayish brown; parafacialia narrowing slightly towards level of lower margin of eye. Antenna black; third segment about 2.5–2.6 times as long as wide; arista distinctly pubescent, the longest hair much shorter than basal diameter of arista. Palpus black with sparse gray pollen, long and slender. Haustellum black with brownish tint.

Thorax black in ground color, with grayish brown pollen, and patches of brown pollen, especially on dorsum. Mesonotum with 2 blackish paramedian vittae in caudal view; 4 pairs of *pre acr* and without few of additional setulae in row; the distance of *pre acr* rows closer than to *dc*. Second *ph* as long as or slightly longer than half of anterior *ntpl*. *Pra* as long as or slightly longer than one third of anterior *ntpl*. Posterior *ntpl* about 0.7–0.8 times as long as anterior *ntpl*. Proepisternum with 3 *prepst*. Anepisternum with 2 *prepm*.

Legs brownish, knees and tarsi more amber; fore tibia with 1 *pv* and apical *pv*; mid tibia with 1 *pd*, 2 *pv*, and apical *av* and *pv*; hind tibia with 4 *ad*, 1 *av*, 6 *pd*, and apical *av*.

Wing hyaline; costal spine indistinguishable from anterior setulae; m-m slightly sinuate. Calypter and knob of halter pale brown.

Abdomen with bluish gray pollen, with black narrow median vitta.

Length. Body 7.0 mm, wing 5.2 mm.

MATERIAL EXAMINED: [KPNU] <GW> 1 ex., Seoraksan, 29.vii.1982, YJ Kwon; 1 ex., Seoraksan, 30.vii.1982, YJ Kwon.

DISTRIBUTION: Korea, Japan (Hokkaido, Honshu), China (Heilongjiang), Russia (Kuril), N. America.

LOCALITY: GW: Seoraksan.

HOST: *Cacalia hastata* subsp. *orientalis*, *Petasites japonicus* subsp. *giganteus* (cf. Suwa, 1999).

90. *Pegomya bicolor* (Wiedemann, 1817) (Fig. 90)

Anthomyia bicolor Wiedmann, 1817: 77 (Germany).

Pegomya bicolor: Suwa, 1983b: 42; Dely-Draskovits, 1993: 78; Suwa, 1999: 231; Han et al., 2014: 157; Suwa, 2013: 182.

Pegomyza bicolor jynx Séguy, 1926: 44 (China: Jiangsu).

Pegomya bicolor jynx (nec Séguy): Kwon & Suh, 1982d: 4, 5; Suh & Kwon, 1985: 159; Kor. Soc. Plant Prot., 1986: 247; Suh, 1989: 52; Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 304; Kwon et al., 1994: 266; Kwon et al., 1996: 224.

Pegomya jynx (nec Séguy): Paek et al., 2010: 242.

Pogomyia bicor cinereorufa Ringdahl, 1930: 173 (Iceland).

Pegomyia bicolor sapporensis Kato, 1941: 63 (Japan: Sapporo).

Anthomyia mitis Meigen, 1826: 183 (not given).

Anthomyia rumicis Bouché, 1834: 209 (not given).

Zabia longipes Robineau-Desvoidy, 1851: 233 (not given).

Male. Brownish black in ground color, with thin grayish pollen. Head about 1.2–1.3 times as high as long in profile. Frons at narrowest part slightly wider than distance between posterior ocelli inclusive. Interfrontalia and parafrontalia grayish black, with or without a pair of very fine *if*, and with 4 *ori*. Profrons grayish black, about 1.5–1.6 times as wide as the width of third antennal segment. Parafacialia and cheek grayish black; parafacialia narrowing slightly towards level of lower margin of eye. Antenna black; third segment about 2.2–2.3 times as long as wide; arista distinctly pubescent, the longest hair more shorter than basal diameter of arista. Palpus and haustellum black with sparse gray pollen, long and slender.

Thorax black in ground color, with gray pollen, and patches of brown pollen, especially on dorsum. Me-

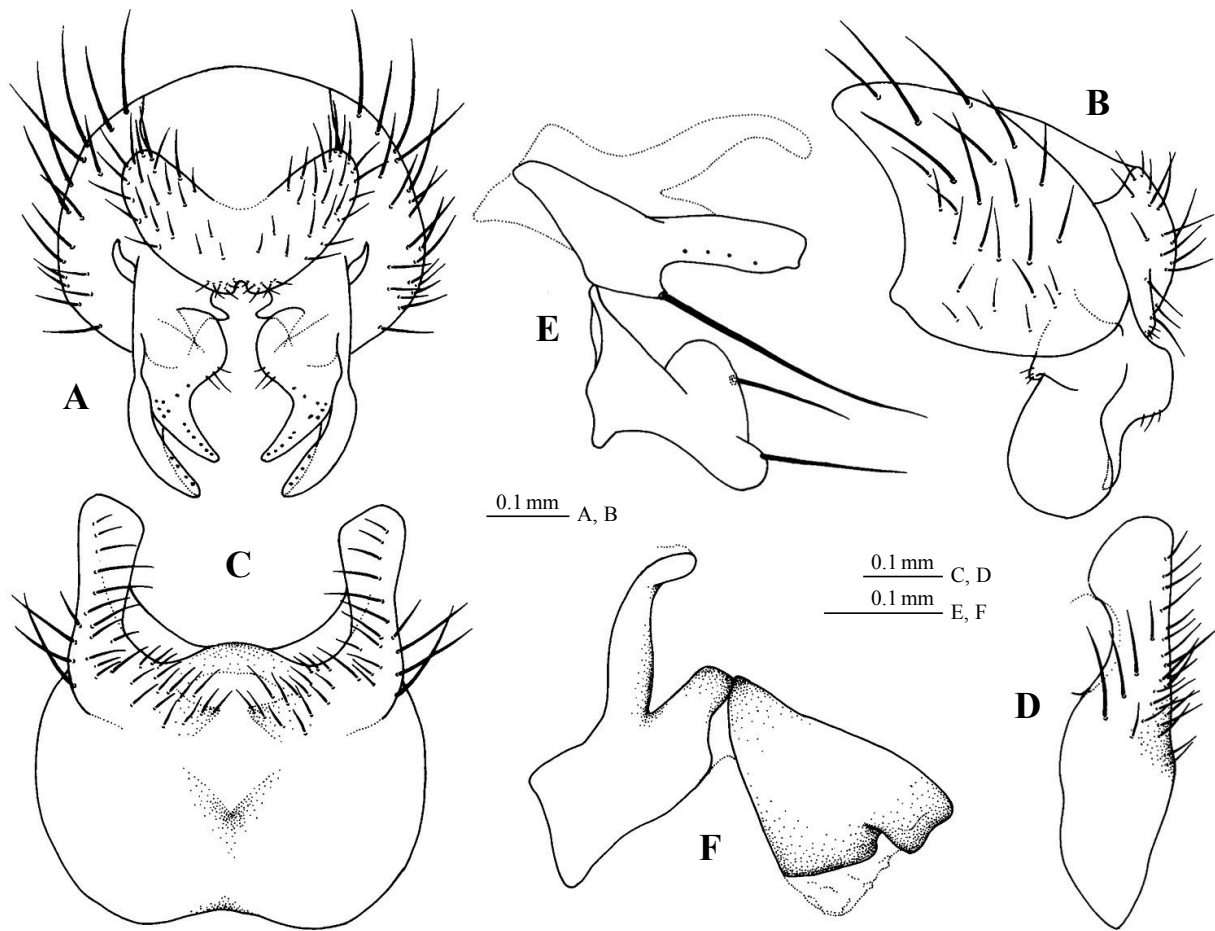


Fig. 90. *Pegomya bicolor* (Wiedemann, 1817), male. A, B. hypopygium; C, D. fifth sternite; E. gonocoxal lobe and gonostylus; F. phallus.

sonotum with 2 blackish paramedian vittae in caudal view; 5 pairs of *pre acr* and a few of additional setulae in row; the distance separating *pre acr* rows closer than to *dc*. Second *ph* and *pra* as long as or slightly longer than two thirds of anterior *ntpl*. Posterior *ntpl* about 0.8–0.9 times as long as anterior *ntpl*. Proepisternum with 3 *prepst*. Anepisternum with distinct upper anterior seta, and 2 *prepm*.

Legs brownish, fore femur and tarsi more amber; fore tibia with 1 *ad*, 1 *pv* and apical *pv*; mid tibia with 1 *ad*, 2 *pd*, and apical *av* and *pv*; hind tibia with 5 *ad*, 1 *av*, 4 *pd*, and apical *av*.

Wing hyaline; costal spine strong, about as long as humeral crossvein; m-m nearly straight. Calypter whitish yellow. Knob of halter pale yellow.

Abdomen with bluish gray pollen, and black narrow median vitta.

Length. Body 6.0–6.5 mm, wing 5.4–5.7 mm.

MATERIAL EXAMINED: [KPNU] <GB> 1 ex., Palgongsan, 6.vi.1978, YJ Kwon; 1 ex., Palgongsan, 20.vi.1978,

YJ Kwon; 1 ex., Daegu, 26.ix.1981, YJ Kwon; 1 ex., Daegu, 12.iv.1987, YJ Kwon; <GN> 1 ex., Keumsan, 20.iii.1982, YJ Kwon; [NIAST] <GB> 1 ex., Palgongsan, 2.vi.1979, YJ Kwon; 1 ex., Palgongsan, 6.vi.1978, YJ Kwon.

DISTRIBUTION: Korea, Japan (Hokkaido, Honshu, Kyushu, Shikoku), China (Gansu, Heilongjiang, Liaoning, Qinghai, Shanghai, Sichuan), Russia (Kamchatka, Kuril, Sakhalin), Syria, Israel, Europe, N.Africa.

LOCALITY: South-GB: Daegu, Palgongsan; GN: Geumsan (= Keumsan).

HOST: *Rumex acetosa*, *R. acetosella*, *R. obtusifolius* (cf. Suwa, 1971; Suwa, 1974).

91. *Pegomya cunicularia* (Rondani, 1866) (Fig. 91)

Chortophila cunicularia Rondani, 1866, Atti. Soc. Ital. Sci. 9: 163 (Italy).

Pegomya cunicularia: Michelsen, 1980: 301–303; Suwa, 1983b: 42; Suh & Kwon, 1985: 159, 160; Suh et al., 1985: 208; Kor. Soc. Plant Prot., 1986: 247; Suh, 1989: 53, 54; Dely-Draskovits, 1993: 79; Ent. Soc.

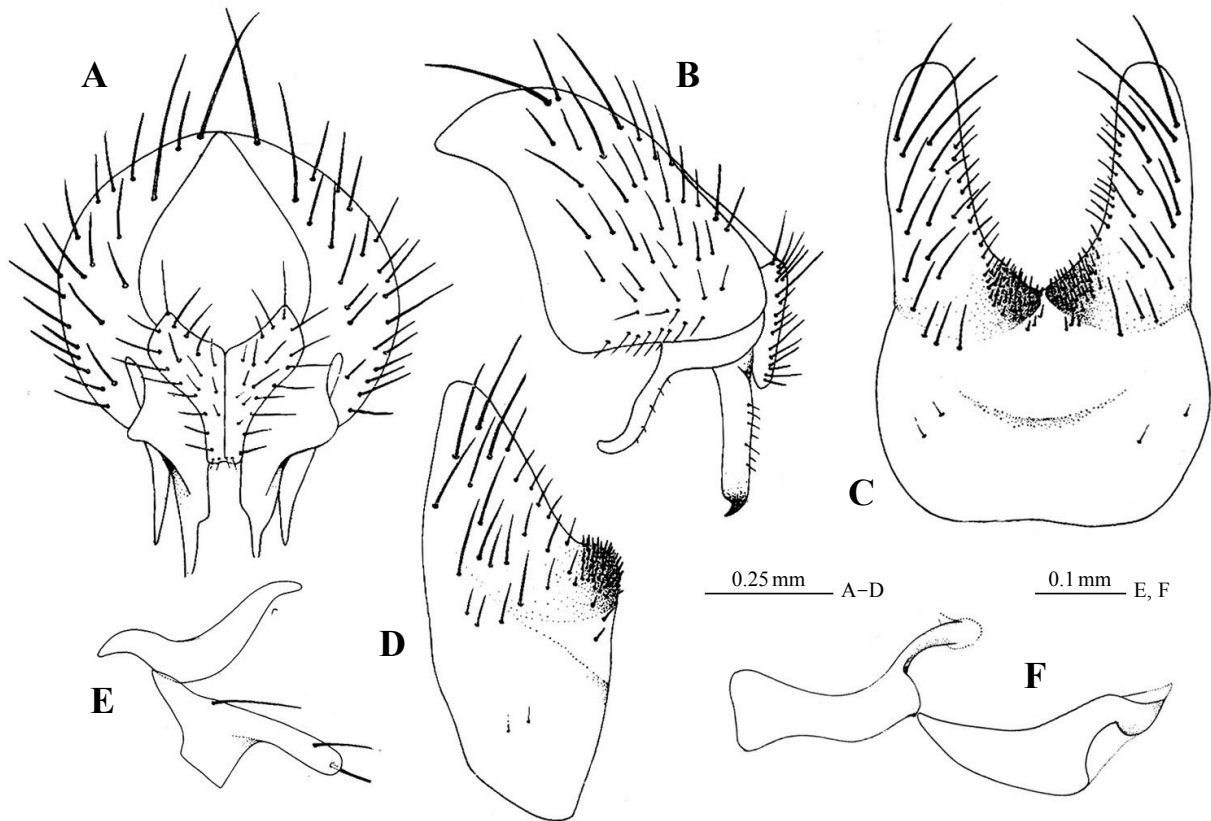


Fig. 91. *Pegomya cunicularia* (Rondani, 1866), male. A, B. hypopygium; C, D. fifth sternite; E. gonocoxal lobe and gonostylus; F. phallus.

Kor. & Kor. Soc. App. Ent., 1994: 304; Kwon et al., 1996: 224; Suwa, 1999: 232; Paek et al., 2010: 242; Suwa, 2013: 183; Han et al., 2014: 157.

Pegomya cunicularis (sic): Kwon & Suh, 1982b: 182, 183.

Pegomyia tristriata Stein, 1908: 106 (Canary Is).

Pegomya mixta Villeneuve, 1922: 52 (not given); Suwa, 1974: 192.

Pegomyia hyoscyami (nec Panzer): Yokoo, 1940: 198 (Korea); Ito, 1947: 269; Kato, 1950: 1683; Shiraki, 1958: 855; Paik, 1963: 207, 208; Fan, 1965: 45 (North-western Korea); Zool. Soc. Kor., 1968: 184; Hennig, 1973: 576–588, pls. 64(823), 84(973, 974); Suwa, 1981a: 107; Kim, 1984: 210; Suh & Kwon, 1985: 160; Kor. Soc. Plant Prot., 1986: 247; Park et al., 1986: 136; Suh, 1989: 56, 57; Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 304; Suh & Kwon, 1995: 196; Kwon et al., 1996: 224; Paek et al., 2010: 243; Han et al., 2014: 158.

Pegomyia hyoscyami (sic, nec Panzer): Lee et al., 1985: 429.

Pegomyia hyoscyami var. *betae* (nec Curtis): Kato, 1941: 56.

Pegomya betae (nec Curtis): Suwa, 1971: 263.

Male. Brownish black in ground color, with thin silver pollen. Head about 1.2–1.3 times as high as long in profile. Frons at narrowest part slightly wider than distance between posterior ocelli inclusive. Interfrontalia dull tinged with brown near lunule. Parafrontalia grayish brown, with 5–6 *ori*. Profrons grayish brown, about 1.6–1.7 times as wide as the width of third antennal segment. Parafacialia and cheek grayish brown; parafacialia narrowing slightly towards level of lower margin of eye. Antenna black, first and second segments more brown; third segment about 2.3–2.4 times as long as wide; arista distinctly pubescent, the longest hair more shorter than basal diameter of arista. Palpus yellow with blackish apex, long and slender. Haustellum black, and slight stout.

Thorax black in ground color, with grayish brown pollen, and patches of brown pollen, especially on dorsum. Mesonotum with 3 blackish vittae in caudal view; 3 pairs of *pre acr* and a few of additional setulae in row; the distance of *pre acr* rows closer than to *dc*. Second *ph* very weak, and indistinguishable from surrounding setulae. *Pra* as long as or slightly shorter than one third of anterior *ntpl*. Posterior *ntpl* about 0.6–0.7 times as long as anterior *ntpl*. Proepisternum with 2 *prepst*. Anepisternum with a distinct upper anterior seta, and 2 *prepm*.

Legs brownish, fore femur and tarsi more amber; fore tibia with 1 *pv* and apical *pv*; mid tibia with 1 *ad*, 1 *pd*, 2 *pv*, and apical *av* and *pv*; hind tibia with 5 *ad*, 1 *av*, 2 *pd*, and apical *av*.

Wing hyaline; costal spine indistinguishable from anterior setulae; m-m nearly straight. Calypter and knob of halter pale yellow.

Abdomen with bluish gray pollen, with black narrow median vitta.

Length. Body 5.3–6.0 mm, wing 4.7–5.0 mm.

MATERIAL EXAMINED: [KPNU] <GW> 5 exs., Ganghwado, 22.v.1989, YJ Kwon; <GB> 1 ex., Ulleungdo, 29.ix.1981, YJ Kwon; <GN> 1 ex., Myeongseok, 8.iv.1973, SH Park; 2 exs., Bangeojin, 10.iv.1982, YJ Kwon; 3 exs., Chilwon-myeon, 17.iv.1982, YJ Kwon; [NIAS] <GG> 1 ex., Suwon, vi.1972, JW So; 2 exs., Suwon, viii.1972, JW So; 1 ex., Suwon, vii.1973, GM Choi; 1 ex., Suwon, 20.v.1980, KR Choe; 1 ex., Suwon, 7.vi.1980, CG Yoo; 1 ex., Suwon, 27.ix.1974, YJ Kwon; 2 exs., Daejeon, 6.v.1970, YJ Kwon; <GN> 2 exs., Bangeojin, 10.iv.1982, YJ Kwon.

DISTRIBUTION: Korea, Japan (Hokkaido, Honshu, Kyushu), China (Beijing, Hebei, Heilongjiang, Hunan, Sichuan, Xinjiang), Russia (Sakhalin), Europe, N.Africa.

LOCALITY: Central-GG: Ganghwado, Suwon; GW: Jumunjin; CN: Daejeon; South-GB: Jangsa, Ulleungdo; GN: Bangeojin, Chilwon-myeon, Geumsan, Jangseungpo, Myeongseok-myeon.

HOST: *Atriplex* sp., *Beta vulgaris* (cf. Michelsen, 1980), *Chenopodium* spp. (cf. Suwa, 1970; Michelsen, 1980), *Spinacia oleracea* (cf. Suwa, 1970).

REMARKS: *Pegomya hyoscyami* (Panzer, 1809) are recorded in Korea as a pest of spinach, the range of this species seems restricted to Europe. Far East Asia records refer to other species-complex, such as *betae*, *cunucularis* and *exilis* (Michelsen, 1980; Fan, 1986). All the native records should be reexamined.

92. *Pegomya exilis* (Meigen, 1826) (Fig. 92)

Anthomyia exilis Meigen, 1826: 184 (Germany).

Pegomya exilis: Michelsen, 1980: 303, 304, figs. 3, 4, 14, 18, 19; Suh, 1989: 54, 55; Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 304; Kwon et al., 1996: 224; Paek et al., 2010: 243; Han et al., 2014: 157.

Chorthophila perforas Rondani, 1866: 156, 163 (Italy).

Male. Brownish black in ground color, with thin grayish pollen. Head about 1.1–1.2 times as high as long in profile. Frons at narrowest part equal to width of anterior ocellus. Interfrontalia and parafacialia fuscous, with 6 *ori*. Parafacialia and cheek brownish black, with gray pollen; parafacialia narrowing slightly towards level of lower margin of eye. Antenna black without first and second segments brown; third segment about 1.7–1.8 times as long as wide; arista distinctly pubescent, the longest hair more shorter than basal diameter of arista. Palpus brownish black with sparse gray pollen, long and slender. Haustellum brownish black.

Thorax black in ground color, with gray pollen, and patches of brown pollen, especially on dorsum. Mesonotum with 3 blackish vittae in caudal view; 4 pairs of *pre acr*, the distance separating *pre acr* rows closer than to *dc*. Posterior *ntpl* about one third as long as anterior *ntpl*. Proepisternum with 2 *prepst*. Anepisternum with 2 long and 2 additional *prepm*.

Legs brownish, tarsi more amber; fore tibia with 1 *pv* and apical *pv*; mid tibia with 1 *ad*, 1 *pd* and apical

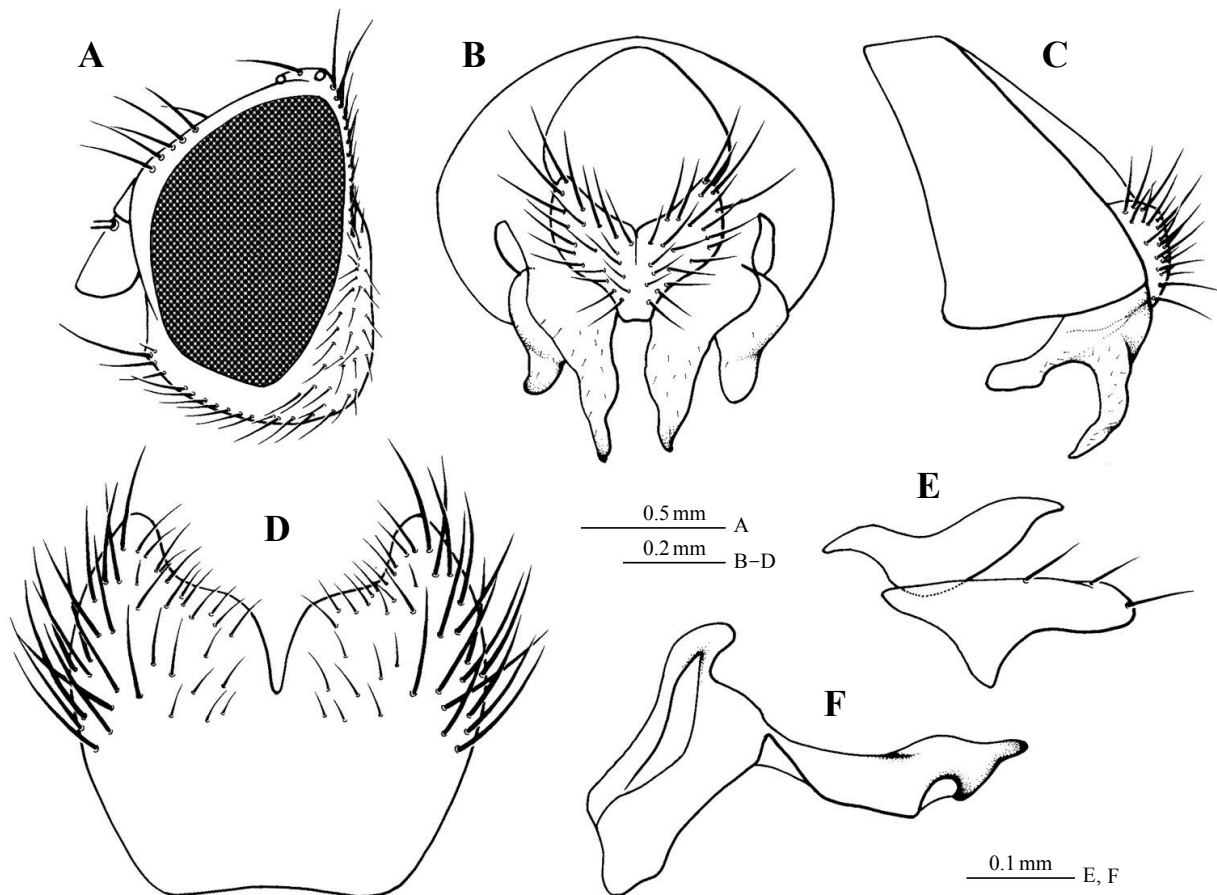


Fig. 92. *Pegomya exilis* (Meigen, 1826), male. A. head; B, C. hypopygium; D. fifth sternite; E. gonocoxal lobe and gonostylus; F. phallus.

av, and without apical *pv*; hind tibia with 5–6 *ad*, 1–2 *av*, 2–3 *pd*, and apical *av*.

Wing hyaline; costal spine indistinguishable from anterior setulae; m-m nearly straight. Calypter pale yellow. Knob of halter yellow.

Abdomen with brownish gray pollen, with black narrow median vitta.

Length. Body 5.0–5.5 mm, wing 4.5–4.8 mm.

MATERIAL EXAMINED: [KPNU] <GN> 7 exs., Jirisan, 8.viii.1987, YJ Kwon; [NIAS] <GN> 1 ex., Jirisan, 8.viii.1987, YJ Kwon.

DISTRIBUTION: Korea, Japan (Hokkaido, Honshu), China (Xizang), Europe.

LOCALITY: South-GN: Jirisan.

HOST: *Chenopodium album*, *C. polyspermum* (cf. Michelsen, 1980).

93. *Pegomya flavifrons* (Walker, 1849) (Fig. 93)

Eriphia flavifrons Walker, 1849: 966 (Canada: Ontario).

Pegomya (s.str.) *flavifrons*: Hockett, 1965: 127, 128.

Pegomya flavifrons: Suwa, 1983b: 42; Suh & Kwon, 1985: 158; Dely-Draskovits, 1993: 80; Kor. Soc. Plant Prot., 1986: 247; Suh et al., 1985: 208; Suh, 1989: 55, 56; Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 304; Kwon et al., 1996: 224; Suwa, 1999: 233; Paek et al., 2010: 243; Han et al., 2014: 158.

Anthomyia (*Pegomyia*) *albimargo* Pandellé, 1901: 296 (France: Tarbes and Paris).

Pegomya albimargo: Kwon & Suh, 1982d: 4.

Pegomyia villeneuviana Hendel, 1925: 302 (Austria: Wien).

Pegomyia fringilla Malloch, 1920: 181 (USA: Pennsylvania).

Pegomyia celosia Hering, 1932: 570 (Germany: Geisenheim).

Male. Brownish black in ground color, with thin grayish pollen. Head about 1.2–1.3 times as high as long in profile. Frons at narrowest part equal to width of anterior ocellus. Interfrontalia and parafrontalia dull, with 4–5 *ori*. Parafacialia and cheek brownish black, with gray pollen; parafacialia narrowing slightly towards level of lower margin of eye; cheek at narrowest part about 0.2–0.3 times as high as head height. Antenna black; third segment about 1.8–1.9 times as long as wide; arista distinctly pubescent, the longest hair more shorter than basal diameter of arista. Palpus black with brownish tint, long and slender. Haustellum brownish black.

Thorax black in ground color, with gray pollen, and patches of brown pollen, especially on dorsum. Mesonotum with 3 pairs of *pre acr*, the third setula longest, the distance separating *pre acr* rows closer than to *dc*. Posterior *ntpl* about one third as long as anterior *ntpl*. Proepisternum with 2 *prepst*. Anepisternum with a distinct upper anterior seta, and 2 *prepm*.

Legs brownish black; fore tibia with 1 *ad* and 1 *pv*; mid tibia with 1 *ad*, 2 *pd*, 2 *pv* and apical *av*, and without apical *pv*; hind tibia with 3 *ad*, 1 *av*, 2 *pd* and apical *av*, and without apical *pv*.

Wing faintly brownish tinged, denser basally; costal spine indistinguishable from anterior setulae; m-m nearly straight. Calypter pale yellow. Knob of halter yellowish brown.

Abdomen with brownish gray pollen, with black median vitta.

Length. Body 4.5–5.0 mm, wing 4.0–4.6 mm.

MATERIAL EXAMINED: [KPNU] <GB> 1 ex., Daegu, 30.iii.1984, YJ Kwon; 1 ex., Paribong, 11.v.2007, SJ Suh; <GN> 13 exs., Jirisan, 3.vi.1973, YS Park; 1 ex., Hwangmaesan, 6.vi.1998, SJ Suh; 1 ex., Odosan, 17.vii.2000, SJ Suh; <JN> 2 exs., Jogyesan, 5.vi.1983, YJ Kwon; 1 ex., Dolsando, 17.iv.1986, YJ Kwon; 1 ex., Dubongsan, 23.v.2003, SJ Suh; [NIAS] <GB> 1 ex., Daegu, 7.vi.1981, YJ Kwon; 1 ex., Daegu, 30.iii.1984,

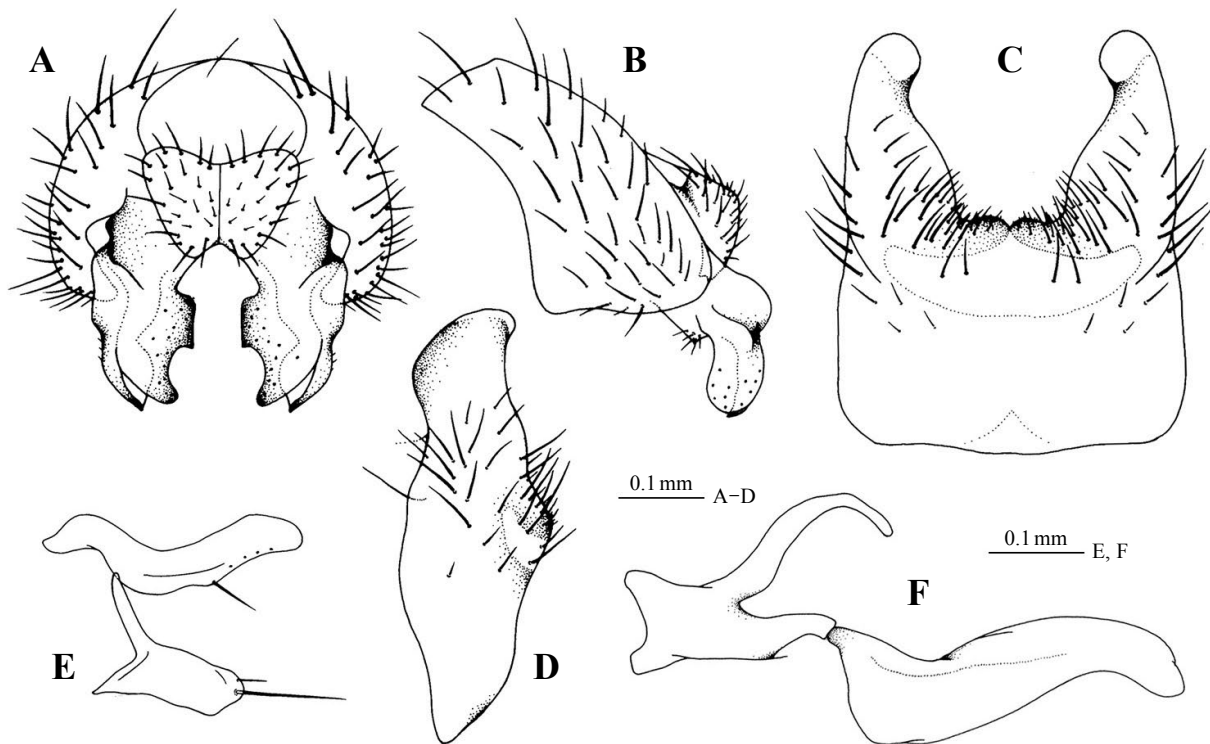


Fig. 93. *Pegomya flavifrons* (Walker, 1849), male. A, B. hypopygium; C, D. fifth sternite; E. gonocoxal lobe and gonostylus; F. phallus.

YJ Kwon.

DISTRIBUTION: Korea, Japan (Hokkaido, Honshu, Kyushu), China (Qinghai, Shanxi, Xinjiang), Europe, N.Africa, N. America.

LOCALITY: South-GB: Daegu, Paribong; GN: Hwangmaesan, Jirisan, Odosan; JN: Dolsando, Jogyesan, Dubongsan.

HOST: *Celosia* sp., *Cerastinum caspitosum* var. *glandulosum*, *Lychnis* spp., *Moehringia* sp., *Silene* spp. (cf. Hennig, 1974), *Melandrium* spp., *Stellaria media* (cf. Suwa, 1971; Hennig, 1973; Suwa, 1974).

94. *Pegomya holostea* (Hering, 1924) (Fig. 94)

Hylemyia holostea Hering, 1924: 232 (Germany: Berlin).

Pegomya holostea: Suh & Kwon, 2001: 167; Han et al., 2014: 158.

Pegomya cerastii Hering, 1931: 546.

Pegomya globosa Ringdahl, 1951: 34 (Sweden: Abisko).

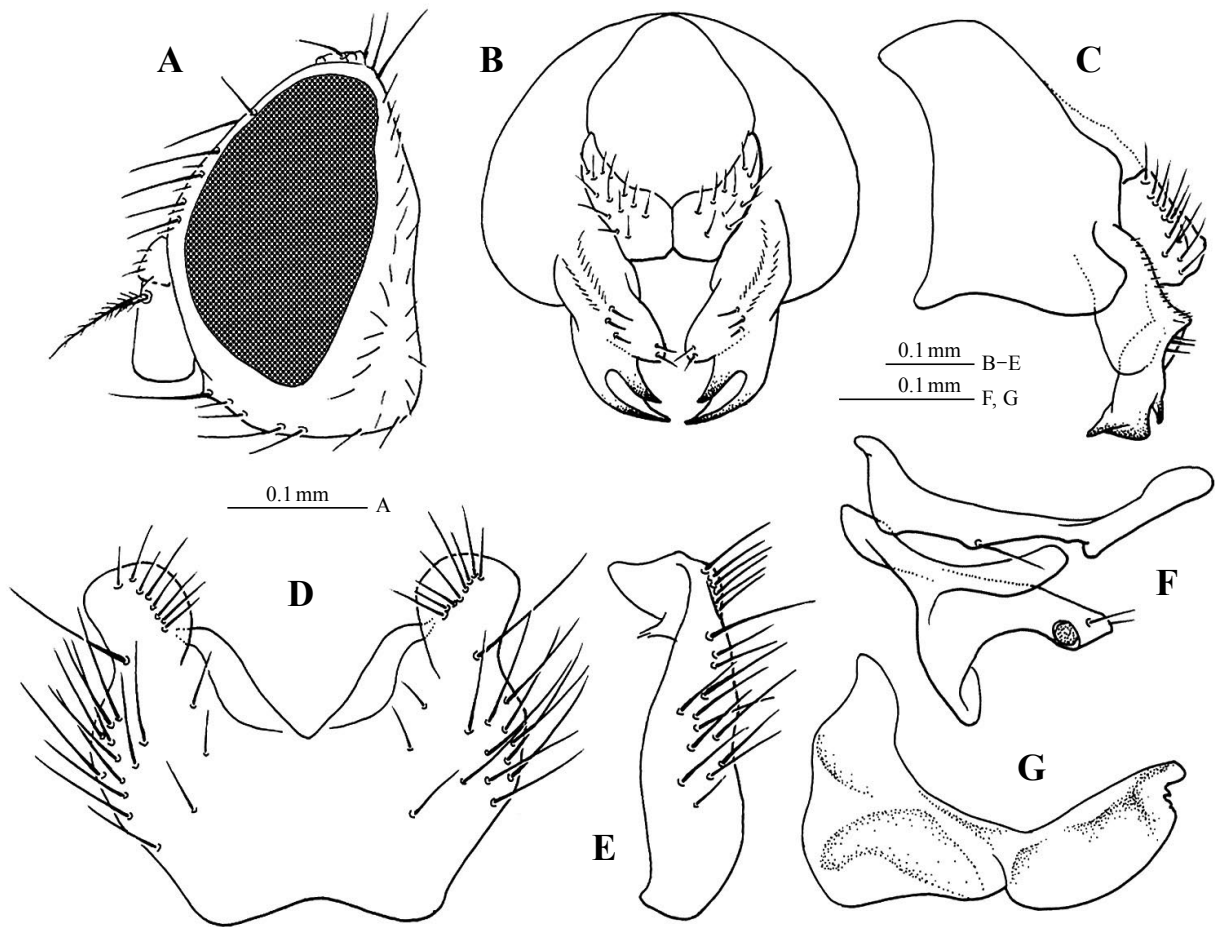


Fig. 94. *Pegomya holosteae* (Hering, 1924), male. A. head; B, C. hypopygium; D, E. fifth sternite; F. gonocoxal lobe and gonostylus; G. phallus.

Male. Black in ground color, with thin brownish pollen. Head about 1.5 times as high as long in profile. Frons at narrowest part nearly as wide as anterior ocellus. Interfrontalia dark, with a pair of proclinate cruciate *if*; parafrontalia dull, with 4 strong and some additional *ori*, and 1 fine *ors*. Parafacialia and cheek black; parafacial width about 0.6 times as wide as width of third antennal segments, Parafacialia narrowing slightly towards level of lower margin of eye; cheek at narrowest part about as high as width of third antennal segment, with 2–3 genal setae. Antenna black; third segment about 1.5 times as long as wide; arista shortly pubescent, the longest setula as long as basal diameter of arista. Haustellum and palpus black.

Thorax black in ground color, with brownish pollen, and patches of brown pollen, especially on dorsum; mesonotum with brownish median vitta presuturally in caudal view; 3 pairs of *pre acr*, the third pair longest, *pre acr* rows about 0.5 times as wide as width between *pre acr* and *dc* rows, with several fine irregular setulae between rows; post-acrostical setae slender, becoming longer in front of scutellum. Scutellum with some ventral setulae. Second *ph* strong and distinguishable from accessory setulae; *pra* slightly shorter than pos-

terior *ntpl*. Posterior *ntpl* as long as or slightly longer than anterior *ntpl*. Proepisternum with 2 *prepst*. Anepisternum with a distinct upper anterior seta, having 1 long and 2 additional *prepm*. *Kepst* 1:2.

Legs black; fore tibia with 1 *pv*; mid tibia with 1 *ad*, 1 *pd*, 1 *p* and 1 *pv*; hind tibia with 3 *ad*, 2 *av*, 2 *pd*, and strong apical *pd*.

Wing brownish tinged, denser basally; costal spine distinguishable from anterior setulae; m-m nearly straight. Calypter and knob of halter brown.

Abdomen black, depressed, and long-ovoid. Prebasal sclerite bare; fifth sternite with a lobe on each apex, having a series of setae.

Length. Body 5.2 mm, wing 4.6 mm.

MATERIAL EXAMINED: [KPNU] GB: 1 ex., Gapjongsan, Sangju-shi, 14.v.2000, SJ Suh.

DISTRIBUTION: Korea, Japan (Hokkaido, Honshu, Kyushu, Nansei Iss.), China (Liaoning), Europe, N. America.

LOCALITY: South-GB: Gapjongsan.

HOST: *Stellaria* spp. and *Cerastium* spp. (cf. Suwa, 1974).

95. *Pegomya pulchripes* (Loew, 1857) (Fig. 95)

Anthomyia pulchripes Loew, 1857: 104 (Germany).

Pegomya pulchripes: Hennig, 1973: 617–619; Suh & Kwon, 1986: 157, 158; Suh, 1989: 57, 58; Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 304; Kwon et al., 1996: 224; Michelsen, 2015: 71; Paek et al., 2010: 243; Suwa, 2013: 184; Han et al., 2014: 158.

Musca flavipes Fallén, 1825: 90 (nom. praeocc.).

Pegomyia flavipes var. *diluta* Stein, 1906: 71 (Italy: Sondrio).

Male. Black in ground color, with thin grayish pollen. Head about 1.3–1.4 times as high as long in profile. Frons at narrowest part equal to width of anterior ocellus. Interfrontalia dull tinged with brown near lunule; parafrontalia with 5 *ori*. Parafacialia and cheek black, with gray pollen; parafacialia narrowing slightly towards level of lower margin of eye. Antenna black without first and second segments brown; third segment about 2.0–2.1 times as long as wide; arista distinctly pubescent, the longest hair slightly longer than basal diameter of arista. Palpus and haustellum brown.

Thorax black in ground color, with brownish gray pollen, and patches of brown pollen, especially on dorsum. Mesonotum with 3 pairs of *pre acr*, the distance separating *pre acr* rows closer than to *dc*. Posterior *ntpl* about one third as long as anterior *ntpl*. Proepisternum with 2 *prepst*. Anepisternum with 2 long and 3 additional *prepm*.

Legs brownish black; fore tibia with 1 *ad* and 1 *pv*; mid tibia with 1 *pd*, 2 *pv* and apical *pv*, and without

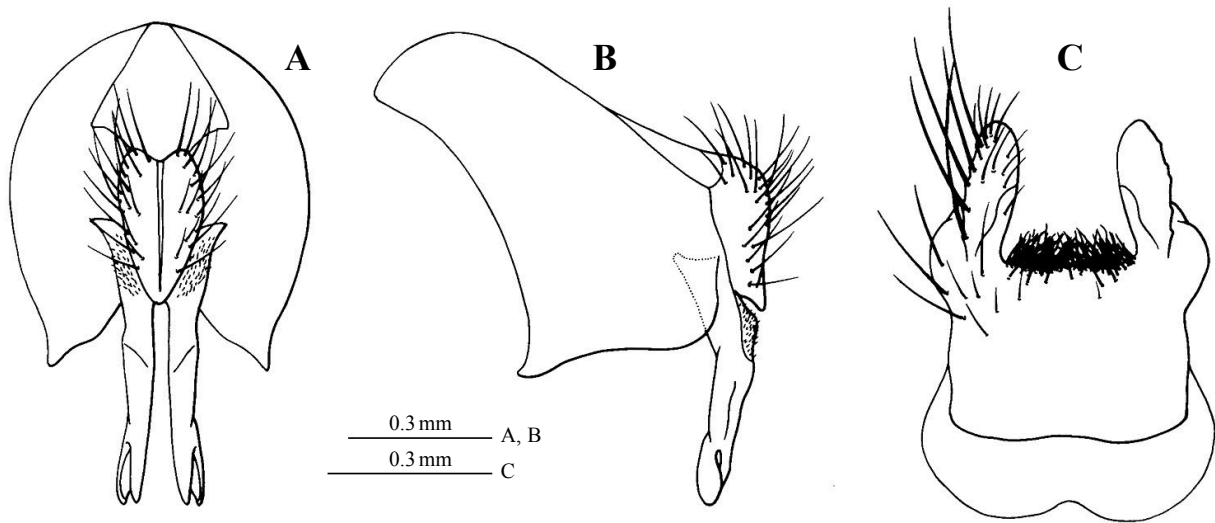


Fig. 95. *Pegomya pulchripes* (Loew, 1857), male. A, B. hypopygium; C. fifth sternite.

apical *av*; hind tibia with 4 *ad*, 1 *av* and 2 *pd*.

Wing faintly brownish tinged, denser basally; costal spine indistinguishable from anterior setulae; m-m slightly sinuate. Calypter pale yellow. Knob of halter yellowish brown.

Abdomen with brownish gray pollen.

Length. Body 6.0–7.5 mm, wing 5.3–5.8 mm.

MATERIAL EXAMINED: [KPNU] <GB> 1 ex., Gapjangan, 28.iv.2000, SJ Suh; <GN> 2 exs., Jirisan, 24.vii.1985, YJ Kwon.

DISTRIBUTION: Korea, Japan (Hokkaido, Honshu), China (Hebei, Sichuan), Russia (Kurils, Sakhalin), Europe.

LOCALITY: South-GB: Gapjangan; GN: Jirisan.

HOST: *Leccinum* sp. (cf. Michelsen, 2015).

96. *Pegomya quadrivittata* (Karl, 1935) (Fig. 96)

Pegomya quadrivittata Karl, 1935: 44 (Taiwan); Hennig, 1973: 619–621, pls. 67 (800), 72 (855), 81 (945); Suwa, 1981a: 107, 108; Suwa, 1981b: 15–28; Suwa, 1983b: 42, 43; Suh & Kwon, 1985: 157, 158; Suh et al., 1985: 208; Fan et al., 1988: 354; Suh, 1989: 58, 59; Dely-Draskovits, 1993: 84; Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 304; Kwon et al., 1994: 266; Kwon et al., 1996: 224; An, 1996: 61; An, 1998: 62; Wei et al., 1996: 796; Suwa, 1999: 231; Paek et al., 2010: 243; Han et al., 2014: 159.

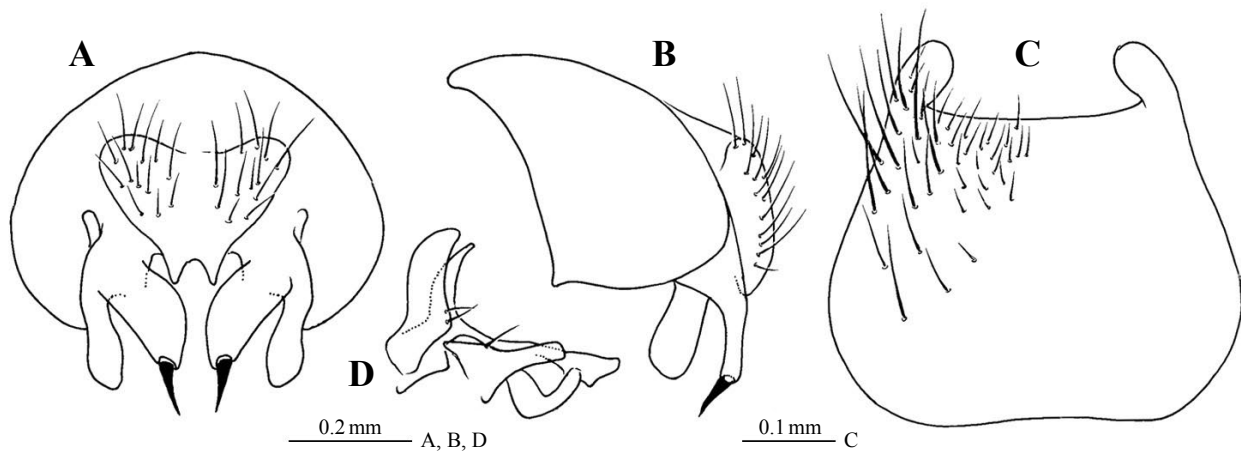


Fig. 96. *Pegomya quadrivittata* (Karl, 1935), male. A, B. hypopygium; C. fifth sternite; D. gonocoxal lobe, gonostylus and phallus.

Male. Black in ground color, with thin grayish pollen. Head about 1.2 times as high as long in profile. Frons at narrowest part equal to width of anterior ocellus. Interfrontalia fuscous; parafrontalia with 4 *ori*. Parafacialia and cheek black, with gray pollen; parafacialia narrowing slightly towards level of lower margin of eye. Antenna black; third segment about 2.4–2.5 times as long as wide; arista distinctly pubescent, the longest hair slightly longer than basal diameter of arista. Palpus and haustellum black.

Thorax black in ground color, with brownish gray pollen, and patches of brown pollen, especially on dorsum. Mesonotum with four paler blackish vittae presuturally in caudal view; 4–5 pairs of *pre acr*, the distance separating *pre acr* rows closer than to *dc*. Second *ph* strong, about 1.1–1.2 times as long as anterior *ntpl*. Posterior *ntpl* about one third as long as anterior *ntpl*. Proepisternum with 2 long and 1 additional *prepst*. Anepisternum with a distinct upper anterior seta, and 2 *prepm*.

Legs yellowish brown, fore femora and tarsi more amber; fore tibia with 1 *ad*, 1 *pv* and apical *pv*; mid tibia with 1 *ad*, 1 *pd*, 3 *p* and strong apical *pv*; hind tibia with 3 *ad*, 3 *av*, 3 *pd*, and 1–2 *pv*.

Wing faintly brownish tinged, denser basally; costal spine indistinguishable from anterior setulae; m-m nearly straight. Calypter whitish yellow. Knob of halter yellow.

Abdomen with brownish gray pollen, with black narrow median vitta.

Length. Body 6.0–8.0 mm, wing 6.0–7.5 mm.

MATERIAL EXAMINED: [KPNU] <GG> 2 exs., Gangwhado, 10.v.1982, YJ Kwon; 2 exs., Myeongseongsan, 16.v.1982, YJ Kwon; 1 ex., Soyosan, 21.v.1989, YJ Kwon; <GW> 1 ex., Obongsan, 18.v.1981, YJ Kwon; 5 exs., Obongsan, 17.v.1981, YJ Kwon; 1 ex., Duwonbong, 9.vi.2000, SJ Suh; <GB> 1 ex., Palgongsan, 27.v.1975, YJ Kwon; 1 ex., Palgongsan, 23.v.1981, YJ Kwon; 5 exs., Sobaeksan, 15.v.1981, YJ Kwon; 1 ex., Sobaeksan, 6.vi.1986, YJ Kwon; 27 exs., Irweolsan, 28–29.v.1984, TH Jo; 17 exs., Naeyeonsan, 30.iv.1981,

SH Park; 6 exs., Naeyeonsan, 30.iv.1981, SR Sohn; 2 exs., Naeyeonsan, 14.v.1981, SH Park; 3 exs., Naeyeonsan, 4.vi.1981, SH Park; 1 ex., Naeyeonsan, 18.vi.1981, SH Park; 1 ex., Geumosan, 25.v.1983, SH Park; 1 ex., Geumosan, 16.viii.1983, TH Jo; 1 ex., Geumosan, 9.viii.1983, TH Jo; 5 exs., Palgongsan, 28.vii.1998, SJ Suh, on *Persicaria nepalensis*; 1 ex., Eungbongsan, 6.v.2000, SJ Suh; 1 ex., Daeryongsan, 28.iv.2007, SJ Suh; <GN> 1 ex., Gayasan, 26.vi.1982, YJ Kwon; 2 exs., Ssanggye, 28.v.1973, JS Park; 1 ex., Hwangmaesan, 7.viii.1998, SJ Suh; <JB> 1 ex., Maisan, 11.v.1980, YJ Kwon; 1 ex., Maisan, 11.v.1984, YJ Kwon; [NIBR] <GB> 1 ex., Palgongsan, 28.vii.1998, SJ Suh, on *Persicaria nepalensis*; [NIAS] <GB> 1 ex., Palgongsan, 27.v.1975, YJ Kwon; 1 ex., Palgongsan, 23.v.1981, YJ Kwon.

DISTRIBUTION: Korea, Japan (Hokkaido, Honshu, Kyushu, Shikoku, Nansei Iss.), China (Fujian, Guangdong, Henan, Liaoning, Sichuan, Yunnan, Xizang), Taiwan, India, Malaysia, Myanmar, Sri Lanka.

LOCALITY: Central-GG: Ganghwado, Myeongseongsan, Soyosan; GW: Obongsan, Odaesan, Duwonbong; South-GB: Bohyeonsan, Daegu, Irweolsan, Naeyeonsan, Palgongsan, Sobaeksan, Eungbongsan, Daeryongsan; GN: Gayasan, Hwangmaesan, Ssanggye; JB: Maisan.

HOST: *Persicaria filiforme* (cf. Suwa, 1974), *P. nephalense*, *P. sieboldi*, *P. thunbergi* (cf. Suwa, 1971, 1974; Hennig, 1973), *Rumex acetosa*.

97. *Pegomya rubivora* (Coquillett, 1897) (Fig. 97)

Phorbia rubivora Coquillett, 1897, Can. Ent. 29: 162 (USA: New York).

Pegomya rubivora: Hockett, 1924: 47; Hennig, 1973: 621–624, pls. 66 (787), 74 (873), 78 (916); Suwa, 1983b: 43; Suh & Kwon, 1985: 158, 159; Suh, 1989: 59; Dely-Draskovits, 1993: 84; Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 305; Kwon et al., 1994: 267; Kwon et al., 1996: 224; Suwa, 1999: 236; Paek et al., 2010: 243; Han et al., 2014: 159.

Anthomyia (Chortophila) dentiens Pandellé, 1900: 268 (France: Landes).

Chortophila laticornis Stein, 1914: 50 (Germany).

Chortophila rubicola Enderlein, 1933: 327 (Germany).

Male. Black in ground color, with thin grayish pollen. Head about 1.6 times as high as long in profile. Frons at narrowest part equal to width of anterior ocellus. Interfrontalia and parafrontalia dull, 5–6 *ori*. Parafacialia and cheek black, with gray pollen; parafacialia narrowing slightly towards level of lower margin of eye. Antenna black; third segment about 1.7 times as long as wide; arista distinctly pubescent, the longest hair slightly longer than basal diameter of arista. Palpus and haustellum black.

Thorax black in ground color, with brownish gray pollen, and patches of brown pollen, especially on dorsum. Mesonotum with paler blackish vittae between *pre acr* and *dc* rows in caudal view; 3 pairs of *pre acr* and a few of additional setulae in rows, the distance separating *pre acr* rows closer than to *dc*. Posterior *ntpl*

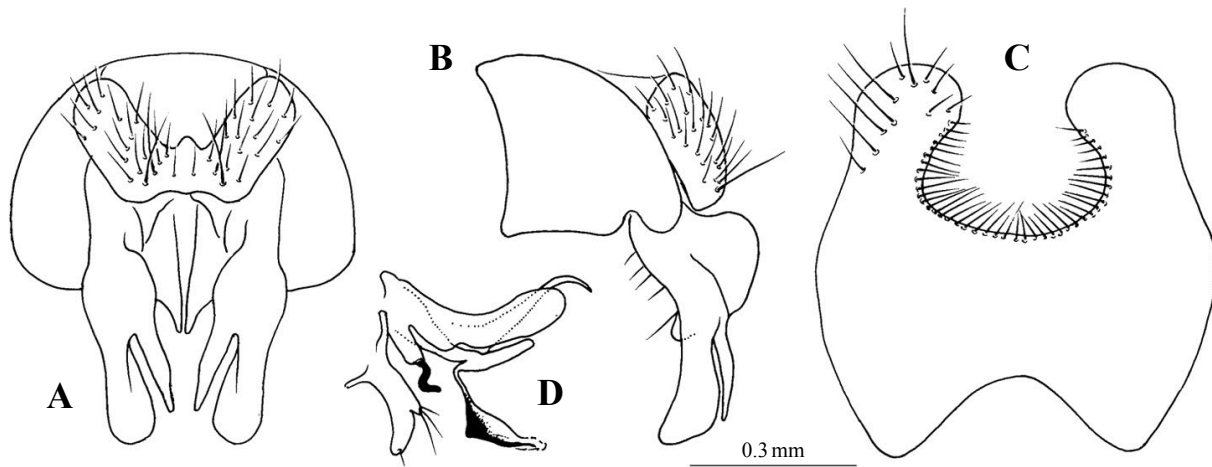


Fig. 97. *Pegomya rubivora* (Coquillett, 1897), male. A, B. hypopygium; C. fifth sternite; D. gonocoxal lobe, gonostylus and phallus.

about one third as long as anterior *ntpl*. Proepisternum with 2 *prepst*. Anepisternum with 2 *prepm*.

Legs black; fore tibia with 1 *ad* and 2 *pv*; mid tibia with 1 *ad*, 3 *d*, 1 *pd* and strong apical *av*; hind tibia with 3 *ad*, 1 *av*, 2 *pd*.

Wing hyaline; costal spine indistinguishable from anterior setulae; m-m nearly straight. Calypter whitish yellow. Knob of halter yellow.

Length. Body 5.8–7.0 mm, wing 5.5–6.3 mm.

MATERIAL EXAMINED: [KPNU] <GB> 1 ex., Palgongsan, 7.v.1983, YJ Kwon; 1 ex., Munsusan, 7.v.2007, SJ Suh; <GN> 1 ex., Jirisan, 27.v.1976, YJ Kwon.

DISTRIBUTION: Korea, Japan (Hokkaido, Honshu), China (Heilongjiang, Liaoning), Russia (Kamchatka), Europe, N. America.

LOCALITY: Central-GW: Odaesan; South-GB: Palgongsan, Munsusan; GN: Jirisan.

HOST: *Filipendula ulmaria*, *Rubus idaeus* (cf. Hennig, 1973).

98. *Pegomya rufina* (Fallén, 1825) (Fig. 98)

Musca rufina Fallén, 1825, Mon. Musc. Svec. 9: 92 (Sweden).

Pegomya rufina: Ringdahl, 1959: 250; Hennig, 1973: 626–629; Suh & Kwon, 1986: 158; Suh et al., 1985: 208; Suh, 1989: 60; Dely-Draskovits, 1993: 84, 85; Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 304; Kwon et al., 1996: 224; An, 1998: 62; Paek et al., 2010: 243; Han et al., 2014: 159.

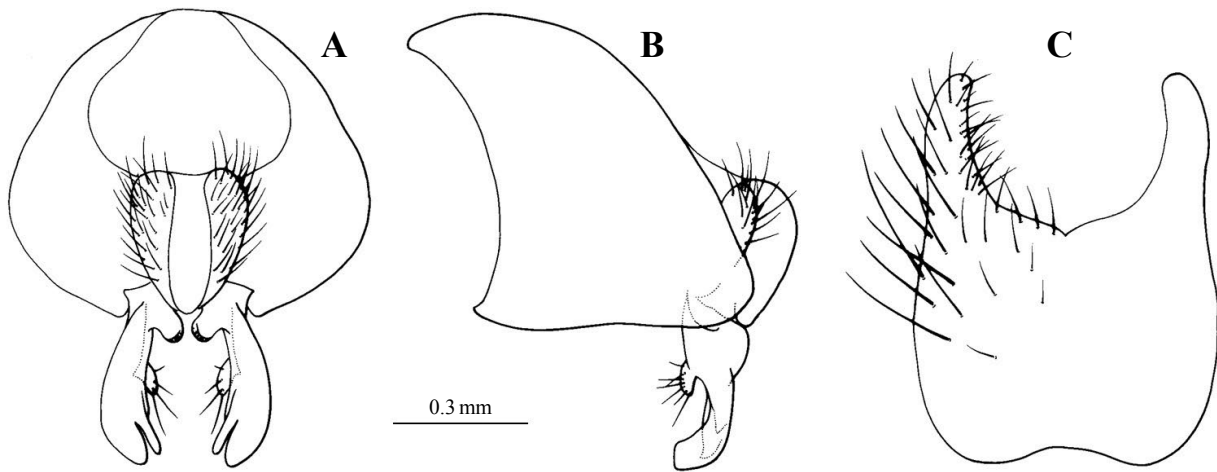


Fig. 98. *Pegomya rufina* (Fallén, 1825), male. A, B. hypopygium; C. fifth sternite.

Anthomyza ochreata Zetterstedt, 1838: 697 (Sweden).

Anthomyza guttfrons Zetterstedt, 1846: 1772 (Sweden: Ostrogothia and Westrogothia).

Anthomyia damianitschi Schiner, 1865: 998 (not given).

Pegomyia squamifera Stein, 1906: 63 (Germany: Genthin and Berlin).

Male. Black in ground color, with thin grayish pollen. Head about 1.5–1.6 times as high as long in profile. Frons at narrowest part equal to width of anterior ocellus. Interfrontalia dull tinged with brown near lunule; parafacialia with 4 *ori*. Parafacialia and cheek black, with gray pollen; parafacialia narrowing slightly towards level of lower margin of eye. Antenna black; third segment about 2.5 times as long as wide; arista distinctly pubescent, the longest hair slightly longer than basal diameter of arista. Palpus and haustellum black.

Thorax black in ground color, with brownish gray pollen, and patches of brown pollen, especially on dorsum. Mesonotum with 3 pairs of *pre acr*, the distance separating *pre acr* rows closer than to *dc*. Posterior *ntpl* about one third as long as anterior *ntpl*. Proepisternum with 2 *prepst*. Anepisternum with a distinct upper anterior seta and, 2 long and 6 additional *prepm*.

Legs black; fore tibia with 1 *ad* and 1 *pv*; mid tibia with 1 *ad*, 2–3 *pd*, and strong apical *av* and *pv*; hind tibia with 4 *ad*, 1 *av*, and 2 *pd*.

Wing faintly brownish tinged, denser basally; costal spine indistinguishable from anterior setulae; m-m nearly straight. Calypter and knob of halter brownish yellow.

Length. Body 6.0–7.3 mm, wing 5.0–6.0 mm.

MATERIAL EXAMINED: [KPNU] <GB> 1 ex., Sobaeksan, 10.v.1985, YJ Kwon; 1 ex., Geumosan, 22.vi.1983, SH Park.

DISTRIBUTION: Korea, Japan (Hokkaido), China (Shaanxi), Russia, Europe, N. America.

LOCALITY: South-GB: Geumosan, Sobaeksan.

HOST: *Boletus variegatus*, *Psalliota flavescens* (cf. Hennig, 1973).

99. *Pegomya spiraculata* Suwa, 1974 (Fig. 99)

Pegomya spiraculata Suwa, 1974: 207, 208 (Japan); Suwa & Park, 1982: 502; Suh & Kwon, 1985: 157; Suh, 1989: 60; Dely-Draskovits, 1993: 86; Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 304; Suh & Kwon, 1995: 196; Kwon et al., 1996: 224; Suwa, 1999: 237; Suwa, 2005: 105; Paek et al., 2010: 243; Han et al., 2014: 159.

Male. Black in ground color, with thin grayish pollen. Head about twice as high as long in profile. Frons at narrowest part equal to width of anterior ocellus. Interfrontalia and parafrontalia dull, with 4 *ori*. Parafacialia and cheek black, with gray pollen; parafacialia narrowing slightly towards level of lower margin of eye. Antenna black; third segment about 3.0 times as long as wide; arista distinctly pubescent, the longest hair slightly longer than basal diameter of arista. Palpus black with brownish tint, long and slender. Haustellum black, and stout.

Thorax black in ground color, with brownish gray pollen, and patches of brown pollen, especially on dorsum. Mesonotum with 3 pairs of *pre acr* and a few of additional setulae in rows, the distance separating *pre acr* rows about 1.5 times as wide as distance between *pre acr* and *dc* rows. Posterior *ntpl* as long as anterior *ntpl*. Proepisternum with 2 and 1 additional *prepst*. Anepisternum with 2 long and a few of additional *prepm*.

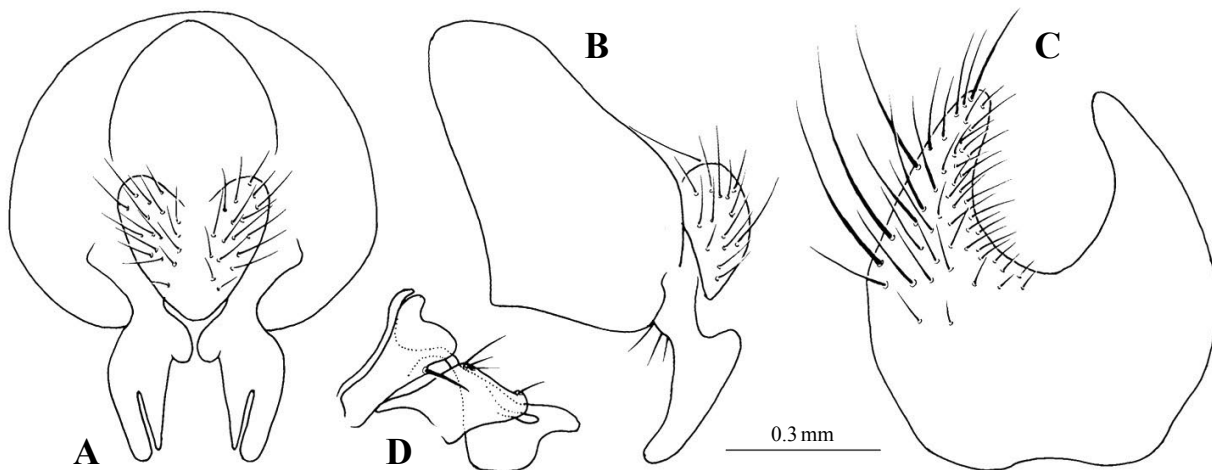


Fig. 99. *Pegomya spiraculata* Suwa, 1974, male. A, B. hypopygium; C. fifth sternite; D. gonocoxal lobe, gonostylus and phallus.

Legs brown; fore tibia with 1 *pv*; mid tibia with 1 *ad*, 1 *pd*, 2 *pv*, and strong apical *av* and *pv*; hind tibia with 4 *ad*, 1 *av*, 2 *pd*, and apical *av*.

Wing faintly brownish tinged, denser basally; costal spine indistinguishable from anterior setulae; m-m slightly sinuate. Calypter pale brown; the lower calypter rather protruding beyond the upper one. Knob of halter brown.

Abdomen with brownish gray pollen; second segment brown, third segment fuscous tinged.

Length. Body 6.0–7.0 mm, wing 5.5–6.0 mm.

MATERIAL EXAMINED: [KPNU] <JJ> 1 ex., Seongpanak, 19.vi.1973, SH Park; 3 exs., Seongpanak, 19.vi.1973, JS Park; 1 ex., Hallasan, 18.vi.1973, SH Park; [NIAST] <JJ> 1 ex., Seongpanak, 19.vi.1973, JS Park.

DISTRIBUTION: Korea, Japan (Hokkaido, Honshu, Kyushu), China (Liaoning).

LOCALITY: Jeju-JJ: Hallasan (= Soungpanak).

100. *Pegomya winthemi* (Meigen, 1826) (Fig. 100)

Anthomyia winthemi Meigen, 1826: 186 (Europe).

Pegomya winthemi: Suh et al., 1991: 203, 204; Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 304; Kwon et al., 1996: 224; Paek et al., 2010: 243; Han et al., 2014: 159.

Sapromyza blepharopteroides Dufour, 1839: 42 (not given).

Anthomyia scutellaris Roser, 1840: 59 (not given).

Anthomyia latitarsis Zetterstedt, 1846: 1754 (Sweden: Skåne).

Anthomyia digitaria Rondani, 1866: 152 (Italy).

Pegomyia winthemi var. *obscura* Stein, 1906: 62 (Austria).

Pegomyia fuscofasciata Malloch, 1920: 178 (USA: Massachusetts).

Male. Black in ground color with brownish gray pollen. Head 1.5–1.7 times as high as long in profile. Interfrontalia linear and convergent caudad. Parafrontalia armed with 2–3 *ori*. Antenna yellow; third antennal segment 1.8–2.2 times as long as wide, having shortly pubescent arista.

Apex of scutellum and humeral callus tinged with brown to yellow; second *ph* 0.3–0.6 times as long as first *ph*; *pra* as long as or slightly shorter than posterior *ntpl*. Anepisternum with a distinct upper anterior seta, and having 1 long and 3 fine *prepm*. *Kepst* 2:2.

Femora and tibiae yellow, tarsi dark brown; fore tibia with 1 *ad*, 1–2 *pv*; mid tibia with 1 *ad* and 2 *pv* hind tibia with 3 *ad*, 2 *av* and 2 *pv*.

Wing faintly brown. Calypter yellow; the lower calypter much protruding beyond the upper one. Knob of halter brown.

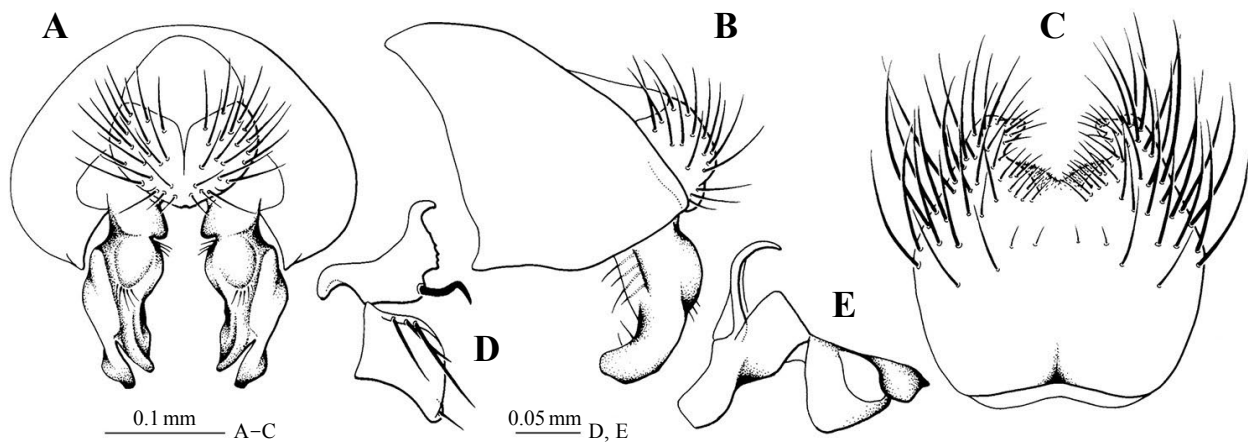


Fig. 100. *Pegomya winthemi* (Meigen, 1826), male. A, B. hypopygium; C. fifth sternite; D. gonocoxal lobe and gonostylus; E. phallus.

Abdomen brown, with black hind marginal band on each segment.

Length. Body 5.6–5.8 mm, wing 5.5–5.6 mm.

MATERIAL EXAMINED: [KPNU] <GB> 8 exs., Geumosan, 15.vi.1983, SH Park; 2 exs., Geumosan, 22.vi.1983, TH Jo; 4 exs., Geumosan, 12.vii.1983, TH Jo; [NIAS] <GB> 1 ex., Geumosan, 29.vi.1983, TH Jo.

DISTRIBUTION: Korea, Japan (Hokkaido, Honshu, Kyushu), China (Heilongjiang, Liaoning), Russia (Sakhalin), Czechoslovakia, Denmark, Finland, France, Germany, Hungary, Italy, Norway, Spain, U.K., Russia, Yugoslavia, N. America.

LOCALITY: South-GB: Geumosan.

HOST: The larva lives on *Agaricus* spp., *Armillaria mellea*, *Boletus* spp., *Inocybe* spp. and *Muscidula* spp. (cf. Hennig, 1973).

Genus *Pegoplata* Schnabl et Dziedzicki, 1911

Gymnogaster Lioy, 1864: 989 (nom.praeocc.). Type-species: *Anthomyia infirma* Meigen, 1826 (not given).

Pegoplata Schnabl et Dziedzicki, 1911: 108, 109 (as subgenus of *Pegomyia*). Type-species: *Pegomyia palposa* Stein, 1897 (Germany).

Nudaria Karl, 1928: 171 (nom.praeocc., subgenus *Chortophila*). Type-species: *Anthomyia infirma* Meigen, 1826 (not given).

Nupedia Karl, 1930: 174 (as subgenus *Chortophila*). Type-species: *Anthomyia infirma* Meigen, 1826 (not given).

Psiloplastinx Enderlein, 1936: 199 (as subgenus *Chortophila*). Type-species: *Anthomyia infirma* Meigen, 1826 (not given).

DIAGNOSIS: Head dimorphic sexually; in male, the eye only narrowly separated; *if* normally well developed in both sex; palpus blade-like; additional *ntpl* setulae absent; scutellum with two long marginal pairs of setae and a shorter discal pair, and with fine pubescence on ventral surface; prosternum and meron bare; hind tibia without apical *pv*; fifth sternite flat and slightly heart-shaped with dense inner fields of short setulae or spinules; hypandrium consists of a triangular horizontal plates and relatively short vertical arms; ejaculatory apodeme small and slender, 0.2–0.5 times as long as aedeagal apodeme (Griffiths, 1986).

Key to species of Korean *Pegoplata*

1. Palpus slender 2
1. Palpus blade-like 3
2. Palpus elongate *P. debilis*
2. Palpus distinctly broadened at apex *P. nigroscutellata*
3. Lower calypter protruding beyond the upper one; fore tibia wholly black; second *ph* rather distinct
..... *P. palposa*
3. Lower calypter not protruding beyond the upper one; fore tibia brown at base; second *ph* very fine
..... *P. annulata*

101. *Pegoplata annulata* (Pandellé, 1899) (Fig. 101)

Anthomyia (*Hylemyia*) *annulata* Pandellé, 1899: 21 (Germany).

Pegoplata annulata (Pandellé, 1899): Suwa, 2013: 186.

Pegomyia (*Pegoplata*) *virginea nitidicauda* Schnabl & Dziedzicki, 1911: 268.

Pegoplata virginea (nec Meigen): Suwa, 1981a: 108; Suwa, 1983b: 40; Suh & Kwon, 1985: 166; Suh et al., 1985: 209; Fan et al., 1988: 275; Suh, 1989: 69; Suh et al., 1991: 43; Dely-Draskovits, 1993: 92; Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 304; Kwon et al., 1994: 267; Kwon et al., 1996: 224; Paek et al., 2010: 243.

Pegoplata juvenilis (nec Stein): Wei et al., 1996: 768; Suwa, 1999: 238; Han et al., 2014: 160.

Male. Black in ground color, with thin grayish pollen. Head about 1.2–1.3 times as high as long in profile. Frons much wider than ocellus. Interfrontalia dull tinged with brown, a pair of proclinate fine *if*; parafrofrontalia with 5 *ori*. Parafacialia and cheek black, with gray pollen. Antenna black; third segment about 2.2–2.3 times as long as wide; arista distinctly plumose, the longest hair about 5.0 times as long as basal diameter of

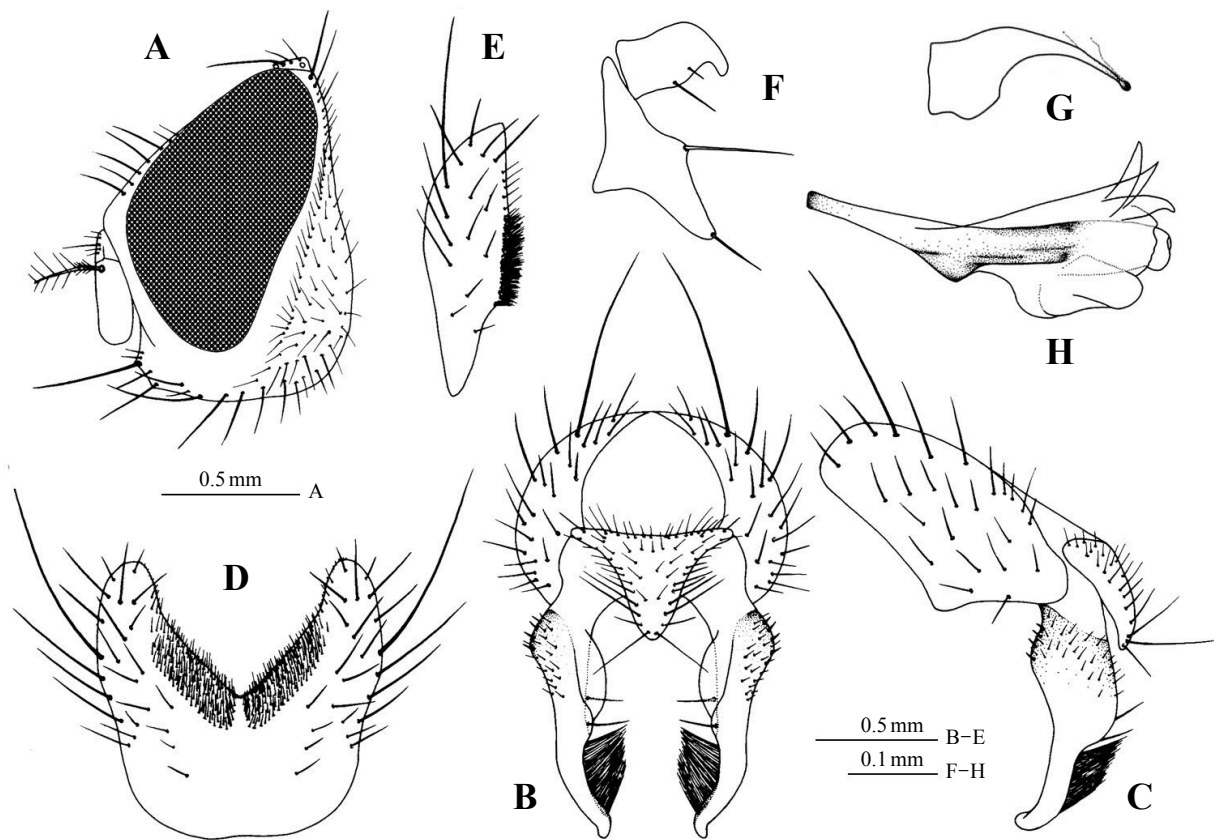


Fig. 101. *Pegoplata annulata* (Pandellé, 1899), male. A. head; B, C. hypopygium; D, E. fifth sternite; F. gonocoxal lobe and gonostylus; G. ephiphallus and basiphallus; H. distiphallus.

arista. Palpus black, long and blade. Haustellum black with sparse gray pollen, and stout.

Thorax black in ground color, with gray pollen, and patches of brown pollen, especially on dorsum. Mesonotum with 3 pale brownish black median vittae presuturally in caudal view; 3 pairs of *pre acr* and several fine irregular setulae between rows, the distance separating *pre acr* rows about as wide as distance between *pre acr* and *dc* rows. Second *ph* strong, about 1.2 times as long as anterior *ntpl*. Posterior *ntpl* about one third as long as anterior *ntpl*. Proepisternum with 2 *prepst*. Anepisternum with a distinct upper anterior seta and, 2 long and 3 additional *prepm*.

Legs black; fore tibia with 1 *ad* and 1–2 *pv*; mid tibia with 2 *ad*, 1 *d*, 1 *pd*, and strong apical *av* and *pv*; hind tibia with 2 *ad*, 1 *av* and 2 *pd*.

Wing faintly brownish tinged, denser basally; costal spine indistinguishable from anterior setulae; m-m slightly sinuate. Calypter pale brown; the lower calypter slightly protruding beyond the upper one. Knob of halter yellow.

Abdomen with bluish gray pollen, with black narrow median vitta.

Length. Body 5.5–7.5 mm, wing 4.5–6.0 mm.

MATERIAL EXAMINED: [KPNU] <GW> 12 exs., Obongsan, 17.v.1981, YJ Kwon; 3 exs., Seoraksan, 29.vii.1983, YJ Kwon; 1 ex., Seoraksan, 30.vi.1984, YJ Kwon; 1 ex., Obongsan, 12.v.1985, YJ Kwon; 1 ex., Seoraksan, 23.v.1989, YJ Kwon; 4 exs., Eungbongsan, 6.v.2000, SJ Suh; 4 exs., Samyeongsan, 11.v.2003, SJ Suh; <CB> 4 exs., Woraksan, 27.vi.1987, YJ Kwon; <CN> 1 ex., Chilgapsan, 3.vii.2009, SJ Suh; <GB> 2 exs., Palgongsan, 10.v.1982, YJ Kwon; 5 exs., Palgongsan, 29.v.1985, YJ Kwon; 3 exs., Palgongsan, 27.v.1985, YJ Kwon; 2 exs., Palgongsan, 26.v.1985, YJ Kwon; 1 ex., Palgongsan, 18.vi.1985, YJ Kwon; 2 exs., Palgongsan, 19.vi.1985, YJ Kwon; 1 ex., Palgongsan, 16.v.1986, YJ Kwon; 1 ex., Palgongsan, 20.vi.1985, YJ Kwon; 1 ex., Palgongsan, 7.v.1983, YJ Kwon; 4 exs., Palgongsan, 23.v.1981, YJ Kwon; 1 ex., Palgongsan, 27.iv.1982, YJ Kwon; 1 ex., Palgongsan, 24.viii.1980, YJ Kwon; 1 ex., Palgongsan, 7.vi.1981, YJ Kwon; 5 exs., Juwangsansan, 28.vii.1984, YJ Kwon; 3 exs., Daegu, 7.vi.1981, YJ Kwon; 1 ex., Sobaeksan, 15.v.1981, YJ Kwon; 1 ex., Sobaeksan, 10.v.1985, YJ Kwon; <GN> 1 ex., Jirisan, 5.v.1983, YJ Kwon; 1 ex., Jirisan, 6.v.1983, YJ Kwon; 2 exs., Jirisan, 25.vii.1985, YJ Kwon; 1 ex., Jirisan, 10.viii.1989, YJ Kwon; <JB> 1 ex., Maisan, 11.v.1980, YJ Kwon; 2 exs., Deogyusan, 15.v.1999, SJ Suh; [NIAST] <GW> 3 exs., Obongsan, 17.v.1981, YJ Kwon; 3 exs., Palgongsan, 29.v.1985, YJ Kwon.

DISTRIBUTION: Korea, Japan (Hokkaido, Honshu, Kyushu, Shikoku), China (Heilongjiang), Russia (Sakhalin), Europe.

LOCALITY: North-HB: Sobaeksan; PB: Myohyangsan; Central-HH: Suyangsan; GW: Obongsan, Odaesan, Seoraksan, Eungbongsan, Samyeongsan; CB: Woraksan; CN: Chilgapsan; South-GB: Bohyeonsan, Daegu, Geumosan, Irweolsan, Juwangsansan, Palgongsan, Sobaeksan; GN: Goseong (= Okcheonsa), Jirisan, Myeongseok-myeon, Sacheon (= Dasolsa); JB: Maisan, Deogyusan; JN: Jogyesan.

102. *Pegoplata debilis* (Stein, 1916) (Fig. 102)

Chortophila debilis Stein, 1916, Arch. Naturgesch. 81A(10): 183 (Germany).

Nupedia debilis: Tiensuu, 1938: 27; Suh & Kwon, 1985: 164, 165; Suh, 1989: 67; Ent. Soc. Kor. & Kor. Soc.

App. Ent., 1994: 304; Kwon et al., 1994: 266; Kwon et al., 1996: 224.

Pegoplata debilis: Paek et al., 2010: 243; Han et al., 2014: 159.

Male. General coloration black, faintly grayish pollinose. Head 1.2–1.3 times as high as long in profile; frons a little wider than half diameter of anterior ocellus, with 5 *ori* and 1 short *if*; parafrofrontalia broadly convergent with each other; parafacialia and cheek with silvery pruinescence. Antenna black, with arista minutely pubescent. Palpus and haustellum black, the latter with mentum faintly grayish pollinose.

Thorax thinly purple grayish pollinose. Mesonotum with obscure blackish median vitta in caudal view; 3 pairs of *pre acr* and several fine irregular setulae between rows, the distance of *pre acr* rows as wide as *dc* rows. Second *ph* strong, as long as first *ph*, and much longer than anterior *ntpl*. *Pra* very short, 0.4 times as

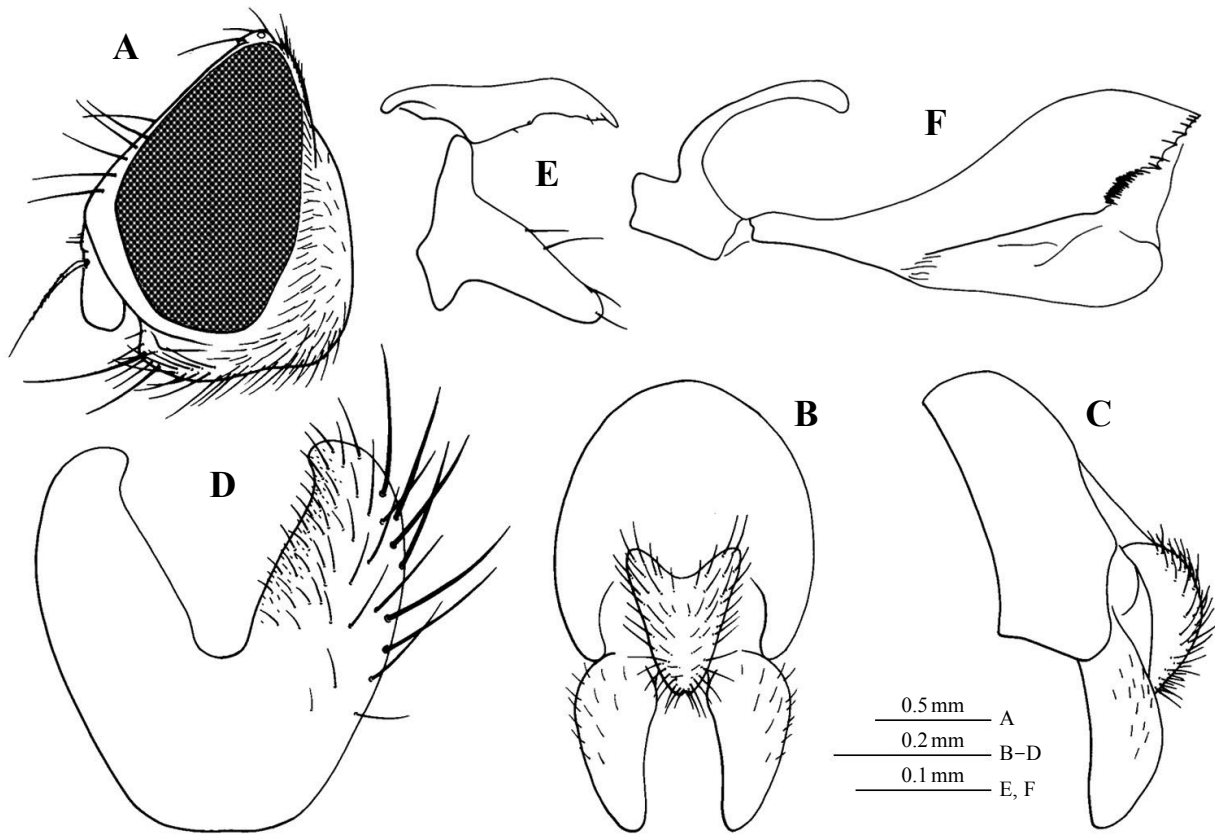


Fig. 102. *Pegoplata debilis* (Stein, 1916), male. A. head; B, C. hypopygium; D. fifth sternite; E. gonocoxal lobe and gonostylus; F. phallus.

long as anterior *ntpl*. Anterior *ntpl* about as long as posterior *ntpl*. Proepisternum with 2 *prepst*. Anepisternum with 3 long and 3–4 fine *prepm*.

Legs wholly black; fore tibia with 1 *pv*; mid tibia with 1 *ad*, 1 *pd* and 2 *pv*; hind tibia with 2 robust *ad*, 1 *a*, 1 *av* and 2 *pd*.

Wing hyaline with base more yellowish tinged; m-m nearly straight. Calypter white. Knob of halter reddish yellow.

Abdomen dark bluish gray; median vitta broad; fore marginal bands present and often subtriangular. Prebasal sclerite setose on posterior margin.

Length. Body 4.9–5.2 mm, wing 4.6–4.9 mm.

MATERIAL EXAMINED: [KPNU] <GB> 2 exs., Palgongsan, 7.iv.1984, YJ Kwon.

DISTRIBUTION: Korea, Europe.

LOCALITY: South-GB: Palgongsan.

HOST: *Salix livida* (cf. Tiensuu, 1938; Hennig, 1968).

103. *Pegoplata nigroscutellata* (Stein, 1920) (Fig. 103)

Chortophila nigroscutellata Stein, 1920: 90 (USA: Washington).

Pegomyia nigroscutellata: Hockett, 1941: 57.

Pegoplata nigroscutellata: Dely-Draskovits, 1993: 91.

Nupedia nigroscutellata: Hennig, 1968: 234, 235, pls. 16 (251), 17 (268); Suwa, 1983b: 38; Suh & Kwon, 1985: 164; Suh, 1989: 67; Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 304; Kwon et al., 1996: 224; Suwa, 1999: 238; Paek et al., 2010: 243; Han et al., 2014: 160.

Pegomyia slossonae Malloch, 1920: 127 (USA: New Hampshire).

Male. Black in ground color, with thin grayish pollen. Head about 1.2–1.3 times as high as long in profile. Frons much wider than ocellus. Interfrontalia and parafrontalia dull, with a pair of proclinate cruciate *if*, and 3 *ori*. Parafacialia and cheek black, with gray pollen. Antenna black; third segment about 2.3–2.5 times as long as wide; arista distinctly pubescent, the longest hair slightly shorter than basal diameter of arista. Palpus and haustellum black.

Thorax black in ground color, with gray pollen, and patches of brown pollen, especially on dorsum. Mesonotum with a bluish median vitta presuturally in caudal view; 3 pairs of *pre acr* and several fine irregular setulae between rows, the distance separating *pre acr* rows about as wide as distance between *pre acr* and *dc* rows. Second *ph* about as long as anterior *ntpl*. Posterior *ntpl* about as long as anterior *ntpl*. Proepisternum with 2 *prepst*. Anepisternum with 2 *prepm*.

Legs black; fore tibia with 1 *ad* and 1 *pv*; mid tibia with 1 *ad*, 2 *pd*, 2 *pv*, and apical *av* and *pv*; hind tibia with 3 *ad*, 1–2 *av* and 3 *pd*.

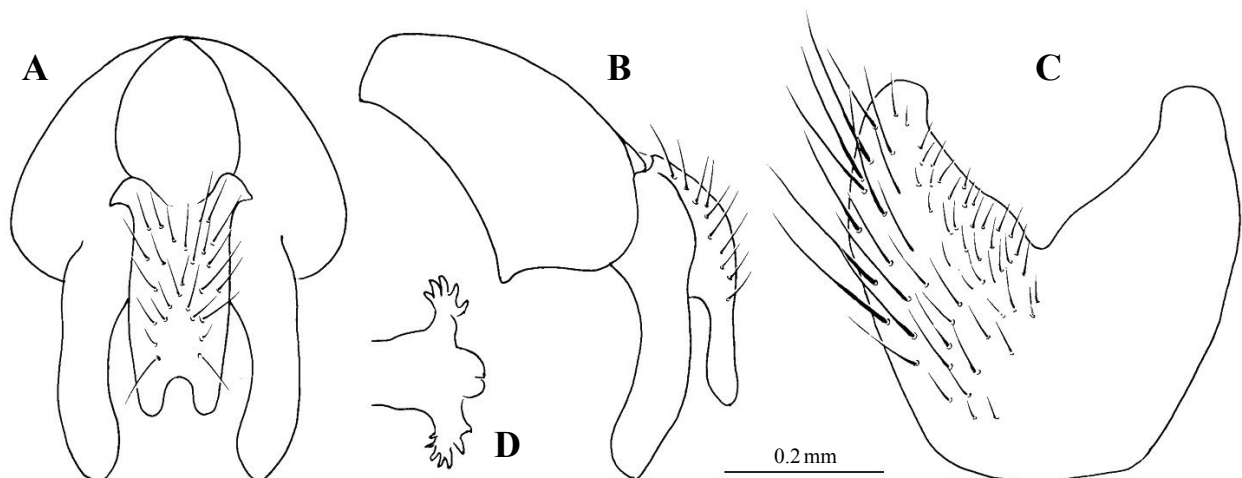


Fig. 103. *Pegoplata nigroscutellata* (Stein, 1920), male. A, B. hypopygium; C. fifth sternite; D. distiphallus.

Wing hyaline; costal spine indistinguishable from anterior setulae; m-m slightly sinuate. Calypter whitish yellow. Knob of halter yellow.

Abdomen with bluish gray pollen, with black median vitta.

Length. Body 5.5–6.0 mm, wing 4.5–4.8 mm.

MATERIAL EXAMINED: [KPNU] <GW> 4 exs., Odaesan, 24.v.1989, YJ Kwon; [NIAST] <GW> 2 exs., Odaesan, 24.v.1989, YJ Kwon.

DISTRIBUTION: Korea, Japan (Hokkaido, Honshu), China (Heilongjiang, Qinghai), Europe, N. America.

LOCALITY: Central-GW: Odaesan, Seoraksan.

104. *Pegoplata palposa* (Stein, 1897) (Fig. 104)

Hydrophoria palposa Stein, 1897: 320 (Germany: Genthin and Usedom Is; Poland).

Pegomyia (Pegoplata) palposa: Séguy, 1923: 149.

Pegoplata palposa: Hennig, 1968: 238, 239, pls. 16 (225), 17 (270), 19 (288); Suwa et Park, 1982: 502; Suwa, 1983b: 38; Suh & Kwon, 1985: 166; Suh et al., 1985: 208, 209; Suh, 1989: 68, 69; Dely-Draskovits, 1993: 91; Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 304; Kwon et al., 1996: 224; Suwa, 1999: 239; Paek et al., 2010: 243; Han et al., 2014: 160.

Hydrophoria orientalis Hockett, 1924: 16 (USA: New York).

Pegomyia (Pegoplata) palpata (sic): Schnabl et Dziedzicki, 1911: 108, 109.

Male. Black in ground color, with thin grayish pollen. Head about 1.4 times as high as long in profile. Frons much wider than an ocellus. Interfrontalia and parafrontalia dull, with a pair of proclinate cruciate *if*, and 4 *ori*. Parafacialia and cheek black, with gray pollen. Antenna black; third segment about 2.5 times as long as wide; arista distinctly plumose, the longest hair about 5.0 times as long as basal diameter of arista. Palpus black, long and bladelike. Haustellum black with sparse gray pollen and stout.

Thorax black in ground color, with gray pollen, and patches of brown pollen, especially on dorsum. Mesonotum with 3 pairs of *pre acr* and several fine irregular setulae between rows, the distance separating *pre acr* rows about as wide as distance between *pre acr* and *dc* rows. Second *ph* much longer than anterior *ntpl*. Posterior *ntpl* about one third as long as anterior *ntpl*. Proepisternum with 2 *prepst*. Anepisternum with 1–2 distinct upper anterior seta and 2 long and 4 additional *prepm*.

Legs black; fore tibia with 1 *ad* and 1 *pv*; mid tibia with 1 *ad*, 2 *pd*, 1 *p*, and strong apical *av* and *pv*; hind tibia with 2–3 *ad*, 1 *av* and 2 *pd*.

Wing faintly brownish tinged, denser basally; costal spine indistinguishable from anterior setulae; m-m

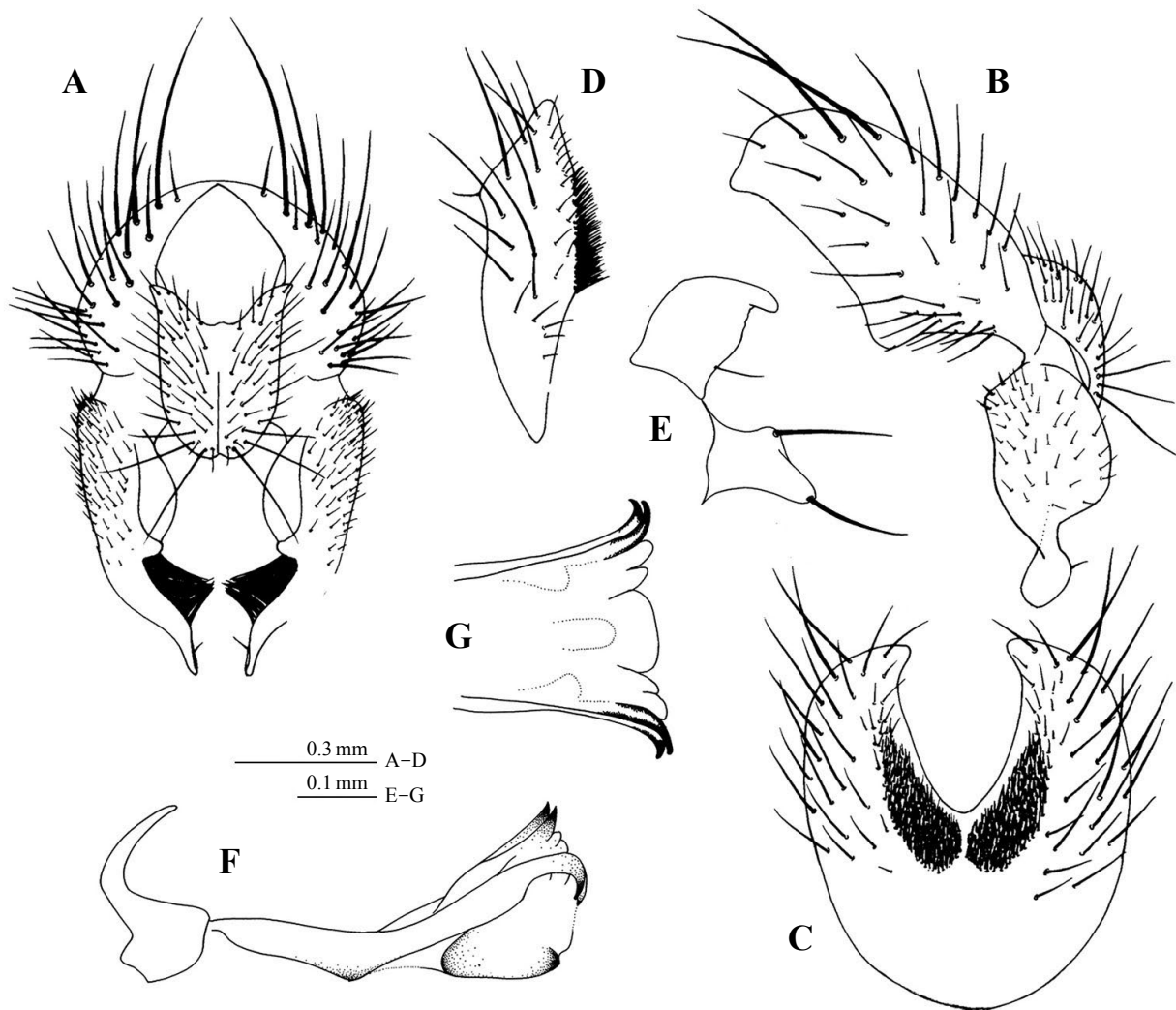


Fig. 104. *Pegoplata palposa* (Stein, 1897), male. A, B. hypopygium; C, D. fifth sternite; E. gonocoxal lobe and gonostylus; F. ephiphallus and basiphallus; G. distiphallus.

slightly sinuate. Calypter whitish yellow; the lower calypter much protruding beyond the upper one. Knob of halter yellow.

Abdomen with bluish gray pollen, with black narrow median vitta.

Length. Body 7.0–7.5 mm, wing 5.5–7.0 mm.

MATERIAL EXAMINED: [KPNU] <GW> 8 exs., Odaesan, 27.vii.1983, YJ Kwon; 3 exs., Odaesan, 29.vii.1983, YJ Kwon; 1 ex., Samyeongsan, 14.vi.2003, SJ Suh; 1 ex., Duwonbong, 9.vi.2000, SJ Suh; <GN> 1 ex., Jirisan, 5.v.1983, YJ Kwon; 1 ex., Jirisan, 6.v.1983, YJ Kwon; <JB> 1 ex., Deogyusan, 20.v.1999, SJ Suh; <JN> 1 ex., Baegunsan, 5.vi.1999, SJ Suh; [NIAST] <GW> 2 exs., Odaesan, 27.vii.1983, YJ Kwon.

DISTRIBUTION: Korea, Japan (Hokkaido, Honshu, Shikoku), China (Heilongjiang, Liaoning), Taiwan, Europe, N. America.

LOCALITY: Central-GW: Odaesan, Samyeongsan, Duwonbong; South-GN: Jirisan; JB: Deogyusan; JN: Baegunsan.

Genus *Phorbia* Robineau-Desvoidy, 1830

Phorbia Robineau-Desvoidy, 1830: 559. Type-species: *Phorbia musca* Robineau-Desvoidy, 1830 (France: Paris and Saint-Sauveur).

Chortophila Macquart, 1835: 323. Type-species: *Anthomyia sepia* Meigen, 1826 (not given).

DIAGNOSIS: Eyes without evident pubescence; face without keel; arista not angled; mentum rather short, about 0.3–0.4 times as long as head height; scutellum with two long marginal pairs of setae and a shorter discal pair, and with fine pubescence on ventral surface; proepisternum and meron bare; anepisternum without anterodorsal seta; sternite 5 process long, with short basal portion of the sternite, with outer lateral setae become progressively longer distally; hypandrium rudimentary or absent, and with pedestal-like posterior extension; female postabdomen strongly laterally compressed (Griffiths, 1996).

Key to species of Korean *Phorbia*

1. Frons nearly as wide as anterior ocellus; parafrontalia without *ors* in male 2
1. Frons at narrowest part nearly as wide as distance between posterior ocelli; parafrontalia with *ors* in male 4
2. Mid tibia without *pd* *P. odaesana*
2. Mid tibia with *pd* 3
3. Mid tibia with *ad* *P. asiatica*
3. Mid tibia without *ad* *P. soyosana*
4. Notopleuron with additional *ntpl* setulae *P. dissimilis*
4. Notopleuron without additional *ntpl* setulae 5
5. Cercal plate with numerous long setae *P. subfascicularis*
5. Cercal plate with few long setae 6
6. Mid tibia with *av* *P. longipilis*
6. Mid tibia without *av* 7
7. Surstylus with expanded subapex in profile *P. kochai*
7. Surstylus without expanded subapex in profile *P. taeguensis*

105. *Phorbia asiatica* Hsue, 1981 (Fig. 105)

Phorbia asiatica Hsue, 1981: 416 (China: Liaoning); Suh & Kwon, 1986: 161; Suh, 1989: 122; Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 304; Kwon et al., 1994: 267; Kwon et al., 1996: 224; Paek et al., 2010: 243; Han et al., 2014: 160.

Male. Black in ground color, with brownish gray pollen. Head about 1.2–1.3 times as high as long in profile. Frons nearly as wide as anterior ocellus. Interfrontalia dull, with a pair of proclinate *if*; parafrontalia silvery gray with 0–1 *ors* and 5–7 *ori*. Parafacialia and cheek black with gray pollen. Antenna black; third segment about twice as long as wide; arista distinctly pubescent. Palpus black, and haustellum stout.

Thorax black in ground color, with brownish gray pollen, and patches of brown pollen, especially on dorsum. Mesonotum with brownish black obscure median, submedian and broad lateral vittae presuturally in caudal view; 3 pairs of *pre acr*, the distance separating *pre acr* rows about half as wide as distance between *pre acr* and *dc* rows. Second *ph* indistinguishable from accessory setulae. *Pra* strong, about as long as anterior *ntpl*. Posterior *ntpl* about two thirds as long as anterior *ntpl*. Proepisternum with 2 *prepst*. Anepisternum with 2 *prepm*.

Legs black; fore tibia with 0–1 *ad*, 1 *pv*, and strong apical *ad*, *pd* and *pv*; mid tibia with 1–2 *ad*, 1–2 *av*,

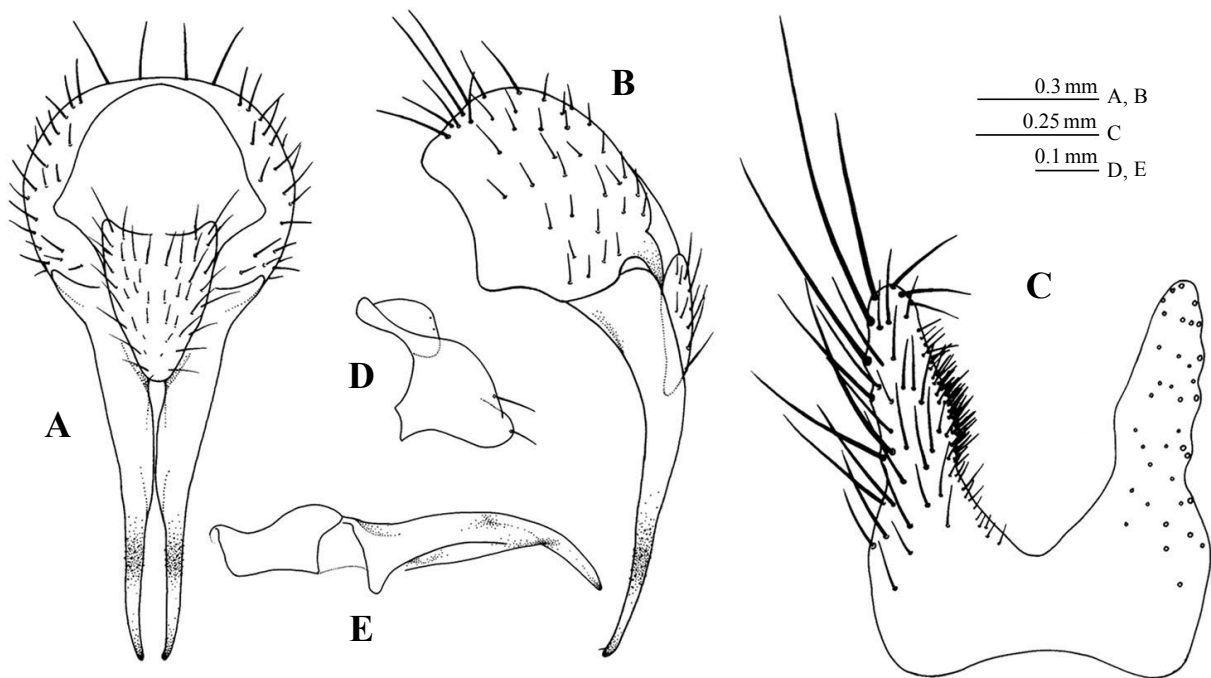


Fig. 105. *Phorbia asiatica* Hsue, 1981, male. A, B. hypopygium; C. fifth sternite; D. gonocoxal lobe and gonostylus; E. phallus.

2-3 *pd*, 2-3 *pv*, and apical *av* and *pv*; hind tibia with 4-6 *ad*, 3-5 *av*, 3-7 *pd*, 2-4 *pv*, and strong apical *av*.

Wing faintly black tinged, denser basally; costal spine strong, about as long as humeral crossvein; m-m nearly straight. Calypter whitish yellow. Knob of halter yellow.

Abdomen black with brownish gray pollen, with black obscure median vitta.

Length. Body 5.7-7.5 mm, wing 5.0-6.5 mm.

MATERIAL EXAMINED: [KPNU] <GG> 3 exs., Incheon, 23.iii.2006, SJ Suh; <GB> 3 exs., Palgongsan, 29.iii.1986, YJ Kwon; <GN> 2 exs., Masan, 5.iv.1986, YJ Kwon; <JN> 1 ex., Chogyesan, 16.iv.1986, YJ Kwon.

DISTRIBUTION: Korea, Japan (Kyushu), China (Liaoning).

LOCALITY: Central-GG: Incheon; South-GB: Palgongsan; GN: Masan; JN: Goheung, Jogyesan.

106. *Phorbia dissimilis* Suh et Kwon, 1985 (Fig. 106)

Phorbia dissimilis Suh & Kwon, 1985: 205 (Korea: Daegu); Suh, 1989: 122; Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 304; Kwon et al., 1996: 224; Paek et al., 2010: 243; Han et al., 2014: 160.

Male. General coloration black with blue grayish pollinose. Head a little higher than long in profile; frons twice as wide as an diameter ocellus; parafrotaia distinctly separated from each other; 6 *ori*, 1 minute *ors* and 1 short *if*. Parafacialia and cheek slivery pruinose and lustrous; profrons wider than third antennal segment width. Antenna fuscous and minutely pubescent; third antennal segment about 1.6-2.0 times as long as wide. Palpus blackish; haustellum dark brownish, with mentum faintly grayish pollinose.

Thorax blue grayish pollinose, which tinged with brown; mesonotum with obscure brownish median and lateral vitta; 3 pairs of slender *pre acr*. Second *ph* weak; *pra* about as long as anterior *ntpl*. Anepisternum with some additional *prepm*.

Legs black; fore tibia with 1-2 *pv*; mid femur with 5 strong *av*, and a row of *pv* which are much longer than the femur height; mid tibia with 1 *ad*, 1 *pd*, 1 *p*; hind tibia with 5 *ad*, 3-4 *av*, 3 *pd*, 2-4 *pv*, and without apical *pv*.

Wing faintly brownish tinged, denser at base; m-m nearly straight. Calypter yellowish; knob of halter deep brownish to dark brownish.

Abdomen strongly swollen on caudal half, club-shaped in profile.

Length. Body 4.8-5.5 mm, wing 4.1-4.9 mm.

MATERIAL EXAMINED: [KPNU] <GB> 1 ex., Daegu, 26.iii.1982, YJ Kwon; 2 exs., Chillyang-myeon, 7.iv.1986, YJ Kwon; <GN> 2 exs., Masan, 5.iv.1986, YJ Kwon; 1 ex., Masan, 25.iii.1984, YJ Kwon; 1 ex., Masan,

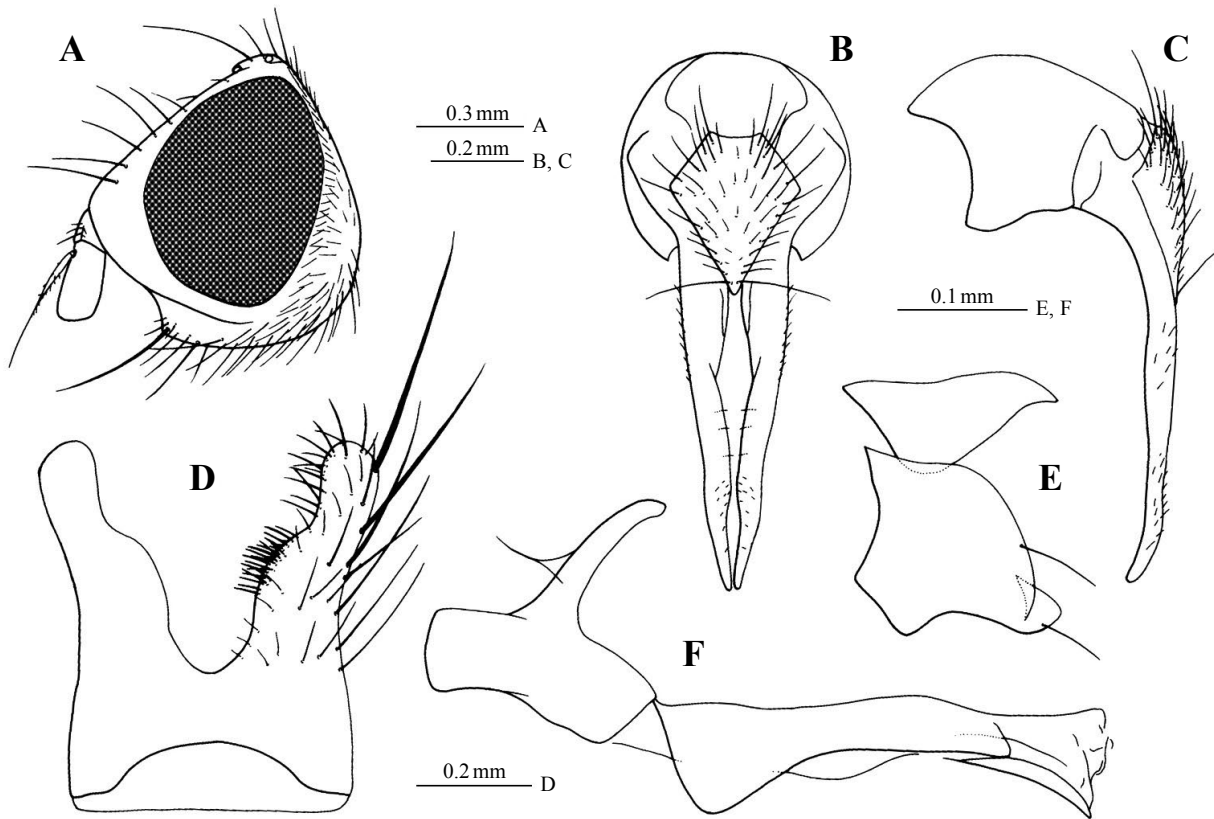


Fig. 106. *Phorbia dissimilis* Suh et Kwon, 1985, male. A. head; B, C. hypopygium; D. fifth sternite; E. gonocoxal lobe and gonostylus; F. phallus.

23.iii.1986, YJ Kwon; 1 ex., Jirisan, 29.iii.1989, YJ Kwon.

DISTRIBUTION: Korea.

LOCALITY: South-GB: Daegu, Jillyang-myeon; GN: Jirisan, Masan.

107. *Phorbia kochai* Suwa, 1974 (Fig. 107)

Phorbia kochai Suwa, 1974: 176, 177, figs. 471–474 (Japan: Honshu); Suh, 1989: 123; Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 304; Kwon et al., 1996: 224; Paek et al., 2010: 243; Han et al., 2014: 161.

Male. Black in ground color, with brownish gray pollen. Head about 1.1–1.2 times as high as long in profile. Frons at narrowest part nearly as wide as distance between posterior ocelli exclusive. Interfrontalia dull, with a pair of proclinate *if*; parafrontalia silvery gray with 1 fine *ors* and 5–7 *ori*. Parafacialia and cheek black with gray pollen. Antenna black; third segment about twice as long as wide; arista distinctly pubescent. Palpus and haustellum with sparse gray pollen.

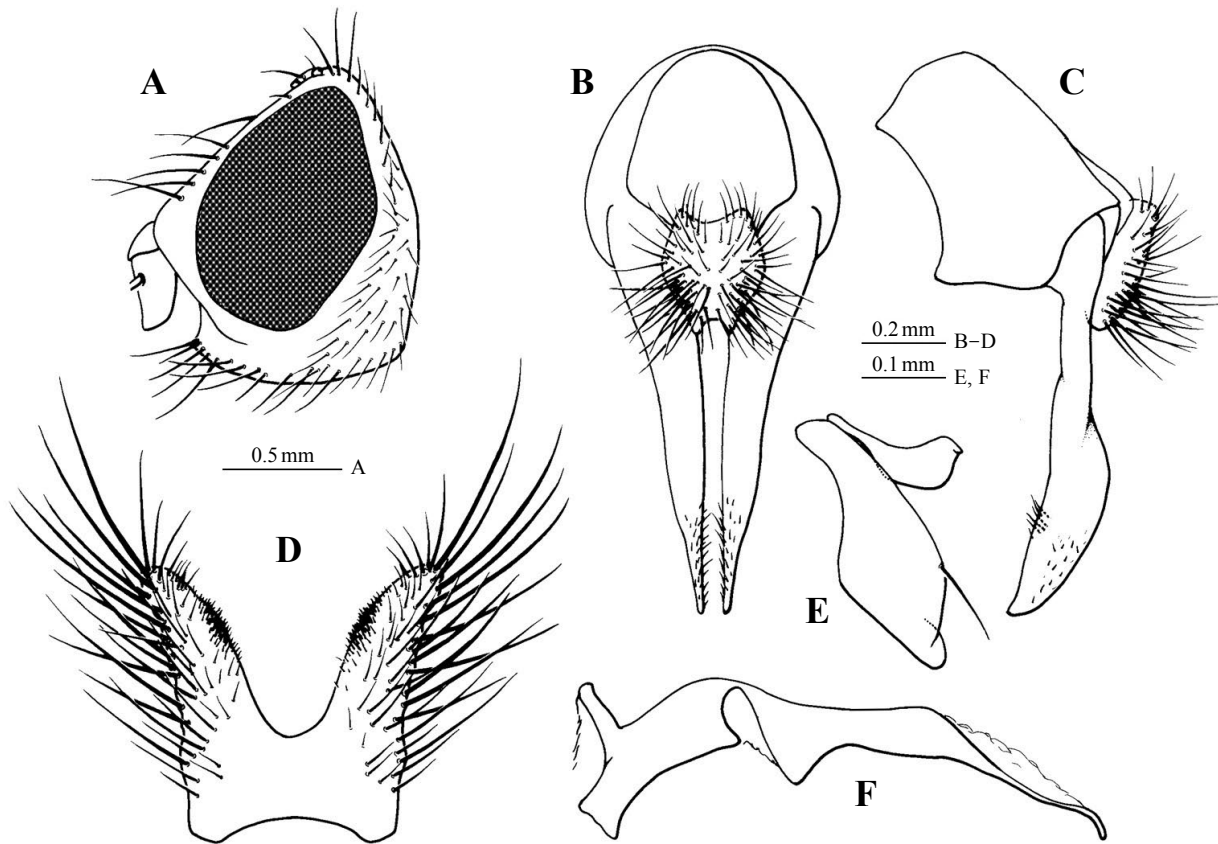


Fig. 107. *Phorbia kochai* Suwa, 1974, male. A. head; B, C. hypopygium; D. fifth sternite; E. gonocoxal lobe and gonostylus; F. phallus.

Thorax black in ground color, with gray pollen, and patches of brown pollen, especially on dorsum. Mesonotum with obscure brownish black median and submedian vittae presuturally in caudal view; 3 pairs of *pre acr*, the distance of *pre acr* rows about half as wide as distance between *pre acr* and *dc* rows. Second *ph* thin, slightly longer than half of anterior *ntpl*. *Pra* strong, slightly shorter than anterior *ntpl*. Posterior *ntpl* about 0.7–0.8 times as long as anterior *ntpl*. Proepisternum with 2 *prepst*. Anepisternum with 2 *prepm*.

Legs black; fore tibia with 0–1 *ad*, 1 *pv* and strong apical *d*, *ad* and *pv*; mid tibia with 1 *ad*, 3 *pd*, 2 *pv*, and apical *av* and *pv*; hind tibia with 4–5 *ad*, 3–5 *av*, 5 *pd*, 3–4 *pv*, and strong apical *av*.

Wing faintly black tinged, denser basally; costal spine small and much shorter than r-m; m-m nearly straight. Calypter and knob of halter whitish yellow to dark yellow.

Abdomen black with bluish gray pollen, with black obscure median vitta.

Length. Body 5.0–5.5 mm, wing 4.0–4.5 mm.

MATERIAL EXAMINED: [KPNU] <GW> 4 exs., Seoraksan, 21.v.1989, YJ Kwon; <GB> 1 ex., Irwolsan, 23.v.2007, SJ Suh; 2 exs., Munsusan, 7.v.2007, SJ Suh.

DISTRIBUTION: Korea, Japan (Honshu, Kyushu), China (Sichuan).

LOCALITY: Central-GW: Seoraksan; South-GB: Irwolsan, Munsusan.

108. *Phorbia longipilis* (Pandellé, 1900) (Fig. 108)

Anthomyia (*Chortophila*) *longipilis* Pandellé, 1900: 261 (Germany).

Chortophila (s. str.) *longipilis*: Séguy, 1923: 129.

Phorbia longipilis: Hennig, 1969: 309, 310, pls. 28 (397), 30 (415), 33 (445); Suh & Kwon, 1985: 204, 205; Suh, 1989: 123, 124; Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 304; Kwon et al., 1996: 224; Suwa, 1999: 240; Paek et al., 2010: 243; Han et al., 2014: 161.

Chortophila (*Adia*) *pseudopenicillaris* Kramer, 1917: 306 (Germany).

Hylemyia (*Phorbia*) *greisescens* Ringdahl, 1933: 18 (Sweden: Stockholm).

Male. General coloration black, with dark brown grayish pollinose. Head 1.2–1.3 times as high as long

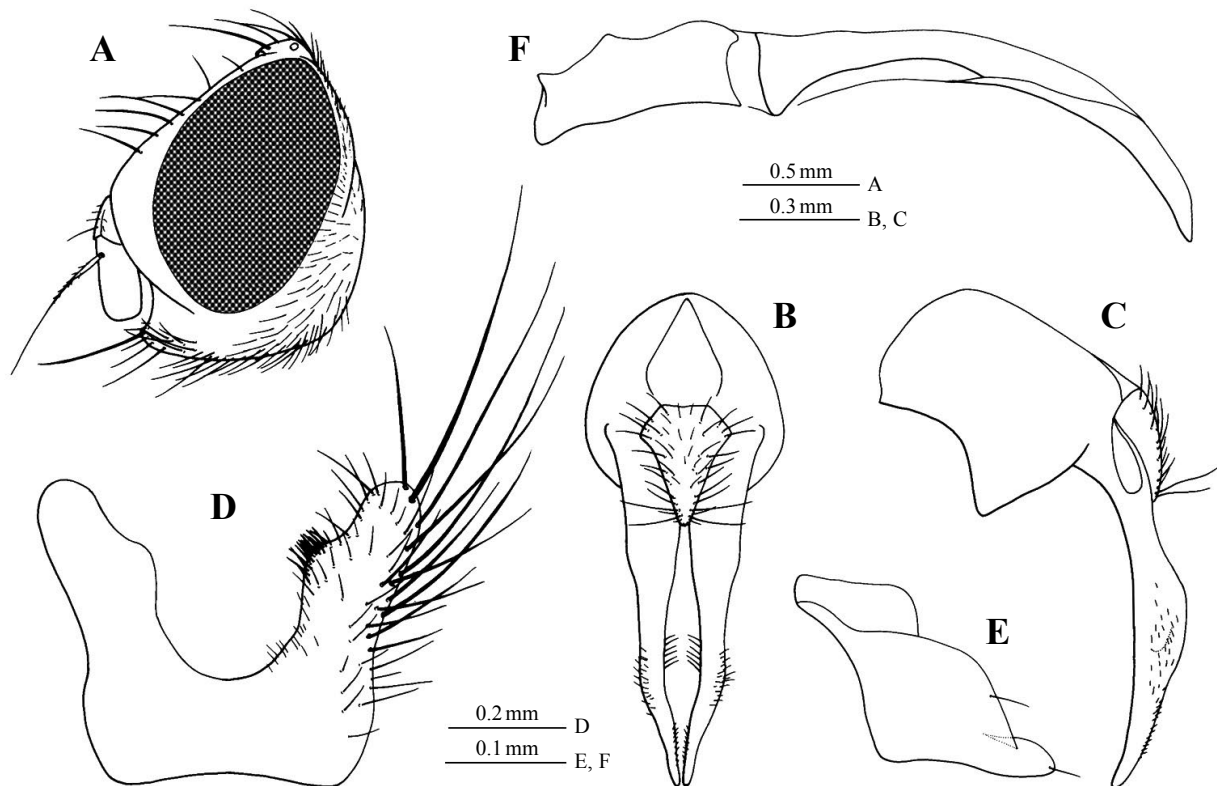


Fig. 108. *Phorbia longipilis* (Pandellé, 1900), male. A. head; B, C. hypopygium; D. fifth sternite; E. gonocoxal lobe and gonostylus; F. phallus.

in profile; frons about as wide as distance between posterior ocelli exclusive; interfrontalia linear caudad; 5 *ori*, 1 rather distinct *ors*, and 1 fine *if*. Parafacialia and cheek grayish pruinose; profrons 1.5 times as wide as third antennal segment width. Antenna black; third antennal segment about 1.5 times as long as wide; arista minutely pubescent. Haustellar mentum shining black.

Thorax purple grayish pollinose and somewhat brownish tinged; mesonotum with rather distinct median and sublateral vittae; 3 pairs of slender *pre acr*. Second *ph* half as long as first *ph*; *pra* longer than anterior *ntpl*. *Kepst* 1:3, the posterior lowest one weaker than the other.

Legs black; fore tibia with 0–1 *ad* and 2 *pv*; mid tibia with 2 *ad*, 2 *av*, 2 *pd* and 2 *pv*; hind tibia with 5 *ad*, 4 *av*, 4 *pd*, 4 *pv*, and no apical *pv*.

Wing sparsely brownish tinged; m-m straight. Calypter pale yellow; knob of halter reddish yellow.

Abdomen strongly swollen on caudal half, club-shaped in profile.

Length. Body 4.9 mm, wing 4.3 mm.

MATERIAL EXAMINED: [KPNU] <GB> 2 exs., Daegu, 26.iii.1984, YJ Kwon; [NIAST] <GG> 1 ex., Suwon, 1.iv.1983, YI Lee.

DISTRIBUTION: Korea, Japan (Honshu), China (Heilongjiang), Europe.

LOCALITY: Central-Suwon; South-GB: Daegu.

109. *Phorbia odaesana* Suwa, 1983 (Fig. 109)

Phorbia odaesana Suwa, 1983b: 40–42 (Korea: Odaesan); Suh & Kwon, 1985: 204; Suh, 1989: 124; Dely-Draskovits, 1993: 94; Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 304; Kwon et al., 1996: 224; Paek et al., 2010: 243; Han et al., 2014: 161.

Male. Black in ground color, with gray pollen. Head about 1.1–1.2 times as high as long in profile. Frons nearly as wide as anterior ocellus. Interfrontalia dull, with a pair of proclinate fine *if*; parafrontalia silvery gray with 6 *ori*. Parafacialia and cheek black with gray pollen. Antenna black; third segment about 1.6–1.7 times as long as wide; arista distinctly pubescent. Palpus and haustellum with sparse gray pollen.

Thorax black in ground color, with bluish gray pollen, and patches of brown pollen, especially on dorsum. Mesonotum with brownish black obscure median vitta presuturally in caudal view; 3 pairs of *pre acr*, the distance separating *pre acr* rows about half as wide as distance between *pre acr* and *dc* rows. Second *ph* indistinguishable from accessory setulae. *Pra* strong, about as long as anterior *ntpl*. Posterior *ntpl* about 0.8–0.9 times as long as anterior *ntpl*. Proepisternum with 2 *prepst*. Anepisternum with 4 *prepm*.

Legs black; fore tibia with 1 *pv* and strong apical *d*, *ad* and *pv* blunt apically; mid tibia with 1 *ad*, 1 *av*, 2 *pv*, and apical *av* and *pv*; hind tibia with 4–5 *ad*, 2 *av*, 4–5 *pd*, 3 *pv*, and strong apical *av*.

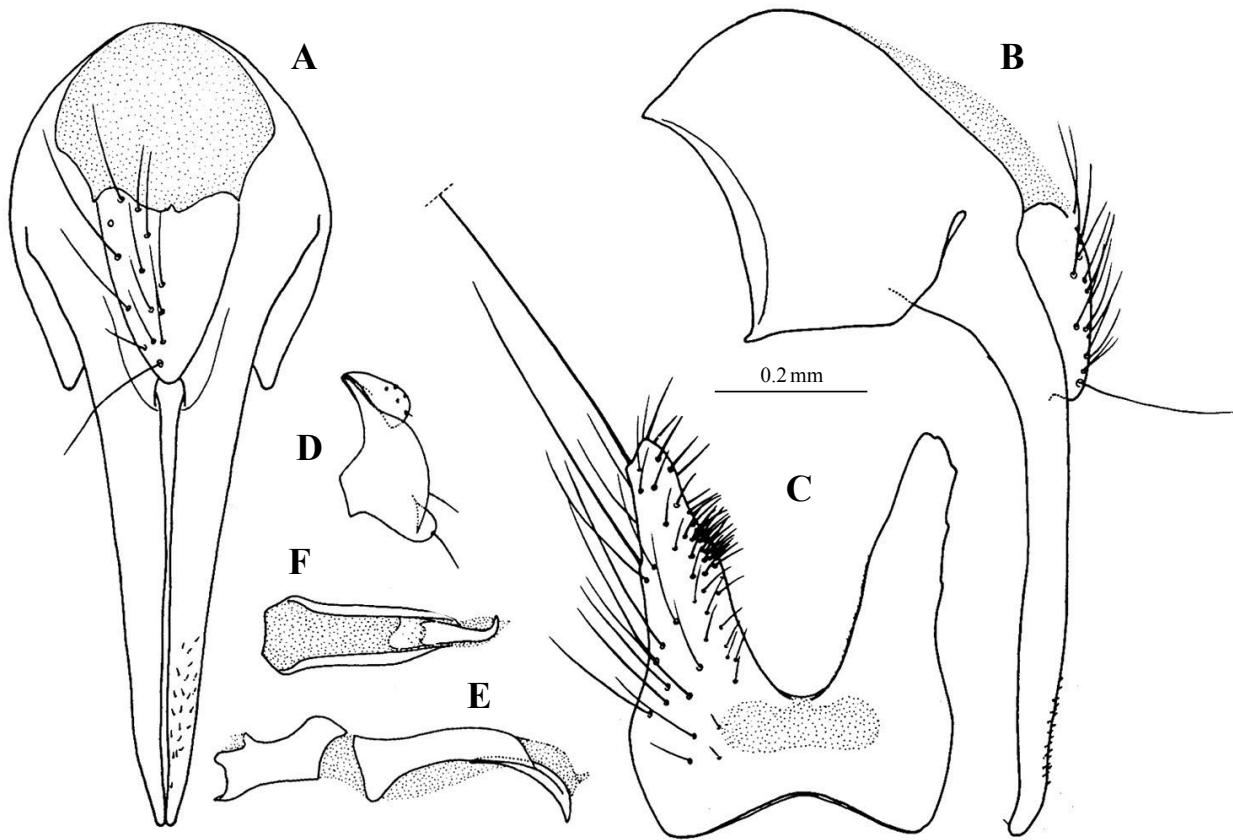


Fig. 109. *Phorbia odaeana* Suwa, 1983, male (after Suwa). A, B. hypopygium; C. fifth sternite; D. gonocoxal lobe and gonostylus; E. phallus; F. distiphallus.

Wing faintly brown tinged, denser basally; costal spine indistinguishable from anterior setulae; m-m nearly straight. Calypter whitish yellow. Knob of halter yellow.

Abdomen black with brownish gray pollen, with black obscure median vitta.

Length. Body 4.0–4.5 mm, wing 3.5–4.0 mm.

MATERIAL EXAMINED: [KPNU] <GW> 2 exs., Odaesan, 24.v.1989, YJ Kwon.

DISTRIBUTION: Korea.

LOCALITY: Central-GW: Odaesan.

110. *Phorbia soyosana* Suh et Kwon, 1985 (Fig. 110)

Phorbia soyosana Suh & Kwon, 1985: 203, 204 (Korea: Soyosan); Suh, 1989: 124; Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 304; Kwon et al., 1996: 224; Paek et al., 2010: 243; Han et al., 2014: 161.

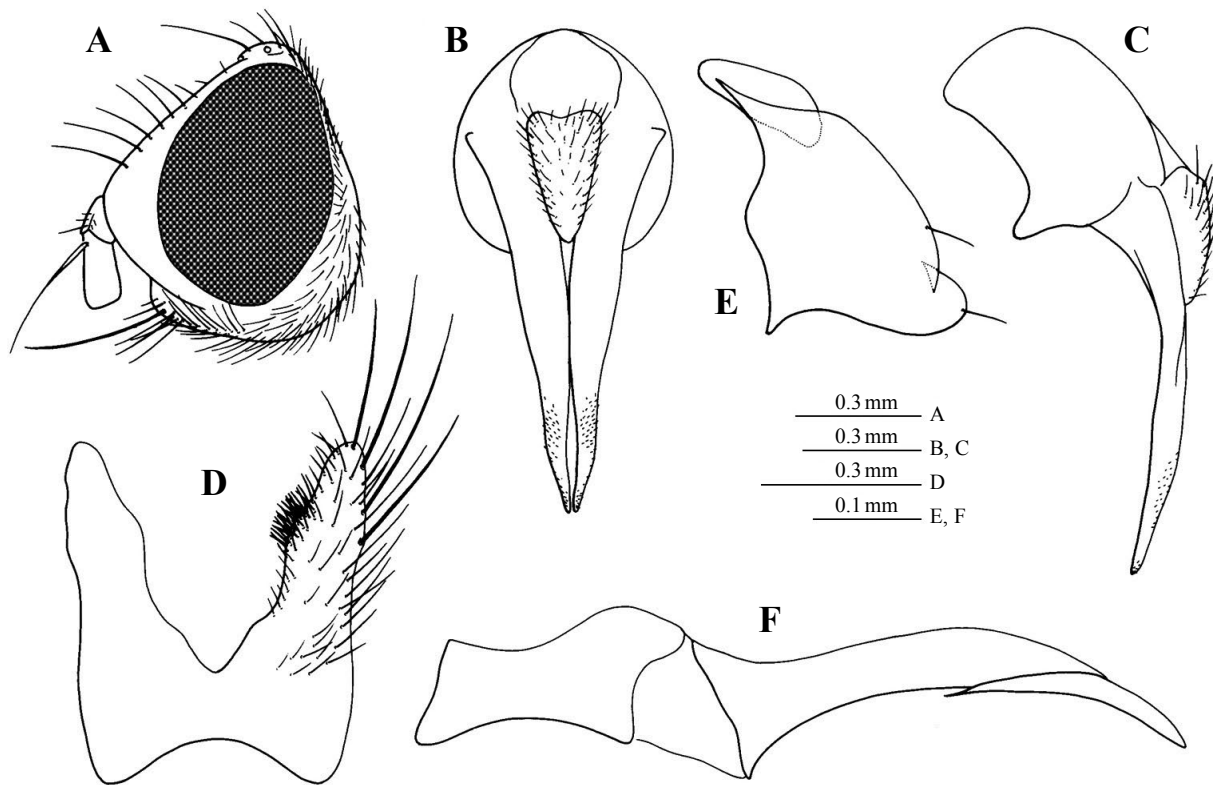


Fig. 110. *Phorbia soyosana* Suh et Kwon, 1985, male. A. head; B, C. hypopygium; D. fifth sternite; E. gonocoxal lobe and gonostylus; F. phallus.

Male. General coloration purplish black with grayish pollinose. Head 1.1–1.2 times as high as long in profile; frons slightly wider than anterior ocellus; parafrofrontalia narrowly separated from each other; 8 *ori* and 1 *if*. Parafacialia and cheek slivery grayish pruinose; profrons 1.5 times as wide as third antennal segment width. Antenna with arista minutely pubescent; third antennal segment 1.8 times as long as wide.

Thorax grayish pollinose; mesonotum partially tinged with brown, especially along rows of *dc*; 4 pairs of *pre acr*. Second *ph* about as long as first *ph*; *pra* equal to length of anterior *ntpl*. *Kepst* 1:3, the posterior lowest much finer than the others.

Legs wholly black; fore tibia with 1 *pv*; mid femur with 3 strong *av* on basal third; mid tibia with 1 *ad*, 2 *pd*, and 2 *pv*; hind tibia with 3 *ad*, 2 *av*, 4 *pd*, and 2 fine *pv*.

Wing tinged with brown, rather strongly at base. Calypter whitish, slightly yellowish marginally; knob of halter dull yellow.

Abdomen densely brown grayish pollinose, with broad median vitta.

Length. Body 4.7 mm, wing 4.1 mm.

MATERIAL EXAMINED: [KPNU] <GG> 1 ex., Soyosan, 15.v.1982, YJ Kwon.

DISTRIBUTION: Korea.

LOCALITY: Central-GG: Soyosan.

111. *Phorbia subfascicularis* Suwa, 1994 (Fig. 111)

Phorbia subfascicularis Suwa, 1994: 529 (Japan: Honshu); Suwa, 1999: 240; Han et al., 2014: 161.

Phorbia fascicularis (nec. Tiensuu, 1936): Suwa, 1983b: 40; Suh & Kwon, 1985: 205, 206; Suh et al., 1985: 210; Suh, 1989: 122, 123; Dely-Draskovits, 1993: 93; Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 304; Kwon et al., 1996: 224; Paek et al., 2010: 243.

Male. Black in ground color, with brownish gray pollen. Head about 1.1–1.2 times as high as long in profile. Frons at narrowest part nearly as wide as distance between posterior ocelli exclusive. Interfrontalia dull, with a pair of proclinate *if*; parafrontalia silvery gray with 1 fine *ors* and 5 *ori*. Parafacialia and cheek black with gray pollen. Antenna black; third segment about 1.7–1.8 times as long as wide; arista distinctly pubescent. Palpus and haustellum black to brownish black.

Thorax black in ground color, with brownish gray pollen, and patches of brown pollen, especially on dorsum. Mesonotum with obscure brownish black median and submedian vittae presuturally in caudal view;

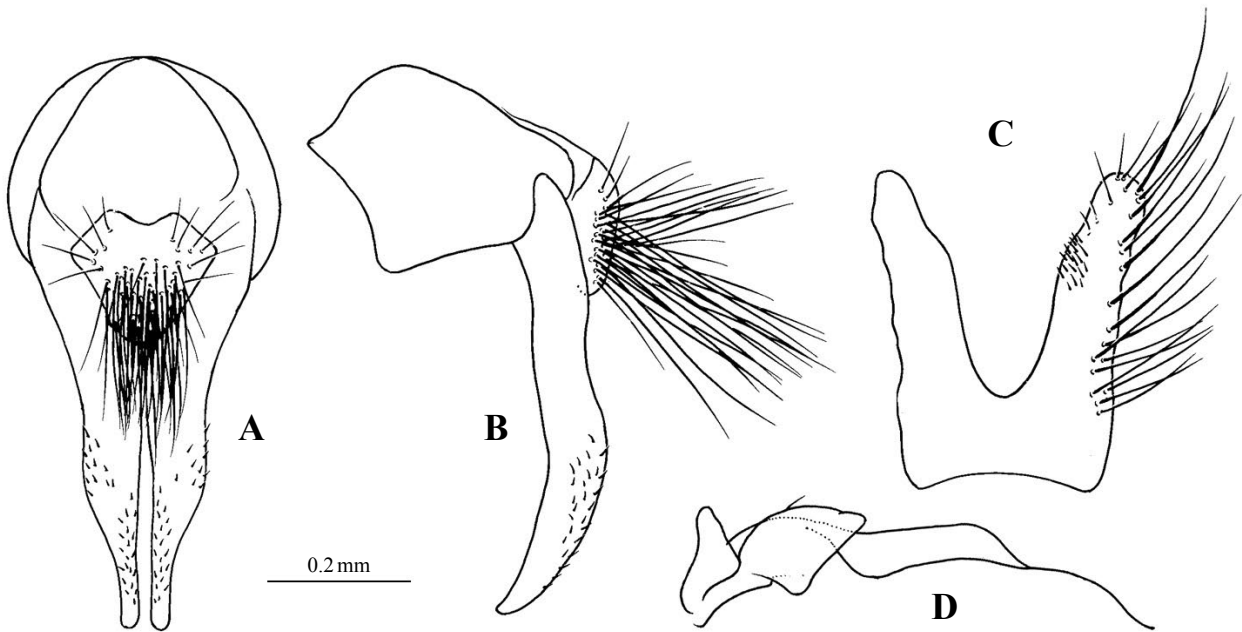


Fig. 111. *Phorbia subfascicularis* Suwa, 1994, male. A, B. hypopygium; C. fifth sternite; D. gonocoxal lobe, gonostylus and phallus.

3 pairs of *pre acr*, the distance separating *pre acr* rows about half as wide as distance between *pre acr* and *dc* rows. Second *ph* indistinguishable from accessory setulae. *Pra* strong, about as long as anterior *ntpl*. Posterior *ntpl* about 0.8–0.9 times as long as anterior *ntpl*. Proepisternum with 2 *prepst*. Anepisternum with 2 *prepm*.

Legs black; fore tibia with 1 *pv* and strong apical *d*; mid tibia with 1 *ad*, 1 *av*, 2 *pd*, 2 *pv*, and apical *av* and *pv*; hind tibia with 4–6 *ad*, 3 *av*, 4 *pd*, 3 *pv*, and strong apical *av*.

Wing faintly black tinged, denser basally; costal spine small and much shorter than r-m; m-m nearly straight. Calypter whitish yellow. Knob of halter yellow.

Abdomen black with brownish gray pollen, with black obscure median vitta.

Length. Body 3.9–4.4 mm, wing 3.5–3.8 mm.

MATERIAL EXAMINED: [KPNU] <GN> 3 exs., Chungmu, 7.iv.1986, YJ Kwon; 1 ex., Cheonggok, 8.iv.1973, SH Park.

DISTRIBUTION: Korea, Japan (Honshu), China (Heilongjiang), Europe, N. America.

LOCALITY: Central-GW: Odaesan; South-GN: Chonggok, Tongyeong (= Chungmu).

112. *Phorbia taeguensis* Suh et Kwon, 1985 (Fig. 112)

Phorbia taeguensis Suh & Kwon, 1985: 206 (Korea: Daegu); Suh, 1989: 124; Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 304; Kwon et al., 1996: 224; Paek et al., 2010: 243; Han et al., 2014: 161.

Male. General coloration black, brown grayish pollinose. Head 1.2–1.3 times as high as long in profile; frons rather wider than distance between posterior ocelli exclusive; parafrofrontalia distinctly separated from each other; 5–6 *ori*, a distinct *ors* and 1 prominent *if*. Parafacialia and cheek slivery pruinescent; profrons 1.4–1.5 times as wide as third antennal segment width. Antenna black; arista shortly pubescent; third antennal segment about 1.7–2.0 times as long as wide. Palpus black; haustellum dark brownish, with mentum shining.

Thorax blue grayish pollinose, partially dark brownish tinged; mesonotum with distinct dark brown median and sublateral vittae; 3–4 pairs of *pre acr*. Second *ph* about half as long as first *ph*; *pra* long than anterior *ntpl*. *Kept* 1:3, the posterior lowest one weaker than the others.

Legs black; fore tibia with 1 *pv*; mid femur with a row of *pv* which are much longer than the femur height; mid tibia with 1–2 *ad*, 2 *pd* and 2 *pv*; hind tibia with 4–5 *ad*, 3 *av*, 3–5 *pd*, 0–4 fine *pv*, and no apical *pv*.

Wing blackish tinged, denser at base; costal spine strong; m-m nearly straight. Calypter yellowish; knob of halter dark brown.

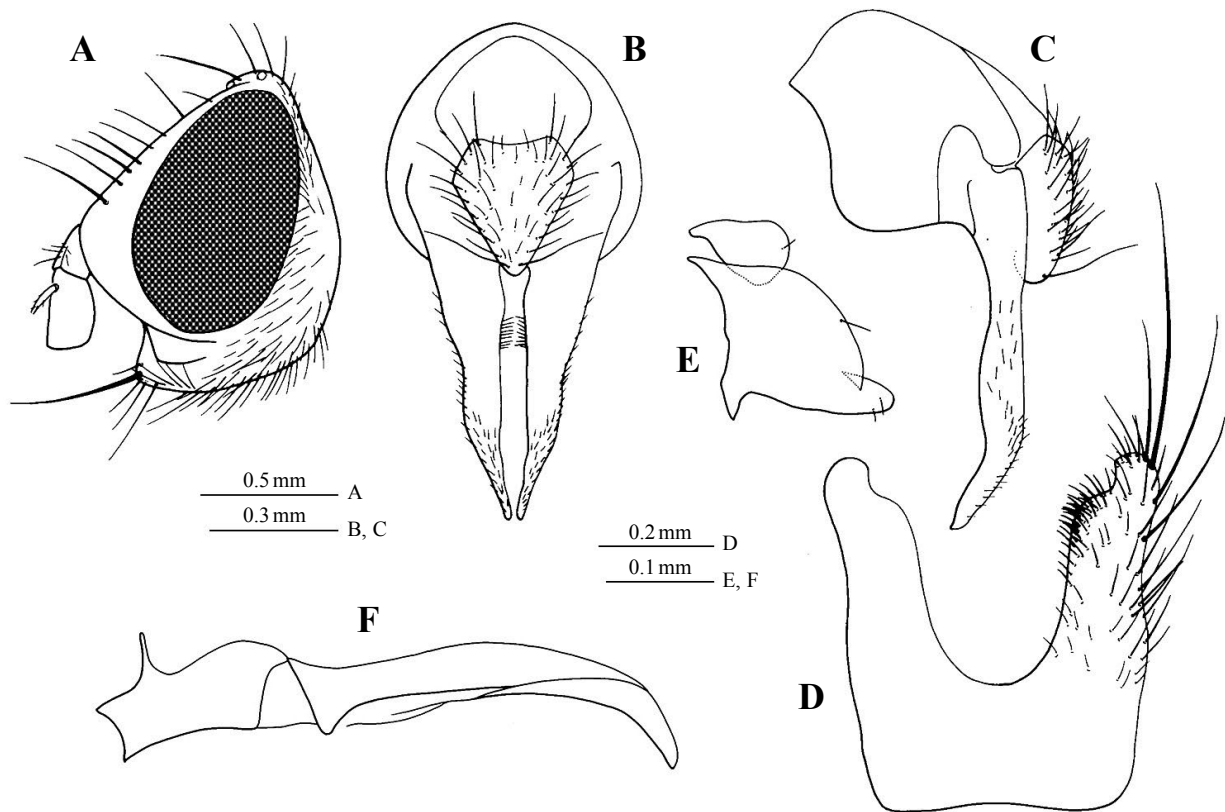


Fig. 112. *Phorbia taeguensis* Suh et Kwon, 1985, male. A. head; B, C. hypopygium; D. fifth sternite; E. gonocoxal lobe and gonostylus; F. phallus.

Abdomen blue grayish pollinose, strongly swollen on caudal half, club-shaped in profile.

Length. Body 4.3–5.4 mm, wing 3.8–4.9 mm.

Female. Frons 0.38–0.4 times as wide as head-width, with 4 *ori*, 3 *ors* and 1 *if*; abdomen with compressed terminal segment.

Length. Body 4.4–5.6 mm, wing 3.7–5.1 mm.

MATERIAL EXAMINED: [KPNU] <GB> 3 exs., Daegu, 30.iii.1984, YJ Kwon; 22 exs., Daegu, 18.iii.1984, YJ Kwon; 14 exs., Daegu, 26.iii.1984, YJ Kwon.

DISTRIBUTION: Korea.

LOCALITY: South-GB: Daegu.

Genus *Strobilomyia* Michelsen, 1988

Strobilomyia Michelsen, 1988: 274–280. Type-species: *Chortophila anthracina* Czerny, 1906 (Austria).

DIAGNOSIS: Eye bare; parafacialia narrow; arista with pubescence very short; second *ph* developed; *pra* about as long as posterior *ntpl*; scutellum with setulae below apex; lower calypter neither reduced nor enlarged relative to upper calypter; costa with spinules and spines very short, on dorsal face bare but as rule with fine hairs on ventral face; fore tibia with apical *pd* weak; mid femur without *av* on distal half; mid tibia with 0 *av*, 1 *ad*; hind tibia with more than 3 *ad*, 2 *pd*; cercal plate heart-shaped, with 1–2 pairs of often very strong subapical setae and 0–3 pairs of apical setulae; surstylus with deep incision devoid of spinose setae at apex (Michelsen, 1988).

Key to species of Korean *Strobilomyia*

1. Haustellum short, conical; prementum matt pruinose; third antennal segment shorter *S. laricicola*
1. Haustellum cylindrical; prementum shiny; third antennal segment more than 1.5 times as long as broad 2
2. Inner vertical seta about as long as anterior ocellar seta; hind tibia with well-developed apical *pv* *S. oriens*
2. Inner vertical seta and hind tibial apical *pv* weaker *S. viaria*

113. *Strobilomyia laricicola* (Karl, 1928)

Chortophila (*Thrixina*) *laricicola* Karl, 1928: 69 (Austria).

Hylemia laricicola (sic): Hosoya, 1943: 184.

Hylemia laricicola: Ko, 1969: 324; Kor. Soc. Plant Prot., 1972: 218.

Lasiomma laricicola: Ackland, 1965: 139–141; Suwa, 1974: 84; Suwa, 1981a: 103, 104; Suh & Kwon, 1985: 179; Dely-Draskovits, 1993: 67.

Strobilomyia laricicola: Michelsen, 1988: 303, 304; Suh, 1989: 85; Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 304; Kwon et al., 1996: 224; Paek et al., 2010: 243; Han et al., 2014: 161.

Male. Black in ground color, with pale gray pollen. Interfrontalia black. Antenna black; third segment about 1.5 times as long as wide; arista minutely pubescent. Haustellum short, conical. Prementum matt pruinose.

Thorax black in ground color, with brownish gray pollen, and patches of brown pollen, especially on dor-

sum. Mesonotum with obscurely black vittae presuturally in caudal view. *Pra* short. Notopleuron without additional setulae. *Kepst* 2:2.

Legs black; fore tibia with 2 fine *d*; mid tibia with 1 *ad*, 1 *pd*, and 2–3 *p-pv*; hind tibia with 6–7 *ad*, 5–6 *av*, 3 *pd*, and 7 *pv*.

Wing faintly brownish tinged, denser basally.

Abdomen with grayish pollen, with black median vitta.

Length. Body 4.5–6.0 mm, wing 4.4–5.6 mm.

DISTRIBUTION: Korea, Japan (Hokkaido, Honshu), China (Neimenggu, Heilongjiang), Russia (Siberia), Europe.

HOST: *Larix decidua* (cf. Zonova, 1935; Suwa, 1974; Michelsen, 1988), *L. gmelini* (cf. Fan et al., 1982; Michelsen, 1988), *L. kaempferi* (= *L. leanepmepis*, cf. Yamada, 1972; Suwa, 1974; Michelsen, 1988), *L. ogensis* (= *L. koreana*, cf. Hosoya, 1943; Suwa, 1974; Michelsen, 1988), *L. sibirica* (cf. Suwa, 1974; Michelsen, 1988).

114. *Strobilomyia oriens* (Suwa, 1983) (Fig. 113)

Lasiomma oriens Suwa, 1983a: 709 (Japan: Hokkaido); Suwa, 1983b: 26–29; Suh & Kwon, 1985: 179.

Strobilomyia oriens: Michelsen, 1988: 312; Suh, 1989: 87, 88; Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 304; Kwon et al., 1996: 224; Suwa, 1999: 240; Suwa, 2005: 105; Paek et al., 2010: 243; Han et al., 2014: 162.

Phorbia oriens: Dely-Draskovits, 1993: 94.

Male. Black in ground color, with pale bluish gray pollen. Head about 1.3 times as high as long in profile. Frons much narrower than anterior ocellus; parafrofrontalia contiguous to each other. Interfrontalia dull tinged with brown; parafrofrontalia silvery white with 6–7 *ori*. Antenna black; third segment about 1.6 times as long as wide; arista minutely pubescent. Haustellum cylindrical. Prementum shiny.

Thorax black in ground color, with bluish gray pollen, and patches of brown pollen, especially on dorsum. Mesonotum with obscurely black median and submedian vittae presuturally in caudal view; 3 pairs of *pre acr* and several fine irregular setulae between rows, the distance separating *pre acr* rows slightly shorter than distance between *pre acr* and *dc* rows. Second *ph* developed, slightly shorter than first *ph*. *Pra* longer than posterior *ntpl*, and shorter than anterior *ntpl*.

Legs black; fore tibia with 2 *pv*; mid tibia with 1 *ad*, 1 *pd*, 2 *p*, and 1 *pv*; hind tibia with 12 *ad*, 5 *av*, 3 *pd*, 8 *pv* and strong apical *pv*.

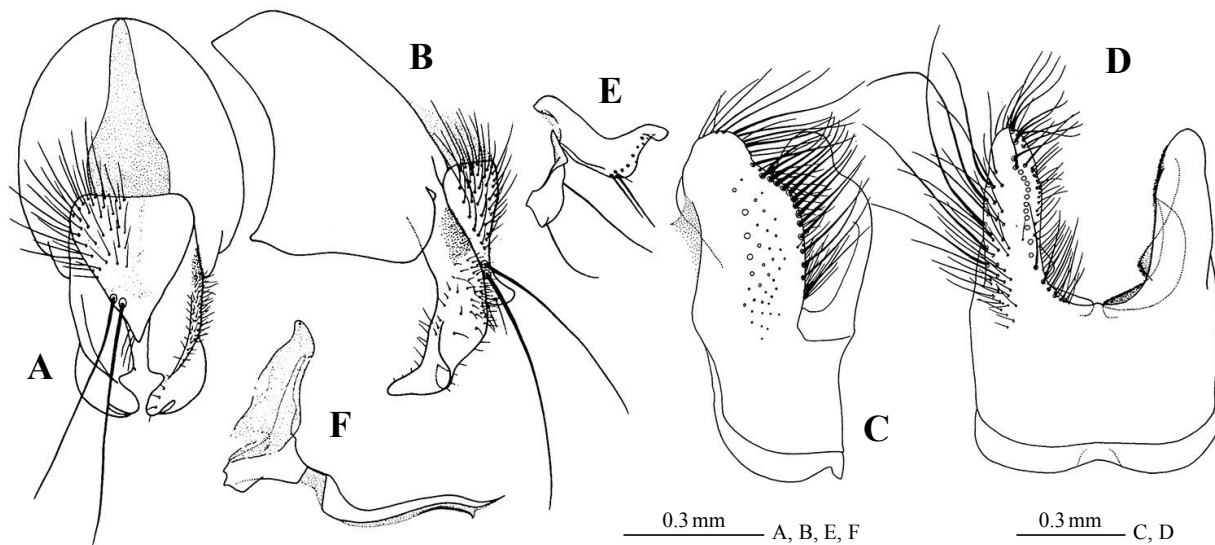


Fig. 113. *Strobilomyia oriens* (Suwa, 1983), male (after Suwa). A, B. hypopygium; C, D. fifth sternite; E. gonocoxal lobe and gonostylus; F. phallus.

Wing faintly brownish tinged, denser basally; costal spine small and much shorter than r-m; m-m slightly sinuate. Calypter and knob of halter pale yellow.

Abdomen with bluish gray pollen, with black median vitta.

Length. Body 7.7 mm, wing 6.8 mm.

DISTRIBUTION: Korea, Japan (Hokkaido).

LOCALITY: South-GN: Jirisan.

HOST: *Abies Sakhalinensis* (cf. Suwa, 1983; Michelsen, 1988).

115. *Strobilomyia viaria* (Huckett, 1965) (Fig. 114)

Hylemya (Lasiomma) viarium Huckett, 1965: 106 (Canada: Manitoba).

Strobilomyia viaria: Suh et al., 1991: 205, 206; Ent. Soc. Kor. & Kor. Soc. App. Ent., 1994: 304; Kwon et al., 1996: 224; Paek et al., 2010: 243; Han et al., 2014: 162.

Lasiomma melania melaniola Fan, 1982: 7, 11.

Male. Black in ground color, with faintly brown pollen. Head 1.4–1.5 times as high as long in profile. Frons width slightly narrower than diameter of anterior ocellus. Interfrontalia and parafrentalia with a short *if* and 5–6 strong *ors*. Third antennal segment about 1.6 times as long as wide; arista shortly pubescent.

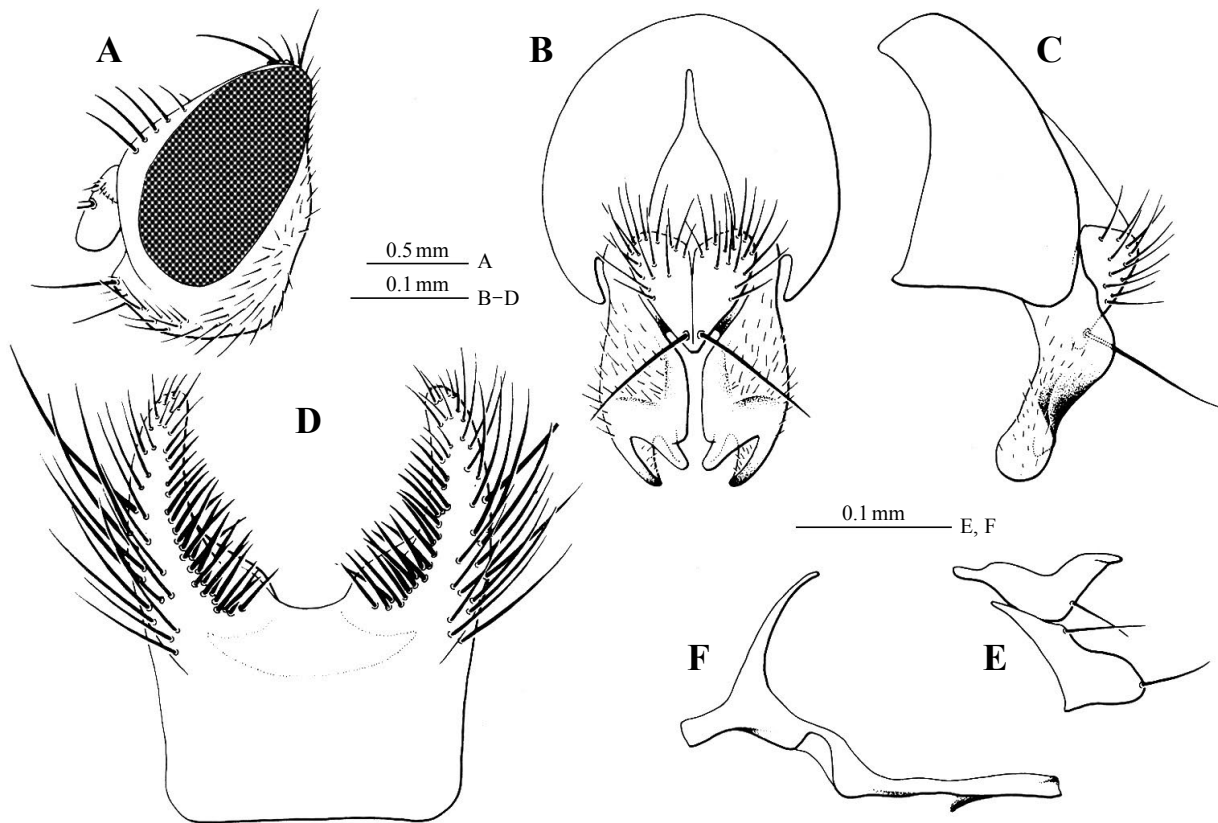


Fig. 114. *Strobilomyia viaria* (Huckett, 1965), male. A. head; B, C. hypopygium; D. fifth sternite; E. gonocoxal lobe and gonostylus; F. phallus.

Pre acr rows with several fine irregular setulae between rows; second *ph* slightly shorter than first *ph*. *Pra* strong, 0.8–0.9 times as long as posterior *ntpl*. Notopleuron without additional setulae. *Kepst* 2:2.

Legs black; fore tibia with 1 *pv*; mid tibia with 1 *ad*, 1 *pd* and 2 *pv*; hind tibia with 7 *ad*, 5 *av*, 3 *pd* and 3 *pv*.

Wing faintly brown; costal spine practically indistinguishable from costal setae. Calypter brown. Knob of halter yellow.

Fifth sternite with a series of strong setae on each inner margin of lobe.

Length. Body 4.7 mm, wing 4.6 mm.

MATERIAL EXAMINED: [KPNU] <GB> 1 ex., Geumosan, 13.iv.1983, SH Park.

DISTRIBUTION: Korea, China (Heilongjiang, Liaoning), Russia (E.Siberia), N. America.

LOCALITY: South-GB: Geumosan.

HOST: The larva lives on *Larix dhurica*, *L. gmelini*, *L. kaempferi*, *L. laricina* and *L. sibirica* (cf. Fan et al., 1988; Michelsen 1988; McClure et al., 1996).

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