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Title	THE ALTICOLA GROUP PEGOMYA, WITH DESCRIPTIONS OF SOME NEW SPECIES FROM TAIWAN AND NEPAL (DIPTERA : ANTHOMYIIDAE)
Author(s)	Suwa, Masaaki
Citation	Insecta matsumurana. New series : journal of the Faculty of Agriculture Hokkaido University, series entomology., 29, 1-38
Issue Date	1984-12
Doc URL	https://hdl.handle.net/2115/9824
Type	departmental bulletin paper
File Information	29_p1-38.pdf



THE ALTICOLA GROUP OF PEGOMYA, WITH DESCRIPTIONS
OF SOME NEW SPECIES FROM TAIWAN AND NEPAL
(DIPTERA : ANTHOMYIIDAE)

By MASA AKI SUWA

Abstract

SUWA, M. 1984. The *alticola* group of *Pegomya*, with descriptions of some new species from Taiwan and Nepal (Diptera : Anthomyiidae). *Ins. matsum. n. s.* 29 : 1-38, 1 tab., 127 figs.

Pegomya alticola Hockett and its allies, 11 species in total, are reviewed. Of them, 1 species from Taiwan, *P. taiwanensis*, and 8 others from Nepal, *P. thapai*, *P. hiroshii*, *P. kumari*, *P. himalaica*, *P. setifemur*, *P. compressa*, *P. sharmai*, and *P. nagendrai*, are described as new to science. *P. criniventris* Suwa from Japan, once suppressed as a synonym of *P. alticola* from N. America, is recognized as a good species, and *P. alticola* is newly recorded from Japan. The taxonomic position of the *alticola* group is briefly discussed.

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- 1) Research Trips for Agricultural and Forest Insects in the Subcontinent of India [Grants-in-Aid for Overseas Scientific Survey, Ministry of Education, Japanese Government, 1983, No. 58041001 ; 1984, No. 59043001], Scientific Report No. 17.
- 2) Results of Kyushu University Scientific Expedition to the Nepal Himalaya. Diptera 5.

INTRODUCTION

Pegomya alticola Hockett, 1939, from North America, *P. criniventris* Suwa, 1974, from Japan, and some species of the genus newly found in Asia form a close group, which is here called the *alticola* group. *P. alticola* had not been associated with any group until Griffiths (1982) placed it in his *genupuncta* subsection of the *Pegomya hyoscyami* section. The newly found species support his treatment, and the *alticola* group undoubtedly belongs to the *genupuncta* subsection. In the following lines 9 species, 8 from Nepal and 1 from Taiwan, are described as new to science. *P. criniventris* was suppressed as a synonym of *alticola* by Griffiths (l.c.). It is, however, recognized as distinct in this paper, and *P. alticola* is newly recorded from Japan. At present no host-records are available. As Griffiths (l.c.) supposed from the life-history of other members of the *genupuncta* subsection the species of the *alticola* group may be leaf-miners of Compositae. Recently in Nepal I collected leaf-mining larvae of *Pegomya* from some plants belonging to Compositae, but I failed to rear them to adults.

The Nepalese material used in this paper is composed of 2 collections: the larger one was obtained in 1972 by the Kyūshū University Scientific Expedition to the Nepal Himalaya and the other in 1983 by myself in connection with the Research Trips for Agricultural and Forest Insects in the Subcontinent of India (Hokkaidō University, Agricultural Department of Nepal, and Tribhuvan University Joint Project).

THE ALTICOLA GROUP OF PEGOMYA

Members. In this group are included the following 11 species: -

1. *Pegomya thapai* sp. nov. Nepal.
2. *P. alticola* Hockett. Western N. America and Japan.
3. *P. criniventris* Suwa. Japan and the Kuriles.
4. *P. taiwanensis* sp. nov. Taiwan.
5. *P. hiroshii* sp. nov. Nepal.
6. *P. kumari* sp. nov. Nepal
7. *P. himalaica* sp. nov. Nepal
8. *P. setifemur* sp. nov. Nepal.
9. *P. compressa* sp. nov. Nepal.
10. *P. sharmai* sp. nov. Nepal.
11. *P. nagendrai* sp. nov. Nepal.

Most of the species listed above are based on the males alone. Although a large collection of female specimens, obviously referable to the group, is at hand, I have not yet been fully successful in combining them with the males. This female collection comprises 1 specimen from Alaska (*alticola*), 17 from Japan and the Kuriles (*criniventris*), 1 from Taiwan (? *taiwanensis*), and many from Nepal (at least 6 species, not identified). In the descriptions of the Nepalese species they are omitted. Further study on the females will be given in another paper.

Diagnosis. Superficially the group is distinguished from others by the combination of some characters: - Mesonotum without *pra*; male 5th sternite with an

expansion or brim on inner margin of each process ; male t_2 normally with no *ad*.

♂. Body in pollinosity grey and more or less bluish, sometimes with a brownish tinge and always with no yellowish tinge. Haustellum with pollinose mentum. Abdomen with hypopygium and 5th sternite often partly yellowish. Legs largely yellow to wholly blackish, with tarsi always blackish. Wings more or less tinged with brownish yellow to dark brown, distinctly so near base, and usually yellowish just basally ; calyptres tinged with yellow ; halteres yellow, more or less darkened basally.

Head less than 1.4 times as high as long ; parafrontals often with 1 minute *ors* ; A_3 rather short, at most only a little longer than twice the width ; arista rather distinctly pubescent, with hairs not longer than basal diameter of arista ; profrons wider than A_3 ; cheeks higher than profrons-width, with genal setae arranged in a few rows.

Mesonotum with *pre-acr* arranged in 2 closely approximated rows, distance between the rows at most about half as long as that to *dc*-rows ; *pra* absent ; mesopleura with no distinct anterior *mpl*.

Abdomen depressed at least basally, with caudal segments slightly to remarkably swollen ; 6th tergite with no setae ; 5th sternite with an expansion or brim on inner margin of each process, with outer marginal setae differentiated into apical series of short setae and median tuft of long setae (the apical series is often reduced, and in the case of *P. thapai* the differentiation little developed), and in most species with a "shoulder" (a blunt prominence) developed between basal plate and process on lateral margin ; epandrium in most species well developed in contrast with small surstyli and more or less swollen along lower (posterior) margin of lateral side ("lower swelling") ; surstyli often swollen dorsally near base and distinctly concave just beyond the swelling (the caudal margin of the swelling is, therefore, sharply edged and is here named "dorsal overhang") ; outer process of surstyli in most species divided apically into 2 lobes (dorsal and ventral, or seemingly apical and basal) by a shallow or deep notch ; distiphallus simple and rather uniformly sclerotized, without differentiated side projections ; ejaculatory apodeme small and slender.

Fore and mid tibiae with *ad* absent, at most occasionally visible in certain species ; t_1 with apical *pd* vestigial and indistinguishable from adjacent setulae ; f_3 on posterior to postero-dorsal surface with a row of setae as in usual cases in *Pegomya*, and on posterior surface, in some species, with many additional setae rather towards postero-ventral surface or on basal half. Wings with costal thorns minute ; lower calyptre smaller than the upper.

♀. Paler than male. Head in ground colour largely yellowish, at most blackish on upper half of frons and on occiput. Interfrontalia without *if*.

Abdomen depressed and long-ovoid ; 7th tergite not divided even if membranous postero-medianly, and protruded caudad at postero-lateral corners, with short setulae on and near the protrusions ; 7th sternite lengthened in accordance with the protruded 7th tergite, and usually narrowing caudad, rather sparsely with short setulae on posterior half ; 8th tergite undivided, often broadly membranous postero-medianly, with short setulae on postero-lateral corners and along posterior margin except medianly ; the setae on 7th tergite, 7th sternite and 8th tergite erect or usually recurrent, some of them being usually more or less spinule-like and often set

Table 1. Distribution of some characters in the *Pegomya hyoscyami* section.

Characters	Code			Taxa				
	Primitive state	Derivative state	Further modified state	<i>Hyoscyami</i> subsection	<i>Genupuncta</i> subsection			
	0	1	2		<i>Depressiventris</i> group	<i>Genupuncta</i> group	<i>Alticola</i> group	<i>Terebrans</i> group
1. Mesonotum with <i>pra</i>	present	absent	—	0, 1*	0	0	1	0, 1*
2. Male t_2 with <i>ad</i>	present	absent	present	0, 1	0?—1**	0, 1	1	1, 2*
3. Male 5th sternite with outer marginal setae differentiated into apical series and median tuft, though apical series often reduced	no	yes	—	0	0	0	0*, 1	0
4. Male 5th sternite with shoulders well developed	no	yes	no	0	0	0	0*, 1, 2*	0
5. Surstyli with outer process notched	yes	no	—	0, 1	0	0	0, 1	0, 1
6. Surstyli with dorsal overhang	absent	present	absent	0	0	0	1, 2	0
7. Distiphallus with acrophallus withdrawn between lateral protrusions	no	yes	—	0	0	0	0	1
8. Female 7th tergite	undivided	divided	—	1	0	0	0	0
9. Female 7th tergite and sternite protruded caudad and armed with spinulate setulae, or with such a tendency	no	yes	—	0	0	1	1	1
10. Female 8th sternite with setulae	fine	spinulate	fine	0	1	1	1, 2*	1
11. Female 8th sternite represented by	2 plates	1 plate	2 plates	0	0	0	1, 2*	0

* Found in 1 or a few species only.

** In *P. depressiventris*, the single male-known representative of the group, male t_2 with 0-1 *ad* (after Hennig, 1973).

on tubercles; 8th sternite represented by a single plate which is densely covered with spinule-like setulae, or in certain cases by 2 plates with short fine or spinulate setulae.

Mid tibia always with 1 strong *ad*.

Relationship to the allied groups. On the basis of the structures of the aedeagus and the ovipositor Griffiths (1982) placed *P. alticola* in his *genupuncta* subsection of the *Pegomya hyoscyami* section. According to him I include in the subsection the following 4 groups (superspecies in the sense of Griffiths): - the *depressiventris* group, the *genupuncta* group, the *alticola* group and the *terebrans* group. Distribution of some characters is summarized in Table 1.

1. *Pra.* Not only in *Pegomya* but also in the whole family of Anthomyiidae the *pra* are ordinary setae and found in most species. So far as the Japanese species of the family except the *alticola* group are concerned, only 2 species, *Delia bacilligera* Hennig and *Leucophora grisella* Hennig, are devoid of the setae. In the *hyoscyami* section other than the *alticola* group, so far as I am aware, only a few species, e.g. *P. pribilofensis* Hockett, of the *hyoscyami* subsection, and 1 species, *P. varipes* (Pokorný), of the *terebrans* group, are devoid of the setae. The disappearance of *pra* in all the known species of the *alticola* group is, therefore, very characteristic of this group, though may have also occurred independently in a few other scattered species.

2. *Ad* of male t_2 . The male t_2 is usually armed with 1 *ad* in Anthomyiidae, yet the loss of the seta is often seen in various genera including *Pegomya*. Nevertheless, the loss in all the known species of the *alticola* group indicates that the seta is lacking in the groundplan of the group. It is lost in the *terebrans* group, too. Some phylogenetic relationship between the two groups might be reflected in sharing this character.

3-4. Male 5th sternite. The *alticola* group is uniquely characterized by having well developed shoulders and median tufts of long setae on the male 5th sternite. The 5th sternite of *thapai* is less specialized in the shape and chaetotaxy (Figs. 2 & 3) and may be primitive in this respect. The absence of the shoulders in *kumari* (Figs. 59 & 60) may have been resulted from the extension of the sternite in association with the abdominal elongation.

5-6. Surstyli. In *Pegomya* the surstyli are divided apically into 2 processes (inner and outer). The notched outer process is widely found in the *hyoscyami* section and is considered as a constitutive character in the section (Griffiths, l.c.). The notch is, however, completely lost in the *hyoscyami* group of the *hyoscyami* subsection and often degenerative or completely lost in the *alticola* and *terebrans* groups. The loss or degeneration of the notch may have occurred more than once in the *hyoscyami* section. The dorsal overhang of the surstyli is often seen in the *alticola* group and present in *P. thapai*, a species supposedly most primitive among the known members of the group. So far as I am aware, it is not found in other groups. Its absence in some species of the *alticola* group may be due to secondary loss.

7. Distiphallus. In *Pegomya* the distiphallus is basically divided into a median projection (mesophallus) and a pair of upcurved side projections (paraphalli). The simplified distiphallus in the *hyoscyami* section may be formed by a fusion of the mesophallus and paraphalli. The paraphalli are recognizable as lateral protrusions near middle of the distiphallus. In the *terebrans* group the apex of distiphallus is

withdrawn between the lateral protrusions (apomorphic, according to Griffiths, l.c.).

8-9. Female 7th abdominal segment. In Anthomyiidae the 7th tergite is usually membranous medianly in various degrees and divided into lateral plates in many species and groups. The division of the tergite may have often occurred independently. Among the *hyoscyami* section the tergite is widely divided in the *hyoscyami* subsection and not divided in the *genupuncta* subsection even if membranous postero-medianly. This character in the latter subsection may be primitive (plesiomorphous, Griffiths, l.c.). In the *alticola* group the 7th tergite and sternite are specialized in the caudal protrusion and in the chaetotaxy. In 1 Nepalese species the 7th sternite is maintained wide caudad, and with setulae short and fine though recurrent. The same high specialization as in the *alticola* group is seen in the *terebrans* group too, although less prominent in a certain case (cf. Figs. 144-146, Griffiths, l.c.). The highly specialized condition of the 7th segment found in the two groups is quite characteristic. It seems to be difficult to imagine that such specialization have evolved independently. The less prominent condition in the two groups may not be symplesiomorphic but may have been independently resulted from a subsequent modification. In the *genupuncta* group the specialization of the 7th segment is less prominent (ovipositor is shown for 2 species, cf. Fig. 126, Griffiths, l. c. and Textfig. 512, Hennig, 1973). At present it is uncertain to me whether the condition is incipient or reversional.

10-11. Female 8th sternite. In Anthomyiidae in general and also in *Pegomya* the 8th sternite is basically divided into 2 small plates with fine setulae. In the *genupuncta* subsection except the *alticola* group it is represented by 2 spinulose plates and in the *alticola* group usually by a single spinulose plate. In 1 Nepalese species (? *setifemur*) of this group the sternite is divided into 2 fine-setulose plates. This is quite unusual not only in the group but also in the subsection. It seems reasonable to interpret the condition as reversional. In another Nepalese species (not *thapai*) of the group the sternite is represented by 2 plates which are almost contiguous to each other and rather sparsely spinulose. Considering the case of the supposed *setifemur*, it seems to me that this condition also is reversional. In the above 2 species the 7th segment is highly specialized as mentioned in the preceding paragraph. Anyway, the undivided (secondarily united, to be exact) 8th sternite is a character unique to the *alticola* group.

Judging from a few synapomorphic characters—the specialized female 7th abdominal segment (not found in the *depressiventris* group) and the spinulose female 8th sternite—the *alticola* group undoubtedly belongs to the *genupuncta* subsection. Among the subsection the group is discriminated from others by the following autapomorphic characters: - the specialized male 5th sternite (less prominent in *thapai*), the surstyli with dorsal overhang (subsequently lost in some species) and the female 8th sternite represented by a single plate (redivided in certain cases).

Subgrouping. On the basis of the male genital structures the members of the group are tentatively classified into 5 subgroups: -

1. *Thapai* subgroup: *thapai*.
2. *Alticola* subgroup: *alticola*, *criniventris*, *taiwanensis* and *hiroshii*.
3. *Kumari* subgroup: *kumari*.
4. *Himalaica* subgroup: *himalaica*, *setifemur* and *compressa*.
5. *Sharmai* subgroup: *sharmai* and *nagendrai*.

1. The *thapai* subgroup is characterized by the following characters: - Fifth sternite with shoulders hardly developed, with outer marginal setae not sharply differentiated into apical series and median tuft, and with broad basal expansion on inner margin of each process; surstyli with outer process distinctly notched and with dorsal overhang visible. The less specialized male 5th sternite and the surstyli with a dorsal overhang are here considered as incipient characters of the *alticola* group.

2. The *alticola* subgroup: - Fifth sternite with broad median expansion on inner margin of each process; surstyli with dorsal overhang distinct; praegonites with dorso-apical corner obtuse. The median expansions on the 5th sternite may be homologous with the basal expansions of the *thapai* subgroup. *P. hiroshii* is distantly related to the other 3 species in having the 5th sternite with apical series of setae well retained, the surstyli with unnotched outer process, and the basiphallus with apically arising epiphallus.

3. The *kumari* subgroup: - Fifth sternite with shoulders lacking; surstyli simplified, without dorsal overhang, and with outer process much reduced. In having the median expansions on 5th sternite and the similar aedeagus this might be closely related to the *alticola* subgroup. The absence of shoulders on 5th sternite may be due to the further modification probably in association with the abdominal elongation.

4. The *himalaica* subgroup: - Fifth sternite with basal brim and subapical projection on inner margin of each process, and with apical series of setae well retained; surstyli with dorsal overhang invisible, and with outer process more or less notched. As to the 5th sternite it is uncertain to me which organ, the basal brims or the subapical projections, is homologous with the median expansions of the *alticola* subgroup. Gradual morphoclines are seen in the sequence *himalaica* – *setifemur* – *compressa* concerning the characters of the subapical projections of the 5th sternite (from a prominent to a less prominent state) and the surstyli (from an incompressed to a much compressed state). On the other hand, in the aedeagal structures there is a large gap between *compressa* and the other two.

5. The *sharmai* subgroup is highly specialized in many aspects: - Fifth sternite with basal brim and subapical expansion on inner margin of each process; processes of 5th sternite much attenuated on apical half; surstyli with inner process strongly concave at inner base, much prolonged and sinuate; postgonites narrowed, with large hook-like apex; basiphallus broadened apicad, with apex distinctly sunken at centre; epiphallic lamella rather well sclerotized, compressed and fused with up-curved epiphallus. As to the 5th sternite I am not sure that the subapical expansions in this subgroup are homologous with the subapical projections in the *himalaica* subgroup.

At present I have no definite idea as to the relationship among these subgroups.

Distribution. The *alticola* group is now known from a broad region including eastern Asia and western North America. In spite of this and also of the fact that the other groups of the *genupuncta* subsection are widely distributed in the Holarctic region no species of the *alticola* group has been recorded from Europe, where the anthomyiid fauna is well investigated. Most of the known species of the group are found in Nepal, and the Nepalese species are diversified into distinct subgroups. Outside Nepal only 3 species have been known, 1 from N. America, 2 (of them 1

common to N. America) from Japan and 1 from Taiwan. They are very closely related to one another, belonging to the *alticola* subgroup. A Nepalese species, *P. hiroshii*, is also included in that subgroup, yet it is rather distant from the 3 species. All this suggests that the non-Nepalese species are descendants from a lineage originated from the Himalayas or neighbourings. Further species of the group are expected to be found in the Himalayas and the montane region of southern China and to give a substantial clue to the phylogenetic problems of the group. In this connection it should be added that all the known species of the group from Nepal were collected at altitudes between 2100 and 4700 m, mostly above 3000 m.

KEY TO THE KNOWN SPECIES OF THE GROUP (MALES)

1. Legs wholly blackish, at most occasionally brownish on trochanters; abdomen always longer than twice the width. 2
- Legs partly yellow, at least on trochanters and t_3 ; abdomen often shorter than twice the width. 3
2. Abdomen with 4th sternite almost divided into 2 plates by membranous median area and densely setose (Fig. 57). 6. *kumari*
- Abdomen with 4th sternite not membranous medianly nor densely setose. 1. *thapai*
3. Mid and hind femora largely blackish, and yellow at base narrowly and on apical third ventrally; epistoma projecting forwards beyond profrons-tip. 4
- Mid and hind femora largely yellow, even in the darkest case f_2 at least mainly yellow on basal half and f_3 at most darkened on apical third dorsally; epistoma not projecting forwards beyond profrons-tip. 5
4. Abdomen very remarkably developed on hypopygium, with pregenital sclerite* longer than 5th tergite in median length in dried condition; 4th sternite more than twice as wide as long (Fig. 119). 11. *nagendrai*
- Abdomen less developed on hypopygium, with pregenital sclerite shorter than 5th tergite; 4th sternite less than twice as wide as long (Fig. 99). 10. *sharmai*
5. Mid tibia yellow, at most darkened basally. 6
- Mid tibia wholly blackish. 8
6. Frons narrower than anterior ocellus; parafrontals contiguous to each other; 5th sternite with apical series of short setae and with median expansions evenly margined (Fig. 51). 5. *hiroshii*
- Frons wider than anterior ocellus; parafrontals separated from each other by narrow interfrontalia; 5th sternite without apical series of setae and with median expansions roundly margined (Fig. 14). 7
7. Mesonotum rather densely pollinose and weakly shining, with 3-5 pairs of *pre-acr*; abdomen with median vitta moderate to rather broad in width and obscure, rarely narrow and sharp; 5th sternite with cephalic apodeme weakly developed and never filling the median recess of basal plate (Fig. 14). 2. *alticola*
- Mesonotum rather thinly pollinose and half-shining; abdomen with median vitta narrow to moderate in width and sharp; 5th sternite with cephalic apodeme developed to fill the median recess of basal plate (Figs. 31 & 33). 3. *criniventris*
8. Mid femur on apical half largely darkened except on yellowish ventral side; f_3 on anterior surface with a row of long setae between *ad*- and *av*-rows. 4. *taiwanensis*
- Mid femur largely yellowish, only darkened at apex; f_3 on anterior surface without such setae. 9
9. Hind femur on basal half of posterior surface very densely setose; 4th sternite rather densely setose medianly (Fig. 81). 8. *setifemur*

* In the sense of Griffiths (1982), basal sclerite in my previous papers, and synsternite 7+8 of authors.

- Hind femur on posterior surface sparsely setose as in usual cases; 4th sternite sparsely setose medianly (Figs. 69 & 86). 10
- 10. First sternite setose on whole width (Fig. 86); 5th sternite with subapical projections weakly developed (Fig. 87); surstyli strongly compressed (Fig. 88). 9. *compressa*
- First sternite setose laterally and bare medianly (Fig. 69); 5th sternite with subapical projections well developed (Fig. 70); surstyli hardly compressed (Fig. 75). 7. *himalaica*

DESCRIPTIONS OF THE SPECIES

1. *Pegomya thapai* sp. nov.

(Figs. 1-9)

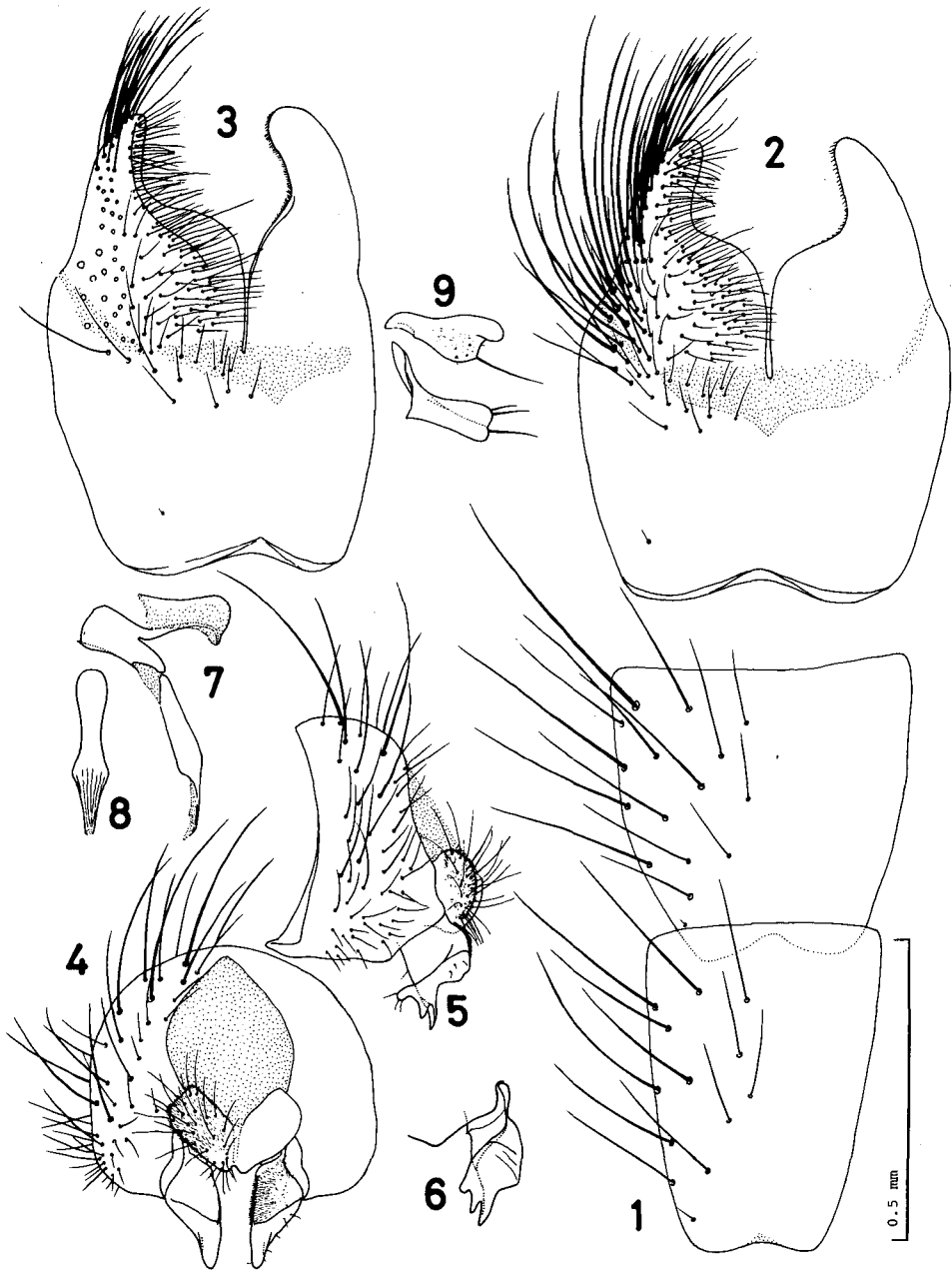
Material. *Nepal.* E. Nepal: Thudam, 3500 m, 27°45'N 87°32'E, 2 ♂, 22. vi-2. vii. 1972 (MT = Malaise trap), and 2 ♂, 20. vi. 1972 (H. Shima); N.E. of Thudam, 4000 m, 4 ♂, 25. vi. 1972 (Y. Nishida & H. Shima). Janakpur: Daldung La, 3800-4000 m, Rolwaling Valley, 1 ♂ (holotype, deposited in EIHU = Entomological Institute, Hokkaidō University), 15. viii. 1983; Beding - Nangaon, 3700-4000 m, Rolwaling Valley, 1 ♂, 18. viii. 1983; Nangaon, 4000-4100 m, Rolwaling Valley, 2 ♂, 18. viii. 1983. Bagmati: Syng Gomba - Gosainkund, 3600 m, 1 ♂, 23. ix. 1983; Dadakharka - Ghopte, 3300-3600 m, Gosainkund Lekh, 1 ♂, 26. ix. 1983.

♂. Body-length 4.6-5.5 mm; wing-length 4.7-5.4 mm. Body including appendages in ground colour blackish in well pigmented specimens, yet often partly brownish especially on cheeks and trochanters (probably due to the teneral condition), and in 1 specimen (from Thudam) yellow on interfrontalia, lower part of orbits and most part of cheeks; in pollinosity pale bluish grey. Palpi sometimes slightly brownish at base. Mesonotum obscurely vittate, in frontal view with paramedian vittae rather distinctly visible. Abdomen half-shining in some lights, with median vitta rather narrow to broad and usually sharp; cercal plate, lower swellings of epandrium and processes of 5th sternite dark brownish to blackish. Wings with a dark brownish tinge, more or less yellowish basally.

Head about 1.2-1.3 times as high as long; frons slightly narrower to rather distinctly wider than anterior ocellus; interfrontalia about one-third to two-thirds as wide as anterior ocellus, or sometimes much narrower; parafrontals with some (4-7) rather strong and a few fine *ori* (usually mingled with a few or some micro-setulae) and with no *ors*; A_3 1.8-2 times as long as wide; profrons distinctly wider than A_3 , about 1.4-1.6 times as wide as the latter; parafacials at middle as wide as or usually a little wider than A_3 ; cheeks 1.2-1.5 times as high as profrons-width, with genal setae arranged in 2 (rarely 1 or 3) rows; epistoma projecting as far as or slightly beyond profrons-tip, rarely situated a little behind the tip; palpi as long as or usually a little longer than A_2 and A_3 combined, and rather distinctly broadened on apical third, with the greatest width equal to twice the basal width or more and distinctly narrower than distal segment of fore tarsus; haustellar mentum longer than palpi.

Mesonotum sparsely setulose, with 5-8 *pls* (postsutural lateral setulae*); 2-6

* Accessory setulae found near *ia* (2 *ia* recognized) and *sa* (1 *sa* recognized), including a few occasional seta-like ones, and not including those on posterior callosities.



Figs. 1-9. *Pegomya thapai* sp. nov., ♂. 1, 3rd (lower) and 4th sternites; 2, 5th sternite, ventral view; 3, ditto, ventro-lateral view; 4, hypopygium, dorsal view; 5, ditto, lateral view; 6, surstylus (left), dorso-lateral view; 7, basiphallus and distiphallus, lateral view; 8, distiphallus, dorsal view; 9, praegonite and postgonite. Paratype from Thudam.

(usually 4-5) *pre-acr* arranged in 2 rows; 2nd *ph* as fine as accessory setulae, sometimes slightly developed; *stpl* 1: 2, below the posteriors sometimes with 1 seta distinguishable from adjacent setulae; scutellum on dorsal surface hardly setulose, only with a few or some (4-5) setulae towards lateral margin (excluding 1 or a few setulae just near the basal seta, same in the succeeding descriptions).

Abdomen depressed, nearly parallel-sided and 2.2-2.8 times as long as wide, with caudal segments slightly swollen; 1st sternite setose on whole width, or sometimes bare medianly; 4th sternite (Fig. 1) longer than wide; 5th sternite (Fig. 2) with shoulders weakly developed, and with median tufts of setae not numerous in number and not sharply differentiated from apical series; processes of 5th sternite declined towards inner margin especially on apical half, and with basal expansion turned up marginally; surstyli (Figs. 4 & 5) with dorsal overhang distinct; distiphallus (Fig. 8) wrinkly on apical third dorsally; praegonites (Fig. 9) with 3 setae apically (3 specimens dissected).

Fore tibia with 1 *pv*; f_2 with some (4-5) *pv* in basal half; t_2 with 1 *pd* and 1-2 *p-pv*; f_3 with some (usually 5-6) *av*, 1 *pv* near base (rather fine, often much weakened; here named basal *pv*), 1 or rarely 2 *pv* near middle and 1 or 2 *pv* near apex; t_3 with 1 or sometimes 2 *av*, 2 *ad* and 2-3 *pd*, a few setulae towards apex on postero-dorsal surface being often more or less developed. Wings with *m-m* hardly oblique and hardly to rather distinctly sinuate.

♀. Unknown.

P. thapai can be readily distinguished from other members of the group by the blackish legs, the slender abdomen and the sparsely setose 4th sternite. In the less specialized 5th sternite and the apically wrinkled distiphallus the present species somewhat resembles *P. valgenovensis* Hennig of the *genupuncta* group (cf. Figs. 49-52, Suwa, 1984). In the surstyli *P. thapai* is more or less similar to *P. depressiventris* (Zetterstedt) (cf. Figs. 121-122, Griffiths, 1982). These facts indicate that the species is close to the groundplan of the *alticola* group.

2. *Pegomya alticola* Hockett

(Figs. 10-29)

Pegomyia alticola Hockett, 1939: 25. *Pegomya alticola*: Griffiths, 1982: 109.

Material. *Japan*. Hokkaidō: Sapporo, 3 ♂, 11-28. v. 1959 (S. Ueda & S. Takagi), and 1 ♂, 12. vi. 1968 (T. Kocha). Honshū: Yorii, Saitama-ken, 3 ♂, 25. iv. 1978 (K. Hara); Hashidate-gawa, Chichibu, Saitama-ken, 3 ♂, 11. v. 1974 & 24. iv. 1977 (K. Hara). *North America*. Alaska: Nome, 1 ♂, 21. vi. 1951 & 1 ♀, 9. vii. 1951 (D.P. Willans), det. as *P. alticola* by G.C.D. Griffiths.

Japanese Form: -

♂. Body-length 5.2-6.8 mm; wing-length 5-6.4 mm. Body mainly blackish in ground colour, rather densely covered with pale bluish grey pollen, and weakly shining in some lights, more or less tinged with brown in pollinosity. Head often brownish in ground colour on interfrontalia, parafacials and cheeks; antennae black; palpi black, slightly brownish at base; haustellar mentum dark brown to blackish. Mesonotum obscurely vittate in caudal view. Abdomen with median vitta moderate to rather broad in width and obscurely margined, rarely narrow and sharp; fore marginal bands usually absent; 5th sternite black on basal plate, and

yellow to brownish on median membrane and on processes basally and apically ; cercal plate yellow to brown ; epandrium more or less brownish on lower swellings. Coxae largely blackish and partly brownish ; trochanters yellow to brown, darker in fore legs ; f_1 dark brown to blackish in main part, and yellow to brown on apical third to half ventrally and at base narrowly ; f_2 and f_3 yellow, faintly or rather distinctly darkened at apex dorsally ; t_1 variously darkened, in paler specimens largely yellow and slightly darkened near base, in darker ones brownish yellow near apex and dark brown to blackish on the rest ; t_2 and t_3 yellow, more or less darkened basally. Wings tinged with brownish yellow, rather strongly near base.

Head 1.2-1.3 times as high as long ; frons 1.4-1.7 times as wide as anterior ocellus ; interfrontalia narrower than anterior ocellus ; parafrontals with 6-8 distinct or strong and 1 or a few weak or fine *ori* and with 1 minute *ors* ; A_3 1.6-1.8 times as long as wide ; profrons 1.2-1.4 times as wide as A_3 ; cheeks 1.2-1.4 times as high as profrons-width, with genal setae in a few rows ; epistoma situated behind profrons-tip ; palpi slightly shorter to slightly longer than A_2 and A_3 combined, and more or less broadened on apical half, with the greatest width less than twice of the basal width and distinctly narrower than distal segment of fore tarsus ; haustellar mentum not slender, probably about as long as palpi (difficult to measure its correct length in dried condition).

Mesonotum rather densely setulose laterally, with 14-26 (usually ca. 20) *pls* ; 6-10 (3-5 pairs) *pre-acr* in 2 rows ; 2nd *ph* well developed, or sometimes fine ; *pra* appearing in 1 specimen (probably reversional), about two-thirds as long as posterior *ntpl* ; *stpl* 1 : 2, below the posteriors often with 1 seta distinguishable from adjacent setulae, though fine ; scutellum on dorsal surface rather sparsely to rather densely setulose towards lateral margin.

Abdomen more or less ovoid and 1.6-1.9 times as long as wide, with caudal segments half-depressed ; 6th tergite in 2 specimens from Sapporo abnormally with respectively 3 and 8 setae along caudal margin ; 1st sternite setose on whole width ; 4th sternite (Figs. 11-13) much wider than long ; 5th sternite (Fig. 14) with subapical inner-marginal concavity much obtuse-angled, and with cephalic apodeme weakly developed and never filling the median recess of basal plate (7 specimens dissected, no exceptions) ; hypopygium and aedeagus as in Figs. 21-26, & 29 ; cercal plate with median keel hardly or only slightly visible in lateral view ; surstyli with ventral (basal) lobe of outer process directed caudad though variable in length, and with basal process variable in development ; distiphallus with gonopore-margin distinctly excavated in profile ; praegonites with 4 or sometimes 3 long setae and oftens with 1 or 2 additional minute setulae.

Fore tibia with 0 or rarely 1 *ad* and 1-2 or rarely 3 *pv* ; f_2 with 2-5 *pv* in basal half ; t_2 with 1 *pd* and 2-3 (rarely 4) *p-pv*, and sometimes with 1 *ad* (probably reversional) ; f_3 with 5-8 *av* except near base, 1-2 *pv* near middle and usually 1 *pv* near apex, and with basal *pv* discernible ; t_3 with 1 *av*, 2-4 *ad* and 3-4 (rarely 5) *pd*. Wings with *m-m* more or less oblique and hardly sinuate.

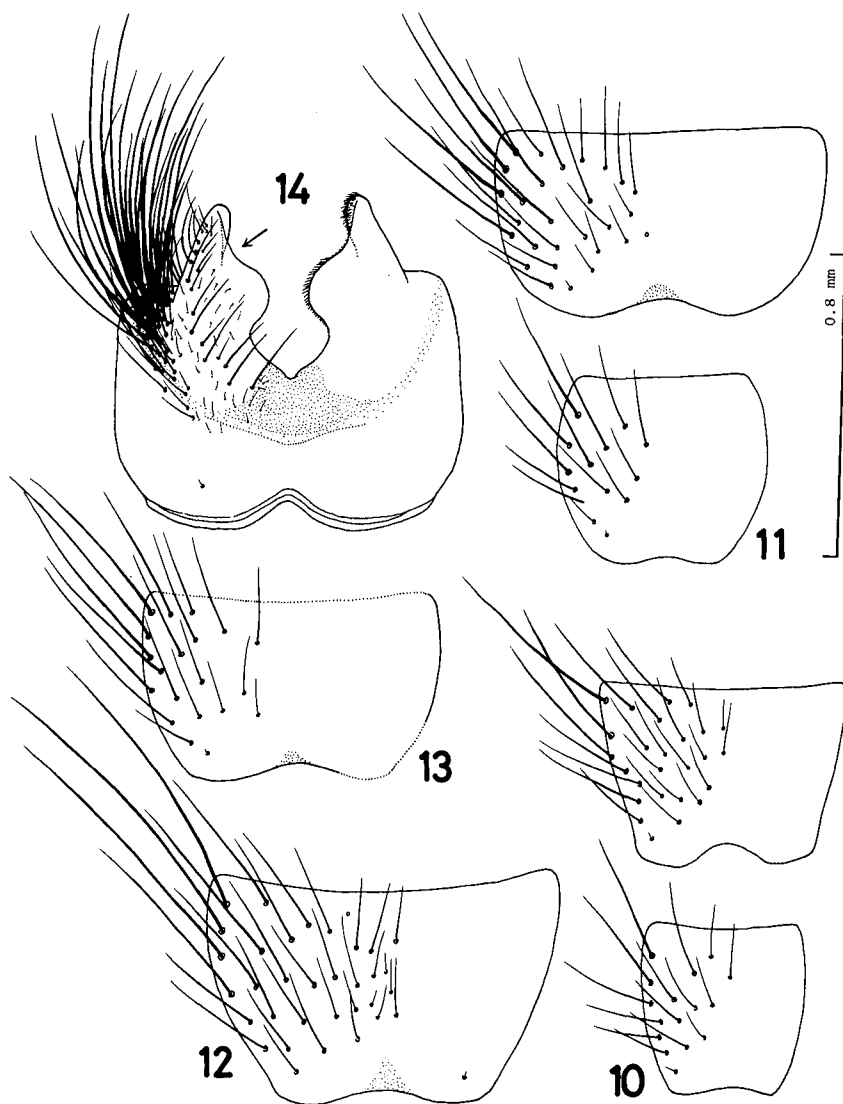
♀. No Japanese material available.

North American form : -

♂. Paler than the Japanese form. According to Griffiths (1982) and also based on the present specimen, A_1 and A_2 yellow to orange brown ; palpi yellow, with darkened apex ; thorax in ground colour with brownish suffusion on scutellum and

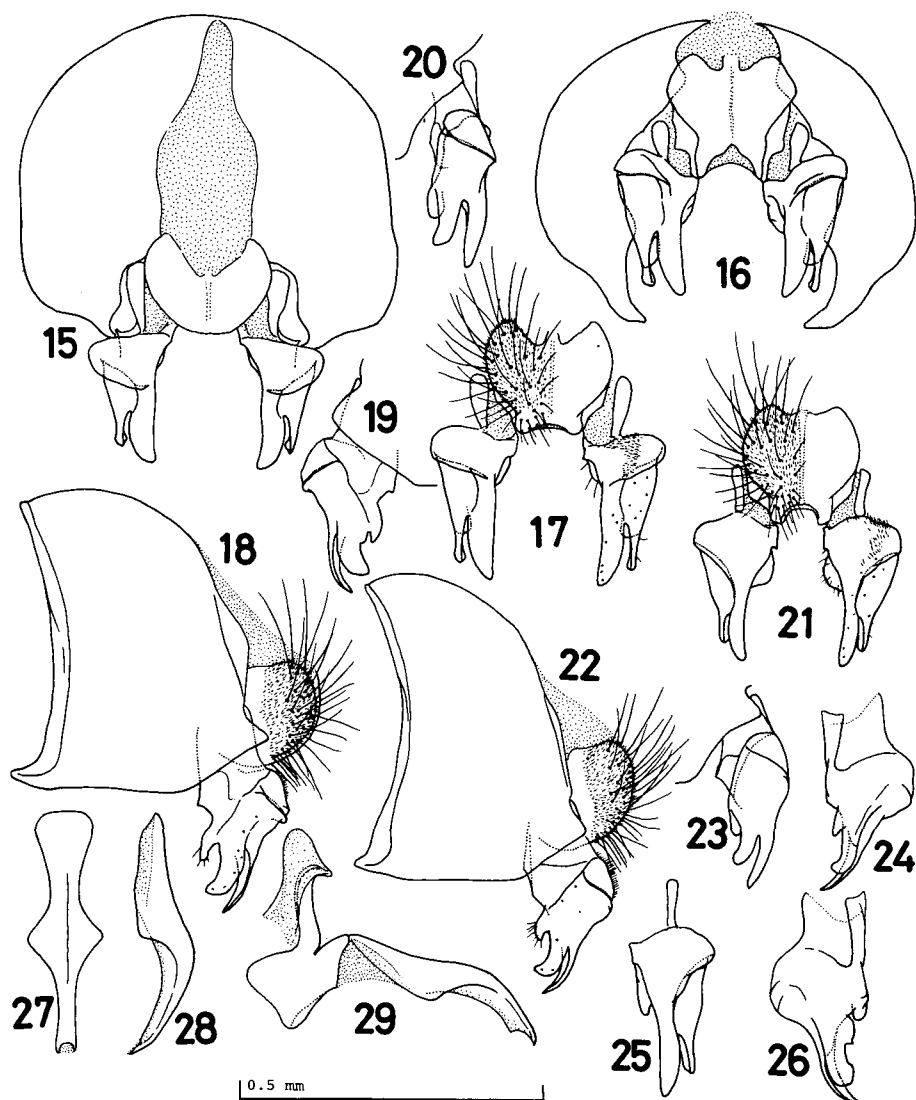
others; abdomen in ground colour blackish dorsally and more or less paler ventrally; f_1 entirely yellowish or partly infuscated on dorsal and outer (posterior) surfaces. In the present specimen, 4th sternite (Fig. 10) narrower than in the Japanese form; distiphallus (Fig. 28) with gonopore-margin hardly excavated in profile.

♀. Much paler than in the male. Body in ground colour largely yellowish; head darkened on upper half of occiput; mesonotum blackish except on yellowish margin; abdomen yellow; legs entirely yellow except for blackish tarsi. Ovipositor with 8th sternite represented by a single plate which is densely covered with spinule-like setulae.

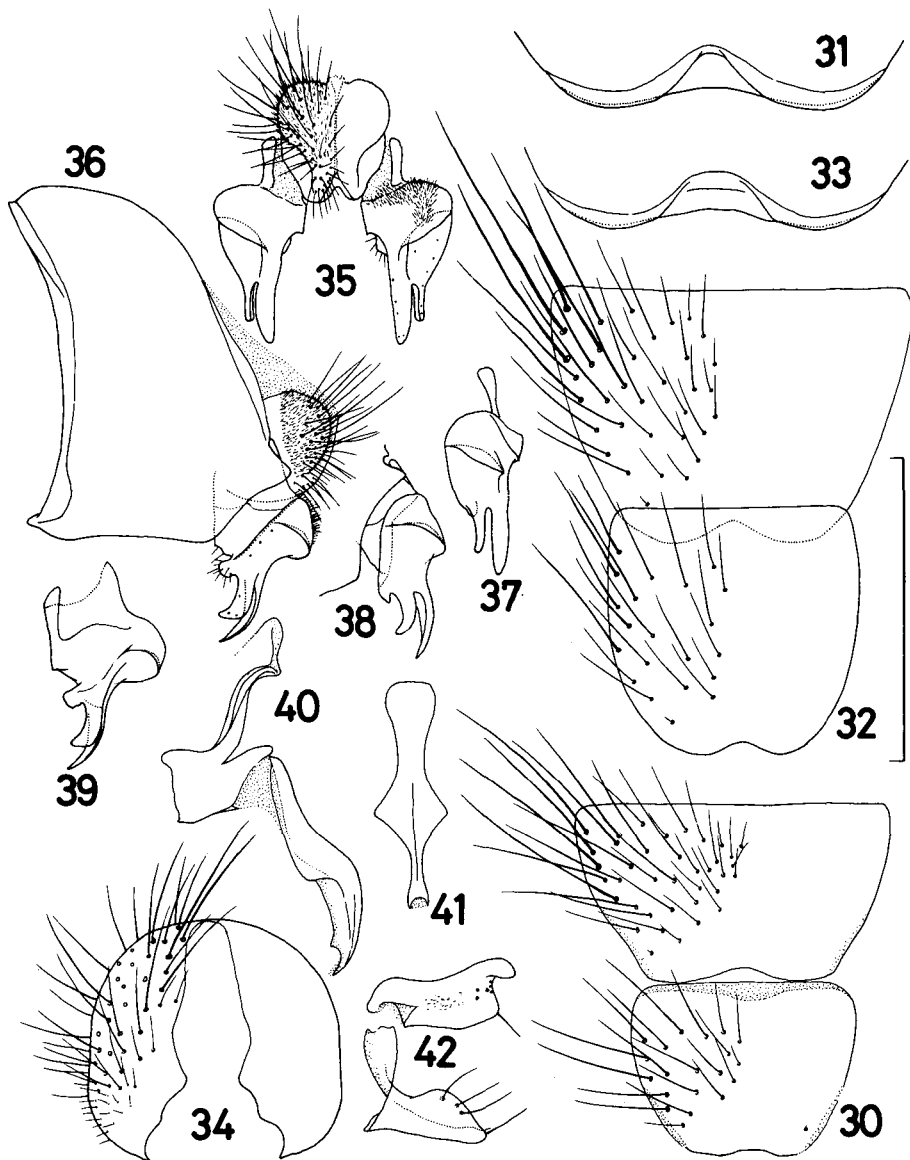


Figs. 10-14. *Pegomya alticola* Hockett, ♂. 10-11, 3rd (lower) and 4th sternites; 12-13, 4th sternite; 14, 5th sternite, arrow indicating the subapical inner-marginal concavity. Alaska (Fig. 10), Sapporo (Fig. 11; Figs. 13-14) and Chichibu (Fig. 12).

The Japanese specimens examined are different from the N. American one only in a few points as mentioned above, and may correctly be referred to the species. This species is most closely related to the following *P. criniventris*, from which it is not easily distinguishable unless its genital structures are seen.



Figs. 15-29. *Pegomya alticola* Hockett, ♂. 15, hypopygium, dorsal (slightly frontal) view; 16, ditto, dorso-caudal view; 17 & 21, ditto, dorsal view; 18 & 22, ditto, lateral view; 19, surstylus (right), lateral view; 20 & 23, surstylus (left), dorso-lateral view; 24, ditto, lateral (slightly ventral) view; 25, surstylus (right), dorsal view; 26, ditto, lateral (slightly ventral) view; 27, distiphallus, dorsal view; 28, ditto, lateral view; 29, basiphallus and distiphallus, lateral view. Alaska (Figs. 15-20, & 27-28), Sapporo (Figs. 21-24, & 29) and Chichibu (Figs. 25-26).



Figs. 30-42. *Pegomya criniventris* Suwa, ♂. 30 & 32, 3rd (lower) and 4th sternites; 31 & 33, 5th sternite, cephalic apodeme; 34, epandrium, dorsal view; 35, hypopygium, dorsal view; 36, ditto, lateral view; 37, surstylus (left), dorsal (slightly lateral) view; 38, ditto, dorso-lateral view; 39, ditto, lateral (slightly ventral) view; 40, basiphallus and distiphallus, lateral view; 41, distiphallus, dorsal view; 42, praegonite and postgonite. Mt. Taisetsu (Fig. 30), Mt. Yatsugatake (Fig. 31) and Mt. Kariba-yama (Figs. 32-42). Scale 0.8 mm for Figs. 30-34, and 0.5 mm for Figs. 35-42.

3. *Pegomya criniventris* Suwa

(Figs. 30-42)

Pegomya criniventris Suwa, 1974: 193; id., 1981: 12.

Material. In addition to the type-series the following specimens are available: - *Japan*. Hokkaidô: Mt. Kariba-yama, 2 ♂, 19-23. vii. 1972 (M. Suwa); Mt. Taisetsu (=Daisetsu), 1600-1800 m, 1 ♂, 1 ♀, 28. vii-3. viii. 1975 (M. Suwa). Honshû: Mt. Hakusan, Ishikawa-ken, 1 ♂, 22. vii. 1969 (H. Kurahashi), and 1 ♂, 6. viii. 1970 (K. Kanmiya). *Kuriles*. Tokotan, Uruppu, 1 ♂, 6 ♀, 9-23. viii. 1936 (Y. Sugihara).

This species is closely related to the preceding *P. alticola* and was recently suppressed as a synonym of that species by Griffiths (1982). However, it is here recognized as a good species by having the following characters: -

♂. Body-length 5.2-7 (usually more than 6) mm. Head less frequently brownish in ground colour on interfrontalia and orbits; mesonotum rather thinly pollinose and half-shining; abdomen with median vitta narrow to moderate in width and sharp.

Parafrontals with or without 1 minute *ors*; haustellar mentum rather slender, and slightly longer than palpi. Mesonotum less densely setulose laterally, with 8-18 (usually 10-15) *pls*; 3-6 (2-3 pairs) *pre-acr* present. Abdomen 1.8-2.4 times (usually more than twice) as long as wide; 5th sternite with subapical inner-marginal concavity right-angled or slightly obtuse-angled (cf. Fig. 524, Suwa, 1974), and with cephalic apodeme developed to fill the median recess of basal plate (Figs. 31 & 33) (13 specimens including the one from the Kuriles dissected, no exceptions); cercal plate with median keel well developed and easily visible in lateral view (Fig. 36); surstyli more strongly concave beyond the dorsal overhang, and with ventral lobe of outer process directed ventro-inwards and not caudad (Figs. 36 & 39).

♀. In comparison with the female specimen of *alticola* from Alaska, the female of *criniventris* seems to be different in having the 8th sternite slightly larger and covered with finer spinulate setulae. Further comparison based on more material is needed.

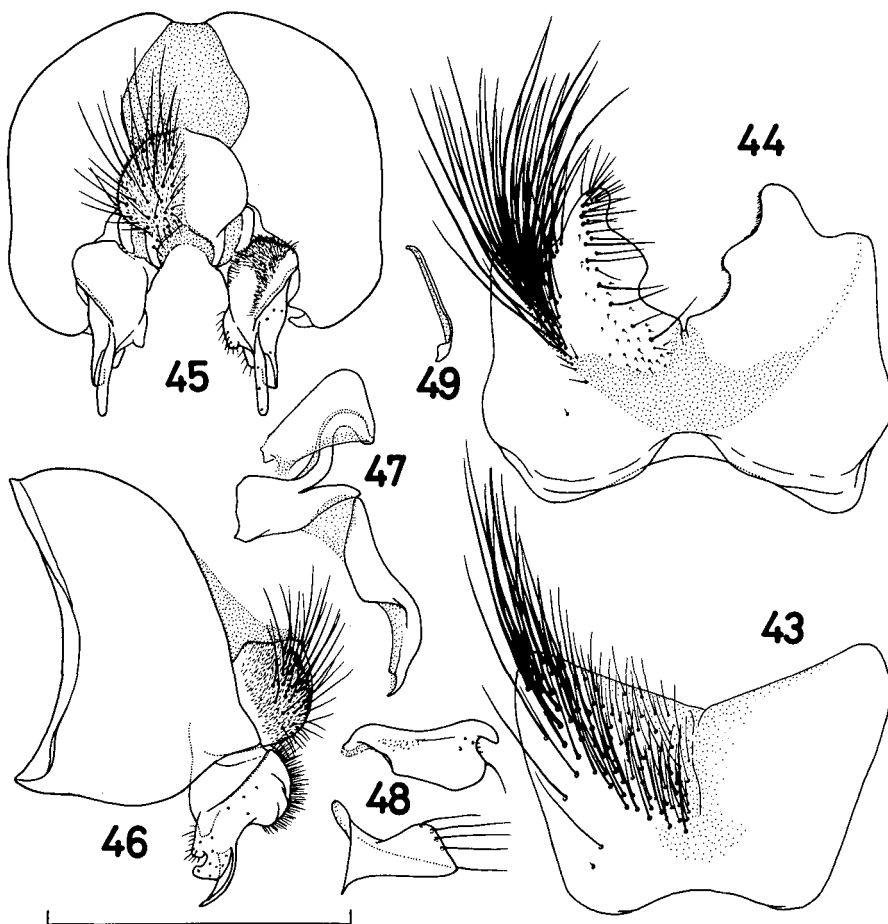
This species has been collected later in season (July and August) at higher localities than *alticola*, the latter having been collected in Japan in April to June at lower localities, though the precise altitudes of their localities cannot be determined from the data-labels attached to the specimens.

4. *Pegomya taiwanensis* sp. nov.

(Figs. 43-48)

Material. *Taiwan*. Chiayi-Hsien: Tungpu, 2500 m, 1 ♂ (holotype, EIHU), 2. vi. 1967 (T. Shirôzu).

♂. Body-length 5.4 mm; wing-length 5.7 mm. Body mainly blackish in ground colour and bluish grey in pollinosity. Legs partly yellow. Parafacials and cheeks dark brownish in ground colour; antennae blackish; palpi blackish, slightly paler at base; haustellar mentum blackish. Mesonotum rather densely pollinose and slightly shining in some lights, in frontal view with lateral patches visible, and



Figs. 43-49. *Pegomya taiwanensis* sp. nov., ♂. 43, 4th sternite; 44, 5th sternite; 45, hypopygium, dorsal view; 46, ditto, lateral view; 47, basiphallus and distiphallus; 48, praegonite and postgonite; 49, ejaculatory apodeme. Holotype from Tungpu. Scale 0.8 mm for Figs. 43-44, and 0.5 mm for Figs. 45-49.

in caudal view with median and sublateral vittae very obscurely visible. Abdomen with median vitta and fore-marginal bands rather sharp and moderate in width; cercal plate, lower swellings of epandrium, and processes of 5th sternite dark brownish, not yellow. Coxae blackish, partly brownish or yellowish; trochanters yellow; f_1 blackish, slightly brownish at base anteriorly and near apex antero-ventrally; f_2 on basal half mainly yellowish, and on apical half largely darkened except on yellowish ventral side; f_3 largely yellow, on apical third darkened dorsally; t_1 and t_2 blackish; t_3 yellow, darkened basally. Wings more or less tinged with dark brown, strongly near base, and slightly yellowish at base narrowly.

Head about 1.3 times as high as long; frons a little narrower than anterior ocellus; interfrontalia about one-third of anterior ocellus in width; parafrontals with 8-9 *ori* and 1 minute *ors*; A_3 1.9 times as long as wide; profrons 1.4 times as

wide as A_3 ; cheeks 1.3 times as high as profrons-width, with genal setae in 3 rows; epistoma situated behind profrons-tip; palpi slender and slightly longer than A_2 and A_3 combined, with the greatest width less than twice the basal width; haustellar mentum not slender, probably a little shorter than palpi.

Mesonotum rather sparsely setulose laterally, with 16 *pls* on left side (unable to count on right side); 5 *pre-acr* in 2 rows; 2nd *ph* well developed, about as long as the 1st; *stpl* 1:2; scutellum on dorsal surface with a few setulae towards lateral margin.

Abdomen depressed basally and half-depressed on caudal segments, nearly parallel-sided and about twice as long as wide; 1st sternite setose on whole width in a few rows; 4th sternite (Fig. 43) almost membranous along posterior margin and median line, and densely setose; 5th sternite and hypopygium as in Figs. 44-48; 5th sternite with cephalic apodeme developed to fill the median recess of basal plate; surstyli strongly concave beyond dorsal overhang; praegonites with 5 apical setae.

Fore tibia with 1 *pv*; f_2 with some (6-7) *pv* on basal half; t_2 with 1 *pd* and 2 *p-pv*; f_3 slightly sinuate along ventral side and rather hairy because of additional row of long setae on anterior surface and lengthened ground setulae on posterior surface, with a row of long *av*, the longest one about twice as long as f_3 -height, with 4-5 slender *pv* near middle and 1 *pv* near apex, and with basal *pv* indiscernible; t_3 with 1-2 *av*, 2 *ad* and 3 *pd* (1 additional *pd* present on the right tibia). Wings with *m-m* nearly erect and faintly sinuate.

♀. There is at hand a female specimen collected at Tatchia-anpu (3. iv. 1967, T. Shirōzu) near the locality of the present male specimen. This female specimen agrees well with the male one except in the usual sexual differences. The ovipositor, resembling that of *alticola* or *criniventris*, has the 8th sternite represented by a single plate with many spinulate setulae. We have still very insufficient knowledge as to the anthomyiid fauna of Taiwan to be fully convinced of their combination.

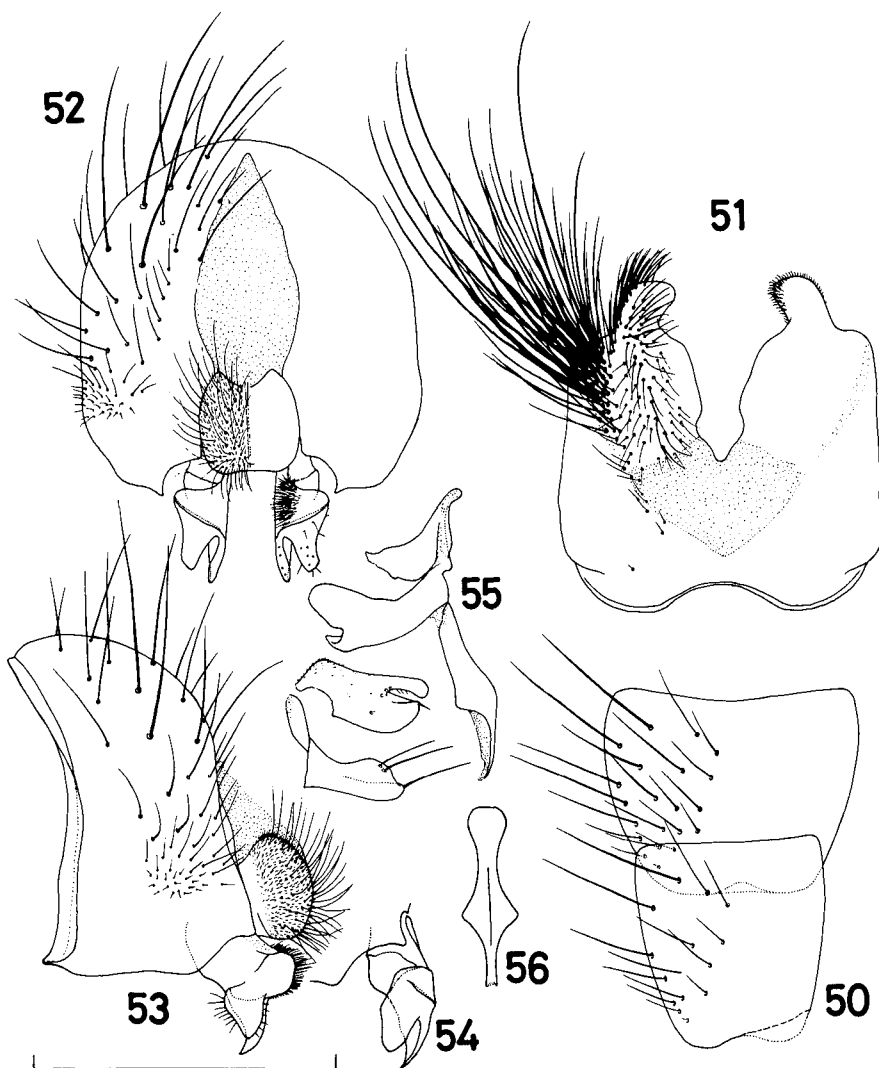
The resemblance found in the 5th sternite and surstyli indicates that the present species is closely related to *criniventris*, from which it is, however, readily distinguished by the darker legs and the peculiar 4th sternite. The primary setae on the body are more or less slender in comparison with *criniventris*. Anyway, *P. taiwanensis* is undoubtedly included in the same subgroup with *criniventris* and *alticola*.

5. *Pegomya hiroshii* sp. nov.

(Figs. 50-56)

Material. *Nepal*. E. Nepal: Thudam, 3500 m, 11 ♂ (one the holotype, 26. vi. 1972, deposited in BLKU=Biological Laboratory, Kyūshū University), 21. vi - 2. vii. 1972 (MT), and 3 ♂, 27. vi. 1972 (Y. Nishida & H. Shima); N.E. of Thudam, 4000 m, 3 ♂, 25. vi. 1972 (Y. Nishida); Topke Gola, 3700 m, 1 ♂, 8. vii. 1972 (J. Emoto); Topke Gola - Thurukpa, 3700-2600 m, 1 ♂, 9. vii. 1972 (J. Emoto).

♂. Body-length 5.2-6.4 mm; wing-length 5.6-6.5 mm. Body blackish in ground colour and bluish grey in pollinosity. Interfrontalia, parafacials and cheeks often yellow in ground colour; antennae blackish; palpi largely blackish, and yellow or brownish at base narrowly or sometimes on basal third, in a few cases almost entirely blackish. Mesonotum very faintly vittate, in frontal view with



Figs. 50-56. *Pegomya hirosii* sp. nov., ♂. 50, 3rd (lower) and 4th sternites; 51, 5th sternite; 52, hypopygium, dorsal view; 53, ditto, lateral view; 54, surstylus (left), dorso-lateral view; 55, aedeagus; 56, distiphallus, dorsal view. Paratype from N.E. of Thudam. Scale 0.8 mm for Figs. 50-51, and 0.5 mm for Figs. 52-56.

paramedian vittae and lateral patches obscurely visible, and in caudal view with broad median and narrow sublateral vittae obscurely visible. Abdomen hardly to rather distinctly tinged with brown in pollinosity; median vitta rather sharp, narrow on 2nd tergite and moderate to rather broad on 3rd to 5th tergites; cercal plate yellow to brown; lower swellings of epandrium brownish, sometimes much darkened; 5th sternite with processes yellow to brown especially on apical and inner part, sometimes much darkened. Coxae blackish or dark brown, partly yellow to brown; trochanters yellow; f_1 largely blackish or dark brown, and yellowish at base narrowly and on apical half ventrally; f_2 and f_3 yellow, with apex narrowly

darkened ; t_1 yellow, darkened in basal half or rarely in most part ; t_2 and t_3 largely yellow, darkened basally. Wings with a brownish tinge, darker near base, and more or less yellowish just basally.

Head about 1.3 times as high as long ; frons about two-thirds as wide as anterior ocellus ; parafrontals contiguous to each other, with about 8-10 *ori* (not uniform in length) and usually with 1 minute *ors* ; A_3 1.8-2.1 times as long as wide ; profrons 1.3-1.5 times as wide as A_3 ; cheeks 1.1-1.5 times as high as profrons-width, with genal setae in 2-3 rows ; epistoma situated behind profrons-tip ; palpi about as long as A_2 and A_3 combined, and rather distinctly broadened on apical half, with the greatest width equal to or slightly narrower than the width of distal segment of fore tarsus ; haustellar mentum a little shorter than palpi.

Mesonotum rather sparsely setulose laterally, with 7-16 (usually 9-13) *pls* ; 3-6 (usually 5) *pre-acr* in 2 rows ; 2nd *ph* variable in strength, completely lacking to well developed ; *stpl* 1:2, below the posteriors often with 1 seta distinguishable from adjacent setulae ; scutellum on dorsal surface with some (usually 5-7) setulae towards lateral margin.

Abdomen mainly depressed, more or less thickened on caudal segments, nearly parallel-sided, and 1.8-2.2 times as long as wide ; 1st sternite setose on whole width ; 3rd to 5th sternites and hypopygium as in Figs. 50-56 ; 5th sternite with apical series of short setae and with median expansions evenly margined ; surstyli with dorsal overhang distinct, and with outer process unnotched ; praegonites with 1 seta at ventro-apical corner and 2 or sometimes 3 setae at dorso-apical corner ; epiphallus arising from apex of basiphallus.

Fore tibia with 1 *pv* ; f_2 with some (4-5) *pv* in basal half ; t_2 with 1 *pd* and 2 *p-pv* ; f_3 with some (4-7) *av* except near base, 1 or a few short *pv* (often much weakened) near middle and 1 or sometimes 2 *pv* near apex, and with basal *pv* sometimes discernible ; t_3 with 1 or sometimes 2 *av*, 2-4 *ad* and 3-4 *pd*, a few setulae near apex on postero-dorsal surface being usually a little developed. Wings with *m-m* usually rather distinctly oblique and sinuate.

♀. Unknown.

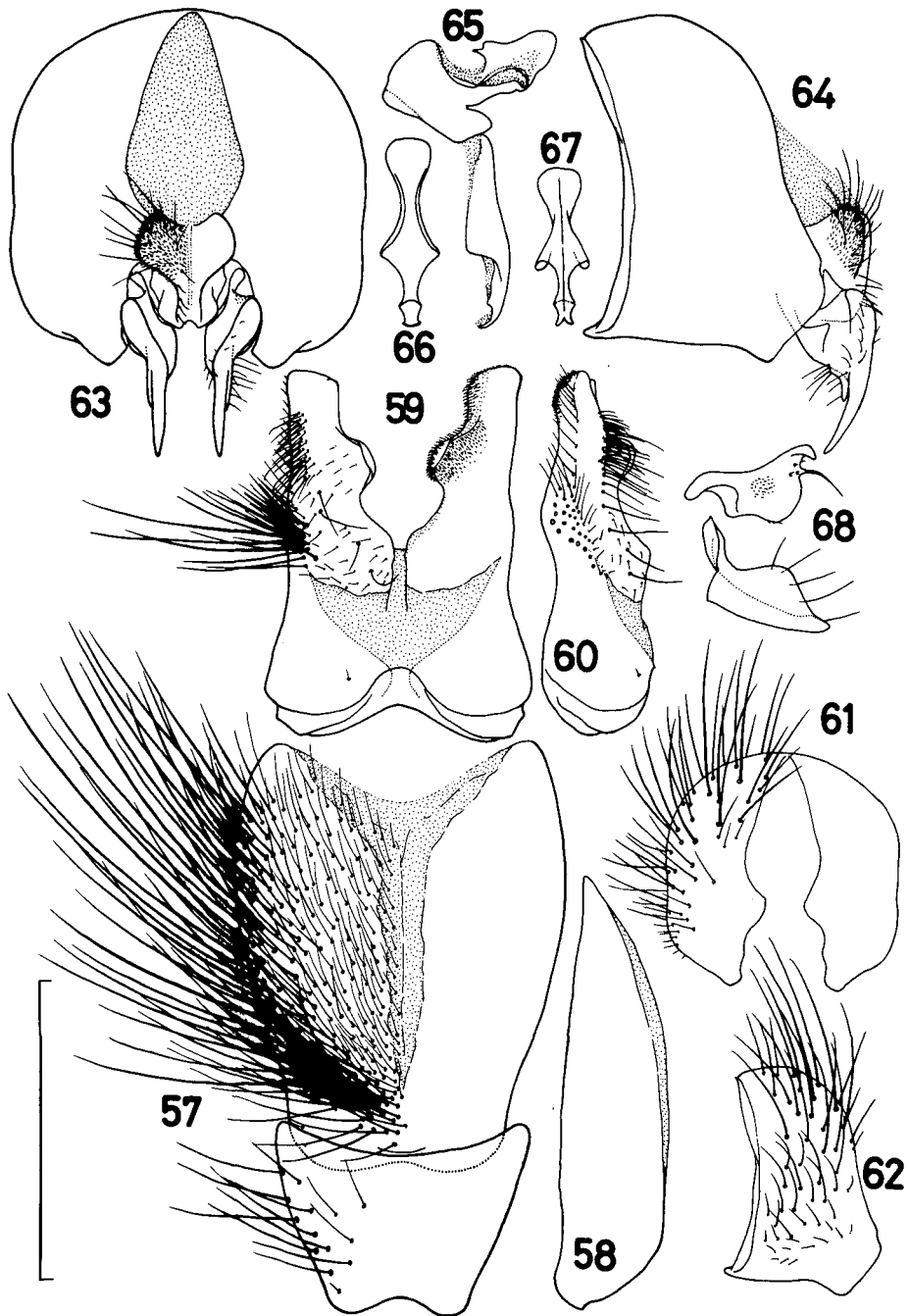
The aedeagus, with epiphallus arising from apical corner of the basiphallus, is quite unique to the present species among the group. *P. hiroshii* may, however, be included in the *alticola* subgroup by having the 5th sternite with median expansions, the surstyli with distinct dorsal overhang, and the praegonites with obtuse dorso-apical corner.

6. *Pegomya kumari* sp. nov.

(Figs. 57-68)

Material. *Nepal*. Janakpur : Daldung La, 3800-4000 m, Rolwaling Valley, 1 ♂ (holotype, EIHU), 15. viii. 1983.

♂. Body-length 6.1 mm ; wing-length 6.4 mm. Body including appendages mainly blackish in ground colour and bluish grey in pollinosity. Palpi brownish basally. Mesonotum half-shining in some lights, and very obscurely vittate in caudal view. Abdomen half-shining in some lights, with median vitta rather broad and obscure ; epandrium brownish on lower swellings ; cercal plate brownish ; 5th sternite dark amber on processes apically and on median membrane. Trochanters



Figs. 57-68. *Pegomya kumari* sp. nov., ♂. 57, 3rd (lower) and 4th sternites, ventral view; 58, 4th sternite, lateral view; 59, 5th sternite, ventral view; 60, ditto, lateral view; 61, epandrium, dorsal view; 62, ditto, lateral view; 63, hypopygium, dorsal view; 64, ditto, lateral view; 65, basiphallus and distiphallus, lateral view; 66, distiphallus, ventral view; 67, ditto, dorso-caudal view; 68, praegonite and postgonite. Holotype from Daldung La. Scale 0.8 mm for Figs. 57-62, and 0.5 mm for Figs. 63-68.

brownish. Wings distinctly tinged with dark brown, strongly near base, and more or less yellowish just basally.

Head about 1.2 times as high as long; frons about 1.6 times as wide as anterior ocellus; interfrontalia somewhat narrower than anterior ocellus; parafrontals with 6 long and some (3-5) fine *ori* (mingled with some micro-setulae) and with 1 minute *ors*; A_3 1.8 times as long as wide; profrons about 1.7 times as wide as A_3 ; parafacials at middle 1.4 times as wide as A_3 ; cheeks about 1.2 times as high as profrons-width, with genal setae in about 3 rows; epistoma projecting forwards slightly beyond profrons-tip; palpi slightly longer than A_2 and A_3 combined, rather distinctly broadened on apical half, with the greatest width more than twice of the basal width and nearly as wide as distal segment of fore tarsus; haustellar mentum longer than palpi.

Mesonotum sparsely setulose laterally, with 9-10 *pls*; 5 *pre-acr* arranged in 2 rows; 2nd *ph* rather well developed on the left body-side and fine on the other; *stpl* 1:2, in addition with a rather distinct seta below the posteriors; scutellum on dorsal surface with a few setulae towards lateral margin.

Abdomen depressed except on thickened caudal segments, 2.4 times as long as wide, widest on 3rd tergite and gradually narrowing caudad; 1st sternite setose on whole width; 3rd to 5th sternites and hypopygium as in Figs. 57-68; 4th sternite almost divided into 2 plates by membranous median area and densely setose, the outer setae being very long and strong and the inner ones fine; 5th sternite with apical series of setae sparse and fine, and without shoulders; surstyli without dorsal overhang, and with outer process much reduced; praegonites obtuse dorso-apically, and with 5 setae.

Fore tibia with 1 *pv*; f_2 with 4-5 *pv* in basal half; t_2 with 1 *pd*, 1 *p* (rather towards postero-dorsal surface) and 0-1 *p-pv*; f_3 (left one missing) with 5 *av* on apical two-thirds, 4 *pv* (including basal one) on basal half and 2 rather weak *pv* near apex; t_3 with 1 *av*, 2 *ad* and 3 *pd*, and in addition with 3 short *pd* discernible near apex. Wings with *m-m* erect and straight.

♀. Unknown.

The 5th sternite without shoulders and surstyli with the small outer process give a peculiarity to the present species. The aedeagus is, however, not distantly different from that of the *alticola* subgroup. This species might be closer to the subgroup than to others. Absence of shoulders on the 5th sternite may be a result of its abdominal elongation. The 4th sternite also is similar to that of *taiwanensis* except in the length.

7. *Pegomya himalaica* sp. nov.

(Figs. 69-77, & 93-94)

Material. *Nepal*. E. Nepal: Thudam, 3500 m, 9 ♂ (one the holotype, 2. vii. 1972, BLKU), 21. vi - 2. vii. 1972 (MT); N.E. of Thudam, 4000 m, 1 ♂, 25. vi. 1972 (H. Shima).

♂. Body-length 5.3-5.7 mm (not exact owing to shrinkage of abdomen in dried condition); wing-length 6-6.2 mm. Body mainly blackish in ground colour and bluish grey in pollinosity. Interfrontalia, parafacials and cheeks sometimes yellowish in ground colour; antennae blackish; palpi yellowish on basal third and blackish

on the rest. Mesonotum half-shining, and obscurely vittate in caudal view. Abdomen half-shining, with median vitta hardly visible; epandrium brownish on lower swellings; cercal plate and processes of 5th sternite brownish to dark brown. Coxae blackish or dark brown, and partly brownish or yellow; trochanters yellowish; f_1 largely blackish, and only yellowish at base anteriorly and in apical half antero-ventrally; f_2 and f_3 yellowish, with darkened apex; t_1 and t_2 dark brownish to blackish; t_3 yellow, with darkened base. Wings rather distinctly tinged with dark brown.

Head about 1.2-1.3 times as high as long; frons as wide as or slightly narrower than anterior ocellus; parafrontals very narrowly separated from each other, rarely contiguous, with 6-8 *ori* (not uniform in length) and no *ors*; A_3 1.8-2.1 times as long as wide; profrons 1.2-1.4 times as wide as A_3 ; cheeks distinctly higher than profrons-width, with genal setae in 2-3 rows; epistoma situated behind profrons-tip; palpi about as long as A_2 and A_3 combined, and distinctly broadened on apical half, with the greatest width nearly equal to the width of distal segment of fore tarsus, or sometimes slightly less; haustellar mentum shorter than palpi.

Mesonotum sparsely setulose laterally, with 6-8 *pls*; 2-6 *pre-acr* in 2 rows; 2nd *ph* fine; *stpl* 1: 2, below the posteriors often with 1 additional fine or rather distinct seta; scutellum on dorsal surface with a few or some (at most about 5) setulae towards lateral margin.

Abdomen depressed on basal half, rather well developed on caudal half, ovoid in dorsal view, and 1.5-1.7 times as long as wide; 1st to 5th sternites and hypopygium as in Figs. 69-77, & 93-94; 1st sternite setulose laterally and bare medianly; 4th sternite much wider than long; 5th sternite reticulated at inner base of processes and scarcely sclerotized there, and distinctly swollen inside near subapical projection, the latter being prominent; surstyli hardly overhanged dorsally, only with some wrinkles; praegonites with 1 seta ventro-apically and 2 or sometimes 3 setae dorso-apically.

Fore tibia with 1 *pv*; f_2 with 3-4 *pv* in basal half; t_2 with 1 *pd* and 2 *p-pv*; f_3 with 5-8 *av*, 1-2 *pv* near middle and 1 *pv* near apex, and with basal *pv* sometimes discernible, though fine; t_3 with 1 *av* (rarely absent), 2 or usually 3 *ad* and 3-4 *pd*, and usually with 1 or a few additional short *pd* near apex. Wings with *m-m* hardly to slightly oblique and slightly to rather distinctly sinuate.

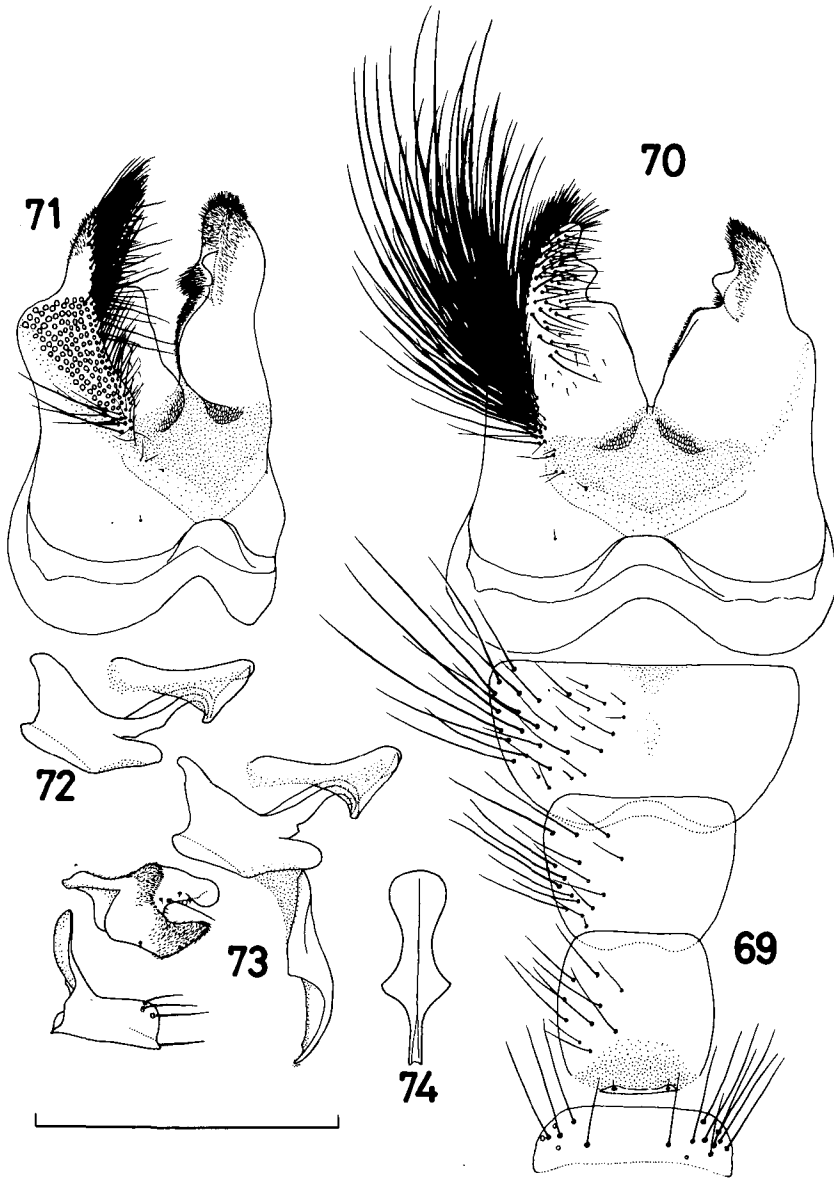
♀. Unknown.

In the 5th sternite with subapical projection and basal brim along inner margin of processes and the surstyli without dorsal overhang *P. himalaica* differs from the *alticola* subgroup and agrees with the following *setifemur* and *compressa*, forming another unit, the *himalaica* subgroup.

8. *Pegomya setifemur* sp. nov.

(Figs. 78-85, & 95-96)

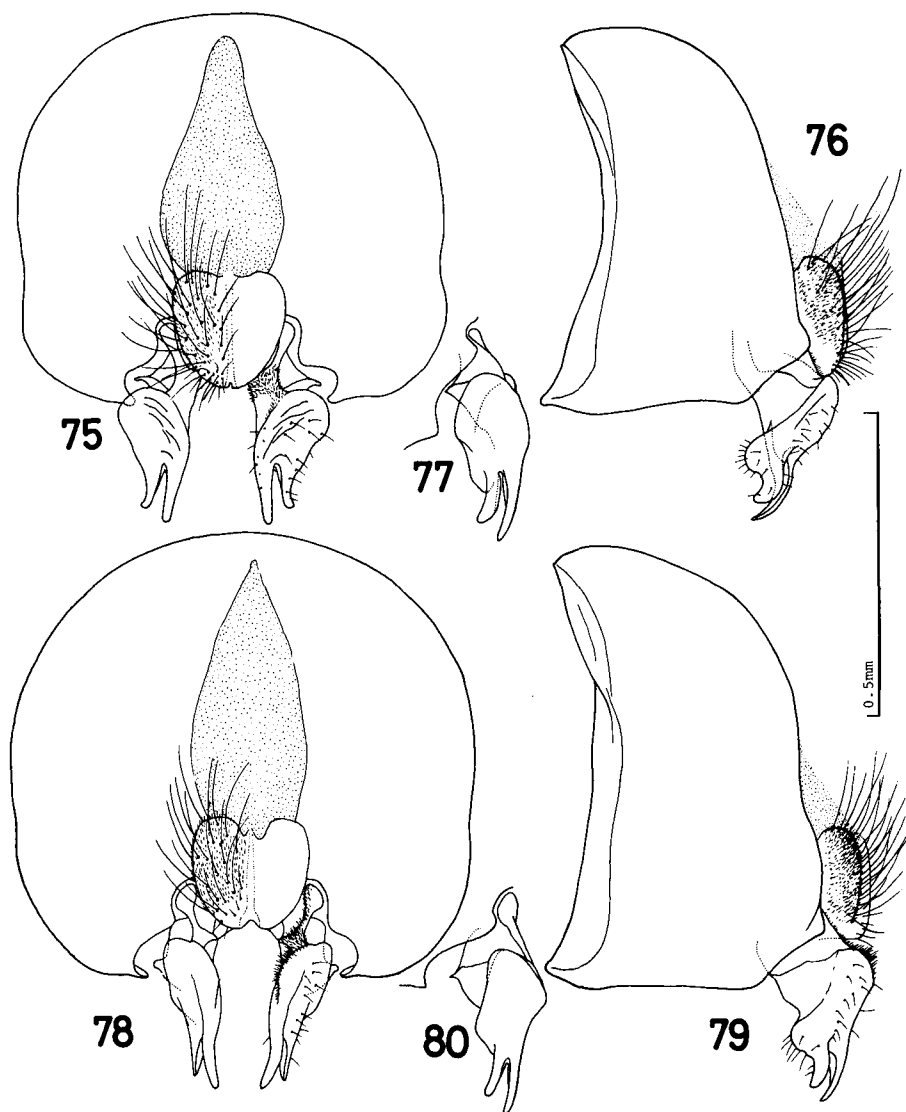
Material. *Nepal*. E. Nepal: Thudam, 3500 m, 27 ♂ (one the holotype, 26. vi. 1972, BLKU), 22. vi-9. vii. 1972 (MT), and 4 ♂, 20-24. vi. 1972 (H. Shima, J. Emoto & Y. Nishida); Thudam, 3500-3800 m, 2 ♂, 24. vi. 1972 (H. Shima); N.E. of Thudam, 4000 m, 2 ♂, 25. vi. 1972 (Y. Nishida); Thudam - Tanga La, 3500-4700 m, 2 ♂, 5. vii. 1972 (Y. Nishida); Topke Gola - Tanga La, 3700-4700 m, 1 ♂, 7. vii. 1972 (J. Emoto).



Figs. 69-74. *Pegomya himalaica* sp. nov., ♂. 69, 1st (lowest) to 4th sternites; 70, 5th sternite, ventral view; 71, ditto, ventro-lateral view; 72-73, aedeagus; 74, distiphallus, dorsal view. Paratype from Thudam (Figs. 69-72) and another paratype from N. E. of Thudam (Figs. 73-74). Scale 0.8 mm for Figs. 69-71, and 0.5 mm for Figs. 72-74.

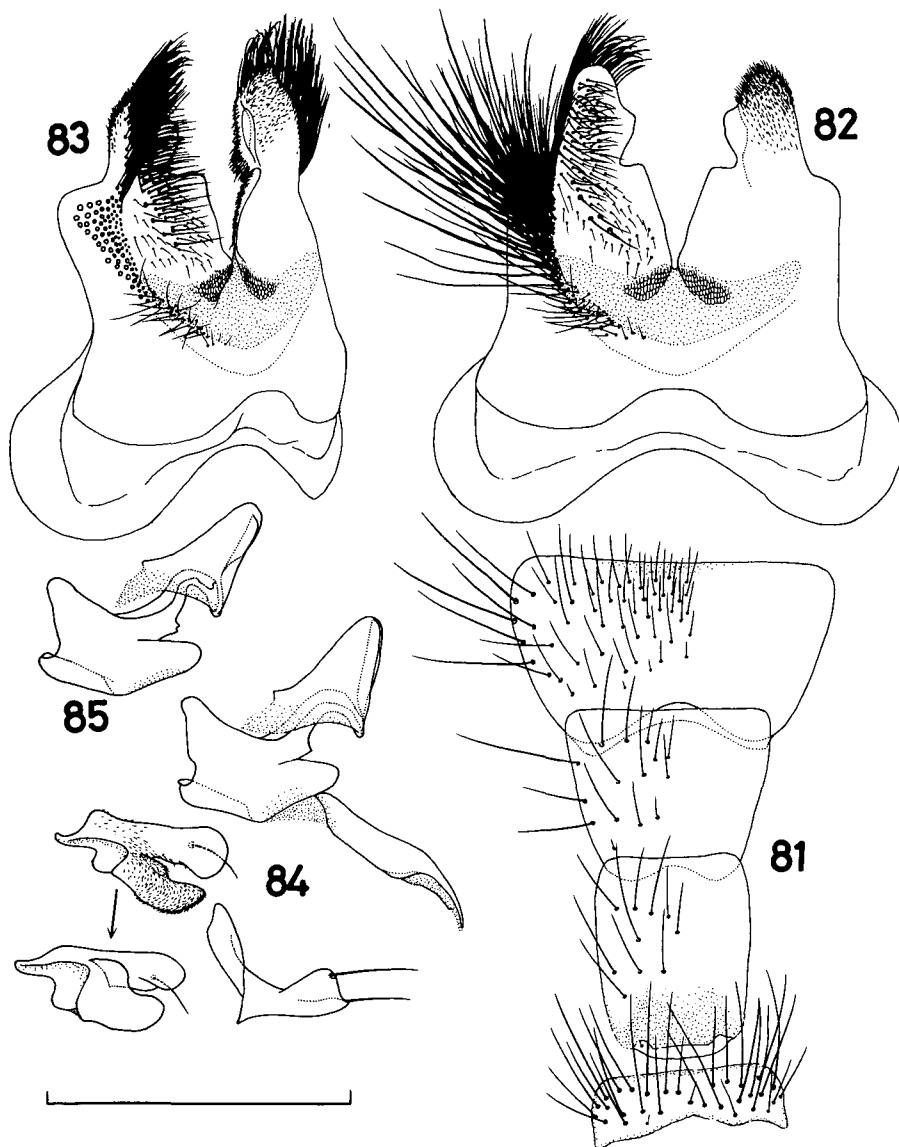
Janakpur : Daldung La, 3800-4000 m, Rolwaling Valley, 2 ♂, 15. viii. 1983.

♂. Body-length 5-5.8 mm; wing-length 5.6-6.4 mm. Body mainly blackish in ground colour and bluish grey pollinose. Legs partly yellow. Interfrontalia near lunule, parafacials and cheeks sometimes brownish in ground colour; antennae black; palpi yellow or sometimes brownish on basal fourth to third and black on the



Figs. 75-77. *Pegomya himalaica* sp. nov., ♂, paratype from N.E. of Thudam. Figs. 78-80. *Pegomya setifemur* sp. nov., ♂, paratype from Thudam. 75 & 78, hypopygium, dorsal view; 76 & 79, ditto lateral view; 77 & 80, surstylus (left), dorso-lateral view.

rest. Mesonotum half-shining in some lights and faintly vittate. Abdomen half-shining in some lights, with median vitta obscure and often hardly visible, or sometimes rather distinct; epandrium brownish yellow to dark brown on lower swellings; cercal plate and processes of 5th sternite yellowish, often more or less darkened. Coxae blackish, mid and hind ones usually yellow to brown in part narrowly; trochanters yellowish; f_1 largely blackish, only yellowish on apical half antero-ventrally and at base slightly; f_2 and f_3 yellow, with darkened apex; t_1 and t_2 blackish; t_3 yellow, darkened basally. Wings tinged with dark brown, rather strongly so at base.



Figs. 81-85. *Pegomya setifemur* sp. nov., ♂. 81, 1st (lowest) to 4th sternites; 82, 5th sternite, ventral view; 83, ditto, ventro-lateral view; 84-85, aedeagus. Paratype from Thudam (Figs. 81-84) and another paratype from Thudam (Fig. 85). Scale 0.8 mm for Figs. 81-83, and 0.5 mm for Figs. 84-85.

Head about 1.2-1.3 times as high as long; frons about as wide as (in specimens from Thudam) or rather distinctly wider than (in specimens from Rolwaling Valley) anterior ocellus; parafrontals narrowly separated from each other, with 7-9 *ori* (not uniform in length) and no *ors*; A_3 1.6-2 times as long as wide; profrons 1.3-1.4 times as wide as A_3 ; parafacials at middle about as wide as A_3 ; cheeks rather distinctly higher than profrons-width, with genal setae in 2 rows; epistoma situated

behind profrons-tip; palpi about as long as A_2 and A_3 combined, and distinctly broadened on apical half, with the greatest width nearly equal to the width of distal segment of fore tarsus; haustellar mentum a little shorter than palpi.

Mesonotum rather sparsely setulose laterally, with 5-14 (usually about 10) *pls*; 4-7 (2-3 pairs) *pre-acr* in 2 rows; 2nd *ph* much weaker than the 1st, hardly to distinctly differentiated from accessory setulae; *stpl* 1:2, below the posteriors usually with 1 seta distinguishable from adjacent setulae, though very fine; scutellum on dorsal surface with a few or some (at most about 5) setulae towards lateral margin.

Abdomen depressed on basal half and much thickened on caudal half, more or less ovoid in dorsal view, and about 1.4-1.8 times as long as wide; 1st to 5th sternites and hypopygium as in Figs. 79-85, & 95-96; 1st sternite setose on whole width, or sometimes bare medianly; 4th sternite much wider than long, and rather densely setose medianly; 5th sternite reticulated at inner bases of processes and scarcely sclerotized there, and slightly swollen inside near subapical projection, the latter being rather prominent; surstyli somewhat compressed, without dorsal overhang; cercal plate with median keel distinctly visible in profile; praegonites with 2 apical setae.

Fore tibia with 1 *pv*; f_2 with a few or some *pv* in basal half; t_2 with 0 or sometimes 1 *ad*, 1 *pd* and 1-3 *p-pv*; f_3 much densely setose on basal half of posterior surface, the setae near base and near the ordinary row of *p-pd* being strong and the rest finer, with 6-9 *av*, 1-2 *pv* near middle (rather strong, sometimes much weakened) and 1-2 *pv* near apex (often much weakened), and with basal *pv* fine and often indiscernible; t_3 with 1 *av*, 2-3 (rarely 4) *ad* and 3-4 (rarely 2) *pd*, and near apex with a few additional *pd* discernible and often rather well developed, in 1 specimen from Thudam 1 strong *a* present on each t_3 . Wings with *m-m* more or less oblique and usually a little sinuate.

♀. Unknown.

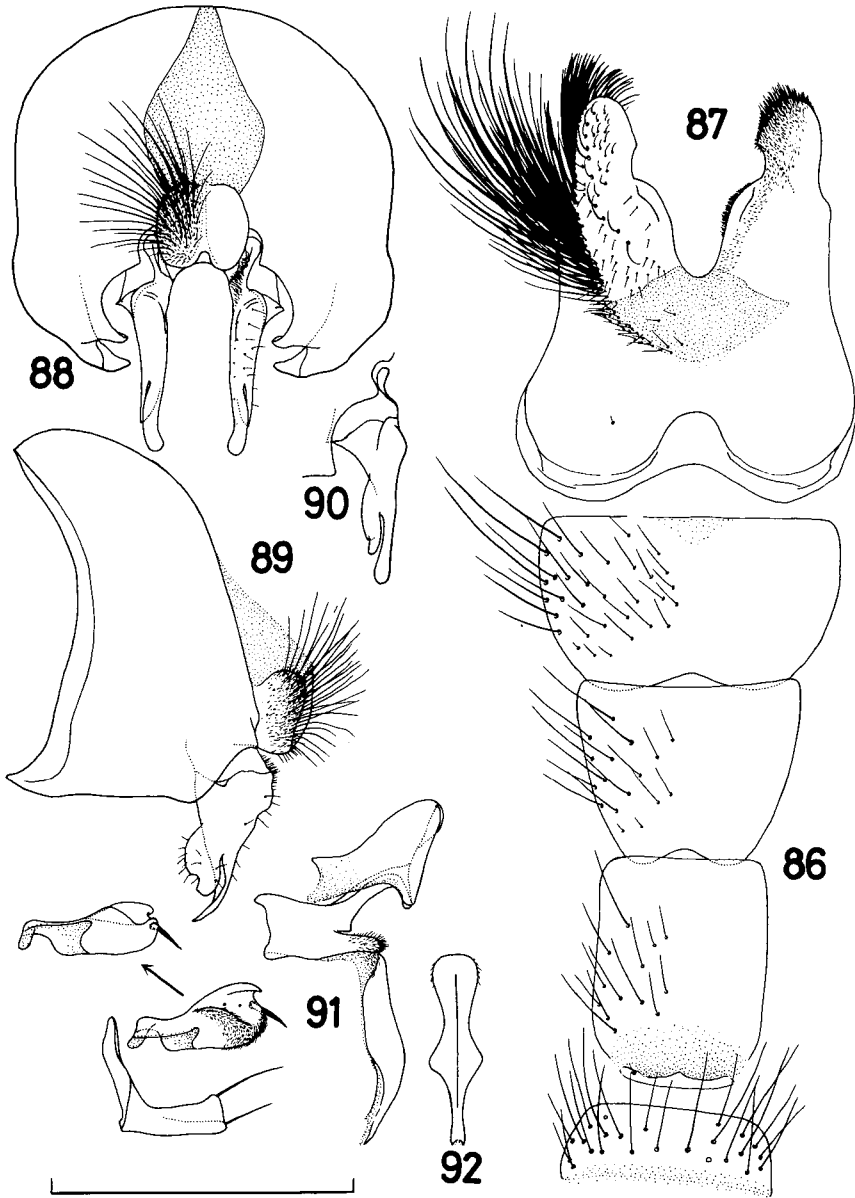
Judging from the striking resemblance in the genital structures this species is most closely related to the preceding *P. himalaica*, from which it can, however, be readily distinguished by the densely setose hind femur and different details in the genitalia.

9. *Pegomya compressa* sp. nov.

(Figs. 86-92, & 97-98)

Material. *Nepal*. E. Nepal: Thudam, 3500 m, 1 ♂, 24. vi. 1972 (MT), and 1 ♂ (holotype, BLKU), 29. vi. 1972 (MT).

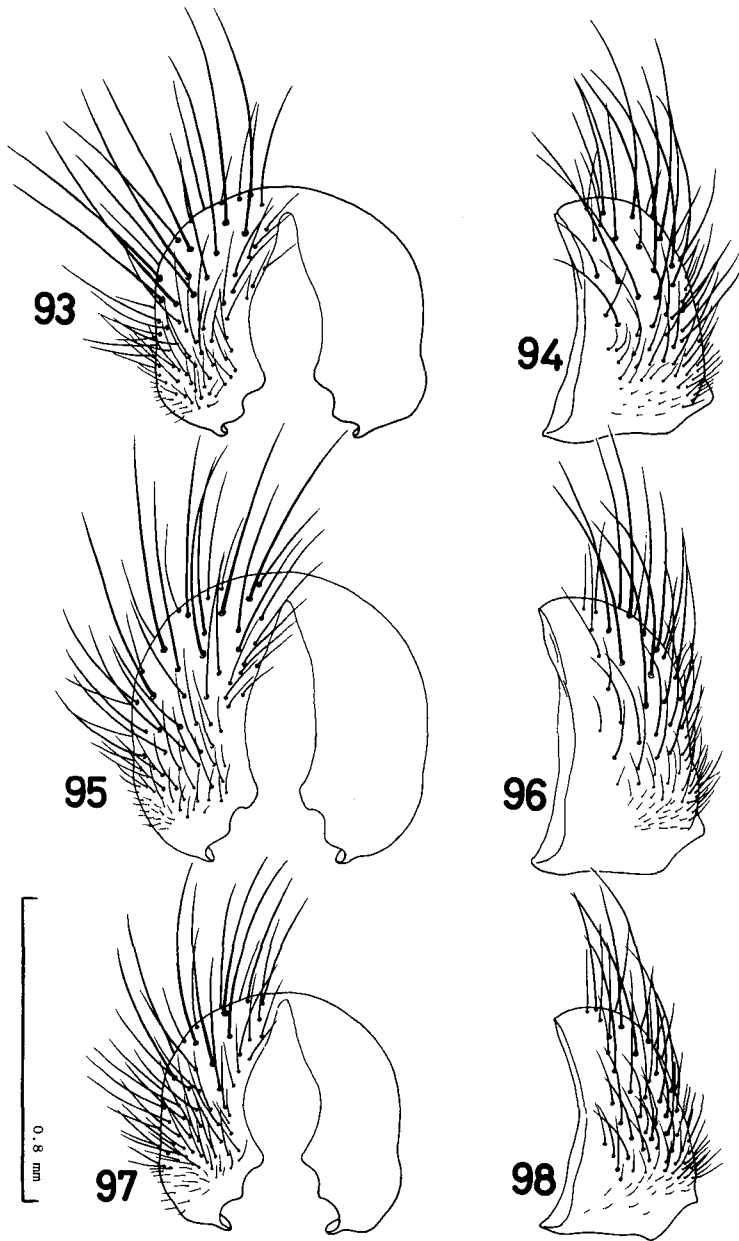
♂. Body-length 6 mm (paratype); wing-length 6.1 mm. Body mainly blackish in ground colour and bluish grey in pollinosity. Darker in holotype. Interfrontalia brownish yellow or blackish in ground colour; parafacials and cheeks yellow or dark brown in ground colour; antennae blackish; palpi blackish, with basal fourth yellow or brownish yellow. Mesonotum half-shining in some lights and faintly vittate in caudal view. Abdomen pale bluish grey pollinose and slightly brownish in some lights, with median vitta hardly or very obscurely visible in caudal view; epandrium yellow or brownish yellow on lower swellings; cercal plate yellow; 5th sternite with processes yellow and partly darkened. Coxae blackish, in small part



Figs. 86-92. *Pegomya compressa* sp. nov., ♂. 86, 1st (lowest) to 4th sternites; 87, 5th sternite, ventral view; 88, hypopygium, dorsal view; 89, ditto, lateral view; 90, surstylus (left), dorso-lateral view; 91, aedeagus; 92, distiphallus, dorsal view. Paratype from Thudam. Scale 0.8 mm for Figs. 86-87, and 0.5 mm for Figs. 88-92.

yellowish; trochanters yellow; f_1 largely blackish, and only yellowish at base anteriorly and on apical third antero-ventrally; f_2 and f_3 yellow, darkened apically; t_1 and t_2 blackish; t_3 yellow, with darkened base. Wings more or less tinged with dark brown, distinctly near base, and narrowly yellowish just basally.

Head 1.2-1.3 times as high as long; frons somewhat narrower than anterior



Figs. 93-98. Epandrium, dorsal (left) and lateral views. 93-94, *Pegomya himalaica* sp. nov., paratype from N.E. of Thudam; 95-96, *Pegomya setifemur* sp. nov., paratype from Thudam; 97-98, *Pegomya compressa* sp. nov., paratype from Thudam.

ocellus; parafrontals narrowly separated from each other (holotype) or contiguous (probably due to shrinkage), with 7-9 rather strong and 1-2 fine *ori* and no *ors* (1 minute *ors* present on right parafrontalia in holotype); A_3 about twice as long as wide; profrons about 1.4 times as wide as A_3 ; parafacials at middle about as wide

as A_3 ; cheeks a little higher than profrons-width, with genal setae in 2-3 rows; epistoma situated behind profrons-tip; palpi about as long as A_2 and A_3 combined and somewhat broadened on apical half, with the greatest width about twice of the basal width and distinctly narrower than distal segment of fore tarsus; haustellar mentum shorter than palpi.

Mesonotum rather sparsely setulose laterally, with 8-15 *pls*; 5 (holotype) or 7 *pre-acr* in 2 rows; 2nd *ph* well developed, as long as (paratype) or slightly shorter than the 1st; *stpl* 1:2, below the posteriors with 1 additional seta distinguishable from adjacent setulae; scutellum on dorsal surface with about 10 setulae towards lateral margin.

Abdomen slightly shorter than twice the width and nearly parallel-sided (paratype); 1st to 5th sternites and hypopygium as in Figs. 86-92, & 97-98; 1st sternite setose on whole width; 4th sternite much wider than long; 5th sternite with subapical projections less prominent; surstyli compressed, with outer process slightly notched; praegonites with 2 apical setae; basiphallus pilose apically.

Fore tibia with 1 *pv*; f_2 with 2-3 *pv* in basal half; t_2 with 1 *pd* and 1-2 *p-pv*; f_3 with 6-7 *av*, 1-2 *pv* near middle and 1-2 *pv* near apex, and with basal *pv* indiscernible (weak one visible on the left f_3 in paratype); t_3 with 1 *av*, 2-3 *ad* and 2-4 *pd*, and near apex with a few additional *pd* discernible. Wings with *m-m* distinctly oblique and sinuate.

♀. Unknown.

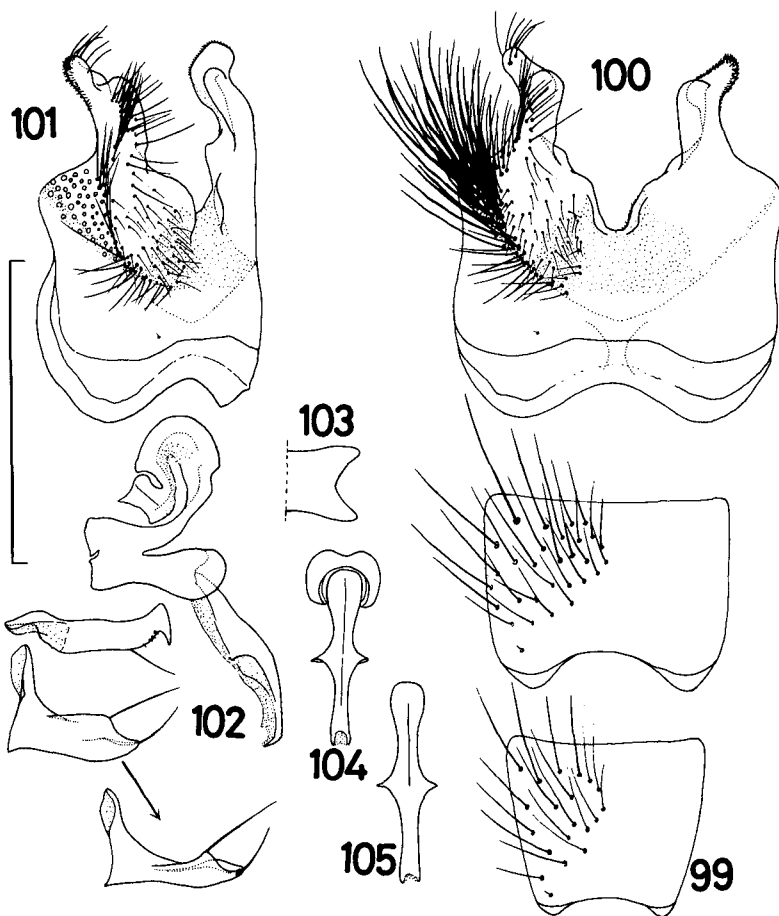
As already mentioned *P. compressa* forms a close unit, the *himalaica* subgroup, together with *himalaica* and *setifemur*, and is placed at the extremities of morphoclines constructed for the 5th sternites and the surstyli of these species. The present species is, however, sharply discriminated from the other two by having the pilose basiphallus and the unleft postgonites in the aedeagal structures. In most external features *P. compressa* is quite similar to *himalaica* and hardly distinguished from the species. If the setal pattern on the 1st sternite (setose on whole width in *compressa*) is stable, it may be useful for the identification.

10. *Pegomya sharmai* sp. nov.

(Figs. 99-113)

Material. *Nepal*. E. Nepal: Thudam, 3500 m, 2 ♂, 28 & 30. vi. 1972 (MT), and 1 ♂ (holotype, BLKU), 18. vi. 1972 & 1 ♂, 20. vi. 1972 (H. Shima); N.E. of Thudam, 4000 m, 2 ♂, 25. vi. 1972 (Y. Nishida); Thudam - Tanga La, 3500-4700 m, 2 ♂, 5. vii. 1972 (Y. Nishida).

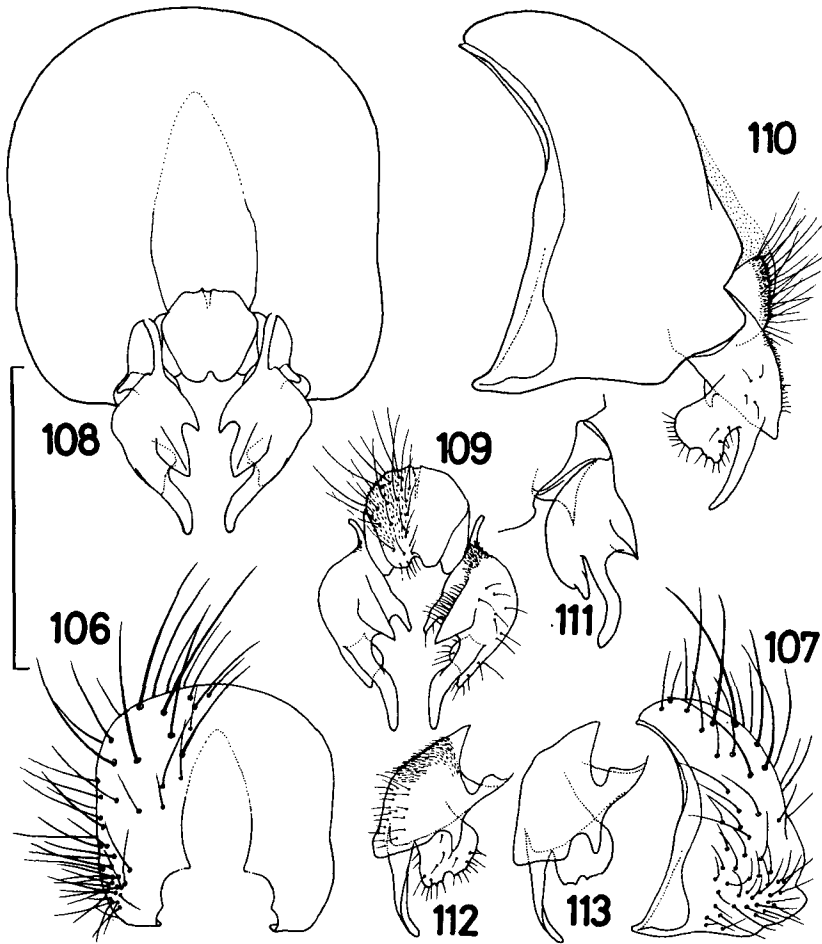
♂. Body-length 5-5.4 mm; wing-length 5.3-5.6 mm. Body mainly blackish in ground colour and bluish grey in pollinosity. Parafacials and cheeks often yellowish to brown in ground colour; antennae blackish; palpi yellow on basal half and blackish on apical half. Mesonotum rather thickly pollinose and half-shining in some lights; in frontal view hardly vittate and in caudal view very obscurely vittate. Abdomen half-shining in some lights and obscurely darkened medianly in caudal view; epandrium brownish on lower swellings; cercal plate yellow to brown; 5th sternite yellow to brown on median membrane and processes, the latter being partly darkened. Fore coxae blackish on dorsal (outer) half and yellowish on other half; mid and hind coxae partly yellowish; trochanters yellow; femora largely blackish,



Figs. 99-105. *Pegomya sharmai* sp. nov., ♂. 99, 3rd (lower) and 4th sternites; 100, 5th sternite, ventral view; 101, ditto, ventro-lateral view; 102, aedeagus; 103, basiphallus, apical part, dorsal view; 104, apex of basiphallus, caudal view, and distiphallus, dorso-caudal view; 105, distiphallus, dorsal view. Paratype from Thudam - Tanga La. Scale 0.8 mm for Figs. 99-101, and 0.5 mm for Figs. 102-105.

at base narrowly yellow, and in apical half (f_1) or apical third (f_2 and f_3) yellow ventrally; t_1 and t_2 blackish or dark brown; t_3 yellow, with darkened base. Wings with dark brownish tinge, yellow basally.

Head 1.1-1.25 times as high as long; frons about twice as wide as anterior ocellus; interfrontalia as wide as or slightly wider than anterior ocellus; parafrontals with 6-8 *ori* (not uniform in length, mingled with a few or some micro-setulae) and usually with 1 minute or rather distinct *ors*; A_3 1.6-2 (usually 1.7-1.8) times as long as wide; profrons 1.3-1.7 times as wide as A_3 ; parafacials at middle 1-1.3 times as wide as A_3 ; cheeks a little higher than profrons-width, with genal setae in 2 rows; epistoma projecting forwards a little beyond profrons-tip; palpi slender, about as long as A_2 and A_3 combined, with the greatest width about twice the basal width and narrower than distal segment of fore tarsus; haustellar mentum somewhat longer than palpi.



Figs. 106-113. *Pegomya sharmai* sp. nov., ♂. 106, epandrium, dorsal view; 107, ditto, lateral view; 108, hypopygium, dorsal view; 109, ditto, dorsal (slightly caudal) view; 110, ditto, lateral view; 111, surstylus (left), dorso-lateral view; 112-113, surstylus (left), inside view. Paratype from Thudam - Tanga La (Figs. 106-112) and another paratype from Thudam (Fig. 113). Scale 0.8 mm for Figs. 106-107, and 0.5 mm for Figs. 108-113.

Mesonotum rather sparsely setulose laterally, with 7-12 *pls*; 4-6 (2-3 pairs) *pre-acr* in 2 rows; 2nd *ph* as fine as accessory setulae; *stpl* 1 : 2, below the posteriors sometimes with 1 additional seta discernible; scutellum on dorsal surface with a few or some (at most about 5) setulae towards lateral margin.

Abdomen depressed on basal half or less, much swollen on the rest, nearly parallel-sided and 1.9-2.4 times as long as wide; 1st sternite setose on whole width, rarely bare medianly; 3rd to 5th sternites and hypopygium as in Figs. 99-113; 4th sternite less than twice as wide as long, and not very densely setose medianly; processes of 5th sternite much attenuated on apical half, with apex directed outwards; surstyli with inner process strongly concave at inner base, much prolonged and distinctly sinuate, with basal process hook-shaped, and with dorsal overhang

developed to project inwards; epiphallallic lamella rather well sclerotized, compressed, not hood-like, and completely fused with upcurved epiphallus; basiphallus broadened apicad and distinctly sunken apically; praegonites with 2 setae; postgonites much narrowed and strongly hooked apically.

Fore tibia with 1 or rarely no *pv*; f_2 with a few or some *pv* in basal half; t_2 with 1 *pd* and 1-2 *p-pv* (in 1 specimen with no discernible setae); f_3 with some (4-6) *av* except near base, 1 or a few *pv* near middle and 1-2 *pv* near apex, with basal *pv* indiscernible, and, in addition to the ordinary row of *p-pd*, with an irregular row of fine or distinct *p* rather ventrally; t_3 with 1 *av*, 2 *ad* and 2-3 *pd*, and often with 1 or 2 additional *pd* near apex. Wings with *m-m* erect, and straight or faintly curved inwards.

♀. Unknown.

Even though many peculiarities are found in the genital structures, this species undoubtedly belongs to the *alticola* group in having the 5th sternite with developed shoulders and differentiated outer marginal setae and the distiphallus of the type characteristic of the group. The peculiarities are shared with the following *P. nagendrai*, with which it forms the *sharmai* subgroup.

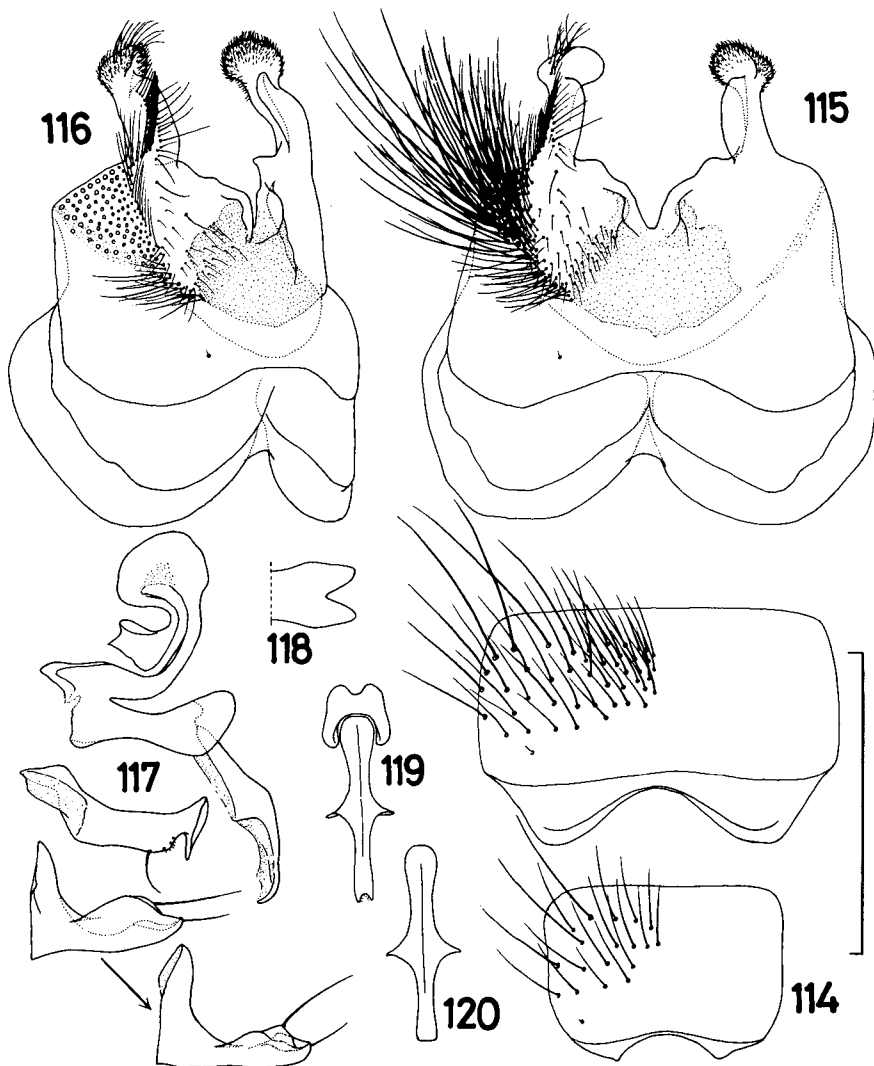
11. *Pegomya nagendrai* sp. nov.

(Figs. 114-127)

Material. *Nepal*. E. Nepal: N.E. of Thudam, 4000 m, 1 ♂, 23. vi. 1972 (Y. Nishida). Janakpur: Dongo Kharka - Beding, 3000-3300 m, Rolwaling Valley, 1 ♂, 22. viii. 1983 & 1 ♂ (holotype, EIHU), 22-23. viii. 1983. Bagmati: Ghora Tabela - Langtang, 3000-3400 m, 1 ♂, 12. ix. 1983.

♂. Body-length 5.1-5.7 mm; wing-length 5.6-5.9 mm. Body mainly blackish in ground colour and bluish grey in pollinosity, half-shining in some lights. Parafacials dark brownish to black in ground colour; cheeks dark brownish in ground colour; palpi yellow to brown on basal third to half and blackish on the rest. Mesonotum obscurely vittate in caudal view. Abdomen with median vitta rather broad and obscurely visible in caudal view; epandrium more or less brownish on lower swellings; cercal plate yellow to brown; 5th sternite yellow to brown on median membrane and on apical half of processes. Fore coxa blackish on dorsal half and yellowish to brown on other half; mid and hind coxae partly yellow to brown; trochanters yellowish; femora largely blackish, and yellowish at base narrowly and in apical half or less ventrally; t_1 and t_2 blackish; t_3 yellow, with darkened base. Wings rather weakly tinged with dark brown, more or less yellowish at base.

Head about 1.2 times as high as long; frons about twice as wide as anterior ocellus; interfrontalia as wide as or a little wider than anterior ocellus; parafrontals with 6-7 *ori* (not uniform in length) and with 2 *ors*, the upper *ors* being minute (absent on the right parafrontalia in 1 specimen) and the lower one minute or rather distinct (absent on the left in holotype); A_3 1.7-2 times as long as wide; profrons 1.4-1.6 times as wide as A_3 ; parafacials at middle slightly wider than A_3 ; cheeks 1.3-1.4 times as high as profrons-width, with genal setae in 2 rows (an irregular row in 1 specimen); epistoma more or less projecting forwards beyond profrons-tip; palpi slender, and somewhat longer than A_2 and A_3 combined, with the

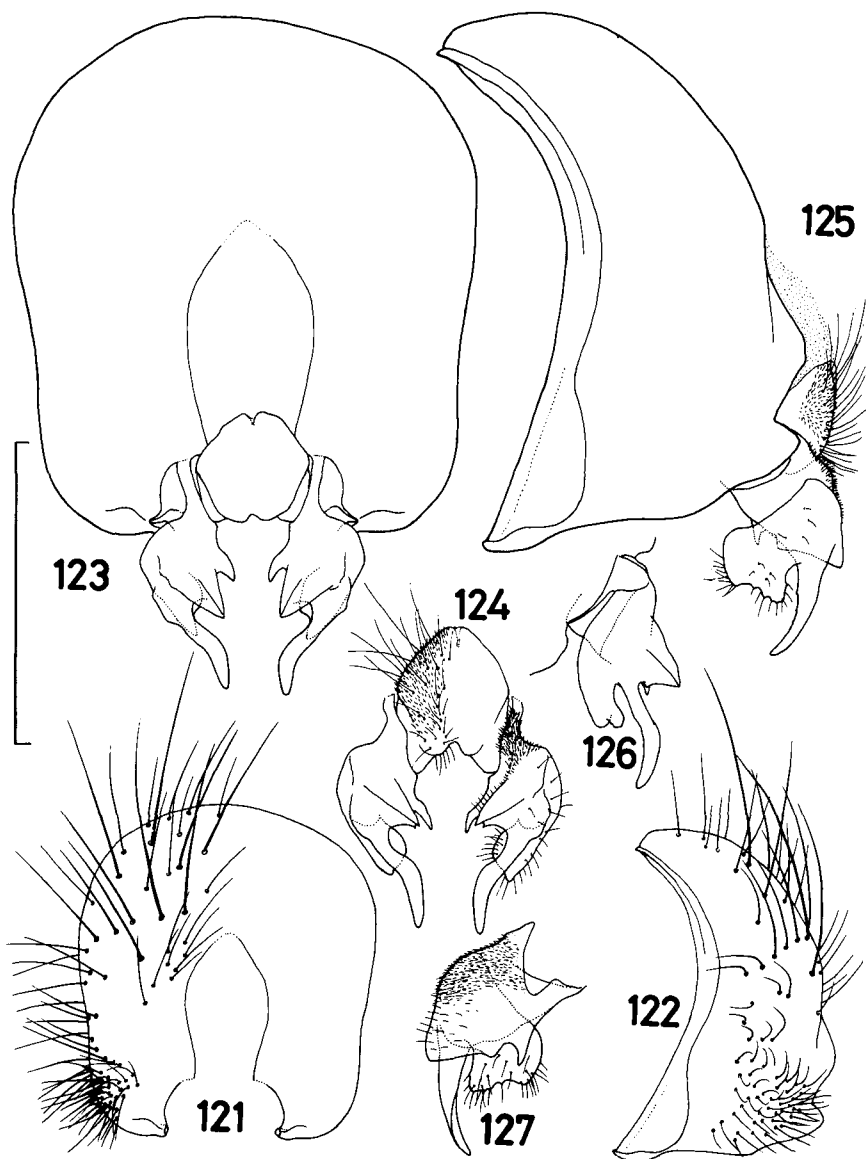


Figs. 114-120. *Pegomya nagendrai* sp. nov., ♂. 114, 3rd (lower) and 4th sternites; 115, 5th sternite, ventral view; 116, ditto, ventro-lateral view; 117, aedeagus; 118, basiphallus, apical part, dorsal view; 119, apex of basiphallus, caudal view, and distiphallus, dorso-caudal view; 120, distiphallus, dorsal view. Holotype from Dongo Kharka - Beding. Scale 0.8 mm for Figs. 114-116, and 0.5 mm for 117-120.

greatest width equal to twice the basal width or less, and distinctly narrower than distal segment of fore tarsus; haustellar mentum a little longer than palpi.

Mesonotum rather sparsely setulose laterally, with 8-12 *pls*; 4-5 *pre-acr* in 2 rows; 2nd *ph* as fine as accessory setulae; *stpl* 1:2, below the posteriors with a fine seta hardly or faintly distinguishable from adjacent setulae; scutellum on dorsal surface hardly setulose, only with 1 to about 4 setulae towards lateral margin.

Abdomen depressed at base only and club-shaped in profile, with hypopygium very remarkably developed, in dorsal view widest on 3rd tergite and slightly



Figs. 121-127. *Pegomya nagendrai* sp. nov., ♂. 121, epandrium, dorsal view; 122, ditto, lateral view; 123, hypopygium, dorsal view; 124, ditto, dorsal (slightly caudal) view; 125, ditto, lateral view; 126, surstylus (left), dorso-lateral view; 127, ditto, inside view. Holotype from Dongo Kharka - Beding. Scale 0.8 mm for Figs. 121-122, and 0.5 mm for Figs. 123-127.

narrowing caudad, and 1.7-1.9 times as long as wide; pregenital sclerite large, and longer than 5th tergite in median length in dried condition; 1st sternite setose on whole width; 3rd to 5th sternites and hypopygium as in Figs. 114-127; 4th sternite wider than twice the length, and densely setose medianly; 5th sternite with processes directed inwards apically, and with cephalic apodeme very broadly developed;

epandrium well developed; basiphallus deeply sunken apically; postgonites with recurvature on apical hook.

Fore tibia with 1 *pv*, and usually with no *pd* (in 1 specimen 1 *pd* present on left tibia); t_2 with 1 *pd*, 1 *p* and no *pv* (in 1 specimen 1 weak *pv* visible on left tibia); f_3 sinuate especially on ventral side, with 5-6 *av* in apical two-thirds, a few or some *pv* near middle and 1-2 *pv* near apex, and with basal *pv* indiscernible; on posterior surface, in addition to the ordinary row of *p-pd*, with a few rows of *p* towards postero-ventral surface, the uppermost row being rather regular and composed of rather strong setae and the others irregular and finer; in basal two-thirds of anterior surface with about 2 rows of setae towards antero-ventral surface, the upper row being composed of rather strong setae and the lower one practically regarded as *av*-row and composed of finer setae, a few setae of the lower row near middle of the femur being rather strong; t_3 with 1 *av*, 2 (3 in 1 specimen) *ad* and 2-4 *pd*, and near apex with 1 or 2 additional *pd* more or less developed. Wings with *m-m* nearly erect and hardly or very faintly curved inwards.

♀. Unknown.

P. nagendrai is most closely related to the preceding *P. sharmai*, from which it may, however, be distinguished by the much more swollen abdomen and the sinuate and hairy hind femur. In the more developed epandrium, the more deeply sunken apex of basiphallus, and the apical recurvature of postgonites this species is more derivative.

ACKNOWLEDGEMENTS

I should like to thank Dr. H. Shima (Kyūshū University) in giving me the chance to examine the collection of Nepalese Anthomyiidae made by the university expedition. My cordial thanks are due to Prof. S. Takagi (Hokkaidō University), the leader of our research trip in Nepal, and to Dr. K.C. Sharma (Department of Agriculture, HMG), the chief partner in Nepal, for their great contribution in realization of the project. My appreciation is also extended to Prof. T. Kumata (Hokk. Univ.) and Dr. I. Kudō (Shizuoka Seikō Gakuin High School), the Japanese members of the project, and to Dr. V.K. Thapa (Tribhuvan University), Mr. N.R. Sharma (Dept. Agr., HMG) and J. Kumar (Dept. Agr., HMG), the Nepalese members of the project, for their help in various ways during the trip. My particular acknowledgement is made to Dr. G.C.D. Griffiths (University of Alberta) and Dr. J. F. McAlpine (Agriculture Canada) for their kindness in giving me the opportunity to examine a pair of specimens of *P. alticola* from Alaska. Last but not least I wish to express my sincere thanks to Prof. Takagi in reading the manuscript and giving me a critical advice.

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