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SUPPLEMENTARY NOTES ON THE FAMILY ANTHOMYIIDAE OF JAPAN (DIPTERA), IV

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Abstract

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Ten Japanese species of Anthomyiidae belonging to *Botanophila* and *Pegomya* are dealt with. Of them 3 species, *B. nigrodorsata* (=*Pegohylemyia gnava* (Meigen) sensu Suwa, 1974), *B. tridentifera* (=*Pegohylemyia dziedzickii* Séguy sensu Suwa, 1974) and *B. trifida*, are described as new to science, and 6 others, *B. fugax* (Meigen), *B. lobata* (Collin), *B. dissecta* (Meigen), *B. rubrifrons* (Ringdahl), *P. rufina* (Fallén) and *P. meridiana* (Villeneuve), are recorded as new to Japan. *B. sonchi* (Hardy) is confirmed to occur in Japan.

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INTRODUCTION

Pegohylemyia Schnabl, 1911, has generally been recognized as distinct from *Botanophila* Lioy, 1864, at the generic level or at the subgeneric level under the genus *Hylemya* Robineau-Desvoidy, 1830 (s. lat.), yet it is also known that there are found no reliable differences between the two except in the setal pattern on the hind tibiae, namely the apical *pv* on the tibia is present in *Botanophila* and absent in *Pegohylemyia*. Recently Michelsen (1983) suppressed *Pegohylemyia* as a synonym of the genus *Botanophila* after his unpublished thesis. His opinion is adopted here and 8 species belonging to the genus will be dealt with in the following lines. All these species agree with the previous concept of the genus *Pegohylemyia* in lacking a differentiated apical *pv* on the hind tibiae. Four species of them should be recorded as new to Japan and 3 others should be described as new to science. Two of the 3 new species are identical with *Pegohylemyia gnava* (Meigen) sensu Suwa, 1974, and *Pegohylemyia dziedzickii* Séguy sensu Suwa, 1974, respectively. *B. sonchi* (Hardy) was tentatively recorded from Japan by Suwa (1974) on the basis of a single male specimen. This record is confirmed in the present paper.

On this occasion 2 species of the genus *Pegomya* will be added to the Japanese fauna for the first time.

All the holotypes of the new species are deposited in the collection of Entomological Institute, Hokkaidô University.

Before going further I wish to express my sincere thanks to Dr. V. Michelsen, University of Copenhagen and to Mr. D.M. Ackland, Oxford, for their help in giving me a chance to examine European material of *B. gnava*, *B. sonchi* and *B. dissecta*.

ENUMERATION

1. *Botanophila nigrodorsata* sp. nov.
(Figs. 1-2)

Pegohylemyia gnava (Meigen) sensu Suwa, 1974 : 113.

Material. Hokkaidô : —Mt. Daisetsu, 1♂(holotype, genitalia figured in Suwa, 1974), 23. vii. 1968 (M. Suwa) ; Mt. Tomuraushi, 1♂, 29. vii. 1966 (H. Kurahashi) ; Sôun-kyô, 1♂, 6. viii. 1960 (K. Kamijô) ; Mt. Soranuma, 1♂, 1. viii. 1968 (M. Suwa) ; Rebun-tô, 2♂, 1-2. viii. 1958 (K. Kamijô) ; Yagishiri-tô, 2♂, 6. viii. 1984 (M. Suwa). Honshû : —Mt. Daibosatsu, Yamanashi-ken, 2♂, 6. viii. 1969 (M. Suwa).

This species was once identified with *gnava* by Suwa (1974). Having compared the present specimens with a European one (♂, France) determined as *gnava* by Michelsen, I am convinced that the Japanese species is distinctly different from *gnava* and should be described as new to science.

♂. Body-length 4.3-5.3 mm ; wing-length 3.9-4.9 mm. Body mainly blackish or dark brown in ground colour (much paler in some specimens due to their teneral condition). Interfrontalia orange yellow to brown on lower third and dark brown to black on the rest in ground colour, and pale grey and faintly tinged with brown in

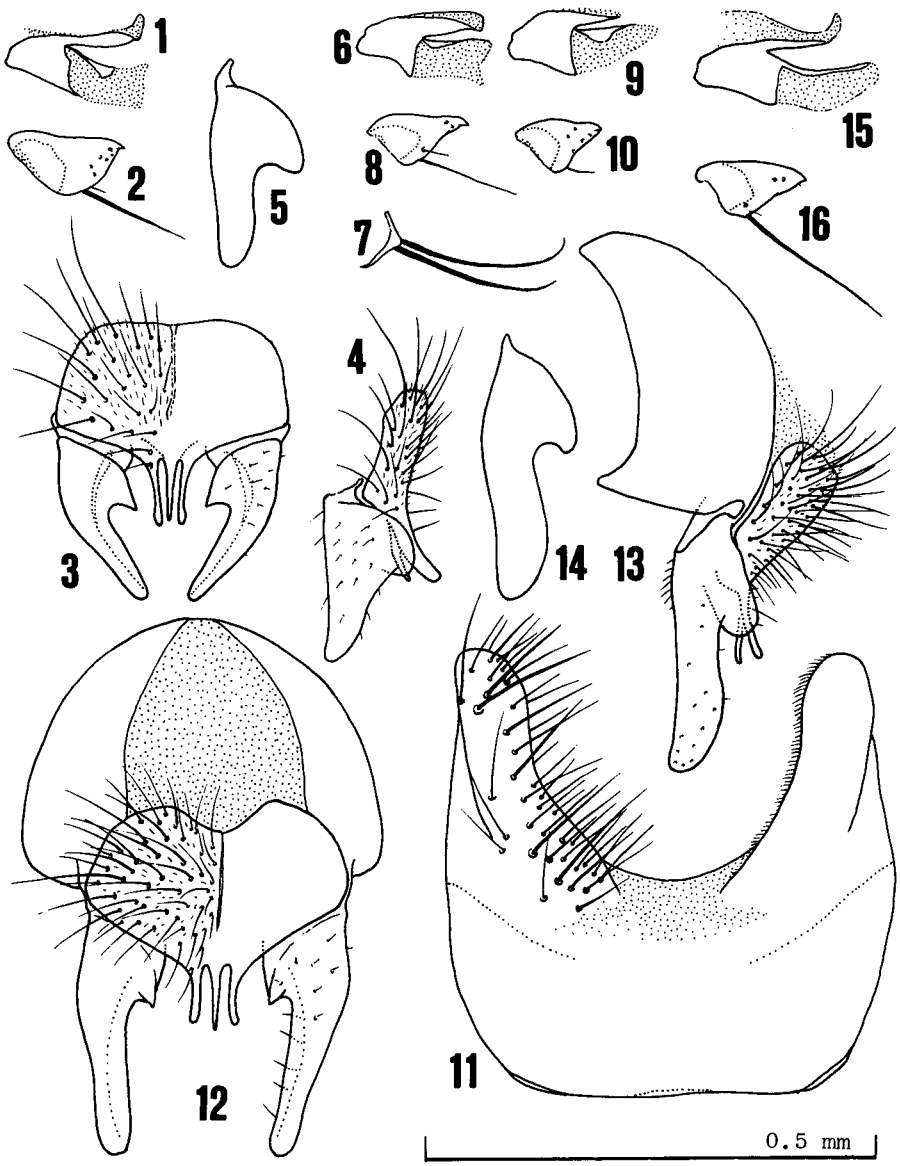
pollinosity; parafrontals in ground colour dark brown to black, paler near lunule, and in pollinosity brownish grey; parafacials in ground colour yellow to brown, often darkened along eyes, and in pollinosity slightly tinged with yellow; cheeks brownish yellow to dark brown in ground colour and pale grey pollinose, hardly or slightly tinged with yellow in the pollinosity; face dark brown or blackish in ground colour; antennae blackish, with A_2 often a little brownish; palpi mainly yellow to brown, much darkened apically; haustellar mentum brown to blackish and pollinose; occiput dark brown or blackish in ground colour and brownish grey pollinose, becoming paler ventrad in the pollinosity. Mesonotum thinly brownish grey pollinose; in frontal angle of view almost entirely blackish, with pollinosity visible peripherally; in caudal angle of view, before transverse suture with pollinosity visible between rows of *dc* and *acr* and along the suture, consequently a rather broad black vitta sharply appearing medianly, and behind transverse suture with pollinosity visible along rows of *dc* and along scutellar suture to postalar calli, the pollinose vittae along *dc*-rows being quite narrow anteriorly and often obscure, and more or less widened posteriorly and fused with the prescutellar pollinose area, the median broad blackish area reaching to scutellar suture. Abdomen rather thinly to densely covered with pale brownish grey pollen, with or without a yellowish tinge in the pollinosity; median vitta broad on 2nd tergite, narrowing caudad, and interrupted at hind margin of each tergite; each of 3rd to 5th tergites at a rather high angle in caudal view obscurely darkened along median vitta to make an inverted triangle enclosing the vitta, this triangular marking becoming sharper and changing to a T-shaped one at a low angle of view. Legs dark brown to black, much paler in teneral specimens. Wings slightly to rather distinctly tinged with brown or brownish yellow, and distinctly yellow basally; calyptrae tinged with yellow; halteres yellow, with brownish base.

Frons 1.3-1.4 (1.6 in 1 specimen) times as wide as anterior ocellus; interfrontalia as wide as or a little narrower than anterior ocellus, with *if* as long as or usually a little shorter than ocellar setae; parafrontals with a few strong and a few or some weaker *ori* and some short and fine associated setulae, and with no *ors*; A_3 1.7-2.1 times as long as wide; arista distinctly pubescent, with the longest hairs a little longer than basal diameter of arista; parafrontals* as wide as or a little narrower than A_3; cheeks about as high as parafrontal width*, with genal setae in 1 row, often with 1 or a few setae discernible below the row; epistoma situated a little behind parafrontal angle**; palpi stick-like, slightly broadened on apical half, and as long as or a little shorter than A_2 and A_3 combined (slightly longer than the combined length in 1 spcimen); haustellar mentum as long as or a little longer than palpi.

Mesonotum with 3-4 pairs of *pre-acr* and with 0-3 setulae between the rows, the middle pair being rather strong and others fine; distance between rows of *pre-acr* half to two-thirds as long as that to *dc*-rows; 2nd *ph* fine and hardly distinguishable from accessory setulae, or at most slightly stronger than the latter; *pra* as long as or slightly shorter than anterior *ntpl*; notopleura usually with 1 or a few accessory

* The parafrontal width is measured at the widest part, namely at the level of the lunule, or of the parafrontal angle. For this part the term "profrons" is incorrectly used in my previous papers.

** In the sense of Griffiths (1982), the angle or corner held between the anterior margins of parafrontal and parafacial with the head in profile.



Figs. 1-2. *Botanophila nigrodorsata* sp. nov., ♂. 1, basiphallus and distiphallus; 2, postgonite. Paratype from Yagishiri-tô, Hokkaidô.

Figs. 3-10. *Botanophila tridentifera* sp. nov., ♂. 3, hypopygium, dorsal view; 4, ditto, lateral view; 5, surstylus (left), dorsolateral view; 6 & 9, basiphallus and distiphallus; 7, praegonite; 8 & 10, postgonite. Paratypes from Mt. Ashibetsu, Hokkaidô (Figs. 3-8) and Masutomi, Yamanashi-ken (Figs. 9-10).

Figs. 11-16. *Botanophila gnava* (Meigen), ♂. 11, 5th sternite; 12, hypopygium, dorsal view; 13, ditto, lateral view; 14, surstylus (left), dorsolateral view; 15, basiphallus and distiphallus; 16, postgonite. France.

setulae around anterior *ntpl*; *stpl* 1 : 2; scutellum scarcely setulose on dorsum, only with a few setulae near each lateral margin.

Abdomen depressed, nearly parallel-sided in main part or very loosely narrowing towards both ends, and about twice (1.8-2.1 times) as long as wide; 6th tergite not setose; 5th sternite and hypopygium as in Figs. 306-309 of Suwa (1974) and Figs. 1-2 of the present paper.

Mid femur with 1 or a few *av* in basal third and a few or some (2-5) *pv* in basal half; f_3 with 5-8 *av*, 1 *pv* near base, 1 or a few *pv* in middle third, and 1-2 *pv* near apex; t_1 with 1 *ad* and 1 *pv*; t_2 with 1 *ad*, 2*pd* and 2 *p-pv*; t_3 with 2-3 *av*, 3-6 (usually 4-5) *ad*, 3 (rarely 2 or 4) *pd* and 1 or a few weak *pv*, and with apical *pd* usually weak (strong in 1 specimen) and apical *pv* not differentiated. Wings with costal thorns minute, hardly or slightly stronger than costal spicules; costa bare ventrally; *dm-cu* (= *m-m* in my previous papers) nearly erect and hardly or faintly sinuate.

♀. Unknown.

In general appearance the present species resembles *B. gnava* (Meigen), which is, however, distinguished from the former by the broader parafacials and the clearly diffrerent genital structures. Judging from the genitalia, *B. gnava* is more closely related to the succeeding *B. tridentifera.*

2. *Botanophila tridentifera* sp. nov.

(Figs. 3-10)

Pegohylemyia dziedzickii Séguy sensu Suwa, 1974 : 114.

Material. Hokkdidô: —Nopporo, 1♂ (holotype, genitalia figured in Suwa, 1974), 9. vi. 1967 (M. Suwa); Shikotsu-ko, 1♂, 16. vi. 1961 (I. Miyagi); Mt. Ashibetsu, 400-800 m, 1♂, 3. vii. 1976 (T. Hattori); Mt. Poroshiri, Hidaka, 1♂, 21. vii. 1973 (T. Hattori); Kôgen-Onsen, 1200-1500 m, Mt. Daisetsu, 1♂, 28. vii - 3. viii. 1975 (M. Suwa). Honshû: —Atsumi-Onsen, Yamagata-ken, 1♂, 12. v. 1974 (T. Hattori); Yokosawa, Shizuoka-shi, Shizuoka-ken, 1♂, 25. iv. 1975 (T. Hattori); Kanayama, Masutomi, Yamanashi-ken, 2♂, 26. v - 4. vi. 1975 (T. Saigusa et al.); Mt. Yatsugatake, Nagano-ken, 2♂, 2. vi. 1967 (T. Kocha); Shimosuwa, 800-1000 m, Nagano-ken, 4♂, 22. v. 1979 (M. Suwa). Kyûshû: —Wakasugi-yama, Fukuoka-ken, 1♂, 3. v. 1963 (T. Saigusa); Chôjabaru, Ôita-ken, 1♂, 17. v. 1977 (K. Ôhara).

In my previous paper (Suwa, 1974) I recognized this species as distinct from *gnava* and identified it with *dziedzickii,* which, however, had already been synonymized with *gnava* by Hennig (1970). This synonymy is accepted by Michelsen (in litt., 1985). Now that the Japanese species once identified with *gnava* has proved to be another distinct one, the present species should also be revised. As stated, 1 European male specimen of *gnava* is available for my study. In my comparisons I am convinced that the Japanese species once identified with *dziedzickii* is quite distinct from *gnava* (= *dziedzickii*), and that it should be new to science.

♂. Body-length 3.3 (?)-4.9 mm (often difficult to get a precise measurement owing to shrinkage on the abdomen); wing-length 3.4-4.5 mm. Body in ground colour wholly blackish in well pigmented specimens, yet usually paler in part

especially on frontal side of head in various degrees to the condition of tenerity. Interfrontalia in ground colour yellow or brownish yellow to blackish on lower half and dark brownish to blackish on the upper; parafrontals brownish to blackish; parafacials and cheeks yellowish to blackish; face dark brownish to blackish; antennae blackish, sometimes slightly paler on A_1 and A_2; palpi dark brown to blackish; haustellar mentum dark brown to blackish, and distinctly pollinose; occiput with brownish grey and more or less bluish pollen on blackish ground colour. Mesonotum with pollinosity brownish grey to brown, rather dense and visible in any angles of view even if rather weakly so in some lights; in frontal angle of view with blackish markings obscurely to rather sharply visible between rows of *dc* and *acr* and on lateral declivities, the inner markings being broadly interrrupted behind transverse suture to 2nd *post-dc*; in caudal angle of view with median and sublateral vittae and presutural lateral patches visible, and with postsutural lateral patches also visible in certain light and fused with sublateral vittae in some lights; median vitta moderate and sharp before transverse suture, rather obscure and much broadened behind the suture to near 2nd *post-dc* and around *prsc*. Abdomen densely greyish pollinose, a little tinged with brown (or rarely yellow) and sometimes blue also in the pollinosity; median vitta sharp, moderate to rather broad or rarely narrow, and interrupted at hind margin of each tergite, somtimes indiscernible on 5th tergite; fore-marginal bands usually visible and sharp even if narrow. Legs dark brown to blackish though much paler in teneral specimens. Wings a little to rather distinctly tinged with brown; calyptrae a little tinged with yellow or brownish yellow especially on margin; halteres yellowish apically and brownish basally.

Frons a little narrower to a little wider than anterior ocellus (about 1.5 times as wide as the latter in 1 spcimen); interfrontalia narrower to wider than half width of anterior ocellus (a little wider than full width of anterior ocellus in the aforementioned specimen), with *if* distinct or rather strong; parafrontals with 3-5 *ori* and some associated short setulae, and with no *ors* (1 minute *ors* discernible on right parafrontal in 1 specimen); A_3 1.5-1.8 times as long as wide; arista distinctly swollen basally and distinctly pubescent, with longest hairs as long as or slightly shorter than basal diameter of arista; parafrontals as wide as or slightly narrower than A_3; cheeks somewhat less high than parafrontal width, with genal setae in 1 or sometimes 2 rows; epistoma situated a little behind parafrontal angle; palpi usually a little shorter, rarely slightly longer, than A_2 and A_3 combined; haustellar mentum as long as or slightly longer than palpi.

Mesonotum with 4-7 (usually 6, namely 3 pairs) *pre-acr* arranged in 2 rows, distance between the rows as long as or somewhat shorter than that to *dc*-rows; 0-6 (usually 1 or 2) accessory setulae visible between rows of *pre-acr*; *ph* not duplicated; *pra* about as long as or sometimes rather distinctly shorter than anterior *ntpl*; notopleura usually with 1 or a few accessory setulae near anterior *ntpl*; *stpl* 1 : 2; scutellum on dorsum with at most 1 or 2 and usually no accessory setulae except for a few ones near basal setae.

Abdomen depressed, long-ovoid or nearly parallel-sided on 2nd to 4th tergites, and 1.6-2.3 (usually 1.7-2) times as long as wide; 6th tergite not setose; 5th sternite and hypopygium as in Figs. 310-313 of Suwa (1974) and Figs. 3-10 of the present paper; cercal plate trifurcated apically, with median projection as long as or slightly shorter than the laterals; postgonites at base with 1 distinct or rather weak seta,

which is rarely accompanied with 1 fine setula (Fig. 8).

Mid femur near base with a few weak to distinct *av* usually discernible, the setae being shorter than the femur-height, and in basal half with some (3-5) longer *pv*, the longest one longer than the height; f_3 with a row of 6-9 *av*, a few *pv* in basal half and 1 or 2 *pv* near apex, and sometimes with a few or some additional finer *pv* discernible; t_1 with 1 *ad* and 1 *pv*; t_2 with 1 *ad*, 2 *pd* and 2 *p-pv*; t_3 with 2-3 *av*, 4-5 (rarely 6) *ad*, 3 *pd* and 2-5 weak *pv*, and with apical *pd* minute, at most only a little stronger than adjacent setulae, and apical *pv* not differentiated. Wings with costal thorns minute, hardly or slightly stronger than costal spicules; costa bare ventrally; *dm-cu* nearly erect and hardly or only slightly sinuate.

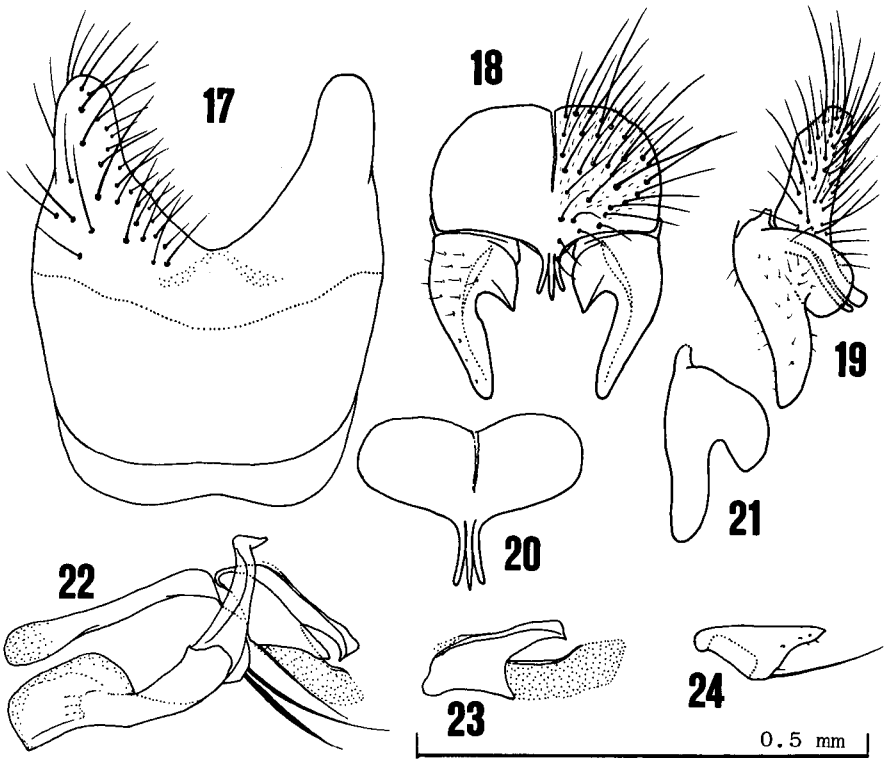
♀. Unknown.

In the male genital structures the present species much resembles *B. gnava*, yet the latter is, so far as the single male specimen available is concerned, clearly different from the former in some features as follows: —Body larger, 5.8 mm in length (5-6 mm after Hennig, 1970); mesonotum much more thinly pollinose and more broadly blackish in any angles of view; parafacials a little wider than A_3 even at the narrowest part; arista longer pubescent, with longest hairs distinctly longer than basal diameter of arista; notopleura with no accessory setulae; surstyli (Figs. 12-14) comparatively long and less broadened near base, with inner lobe shorter; aedeagus with distiphallus not directly connected with epiphallic base (Fig. 15). Judging from the figures of male genital structures of the North American *Botanophila abitibiensis* (Huckett, 1929) given by Huckett (1965a) under the generic name *Hylemya* (*Pegohylemyia*), *B. tridentifera* might be more closely related to that species than to the European *gnava*. *B. abitibiensis* may, however, be different from *tridentifera* in the *pra* slightly shorter than posterior *ntpl* (after the original description) and in the male 5th sternite less densely setose (cf. Fig. 224 of Huckett, 1965a). Further comparisons based on material of both species are necessary for a more dicisive conclusion.

3. *Botanophila trifida* sp. nov.
(Figs. 17-24)

Material. Honshû: —Yokose, Saitama-ken, 1♂ (holotype), 25. ix. 1977 (K. Hara).

♂. Body-length 4.4 mm; wing-length 4.8 mm. Body including appendages blackish in ground colour. Interfrontalia brownish near lunule, darkening dorsad and blackish on upper half; parafrontals brownish near lunule and blackish on remaining part; parafacials and cheeks mainly brownish and partly blackish; palpi slightly brownish at base; haustellar mentum pollinose; occiput in pollinosity brownish grey and in some lights bluish. Mesonotum thinly brownish grey pollinose; in frontal angle of view almost wholly blackish; in caudal angle of view, before tranverse suture with pollinosity visible outside rows of *acr* though becoming obscurer laterad, and behind the suture with pollinosity visible along rows of *dc* and less distinctly visible between rows of *dc* posteriorly, the pollinose vittae along *dc*-rows being narrow and faint anteriorly. Abdomen densely covered with grey and a little brownish pollen; median vitta broad on 2nd tergite, narrowing caudad,



Figs. 17-24. *Botanophila trifida* sp. nov., ♂. 17, 5th sternite; 18, hypopygium, dorsal view; 19, ditto, lateral view; 20, cercal plate, dorsal (slightly cephalic) view; 21, surstylus (left), dorsolateral view; 22 aedeagus; 23, basiphallus and distiphallus; 24, postgonite. Holotype from Yokose, Saitama-ken.

and very narrowly interrupted at hind margin of each tergite; fore-marginal bands discernible, rather narrow; these markings rather sharply visible at a low angle in caudal view. Wings distinctly tinged with brownish yellow; calyptrae with a brownish yellow tinge; halteres yellow apically and reddish brown basally.

Frons a little wider than anterior ocellus; interfrontalia slightly narrower than anterior ocellus, with *if* rather weak and shorter than ocellar setae; parafrontals with 5 *ori* and a few short and fine associated setulae, and with no *ors*; A_3 about twice as long as wide; arista with basal part loosely narrowing apicad, and with longest hairs a little longer than basal diameter of arista; parafrontals slightly narrower than A_3; cheeks about as high as parafrontal width, with genal setae arranged in 1 row; epistoma slightly behind parafrontal angle; palpi slender, more or less broadened on apical half, and a little longer than A_2 and A_3 combined; haustellum rather slender, with mentum probably about as long as palpi.

Mesonotum with 3 pairs of *pre-acr* in 2 rows separated from each other at the 1st pair by a distance three-fourths or four-fifths as long as that to *dc*-rows, and with no accessory setulae between the rows of *acr*; *ph* not duplicated; *pra* a little longer than anterior *ntpl*; notopleura with or without 1 accessory setula above anterior *ntpl*; *stpl* 1 : 2; scutellum scarcely setulose on dorsum.

Abdomen depressed, long-ovoid and 1.9 times as long as wide; 6th tergite with no setae; 5th sternite and hypopygium as in Figs. 17-24; cercal plate trifurcated apically, the projections set close to each other; surstyli with inner lobe well developed.

Mid femur near base with a few short *av* discernible and in basal half with about 4 rather long *pv*; f_3 (left one missing) with a row of 7 *av*, 4 *pv* in basal two-thirds and 1 *pv* near apex; t_1 with 1 *ad* and 1 *pv*; t_2 with 1 *ad*, 2 *pd* and 2 *p-pv*; t_3 (left one missing) with 2 *av*, 5 *ad*, 3 *pd* and 2 weak *pv*, and with apical *pd* a little stronger than adjacent setulae and apical *pv* not differentiated. Wings with costal thorns minute; costa bare ventrally; *dm-cu* nearly erect and slightly sinuate.

♀. Unknown.

This species is quite similar to the forenamed *nigrodorsata* in general appearance and cannot easily be distinguished from the latter unless its genital structures are examined. However, the following characters may be useful for identifying the species: —Palpi almost entirely blackish and longer than A_2 and A_3 combined; mesonotum with rows of *pre-acr* separated from each other by a distance somewhat longer than two-thirds of that to *dc*-rows. So far as based on the male genitalia, *trifida* is apparantly more closely related to *tridentifera,* from which it is, however, readily separable by the mosenotum less densely pollinose and much more broadly blackish in any angles of view and by the cercal plate and surstyli of the male hypopygium distinctly different in details.

4. *Botanophila fugax* (Meigen, 1826)
(Figs. 25-30)

Pegohylemyia fugax: Hennig, 1970: 369.

Material. Hokkaidô: —Mt. Shokambetsu, 1100-1300 m, 1♂, 19. vii. 1984 (M. Suwa).

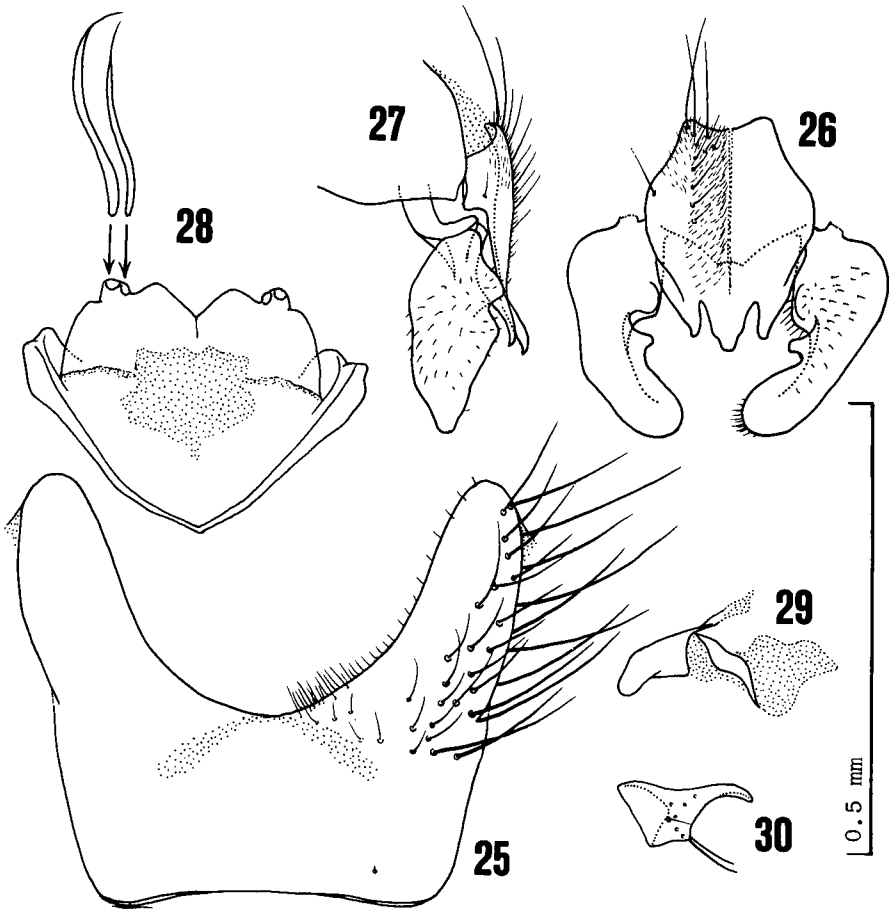
Distribution. Holarctic region. New to Japan.

♂. Arista distinctly pubescent, with longest hairs nearly twice as long as basal diameter of arista; cheeks with genal setae arranged in 2 rows. Mesonotum with 3 pairs of *pre-acr,* setae of the 3rd pair being much weaker than the others, and with some setulae between the rows; distance between rows of *pre-acr* at 1st pair slightly longer and at 2nd pair slightly shorter than that to *dc*-rows respectively; *pra* about two-thirds as long as posterior *ntpl*. Fore tibia with 1 *ad* and 1 *pv*; t_2 with 1 *ad*, 2 *pd* and 2 *p-pv*; t_3 with 3 *av*, 5-6 *ad*, 3 *pd* and 4 *pv*.

♀. Japanese material unavailable.

This species is well known from Europe and N. America and also recorded from a few localities in Asia, namely Ural (after Hennig, 1970), Turkmeniya (Ashkhabad, after Karl, 1935) and Kamchatka (after Ringdahl, 1930). These records from Asia may need confirmation, but the discovery of the species in Japan shows that it is quite widely distributed in the Holarctic region.

In Europe and N. America larvae of the species have been taken from seedlings, leaves, stems and crowns of various crops mostly belonging to the Cruciferae. According to Miles (1951) the larvae are saprophytic and feed on decomposing tissue



Figs. 25-30. *Botanophila fugax* (Meigen), ♂. 25, 5th sternite; 26, hypopygium, dorsal view; 27, ditto, lateral view; 28, hypandrium, anteroventral view; 29, basiphallus and distiphallus; 30, postgonite. Mt. Shokambetsu, Hokkaidô.

produced by other organisms. No biological information on the species is available in Japan.

5. *Botanophila dissecta* (Meigen, 1826)
(Figs. 31-37)

Pegohylemyia dissecta: Hennig, 1970: 366.

Material. Honshû: —Kanayama, Masutomi, Yamanashi-ken, 1♂, 26. v - 4. vi. 1975 (T. Saigusa et al.).

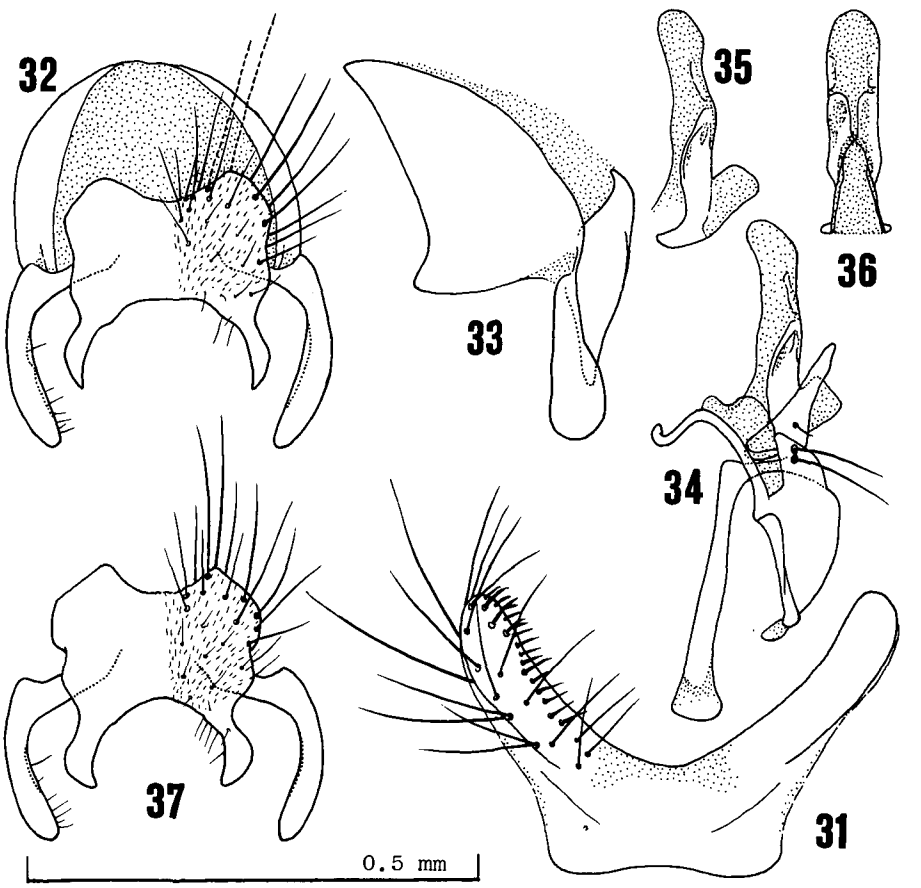
Distribution. Japan; Europe. New to Japan.

♂. Body-length 3.7 mm; wing-length 4 mm. Mesonotum more or less tinged with brown in pollinosity especially behind transverse suture, in frontal angle of view slightly tessellated, with pollinosity well visible, and in caudal angle of view

with some blackish markings appearing, the median vitta being rather broad, sharply visible before transverse suture and rather obscurely so behind the suture though traceable to scutellar suture at a low angle of view, and the paramedian vittae along *dc*-rows narrow and only visible before 1st *post-dc* though becoming continuous to posteriormost *dc* in lateral view.

Frons narrower than anterior ocellus; A_3 1.6 times as long as wide; parafrontals about as wide as A_3; cheeks slightly higher than A_3-width, with genal setae in 1 row. Mesonotum with 3 pairs of *pre-acr* in 2 rows closer to each other than to *dc*-rows and with 2 setulae between the *acr*-rows; *pra* shorter than posterior *ntpl*; notopleura with 1 accessory setula discernible above anterior *ntpl*. Fore tibia with 1 fine *ad* and 1 fine *pv*; t_2 with 1 *ad*, 2 *pd* and 2 *p-pv*; t_3 with 1-2 *av*, 4 *ad*, 3 *pd* and a few weak *pv*.

♀. Unknown to me.



Figs. 31-37. *Botanophila dissecta* (Meigen), ♂. 31, 5th sternite; 32 & 37, hypopygium, dorsal view; 33, ditto, lateral view; 34, aedeagus; 35, basiphallus and distiphallus, lateral view; 36, ditto, ventral view. Masutomi, Yamanashi-ken (Figs. 31-36) and England (Fig. 37).

Havinhg compared the present specimen with a European one (♂, England) determined as *dissecta* by Ackland, I have found that the latter is slightly different as follows: —Mesonotum less thickly pollinose, more obscurely vittate, and a little more densely setulose; cercal plate (Fig. 37) with apical processes less widely set apart from each other.

6. *Botanophila lobata* (Collin, 1967)

Pegohylemyia lobata: Hennig, 1970: 385; Suwa, 1983: 31; Hsue, 1983: 56.

Material. Honshû: —Kanayama, Masutomi, Yamanashi-ken, 3♂, 26. v - 4. vi. 1975 (T. Saigusa et al.).

Distribution. Japan; Korea; N.E. China; England. New to Japan.

♂. Body-length 4.2-4.3 mm; wing-length 4.3-4.4 mm. Mesonotum a little or rather distinctly tinged with brown in pollinosity especially behind transverse suture; in frontal angle of view largely blackish, with pollinosity weakly traceable in part; in caudal angle of view with rather broad median vitta and broad lateral patches appearing, the median vitta being traceable to scutellar suture at a high angle of view even though rather obscurely, yet becoming sharper and ending near 1st *post-dc* at a low angle of view; at a low angle in lateral view with paramedian vittae appearing along *dc*-rows and traceable to posteriormost *dc*.

Frons narrower than anterior ocellus; A_3 1.6-1.7 times as long as wide; parafrontals slightly or rather distinctly narrower than A_3; cheeks less high than A_3-width, with genal setae in 1 row. Mesonotum with 3 pairs of *pre-acr* and with a few setulae between the rows; anterior distance between rows of *pre-acr* a little shorter or at most as long as that to *dc*-rows; *pra* shorter than posterior *ntpl*; notopleura with 1 or a few accessory setulae discernible above anterior *ntpl*. Abdomen depressed and ovoid, 1.5-1.6 times as long as wide. Fore tibia with 1 minute *ad* discernible or practically absent, and with 1 rather distinct *pv* present (indiscernible on right leg in 2 specimens); t_2 with 1 *ad*, 2 *pd* and 1-2 *p-pv*; t_3 with 2 *av* (only 1 *av* on left leg in 1 specimen), 4-6 *ad* and 3-4 *pd*, and with no *pv* discernible.

♀. Unknown to me.

In general appearance the present species is similar to the preceding *dissecta*, from which, however, it is rather easily distinguished by the marking-pattern on the mesonotum, at least so far as the Japanese forms are concerned.

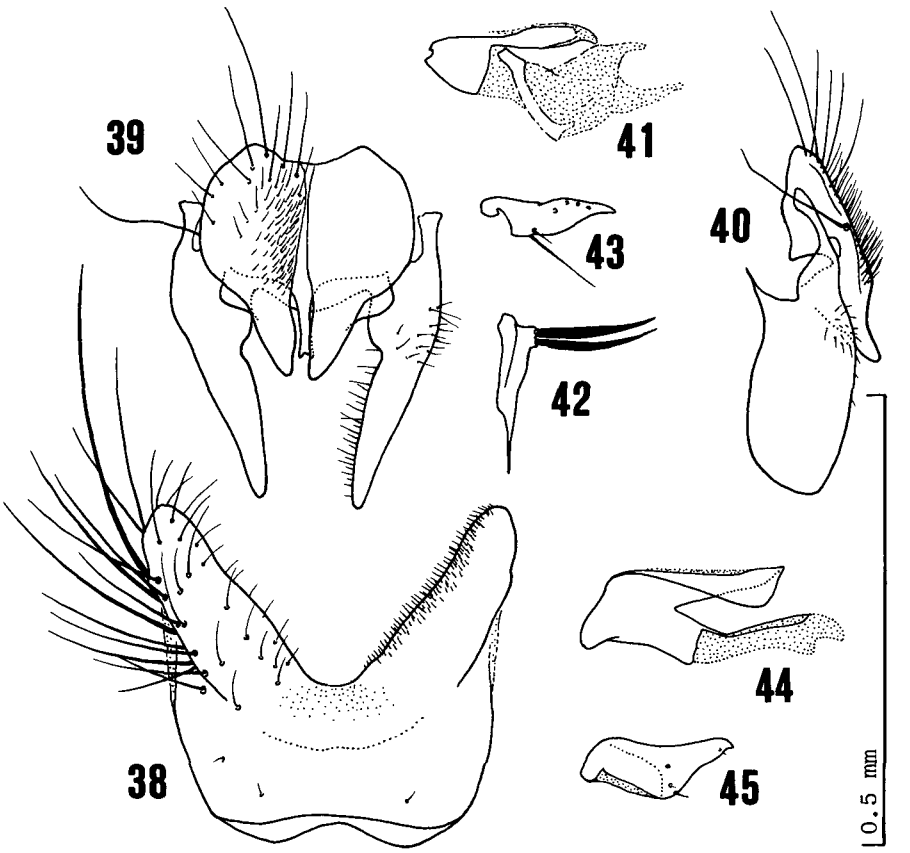
7. *Botanophila rubrifrons* (Ringdahl, 1933)
(Figs. 38-43)

Pegohylemyia rubrifrons: Hennig, 1970: 404; Hsue, 1983: 56.

Material. Hokkaidô: —Chûbetsu-dake, 1700-1900 m, Mt. Daisetsu, 1♂, 21. vii. 1968 (M. Suwa).

Distribution. Japan; N.E. China; Europe (Scandinavia and Austrian Alps). New to Japan.

This species was originally described from Sweden, and then has been known



Figs. 38-43. *Botanophila rubrifrons* (Ringdahl), ♂. 38, 5th sternite; 39, hypopygium, dorsal view; 40, ditto, lateral view; 41, basiphallus and distiphallus; 42, praegonite; 43, postgonite. Mt. Daisetsu, Hokkaidô.

Figs. 44-45. *Botanophila sonchi* (Hardy), ♂. 44, basiphallus and distiphallus; 45, postgonite. Denmark.

from some localities in Scandinavia, from the Austrian Alps and also from N.E. China. Although the record from the Alps might need confirmation (after Hennig, 1970), it is likely that the species is widely distributed in mountainous or cooler districts in the Palaearctic region. A brief redescription based on the present specimen is given as follows: -

♂. Body-length 4.3 mm. Body mainly blackish or dark brownish in ground colour and brownish grey in pollinosity. Frons dark brown on upper half and orange brown on the lower; parafacials and cheeks brownish; face blackish; antennae blackish, with A_1 dark brown; palpi brownish; haustellar mentum blackish, with greyish pollen. Mesonotum rather thinly brownish grey pollinose and obscurely vittate; in frontal angle of view largely blackish, with broad blackish median and paramedian vittae and lateral patches discernible, and with pollinosity thinly visible between the black markings, the pollinose vittae between median and paramedian black vittae being quite narrow and ending near 2nd *post-dc*; in caudal

angle of view with pollinosity broadly visible and with rather broad blackish median and paramedian vittae and lateral patches obscurely discernible, the median vitta sharply margined before transverse suture. Abdomen brownish grey and faintly yellowish in pollinosity, with a purplish tinge in some lights; median vitta narrow and interrupted at hind margin of each tergite, becoming sharper at low angle of view. Legs dark brownish. Wings slightly tinged with brown, distinctly yellowish at base.

Frons a little wider than anterior ocellus; interfrontalia slightly narrower than anterior ocellus, with *if* distinct; parafrontals with 8-9 rather strong or distinct *ori* and some short and fine associated setulae, and with no *ors*; A_3 compressed in this specimen and difficult to get a precise measurement, probably about 1.5 times as long as wide; parafrontals probably a little narrower than A_3; cheeks with genal setae in 2 rows; face distinctly concave near epistoma, the latter protruding as far as parafrontal angle; palpi stick-like, and 1.25 times as long as A_2 and A_3 combined; haustellum slender, with mentum distinctly longer than palpi. Mesonotum rather densely setulose in part; 3 pairs of *pre-acr* present, distance between the rows at the 1st pair being a little shorter than that at the 2nd pair and about as long as that to *dc*-rows, some setulae visible between the rows of *acr*; 2nd *ph* indistinguishable from adjacent setulae; *pra* shorter than posterior *ntpl* though distinct. Abdomen depressed and ovoid, about 1.7 times as long as wide; 6th tergite not setose; 5th sternite and hypopygium as in Figs. 38-43; praegonites with setae flattened; postgonites with 1 or 2 long setae.

♀. Unknown.

8. *Botanophila sonchi* (Hardy, 1872)
(Figs. 44-45)

Pegohylemyia sonchi: Hennig, 1970: 415; Suwa, 1974: 116; Suwa, 1981: 12.

Distribution. Japan; Sakhalin; Europe.

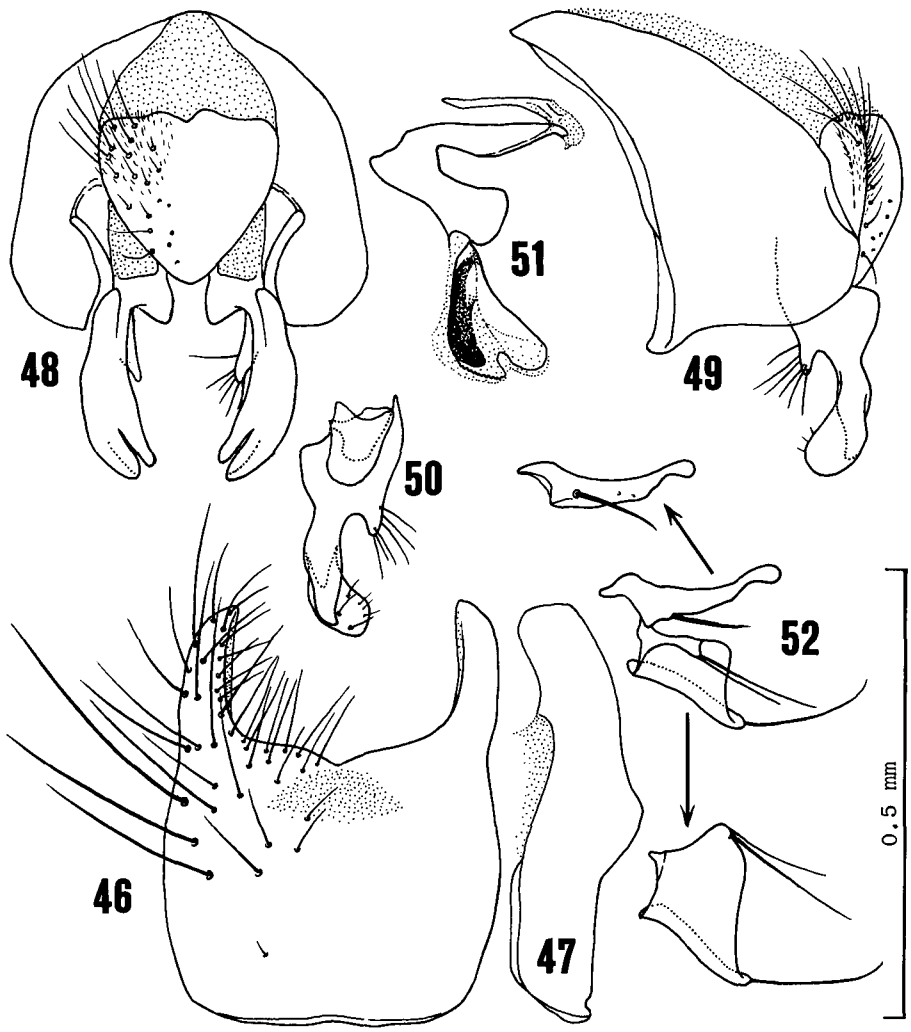
Recently I have had the opportunity to examine 1 European specimen (♂, Denmark) determined as *sonchi* by Michelsen. In comparing it with the specimen at hand (♂, Hokkaidô) which was tentatively referred to the species by Suwa (1974), I have found no significant differences between them and have been convinced that the present Japanese specimen should rightly be identified with *sonchi*. In a key to the Palaearctic species of *Pegohylemyia* Hennig (1970) states that in *sonchi* "Wangen etwas schmäler als das 3. Fühlerglied," but this statement may be erroneous. The parafacials are much wider than A_3 even at the narrowest part in the specimens at hand from Europe and Japan.

9. *Pegomya rufina* (Fallén, 1825)
(Figs. 46-52)

Pegomya rufina: Hennig, 1973: 626.

Material. Hokkaidô: —Mt. Soranuma, 900-1100 m, 1♂, 30. vi. 1984 (M. Suwa).

Distribution. Japan; Europe. New to Japan. The North American species



Figs. 46-52. *Pegomya rufina* (Fallén), ♂. 46, 5th sternite, ventral view ; 47, ditto, lateral view ; 48, hypopygium, dorsal view ; 49, ditto, lateral view ; 50, surstylus (left), inside view ; 51, basiphallus and distiphallus; 52, praegonite and postgonite. Mt. Soranuma, Hokkaidô.

identified with *rufina* by Huckett (1965 b) has recently been described as new to science under the name *Pegomya neomexicana* by Griffiths (1983).

♂. Body-length 5.3 mm ; wing-length 4.7 mm. Body in ground colour blackish, on abdomen faintly brownish. Antennae and palpi blackish ; haustellar mentum blackish and polished ; occiput with setulae all blackish. Thorax in pollinosity tinged with brown especially on mesonotum ; mesonotum in frontal anlge of view almost blackish, with pollinosity hardly visible especially at a low angle of view, and in caudal angle of view blackish only laterally, with pollinosity broadly visible. Legs blackish. Wings slightly tinged with brown, at base yellowish ; calyptrae pale yellow ; halteres brownish basally and yellowish apically.

Head about 1.45 times as high as long; frons very narrow, about half as wide as anterior ocellus; parafrontals contiguous for a considerable length, with 5 *ori* and no *ors*; A_3 long and nearly reaching to epistoma, about 2.7 times as long as wide; arista lissom and short pubescent, with hairs shorter than basal diameter of arista; parafrontals much narrower than A_3, about 0.6 times as wide as the latter; parafacials very narrow, at middle part about half as wide as parafrontals; cheeks about as high as parafrontal width, with genal setae in 1 row; palpi about as long as A_3.

Mesonotum with 3 pairs of distinct *pre-acr*, setae of the middle pair strongest and a little longer than *pra*, and between the rows of *acr* with some setulae arranged in about 2 rows; distance between rows of *pre-acr* about 1.5 times as long as that to *dc*-rows at 1st pair and becoming shorter towards tranverse suture; *ph* duplicated, 2nd one somewhat weaker than the 1st; *pra* about two-thirds of posterior *ntpl* in length; *stpl* 1 : 2, below the anterior seta 1 additional being discernible.

Abdomen depressed, long-ovoid, about twice as long as wide, and widest on 2nd tergite posteriorly; 6th tergite not setose; 5th sternite and hypopygium as in Figs. 46-52.

Fore tibia with 1 *ad* and 1 *pv*; t_2 with 1 *ad*, 1 *pd* and 2-3 *p-pv*; t_3 with 1 *av*, 3 *ad* and 2 *pd*. Wings with *dm-cu* sinuate; lower calyptra somewhat larger than the upper.

♀. Unknown to me.

The present specimen agrees well with the redescription of *rufina* by Hennig (1973) except in the colouration especially of the legs. According to Hennig (l.c.) the European form of the species has the legs mainly yellowish except on the blackish tarsi.

10. *Pegomya meridiana* (Villeneuve, 1923)
(Figs. 53-65)

Pegomya meridiana: Hennig, 1973: 598.

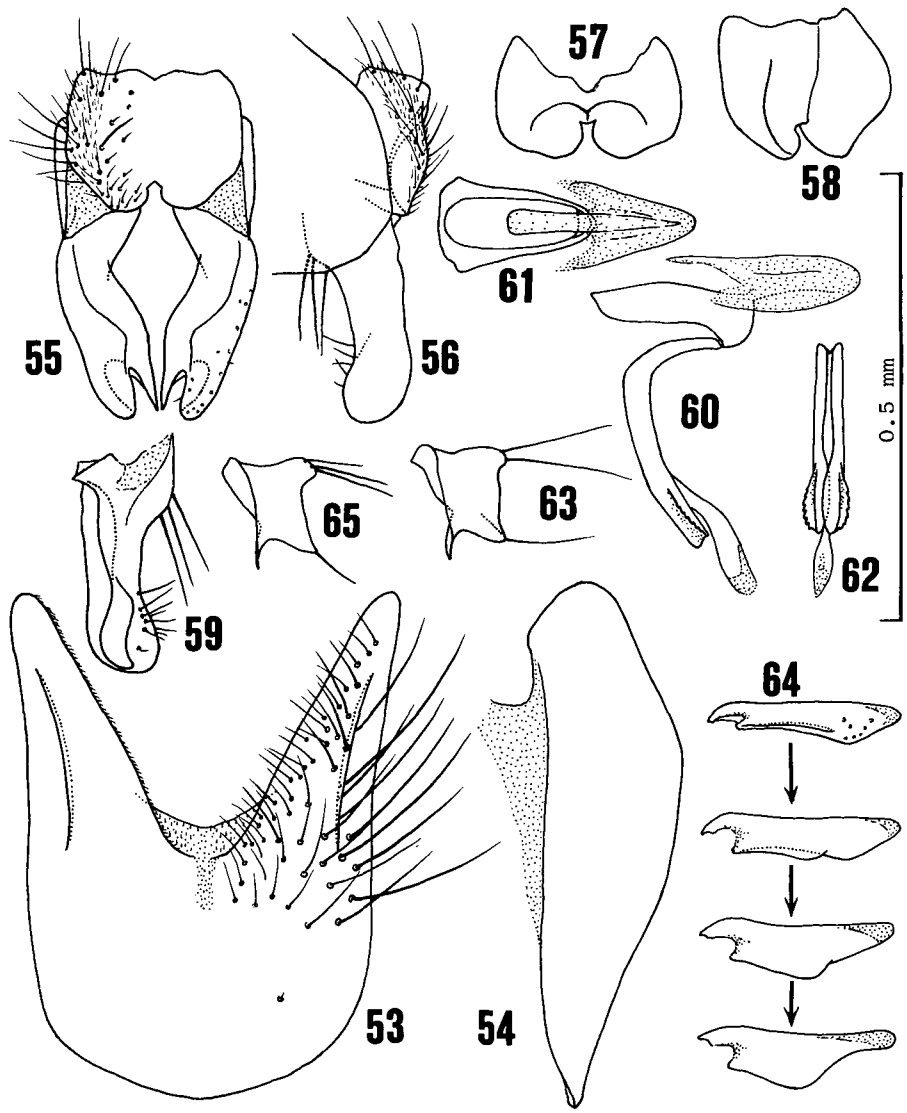
Material. Hokkaidô: —Mt. Ashibetsu, 400-800 m, 1♂, 3. vii. 1976 (T. Hattori); Mt. Shokambetsu, 1100-1300 m, 1♂, 19. vii. 1984 (M. Suwa).

Distribution. Japan; Europe. New to Japan.

♂. Body-length 3.6-3.7 mm; wing-length 3.7 mm in larger specimen (unmeasurable in the other). Body in ground colour wholly blackish or partly brownish (probably due to teneral condition), and in pollinosity brown or brownish grey, with a purplish tinge in some lights. Frons in ground colour orange yellow near lunule and darkening dorsad, or entirely blackish, and in pollinosity whitish grey, scarcely or faintly tinged with brown; parafacials and cheeks brownish yellow or blackish in ground colour; antennae blackish, with A_1 and A_2 slightly brownish; palpi blackish; haustellar mentum blackish and thinly grey pollinose; occiput brownish grey pollinose. Mesonotum in frontal angle of view largely blackish, and in caudal angle of view rather obscurely vittate, with 3 vittae along rows of *acr* and *dc* and lateral patches, and with pollinosity well discernible. Abdomen with median vitta broad on 2nd tergite, narrowing caudad, and interrupted at hind margin of each tergite, each

section being wedge-shaped. Legs blackish or dark brownish. Wings with a dark brownish tinge; calyptrae dark brownish; halteres much darkened at base and at knob apically, and yellowish at stem and at knob basally.

Frons twice, or slightly less, as wide as anterior ocellus; interfrontalia 1.5 times, or slightly less, as wide as anterior ocellus, without *if*; parafrontals with 4-5 *ori* and no *ors* (a short proclinate *ors* discernible on right parafrontal in 1 specimen); A_3 1.7-



Figs. 53-65. *Pegomya meridiana* (Villeneuve), ♂. 53, 5th sternite, ventral view; 54, ditto, lateral view; 55, hypopygium, dorsal view; 56, ditto, lateral view; 57, cercal plate, anterodorsal view; 58, ditto, dorsolateral view; 59, surstylus (left), inside view; 60, basiphallus and distiphallus, lateral view; 61, basiphallus, dorsal view; 62, distiphallus, ventral view; 63 & 65, praegonite; 64, postgonite. Mt. Shokambetsu, Hokkaidô (Figs. 53-64) and Mt. Ashibetsu, Hokkaidô (Fig. 65).

1.8 times as long as wide ; arista with hairs shorter than basal diameter of arista ; parafrontals as wide as or slightly wider than A_3 ; cheeks higher than parafrontal width, with genal setae in 1 row.

Mesonotum with 3 pairs of *pre-acr* in 2 rows closer to each other than to *dc*-rows and with no setulae between the *acr*-rows ; *ph* duplicated, 2nd one weaker than the 1st ; *pra* much shorter than posterior *ntpl*. Abdomen depressed and ovoid, about 1.6 times as long as wide ; 6th tergite bare ; 5th sternite and hypopygium as in Figs. 53-65 ; praegonites with 3 setae at dorsoapical corner (only 2 on left praegonite in 1 specimen, Fig. 63).

Fore tibia with no *ad* and with or without 1 *pv* ; t_2 with 2 *ad* in apical third, the distal seta weaker than the proximal (indiscernible on left leg in 1 specimen), with 2 *pd* in apical third or half and 2 *p-pv*, and in 1 specimen with 1 *av* on right leg ; t_3 with 2 *av* (proximal one fine and shifted a little to anterior surface) and 3 *ad*, and in apical half with 2 *pd* (distal one much reduced and hardly or weakly differentiated from adjacent setulae). Wings with *dm-cu* hardly oblique and a little arcked inward.

♀. Unknown to me. Abdomen with compressed ovipositor (after Hennig, 1973).

The Japanese specimens examined agree with the redescription of *meridiana* by Hennig (1973) except for a few slight differences especially in the chaetotaxy on the legs. In the redescription the European form of the species is described as follows : "t_2 mit 1 *ad* und 1 *pd*, die beide im distalen Drittel stehen und mit 1 Mittelborste auf der Hinterseite, die aber anscheinend auch fehlen kann wie sohl immer bei den ♀♀ : bei den beiden männlichen Syntypen von m e r i d i a n a ist keine Spur einer solchen Borste auf der Hinterseite der t_2 zu erkennen."

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