

THE CHILEAN SPECIES OF *SCAPTOMYZA* HARDY (*)

(Diptera Drosophilidae)

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Sobre un total de 5.300 moscas del género *Scaptomyza* Hardy (Diptera Drosophilidae), colectadas en diferentes zonas de Chile, comprendidas entre Arica y Puerto Montt, el autor encuentra seis especies diferentes. De éstas, dos corresponden a especies nuevas. Se dan descripciones y redesccripciones de los ejemplares adultos de las seis especies, y datos sobre los huevos, pupas y cromosomas de algunas de ellas. Se incluye un cuadro sobre la distribución geográfica de las especies encontradas, y una clave para su determinación.

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The species included in the family Drosophilidae, have provided valuable information bearing on problems of evolution, phylogeny and comparative cytology. Notwithstanding, little is known about the number of species which live in Chile, their distribution area, and the genetic, cytological and ecological structure of the populations they form. A taxonomic approach to the problem seems to be necessary. Stuardo (1946) lists about eleven Chilean members of the group, most of them taken from Malloch (1924). Collecting trips made by the author to different regions of the country establish that this family includes over 28 members, 6 of them belonging to the genus *Scaptomyza* Hardy, and all the rest to the genus *Drosophila* Fallén.

It is the purpose of the present paper to give some data on the Chilean species of *Scaptomyza*, and in another one, now in preparation, the more complex genera *Drosophila* will be referred to.

THE GENUS *SCAPTOMYZA* HARDY 1849

This genus is very close to *Drosophila*, differing from it by having two or four acrostichal rows of hairs in front of the transverse suture (six or more rows in *Drosophila*), two rows between the dorsocentral bristles (four or more in *Drosophila*), occiput more convex than in *Dro-*

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sophila; torax, abdomen and wing more slender; prescutellars never present (Sturtevant 1921).

The species belonging to this genus are usually leaf miners in their larval stages, but some of them will breed in the laboratory on the common *Drosophila* food. The flies have never been found indoors and most of them can be collected in large numbers on the same fermenting banana baits used to trap the other members of the *Drosophila* family. They can also be caught by sweeping the grass with a collecting net.

The genus was first established by Hardy for *Drosophila graminum* Fallén and *Drosophila flaveola* Meigen. Since then, more than fifty species belonging to this genus have been described in different parts of the world (Wheeler, 1952). Duda (1925) has attempted to establish different main groups, by dividing the genus into two sub-genera: *Parascaptomyza*, for the forms with two acrostichal rows, and *Scaptomyza*, for those with four acrostichal rows.

Wheeler (1952) is of the opinion that we know far too little about the genus to allow the establishment of sub-genera. Nevertheless, this same author recognized the following five natural species groups:

- 1.—*Graminum* species group, containing only *S. graminum*.
- 2.—*Adusta* species group, which includes *S. adusta*, *S. paradusta*, and *S. hirsuta*.
- 3.—*Vittata* species group, which contains *S. vittata*, *S. paravittata*, *S. fuscinervis*, *S. nigripalpis*, and two South American species described by Malloch.
- 4.—*Terminalis* species group, includes *S. terminalis*, *S. unipunctum*, and *S. maculifera*.
- 5.—*Montana* species group, includes *S. montana*, *S. nigrocella*, *S. borealis*, *S. nigrita* as well as *S. tetrasticha*.

Of the six members of the genus *Scaptomyza*, found by the author in Chile, one was reported by Duda (1925), three were first described by Malloch (1934) and the last two, *S. pseudovittata* and *S. noei*, correspond to new forms.

In the present paper, the descriptions of the two new species found in Chile are given; in addition a redescription of the other four species is included, due to the fact that the original descriptions omits some characters which are critical for this genus.

KEY TO THE CHILEAN SPECIES OF SCAPTOMYZA HARDY

1. Acrostichals in 2 rows; 1 prominent humeral; mesonotum noticeably striped; three pairs of dorsocentral bristles; palpi black; without a distinct carina. *pseudovittata* n. sp.

- Acrostichals in 4 rows from anterior margin of mesonotum to the level of bases on anterior pair of dorsocentral bristles; two humerals. 2
2. Wings with a dark mark at apices of second, third and fourth veins in male, and third and fourth in female, the latter with a small dark spot against the lower edge of third vein near level of apex of second vein, the male with four dark elongated marks at same point, the upper one above third vein and fused with the second mark, the lower one below fourth vein. *dissimilis* Malloch
- Wing hyaline, grayish or yellowish, absolutely without apical dark markings. 3
3. Antennae dark brown or blackish; mesonotum, scutellum and abdomen pollinose black; male anal plate elongated dorso-ventrally, protruding below; ovipositor large, blunt with coarse teeth. *noei* n. sp.
- Not entirely as above. 4
4. Face almost entirely yellow or only the carina partly darkened in females; antennae yellow; frons yellow or orange yellow; eggs with two short filaments. *multispinosa* Malloch
- Face testaceous, grayish brown or black with pollinose, frons dark brown; eggs with 4 filaments. 5
5. Carina nose like; hind femora yellowish in both sexes, central two series of the intradorsocentral acrostichals normal; testes yellow. *melancholica* Duda
- Carina narrow, low and rounded below; hind femora darkened, specially in females; the two central series of the intradorsocentral acrostichals a little stronger than usual; testes deep orange red. *denticauda* Malloch

DESCRIPTION OF SPECIES

Scaptomyza melancholica Duda, 1925.

External characters of imagines:

♂, ♀. Arista with about 4 upper and 2 lower rays in addition to the terminal fork. Antennae brownish yellow; third joint darkened above and at apex. Frons dark brown to blackish; ocellar triangle and orbits blackish. Proclinate and anterior reclinate orbitals with their bases at the same level, the latter about 1/2 length of posterior reclinate; no extra orbital bristles between posterior reclinate and inner vertical. Only one oral

strong, second oral weaker, about $\frac{1}{2}$ as long as the first. Carina well developed, nose like, widened below. Face pale yellow and dusty. cheeks pallid grayish yellow, their greatest width about $\frac{1}{2}$ greatest diameter of eyes. Palpi whitish yellow with about 3 stout bristles at tips. Eyes red with fine dark pile.

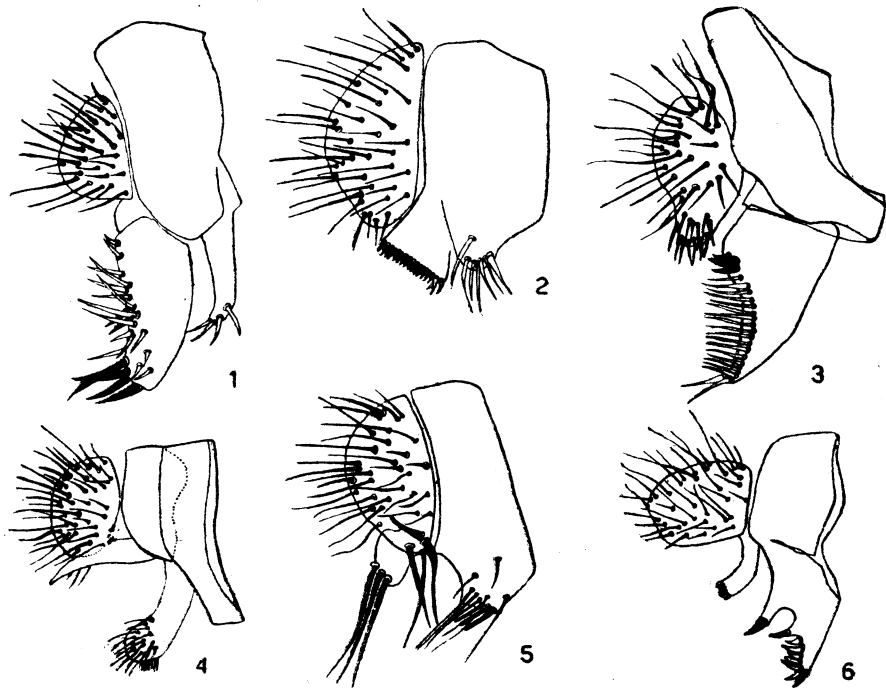


Plate 1.— Camera lucida drawings of the external genital apparatus of male *Scaptomyza*. 1. *S. denticauda*; 2. *S. noei*; 3. *S. melancholica*; 4. *S. dissimilis*; 5. *S. pseudovittata*; 6. *S. multispinosa*.

Acrostichal hairs in 4 rows from anterior margin of mesonotum to the level of anterior dorsocentrals, and 2 rows between them; no prescutellars. Anterior scutellars nearly parallel and with the same length as the posterior. Mesonotum and scutellum black, densely dark grey, dusted. Two strong humerals. Sterno-index about 0,5. Legs uniformly yellow. Apicals and preapicals on first and second tibiae, preapicals on third.

Abdominal tergites black and moderately shining.

Wings grayish hyaline, veins yellow. Two strong bristles at the apex of first costal section; 3rd costal section with heavy bristles on its basal $\frac{1}{3}$. Costal index about 3,8; fourth vein index about 1,6; 5x index about 1,3; 4c index about 0,7. Halteres pale yellow.

Length body: 2 — 2,5 mm.; wings: 2,5 mm.

Internal characters of imagines.

The inner testes are large and not coiled, and represent enlargements of vasa efferentia, yellow in color; the outer testes are lighter and with $1\frac{1}{2}$ coils or gyres. The eyaculatory sack has two long diverticula.

The spermathecae are small, spherical and chitinized. Ventral receptacle is a small tangled mass.

Other characteristics, distribution and types.

Eggs.—4 short filaments. (Plate 2, N.º 2).

Puparia.—Tannish brown; each anterior spiracle with about 5 or 6 branches. Horn index about 9.0.

Chromosomes.—Metaphase plate shows two pairs of V's, one of them with unequal arms, one pair of rods, and a pair of elongated dots. (Plate 4, N.º 1 - 4).

Distribution.—Duda records this species in Chile (Santiago), Los Andes, Quillota and Bolivia. Malloch records this species in Nahuel Huapi, Bariloche, L. Correntoso, Peulla, Puerto Varás, Ancud. We have found this species in Yuta, Camarones, Paihuano, Serena, Ovalle, Santiago, Los Alpes (Colchagua), Paimún (Cautín), Villarrica, Valdivia, Rupanco, Centinela, Ensenada, Puerto Varas and Puerto Montt.

Types.—Type material for the present redescription from Valdivia.

Scaptomyza denticauda Malloch, 1934

External characters of imagines.

♂, ♀. Arista with about 4 upper and 2 lower rays, in addition to the terminal fork. Antennae tannish yellow, third segment darkened above and at apex in some specimens. Frons dark brown, becoming reddish yellow in front. Triangle and orbits dusted and dull dark grey. Lower reclinate bristle a little behind level of proclinate; anterior reclinate about $\frac{1}{2}$ length proclinate. Only one prominent oral, second oral fine and about $\frac{1}{2}$ the first. Carina narrow, low, rounded, and abruptly terminated below by a depressed line. Face testaceous with pollinose. Cheeks dusty dark brown, their greatest width about $\frac{2}{5}$ the greatest diameter of the eyes. Eyes red, very short haired. Palpi yellow, with four or five strong bristles.

Acrostichal hairs in 4 rows anterior to the dorsocentrals, 2 rows between them; the dorsocentral series of acrostichals a little stronger than usual. Anterior scutellars slightly convergent and about the same length as the posterior pair. Two strong humerals. Sterno-index about 0.7. Mesonotum black and densely pollinose, with a rather noticeable

dark brown central strip. Scutellum slightly flattened above. Pleurae blackish with pollinose. Legs testaceous yellow, hind femora distinctly darkened in both sexes. Apical and preapical bristles on first and second tibiae, preapicals on third.

Abdomen glossy black, not shining.

Wings grayish hyaline, veins brown. Two strong bristles at apex of first costal section. Third costal section with heavy bristles on its basal 2/5. Costal index about 3,6; 4th vein index about 1,5; 5x index about 1,4; 4c index about 0,7. Halteres brown.

Length body: 2 — 2,5 mm.; wings: 2,5 mm.

Internal characters of imagines.

The inner testes are large and not coiled, deep brownish red in color; the outer testes has two orange red coils or gyres. Ejaculatory sack with a pair of twisted diverticula.

Spermathecae small, spherical, strongly chitinized in the center. Ventral receptacle is a tangled and coiled mass.

Other characteristics, distribution and types.

Eggs.—4 short filaments (Plate 2, N.º 3).

Puparia.—Orange brown; each anterior spiracle with about 5 branches; horn index about 15,0.

Chromosomes.—Metaphase plate shows one pair of V's, one pair of long rods, one pair of medium-length rods, and one pair of short dots.

Distribution.—Malloch records this species in Nahuel Huapi, L. Correntoso, Casa Pangue, Peulla, Ensenada, and Puerto Varas. We have taken this species in Serena, Santiago, Los Alpes (Colchagua), Paimún (Cautín), Valdivia, Rupanco, Centinela, Puerto Varas, Ensenada and Puerto Montt.

Types.—Type material for the redescription, from Valdivia.

Notes.—This species is very similar to *S. melancholica*, but it is readily distinguished from the latter by the darkened bases of the hind femora in both sexes, and by the external genitalia of the males (Plate 1).

***Scaptomyza multispinosa* Malloch, 1934**

External characters of imagines.

♂, ♀. Arista with about 3 upper and 2 lower rays in addition to terminal fork. Three segments of the antennae uniformly orange yellow.

Frons bright yellow or orange yellow, upper half of back of head the triangle and orbits, except their anterior extremities, fuscus and densely grey dusted. Proclinate and anterior reclinate orbitals with their bases at same level; anterior reclinate a little more than half length other two orbital bristles. Two prominent orals; second one about same length as first. Face yellow with a central carina; carina entirely yellow in males and usually blackened in females. Cheeks pale yellow, their width about $1/3 - 1/4$ the greatest diameter of the eyes. Palpi whitish yellow. Eyes red, with fine pile.

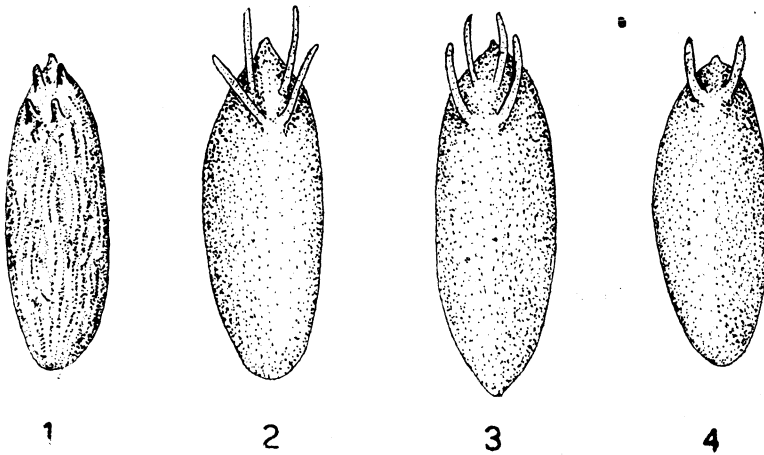


Plate 2.—Eggs of four different species of Chilean *Scaptomyza*. 1. *S. noei*; 2. *S. melancholica*; 3. *S. denticauda*; 4. *S. multispinosa*.

Acrostichal hairs in 4 rows anterior to dorsocentrals and 2 rows between them. Anterior dorsocentrals about $2/3$ length of posterior ones. Two unequal humerals, the lower humeral weaker and about $1/2$ as long as the upper. Anterior scutellars divergent and shorter than the posterior pair. Mesonotum dark brown or black, densely pollinose, and with one to three faint longitudinal vittae. Scutellum more blackish in center. Pleurae dark brown. Sterno-index about 0,7. Legs orange yellow. Preapicals in all tibiae, apicals noticeable only on 2nd tibia.

Abdomen glossy brownish black, slightly darkened in the last segments.

Wings yellowish hyaline, veins yellow. Two strong bristles at the apex of first costal section. Third costal section with heavy bristles on its basal $1/3$. Costal index about 3,6; 4th vein index about $1/4$; 5x index about 1,3; 4c index about 0,7. Halteres yellow.

Length body: 2,5 mm.; wings: 3 mm.

Internal characters of imagines.

The inner testes are large and not coiled, deep yellow in color; the outer testes are light yellow and with one and 1/2 coils or gyres.

Spermathecae spherical, with chitinized centers. Ventral receptacle is a tangled mass.

Other characteristics, distribution and types.

Eggs.—Two short filaments. (Plate 2, N.º 4).

Distribution.—Malloch records this species in Bariloche, Nahuel Huapi, Casa Pangué, Ancud, Castro, Los Andes. We have collected these flies in Paihuano, Santiago, Paimún (Cautín), Valdivia, Rupanco, Centinela, Enserada and Puerto Varas.

Types.—Type material for the present redescription from Ensenada.

Scaptomyza dissimilis Malloch, 1934

External characters of imagines.

♂, ♀. Arista with 4 upper and 2 lower rays, in addition to the terminal fork. Antennae yellow, third joint yellow and covered with fine white hairs. Anterior half of the frons yellow. Orbits, triangle and vertex black, grey dusted. Proclinate and anterior reclinate orbitals with their bases at about the same level; anterior reclinate about 1/2 — 2/3 as long as first oral. Cheeks yellow, their greatest width about 1/5 diameter of eyes. Eyes red, covered with fine white pile.

Acrostichal hairs in 4 series anterior to the dorsocentrals, 2 series between them. Anterior scutellars slightly divergent. Two unequal humerals. Mesonotum black, densely grey dusted, with a broad dark brown central strip that is continued over the scutellum and another similar, but less distinct and incomplete sublateral strip on each side. Pleurae brown. Sterno-index about 0,6. Legs entirely yellow. Preapicals evident only on second tibiae.

Abdominal tergites brownish black.

Wings hyaline, veins yellow. Wings with a dark mark at apices of second, third and fourth veins in male, and third and fourth in female, the latter with a small dark spot against the lower edge of third vein near level of apex of second vein; the male with four dark elongated marks on the same spot, the upper one above the third and fused with the second mark, the lower one below the fourth vein. (Plate 3). Two strong bristles at apex of first costal section. Third costal section with heavy bristles on its basal 1/3; 5x index about 3; fourth vein index about 1,3; 5x index about 1; 4c index about 0,7. Halteres whitish yellow.

Length body: 2 — 2,5 mm.; wings: 2,5 mm.

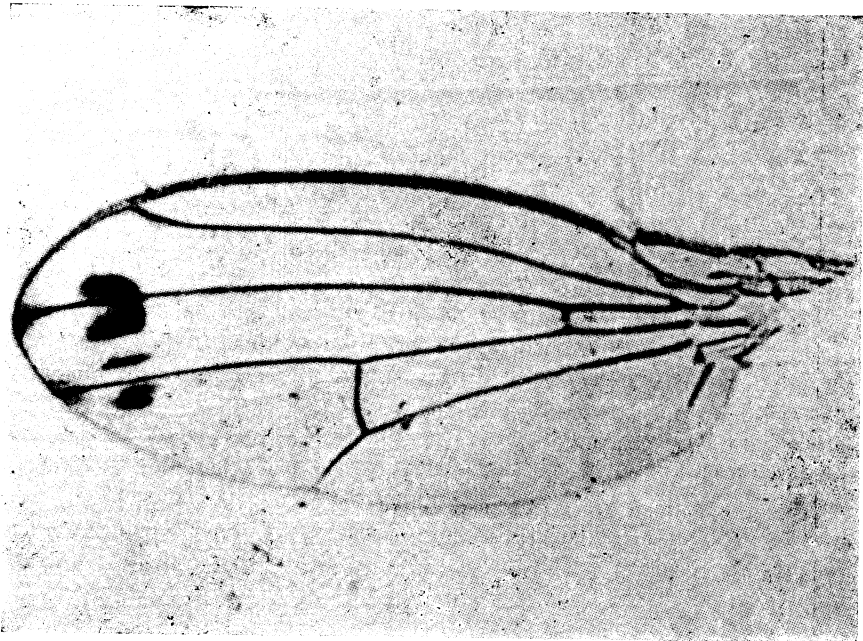


Plate 3.—Male wing of *Scaptomyza dissimilis*.

Distribution, relationships and types.

Distribution.—Malloch records this species in Angol and L. Correntoso. We have collected two specimens in Santiago, and another one in Los Alpes (Colchagua).

Types.—Type material for the present redescription from Santiago.

Relationships.—*S. dissimilis* and one of the North American species studied by Prof. Wheeler (1952), *S. bipunctipennis*, are the only described species in which the apical wings marks differ in the two sexes. As suggested by Prof. Wheeler, these two forms do not seem to be closely related in many respects.

Scaptomyza noei, sp. nov.

External characters of imagines.

♂, ♀. Arista with 3 upper and 2 lower rays in addition to the terminal fork. Antennae dark brown, third joint blackish above and covered with a very fine light pile. Frons pollinose blackish brown; orbits yellowish grey, ocellar triangle blackish. Proclinate and anterior reclinate orbital bristles with their bases at about the same level. Anterior reclinate nearly as long as proclinate and about $3/5$ posterior reclinate. Second oral

about $3/5$ length of first. Face yellowish grey; carina narrow. Palpi pale yellow with a long stout bristle at apex and 3 or 4 less prominent bristles. Cheeks pale yellow with pollinose; their width about $1/5$ greatest diameter of eyes. Eyes dark wine red.

Acrostichals in 4 rows at the level of anterior dorsocentrals and two between them. Anterior dorsocentrals shorter than the posterior pair. Two prominent humerals; anterior scutellars slightly divergent; posterior scutellars shorter and cruciate. Mesonotum dark brownish grey, strongly pollinose and with three faint brown longitudinal stripes, one in the midline and one on each side, at the level of dorsocentral bristles. Scutellum and pleurae very dark brown with pollinose. Sterno-index about 0,55 — 0,60. Legs light brown, darkened in all coxae. Preapical bristles on all tibiae, apicals evident only on second tibiae. Abdomen uniformly black.

Wings hyaline, veins tan. Apex of first costal section with two prominent bristles about equal in length. Third costal section with heavy bristles on its basal $1/4$. Costal index about 3,8 — 4,2; 4th vein index about 1,4; 5x index about 1,2 — 1,3; 4c index about 0,55. Halteres whitish yellow.

Internal characters of imagines.

Testes yellowish orange. The inner testis are enlargements of vasa efferentia coiled in about 1 or $1\frac{1}{2}$ gyres; outer testis with about 2 coils. Spermathecae small, spherical, with chitinized centers. Ventral receptacle is a small, tangled and coiled mass.

Other characteristics, distribution, relationships and types.

Eggs.—With 4 rudimentary filaments and rugose chorion (Plate 2, N.º 1).

Distribution.—We have collected 18 specimens in Yuta (Arica).

Types.—Type material for the present description from Yuta.

Relationships.—As respects the characteristics of the external genitalia in both sexes (fig. 1), it seems that this species is related to the *montana* species group established by Prof. Wheeler (1952). As in all the members of this group, the male anal plate of *S. noei* is elongated dorsoventrally and protruding below (Plate 1. N.º 2); in female the ovipositor is large, blunt and with coarse teeth.

Note.—Named in honor of Professor Juan Noé, founder of the Biological Institute of the University of Chile.

Scaptomyza pseudovittata, sp. nov.

External characters of imagines.

♂. Arista with 5 upper and 2 lower rays in addition to the terminal fork. Antennae tannish yellow; second joint with 2 strong bristles; third

segment pale yellow and covered with fine whitish pile. Frons pale yellow with a faint median grayish stripe which extends from ocellar triangle to the base of antennae. Ocellar triangle blackish. Proclinate and anterior reclinate orbital bristles with their bases at the same level; anterior reclinate about 1/3 other two orbitals. Two prominent orals; second oral about same length as first. Palpi black with two very strong bristles at the apex. Face yellowish white without a distinct carina. Cheeks whitish yellow in front and grayish toward the back; their greatest width about 1/5 greatest diameter of eyes. Eyes red with fine pile.

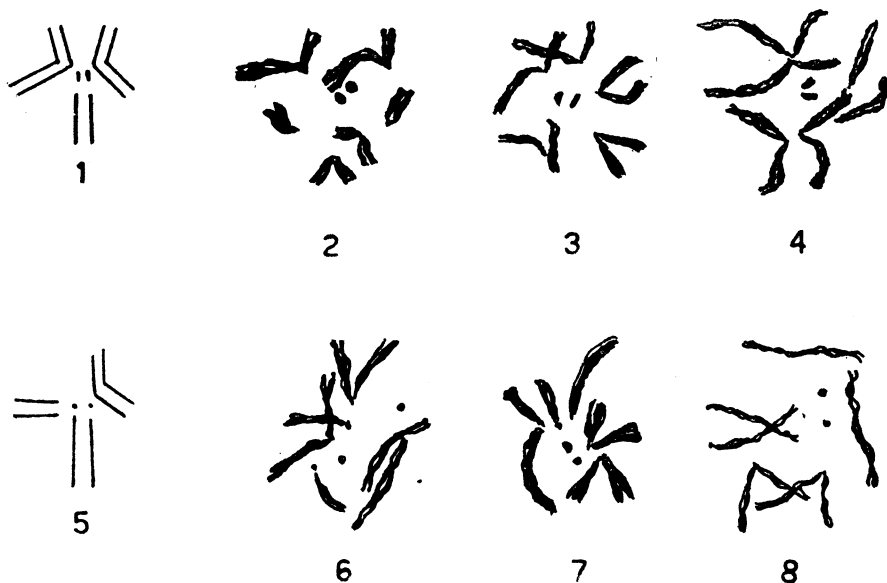


Plate 4.—Camera lucida drawings of metaphase plates of *S. melancholica* (N.º 2, 3 and 4) and *S. denticauda* (N.º 6, 7 and 8). Scheme of karyotype of *S. melancholica* (1) and *S. denticauda* (2).

Acrostichal hairs in two series between and in front of the dorsocentrals; 3 pairs of dorsocentral bristles. The anterior pair as long as the other two pairs, and diverging outward. One prominent humeral. Anterior scutellars parallel or slightly convergent. Sterno-index about 0.6. Mesonotum yellow with three longitudinal grayish brown vittae distributed as follows: a median stripe between the dorsocentrals from the anterior edge of the mesonotum which continue on the midline of scutellum; on each side, a lateral stripe just outside the dorsocentrals and continuing on both sides of the scutellum. Pleurae whitish yellow with a longitudinal stripe which extends from just below the humerals to the bases of the halteres. Legs light yellow; preapicals on all tibiae; apicals evident only on second tibiae.

Abdomen pale yellow, each segment with dark marks as follows: on both sides of the mid-line a dark spot in the same line as the lateral longitudinal stripes of the mesonotum and scutellum; on each lateral margin of the tergites, a black zone which reaches the anterior and posterior margin of the segment, forming on the whole a longitudinal band in correspondence with the longitudinal strip of the pleurae; on the last tergite of males, each median and lateral spot is fused in a sole dark mark.

Wings hyaline, veins brown. Two strong bristles at the apex of first costal section. Third costal section with heavy bristles on its basal 1/4. Costal index about 2.9; 4th vein index about 1,5; 5x index about 1,6. Halteres pale grayish yellow.

Length body: 2 mm.; wings: 2 mm.

Distribution, types and relationships.

Distribution.—Only two specimens, both males, were collected by the author in Azapa (Arica) in July, 1954.

Types.—Type material from the same locality.

Relationships.—It is undoubtable that our species is closely related to *S. vittata* Coquillett, and *S. paravittata* Wheeler (1952); but a careful comparison of the descriptions of the latter two forms with our species indicates that there are a number of quite different characters. Moreover, Hsu's drawings (1949) of the external genitalia of *S. vittata* (according to Wheeler, belonging to specie A) and those of Duda (1935) of specimens collected in Perú and Bolivia are quite different from the genitalia of our species. The descriptions of the species included in the same group, as *nigripalpis* and *fuscinervis* studied by Malloch from flies collected in Southern Brazil, Montevideo and Buenos Aires, do not accord with our species. We prefer to designate the species from Chile as *pseudovittata* sp. nov. until we obtain new data for comparison.

Geographical distribution

The collecting records of the 6 species of *Scaptomyza* from 18 different places, from Arica to Puerto Montt, are included in Table I. It is obvious that these spots represent only a part of the different types of biological and physical environments under which these flies are able to live; therefore an analysis of the distribution of the species will necessarily be incomplete. Most of the collecting spots correspond to completely «wild» environments, far from human habitations. This last circumstance may explain the lack, in our records, of the cosmopolitan species, such as *S. graminum* and *S. adusta*, which are reported from all the major areas of the world. (see reviews of Sturtevant, 1921; Ratterson, 1943; Ratterson and Mainland, 1944, and Wheeler, 1949-52).

An analysis of the data presented in Table I shows that geographically the most widely distributed species is *S. melancholica* present practically

in all the collections in quite a number. It should be pointed out that Duda (1925) records this species in Bolivia. *S. denticauda*, reported by Malloch (1934), in a number of places around the lakes of Southern Chile and Argentina seems to be the dominant species in most collecting spots of Southern Chile, and they extend to the central part of the country. *S. multispinosa* seems also to be a Southern and Central species. *S. dissimilis* was collected only three times in places corresponding to the central part of the country. Notwithstanding, Malloch (1934) records this species in Angol and Correntoso (Argentina).

S. noei collected only in Azapa, and *S. pseudovittata* found only in Yuta, probably represent flies adjusted to the ecological conditions of the Northern desert.

TABLE 1

ZONATION OF *SCIPTOMYZA* SPECIES IN CHILE

PLACES	Date of collect	SPECIES						Number of flies
		<i>melancholica</i>	<i>denticauda</i>	<i>multispinosa</i>	<i>dissimilis</i>	<i>noei</i>	<i>pseudovittata</i>	
Yuta (Arica)	Jul. 1954	2	—	—	—	18	—	20
Azapa (Arica)	Jul. 1954	—	—	—	—	—	2	2
Camarones (Arica).....	Jul. 1954	1	—	—	—	—	—	1
Paihuano (Coquimbo)...	Apr. 1954	15	—	2	—	—	—	17
Serena (Coquimbo).....	Apr. 1954	37	4	—	—	—	—	41
Rapel (Ovalle)	Apr. 1954	22	—	—	—	—	—	22
C. S. Cristóbal (Santiago)	Mar. 1954	11	1	—	—	—	—	12
Bellavista (Santiago)....	Mar. 1954	123	2	7	1	—	—	133
	Nov. 1954	2	—	—	1	—	—	3
Los Alpes (Colchagua)...	Oct. 1954	9	72	—	1	—	—	82
Paimún (Cautín).....	Jan. 1954	120	29	6	—	—	—	155
Villarrica (Cautín).....	Jan. 1954	4	1	—	—	—	—	5
I. Teja (Valdivia)	Feb. 1954	287	421	6	—	—	—	714
	Feb. 1955	658	667	4	—	—	—	1.329
Angachilla (Valdivia) ...	Feb. 1955	280	445	—	—	—	—	725
Rupanco (Osorno).....	Jan. 1954	161	116	32	—	—	—	309
Centinela (Llanquihue)...	Jan. 1955	38	172	1	—	—	—	211
Ensenada (Llanquihue) ..	Feb. 1954	413	805	4	—	—	—	1.222
Pto. Varas (Llanquihue)..	Feb. 1954	91	55	4	—	—	—	150
Pto. Montt (Llanquihue)	Feb. 1954	21	126	—	—	—	—	147
Total		2.295	2.916	66	3	18	2	5.300

LITERATURE CITED

- DUDA, O., 1925, *Die südamerikanischen Drosophiliden (Dipteren) unter Berücksichtigung auch der anderen neotropischen sowie der nearktischen Arten.* Arch. f. Naturgesch. 91 (A 11-12): 1-128.
- HSU, T. C., 1949, *The external genital apparatus of male Drosophilidae in relation to systematics.* Univ. Texas Public. N. 4920: 80-142.
- MALLOCH, J. R., 1934, *Diptera of Patagonia and South Chile.* Pt. VI. (5) 436-452. Brit. Mus. (Nat. Hist.). London.
- PATTERSON, J. T., 1934, *The Drosophilidae of Southwest.* Univ. Texas Public. N. 4313: 7-214.
- PATTERSON, J. T., and MAINLAND, G. B., 1944, *The Drosophilidae of Mexico.* Univ. Texas Public. N. 4445: 9-101.
- STUARDO, C., 1946, *Catálogo de los Dípteros de Chile.* Ministerio de Agricultura, Imprenta Universitaria, Santiago.
- STURTEVANT, A. H., 1921. *The North American Species of Drosophila.* Carnegie Inst. Wash. Public. 301.
- WHEELER, M. R., 1949, *Taxonomic studies on Drosophilidae.* Univ. Texas Public. N. 4920: 157-195.
- WHEELER, M. R., 1952, *The Drosophilidae of the nearctic region, exclusive of the genus Drosophila.* Univ. Texas Public. N. 5204: 162-218.