

A review of the genus *Scaptomyza* Hardy (Diptera, Drosophilidae) in Chile with the description of a new species

Una revisión del género *Scaptomyza* Hardy (Diptera, Drosophilidae)
en Chile con la descripción de una nueva especie*

DANKO BRNCIC

Departamento de Biología Celular y Genética, Facultad de Medicina, Universidad de Chile,
Casilla 6556, Santiago 7

SUMMARY

The genus *Scaptomyza* Hardy in Chile consists of 7 known species belonging to the subgenus *Dentiscaptomyza Takada* (5 species), *Mesoscaptomyza Hackman* (1 species) and *Scaptomyza s. str.* (1 species). A new species of *Dentiscaptomyza* is here described as *S. (D.) budnikae* sp. nov. (Fig. 1).

Keywords: *Scaptomyza*, *Drosophilidae*, *Dentiscaptomyza*, *Mesoscaptomyza*, *Scaptomyza budnikae* sp. nov.

RESUMEN

El género *Scaptomyza* Hardy en Chile consiste en 7 especies conocidas pertenecientes a los subgéneros *Dentiscaptomyza Takada* (5 especies), *Mesoscaptomyza Hackman* (1 especie) y *Scaptomyza s. str.* (1 especie). Una de las especies de *Dentiscaptomyza* es nueva y se describe como *S. (D.) budnikae* sp. nov. (Fig. 1).

Palabras-clave: *Scaptomyza*, *Drosophilidae*, *Dentiscaptomyza*, *Mesoscaptomyza*, *Scaptomyza budnikae* sp. nov.

Since my previous review of the genus *Scaptomyza* in Chile (Brncic 1955, 1957a), the list of species has been increased by the addition of a new entity, here described as *S. budnikae* sp. nov. During the last years the taxonomic treatment of the genus has been modified substantially by the excellent studies of Hackman (1959) and Wheeler and Takada (1962), using features of the male genitalia. The genus has been divided into several subgenera in such a way that in the present report we are capable to cluster the known Chilean species of *Scaptomyza* in a more updated fashion and to present an easier key to species identification.

The Genus SCAPTOMYZA Hardy

Scaptomyza Hardy 1849: 364. Type-species: *S. graminum* Fallen 1923: 8. Syn: *Scaptomyzella* Hendel 1928: 290 (also as *Scaptomyzetta*, error) type-species: *Drosophila flava* Fallen 1923: 7.

This genus is closely related to *Drosophila* differing from it in having two or four acrostichal rows of hairs in front of the transverse suture (six or more rows in *Drosophila*); two rows between the dorso-central bristles (four or more in *Drosophila*); carina often reduced; occiput more convex than in *Drosophila*; thorax, abdomen and wings more slender, pres-

* This work has been partially supported by grants from the Univ. of Chile (Project B 729 – 8235) and PNUD/UNESCO (RLA 78/024).

cutellar never present. The larvae are usually leaf miners.

Wheeler (1981) lists 226 species as belonging to the genus, clustered in 16 subgenus plus 6 species of uncertain affinity. Only three of these subgenera are nearly cosmopolitan (*Scaptomyza s. str.*, *Parascaptomyza* and *Hemiscaptomyza*). The remaining 13 are endemic, some of them restricted to single islands such as the monotypic subgenera *Lauxanomyza* and *Boninoscaptomyza* found in Santa Helena and Bonin Islands respectively, or *Macrosaptomyza* (2 species) found in Tristan da Cunha. Five subgenera exist only in Hawaii, two only in Africa, two only in the neotropics (one of them, *Dentiscaptomyza*, is restricted to Chile and the neighboring regions of the Andes and Argentine Patagonia), and one, *Bunostoma*, in Australia and Oceania. Three subgenera of *Scaptomyza* are found in Chile: *Scaptomyza* (one species) *Mesoscaptomyza* (one species) and *Dentiscaptomyza* (five species).

Subgenus SCAPTOMYZA Hardy (*s. str.*)

Type species: *Scaptomyza graminum* Fallen 1928: 8.

Wheeler and Takada (1962) include in this subgenus a group of species with more or less distinct *Scaptomyza* pattern; acrostichal hairs in 4 rows anteriorly, with 2 or more irregular rows posteriorly between dorsocentrals; palpi pale; apical scutellars normally long and directed posteriorly; two strong humeral bristles; usually dark species. In males, differentiation of the secondary claspers ("paralobes" of Frey) is slight, tertiary claspers are absent and there is no obvious specialized portion of the lower part ("toe") of the genital arch.

The subgenera *Scaptomyza* and *Parascaptomyza* Duda (1924) are the only ones truly cosmopolitan and, according to Wheeler (1981), comprise 30 nominated species. The only known species of the subgenus in Chile is *S. noei* Brncic 1955.

S. (Scaptomyza) noei Brncic

Scaptomyza noei Brncic 1955: 245. Type locality: Lluta (Arica) Chile.

All published records are from Arica (Lluta, Azapa and Camarones) (Brncic 1955, 1957a). Wheeler and Takada (1966) included the species within the subgenus *Scaptomyza* and presented drawings of the male genitalia of a specimen collected in Arica.

Subgenus MESOSCAPTOMYZA Hackman

Hackman 1959: 17. Type species: *S. wheeleri* Hackman 1959: 49.

Hackman (1959) established this subgenus to include several species with the following characteristics: "Usually yellowish species with the typical *Scaptomyza* pattern; arista with 2-4 ventral branches; one humeral bristle; two or four rows of acrostichal hairs; apical scutellars short, bent upright; paralobes occur in the male genitalia of some species. Wing spots occur in the *adusta* species group, blackish palpi in the *vitatta* group". Wheeler and Takada (1962) restricted the subgenus only to those species that have two rows of acrostichals, blackish palpi and more or less tan body with rather prominent mesonotal stripes. Wheeler (1981) included 17 species within the subgenus *Mesoscaptomyza*, all from the neotropical region. In Chile the subgenus is represented by the endemic species *S. pseudovitatta* Brncic (1955).

S. (Mesoscaptomyza) pseudovitatta Brncic

S. pseudovitatta Brncic 1955: 246. Type locality: Azapa (Arica) Chile.

Hackman (1959) considered this species, known only from Chile, to be a subspecies of *S. vitatta* Coquillett (1895: 318), which is widely distributed from Florida to Louisiana (USA), México, Cuba, Jamaica, Puerto Rico, Panamá, Colombia, Perú and Bolivia. However, the male genitalia of the Chilean specimens are very different respecting to those from the northern localities (Fig. in Brncic 1955, and Wheeler

and Takada 1966). According to Wheeler and Takada (1966) and to myself, it seems better to consider *S. pseudovitatta* as a distinct species.

Subgenus DENTISCAPTOMYZA Takada

Takada 1965: 43. Type species: *S. denticauda* Malloch 1934: 449.

Takada (1965) established this subgenus on the basis of male genitalia. The genital arch is divided into two parts and there are two different types of teeth on the primary clasper. In addition, formation of the secondary clasper is discernible. The ventral part of the genital arch is modified to form a "tertiary clasper". All species in the subgenus have acrostichal hairs 4 rowed anteriorly, with 2 or more irregular rows posteriorly between dorsocentral bristles; two strong humerals.

This is a typically endemic subgenus restricted to Chile and the neighboring regions of the Peruvian and Bolivian Andes and the southern parts of Argentina (Patagonian Lake Region).

Wheeler and Takada (1966) and Wheeler (1981) included four species in the subgenus. A fifth species here referred to as *S. budnikae* sp. nov. is described below.

S. (Dentiscaptomyza) denticauda Malloch

S. denticauda Malloch 1934: 449. Type: Peulla (Llanquihue) Chile.

Brncic (1955) stated that this is the most common species in southern Chile and that it has some color variation (Brncic 1957a), with much darker specimens in the regions of Aisen and Magallanes than in the central part of the country. Malloch (1934) recorded this species from several localities in the Patagonian Lake Region of Argentina (Nahuel-Huapi, Correntoso) and Brncic (1957b) reported the species from the Juan Fernández (Robinson Crusoe) Islands. A redescription of the species (with figures) was done by Brncic (1955). Wheeler and Takada (1966) did a complete analysis of the male genital apparatus.

S. (Dentiscaptomyza) intermedia Duda

S. adusta var. *intermedia* Duda 1927: 151 (*Drosophila adusta* var. *intermedia*) Type locality: Quillota (Chile).

= *S. dissimilis* Malloch 1934: 449. Types: Angol, Chile.

= *S. dissimilis* Malloch; Brncic 1955: 244; 1957: 52.

= *S. (Hemiscaptomyza) intermedia* Duda 1927: 151; Hackman 1959: 153.

= *S. (Dentiscaptomyza) intermedia* Duda 1927: 151; Wheeler and Takada 1966: 54.

Duda (1927) described the species from Quillota, Chile as a variety (var. *intermedia*) of *S. adusta* Loew (1862: 231). Hackman (1959) studied Duda's type from the Dresden Museum and concluded that it is identical to *S. dissimilis* Malloch (1934) described from Angol, Chile. Hackman established the synonymy and placed the species in the subgenus *Hemiscaptomyza*. However, on the basis of male genitalial features, Wheeler and Takada (1966) included the species in the subgenus *Dentiscaptomyza*.

A redescription of the species (with figures) is provided by Brncic (1955, 1957a). *Scaptomyza intermedia* is a well distributed species in the central and southern parts of Chile and in the neighboring Lake Region of the Argentine Patagonia. The localities given by Malloch (1934) are Angol (Chile) and Correntoso (Argentina). Brncic (1957a) recorded the species in Santiago and Colchagua. In the California Academy collection, there are specimens collected in 1950 by Ross and Michelbacher from San Carlos (Ñuble, Chile), and El Abanico, (Bío-Bío, Chile).

S. (Dentiscaptomyza) melancholica Duda

S. melancholica Duda 1927: 153. Types: Chile (Santiago, Quillota) and Bolivia (Sorata).

Widespread and common in Chile from Arica to Tierra del Fuego (Brncic 1955, 1957a); and in Juan Fernández (Robinson Crusoe) Islands (Brncic 1957b). Malloch (1934) recorded this species in Argentina (Nahuel-Huapi, Bariloche, and Correntoso). I have also found the species in collections from southern Perú (Ica and Pisco). A re-

description of the species with figures is provided by Brncic (1955, 1957a).

S. (Dentiscaptomyza) multispinosa Malloch

S. multispinosa Malloch 1934: 450. Type locality: Bariloche, Argentina.

Malloch (1934) recorded this species in some localities in the Patagonian Lake Region of Argentina (Bariloche, Nahuel-Huapi), and in Chile (Ancud, Castro, Los Andes). Brncic (1955, 1957a) recorded the same species in many additional places from Coquimbo to southern Chile. Redescriptions of the species (with figures) are provided by Brncic (1955, 1957a).

In Chile, *S. multispinosa* was found infecting various species of *Cruciferae* (*Brassica napus* L., *B. oleracea* L., *B. campestris* L., *B. hirsuta*, *Raphanus sativus* L. and *Capsella bursa-pastoris* L. (Palma 1977)).

S. (Dentiscaptomyza) budnikae sp. nov. (Fig. 1).

Type locality: La Serena (Peñuelas) Chile.

External characters of imagines

Head (♂, ♀).— Arista with 4 dorsal and 2 ventral branches in addition to terminal

fork. Antennae yellow; second joint with two prominent bristles plus about 4 fine hairs; third joint slightly darkened above and at apex, with fine dark pilosity. Front golden yellow. Triangle and orbits pale grayish yellow. Proclinate and anterior reclinate orbital bristles with their bases at same level; middle orbital about a half of the first. Only one prominent oral bristle; second oral fine and about a half of the first. Carina nose-like, not sulcate. Face pale yellow, cheeks pale yellow, their greatest width about 1/6 greatest diameter of eyes. Eyes bright red with fine withish piles. Proboscis withish yellow, maxillary palps with about 4 or 5 fine hairs in the lower margin and two prominent and divergent bristles at apex, the external one shorter and slender than the internal.

Thorax (♂, ♀).— Acorstichal hairs in four rows at the level of the anterior pair of dorsocentrals, farther backwards in two rows. Two pairs of dorsocentral bristles, the anterior one as long as the posterior. Anterior scutellars nearly parallel. Two strong humerals. Sterno-index about 0.6. Mesonotum, scutellum and pleura bright golden yellow. Legs pale yellow.

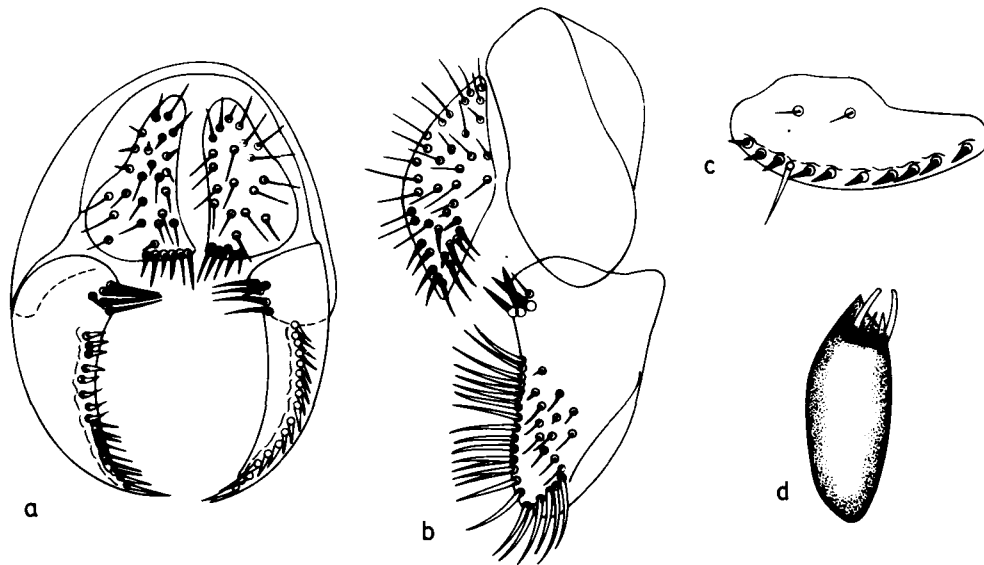


Fig. 1: *Scaptomyza budnikae* sp. nov. a) and b) Lateroblique and lateral view of male genitalia, c) Lateral view of the ovipositor, d) Egg.

Scaptomyza budnikae sp. nov. a) y b) Vista oblicua y lateral de la genitalia masculina, c) Vista lateral del ovipositor, d) Huevo.

Abdomen (♂, ♀).— Bright golden yellow, without bands or marks. Last tergite and anal plate darkened. In females the last tergite darker than in males and the ovipositor guides are blackish and strongly sclerotized (Fig. 1c). Male external genitalia as in Fig. 1a, 1b.

Wings (♂, ♀).— Transparent; veins yellow. Apex of first costal section with two prominent bristles, third costal section with heavy bristles on its basal 1/3 to 1/2. Costal index about 3.5; 4th vein index about 1.5; 5x index about 1.3; 4c index about 0.7. Halteres pale grayish yellow.

Body length (♂, ♀).— About 2.5 mm.

Egg.

Four very short filaments, the lower ones about half the size of the upper ones (Fig. 1d).

Relationships

The presence of acrostichal hairs in 4 rows anteriorly, two strong humerals, ovipositor well developed and sclerotized, and the characteristics of the secondary claspers (*paralobes* of Frey) in the males, together with many other features, permit to include this species in the subgenus *dentiscaptomyza* closely related to *S. denticauda* and *S. melancholica*, but easy to recognize by its bright yellow body color and the male genitalia.

Distribution and types

34 males and 26 females of the species, from a total of 2127 drosophilids were collected over fermenting banana baits left in a small grove of native plants and eucalyptus trees in Peñuelas (La Serena, Chile)

between 20-21 April 1981. Types were deposited in the National Museum of Natural History of Santiago, Chile.

Named after Prof. Myriam Budnik, one of the collectors of the species.

ACKNOWLEDGMENTS

I wish to thank Fabián Jaksic for review and correcting the manuscript. In addition, I acknowledge the helpful suggestions of an anonymous reviewer.

LITERATURE CITED

- BRNCIC D (1955) The Chilean species of *Scaptomyza* Hardy (Diptera, Drosophilidae). *Revista Chilena de Entomología* 4: 237-250.
- BRNCIC D (1957a) Las especies chilenas de Drosophilidae. *Monografías Biológicas, Universidad de Chile* (8) Imp. Stanley p. 136.
- BRNCIC D (1957b) Los insectos de las Islas Juan Fernández 31. Drosophilidae (Diptera). *Revista Chilena de Entomología* 5: 391-397.
- DUDA O (1924) Beitrag zur Systematik der Drosophiliden unter besonderer Berücksichtigung der paläarktischen und orientalischen Arten (Dipteren). *Archiv für Naturgeschichte* 90 A (3): 127-234.
- DUDA O (1927) Die südamerikanischen Drosophiliden (Dipteren) unter Berücksichtigung auch der anderen neotropischen sowie der nearktischen Arten. *Archiv für Naturgeschichte* 91 A (11-12) (1925): 1-228.
- HACKMAN W (1959) On the genus *Scaptomyza* Hardy (Diptera Drosophilidae). *Acta Zoologica Fennica* 97: 1-72.
- MALLOCH JR (1934) Diptera of Patagonia and South Chile Pt. VI (5): 436-452. *British Museum Natural History*. London, Oxford Univ. Press.
- PALMA JC (1977) Descripción morfológica de los estados preimaginales, ciclo vital, bioecología y antagonistas de *Scaptomyza multispinosa* Malloch. Tesis: Universidad Austral de Chile, Valdivia p. 54.
- TAKADA H (1965) Differentiation of the external male genitalia in the Drosophilidae. *Kushiro Women's College Publication* 1: 39-50 (in Japanese; English summary pp. 131-132).
- WHEELER MR & H TAKADA (1966) The nearctic and neotropical species of *Scaptomyza* Hardy (Diptera, Drosophilidae). *Studies in Genetics* III. University of Texas Publication 6615: 37-78.
- WHEELER MR (1981) The Drosophilidae: A taxonomic overview. In "The Genetics and Biology of Drosophila" Vol. 3a (Ashburner, M., Carson, H.L. and Thompson, J.N. Eds.) Academic Press Inc. (London and New York): 1-97.

KEY TO CHILEAN SPECIES OF *SCAPTOMYZA*

1. -- Acrostichal hairs in two rows, before and between the dorsocentral bristles; one prominent humeral; palpi black; mesonotum noticeable striped *S. (S.) pseudovitatta*
- Acrostichal hairs in four rows from anterior margin of mesonotum to the level of bases of anterior pair of dorsocentral bristles, and 2 or more irregular rows posteriorly between dorsocentrals; two prominent humerals; palpi pale; mesonotum not as above 2
2. -- Secondary claspers poorly developed in males and lacking tertiary claspers; female ovipositor plates stout and bearing coarse teeth *S. (M.) noei*
- Secondary claspers evident, tertiary claspers strongly developed, ovipositor plates not as above 3
3. -- Wings with a dark mark at apices of second, third and fourth veins in female, the later with a small dark spot against the lower edge of third vein near level of second vein apex; the male with four dark elongated marks at the same point, the upper one above third vein and fused with the second mark, the lower one below fourth vein *S. (D.) intermedia*
- Wings hyaline, without dark marks or spots 4
4. -- Two oral bristles at each side, nearly equal in size; palpi, face, and antennae of males bright yellow, often darker in females; upper humeral distinctly longer than lower one, mesonotum usually with 1-3 brown stripes, although they may be indistinct *S. (D.) multispinosa*
- Second oral bristle much weaker than the first one, two nearly equal humerals 5
5. -- Yellowish species. Palpi, antennae and face pale yellow; front golden yellow; mesonotum, scutellum and pleura bright yellow. Abdomen bright yellow, without bands or marks, except last tergite and anal plate that is darkened, and ovipositor guides that are blackish and strongly sclerotized *S. (D.) budnikae* sp. nov.
- Dark brown species. Mesonotum dull and heavily pollinose, the abdominal tergites are mostly dull and blackish 6
6. -- Mesonotum heavily grayish pollinose without an evident median brown stripe; carina nose-like; proclinate orbital and anterior reclinate with their bases almost at the same level; hind femora yellowish in both sexes. Testes yellow *S. (D.) melancholica*
- Mesonotum pollinose, usually with a faint brownish median stripe; legs yellow but hind femora, coxa, and trochanter usually darker; carina narrow, low and rounded below; bases of anterior reclinate orbital a bit behind that of proclinate. Testes deep orange red *S. (D.) denticauda*