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Notes on the Oriental Agromyzidae - 4

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With 28 Figures

The material considered here is from Burma, Formosa, India, Indonesia and Pakistan, partly collected by R. Malaise, V. K. Sehgal and the author and partly submitted for identification by the Commonwealth Institute of Entomology. A new genus and five new species are described and four new synonymies are established.

I am considering my paper (Spencer, 1965 b) in the Diptera of Nepal series as Note 3 in my current series on the Oriental Agromyzidae.

All drawings have kindly been prepared by my wife. The scale line in all cases represents 0.1 mm.

Genus *Agromyza* Fallén

Agromyza ceylonensis Spencer

Agromyza ceylonensis Spencer, 1961: 60

India: Namkum, 1 ♀, 12. VIII. 1962, ex leaf-mine on *Bambusa vulgaris* Schrad. (Sehgal). This specimen agrees exactly with the holotype from Ceylon.

The aedeagus of the holotype is illustrated in Figs. 1, 2; this is typical of the grass-feeding *Agromyza* species (cf. Spencer, 1962 b: Figs. 1, 2 and 3).

Genus *Japanagromyza* Sasakawa

Japanagromyza loranthi n. sp.

Head: frons narrow, equal to width of eye, not projecting above eye in profile; orbits conspicuously shining, with two strong ors, the upper weaker, and two ori; orbital setulae fine, sparse, reclinate; ocellar triangle not differentiated; lunule small, grey; jowls relatively broad, on average one-sixth vertical height of eye, deepest in centre.

Mesonotum: two strong pairs of dorso-centrals, pre-scutellars well-developed; acrostichals thick, in some ten rows.

Wing: length in female from 2.2—2.7 mm, first cross-vein variable but well before mid-point of discal cell, last section of m 4 two-thirds penultimate.

Legs: fore-tibia normally with one weak lateral bristle (absent in one of specimens examined), mid-tibia with two conspicuously strong bristles.

Colour: entirely black, mesonotum and abdomen brilliantly shining; squamae grey, fringe black.

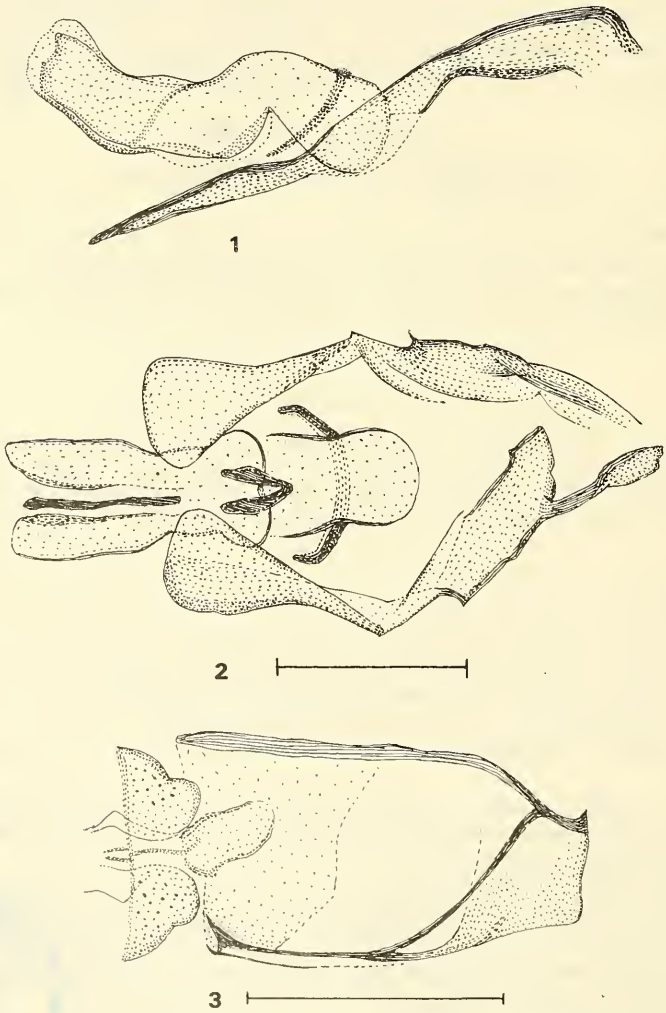
Puparium: orange or paler yellowish, posterior spiracles with three minute bulbs on a low spherical protuberance, the two spiracular processes widely-spaced, forming an equilateral triangle with the anus.

Holotype ♀, India: Pusa, collected 26. I. 1928, emerged 19. II. 1928, ex leaf-mine on *Loranthus* sp. (Loranthaceae); paratypes: 4 ♀♀, Pusa, one 30. III. 1925, three 27.–29. III. 1928, all ex *Loranthus* (Rangi, No. 2304). Holotype in British Museum (Natural History), three paratypes in Dept. of Entomology, Agricultural Research Institute, Delhi, one in author's collection.

In the absence of males it is not possible to include this species in the author's (1962 b) key to Oriental *Japanagromyza* species, nor in the extension of this key

provided by SASAKAWA (1963 c: 25). However, *J. loranthi* can be distinguished from the species with entirely yellow halteres on the following characters:

	Wing length mm	Mesonotum	Jowls	Mid-tibia	Frons	Posterior spiracles of larva
J. loranthi	2.2—2.7	shining black	relatively broad $^1/_6$th eye height	2 bristles	equal to eye width	3 bulbs
J. eucalypti Spencer	1.9—2.2	—	narrow	—	—	numerous bulbs
J. triformis Spencer	—	—	extremely narrow	—	—	—
J. trifida Spencer	—	more mat	—	—	—	—
J. trientis Spencer	—	distinctly mat	$^1/_{20}$th eye height	—	—	—
J. insularum Spencer	—	distinctly mat	$^1/_{12}$th eye height	—	—	—
J. incisa Sasakawa	—	—	—	1 bristle	—	—
J. stylata Sasakawa	—	densely grey-dusted	—	—	$1^1/_2$ times eye width	—



Figs. 1—2. *Agromyza ceylonensis* Spencer: 1, aedeagus, side view; 2, same, ventral view.
Fig. 3. *Ophiomyia centrosematis* (de Meij.): aedeagus, ventral view.

Japanagromyza trispina (Thomson)

Agromyza trispina Thomson, 1869
Japanagromyza trispina (Thomson), Spencer, 1965 b: 25
Agromyza variihalterata Malloch, 1914
Japanagromyza variihalterata (Malloch), Spencer, 1961: 65
Japanagromyza nawai Kato, 1961: 197, **syn. nov.**

Since synonymising *J. variihalterata* with *J. trispina*, Kato's (1961) paper has come to my notice containing a detailed description of both adult and the early stages of *J. nawai*, a blotch-miner on *Glycine* and *Pueraria*. It is clear that *J. nawai* is identical with *J. trispina* and this new synonymy is established herewith.

Genus *Ophiomyia* Braschnikov

Ophiomyia centrosematis (de Meijere), **comb. nov.**

Melanagromyza centrosematis de Meijere, 1940. Lectotype ♀, designated by Spencer, 1962 b, in Zoological Museum, Amsterdam

I am now satisfied that this species correctly belongs in the genus *Ophiomyia*, to which it is transferred herewith. It is clear that this is the species forming stem-mines on *Glycine* in Formosa, which I previously thought to be an *Ophiomyia* n. sp. (Spencer, 1962 b: 677).

A further illustration of the aedeagus of a paralectotype is given in Fig. 3 (cf. Spencer, 1963: Fig. 12); it very closely resembles that of *O. orbiculata* (Hendel) (cf. Spencer, 1964 b: Fig. 63) which feeds in stems of *Vicia* and *Pisum* in Europe. The larval spiracles are also typical of other *Ophiomyia* species.

Sehgal has recently bred the species at Namkum, Bihar, India from mines in the pods of *Tephrosia candida* DC., 21. II. 1963. The genitalia and pupal spiracles agree with those of specimens from *Glycine* and *Centrosema*.

Genus *Melanagromyza* Hendel

Melanagromyza asteracanthae **n. sp.**

Head: frons slightly wider than eye viewed from above, not projecting above eye in profile; eyes conspicuously wide, in male with distinctive patch of slightly proclinate, brownish hairs at level of ors; orbits narrow, with two ors and two ori, all long and approximately equal; orbital setulae fine, sparse, reclinate; jowls narrow, one-tenth vertical height of eye, cheeks linear; ocellar triangle large, brilliantly shining, apex extending just beyond level of lower ors; lunule slightly higher than semicircle; arista conspicuously long, five-sixths vertical height of eye.

Mesonotum: second dorso-central far behind level of supra-alar, only slightly in front of intra-alar; acrostichals numerous, in some 10—12 rows.

Wing: length from 2.7 mm in male to 3.2 mm in female, costa extending strongly to vein m 1 + 2, last section of m 4 two-thirds penultimate.

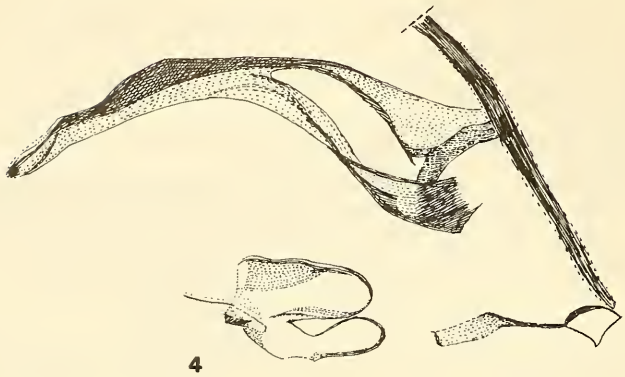
Legs: mid-tibiae with two strong lateral bristles.

Colour: head black but lunule distinctly greyish; mesonotum shining blackish-green, abdomen brilliantly shining green; squamae and fringe silvery-white, margin scarcely differentiated.

Male genitalia: aedeagus in side and ventral views (Figs. 4, 5), typical of the genus.

Puparium: pale brownish, posterior spiracles (Fig. 6) arising from common protuberance, the two processes separated by slightly more than own diameter, each with an ellipse of 12 bulbs, central horn lacking, reduced to a slight swelling.

Holotype ♂, India: Bangalore, 16. XII. 1962, ex leaf-mine on *Asteracantha* sp. (Acanthaceae); paratypes, 1 ♂, 2 ♀♀, same data, 1 ♂, 10. II. 1963 (all C. I. B. C.).



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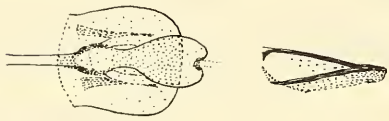

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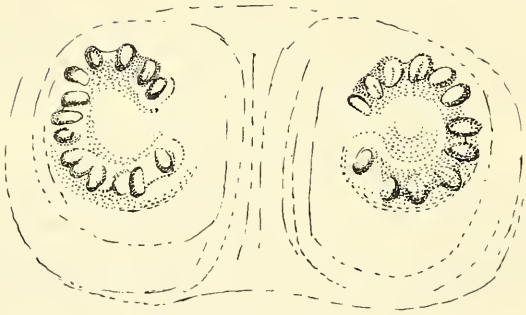

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Figs. 4—6. *Melanagromyza asteracanthae* n. sp.: 4, aedeagus, side view, with ninth sternite; 5, aedeagus, ventral view; 6, posterior spiracles of puparium.

This species can be included in following revision of couplets 10—14 of the author's (1961) key to Oriental *Melanagromyza* species:

10 Eye entirely bare in male 11
— Eye in male with distinct patch of hairs 12
11 Small species, wing length 1.9—2.3 mm . . . . . *albisquama* (Malloch)
— Larger species, wing length in male 2.5 mm . . . . . *cordiophoeta* Spencer
12 Arista only slightly pubescent, appearing bare 13
— Arista conspicuously pubescent 14
13 Mesonotum blackish-blue or blackish-green; small species, wing length 2.2—2.5 mm *cleomae* Spencer
— Mesonotum brighter, shining green; larger species, wing length 2.5—2.8 mm *gerberivora* Spencer
14 Hairs on eye distinctly brownish . . . . . *asteracanthae* n. sp.
— Hairs on eye white 15

Reliable identification of the group of shining greenish species to which *M. asteracanthae* belongs is difficult and in caught specimens examination of male genitalia is essential. Clarification of the two further species, *M. lasiops* (Malloch) and *M. erythrinae* (de Meijere) by the illustration of the genitalia of the holotypes is now desirable, to facilitate accurate identification.

This is the first true *Melanagromyza* reported as a leaf-miner and I feel the exact feeding habit requires confirmation; it is possible that the larva feeds partially at least in the mid-rib, in this way largely conforming to the stem-boring habit of all other species in the genus, as restricted by SPENCER (1965 c).

Melanagromyza cleomae Spencer

Melanagromyza cleomae Spencer, 1961: 70. Holotype ♂ in author's collection

I previously (SPENCER, 1962 b: 673) identified females bred from stems of *Brassica alboglabra* L. A. Bailey at Singapore as *Melanagromyza* sp. *(Brassica)*, suggesting that this probably represented an undescribed species.

I have now been able to examine a male bred from "cabbage stems" at Singapore (Dept. of Zoology, University of Malaya) and have confirmed that the species is *M. cleomae*, which was described from specimens caught on *Cleome* (Capparaceae) at Singapore and Colombo.

The aedeagus of *M. cleomae* is shown in Figs. 7, 8. The distinctive basiphallus is conspicuously similar to that of *M. albocilia* Hendel from Europe (cf. SPENCER, 1965 c: Figs. 5, 6); the differences in the distiphallus, however, suggest that the two species are distinct.

This is the second species known to feed on Cruciferae and Capparaceae [also *L. brassicae* (Riley)].

Melanagromyza conspicua Spencer

Melanagromyza conspicua Spencer, 1961: 71. Holotype ♂ in author's collection
Melanagromyza joycei Sasakawa, 1963 a: 417, **syn. nov.** Holotype ♂ in Bishop Museum, Honolulu

This species was described from Singapore and Ceylon and has since been recorded in Australia (SPENCER, 1963: 315), the Philippines (SPENCER, 1962 b: 670), New Guinea (SPENCER, 1962 a: 655) and New Hebrides (SASAKAWA, 1963 b: 494).

SASAKAWA (1963 a: 417) described *M. joycei* as a new species from New Caledonia, citing trivial differences from *M. conspicua*. *M. joycei* is without question synonymous with *M. conspicua*.

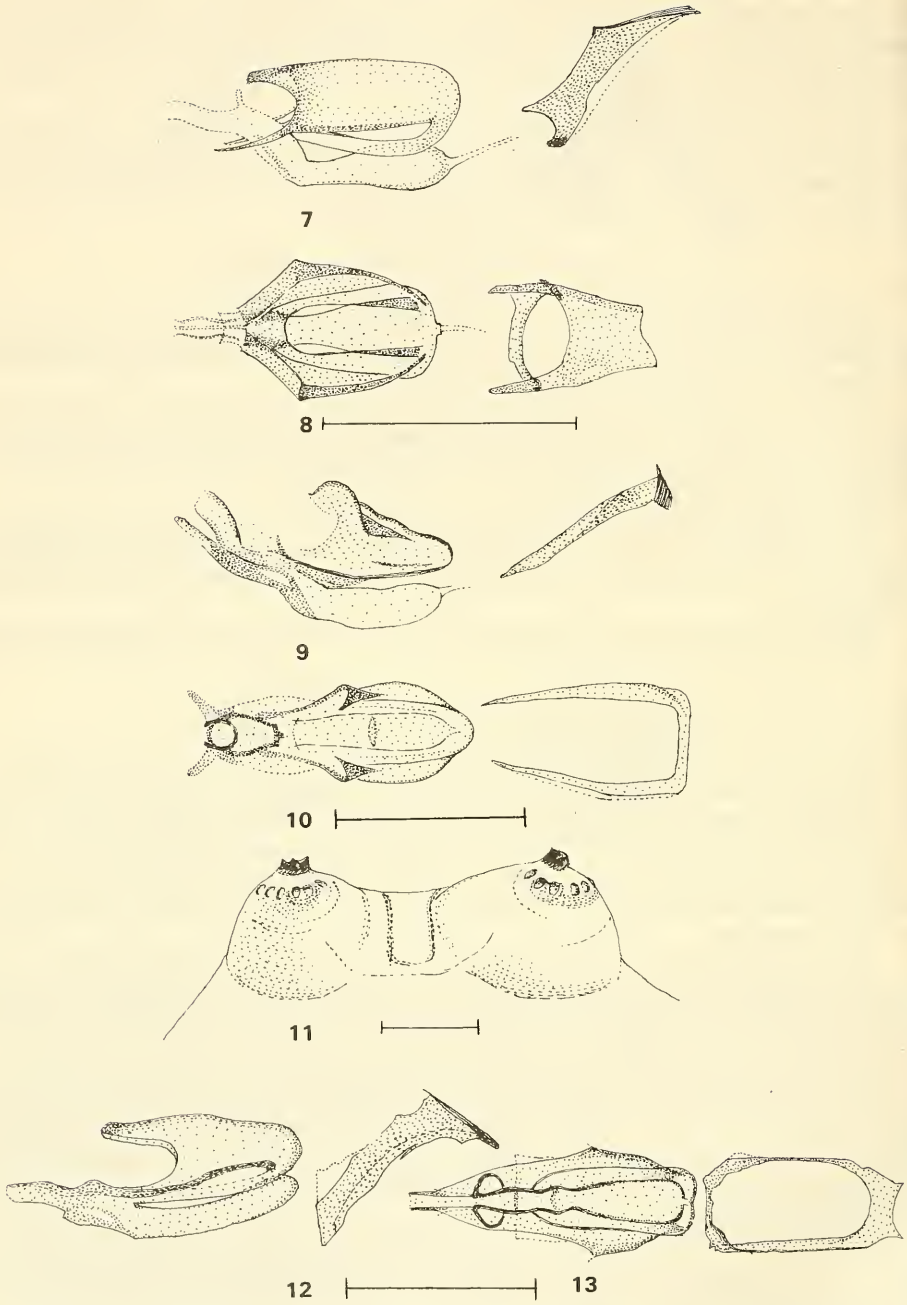
The host-plant of this widespread species has not hitherto been known but I have recently examined a male and female from India: Bangalore, 27. VIII. 1964, confirmed by male genitalia as representing *M. conspicua*, which were bred from "stem-galls" on *Eclipta alba* Hassk. *Eclipta* is an introduced plant of South American origin and it is now clear that the species feeds on a wide range of Compositae, including *Siegesbeckia* on which I caught five specimens in Australia. Whether the species is a true gall-causer seems doubtful. It more probably feeds either inside the stem, causing a swelling at the point of pupation, which may have been mistaken for a gall in the Indian specimens; or as a stem-miner, where pupation also frequently causes a swelling in many *Ophiomyia* species.

The generic placing of this species requires further study. The aedeagus resembles that of two Australian *Ophiomyia* species, *O. angustilunula* Spencer, 1963 and *O. micra* Spencer, 1963 but until additional material is available the species is best retained in *Melanagromyza*.

Melanagromyza cuscutae Hering

Melanagromyza cuscutae Hering, 1958; SPENCER, 1962 b: 670

Pakistan: Abbotabad, 2 ♂♂, 2 ♀♀, 15. VII. 1961, reported as ex stems of *Carduus nutans* L. (GHANI, C. I. B. C.).



Figs. 7—8. *Melanagromyza cleomae* Spencer: 7, aedeagus, side view; 8, same, dorsal view.
Figs. 9—10. *Melanagromyza cuscutae* Hering: 9, aedeagus, side view, 10, same, dorsal view.
Figs. 11—13. *Melanagromyza hibisci* Spencer: 11, posterior spiracles of puparium; 12, aedeagus, side view; 13, same, dorsal view.

This species is known as a feeder in fruits and stems of *Cuscuta* spp. I record the report of it occurring in stems of *Carduus* with reservation; this possibly represents an unusual case of host transference but it cannot be excluded that some mistake was made in the host identification.

The aedeagus of a specimen from Abbotabad is shown in Figs. 9, 10.

Melanagromyza hibisci Spencer

Melanagromyza hibisci Spencer, 1961: 73

I have seen a further series of this species, from Coimbatore, S. India, 15. VIII. 1940. The posterior spiracles of the puparium are shown in Fig. 11.

The male genitalia are distinctive and the aedeagus of a paratype from New Delhi is shown in Figs. 12, 13.

Melanagromyza metallica (Thomson)

It was recently discovered by the author and V. K. Sehgal that this widespread species feeds in stems of Compositae. The posterior spiracles of a specimen bred from a stem of *Ageratum conyzoides* L. at Namkum, India, 15. I. 1963 (Sehgal) are shown in Fig. 14.

Melanagromyza obtusa (Malloch)

The larva of this widespread Oriental species feeds in the pods of Leguminosae, particularly *Cajanus*. There are specimens in the British Museum (Natural History) and at the Agricultural Research Institute, New Delhi from Pusa, 3. IV. 1928 stated to have been bred from stems of *Rumex maritimus* L., which I have now confirmed from male genitalia as *obtusa*. It seems possible that some mistake may have been made either with the data labels or with the identity of this host-plant.

The distinctive aedeagus of this species is shown in Fig. 15.

Melanagromyza theae (Green)

Agromyza theae Green, 1896
Agromyza atomella Malloch, 1914, **syn. nov.**
Melanagromyza styricicola Sasakawa, 1954, **syn. nov.**

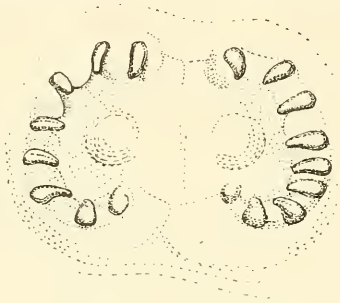
It has hitherto been accepted that this species is monophagous on *Camellia theae*, as opposed to the very similar species, *M. atomella* (Malloch), which is highly polyphagous (cf. Sasakawa, 1961: 351 as *styricicola* Sas.; Spencer, 1963: 312).

I have now examined a further long series of specimens bred from tea at Namkum, India and also other specimens from the same locality bred from *Albizzia lucida* Benth. (Leguminosae), *Gloriosa superba* L. (Liliaceae), *Cedrela toona* Roxb. (Meliaceae), *Cryptolepis buchanani* Roxb. (Asclepiadaceae) and *Sida carpinifolia* L. (Malvaceae), including five further male genitalia preparations, and I am satisfied that these specimens all represent the same species. This material was kindly sent me by V. K. Sehgal who has also bred the species from the following further hosts: *Careya arborea* Roxb. (Myrtaceae), *Ficus hispida* L. (Urticaceae), *Firmiana colorata* Roxb. (Sterculiaceae), *Gardenia jasminoides* Ellis (Rubiaceae), *Hemidesmus indicus* Br. (Asclepiadaceae), *Nyctanthus arbor-tristis* L. (Oleaceae) and *Plumeria* sp. (Apocynaceae).

I have also examined the larval mouth-parts of three specimens:
ex *Camellia theae*, Ranchi, Bihar, India, Aug., 1963 (Sehgal)
ex *Albizzia lucida*, Ranchi, Bihar, India, Aug., 1963 (Sehgal)
ex *Passiflora cinnabarina*, Waterfall, nr. Sydney, N.S.W., 29. I. 1961 (K.A.S.)
All three are identical and agree exactly with Sasakawa's drawing of *M. styricicola* (1961: Fig. 32 e).

Sasakawa (1961: 351—2) attempts to differentiate *M. styricicola* (= *M. atomella*) from *M. theae*. In some cases the differences cited are inaccurate, such as the height of the gena, which in specimens from *tea* is extremely narrow, approximately one-fifteenth

the eye height, while in a specimen from *Euonymus* in Japan, the height is one-tenth the eye height; it is thus not correct that in *styricicola* the gena height is $^1/_{16}$ to $^1/_{18}$ the eye height and in *theae* $^1/_8$th. In other cases the differences are not constant such as a mid-tibial bristle always being present in *styricicola* and either present or lacking in *theae;* this bristle is clearly in the process of being lost and is retained in some, fre-



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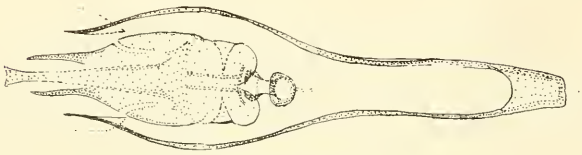

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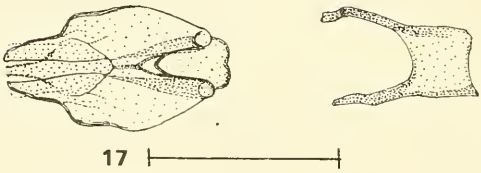

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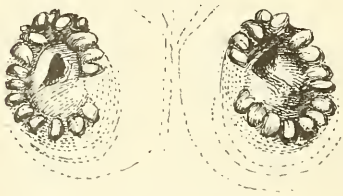

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Fig. 14. *Melanagromyza metallica* (Thomson): posterior spiracles of puparium.
Fig. 15. *Melanagromyza obtusa* (Malloch): aedeagus, dorsal view.
Figs. 16—18. *Melanagromyza urticivora* n. sp.: 16, aedeagus, side view; 17, same, dorsal view; 18, posterior spiracles of puparium.

quently the larger specimens, but is not here of specific significance. It is absent in most of the Indian specimens bred from hosts other than *tea*. Specimens from *tea* I have examined do not have parafrontalia projecting above the eye nor acrostichals in eight rows but in both characters agree completely with typical *styricicola*. SASAKAWA's illustrations suggest a difference in the anterior larval spiracles between *styricicola* (Fig. 32 m) and *theae* (Fig. 33 m). KURODA (1960: Fig. 4 e) has also illustrated this spiracle in a larva obtained on *tea* in Japan and it agrees not with SASAKAWA's *theae* but with *styricicola*.

I therefore establish the synonymy of this species as given above. It seems probable that *M. coffeae* (Koningsberger) also represents the same species but, in the absence of any bred specimens from coffee at the present time, this further synonymy must be delayed for the time being.

Melanagromyza urticivora n. sp.

Head: frons broad, twice width of eye, orbits strongly differentiated, distinctly projecting above eye, with two ors and three equal, inclined ori; orbital setulae fine, all proclinate; lunule large, ocellar triangle broad, somewhat indistinct at apex; jowls rounded, deepest in centre, one-quarter vertical height of eye, cheeks forming narrow ring below eye; eye with conspicuous patch of white hairs at level of ors in male; antennae separated by narrow facial keel.

Mesonotum: second dc strong, just behind level of supra-alar; acrostichals in some 10 rows in front, extending somewhat irregularly with six rows almost to margin of scutellum.

Wing: length from 2.4 mm in male to 3 mm in female, costa extending strongly to vein m 1 + 2, last section of m 4 two-thirds penultimate.

Legs: mid-tibia with one or two strong lateral bristles.

Colour: ocellar triangle and orbits only faintly shining; mesonotum predominantly shining black, faintly greenish, somewhat dull viewed from front; abdomen brilliantly shining, greenish; squamae and fringe white.

Male genitalia: aedeagus typical of stem-boring species, as in Figs. 16, 17.

Puparium: pale yellowish-brown, posterior spiracles separated by own diameter, each with an ellipse of 14 bulbs surrounding a small, indistinct horn (Fig. 18).

Holotype ♂, Pakistan, Murree, c. 6000 ft., 13. VIII. 1961, ex stem *Urtica* sp.; paratypes: Murree, 2 ♀♀, 7. II. 1962; Bahrain, nr. Rawalpindi, 2 ♀♀, 18. X. 1961 — all ex *Urtica* stems. Holotype and three paratypes in British Museum (Natural History), one paratype in author's collection. This species can be included in the author's key to Oriental *Melanagromyza* species (1961: 66) by changing 5 to 3 a in the second alternative of couplet 3 and adding new couplet as follows:

3a Frons strongly projecting; orbital setulae proclinate . . . . *urticivora* n. sp.
— Frons not projecting above eye; orbital setulae reclinate 5

It is immediately distinguishable from *M. aenea* (Meigen) which feeds in *Urtica* stems in Europe by the white squamal fringe and shorter orbital setulae; the horn on the larval posterior spiracular processes is significantly smaller and there are slight differences in the genitalia (cf. SPENCER, 1965 c: Figs. 1—2).

Genus *Phytobia* Lioy

NOWAKOWSKI (1962) restricted *Phytobia* Lioy to the large, cambium-boring species, placed by HENDEL (1931—6) in the sub-genus *Dendromyza* and FRICK (1952) in the sub-genus *Phytobia*. These species are easily mistaken for *Agromyza* species but the sub-costa definitely continues to the costa at least as a fold. SASAKAWA (1963 c) correctly noticed that the genitalia had characters belonging to the Phytomyzinae, but nevertheless erected a new genus *Shizukoa* in the Agromyzinae for four species clearly belonging to *Phytobia*. *Shizukoa* was synonymised with *Phytobia* by SPENCER (1965 a). SASAKAWA

(1963 c) gave a partial key to Oriental *Shizukoa* species but overlooked three species, *Phytobia nigrita* (Malloch), 1914, *Phytobia albohalterata* (de Meijere), 1914 and *Phytobia diversata* Spencer, 1961. The African species in this genus were recently reviewed by Spencer (1966).

One new species is described and the seven other known Oriental species are listed below. A new key for these eight species is also given below.

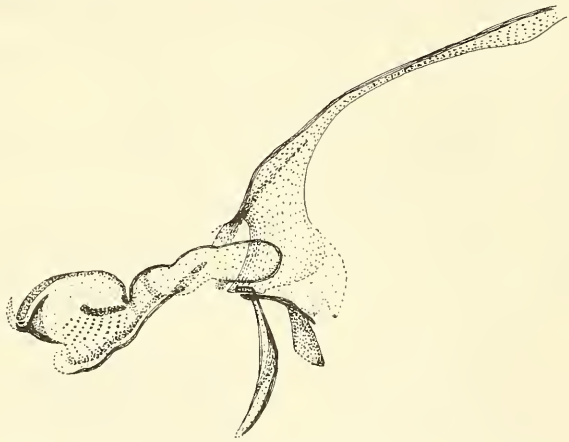
Phytobia gigas n. sp.

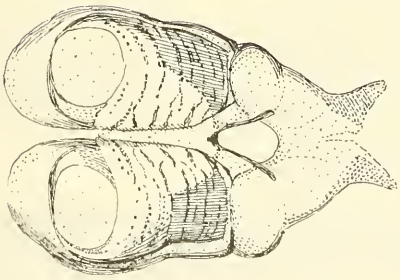
This is the largest species known in the family Agromyzidae.

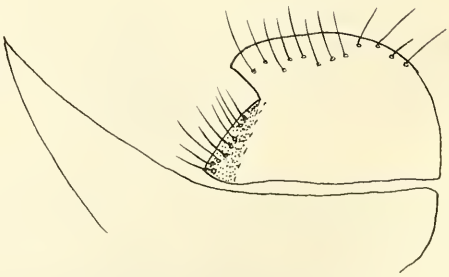
Head: width 2 mm, frons twice width of eye, not or just slightly projecting above eye in profile; orbits somewhat shining, slightly raised, otherwise not differentiated; two ors, three ori (broken, relative lengths not ascertainable), orbital setulae fine, sparse, reclinate; ocellar triangle not differentiated; lunule broad, semicircular; jowls flat below, one-quarter vertical height of eye.

Mesonotum: 3 + 1 strong dorso-centrals, pre-scutellars and intra-alar equal to third dc; acrostichals in some eight rows.

Wing: length in male 6.5 mm, costa extending strongly to apex of vein m 1 + 2, last section of m 4 slightly variable, from two-thirds to almost equal with penultimate; first cross-vein just beyond midpoint of discal cell.







Figs. 19—21. *Phytobia gigas* n. sp.: 19, aedeagus, side view; 20, distiphallus, ventral view; 21, surstylus.

Legs: mid-tibiae with two strong lateral bristles.

Colour: frons variable, either mat black behind becoming reddish towards lunule or entirely reddish-brown; lunule reddish-silvery; first and second antennal segments reddish-brown, third similar or more black in front; cheeks reddish-brown; mesonotum distinctly greyish, weakly shining, abdomen more black, epandrium paler, brownish; wing base and narrow upper- and hind-margins of mesopleura conspicuously orange, pleura otherwise black; legs entirely black; squamae whitish-orange, fringe black.

Genitalia: aedeagus in side view as in Fig. 19, paired distiphallus in ventral view as in Fig. 20; ninth sternite essentially V-shaped, apex slightly rounded; spermal sac with greatly enlarged blade; surstyli separated by very narrow suture, with hairs (no spines) on inner margin (Fig. 21).

Holotype ♂, Burma, Kambaiti, 7000 ft., 9. V. 1934; one ♂ paratype, same locality, 5. V. 1934 (both R. Malaise). Holotype in Naturhistoriska Riksmuseet, Stockholm, paratype in British Museum (Natural History).

Phytobia albohalterata (de Meijere)

Agromyza albohalterata de Meijere, 1914. Holotype ♀ in Zoological Museum, Amsterdam
Dizygomyza (= *Phytobia*) *albohalterata* (de Meij.), de Meijere, 1922: 23

Spencer (1961: 83) synonymised this species with *nigrita* (Malloch) but in view of the very small differences separating species which are now known as distinct in this genus, I consider this species must be resurrected. The wing venation (see key below) clearly indicates that this is a good species.

Phytobia diversata Spencer

Phytobia diversata Spencer, 1961: 81. Holotype ♀ in Deutsches Entomologisches Institut, Berlin

Phytobia maai (Spencer), **comb. nov.**

Agromyza maai Spencer, 1962 b: 664. Holotype ♂ in Bishop Museum, Honolulu
Shizukoa maai (Spencer), Sasakawa, 1963 c: 38

Phytobia magna (Sasakawa), **comb. nov.**

Shizukoa magna Sasakawa, 1963 c: 39. Holotype ♀ in Bishop Museum

Phytobia nigrita (Malloch)

Agromyza nigrita Malloch, 1914: 320. Holotype ♀ in Hungarian National Museum, Budapest
Phytobia nigrita (Malloch), Spencer, 1961: 82

Phytobia propincua (Sasakawa), **comb. nov.**

Shizukoa propincua Sasakawa, 1963 c: 40

Phytobia seticopia (Sasakawa)

Shizukoa seticopia Sasakawa, 1963 c: 41. Holotype ♂ in Bishop Museum
Phytobia seticopia (Sasakawa), Spencer, 1965 a: 8

Key to Oriental *Phytobia* species

1 Exceptionally large species, wing length 6.5 mm . . . . . *gigas* n. sp.
— Smaller species, wing length at most 4.5 mm 2
2 Scutellum yellow . . . . . *diversata* Spencer
— Scutellum concolorus with mesonotum, grey or black 3
3 Last section of vein m 3 + 4 three times length of penultimate *albohalterata* (de Meij.)
— Last and penultimate sections of m 3 + 4 approximately equal 4
4 Fore-tibia with lateral bristle . . . . . *seticopia* (Sasakawa)
— Fore-tibia without lateral bristle 5
5 Large species, wing length up to 4.3 mm . . . . . *magna* (Sasakawa)
— Smaller species, wing length 3 mm 6

6 Orbits projecting above eye in profile . . . . . *propincua* (Sasakawa)
— Orbits not projecting 7
7 Frons narrow, equal to width of eye . . . . . *atrata* (Malloch)
— Frons broader, 1½ times width of eye . . . . . *maai* (Spencer)

Pseudoliriomyza n. gen.

Type of genus: *Liriomyza cordiae* Spencer, 1959.

Adult: small species, wing length up to 2 mm; costa extending strongly to vein m 1 + 2, last section of m 4 twice penultimate. Only three fully-developed dorso-centrals, third at level of supra-alar, four or five further minute bristles beyond dc, similar to acrostichals. Frons and antennae yellow; mesonotum conspicuously mat, ash-grey, with narrow V-shaped yellow patch before scutellum, apex of V not reaching level of second dc; scutellum yellow centrally; pleura largely yellow.

Male genitalia: aedeagus as in Figs. 22, 23, distiphallus large, with symmetrically paired tubules; ninth sternite black, broadly U-shaped (Fig. 24), postgonites large, black (Fig. 25); aedeagal apodeme broad, black in distal third, remainder whitish, narrow; surstyli not separated by suture, with three areas of distinct chitinization (Fig. 26).

Puparium: deep reddish-brown, not shining, deeply segmented; anterior spiracles each with 4—5 bulbs, posterior with 3 rather large bulbs.

Pseudoliriomyza cordiae (Spencer), comb. nov.

Liriomyza cordiae Spencer, 1959: 310

Java: Surabaya, numerous specimens, ex leaf-mines on tree, Sept., 1964 (N. Krauss).

This species was originally described from Tanganyika, where it was bred from leaf-mines on *Cordia ovalis* R. Br. ex D. C. It is thus probable that the host in Java was also *Cordia* sp.

Although this species superficially resembles certain species in the genus *Liriomyza*, the entirely distinctive genitalia confirm that it belongs to a separate genus, described above. The characteristic arrangement of the dorso-central bristles and the coloration of the mesonotum also appear to be distinctive features of the genus.

Genus *Phytomyza* Fallén

I have re-examined the specimen from Formosa identified by Malloch (1914: 334) as *affinis* Fallén and subsequently identified by Spencer (1961: 96) as *robustella* Hendel. It can now be seen that the Formosan specimen on external characters most closely resembles *P. penicilla* Hendel (1931—6: 452), which is recognisable within the *robustella* group by its long antennal pubescence; however, the genitalia are entirely distinct and indicate that the two species are not closely related. The new species is described below as *formosae* n. sp.

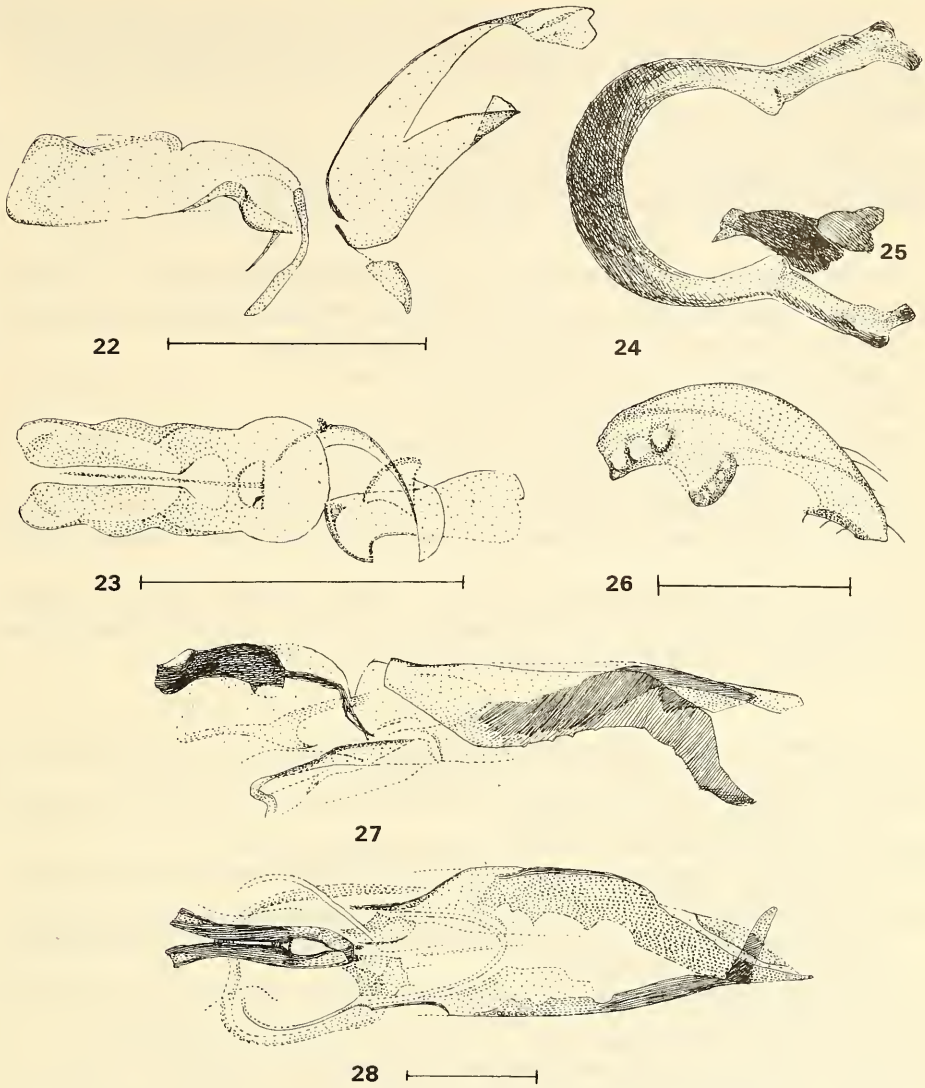
Phytomyza formosae n. sp.

Head: frons broad, almost twice width of eye, not projecting above eye in profile; two equal ors, two ori, the lower substantially weaker; third antennal segment round, with distinct pubescence.

Mesonotum: 3 + 1 strong dorso-centrals, fourth in front of pre-sutural; acrostichals irregularly in 3 or 4 rows in front, reduced to 2 rows at level of third dc.

Wing: length in male 3.5 mm, second costal segment three times length of fourth.

Colour: frons yellow, both vt arising from black ground, face essentially yellow but somewhat brown around bases of antennae; palps and antennae black; mesonotum entirely mat, grey, pleura blackish-grey, only narrowly yellow on upper- and hind-margins; legs black, knees of all legs just perceptibly yellow.



Figs. 22—26. *Pseudoliriomyza cordiae* (Spencer): 22, aedeagus, side view; 23, same, ventral view; 24, ninth sternite; 25, postgonite; 26, surstylus.
Figs. 27—28. *Phytomyza formosae* n. sp.: 27, aedeagus, side view; 28, same, dorsal view.

Male genitalia: aedeagus ending in distinctive paired tubules (Figs. 27, 28).

Holotype ♂, Formosa, Taihoku, April, 1912 (Sauter), in Hungarian Natural History Museum.

Genus *Ptochomyza* Hering

Ptochomyza asparagivora Spencer

Ptochomyza asparagivora Spencer, 1964 a: 39

Pakistan: Rawalpindi, 1 ♂, 28. I. 1961 bred ex stems *Asparagus* sp.

This specimen is tentatively referred to *asparagivora,* described from Abyssinia. It agrees closely with the type series, although unfortunately the third antennal segment is missing.

The genitalia are of the same general form as in *asparagivora* but the ninth sternite is conspicuously stouter, fully developed and almost square apically and in the distiphallus the paired arms are more slender and the two minute terminal processes are lacking (cf. SPENCER, 1964 a: Fig. 51).

I hesitate to treat this as a distinct species, at least until additional material is available permitting the antennae to be compared with those of the type series of *asparagivora*, in which the arista is conspicuously short and distinctive.

Species found by the author at Agricultural Research Institute, Delhi, 18. XI. 1962.

1. *Agromyza nana* Mg. Leaf-mines with larvae on *Melilotus* sp. and *Trigonella* sp. This is the first record of this palaearctic species in India.
2. *Ophiomyia beckeri* (Hendel). Leaf-mines on *Launaea* sp. Previously recorded in India at Chandigarh (SPENCER, 1962 b: 669).
3. *Melanagromyza alysicarpi* Bezzi. A single leaf-mine with a dead larva found on *Alysicarpus* sp. Previously recorded in India at Madras (SPENCER, 1963: 312).
4. *Melanagromyza metallica* (Thomson). Larvae found in stems of *Ageratum conyzoides* but no adults obtained. Subsequently reared from same host by SEHGAL (1965: 5).
5. *Liriomyza compositella* Spencer. Leaf-mines in large numbers found on *Xanthium strumarium* L. Twenty-eight adults emerged 4—6. XII. 1962. Previously known from Bombay, Ceylon and Formosa (SPENCER, 1961: 87).

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