

The Neotropical Agromyzidae (Diptera)

Part 4. New or little-known species from Peru, Venezuela, Brazil and Bolivia.

MITSUHIRO SASAKAWA

Abstract: The specimens of the Agromyzidae from Peru, Venezuela and their adjacent countries in the collection of the California Academy of Sciences, San Francisco, have been examined. Of the 38 Peruvian species studied, 13 are new to science: *Melanagromyza flexuosa* and *M. michelbacheri*, *Ophiomyia chancayana*, *Japanagromyza tingomariensis*, *Phytobia mentula*, *P. monsonensis* and *P. pipinna*, *Cerodontha (C.) macrophalloides*, *Liriomyza bispinosa* and *L. undulatimentula*, and *Calycomyza cuspidata*, *C. punctata* and *C. vallicola*; 18 species are newly recorded. Keys are provided to the 6 genera and 34 species now known in Peru. Three new species: *Cerodontha (Diz.) impatientis*, *Liriomyza geniculata* and *L. irwini*, from Venezuela, *Agromyza serratimentula* n. sp. from Brazil and *Amauromyza (Cephal.) boliviensis* n. sp. from Bolivia, are also described.

Key words: Agromyzidae, Diptera; Peru, Venezuela, Brazil, Bolivia; new species.

Up to the present, 265 species of the Neotropical Agromyzidae have been described by many workers. Only 9 species in 5 genera have hitherto been known in Peru (Spencer, 1963, '73, '77 and '82) and 76 species in 10 genera in Venezuela (Spencer, 1973). In this paper, 13 new Peruvian species in the genera *Melanagromyza*, *Ophiomyia* and *Japanagromyza* of the Agromyzinae, *Phytobia*, *Cerodontha*, *Liriomyza* and *Calycomyza* of the Phytomyzinae, and 3 new Venezuelan species in the genera *Cerodontha* and *Liriomyza* are described. Descriptions are included of a new species of *Agromyza* from Brazil and of *Amauromyza* from Bolivia. Also, 18 species in Peru and 2 in Venezuela are recorded for the first time, making the total thus 40 Peruvian species in 10 genera (Table 1) and 81 Venezuelan species in 11 genera.

The following abbreviations are used for the collection in which the holotypes are deposited: California Academy of Sciences, San Francisco=CAS; for collectors: C.W. & L.B. O'Brien=C.L.O., M.E. Irwin=M.I., A.E. Michelbacher and E.S. Ross=M. & R., Ross and Michelbacher=R. & M., and E.I. Schlinger and E.S. Ross=S. & R.; for figures: A=phallus in lateral view, B=phallus in ventral view, C=surstylus, including processus longus, in inner side, and D=hypandrium, half. The scale line in the figures represents 0.1 mm.

Professor Emeritus, Kyoto Prefectural University, Shimogamo, Kyoto, 606 Japan.

Received on August 13, 1992

Table 1. Genera and number of species of Peruvian Agromyzidae

Genus	Number of species			Total
	Previously known	New	New to Peru	
Agromyzinae				
<i>Melanagromyza</i>	2	2	7	11
<i>Ophiomyia</i>	—	1	3	4
<i>Japanagromyza</i>	1	1	1	3
<i>Agromyza</i>	—	—	1	1
Phytomyzinae				
<i>Phytobia</i>	1	3	1	5
<i>Amauromyza</i>	—	—	1	1
<i>Cerodontha</i> (Cer.)	—	1	2	3
<i>Liriomyza</i>	3	2	1	6
<i>Haplopedes</i>	—	—	1	1
<i>Calycomyza</i>	2	3	—	5
Total	9	13	18	40

I. PERUVIAN SPECIES

Genus *Melanagromyza* Hendel

This is one of the largest genus in the Neotropical Region. Only two species, *M. caerulea* (Malloch) and endemic *lini* Spencer, have hitherto been known in Peru. Nine species are now recorded below, of which two are new to science.

Key to Peruvian species of *Melanagromyza*

1. Fringe on calypter white 2
- Fringe on calypter brown to black 8
2. Mesonotum with 0+2 *dc* 3
- Mesonotum with 0+3 *dc* *biseriata* Sasakawa
3. Arista appearing bare (microscopically pubescent) 4
- Arista pubescent 5
4. Surstylus almost as wide as width of epandrium in lateral view, bearing 23-26 spines; distiphallus ending in curved tubules *neotropica* Spencer
- Surstylus about half width of epandrium, bearing 31-35 spines; distiphallus with dorsal lobes accompanying by a pair of bulbous processes at end *lini* Spencer
5. Fore tibia with a lateral bristle 6
- Fore tibia without distinct bristle laterally 7
6. Wing length 2.6-3.4 mm; epandrium with a row of about 10 spines along posteroventral margin; basiphallus annulose, ovoid in outline; distiphallus with a pair of processes at end of dorsal lobes *caerulea* (Malloch)
- Wing length 2.3 mm; epandrium with only 2 spines along posteroventral margin in addition to spines on surstylus; basiphallus orbiculate incompletely; distiphallus with dorsal lobes simple ..
..... *michelbacheri* n. sp.
7. Wing length 2.0 mm; surstylus with only 3-4 spines in dorsal row and 23 spines along ventral margin; distiphallus with 2 groups of spinulae internally *compositoides* Spencer

- Wing length 3.0 mm; surstylus with 12-13 spines dorsally and 9-10 spines ventrally; distiphallus with dorsal lobes densely spinulose on each outer side. *phaseolivora* Spencer
- 8. Mesonotum weakly greenish or coppery shining; epandrium with a spine-like process on posteroventral corner; phallus without ventral swelling 9
- Mesonotum mat; phallus with a large, membranous swelling on ventral side 10
- 9. Orbital hairs in a dense row; ovipositor sheath elongated..... *minima* (Malloch)
- Orbital hairs in 2 rows; ovipositor normal..... *erechitidis* Spencer
- 10. Wing length 1.9 mm in male; eye bare; distiphallus with dorsal lobes indistinct. ... *flexuosa* n. sp.
- Wing length 3.0 mm in male; eye sparsely hairy on dorsal side; dorsal lobes of distiphallus well developed *nobilis* Spencer

1. *Melanagromyza biseriata* Sasakawa

Melanagromyza biseriata Sasakawa, 1992: 348.

This is small species, with the wing length of 1.9-2.0 mm. The male specimen from Peru exhibits variations in the chaetation, that is, *ori* are 4 or 5 on each parafrontalia; dorsal spiny rows on the surstylus consist of 14-16 spines and ventral rows 23-25.

Specimens examined. 1 ♀, River valley, Chancay, 15.III.1951 (R. & M.); 1 ♂, Callao, 16.XI.1950 (M. & R.), swept in agricultural area.

Distribution. Peru, Argentina. New to Peru.

2. *Melanagromyza caerulea* (Malloch)

Agromyza caerulea Malloch, 1913: 322.

This greenish blue species has the long wing, pale fringe on the calypter and a strong lateral bristle on the fore tibia. The larvae are known as a seed-feeder of *Ipomoea* spp.

The epandrium is provided with a row of 9-11 spines along posteroventral margin just above the surstylus which is somewhat claw-like and bearing 36-38 spines in 4 rows (Fig.1); basiphallus is oval in ventral view; distiphallus is accompanied by a pair of narrow processes at end of dorsal lobes. In Spencer's figures (1963, Fig. 17b; 1973, Fig. 46), the aedeagal hood and epiphallus are illustrated without the basiphallus, and a chitinized process at ventrodistal end of distiphallus is merely brownish area in coloration.

Specimens examined. 3 ♂9 ♀, River valley, Chancay, 15. & 25.III.1951 (R. & M.); 1 ♂, 40 mil. E. of Tingo Maria, 12.XII.1954 (S. & R.).

Distribution. U.S.A. (Florida); Mexico, Costa Rica, Cuba, Dominica, Jamaica, Puerto Rico, Venezuela, Brazil, Peru.

3. *Melanagromyza compositoides* Spencer

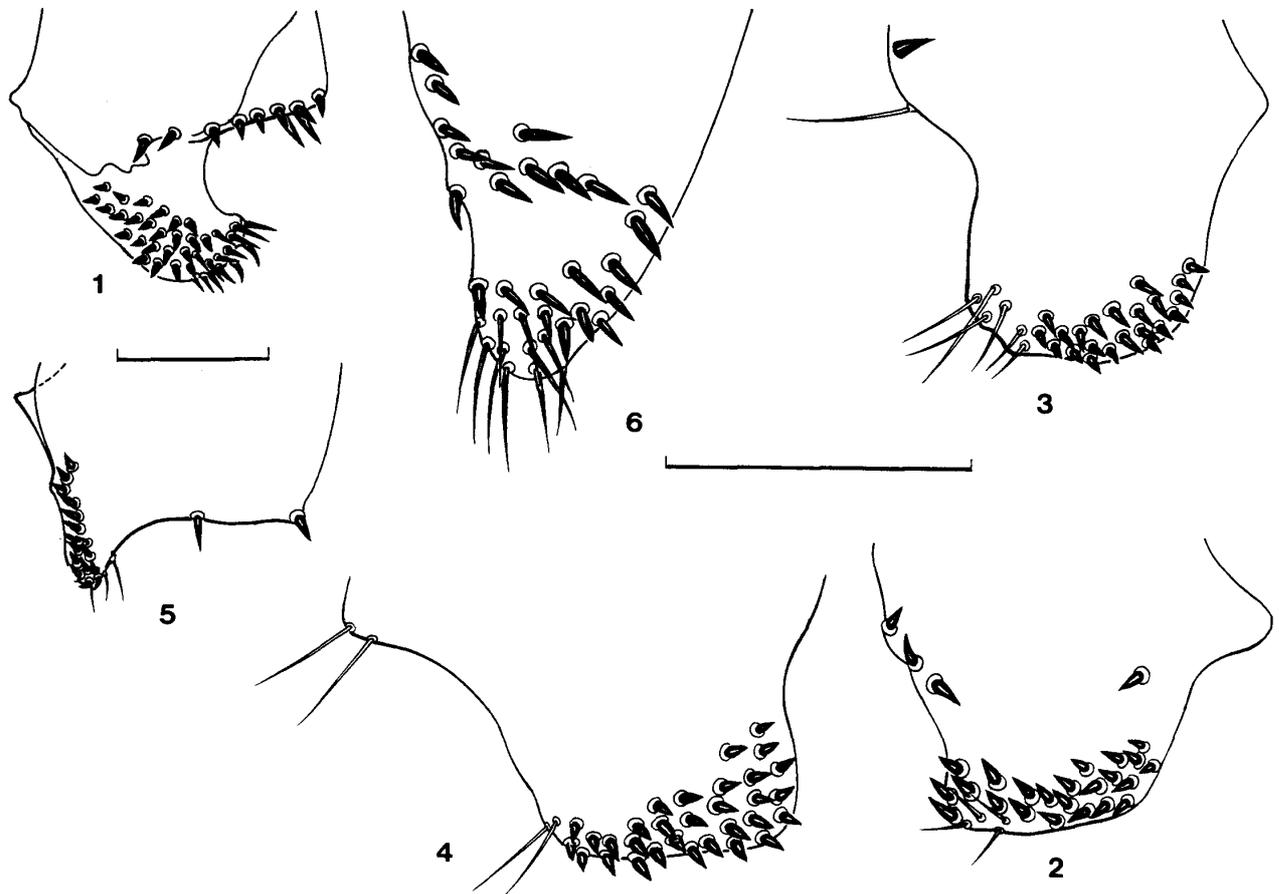
Melanagromyza compositoides Spencer, 1963: 310.

Melanagromyza querula Spencer, 1973: 163.

The distinctive characters of this species are the greenish black mesonotum and abdomen (the former mat centrally when viewed from front), white fringe on calypter and distinctly pubescent arista; wing length 1.9-2.3 mm. Epandrium is provided with 3 spines on posterior margin just above surstylus which is arranged 23 spines (posterior 6 spines stronger than others) in 2-3 rows along margin (Fig. 2); basiphallus is subcircular in outline of ventral view, dorsal lobes of distiphallus is divergent distally.

Specimens examined. 4 ♂ 3 ♀, River valley, Chancay, 15. & 25.III.1951 (R. & M.); 1 ♂ 3 ♀, Monson Valley, Tingo Maria, 10. & 21.X. and 11.XII.1954 (S. & R.); 1 ♀, Callao, 17.XI.1950 (R. & M.); 1 ♂, Departamento de Junin, 6.4 km E. of Acobamba, 31.XI.1954 (S. & R.).

Distribution. Jamaica, Dominican Republic, Trinidad, Venezuela, Peru. New to Peru.



Figs. 1-6. Surstyli of *Melanagromyza caerulea* (Mall.) (1), *compositoides* Spenc. (2), *erechtitidis* Spenc. (3), *lini* Spenc. (4), *Michelbacheri* n. sp. (5) and *phaseolivora* Spenc. (6). Scale 0.1 mm.

4. *Melanagromyza erechtitidis* Spencer

Melanagromyza erechtitidis Spencer, 1966: 10.

All the specimens examined are smaller (1.6-2.0 mm in wing length) than those from Florida.

Male genitalia: Epandrium with a pair of strong spine-like processes just above posteroventral corners; cercus with 7 stout bristles on anteroventral half; surstylus with 21-29 spines in 2-3 rows along margin and several setae on posterior corner (Fig. 3); hypandrium only a little shorter than phallopodeme, with basal apodeme 5/8 of its whole length; epiphallus minutely serrated on ventral side; distiphallus with dorsal lobes distinctly swollen at base, bearing sparse spines internally; ejaculatory apodeme 230-250 μ m long, 150 μ m in greatest width.

Specimens examined. 4 ♂ 3 ♀, River valley, Chancay, 15.III.1951 (R. & M.); 6 ♂ 6 ♀, Monson Valley, Tingo Maria, 23.IX., 8.X., 11.XII. & 23.XII.1954 (S. & R.); 1 ♂, 13 mil. E. of Yurac, Huanuco, 29.IX.1954 (S. & R.).

Distribution. U.S.A. (Florida); Peru. New to Peru.

5. *Melanagromyza flexuosa* n. sp.

Female. Black; ocellar triangle, parafrontalia and gena brown; mesonotum gray dusted, weakly shining on lateral sides when viewed from front; calypter gray, with margin and fringe brown; halter brown; abdomen with greenish luster.

Frons as long as wide, slightly wider than width of eye (10:8), converging ventrally; parafrontalia not projecting above eye in profile, bearing two *ors*, two *ori* and a row of minute *oh*, accompanying by several inclinate hairs between 2nd *ors* and 2nd *ori*; ocellar triangle with ventral tip extending almost to level of 2nd *ori*; eye bare, higher than broad; gena broadest at middle, about 1/4 height of eye; 3rd antennal segment small, as wide as long, minutely pilose; arista about 3/4 height of eye in length, appearing bare.

Mesonotum with 0+2 *dc*, eight rows of *acr* before suture but six before 1st *dc* and four between two *dc*, inner *pa* 1/5 length of outer. Wing with three costal sections in proportion of 3.7:1.0:0.8, r-m beyond middle of discal cell, ultimate section of M_{1+2} three times as long as the penultimate, ultimate section of M_{3+4} 3/5 of penultimate. Mid tibia with two short *pd*.

Length of body 1.9 mm, of wing 1.7 mm.

Male. Similar to female, but length of body 2.3 mm and of wing 1.9; S6 1.5 times as wide as long, 2.5 times as long as S5, without distinct emargination. Genitalia: Epandrium broadened ventrally, with surstylus incurved and bearing about 35 spines in 2-4 rows; cercus with ventral margin truncated, bearing a row of several stout setae on anteroventral one-third; hypandrium with side piece narrow, basal apodeme 1/3 length of its whole length; phallus with ventral membranous part extremely swollen, with basiphallus strongly bended, distiphallus weakly sclerotized (Fig. 7); ejaculatory apodeme 150 μ m long, clavate, 25 μ m in greatest width.

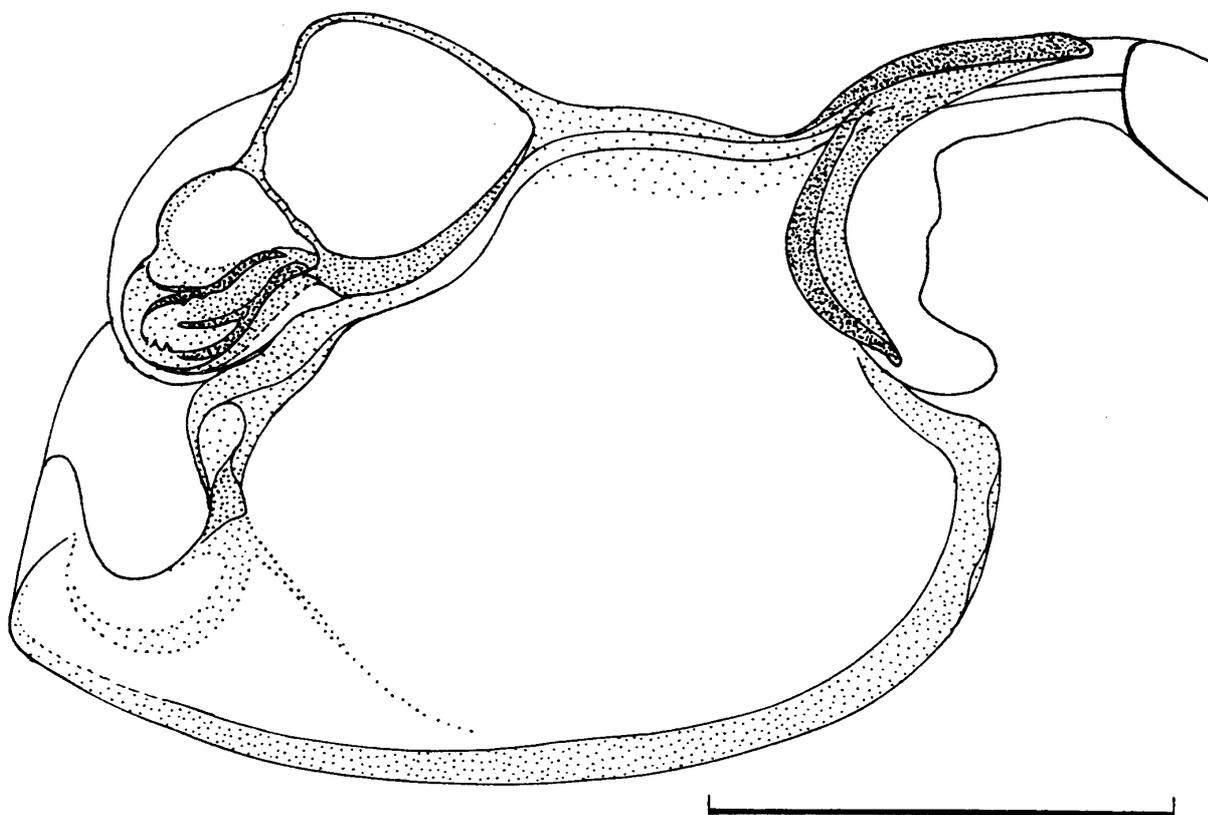


Fig. 7. Phallus of *Melanagromyza flexuosa* n. sp., lateral view. Scale 0.1 mm.

Holotype female, River valley, Chancay, Peru, 15.III.1951 (R. & M.) (CAS No.16933); wing broken. Paratype: 1 ♂, same data as holotype.

Distribution. Peru.

Remarks. Although this species closely resembles *M. marellii* (Brèthes) on the external characters, it is distinguishable by the small size, bended basiphallus and weakly chitinized distiphallus. The form of phallus confirms the close relationship of this species to *M. nobilis* Spencer (Sasakawa, 1992, in press), but they are separable from each other by the characters shown in the key.

6. *Melanagromyza lini* Spencer

Melanagromyza lini Spencer, 1963: 315.

Melanagromyza aguilerai Spencer, 1982: 8 & 37. **N. syn.**

This is a stem-borer of *Linum* sp. Males are 2.2-2.4 mm in wing length, with eye minutely hairy on dorsal side; surstylus about 1/2 as wide as width of epandrium (*not* narrow conspicuously as stated by Spencer), bearing 31-35 spines (*not* hairs by Spencer) (Fig. 4); distiphallus with a pair of bulbous processes at distal end of dorsal lobes. Other characters are as follows: Mesonotum largely black with slight greenish-coppery or bluish reflections posteriorly when viewed from front; abdomen brilliantly greenish or coppery; calypter with fringe whitish; gena 1/4-1/5 height of eye; arista appearing bare. Female wing length is 2.3-2.8 mm.

Specimens examined. 1 ♂ 2 ♀, River valley, Chancay, 15. & 25.III.1951 (R. & M.); 1 ♂ 1 ♀, 53 km N. of Chimbote, 16.III.1951 (R. & M.); 1 ♀, Casa Grande, 22.III.1951 (R. & M.); 1 ♂ 2 ♀, Huanuco (2,000m), 16.IX.1954 (S. & R.); 14 ♂ 11 ♀, Callao, 16-17.XI.1950 (M. & R.), swept in agricultural area.

Distribution. Peru.

Remarks. *Melanagromyza aguilerai* Spencer, known from Chile, clearly refers to this species by the characters of male genitalia (Spencer, 1982, Figs. 11-12), and is synonymised with *lini* herewith.

7. *Melanagromyza michelbacheri* n. sp.

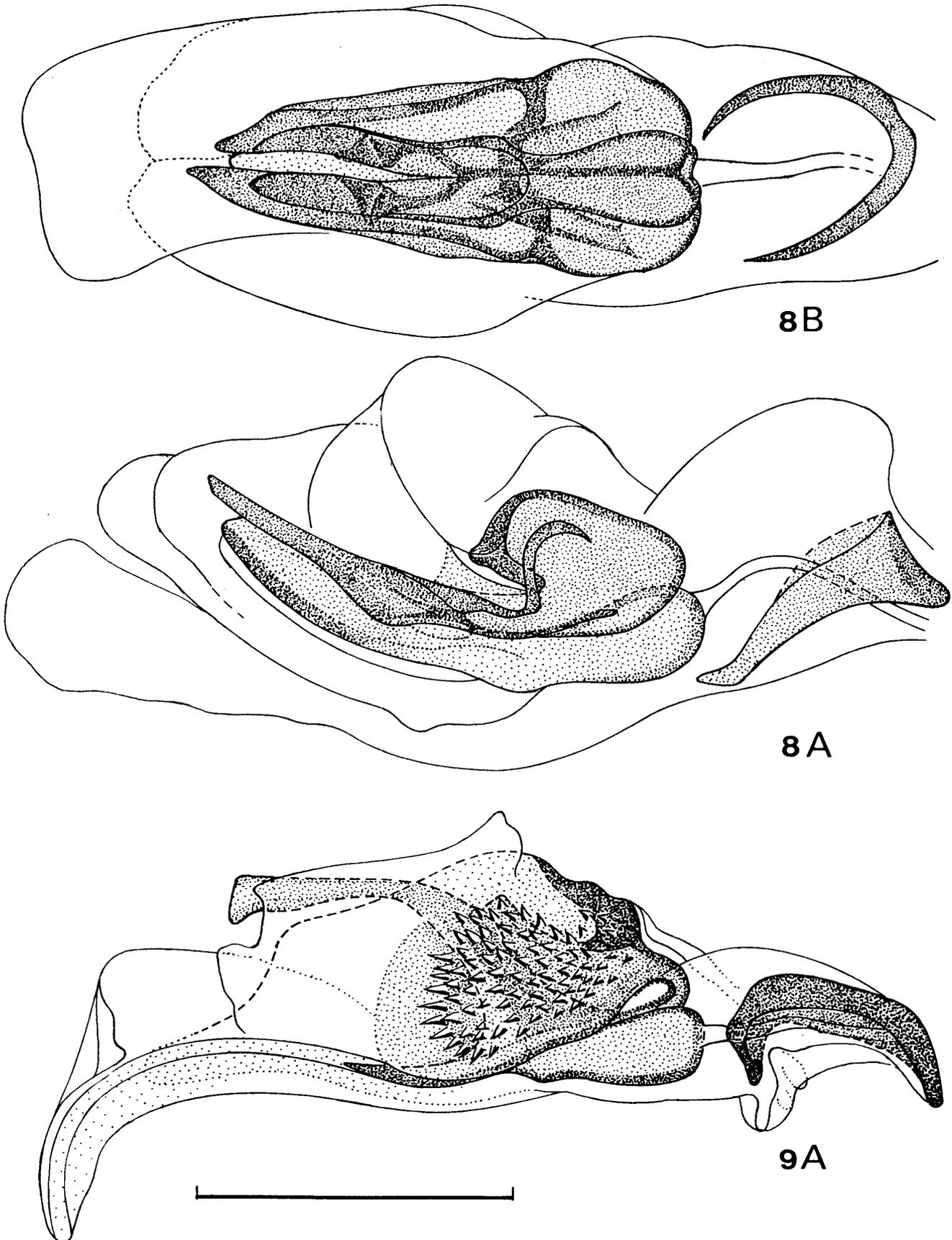
Male. Black; ocellar triangle weakly shining; lunule whitish pollinose; gena tinged with brown; mesonotum greenish shining, sparsely pollinose; wing hyaline; calypter yellowish white, with margin yellow and fringe white; abdomen coppery shining.

Frons narrower than long, slightly wider than width of eye (15:12), very slightly converging ventrally; parafrofrontalia not projecting above eye in profile, bearing two *ors* and two *ori*; distance between *vti* and 1st *ors* twice as wide as that between 1st and 2nd *ors*; *oh* in a row dorsally but in 2 irregular rows ventrad of 2nd *ors*, those of outer row reclinate but of inner row erect or incurved; ocellar triangle strongly narrowed ventrally, with ventral tip extending to level of 2nd *ors*; eye slightly higher than broad, with a patch of white hairs, which are distinctly longer than *oh*, on dorsal side; gena 1/5 height of eye; 3rd antennal segment slightly shorter than wide; arista as long as height of eye, pubescent.

Mesonotum with 0+2 *dc*, ten rows of *acr*. Wing with three costal sections in proportion of 5:1.4:1.2, r-m almost at middle of discal cell, ultimate section of M_{1+2} three times as long as penultimate, ultimate section of M_{3+4} nearly 2/3 of penultimate. Fore tibia with an external bristle; mid tibia with two *pd*.

Sixth sternite 1.4 times as wide as long, shallowly incised at middle of posterior 1/8. Genitalia (Figs. 5,8): Epandrium with two spines on posteroventral apex and at middle of ventral margin; surstylus slightly projected ventrally at anteroventral end of epandrium, bearing 16-17 spines; hypandrium 2/3 length of phallapodeme, with side piece broad, and basal apodeme 1/3 length of side piece; phallus 1/2 of phallapodeme, dorsal lobes of distiphallus not spinose internally; ejaculatory apodeme 200 μ m

long, 75 μ m in greatest width.



Figs. 8-9. Phallus of *Melanagromyza michelbacheri* n. sp. (8) and *phaseolivora* Spenc. (9).

Length of body 2.5 mm, of wing 2.3 mm.

Female unknown.

Holotype male, Callao, Peru, 16.XI.1950 (M. & R.) (CAS No.16934); abdomen and genitalia mounted on a small slide and pinned with specimen.

Distribution. Peru.

Remarks. This species is closely related to *M. caerulea* in the presence of fore-tibial bristle and spines along ventral margin of the epandrium, but the structures of phallus are quite different from each other as shown in the key. Also, it is similar to *M. neotropica* in general appearance and structure of phallus, but easily recognized by the distinctly pubescent arista and presence of the fore-tibial lateral bristle.

8. *Melanagromyza minima* (Malloch)

Agromyza minima Malloch, 1913: 328.

Specimen examined. 1 ♀, 6 mil. S. of San Antonio (30 m), Lima, 13.IX.1954 (S. & R.).

Distribution. U.S.A.; Central America, Caribbean area; Colombia, British Guiana, Peru. New to Peru.

9. *Melanagromyza neotropica* Spencer

Melanagromyza neotropica Spencer, 1963: 319.

This is a flower-head feeder of *Bidens* and *Spilanthes* spp.

Specimen examined. 1 ♂, Callao, 16.XI.1950 (M. & R.), swept in agricultural area.

Distribution. Mexico, Costa Rica, Venezuela, Ecuador, Brazil, Peru, Chile, Argentina. New to Peru.

10. *Melanagromyza nobilis* Spencer

Melanagromyza nobilis Spencer, 1963: 320.

Specimens examined. 1 ♀, 10 km S. of Chiclayo, 21.III.1951 (R. & M.); 1 ♀, Huanuco (1,000 m), 10 mil. SW. of Las Palmas, 17.IX.1954 (S. & R.); 1 ♀, Monson Valley, Tingo Maria, 9.X.1954 (S. & R.); 1 ♀, Callao, 16.XI.1950 (M. & R.).

Distribution. Colombia, Peru. New to Peru.

11. *Melanagromyza phaseolivora* Spencer

Melanagromyza phaseolivora Spencer, 1973: 50.

This large greenish shining black species is a pod-feeder of cultivated green beans. The hairy eye in male is unique for a feeder in Leguminosae, and the genitalia are distinctive in the structures of surstylus and phallus as follows: surstylus is provided with two groups of 13 dorsal spines in an irregular row and 9-10 ventral ones in 2 irregular rows in addition to about 10 stout setae (*not* 6 by Spencer; spines were overlooked by him, 1973) (Fig. 6); basiphallus with lateral sclerites connecting with each other at distal end by a narrow horizontal sclerite; distiphallus with dorsal lobes densely spinulose on outer surface, respectively, and diverging distally (Fig. 9).

Specimens examined. 1 ♀, Colonia Perene, Rio Perene, 18 mil. NE. of La Merced, 3.I.1955 (S. & R.); 3 ♂ 7 ♀, Monson Valley, Tingo Maria, 18. & 23.IX.1954, 4., 8., 10. & 19.X.1954 and 2.XI.1954 (S. & R.); 1 ♀, Yurao, 67 mil. E. of Tingo Maria, 4.X.1954 (S. & R.).

Distribution. Ecuador, Colombia, Peru. New to Peru.

Genus *Ophiomyia* Braschnikov

The genus has not previously been known in Peru. Four species are now recorded below, of which one is new to science.

Key to Peruvian species of *Ophiomyia*

- 1. Vibrissa normal; fringe on calypter white *chancayana* n. sp.
- Vibrissa fasciculate; fringe on calypter brown to black..... 2
- 2. Halter entirely brown to black..... 3
- Halter with knob yellowish above..... *punctohalterata* (Frost)
- 3. Distiphallus with dorsal lobe orbicular at end in lateral view..... *obstipa* Spencer
- Distiphallus with dorsal lobe accompanying by claw-like process at end..... *gentilis* Spencer

12. *Ophiomyia chancayana* n. sp.

Male. Black; ocellar triangle and dorsal part of parafrontalia brown tinged, subshining; mesonotum gray dusted, weakly shining; wing hyaline, calypter entirely yellow, with fringe white.

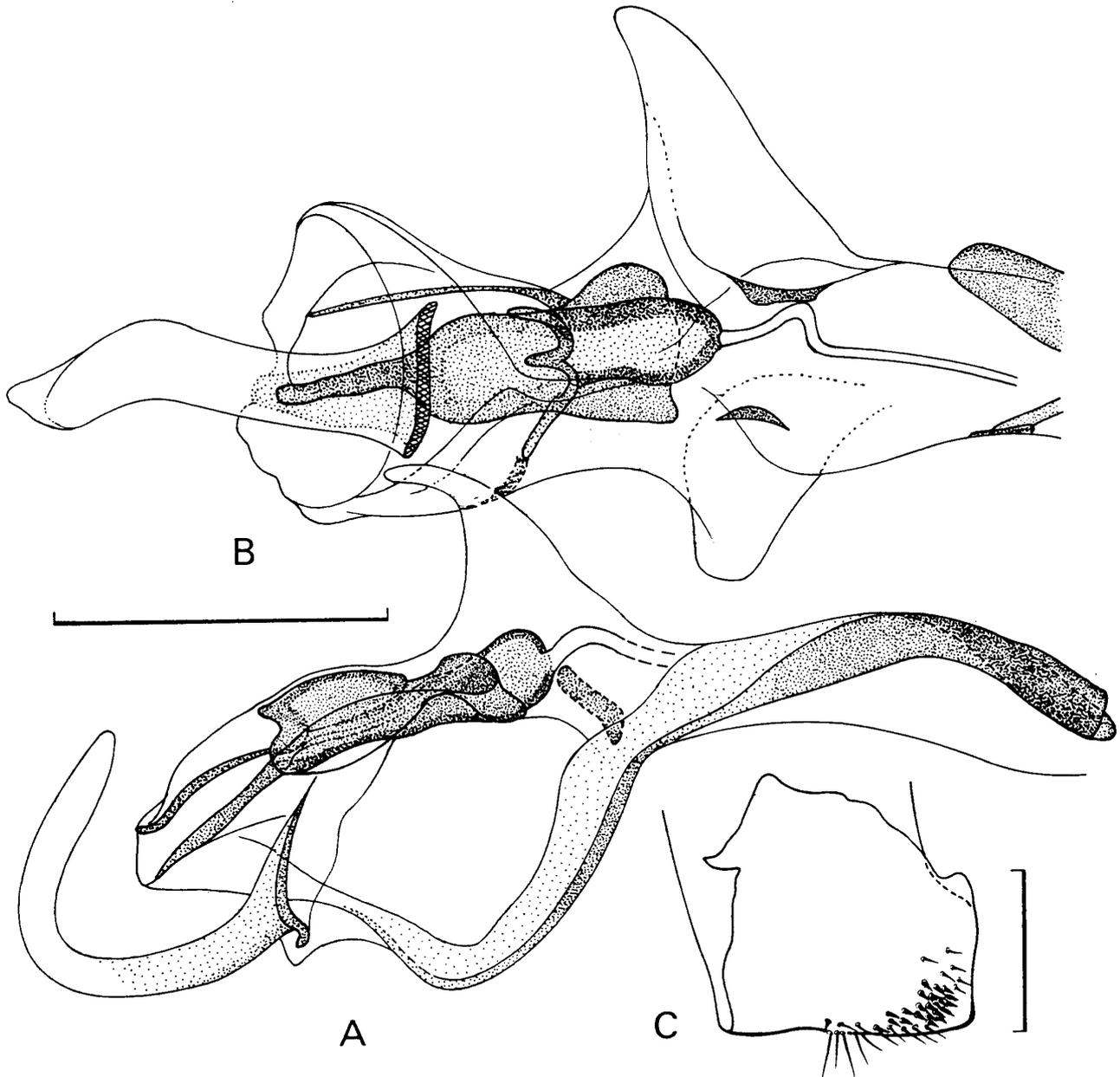


Fig. 10. Male genitalia of *Ophiomyia chancayana* n. sp.

Frons narrower than long, 1.3 times as wide as width of eye, converging ventrally; parafrontalia linearly projecting above eye-margin in profile, bearing two *ors* and two *ori*; *oh* in a row, reclinate; eye higher than broad; gena narrow, 1/20 height of eye, broadened anteriorly, forming angle of about 80° on apex; *vi* normal; face with median carina conspicuously raised throughout its whole height with equal width; proboscis greatly elongated, about twice as long as height of eye, both labella and medioproboscis narrow, of equal length; 3rd antennal segment small, distinctly pilose; arista minutely pubescent; palpus of normal size.

Mesonotum with 0+2 *dc*, 8-10 rows of *acr* before level of anterior *dc* but 4-5 rows behind that, ending at middle between two *dc*. Wing with three costal sections in proportion of 3.8:1:0.8, r-m at middle of discal cell, ultimate section of M_{3+4} 3/4 of penultimate.

Epandrium slightly broadened ventrally; surstylus with 20-24 spines and 1-2 rows of setae; hypandrium about half of phallopodeme, V-shaped, with basal apodeme about 1/4 length of side piece; phallus distinctly swollen ventrally, with dorsal and ventrodorsal membranous processes (Fig.10); ejaculatory apodeme 170 μ m long, slightly expanded distally, 70 μ m in greatest width.

Length of body 2.2 mm, of wing 2.1 mm.

Female unknown.

Holotype male, River valley, Chancay, Peru, 15.III.1951 (R. & M.) (CAS No.16935); abdomen and genitalia mounted on a small slide and pinned with specimen; most of bristles and some segments of legs missing.

Distribution. Peru.

Remarks. This species belongs to the species of *buscki*-group in having the normal vibrissa, raised facial carina, elongated proboscis and white fringe on calypter. However, the hypandrium of this species is not bent rectangularly and the distiphallus is accompanied ventrally by a membranous and elephantine nose-shaped process with an inverted U-shaped narrow sclerite at base.

13. *Ophiomyia gentilis* Spencer

Ophiomyia gentilis Spencer, 1973: 57.

The essential characters of this species are described in Part 3 of this paper (in press). The difference between *gentilis* and *obstipa* in extent of facial carina is not so distinct as noted by Spencer (1973). Only the male genitalia are sufficient to justify considering *gentilis* as distinct.

Specimens examined. 1 ♂, Lambayeque, 21 mil. E. of Olmos, 18.I.1955 (S. & R.); 1 ♂, Carpish Mts., 40 mil. S. of Tingo Maria, 28.XII.1954 (S. & R.).

Distribution. U.S.A. (Florida); Dominica, Costa Rica, Ecuador, Peru. New to Peru.

14. *Ophiomyia obstipa* Spencer

Ophiomyia obstipa Spencer, 1973: 62.

This is a distinctive species with an acute vibrissal angle, narrow but well-defined facial carina, dark fringe on the calypter, and an orbicular process on dorsal lobe of distiphallus. Wing length is 1.7-2.0 mm.

Specimens examined. 3 ♂2 ♀, River valley, Chancay, 15. & 25.III.1951 (R. & M.); 1 ♂1 ♀, Monson Valley, Tingo Maria, 10.X.1954 (S. & R.); 1 ♀, Callao, 17.XI.1950 (R. & M.).

Distribution. U.S.A. (Florida); Peru. New to Peru.

15. *Ophiomyia punctohalterata* (Frost)

Agromyza punctohalterata Frost, 1936: 311.

Specimen examined. 1 ♀, River valley, Chancay, 15.III.1951 (R. & M.).

Distribution. Guatemala, Costa Rica, Venezuela, Peru, Argentina. New to Peru.

Genus *Japanagromyza* Sasakawa

A leaf-miner, *J. desmodivora* Spencer on *Desmodium*, has been known to occur in Peru (Spencer, 1973). Two additional species are now discussed below.

Key to Peruvian species of *Japanagromyza*

- 1. Costa extending to M_{1+2} 2
- Costa ending shortly beyond apex of R_{5+6} *tingomariensis* n. sp.
- 2. Prescutellar bristles present *inaequalis* (Malloch)
- Prescutellars absent..... *desmodivora* Spencer

16. *Japanagromyza inaequalis* (Malloch)

Agromyza inaequalis Malloch, 1914: 89.

This has been known as a leaf-miner of *Vigna* sp. The Peruvian male specimen is small, with the wing length of 2.0 mm, and thirty-three spines on anteroventral 4/5 of cercus (twenty or more by Spencer).

The surstylus and phallus are shown in Fig. 11. Numbers of spines on the cercus and surstylus are different from those in Spencer's papers (1963 & 73), that is, the former is provided with 33 spines and the latter with 2 at base and 4 on elongate part. Hypandrial apodeme is short, about 1/4 of whole length of hypandrium; ejaculatory apodeme is clavated, 225 μ m in length.

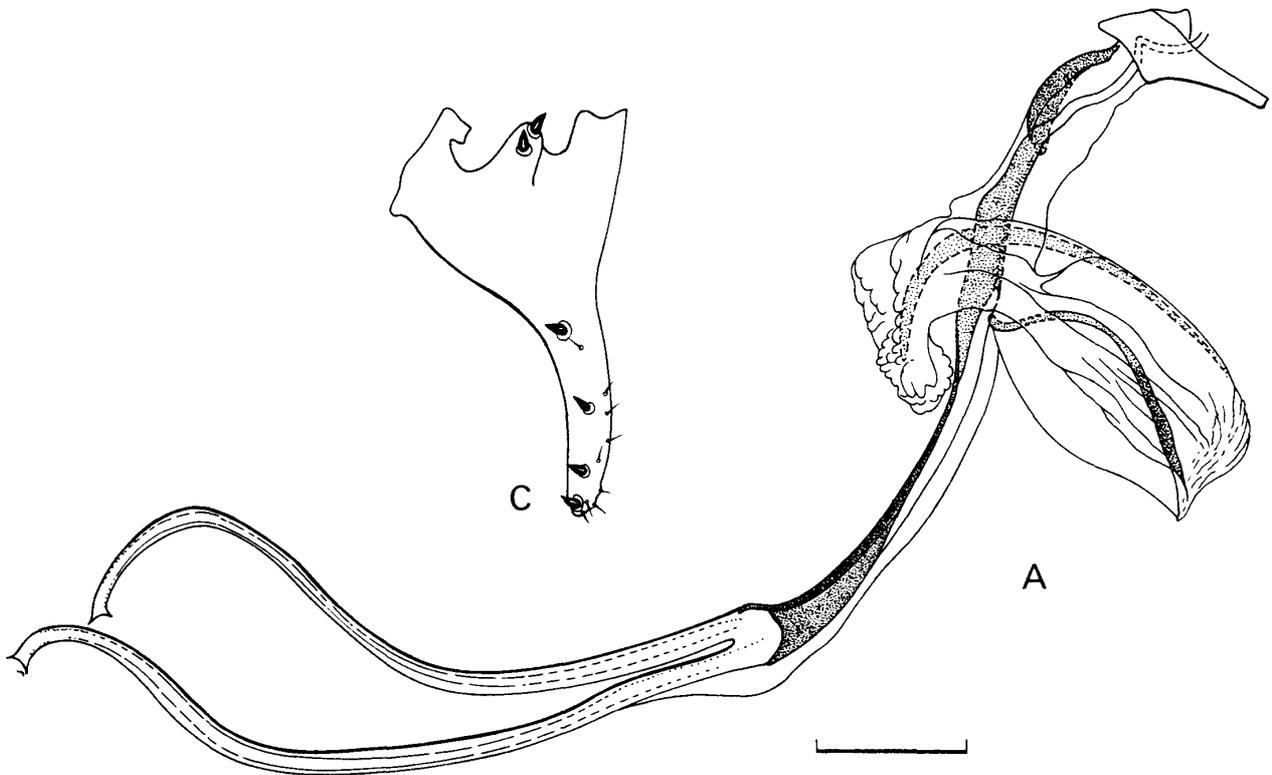


Fig. 11. Male genitalia of *Japanagromyza inaequalis* (Mall.).

Specimens examined. 1 ♂ 1 ♀, River valley, Chancay, 15. III.1951 (R. & M.); 1 ♀, 43 mil. E. of Tingo Maria, 5. X.1954 (S. & R.); 1 ♀, Callao, 16. XI.1950 (M. & R.).

Distribution. U.S.A. (Florida); Dominica, Puerto Rico, Peru. New to Peru.

17. *Japanagromyza tingomariensis* n. sp.

Female. Black; frons and ocellar triangle mat; parafrontalia distinctly bluish shining; antenna tinged with brown; mesonotum gray dusted but bluish shining when viewed from front; calypter whitish, with margin yellow and fringe yellowish white; halter yellow; legs brown-tinged; abdomen brilliantly bluish black.

Frons narrower than long, about 1.3 times as wide as width of eye; parafrontalia not projecting above eye in profile, bearing two *ors*, two *ori* and a row of *oh* which are minute and reclinate; eye 1.5 times as high as wide; face with carina very low; gena 1/10 height of eye; 3rd antennal segment round, minutely pilose; arista plumose, with longest ventral hair 3/5 as long as width of 3rd segment or 1/3 length of 2nd *ori* which is 2/3 of *vti*.

Mesonotum with 0+2 *dc*, eight rows of *acr*, inner *pa* 1/5 length of outer, and without *prsc*. Wing with costa ending at R₅₊₆ (slightly beyond apex), three sections in proportion of 3.5:1.5:1.0, r-m at basal third of discal cell, ultimate section of M₁₊₂ about twice as long as the penultimate, ultimate section of M₃₊₄ 2/3 length of penultimate. Fore tibia with one external bristle; mid tibia with two *pd*.

Length of body 2.3 mm, of wing 2.2 mm.

Male unknown.

Holotype female, Yurac (350m), 67 mil. E. of Tingo Maria, Peru, 4.X.1954 (S. & R.) (CAS No.16927); most of fronto-orbitals missing.

Distribution. Peru.

Remarks. This species resembles *J. desmodivora* Spencer (1966) in the absence of prescutellar bristles, but is distinctive in having the plumose arista, bluish shining parafrontalia and short costa.

Genus *Agromyza* Fallén

18. *Agromyza* sp.

This species is somewhat similar to *A. simillima* Spencer, known from Brazil, in having only two *dc*, but the cross vein r-m is situated at middle of discal cell. It seems preferable to await additional material including males before describing this as a new species.

Specimen examined. 1 ♀, Monson Valley, Tingo Maria, 9.XII.1954 (S. & R.).

Genus *Phytobia* Liroy

Only one species, *Phytobia peruensis* Spencer (1977), has been known from Peru. Three new species are described below.

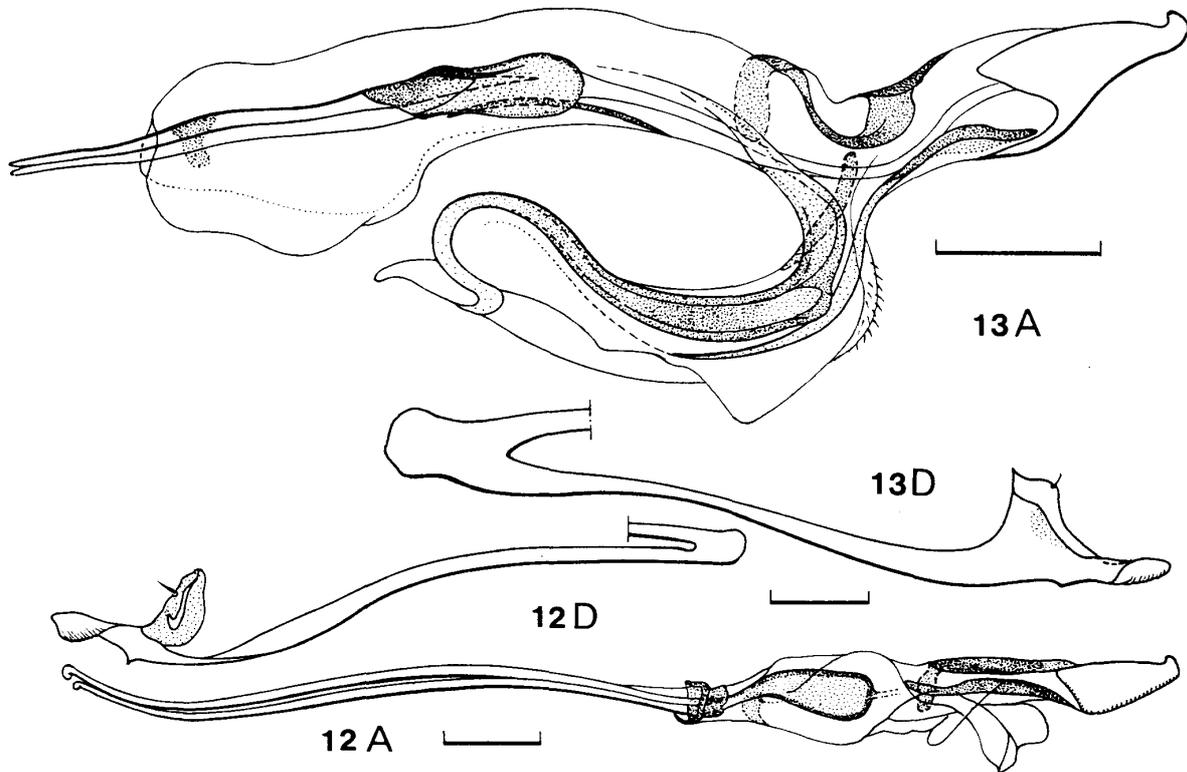
Key to Peruvian species of *Phytobia*

1. Wing immaculate, very faintly tinged with brown; mesonotum centrally black to scutoscutellar suture 2
- Wing maculate along anterior margin and around cross-veins; mesonotum partially yellow in center before scutellum 4
2. Frons uniformly black; mesonotum, abdomen and legs entirely black *peruensis* Spencer
- Frons testaceous along ventral margin or on ventral half; mesonotum with lateral sides partially yellow; abdomen testaceous, with middle tergites vittate; coxae and femora largely yellow.... 3
3. Mesonotum with posterolateral corners narrowly yellow, both *pa* growing on dark area; abdominal

- tergites 5-6 almost entirely black; distiphallus with very long tubules *mentula* n. sp.
- Mesonotum with posterolateral corners broadly yellow, both *pa* on yellow area; tergites 5-6 with a pair of submedian yellowish stripes; phallus with distinct ventral process *pipinna* n. sp.
- 4. Mesonotum with lateral dark area between lines of *dc* and *sa* posteriorly divided into two stripes by yellow line; mesopleuron largely yellow; clouds around cross-veins indistinct; abdomen yellow, tergites fasciated *monsonensis* n. sp.
- Mesonotum without lateral stripes; mesopleuron with large brown triangle on anteroventral part; outer cross-vein distinctly banded with brown; abdomen largely brown . . . sp. (Ecuador, Peru)

19. *Phytobia mentula* n. sp.

Male. Head testaceous but frons including ocellar triangle and back of head black; frontalia brown-tinged centrally, with anterior margin narrowly testaceous, extending laterally to bases of 2nd *ori*; ocellar triangle glossy, parafrontalia shining at bases of *ors* and *ori*; lunule silvery pruinose; face whitish pollinose; antenna and palpus testaceous, 3rd antennal segment slightly brownish apically, arista pale brown. Thorax black; mesonotum brilliantly shining, with posterolateral corners narrowly yellow, both *pa* growing on brown area; humerus with posterior margin and notopleuron yellow, *h* and *prs* at edge of dark area; mesopleuron without pale margin dorsally. Wing very faintly tinged with brown; veins yellow at base; calypter yellowish white, with margin and fringe brownish black; halter yellow. Legs with coxae and femora yellow but apices of mid and hind femora brown; fore tibia and tarsus faintly brown-tinged, mid and hind tibiae and tarsi dark brown. Abdomen strongly shining; tergites 1-4 testaceous but T3 with median, and T4 with median and a pair of submedian brownish black stripes throughout whole length, T5-6 and epandrium brownish black, T6 with posterior margin narrowly testaceous; sternites testaceous yellow, only S6 brown on lateral sides.



Figs. 12-13. Male genitalia of *Phytobia mentula* n. sp. (12) and *pipinna* n. sp. (13).

Frons almost as wide as long, 1.3 times as wide as width of eye, slightly converging ventrally; parafrontalia not projecting above eye in profile, bearing two *ors*, two *ori* and a row of *oh*; *ors* and 1st *ori* reclinate, 2nd *ori* incurved; lunule lower than semicircular; eye slightly higher than broad; gena very narrow, about 1/20 height of eye; *pm* 6 in an irregular row, a few setulae above *vi*; antennae approximated at base, 3rd segment a little longer than wide, rounded apically, minutely pilose; arista as long as height of eye, distinctly pubescent.

Mesonotum with 0+3 *dc*; 1st *dc* short, about twice length of *acr* or 1/3 of 2nd *dc*, and close to 2nd *dc*; *acr* in eight rows but 4-6 rows before strong *prsc*; inner *pa* 1/3 length of outer. Wing with costal sections in proportion of 2.8-3.0:1:0.8; r-m slightly before middle of discal cell; ultimate section of M_{1+2} 2.7 times as long as the penultimate; ultimate section of M_{3+4} nearly 3/4 of penultimate. Mid tibia with one *pd*.

Sternite 6 almost as wide as long, 2.5 times length of S5, with a distinct incision at middle of posterior one-third. Epandrium densely setigerous, surstylus with about thirty-seven spines including 6-7 minute ones; cercus with dense setae, of which dorsal setae are yellowish and ventral ones are blackish and stronger than the dorsal; hypandrium about 4/5 length of phallapodeme, with side piece narrow and parallel to each other at base (Fig. 12); phallus about 1.2 times as long as phallapodeme, with a pair of long tubules of distiphallus, basiphallus short but rather well-developed, ventral process membranous; ejaculatory apodeme 220 μ m long, 180 μ m in greatest width.

Length of body 3.2 mm, of wing 2.7 mm.

Female unknown.

Holotype male, Monson Valley, Tingo Maria, Peru, 23. IX. 1954 (S. & R.) (CAS No. 16937); abdomen and genitalia mounted on a small slide and pinned with specimen.

Distribution. Peru.

Remarks. This species belongs to a group with *P. unica* Spencer (Jamaica) and *pipinna* n. sp. (Peru) in the coloration of mesonotum and scutellum, presence of two long postsutural *dc* and shape of hypandrium. The distiphallus of *mentula* is characteristically composed of a pair of long tubules as found in some species of the genus *Japanagromyza*. But, the structures of surstylus and basal part of distiphallus draw a distinction between the species of both genera.

20. *Phytobia monsonensis* n. sp.

Male. Head black except for yellow lunule which is whitish pruinose; frons sparsely grayish pollinose; antenna and palpus brown. Mesonotum brownish black, mat, gray-dusted, with yellow patch subrectangular just behind level of 3rd *dc* which are growing at edge of yellow incision and broadening posteriorly adjoining scutellum, 4th *dc* on yellow area; lateral black area between lines of *dc* and *sa* ending at level of outer *pa* and forming two short bands divided by narrow yellow stripe caudad from base of *ia*, *sa* at edge of yellow ground, both *pa* and *prs* on yellow; humerus with a small brown spot at base of *h*; scutellum, noto- and pteropleura entirely yellow; pleura black but mesopleuron largely yellow, with ventral margin narrowly blackish; sternopleuron with dorsal margin just above row of setae before *stpl* yellowish. Wing distinctly brown along anterior margin (distal 5/6 of 2nd costal cell and almost entire length of cell R_1), infuscation around both cross-veins indistinct; calypter yellow, with margin and fringe brownish black; halter yellow. Legs black, fore knee faintly yellow. Abdomen yellow; tergites 3-6 with median brown band longitudinally, T5-6 also brown on lateral sides, sternite 6 entirely brown; epandrium dark brown, cercus yellowish brown.

Frons wider than long, nearly twice as wide as width of eye but converging ventrally; parafrontalia linearly projecting above eye in profile, bearing two *ors* and two *ori*; *oh* minute, in a row; lunule lower than semicircular; eye higher than broad (3:2.5); gena about 1/7 height of eye; 3rd antennal segment as long as wide, minutely pilose; arista longer than height of eye (3.5:3), minutely pubescent.

Mesonotum with 1+3 *dc*, eight rows of *acr* anteriorly but six behind level of 2nd *dc*; inner *pa* about 1/2 of the outer. Wing with costal sections in proportion of 5:1.5:1.2; r-m beyond middle of discal cell; ultimate section of M_{1+2} five times length of penultimate; ultimate section of M_{3+4} 2/3 of penultimate. Mid tibia with a long *pd* at middle.

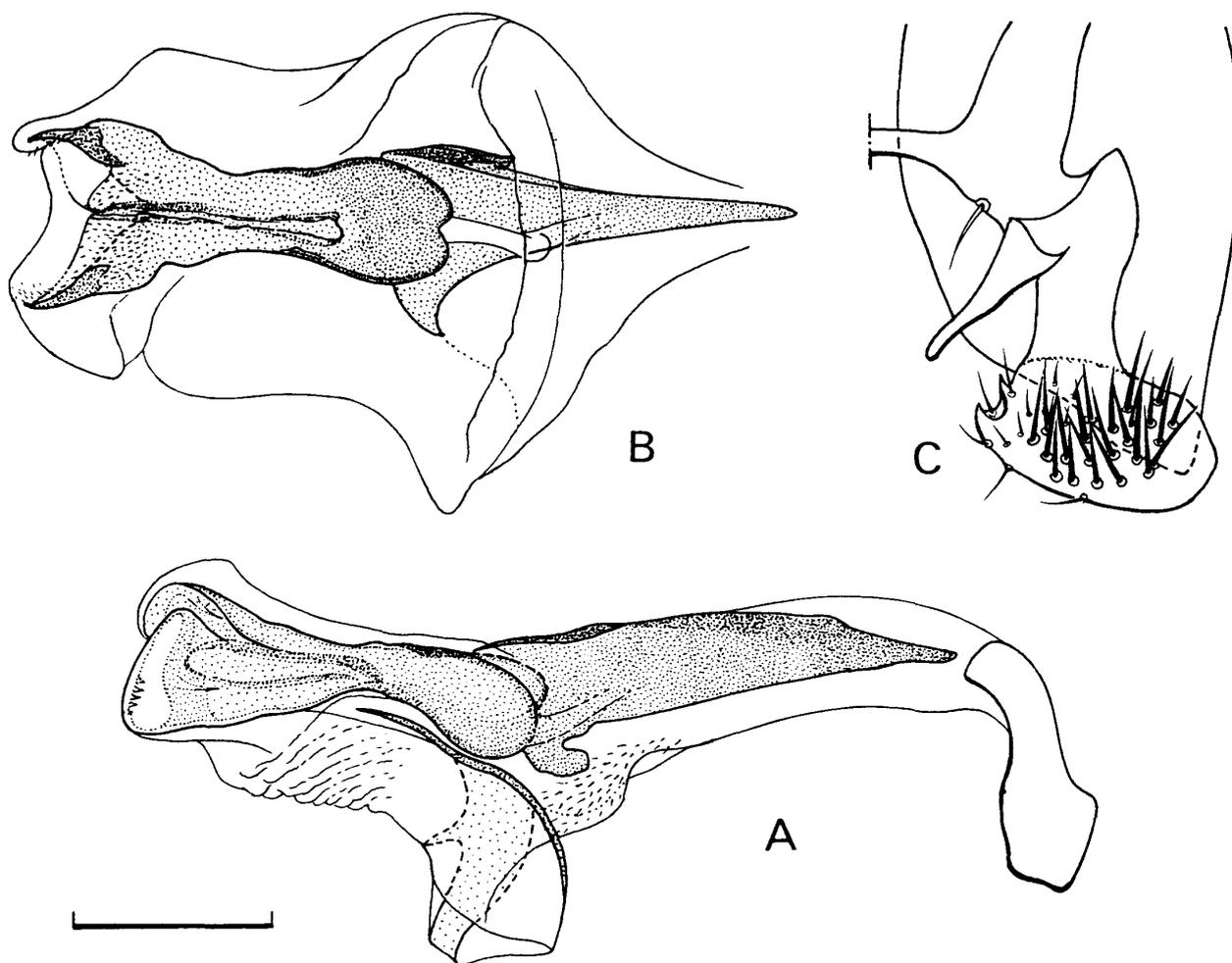


Fig. 14. Male genitalia of *Phytobia monsonensis* n. sp.

Sternite 5 three times as wide as long; S6 1.3 times as wide as long and thrice length of S5, shallowly incised at middle of posterior margin. Genitalia (Fig. 14): Surstylus separated from epandrium, bearing 20-22 setae; hypandrium 2/5 of phallopodeme, circular at base, without apodeme; postgonite black, broadening apically and bearing two setulae; phallus weakly sclerotized, as long as hypandrium, distiphallus bifid distally; ejaculatory apodeme 210 μm long, 120 μm in greatest width (70 μm at base).

Lengths of body and wing 3.5 mm, respectively.

Female unknown.

Holotype male, Monson Valley, Tingo Maria, Peru, 29.XI.1954 (S. & R.) (CAS No.16938); posterior abdomen and genitalia mounted on a small slide and pinned with specimen.

Distribution. Peru.

Remarks. This species is similar to *P. rabelloi* Spencer (1966), known from Brazil, in the coloration of mesonotum and wing, and shape of phallus, but may be distinguished by its posteriorly bifid lateral bands on the mesonotum, broad frons and gena, and large size, and by the presence of three postsutural *dc* and one mid-tibial *pd*. The phallus of *monsonensis* also resembles those of *P. dorsocentralis* (Frost) and *xanthophora* (Schiner) with the wings clear.

21. *Phytobia pipinna* n. sp.

Male. Head yellow, but frontalia and parafrontalia with dorsal half brownish black and ventral half testaceous, ocellar triangle and back of head black, the former subshining; lunule, face and parafacialia whitish pruinose; antenna and palpus yellow, 3rd segment faintly brownish on apical half, arista pale brown. Thorax black, grayish dusted; mesonotum very weakly shining when viewed from front, with lateral sides yellow, extending broadly to posterolateral corners of notum, *h* and *prs* at edge of dark area, *sa* on dark ground, *pa* on yellow; mesopleuron with posterodorsal corner narrowly yellow. Wing very faintly tinged with brown, with veins yellow at base; calypter yellowish white, with margin and fringe brownish black; halter yellow. Legs yellow, apices of mid and hind femora narrowly brown; distal three segments of tarsi tinged with brown. Abdomen testaceous yellow but tergites 3-6 with a median longitudinal brownish black stripe, broadening posteriorly, T4 with sublateral brownish black spot quadrate, T5-6 broadly brownish black on lateral sides excepting posterior margin; sternites yellowish; epandrium entirely brownish black; cercus testaceous.

Frons 1.5 times as wide as width of eye; gena 1/16 height of eye; *pm* 3-4, only a short seta laterad of *vi*; 3rd antennal segment as long as wide; mid tibia with two *pd*; other characters quite similar to those of *mentula* n. sp.

Sternite 6 almost as long as wide, 2.5 times length of S5, with posteromedian incision on distal half. Male genitalia differ from those of *mentula* in the following points: surstylus with 23-26 spines; cercus setose normally; hypandrium slightly shorter than phallapodeme; phallus (Fig.13) with distinct ventral process, tubules of distiphallus short, ejaculatory apodeme 175 μ m long and 120 μ m broad.

Length of body 2.7 mm, of wing 2.4 mm.

Female unknown.

Holotype male, Monson Valley, Tingo Maria, Peru, 8.X.1954 (S. & R.) (CAS No.16939); abdomen and genitalia mounted on a small slide and pinned with specimen.

Distribution. Peru.

Remarks. This species is closely related to *P. mentula* n. sp. in general coloration, chaetotaxy and venation, but is distinguishable by its bicolor frons, broad yellow patches on the posterolateral corners of mesonotum, pale mid and hind tibiae, and fasciate 5-6th tergites. Their male genitalia are quite different from each other.

22. *Phytobia* sp.

This appears to represent an unknown unique species with an external bristle on the fore tibia and spinulose membranous process near dorsal end of the basiphallus. It will be described in the paper of Ecuadorian fauna (Part 3).

Specimen examined. 1 ♂, Monson Valley, Tingo Maria, 10.X.1954 (S. & R.).

Genus *Amauromyza* Hendel

23. *Amauromyza maculosa* (Malloch)

Agromyza maculosa Malloch, 1913: 302.

This is a leaf-miner of the Asteraceae, and the adult is easily recognizable by the bicolor knob of the halter and white fringe on the calypter.

Specimens examined. 1 ♀, Departamento de Lima, Lomas de Lachay, nr. Chancay, 9.I.1955 (S. & R.); 2 ♂, Callao, 16-17.XI.1950 (M. & R.), swept in agricultural area.

Distribution. U.S.A.; Canada; Caribbean area, Costa Rica, Venezuela, Colombia, Peru, Brazil, Chile, Argentina. New to Peru.

Genus *Cerodontha* Rondani

None of the species has been recorded from Peru. Occurrence of two Neotropical species and description of a new species are given below.

24. *Cerodontha (Cerodontha) dorsalis* (Loew)

Odontocera dorsalis Loew, 1863: 54.

Specimens examined. 46 ♂38 ♀, Callao, 16-17.XI.1950 (M. & R.), swept in agricultural area; 1 ♀, Junin, 4 mil. E. of Acobambo, 31.XII.1954 (S. & R.).

Distribution. U.S.A.; Guatemala, Costa Rica, Dominica, Puerto Rico; Colombia, Brazil, Chile, Peru; Canada; Mongolia. New to Peru.

25. *Cerodontha (C.) flavifrons* (Philippi)

Micromma flavifrons Philippi, 1865: 777.

Specimens examined. 9 ♂1 ♀, Pasco (3,500 m), 5 mil. NE. of Cerro de Pasco, 29.XII.1954 (S. & R.).

Distribution. Chile, Peru. New to Peru.

Remarks. This species is distinctive in having the mesonotum and scutellum entirely black and densely dusted with gray. In the polyphagous grass miner, *C. dorsalis*, the mesonotum is yellow centrally adjoining the scutellum which is yellow.

26. *Cerodontha (C.) macrophalloides* n. sp.

Male. Head yellow, but ocellar triangle and occiput black, vertical angle pale brown, ventral half of frons black, ventral half of parafrontalia brown; lunule shiny; antenna and palpus orangish yellow, 1st antennal segment yellow, 3rd segment faintly brownish on apex, arista brown. Thorax brownish black; mesonotum shining, sparsely pollinose; notopleuron and mesopleural suture yellow. Wing hyaline; calypter grayish white, with margin and fringe brown; halter yellow. Legs with coxae and femora yellow, tibiae and tarsi brown; apices of femora faintly tinged with brown. Abdomen brown; tergites 3-4 with posterior margins broadly testaceous yellow when viewed from behind; sternites yellow; cercus yellowish.

Frons as long as wide, nearly twice as wide as width of eye; parafrontalia with ventral part laterad of lunule projecting triangularly above eye-margin in profile, bearing one *ors*, four incurved *ori*; *oh* minute, in two rows laterad of *ori*-row; lunule angulated subrectangularly on dorsal one-third in profile; eye slightly higher than broad; gena 1/3 height of eye; *vi* short but longer than 7-8 *pm*. Third antennal segment narrowed apically, distinctly pointed on tip, with very long whitish hairs on apical half; arista shorter than height of eye, pubescent (Fig. 15E).

Mesonotum with 1+3 *dc*, two rows of *acr* and without inner *pa*. Wing with costal sections in proportion of 4.8:0.9:0.8; r-m distinctly before middle of discal cell; ultimate section of M_{1+2} 2.4 times length of penultimate; ultimate section of M_{3+4} almost 3/4 of penultimate.

Sternite 6 as long as wide, 1.5 times length of S5, with emargination of posterior 1/6. Genitalia (Fig. 15): Epandrium 1/3 length of T6, with a minute papilla on median posterodorsal apex; surstylus distinctly incurved, setose; processus longus sharply pointed distally; hypandrium a little less than half of phallapodeme; postgonite black; phallus a little longer than phallapodeme, distiphallus with a pair of long tubules which are sclerotized shortly on distal 1/3; ejaculatory apodeme large, 300 μ m long, 175 μ m in greatest width.

Length of body 2.1 mm, of wing 1.8 mm.

Female unknown.

Holotype male, Monson Valley, Tingo Maria, Peru, 23.XII.1954 (S. & R.) (CAS No.16926); left antenna and abdomen including genitalia mounted on a small slide and pinned with specimen.

Distribution. Peru.

Remarks. This species closely resembles *C. braziliana* Spencer (1963), but is distinguishable by its small size, distinctly pointed apex of third antennal segment which is distinctly pilose, and sparse rows of *acr*. Also, it is similar to *C. magellani* Spencer (1982) from Chile in the shapes of third antennal segment and phallus, but the clear differences are found in the coloration of head and legs. The paired tubules of distiphallus in *macrophalloides* are characteristic in having the sclerotized rings on distal one-third.

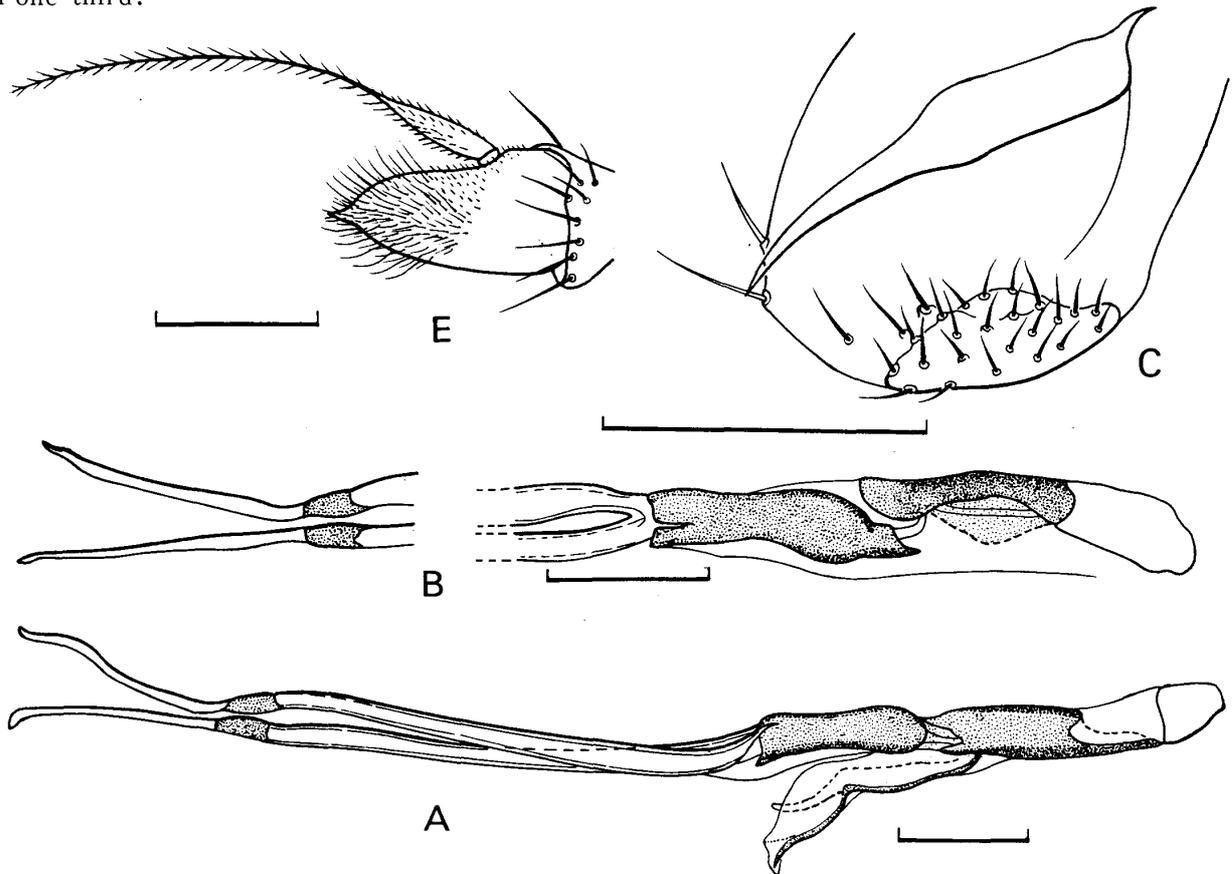


Fig. 15. Third antennal segment and arista (E) and male genitalia of *Cerodontha (C.) macrophalloides* n. sp.

Genus *Liriomyza* Mik

Three Neotropical species. *L. huidobrensis*, *marginalis* and *quadrata*, have been recorded from Peru. One species, *L. tequendamae*, is added newly and two new species, *bispinosa* and *undulatimentula*, are described below. *L. tequendamae* and *undulatimentula* with the stridulating organ are highly advanced in the dark antenna and legs, and indistinct surstylus among the species of *Liriomyza*.

Key to Peruvian species of *Liriomyza*

1. Mesonotum partially yellow before scutellum 2
- Mesonotum uniformly dark before scutellum, with yellow patches at posterolateral corners 3
2. Mesonotum with lateral band between lines of *dc* and *sa* divided into two stripes posteriorly by yellow line; wing length 1.8-2.0 mm *marginalis* (Malloch)
- Mesonotum only with a yellow patch centrally; wing length 2.1-3.2 mm *quadrata* (Malloch)

- 3. Antenna yellow; femora essentially yellow..... 4
- Antenna brown to black; legs black 5
- 4. Parafrontalia entirely yellow, both *vt* on yellow ground; surstylus with two spines, distiphallus unilobate..... *bispinosa* n. sp.
- Parafrontalia darkened to 1st *ors*, both *vt* on dark ground; surstylus with one spine, distiphallus consisting of two parts..... *huidobrensis* (Blanchard)
- 5. Mesonotum with 0+3 *dc*, 4-5 rows of *acr*; wing length 2.1-2.6 mm; distiphallus expanded distally *tequendamae* (Spencer)
- Mesonotum with 1+3 *dc*, two rows of *acr*; wing length 1.9-2.0 mm; distiphallus undulated *undulatimentula* n. sp.

27. *Liriomyza bispinosa* n. sp.

Male. Head yellow but ocellar triangle brown, occiput brownish black and usually separated from ocellar triangle by a yellow line; both *vt* growing on yellow ground, dorsal postorbit shortly darkened beyond base of *vte*; antenna and palpus yellow, arista pale brown. Mesonotum strongly shining, brownish black, very sparsely grayish pollinose, with large yellow patches at posterolateral corners extending mesally to a lateral fourth of distance between bases of 4th *dc* which are growing on dark area, inner *pa* on or at edge of yellow area; *h* at edge of yellow area; pleura yellow, mesopleuron with a pale brown band narrowly along ventral margin before middle, sternopleuron brown on ventral 3/4; scutellum with small brown triangles on lateral bases, both *sc* on yellow area. Wing hyaline; calypter yellow, with margin and fringe brownish black. Legs yellow, tibiae and tarsi faintly tinged with brown. Abdomen shining dark brown, tergites with lateral margins yellow, T3-5 with posterior margin narrowly yellow; cercus yellow.

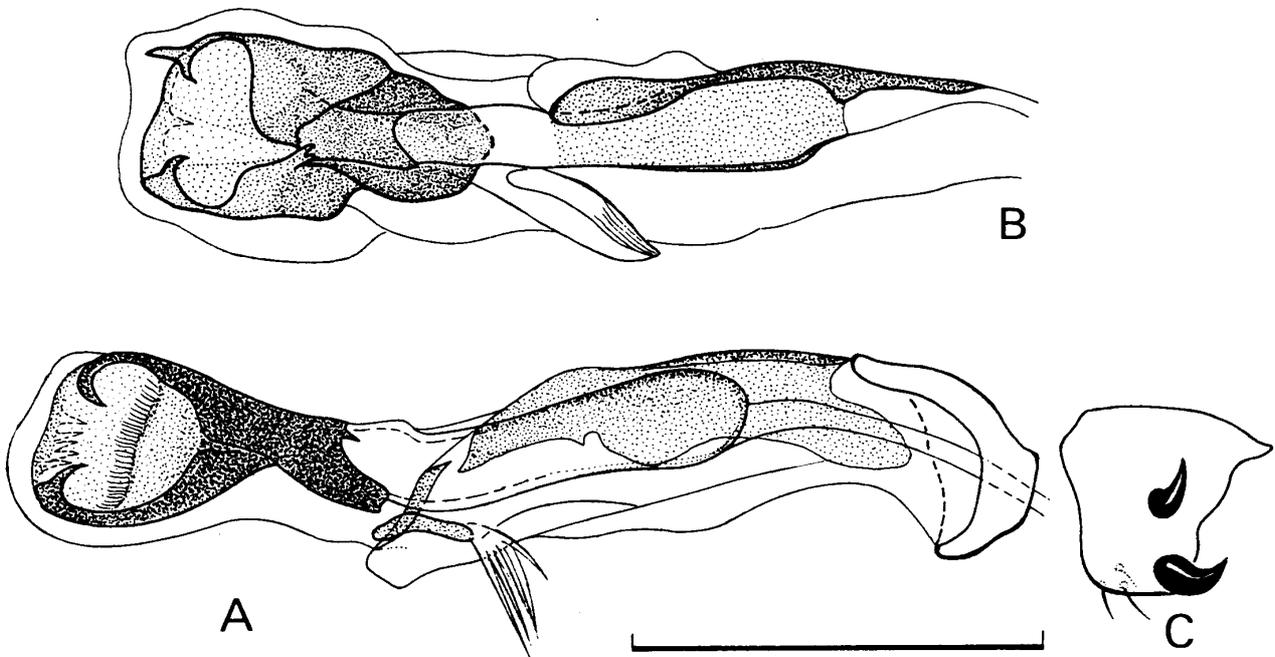


Fig. 16. Male genitalia of *Liriomyza bispinosa* n. sp.

Frons as long as wide, 1.6-1.8 times as wide as width of eye; parafrontalia linearly projecting above eye in profile, bearing two *ors*, two *ori* (rarely three on one side) and a sparse row of *oh*; eye slightly higher than broad; gena 1/5 height of eye; *pm* 3-5; 3rd antennal segment round, minutely pilose; arista as long as height of eye, minutely pubescent.

Mesonotum with 1+3 *dc*, 1st and 2nd *dc* 2/3 length of the 4th, 2nd *dc* close to suture, 3rd *dc* before level of *sa*, inner *pa* 1/2-2/3 of the outer, *acr* in 4 rows. Wing with 2nd costal section nearly thrice as long as the 3rd, r-m at middle of discal cell, ultimate section of M_{1+2} 9-10 times length of penultimate, ultimate section of M_{3+4} 2-2.3 times length of penultimate.

Sternite 6 1.7 times as wide as long, 1.5 times length of S5, without distinct incision mesally; S5 2.5 times as wide as long. Genitalia (Fig.16): Epandrium with a spine on posteroventral corner, cercus with a ventroapical seta longer than others; surstylus with two claw-like spines; processus longus with a pair of setae on distal processes; hypandrium slightly longer than half of phallapodeme; phallus with ventral process quinquefurcate apically; distiphallus with a row of hairs on lateral side of distal lobe, spinulose internally at end; ejaculatory apodeme 140 μ m long, 100 μ m in greatest width.

Length of body 1.3-1.5 (holotype) mm, of wing 1.5 (holotype)-1.7 mm.

Female unknown.

Holotype male, River valley, Chancay, Peru, 15.III.1954 (R. & M.) (CAS No.16928). Paratypes: 1 ♂, Colonia Perene, Rio Perene, 18 mil. NE. of La Merced, 3.I.1955 (S. & R.); 1 ♂, same data as holotype; 1 ♂, Monson Valley, Tingo Maria, 10.X.1954 (S. & R.); 3 ♂, Callao, 16-17.XI.1950 (M. & R.).

Distribution. Peru.

Remarks. This species closely resembles *L. subsativae* Sasakawa in the coloration and presence of two spines on the surstylus, but in *bispinosa* both *vt* are growing on yellow vertical angle and the ultimate section of M_{3+4} is less than 2.5 times length of the penultimate. The phallus of male genitalia shows a distinct difference in the structure between two species.

28. *Liriomyza huidobrensis* (Blanchard)

Agromyza huidobrensis Blanchard, 1926: 10.

This is a highly polyphagous leaf-miner and has been known as an important pest on lettuce, melon, onion, pea, potato, spinach, etc.

Specimens examined. 1 ♂, Colonia Perene, Rio Perene, 18 mil. NE. of La Merced, 3.I.1955 (S. & R.); 1 ♀, 21 mil. E. of Olmos, Lambayeque, 18.I.1955 (S. & R.); 3 ♂5 ♀, River valley, Chancay, 15. & 25.III.1951 (R. & M.); 1 ♀, 53 km N. of Chimbote, 16.III.1954 (R. & M.); 2 ♀, 6 mil. S. of San Antonio, Lima, 13.IX.1954 (S. & R.); 23 ♂15 ♀, Callao, 16-17.XI.1950 (M. & R.); 1 ♂, Monson Valley, Tingo Maria, 11.XII.1954 (S. & R.); 1 ♂1 ♀, 40 mil. E. of Tingo Maria, 12.XII.1954 (S. & R.); 1 ♂, 4 mil. E. of Acobambo, 31.XII.1954 (S. & R.).

Distribution. U.S.A. (California, Hawaii); Costa Rica, Colombia, Venezuela, Brazil, Peru, Chile, Argentina.

29. *Liriomyza marginalis* (Malloch)

Agromyza melampyga var. *marginalis* Malloch, 1913: 283.

Specimens examined. 6 ♀, Callao, 16-17.XI.1950 (M. & R.), swept in agricultural area.

Distribution. U.S.A.; West Indies, Colombia, Venezuela, Brazil, Peru, Chile.

30. *Liriomyza quadrata* (Malloch)

Agromyza quadrata Malloch, 1934: 471.

This is a leaf-miner of *Solanum* species (potato, tomato, etc.).

The specimens from Peru have the entirely yellow postorbital dorsally (both *vt* on yellow ground); yellow central patch on mesonotum extending anteriorly to posterior 2/3-4/5 of distance between 3rd and 4th *dc*, which are growing on brownish black ground, from scutoscutellar suture.

Specimens examined. 2 ♂, Callao, 16.XI.1950 (M. & R.), swept in agricultural area.

Distribution. Venezuela, Colombia, Ecuador, Peru, Chile, Argentina.

31. *Liriomyza tequendamae* (Spencer)

Metopomyza tequendamae Spencer, 1963: 373.

Specimen examined. 1 ♂, 30 mil. NE. of Huanuco (2,500 m), 17.IX.1954 (S. & R.).

Distribution. Colombia, Venezuela, Ecuador, Peru. New to Peru.

32. *Liriomyza undulatimentula* n. sp.

Male. Head ochreous to testaceous but ocellar triangle, parafrontalia excepting ventral part below base of 2nd *ori* and occiput dark brown to brownish black; both *vt* on dark area which extends to dorsal half of dorsal postorbit beyond base of *ute*; face pale brown mesally; peristomal line brownish black; antenna and palpus dark brown. Thorax and abdomen black; mesonotum densely brownish gray dusted, slightly shining on lateral sides when viewed from front; humerus with posterior margin and notopleuron yellow, *prs* at edge of dark area; scutellum yellow centrally, basal *sc* on black area but apical *sc* near edge of yellow area; dorsal margins of meso- and sternopleura linearly yellow; tergites 3-5 with posterior margins linearly yellow. Wing hyaline, with veins yellow at base; calypter grayish, with margin and fringe brownish black; halter yellow. Legs black, all knees yellow.

Frons slightly wider than long, about 1.7 times as wide as width of eye, parallel-sided; parafrontalia 1/4 width of frons at level of 1st *ors*, linearly projecting above eye in profile, bearing two *ors*, two *ori* and a row of minute *oh* which are erect; eye higher than broad; gena a little higher than 1/3 height of eye; 3rd antennal segment round, minutely pilose; arista slightly shorter than height of eye, swollen on basal 1/4, microscopically pubescent.

Mesonotum with 1+3 *dc*, 1st and 2nd *dc* slightly shorter than the 3rd, distance between 2nd and 3rd *dc* about 1/2 that between 3rd and 4th; *acr* in two rows. Wing with costal sections in proportion of 4:1.2:0.9; r-m slightly before middle of discal cell; ultimate section of M_{1+2} 4-4.2 times as long as the penultimate; ultimate section of M_{3+4} 1.3-1.4 times length of penultimate.

Sternite 6 2.6 times as wide as long, 1.5 times length of S5, without posterior emargination; S5 about 4 times as wide as long. Genitalia (Fig.17): Surstylus united with epandrium, forming a black narrow plate with a spine-like process on posterior end and setose posteriorly; processus longus with a pair of long setae; phallus slightly longer than half of phallopodeme, basiphallus with ventral process simple and weakly sclerotized, distiphallus undulate in lateral view, bilobate distally, bearing minute spinules densely before distal end; ejaculatory apodeme 135 μ m long, 110 μ m in greatest width.

Length of body 1.9 mm, of wing 1.9-2.0 (holotype) mm.

Female unknown.

Holotype male, 5 mil. NE. of Cerro de Pasco (3,000m), Pasco, Peru, 29.XII.1954 (S. & R.) (CAS No.16931). Paratype: 1 ♂, same data as holotype.

Distribution. Peru.

Remarks. This species belongs to the *tequendamae*-group in having the dark antennae and legs, but is

distinguishable from them by its broad gena, sparse rows of *acr* and small size. Although the epan-drium and surstyli of this species are typical of the genus *Metopomyza*, it has a distinct stridulating organ as a character of *Liriomyza*.

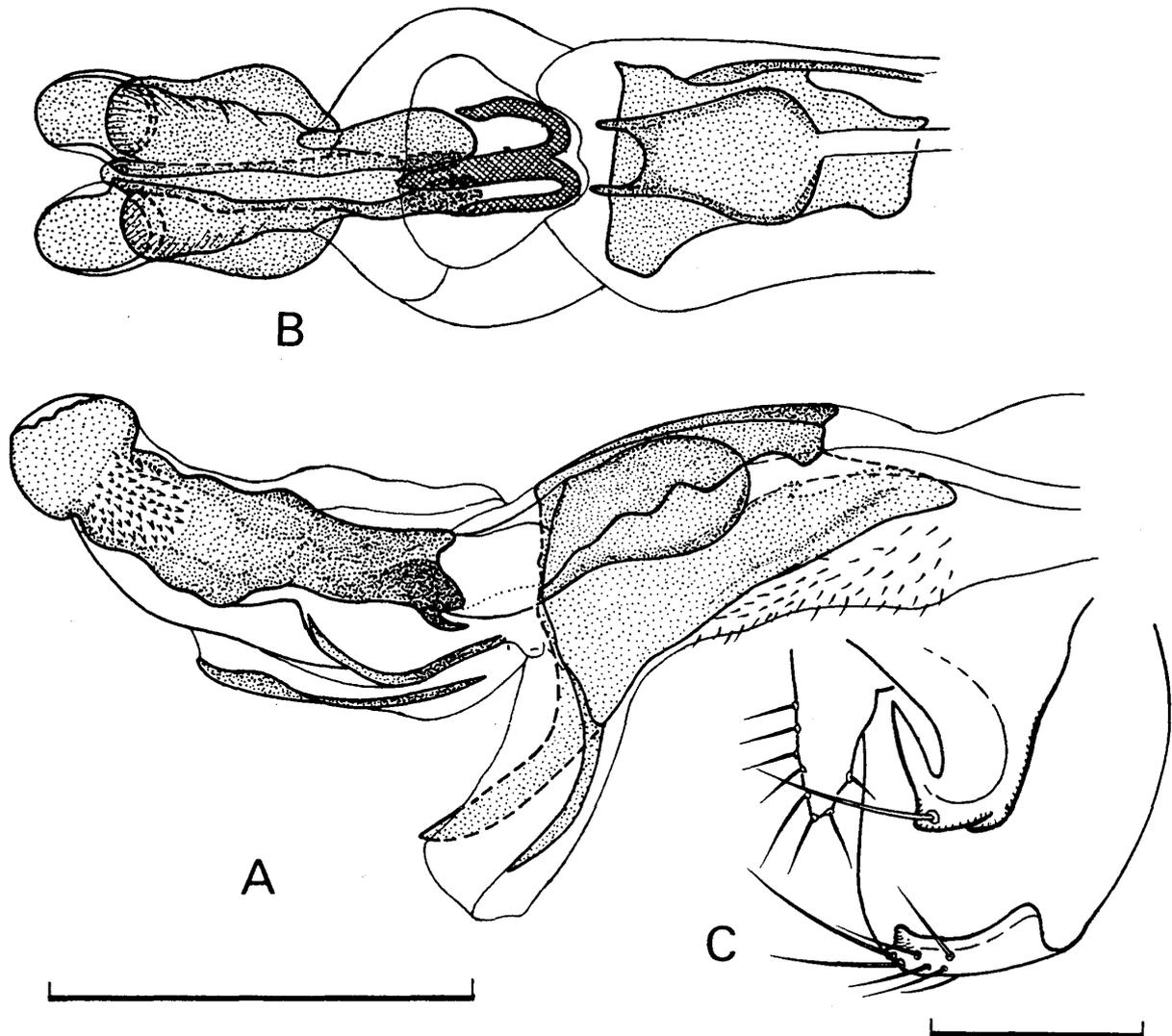


Fig. 17. Male genitalia of *Liriomyza undulatimentula* n. sp.

Genus *Haplopeodes* Steyskal

33. *Haplopeodes tigreensis* (Spencer)

Haplomyza tigreensis Spencer, 1963: 375.

The specimens from Peru are smaller: 1.3 (male) to 1.6 (female) mm in wing length; the 3rd anten-nal segment brown on apical 1/3-1/2; mesonotum with 1-2 *ia*-setulae behind suture (rarely absent).

Specimens examined. 3 ♂ 2 ♀, Callao, 17.XI.1950 (M. & R.); 1 ♂, River valley, Chancay, 15.III. 1954 (R. & M.).

Distribution. Argentina, Peru. New to Peru.

Genus *Calycomyza* Hendel

Two Neotropical species, *C. meridiana* and *sidae*, are recorded from Peru for the first time, and three new species, *C. cuspidata*, *punctata* and *vallicola*, are described below. They are divided into two

species-groups by the coloration of antennae shown in the key.

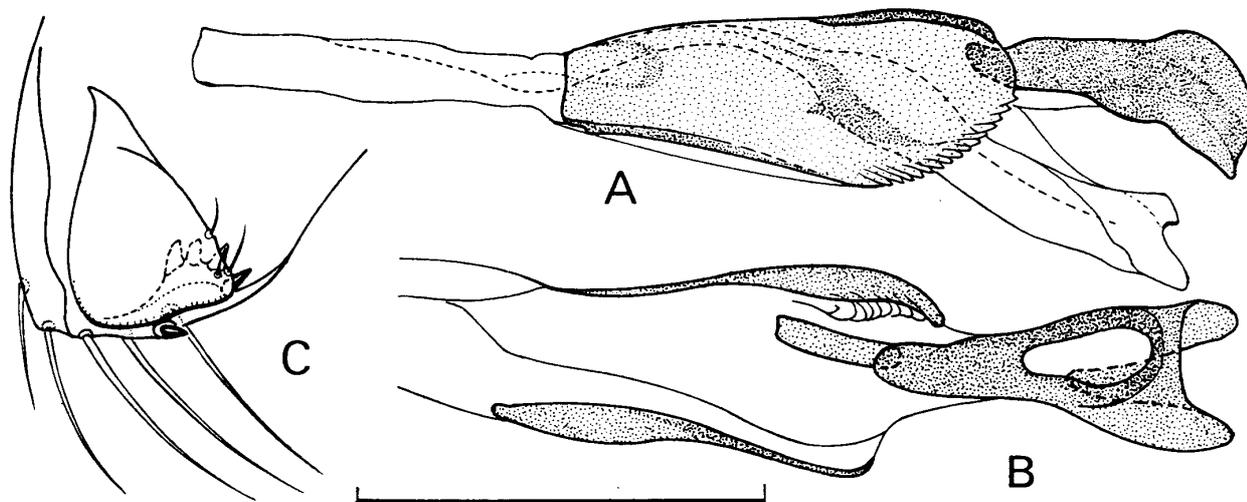


Fig. 18. Male genitalia of *Haplopeodes tigrensis* (Spenc.).

Key to Peruvian species of *Calycomyza*

1. Antennal segments bright yellow to pale testaceous yellow 2
- Antennal segments black..... 3
2. Parafrontalia entirely yellow; mesonotum with large yellow patches on posterolateral corners
..... *punctata* n. sp.
- Parafrontalia darkened dorsally; mesonotum without distinct yellow patches posterolaterally
..... *meridiana* (Hendel)
3. Mesonotum with 1+3 *dc*; mesopleuron with dorsal margin broadly yellow; surstylus with only two spines *cuspidata* n. sp.
- Mesonotum without presutural *dc*; mesopleuron yellow only in dorsoposterior corner..... 4
4. Wing 1.4-1.5 mm long, with ultimate section of M_{3+4} 2.5 times length of penultimate; surstylus with 5-9 spines *sidae* Spencer
- Wing 2.2-2.5 mm long, with ultimate section of M_{3+4} 1.3-1.6 times length of penultimate; surstylus with 14-17 spines *vallicola* n. sp.

34. *Calycomyza cuspidata* n. sp.

Male. Head yellow; frons more or less testaceous; vertical angle dark brown, both *vt* on dark area; parafrontalia brown to 1st *ors*; face with antennal grooves tinged with brown; antenna and palpus dark brown. Thorax black; mesonotum mat, densely gray dusted; humerus excepting central spot and notopleuron yellow, *h* at edge of brown spot; mesopleuron with dorsal margin entirely yellow (about 1/7 height of pleuron). Wing hyaline; calypter yellowish, with margin and fringe brown; halter yellow. Legs black but tarsi brownish. Abdomen shiny brownish black.

Frons as long as wide, a little wider than width of eye, parallel-sided; parafrontalia not projecting above eye in profile, bearing two *ors* (detectable by pits), one or two *ori* and a sparse row of *oh*; eye higher than broad; gena about 1/8 height of eye; *pm* 3-4; 3rd antennal segment small, slightly shorter than wide, rounded apically, with pile slightly longer than diameter of arista; arista as long as height of eye, distinctly pubescent.

Mesonotum with 1+3 *dc*, anterior three pairs subequal to each other, 2nd *dc* equidistant from 1st

and 3rd; four rows of *acr*, posteriormost pair just behind level of 4th *dc* a little longer than others. Wing with costal sections in proportion of 3.1:1:0.8; r-m a little beyond middle of discal cell; ultimate section of M_{1+2} about 6.5 times length of penultimate; ultimate section of M_{3+4} about 1.3 times length of penultimate. Mid tibia with one or two *pd*.

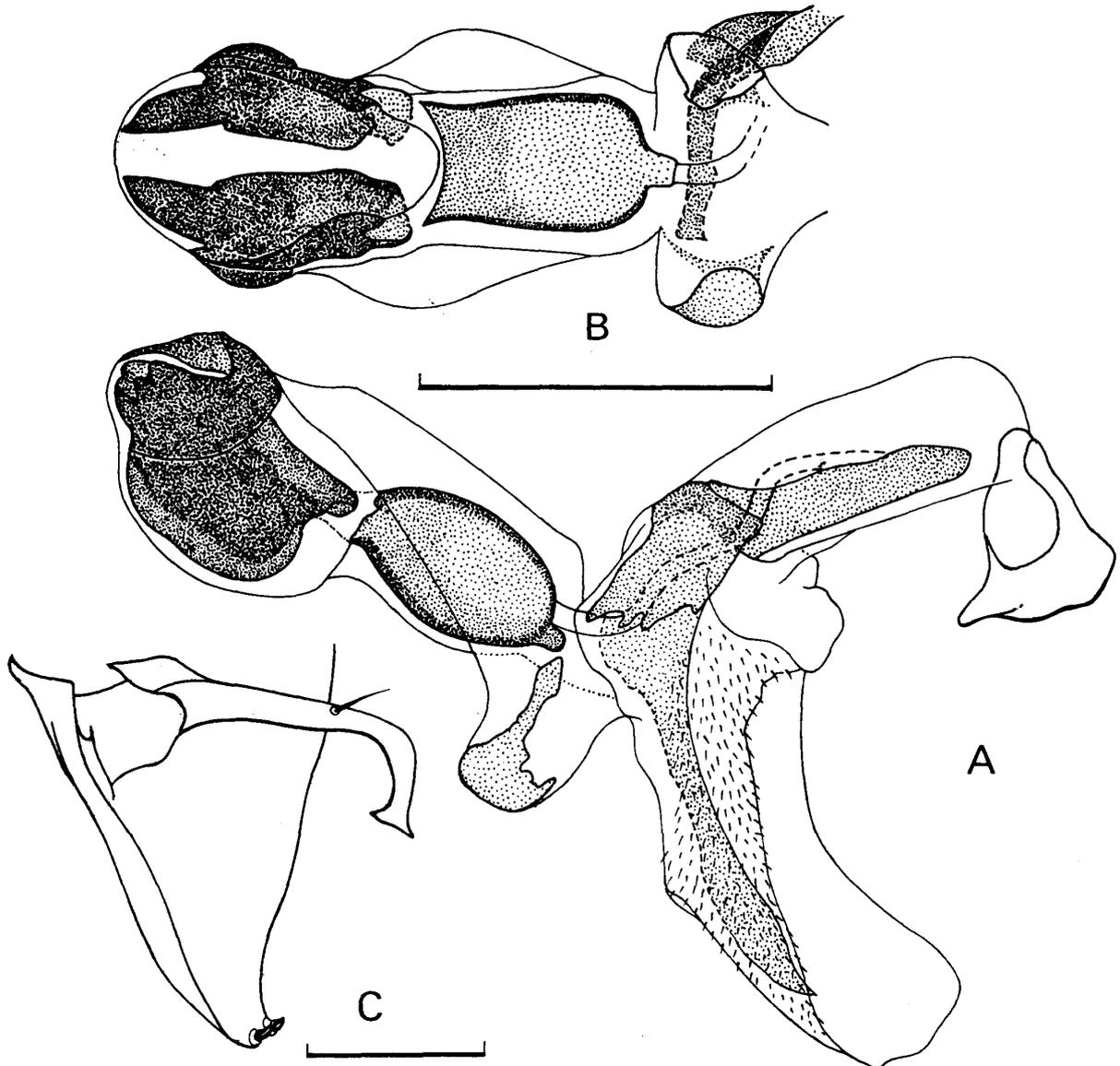


Fig. 19. Male genitalia of *Calycomyza cuspidata* n. sp.

Sternite 6 1.5 times as wide as long, without distinct emargination posteriorly. Genitalia (Fig.19): Epandrium tapered ventrally, ending in two spines of surstylus; processus longus black, with apex ax-shaped, bearing a seta at middle; hypandrium U-shaped, with side piece very narrow; phallus with ventral process very long and setulose, distiphallus with basal lobe as long as distal ones which are separated from each other; ejaculatory apodeme 155 μm long, greatly expanded apically, 185 μm in greatest width.

Length of body 1.9 mm, of wing 1.8 mm.

Female unknown.

Holotype male, Tingo Maria, Peru, 10.VII.1968, (C.L.O.) (CAS No.16922); abdomen and genitalia mounted on a small slide and pinned with specimen; most of bristles and some legs missing.

Distribution. Peru.

Remarks. This species is recognized from *C. longicauda* (Blanchard), known from Argentina, by its pubescent arista, sparse rows of *acr*, short ultimate section of M_{3+4} and small size. The surstylus of this species is peculiar in the shape, as seen in the species of *Cerodontha* (*Dizygomysa*).

35. *Calycomyza meridiana* (Hendel)

Agromyza meridiana Hendel, 1923: 123.

Specimens examined. 1 ♂, Colonia Perene, Rio Perene, 18 mil. NE. of La Merced, Junin, 3.I.1955 (S. & R.); 1 ♀, Tingo Maria, 9.VII.1968 (C.W. & L.B. O'Brien); 1 ♂, Huanuco (1,000 m), 10 mil. SW. of Las Palmas, 17.IX.1954 (S. & R.); 6 ♂9 ♀, Monson Valley, Tingo Maria, 18. & 23.IX. and 10.X.1954 (S. & R.); 1 ♂, Yurac, 67 mil. E. of Tingo Maria, 4.X.1954 (S. & R.); 2 ♀, 26 mil. E. of Tingo Maria, 10.XII.1954 (S. & R.).

Distribution. Costa Rica, West Indies, Colombia, Venezuela, British Guiana, Peru, Brazil. New to Peru.

36. *Calycomyza punctata* n. sp.

Female. Head yellow but ocellar triangle and occiput black; vertical angle brown but *vti* growing at edge of yellow area; lunule and face whitish pollinose; antenna and palpus pale testaceous yellow, arista pale brown. Thorax and abdomen black; mesonotum gray dusted, very weakly shining, with lateral sides yellow, *prs* and *sa* at edge of dark area, and with posterolateral corners broadly yellow in a form of rectangle, extending mesally to a lateral fourth of distance between posteriormost *dc* and anteriorly to level of outer *pa*, but *dc* on dark area and both *pa* at boundary between yellow and black areas; scutellum with anterolateral corners narrowly testaceous but basal *sc* growing on dark area; mesopleuron yellow on dorsal 1/5; abdomen strongly shining, T6 with posterior margin linearly yellow. Wing with veins yellow at bases; calypter yellowish white, with margin and fringe pale brown; halter yellow. Legs brownish black, fore knee yellow.

Frons narrower than long, nearly 1.2 times as wide as width of eye, almost parallel-sided; parafrontalia with ventral half slightly projecting above eye in profile, bearing two *ors*, two *ori* and a sparse row of *oh*; gena 1/6 height of eye; *pm* 3-4; 3rd antennal segment small, round, as long as wide, minutely pilose; arista as long as height of eye, distinctly pubescent.

Mesonotum with 0+2 *dc*. 1st *dc* before level of *sa*, and six rows of *acr*. Wing with costal sections in proportion of 3.2:1:0.9; r-m slightly beyond middle of discal cell; ultimate section of M_{1+2} 6 times as long as the penultimate; ultimate section of M_{3+4} a little longer than penultimate (1.2:1). Mid tibia without *pd*.

Length of body 2.7 mm. of wing 2.6 mm.

Holotype female, Monson Valley, Tingo Maria, Peru, 18.IX.1954 (S. & R.) (CAS No.16923).

Distribution. Peru.

Remarks. This species resembles *C. meridiana* (Hendel) in the pale antenna and dark fringe on the calypter, but is readily distinguishable by its entirely yellow parafrontalia, large yellow patches on posterolateral corners of mesonotum, yellow dorsal margin of mesopleuron and large size.

37. *Calycomyza sidae* Spencer

Calycomyza sidae Spencer, 1973: 88.

The specimens from Peru are large, with 1.6-1.8 mm in wing length, and with short ultimate section of M_{3+4} (2-2.2 times as long as the penultimate), comparing with those in the original description. Following characters of male genitalia will be added: epandrium with about 4 rows of 18-24 spines at

posteroventral corner; surstylus with 5-9 spines and 6-8 long setae; phallus short, $2/5$ length of phallopodeme, with distal pair of ventral processes extending beyond middle of basal tube of distiphallus, paired processes of distiphallus globular; ejaculatory apodeme $200\ \mu\text{m}$ long, expanded only on apical $1/4$, $145\ \mu\text{m}$ in greatest width.

Specimens examined. 1 ♂, River valley, Chancay, 15.III.1951 (R. & M.); 3 ♀, Yurac (3,500m), 67 mil. E. of Tingo Maria, 4.X.1954 (S. & R.); 2 ♂, Monson Valley, Tingo Maria, 19.X. & 11.XII.1954 (S. & R.); 1 ♂, 40 mil. E. of Tingo Maria, 12.XII.1954 (S. & R.).

Distribution. U.S.A. (Florida); Costa Rica, Bahamas, Dominica, Dominican Republic, Ecuador, Venezuela, Peru. New to Peru.

38. *Calycomyza vallicola* n. sp.

Male & female. Head yellow but ocellar triangle and occiput brownish black, dorsal parafrontalia usually darkened to 1st *ors* (very rarely to 2nd *ors* or only orbits), both *vt* on dark area; face faintly brownish on dorsal $1/4$ - $1/2$; antenna brown, 3rd segment darker; palpus dark brown. Thorax black; mesonotum gray dusted, weakly shining, with lateral sides yellow and posterolateral corners narrowly and faintly yellowish; *prs* at edge of dark area; dorsal margin linearly and posterodorsal corner of mesopleuron yellow; hypopleuron yellow; abdomen shiny black. Wing hyaline, with veins yellow at bases; calypter yellow, with margin and fringe dark brown; halter yellow. Legs brownish black but tarsi brownish, fore knee yellow.

Frons narrower than long, as wide as or a little (1.2 times) wider than width of eye; parafrontalia not projecting above eye in profile, bearing two *ors*, two *ori* and a row of *oh*; *oc* slightly shorter than *ors*; eye higher than broad; gena about $1/8$ height of eye; *pm* 4-6; 3rd antennal segment slightly wider than long, minutely pilose; arista as long as height of eye, pubescent.

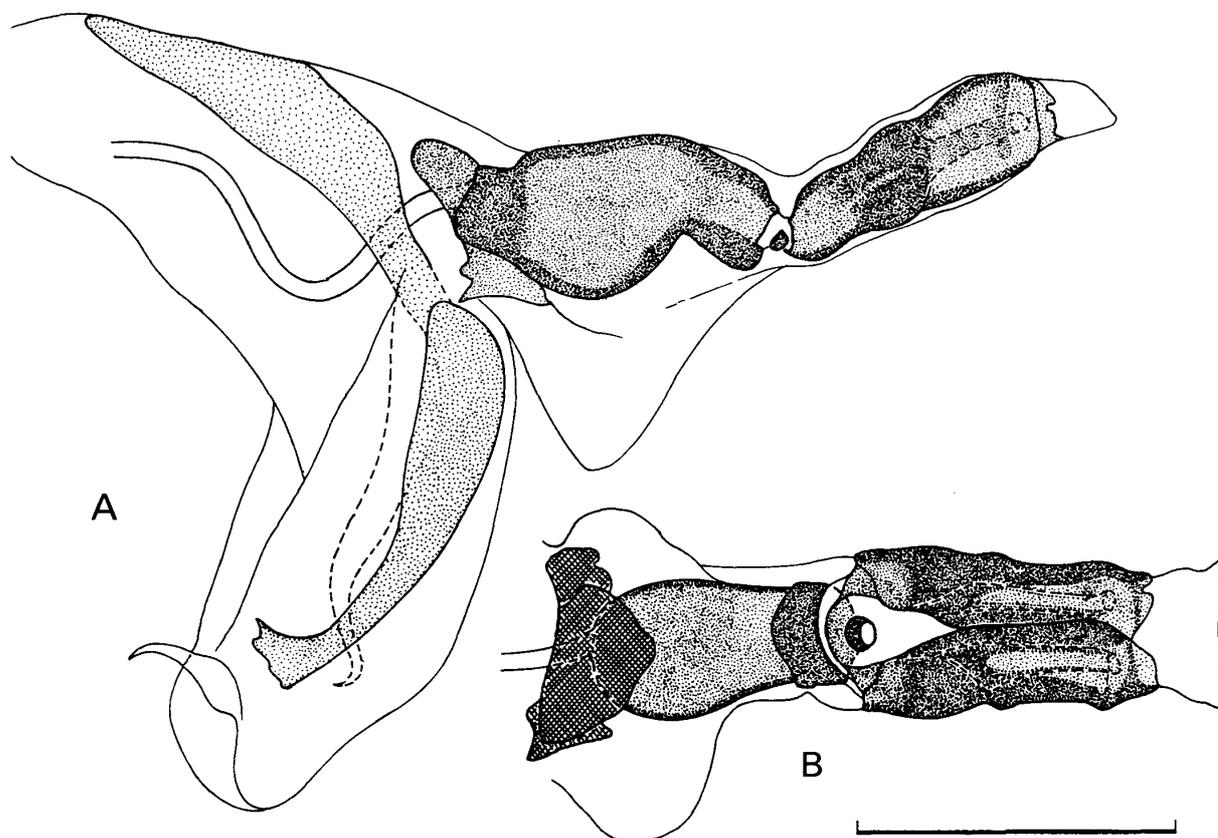


Fig. 20. Male genitalia of *Calycomyza vallicola* n. sp.

Mesonotum with 0+3 *dc*, six rows of *acr* (rarely posteriormost pair longer than others), inner *pa* 1/3 length of outer. Wing with costal sections in proportion of 2.3-2.8:1:0.8; r-m at middle of discal cell; ultimate section of M_{1+2} 7 times length of penultimate; ultimate section of M_{3+4} 1.3-1.7 times length of penultimate. Mid tibia with two *pd*.

Male sternite 6 nearly 1.3 times as wide as long, 3.5 times length of S5, with shallow emargination on posterior margin. Male genitalia (Fig.20): Epandrium with 25 spines on posteroventral corner, surstylus with 14-17 spines; hypandrium V-shaped, with side piece narrow; phallus with ventral processes distinct, distiphallus separated into two distal lobes which enclose tubules; ejaculatory apodeme 250 μ m long, 225 μ m in greatest width.

Length of body 2.3-2.6 mm, of wing 2.2-2.5 (holotype) mm.

Holotype male, Monson Valley, Tingo Maria, Peru, 9.X.1954 (S. & R.) (CAS No.16924). Paratypes: 3♂2♀, same locality as holotype, 18.IX., 19. & 26.X. and 2.XI.1954 (S. & R.).

Distribution. Peru.

Remarks. This species is intermediate between *C. compositana* Spencer and *steviae* Spencer (1973), known from Venezuela, in the size and width of frons, but is distinguishable from them by the absence of presutural *dc* and by short ultimate section of M_{3+4} . The distiphallus of *vallicola* is characteristic in having a pair of tubules which are enclosed entirely with cylindroid lobes.

II . VENEZUELAN SPECIES

The Venezuelan Agromyzidae with seventy-six species were revised by Spencer (1973). Following five species will be added to their fauna. It was very interested in the air-borne species: *Melanagromyza caerulea* and *floridensis*, *Nemorimyza posticata*, a new species of *Cerodontha* (*Dizygomyza*) and two new species of *Liriomyza*, were collected by the flight trap (1,100m) by Dr. M.E. Irwin on March 4, 1967.

1 . *Melanagromyza caerulea* (Malloch)

A seed-feeder of *Ipomoea* spp. (Convolvulaceae). See p. 3.

Specimen examined. 1♀, Parque Nacional Henry Pittier, Rancho Grande, Aragua, 4.III.1967 (M. I.).

2 . *Melanagromyza floridensis* Spencer

Melanagromyza floridensis Spencer, 1963:312; 1973: 17.

A seed-feeder of *Desmodium* spp. (Leguminosae).

Specimen examined. 1♀, same data as for *caerulea*.

Distribution. U.S.A. (Florida); Caribbean area, British Guiana, Venezuela.

3 . *Nemorimyza posticata* (Meigen)

Agromyza posticata Meigen, 1830: 172.

The larvae of this Holarctic species are the leaf-miner on Asteraceae.

Specimen examined. 1♂, Parq. Nac. H. Pittier, Rancho Grande, Aragua, 4.III.1967 (M. I.).

Distribution. U.S.A., Canada; Europe; Japan; Costa Rica, Venezuela. New to Venezuela.

4 . *Cerodontha* (C.) *dorsalis* (Loew)

This is a leaf-miner on Gramineae. See p.17.

Specimens examined. 1 ♂, Pass on Pacific and Atlantic Division, Estado Trujillo, Venezuela, 15.IX.1957 (Malkio); 1 ♀, 3 km E. of Ypacarai, Paraguay, 7.X.1968 (C. L. O.).

New to Venezuela and Paraguay.

5. *Cerodontha (Dizygomyza) impatientis* n. sp.

Female. Black; dorsal half of frontalia, inner margin of parafrontalia, lunule, face and gena brown; lunule silvery pruinose; ocellar triangle and parafrontalia shining; 1st antennal segment brown; mesonotum shining, sparsely gray dusted; notopleuron slightly tinged with brown; mesopleuron with dorsal margin and dorsoposterior corner narrowly whitish yellow; wing with veins yellow at bases; calypter yellow, with margin brown and fringe blackish brown; fore knee conspicuously yellow, all tarsi brown, basal 1-3 segments yellowish; abdomen strongly shining.

Frons 1.5 times as wide as width of eye, parallel-sided; parafrontalia not projecting above eye in profile; *ors* two, 2nd *ors* 2/3 length of the 1st and shorter than 1st *ori*; *ori* two; *oh* only four in a row, reclinate; lunule higher than semicircular; gena 1/7 height of eye; 3rd antennal segment small, round, minutely pilose; arista as long as height of eye, pubescent.

Mesonotum with 1+3 *dc*, six rows of *acr* anteriorly; *prsc* short, about 1/4 length of 4th *dc*, a pair of setulae almost on level of 4th *dc* subequal to *prsc* in length; inner *pa* 1/2 of the outer and subequal to *ia*. Wing with three costal sections in proportion of 3.1:1:0.7, r-m slightly before middle of discal cell, ultimate section of M_{1+2} about 3.5 times as long as penultimate, ultimate section of M_{3+4} about 2/3 of penultimate. Mid tibia with a *pd*.

Lengths of body and wing 2.7 mm, respectively.

Male unknown.

Holotype female, Parque Nacional Henry Pittier, Rancho Grande, Aragua, Venezuela, 4.III.1967 (M. I.) (CAS No.16925).

Distribution. Venezuela.

Remarks. This air-borne species is similar to *C. (Diz.) orcina* Spencer (1973) in having the high lunule, shiny black mesonotum with 1+3 *dc* and weak *prsc*, and yellow fore knee, but is distinguishable by its large size, short 2nd *ors*, dense rows of *acr* and short ultimate section of M_{3+4} .

6. *Liriomyza geniculata* n. sp.

Male. Head yellow including antenna and palpus, but ocellar triangle with central part between ocelli dark brown, connecting with dark occiput by narrow, pale brown area; arista brown, dark brown area of occiput extending to dorsal postorbital beyond base of *vt*, both *vt* on yellow ground. Mesonotum shining brownish black, very sparsely pollinose, with large yellow patches at posterolateral corners, extending mesally to lateral 1/4 of distance between 4th *dc*, inner *pa* on yellow area and outer *pa* at edge of yellow area; scutellum entirely yellow; humerus with narrow spot before base of *h*; pleura yellow, mesopleuron with a small brown spot at middle of ventral margin, hypo- and sternopleura brown ventrally; wing hyaline, calypter with margin brown, fringe fulvous; legs yellow, tibiae and tarsi faintly tinged with brown. Abdomen with T1-2 yellowish, posterior tergites yellowish brown to brown and with posterior margins linearly yellow; sternites yellow; epandrium brown, cercus yellow.

Frons nearly 1.3 times as wide as width of eye; parafrontalia not projecting above eye in profile; two *ors*, two *ori*; *oh* minute, in a row; gena about 1/5 height of eye; 3rd antennal segment small, round, normally pilose; arista as long as height of eye, microscopically pubescent.

Mesonotum with 1+3 *dc*, anterior two short, 2nd *dc* about 1/2 of 4th and close to suture, distance between 2nd and 3rd *dc* about 1/2 that between 3rd and 4th; *acr* in four rows. Wing with three costal sections in proportion of 3.2:1:0.8, r-m beyond middle of discal cell, ultimate section of M_{1+2} 8-10

times as long as the penultimate, ultimate section of M_{3+4} 2.3-2.4 times as long as the penultimate.

Surstylus 2/5 as long as ventral width of epandrium, bearing two long spines on tip; hypandrium with side piece very narrow, about 1/2 length of phallapodeme; phallus 1/2 length of phallapodeme, basiphallus well developed, median process L-shaped in lateral view and minutely spinulose distally, distiphallus broadened distally, somewhat forming two lobes (Fig.21); ejaculatory apodeme 140 μ m long and 80 μ m in greatest width.

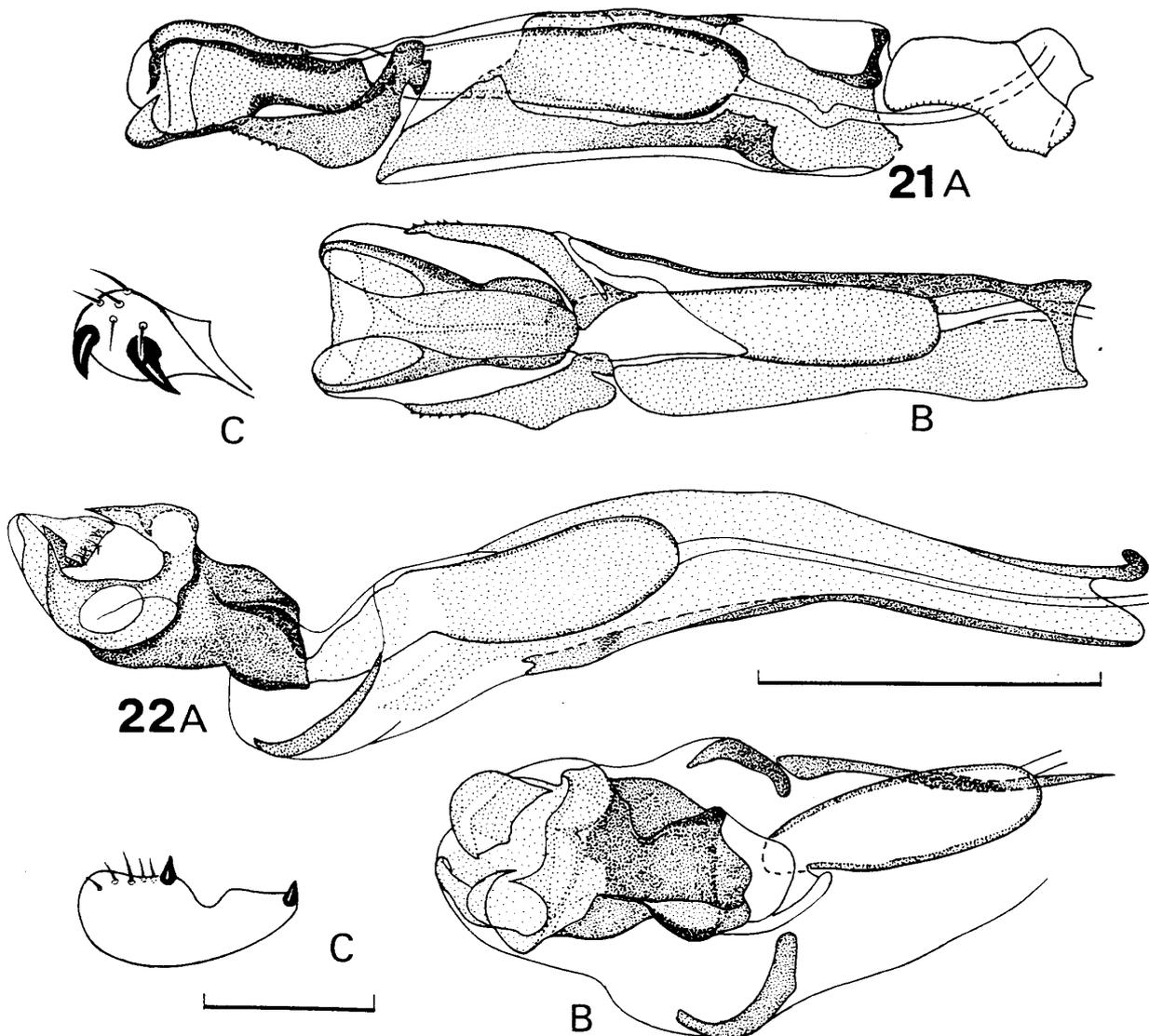
Lengths of body and wing 1.6 mm, respectively.

Female unknown.

Holotype male, Parque Nacional Henry Pittier, Rancho Grande, Aragua, Venezuela, 4.III.1967 (M. I.) (CAS No.16929); abdomen and genitalia mounted on a small slide and pinned with specimen.

Distribution. Venezuela.

Remarks. The male genitalia of this species indicate a close relationship with *L. sabaziae* Spencer (1963). However, the coloration of vertical angles and mesonotum is similar to those of Venezuelan *trivialis* Spencer and *solanivora* Spencer (1973). The median sclerites of phallus in *geniculata* are quite specific.



Figs. 21-22. Male genitalia of *Liriomyza geniculata* n. sp. (21) and *irwini* n. sp. (22).

7. *Liriomyza irwini* n. sp.

Male. Head including antenna and palpus yellow; brown ocellar triangle separated from dark occiput by yellow line; both *vt* growing on yellow ground; dorsal postorbital brown for a short distance beyond *vt*; arista brown. Thorax yellow; mesonotum with shiny black central area, extending posteriorly to middle of distance between 3rd and 4th *dc*, 4th *dc* at edge of yellow area; lateral dark area between lines of *dc* and *sa* slightly incised before base of inner *pa*; *prs* and outer *pa* at edge of yellow area; scutellum with small brown spot on lateroproximal corner, both *sc* on yellow ground; mesopleuron with a brown spot at middle of ventral margin; brown triangles on sterno- and hypopleura well separated; calypter with margin and fringe blackish brown; legs yellow, mid and hind tibiae and distal segments of tarsi tinged with brown, basal half of hind tibia distinctly brown; abdominal tergites shining brownish black, with lateral margins broadly and posterior margins narrowly yellow, sternites and cercus yellow.

Frons 1.3-1.6 times as wide as width of eye; parafrontalia linearly projecting above eye in profile; two *ors*, two *ori*, *oh* minute and in a row; gena about 1/5 height of eye; 3rd antennal segment small, round, as long as wide, minutely pilose; arista slightly shorter than height of eye, microscopically pubescent.

Mesonotum with 1+3 *dc*, anterior two short and less than half length of 4th *dc*, four irregular rows of *acr* on black area and two or three pairs on yellow area incurved; mesopleuron with 4-5 dorsally directed setulae. Wing with costa extending to M_{1+2} , 2nd section 3.5-3.7 times as long as the 3rd, r-m very slightly beyond middle of discal cell, ultimate section of M_{1+2} 10 times as long as the penultimate, ultimate section of M_{3+4} 2.5 times as long as the penultimate.

Epandrium broadened ventrally, with a spine on each posteroventral corner; cercus without distinct bristles at ventral end; surstylus narrowing posteriorly, with two spines at middle and on caudal apex; hypandrium of normal size; phallus 4/7 length of phallopodeme, basiphallus about thrice as long as distiphallus which is broad but less sclerotized on distal half (Fig.22); ejaculatory apodeme 170 μ m long, 160 μ m in greatest width. Sixth sternite slightly wider than long, emarginated at middle of posterior 1/5.

Length of body 1.7-2.0 mm, of wing 1.7 (holotype)-1.9 mm.

Female unknown.

Holotype male, Parque Nacional Henry Pittier, Rancho Grande, Aragua, Venezuela, 4.III.1967 (M. I.) (CAS No.16930). Paratypes: 2♂, same data as holotype.

Distribution. Venezuela.

Remarks. This species resembles *L. insignis* Spencer (1963; only female recorded from Costa Rica) in the coloration of mesonotum, but is immediately recognizable by its coloration of scutellum, mesopleuron, fringe on calypter, and hind tibia, and long ultimate section of M_{3+4} .

III. BRAZILIAN SPECIES

A new species is described below from Brazil.

1. *Agromyza serratimentula* n. sp.

Male. Black; ocellar triangle and parafrontalia shining; gena tinged with brown; antenna and palpus pale brown; thorax sparsely pollinose, mesonotum and abdomen strongly shining; wing hyaline, calypter grayish, with margin black and fringe brown; legs brown.

Frons nearly 1.5 times as wide as width of eye, with several hairs along ventral margin; parafrontalia linearly projecting above eye in profile, bearing two reclinate *ors* and two incurved *ori*; 2nd *ors* distinctly before middle of frons, distance between 2nd *ors* and *vti* about three times that between two *ori*;

oh reclinate, in a row; ocellar triangle with ventral tip extending midway between two *ors*; gena approximately 1/11 height of eye; 3rd antennal segment small, rounded, with pile distinct; arista shorter than height of eye, distinctly pubescent.

Mesonotum with two postsutural *dc*, accompanying by two short setae before the 1st, of which anterior one is 1/3 and the posterior 1/2 length of 1st *dc*; *acr* in six irregular rows, *prsc* strong. Wing with costa extending to M_{1+2} , three sections in proportion of 5:2:1.3, r-m slightly before middle of discal cell, ultimate section of M_{1+2} 2.2 times as long as the penultimate, ultimate section of M_{3+4} 1/2 of penultimate. Mid tibia with a *pd*.

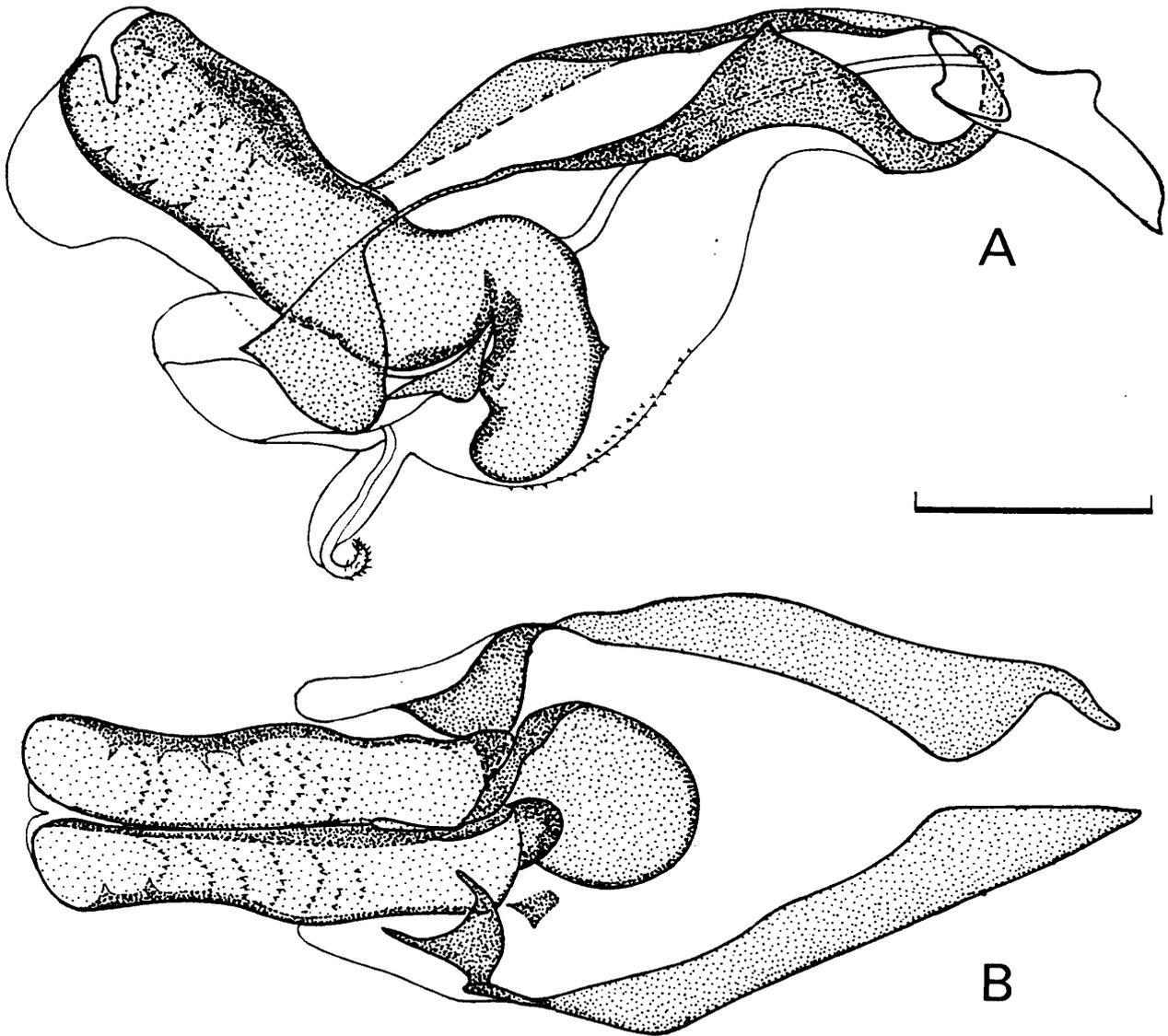


Fig. 23. Phallus of *Agromyza serratimentula* n. sp.

Fifth sternite four times as wide as long; S6 four times as long as S5, about 1.5 times as wide as long and excavated on posterior 3/8. Epandrium 1/2 as long as T6, cercus broadened ventrally; surstylus with 14-15 spines; hypandrium nearly 2/3 length of phallapodeme; phallus subequal to hypandrium in length, basiphallus with a membranous, short and apically hairy process ventrally, distal tubes of distiphallus with rows of serrulate spinulae on surface (Fig. 23); ejaculatory apodeme slightly expanded, 185 μm long, 85 μm in greatest width.

Length of body 2.2 mm, of wing 2.4 mm.

Female unknown.

Holotype male, Nova Teutonia, Santa Catarina, Brazil, IX.1977 (F. Plaumann) (CAS No.16920); abdomen and genitalia mounted on a small slide and pinned with specimen.

Distribution. Brazil.

Remarks. This species differs distinctly from *A. plaumanni* Spencer (1963) by its small size, very narrow gena, number of *dc* and presence of serrulation on tubes of the distiphallus.

2. *Ophiomyia buscki* (Frost)

Agromyza buscki Frost, 1936: 315.

Specimen examined. 1 ♀, Estação Biológica de Boracéia (850 m), São Paulo, 27.II.1967 (M. I.), by Malaise trap.

Distribution. Argentina, Brazil, Panama.

IV. BOLIVIAN SPECIES

1. *Amauromyza* (*Annimyzella*) *maculosa* (Malloch)

Specimen examined. 1 ♀, 50 mil. N. of Potosi, 22.II.1951 (R. & M.).

Distribution. See p.16. New to Bolivia.

2. *Amauromyza* (*Cephalomyza*) *boliviensis* n. sp.

Female. Head testaceous, ocellar triangle and back of head black; parafrontalia brown to black between bases of *or* and orbit, both *vt* growing on black vertex; face excepting epistoma brown; peristome linearly black; antenna and palpus brownish black. Thorax and abdomen black; mesonotum mat, densely gray dusted; abdomen less dusted, weakly shining; T6 with yellow posterior margin; ovipositor sheath shiny except for pubescent basal 1/3. Wing very faintly tinged with brown; calypter grayish, with margin and fringe brownish black; legs entirely black.

Frons twice as wide as width of eye, parallel-sided, with ventral part including lunule conspicuously projecting above eye in profile, dorsal parafrontalia slightly projecting above eye; one reclinate *ors* at inner margin of parafrontalia, four incurved *ori* at center of parafrontalia; *oh* minute, in a dense row; parafacialia wider than parafrontalia; epistoma slightly lower than height of face, about twice as high as width of 3rd antennal segment; gena 1/2 height of eye; *pm* six; 3rd antennal segment slightly narrowed apically, slightly longer than wide, minutely pilose; arista longer than height of eye, minutely pubescent.

Mesonotum with 1+3 *dc*, four rows of *acr*. Wing with 2nd costal section about three times as long as the 3rd or 4th, r-m before middle of discal cell, ultimate section of M_{1+2} 4.5 times as long as the penultimate, ultimate section of M_{3+4} slightly longer than penultimate (20:15).

Lengths of body and wing 3.1 mm, respectively.

Male unknown.

Holotype female, Puente, S. Bolivia, 19.II.1951 (R. & M.) (CAS No.16921).

Distribution. Bolivia.

Remarks. This is the first record on the occurrence of the subgenus *Cephalomyza* in the Neotropical Region. *A. (C.) boliviensis* resembles *scleritica* Spencer (1981), known from California, but is immediately distinguishable by its large size, coloration of head, and large discal cell.

Acknowledgement

I am indebted to Dr. Paul H. Arnaud, Jr., California Academy of Sciences, San Francisco, for enabling me to examine the South American specimens.

References*

- Sasakawa, M., 1992. The Neotropical Agromyzidae (Diptera) Part 1. New or little-known species from Argentina. *Jpn. J. Ent.*, **60**: 346-357.
- , 1992. The Neotropical Agromyzidae (Diptera) Part 2. New or little-known species from Colombia. *Akitu*, n. ser., in press.
- , 1992. The Neotropical Agromyzidae (Diptera) Part 3. New or little-known species from Ecuador. *Jpn. J. Ent.*, in press.
- Spencer, K. A., 1966a. New and interesting Agromyzidae from Florida. *Stuttg. Beitr. Naturk.*, **158**: 1-20.
- , 1966b. Notes on the Neotropical Agromyzidae - 1. *Papeis Avulsos Dept. Zool. Sao Paulo*, **19**:141-150.
- , 1973. Agromyzidae (Diptera) of economic importance. *Ser. Ent.*, **9**:1-418, The Hague (Dr. W. Junk).
- , 1977. Notes on world Agromyzidae, with the description of 16 new species (Diptera: Agromyzidae). *Beitr. Ent., Berlin*, **27**:233-251.
- Spencer, K. A. & C. E. Stegmaier, Jr., 1973. Agromyzidae of Florida, with a supplement on species from the Caribbean. *Arthropods of Florida and neighboring land areas*, **7**:1-205, Gainesville (Fla. Dept. Agric.).

* See the references in Parts 1-3.