

Four new Hawaiian *Liriomyza* species and notes on other Hawaiian Agromyzidae (Diptera)¹

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While preparing a revision of the North American species which key out to *Agromyza pusilla* Meigen in either of Malloch's two keys (1913, 1918), the writer found the species herein described to be distinct. Because of the relative importance of these species from an economic standpoint, it was felt that names should be given to them immediately. However, these species will be included in the revisional paper so that they may be placed in the keys and be compared directly with the other species in the group. A key is not included here because certain of the specimens studied do not belong to any of the described species. More specimens are needed before further descriptions can be made.

According to the descriptions, none of the four new species is similar to any species described by Malloch from Formosa (1914) or from Australia (1925, 1927). Paratypes of two of Watt's species (1923), which can be placed in the genus *Liriomyza*, were studied at the Illinois Natural History Survey collection. Neither of them is similar to the Hawaiian species.

The writer wishes to acknowledge the invaluable help of Dr. D. Elmo Hardy and Wallace C. Mitchell, of the University of Hawaii, in collecting and sending specimens especially for this study.

Liriomyza pullata new species

Female—Shining black and yellow. Head yellow, ocellar triangle and back of head black, black of back reaching eye margin immediately dorsad of the median posterior curve and extending to vertex; both vt setae arising from the black area, but vt₁ at edge of black; genovertical plates not darkened. Thorax with black of mesonotum extending nearly to humeri and slightly beyond prs, sa, and outer pa setae; posteriorly extending from outer pa seta to scutellum; scutellum with lateral black triangles of moderate size, basal sc setae arising from the edge of the triangles, but on the black; humeri with black area small, h seta arising from the yellow; anepisternum with black triangle about three-fifths its anterior height and extending posteriorly the entire ventral length, and uniting with a relatively broad black line along the posterior margin; katapisternum with an equilateral black triangle; meropleurite posteriorly about three-fourths black; rest of pleura yellow except for a relatively wide black stripe below the wing base. Legs with femora yellow, each with a small dorsal black spot at base, hind pair with a dorsal black stripe distally; tibiae and tarsi brownish. Wings hyaline, calypters with margin and fringe black. Abdomen intense shining black; only the second tergite narrowly yellow laterally, and with a narrow yellow stripe centrally; all segments posteriorly very narrowly yellow; sixth segment about one-third yellow; seventh segment shining black.

¹ Scientific Paper No. 1093, Washington Agricultural Experiment Stations, Pullman.

Head—Oval in profile. Eye only one and two-tenths times as high as long. Gena, midway between vibrissal angle and posterior margin, about one-fourth eye height; vibrissae strong, three short setae on subcranial margin. Genovertical plates not raised above eye margins; two sfo and two ifo setae; orbital setulae sparse, about four on a side. Antennae with third segment rounded, broader than long; setulae shorter than basal arista thickness; arista about as long as eye width, slightly thickened on basal one-fourth, distally tapering uniformly, setulae minute. Mouthparts of normal size.

Thorax—Setae of moderate length. First dc seta the longest, but only slightly longer than the second, third about two-thirds as long as first, and fourth about one-third as long as the first; second dc seta about one and three-fourths as far from the first as the third is from the second; fourth as far from third as third is from second; ia present, subequal to acr setae; inner pa seta one-half as long as outer pa; acr in four irregular rows, extending posteriorly to second dc setae, only about three posterior to this; seven and eight setae in the ia rows posterior to the transverse suture. Humeri with two or three setulae each, plus the h. Anepisternum with two dorsally directed setulae and three posteriorly, the latter in line with the aes.

Wing—About twice as long as broad. Costa terminating slightly posterior to wing tip, second costal segment about 2.5 times as long as the third, fourth about two-thirds as long as third; cross vein m-m at about its own length from r-m, at a strongly acute angle to penultimate section of M_{1+2} ; ultimate section of M_{1+2} about 11 times as long as the penultimate; ultimate section of M_{3+4} about 2.6 times as long as the penultimate.

Abdomen—Setae of moderate length, about three-fourths the length of the tergites, those on sixth segment longer; seventh segment with two irregular rows of short setae.

Size—1.5 mm. in body length.

Male—Smaller, about 1.25 mm. in body length; wing with ultimate section of M_{1+2} about 10 times as long as penultimate; second abdominal tergite laterally yellow, all others narrowly yellow laterally, dorsally the second segment with center yellow stripe, all segments very narrowly yellow along posterior margins, sixth segment about one-fourth yellow; ninth tergite black, cerci bright yellow.

Holotype ♀: Kanoa, Molokai, March 3, 1929, O. H. Swezey, collector, ex *Datura* sp., deposited in the Hawaiian Sugar Planters' Association Experiment Station collection. *Paratypes*: 1 ♀, topotypical; 1 ♀, Makolelau, Molokai, March 23, 1929, O. H. Swezey, collector, ex *Lipochaeta* sp.; 1 ♀, Honolulu, Oahu, September, 1951, W. C. Mitchell, collector, ex *Aster* sp.; 1 ♂, 1 ♀, Waimanalo, Oahu, January 31, 1951, D. E. Hardy, collector, sweeping; 1 ♀, Honolulu, Oahu, April, 1951, D. E. Hardy, collector, at light. Paratypes have been deposited in the collections of the U. S. National Museum, University of Hawaii, and that of the writer. Also studied was a headless male reared from *Aster* sp., same data as the female reared from *Aster*.

L. pullata is most closely related to *L. canomarginis* and has in common with it the prs seta arising from the black of the mesonotum, basal sc setae arising from the black lateral triangles, cross vein m-m at an acute angle to the penultimate section of M_{1+2} , and the setae of the abdomen equal in length to about three-fourths a tergal length. *L. pullata* is distinguished by the relatively short third and fourth dc setae, particularly the latter, the second dc seta being nearly twice as far from the first as from the third, margin of the calypter black, and the black abdomen with lateral and central yellow areas on the second tergite.

Liriomyza canomarginis new species

Male—Shining yellow and black. Head yellow, ocellar triangle and back of head black, black of back reaching eye margin immediately dorsad of the median posterior curve and extending dorsally to vertex; both vt setae arising from black area, although vti at edge; genovertical plates not darkened. Thorax with black of mesonotum extending laterally nearly to humeri, with the prs, sa and outer pa setae at the edge of the black; inner pa arising from black; scutellum with basal setae arising from the edge of the black lateral triangles; humeral black spot small, two setulae in it, other setulae and h on yellow; anepisternum with black area about one-half the anterior height and extending for nearly the entire ventral length, the dorsal margin slopes towards the posteroventral angle of the aes, and then rises abruptly to include the row of setae along the posterior margin; katepisternum with an equilateral black triangle; meropleurite posteriorly about two-thirds black; rest of pleura yellow except for a rather thin elongate black stripe extending from the wing base nearly to the posteroventral angle of the aes. Legs with femora yellow except for a small dorsal black area on all pairs, and a few darker stripes, particularly on hind pair; tibiae brownish, tarsi somewhat darker. Wings hyaline, margin and fringe of calypters scarcely darkened, grayish. Abdomen black dorsally, all tergites laterally rather broadly yellow, yellow extending onto dorsum; all tergites narrowly yellow posteriorly, sixth wider, about one-fourth the tergal length; ninth tergite black, cerci yellow.

Head—Oval in profile. Eye about one and one-third times as high as long. Gena, midway between vibrissal angle and posterior margin, about one-fifth eye height; vibrissae well developed, two setae on subcranial margin. Genovertical plates slightly raised above eye margins immediately dorsad of antennae; each with two sfo and two ifo setae; orbital setulae sparse, three or four on a side. Antennae with third segment rounded, broader than long; setulae about equal in length to the basal arisal thickness; arista short, in length slightly less than the eye width, tapering uniformly, setulae minute. Mouthparts of normal size.

Thorax—Setae relatively long, slender. Second dc seta about three-fourths the length of the first, the third nearly equal in length to the second, and the fourth about one-half as long as the first; second dc about one and one-half times as far from the first as from the third, third and fourth about as far apart as second and third; ia absent, four and five setae in the ia rows posterior to the transverse suture; acr setae in four irregular rows extending posteriorly to the second dc setae, only two or three posterior to this; inner pa weak, about two-fifths the length of the outer pa. Humeri with three setulae plus the h. Anepisternum with two dorsally and two posteriorly directed setulae, the latter situated one on each side of the aes.

Wing—Slightly more than twice as long as wide; costa terminating at wing tip; second costal section about 2.8 times as long as the third; third section slightly longer than the fourth; cross vein m-m about three-fourths of its length from r-m, at an acute angle to the penultimate section of M_{1+2} ; ultimate section of M_{1+2} about 13 times as long as the penultimate; ultimate section of M_{4+5} about 3.5 times as long as the penultimate.

Abdomen—Setae moderately elongate, about three-fourths a tergal length, those on sixth segment slightly longer.

Size—1.25 mm. in body length.

Female—Larger, 1.5 mm. in body length; genovertical plates not raised above eye margins; humeri with two setulae; anepisternum with three dorsally directed setulae; abdomen with tergites narrowly yellow laterally, posteriorly with narrow yellow margins, sixth tergite about one-sixth yellow; seventh segment shining black.

Holotype ♂: Kaimuki, Oahu, April 12, 1921, O. H. Swezey, collector, ex *Indigofera* sp., deposited in the Hawaiian Sugar Planters' Association Experiment Station collection. **Paratypes**: 2 ♂ ♂, 5 ♀ ♀, Lualualei, Oahu, June 26, 1943, T. Nishida, collector, ex bean; 1 ♂, Honolulu, Oahu, April, 1951, D. E. Hardy, collector, at light. Paratypes have been deposited in the collections of the U. S. National Museum, University of Hawaii, and that of the writer.

The genovertical plates are usually slightly raised above the eye margins immediately dorsad of the antennae. This may not be evident when the head is partially collapsed due to the drying of teneral specimens. The angle of cross vein m-m to the penultimate section of M_{1+2} is not constant. In about one-half of the specimens examined, this vein was strongly acute and in the remainder it was slightly acute, but never perpendicular.

As stated under *L. pullata*, that species and *L. canomarginis* have a number of characters in common which separate these two species from *L. minutisetata* and *L. hawaiiensis*. *L. canomarginis* can be separated from *L. pullata* by the grayish margin of the calypter, the relatively long third and fourth dc setae, the second dc being only one and one-half times as far from the first as from the third, and the abdominal tergites being at least narrowly yellow laterally.

Liriomyza minutisetata new species

Female—Shining yellow and black. Head yellow, ocellar triangle and back of head black, black of back reaching eye margin at posterior median curve and extending dorsally to vertex; vte seta arising from the black color, vti arising from yellow, at the edge of a slightly darkened area, which is orange in color; genovertical plates not darkened. Thorax with black of mesonotum extending laterally nearly to humeri and prs setae, the sa and outer pa setae arising from black, prs seta at edge of black, usually touching it; black extending straight from outer pa to inner one-third of scutellar width before reaching it; scutellum with lateral black triangles very small, basal pair of setae arising from yellow color, close to edge of the triangles; humeral black spot very small, only one setula on black, others and h on yellow; anepisternum with a small black spot about one-fourth its anterior height, with a slightly darkened stripe extending dorsally along anterior margin for about one-half its height, making the black area subtriangular in shape, and about one-half its ventral width; katapisternum with an equilateral black triangle; meropleurite more than one-half black posteriorly; rest of pleura yellow except for an elongate posteriorly curving, brown area beneath wing base. Legs with femora bright yellow; tibiae tan; tarsi brown. Wings hyaline, calypters with margin and fringe blackish. Abdomen black dorsally, all tergites laterally yellow for a width equal to the portion of the tergites visible in lateral view; sixth segment posteriorly about one-third yellow; seventh segment shining black.

Head—Moderately elongate in profile. Eye about one and one-third times as high as long. Gena, midway between vibrissal angle and posterior margin, about one-fourth eye height; rather narrow; vibrissae well developed, three and four setae on the subcranial margins. Genovertical plates not raised above eye margins; each bearing 2 sfo and 2 ifo setae, and two or three orbital setulae, latter minute. Antennae with third segment rounded, broader than long; setulae slightly less in length than the basal arista thickness; arista thickened on basal one-fourth, tapering uniformly distally, long, slightly greater than the eye width. Mouthparts of normal size.

Thorax—Setae relatively short. Second dc seta about three-fourths the length of the first, the third about one-half the first, and the fourth only two-fifths the first; second dc about one and one-half times as far from the first as from the third, third and fourth about as far apart as the second to the third; ia present, subequal to an acr in length; inner pa slender, minute, about one-third the length of the outer pa; acr in four irregular rows, extending posteriorly to about midway between first and second dc, very sparse posterior to second dc, only two or three present; seven setulae in the ia row posterior to the transverse suture. Humeri each with two or three setulae plus the h. Anepisternum with one dorsally directed setula and posteriorly three in a row with the aes.

Wing—Slightly more than twice as long as wide; costa terminating at wing tip; second costal segment about 3.5 times as long as the third and fourth segments, which are of equal length; cross vein m-m at about its own length from r-m, at a very slight acute angle to penultimate section of M_{1+2} ; ultimate section of M_{1+2} about 10 times as long as the penultimate; ultimate section of M_{3+4} about 3 times as long as the penultimate.

Abdomen—Setae relatively short, in length about one-half the tergal length; those on the sixth segment slightly longer; seventh segment encircled with two irregular rows of setae.

Size—1.3 mm. in body length.

Male—Smaller, 1.25 mm. in body length; anterior stripe of anepisternal black spot absent; two setulae on dorsal margin of anepisternum; abdomen more yellowish, yellow wider laterally, extending onto dorsum, fourth and fifth tergites posteriorly about one-fourth yellow; ninth tergite dark brown, cerci brownish.

Holotype ♀: Honolulu, Oahu, September 7, 1951, W. C. Mitchell, collector, ex tomato, deposited in the Hawaiian Sugar Planters' Association Experiment Station collection. *Paratypes*: 2 ♂ ♂, 1 ♀, topotypical; 3 ♂ ♂, Waianae, Oahu, January, 1951, W. C. Mitchell, collector, ex tomato; 3 ♂ ♂, 1 ♀, Waianae, Oahu, March, 1951, W. C. Mitchell, collector, ex tomato; 1 ♂, 2 ♀ ♀, Honolulu, Oahu, September 7, 1951, W. C. Mitchell, collector, ex eggplant; 1 ♂, 3 ♀ ♀, Honolulu, Oahu, September 7, 1951, W. C. Mitchell, collector, ex cauliflower; 2 ♂ ♂, Kunia, Oahu, September, 1951, D. E. Hardy, collector, ex squash. Paratypes have been deposited in the collections of the U. S. National Museum, University of Hawaii, and that of the writer.

The anepisternal black spot is frequently small and oval in shape, as in the male, but may have an anterior dorsal extension, making the spot subtriangular in shape, as in the holotype. In two out of the seventeen specimens examined, cross vein m-m is one and one-half times its length from r-m. Also, m-m may be perpendicular to the penultimate section of M_{1+2} and is never at a strongly acute angle.

L. minutiseta and *L. hawaiiensis* are more closely related than the other two species and have in common the prs seta arising from the yellow of the mesonotum, basal sc setae arising from the yellow of the scutellum, and cross vein m-m at a slightly acute angle or perpendicular to the penultimate section of M_{1+2} . *L. minutiseta* may be separated from *L. hawaiiensis* by the vt seta arising from the yellow of the vertex, the short thin setae, minute inner pa, small black area on the anepisternum, second dc seta one and one-half times as far from the first as the first is from the third, and the length of the abdominal setae being about one-half a tergal length.

Liriomyza hawaiiensis new species

Female—Shining yellow and black. Head yellow, ocellar triangle and back of head black, black of back reaching eye margin immediately dorsad of median posterior curve and extending dorsally to vertex; both vt setae arising from black area, although vt is at edge; genoverical plates not darkened. Thorax with black of mesonotum extending laterally nearly to humeri, prs, and outer pa setae, sa seta in black, black extending in a curve from outer pa seta to scutellum so that inner pa is at edge of black and the posterolateral angles of the mesonotum are broadly yellow; scutellum with lateral black triangles small, basal pair of setae arising from yellow color, at edge of the black; humeral black spot very small, h seta arising from yellow, as are all setulae but one or two; anepisternum with black triangle about two-thirds its anterior height and three-fourths its ventral width, a faint thin black line along posterior margin running through base of aes seta; katopisternum with an equilateral black triangle; meropleurite posteriorly about one-half black; rest of pleura yellow except for a thin black stripe below base of

wing, with a black spot posteriorly. Legs with femora bright yellow; tibiae and tarsi dark brown. Wings hyaline, calyters with margin and fringe blackish. Abdomen black dorsally, tergites narrowly yellow posteriorly, first four narrowly, fifth slightly broader, and sixth about one-half yellow; all tergites broadly yellow laterally for a width equal to the portion of the tergites visible in lateral view; seventh segment shining black.

Head—Elongate and flattened in profile. Eye about one and one-half times as high as long, somewhat narrowing ventrally. Gena, midway between vibrissal angle and posterior margin, about one-fourth the eye height; narrow, receding anteriorly and only about as long as high; vibrissae well developed, four setae on ventral margin. Genovertical plates not raised above eye margins; two sfo and 2 ifo setae; orbital setulae minute, about six on each side. Antennae with third segment rounded, broader than long; setulae slightly longer than basal arisal thickness; arista uniformly tapering, about as long as eye width, arisal setulae minute. Mouthparts of normal size.

Thorax—Setae strikingly long and strong. Second dc seta about three-fourths as long as first, third about one-half the first, and fourth about two-fifths the first; posterior three dc setae about equally spaced from each other, fourth a little closer; ia present, about one and one-half times as long as an acr seta; inner pa strong, slightly more than half as long as outer pa; acr in four irregular rows extending posteriorly nearly to first dc seta, becoming sparser posterior to second dc; eight to eleven setae in the ia rows posterior to the transverse suture. Humeri each with six setulae plus the h seta. Anepisternum with three dorsally directed setulae near dorsal margin and two posteriorly directed setulae, one on each side of the aes seta, along posterior margin.

Wing—About twice as long as wide; costa terminating at wing tip; second costal section about 4 times as long as third and fourth sections, which are of equal length; cross vein m-m about its own length from r-m, perpendicular to penultimate section of M_{1+2} ; ultimate section of M_{1+2} about 11 times as long as the penultimate; ultimate section of M_{3+4} about 3 times as long as the penultimate.

Abdomen—Setae relatively long, subequal in length to the tergal length, those on sixth segment one and one-half times as long; two irregular rows of setae encircling seventh segment.

Size—1.5 mm. in body length.

Male—Similar, smaller, 1.25 mm. in body length; cross vein m-m vestigial in left wing; abdomen much more yellowish, yellow posterior margins of tergites about one-fourth the tergal length, sixth segment predominately yellow; ninth tergite brownish, cerci bright yellow.

Holotype ♀: Honolulu, Oahu, January 1, 1947, E. C. Zimmerman, collector, ex leaf of *Cleome* sp., deposited in the collection of the Hawaiian Sugar Planters' Association. *Paratypes*: 1 ♂, 1 ♀, topotypical; 2 ♂ ♂, Lanai, October 6, 1939, H. Akamine, collector, ex daikon; 1 ♂, 3 ♀ ♀, Waiakoa, Maui, September 18, 1951, H. A. Bess, collector, ex cabbage; 2 ♀ ♀, Kahului, Maui, September 18, 1951, B. Kumabe, collector, ex cabbage; 15 ♂ ♂, 15 ♀ ♀, Hilo, Hawaii, April, 1951, H. A. Bess, collector, ex cabbage; 1 ♀, Hilo, Hawaii, December 12, 1927, Goff, collector, ex Chinese cabbage; 2 ♂ ♂, 2 ♀ ♀, Honolulu, Oahu, March 8, 1945, O. H. Swezey, collector, ex nasturtium; 3 ♂ ♂, 4 ♀ ♀, Waianae, Oahu, January, 1951, W. C. Mitchell, collector, ex tomato; 2 ♀ ♀, Honolulu, Oahu, September 7, 1951, W. C. Mitchell, collector, ex tomato. Paratypes have been deposited in the collections of the U. S. National Museum, University of Hawaii, and that of the writer. Seventeen specimens, in inferior condition, are also placed in this species.

L. hawaiiensis is apparently common and widespread. It is most closely related to *L. minutiseta*, from which it can be distinguished by the vti arising from the edge of the black of the vertex, the very long strong

setae, the very narrow gena which is as high as long, the long narrow eye which is one and one-half times as high as long, the antennal setulae longer than the basal arisal thickness, the subequal spacing of the dc setae, and the length of the abdominal setae which are subequal to a tergal length.

NOTES ON OTHER HAWAIIAN SPECIES

Melanagromyza Hendel**Melanagromyza simplex** (Loew)

Agromyza simplex Loew, 1869, Berl. ent. Zeit., 13:46.

Bianchi (1941) first reported the asparagus miner in the Hawaiian Islands when he described a heavy infestation on the island of Oahu. Found wherever asparagus is grown, this is no doubt an introduced species. Four specimens were examined from Waimea, Oahu, collected by O. H. Swezey on May 18, 1937, in an asparagus field.

Ophiomyia Braschnikov**Ophiomyia lantanae** (Froggatt)

Agromyza lantanae Froggatt, 1919, Agric. Gaz. New South Wales, 30:665.

Froggatt's description was of a popular nature so Aldrich (1923) re-described the species. Hardy (in correspondence) states that there are paratypes in the H.S.P.A. Experiment Station collection. These were no doubt designated by Aldrich at the time of the redescription. It is doubtful if a holotype, as such, exists.

O. lantanae was introduced into Hawaii in 1902, through the efforts of Albert Koebele, working in Mexico, and R. C. L. Perkins, to aid in the control of *Lantana camara* (Perkins & Swezey, 1924). The male of this species is easily distinguished by the extremely long, slender, upcurved vibrissal fascicule of setae. The following data were obtained from specimens examined: 3, Pacific Heights, Oahu, November 21, 1903; 2, Honoukaa, Hawaii, March 18, 1922, O. H. Swezey, collector; 4, Kunia, Oahu, February 14, 1950, R. van den Bosch, collector, on *Lantana camara*.

Ophiomyia sp.

Agromyza sp.: Van Zwaluwenburg, 1942, Proc. Haw. Ent. Soc., 11:148.

The writer has studied two specimens reared from leaf mines on *Scaevola frutescens* from Canton Island. The species appears to be distinct. It is not here described because of the short series and the lack of specimens from Guam and Samoa.

Phytobia LioySubgenus *Calycomyza* Hendel**Phytobia (Calycomyza) humeralis** (von Roser)

Agromyza humeralis von Roser, 1840, Korresp.-Bl. Würtem. landw. Ver., 8:63.

This Holarctic species is apparently quite abundant, at least on the island of Oahu. The larvae mine in the leaves of many species of Compositae (Hendel, 1931; Frick, 1952). The Hawaiian specimens bore the following data: 11, Honolulu, Oahu, September 29, 1950, W. C. Mitchell, collector, ex *Aster* sp.; 1, Honolulu, Oahu, February 21, 1951, R. van den Bosch, collector, by sweeping.

Phytobia (Calycomyza) jucunda (van der Wulp)

Agromyza jucunda van der Wulp, 1867, Tijdschr. Ent., 10:161.

The larvae of *P. jucunda* mine the leaves of a number of species of Compositae (Frick, 1952). Neither of the specimens from Hawaii was reared. One was collected by sweeping, Honolulu, Oahu, February, 1951, R. van den Bosch, collector, and the other at a light trap, Hickam Field, Oahu, July, 1945.

Liriomyza Mik

Liriomyza brassicae (Riley)

Oscinis brassicae Riley, 1884, Ann. Rept. U.S.D.A., 1884:322.

Eight specimens, which agree with reared material from California, were collected by sweeping. This species may be distinguished from the four new species by the narrow black stripes extending from the vertex down the genovertical plates along the eye margins. The larvae mine the leaves of various crucifers. However, judging from the collecting records, the dominant species on cruciferous crops in Hawaii would appear to be *L. hawaiiensis* n. sp. Seven of the specimens studied are from Waimanalo, Oahu, January 31, 1951, D. E. Hardy, collector, sweeping, and one is from Honolulu, Oahu, January, 1951, D. E. Hardy, collector, sweeping.

Phytoliriomyza Hendel

Phytoliriomyza perpusilla (Meigen)

Agromyza perpusilla Meigen, 1830, System. Besch. bekannt. eur. zweifl. Insekt., 6:181.

This widespread Holarctic species is represented by one specimen collected by W. W. Wirth, July 25, 1946, on Mt. Kaala, Oahu, at an elevation of 4,000 feet.

Pseudonapomyza Hendel

Pseudonapomyza spicata (Malloch)

Phytomyza spicata Malloch, 1914, Ann. Mus. Hungar., 12:334; Bezzi, 1928, Dipt. Fiji, pg. 167 (as *P. atra*); Malloch, 1935, Insect. Samoa, 6 (9):341; Swezey, 1941, Haw. Plant. Rec., 45:26; Swezey, 1946, Bishop Mus. Bull., 189:200; Swezey, 1948, Jour. Econ. Ent. 41:671.

Pseudonapomyza spicata (Malloch): Hendel, 1920, Arch. Nat., Abt. A., 84:115; Hendel, 1932, in Lindner: Die Flieg. palaearkt. Reg., 59:302; Frick, 1952, Univ. Calif. Publ. Ent., 8:418.

This species belongs in the genus *Pseudonapomyza*, as Hendel believed, but is distinct from *P. atra* (Meigen), 1830 (Frick, 1952). Swezey (1941)

had not found *P. spicata* in Hawaii, but by 1946 it had become established on 14 species of grasses (Swezey, 1948). Bezzi (1928) reported the species as a miner of corn and sugar cane. The distribution now includes Formosa, Fiji, Samoa, Guam, and the islands of Oahu, Maui and Molokai.

Seventeen specimens were studied, which had the following data on the labels: 2, Piti, Guam, July 31, 1936, O. H. Swezey, collector, leaf miner on corn; 2, Hawaiian Sugar Planters' Experiment Station, Honolulu, Oahu, November 25, 1946, R. H. Van Zwaluwenburg, collector; 5, Kailua, Oahu, November 26, 1946, O. H. Swezey, collector, ex corn; 1, Hawaiian Sugar Planters' Experiment Station, Honolulu, Oahu, February, 1947, R. H. Van Zwaluwenburg, collector, ex sugar cane seedling leaves; 1, Mt. Tantalus, Oahu, November 12, 1950, D. E. Hardy, collector; 5, Ewa, Oahu, November 23, 1951, W. C. Mitchell, collector, sweeping *Gynandropsis* sp.; 1, Honolulu, Oahu, November, 1951, D. E. Hardy, collector, on window of laboratory.

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