



FAMILY SCIOMYZIDAE

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Abstract

The Sciomyzidae are a family of acalyptrate flies of worldwide distribution, with 543 extant species and 14 described subspecies in 63 genera. Although 274 species in 37 genera are found in the Western Hemisphere, the sciomyzid fauna of Central and South America remains relatively unknown, comprising 103 species in 25 genera, with only seven species in five genera having been recorded from Colombia: *Dictya bergi* Valley, *Perilimnia albifacies* Becker, *Pherbellia guttata* (Coquillett), *Sepedomerus bipuncticeps* (Malloch), *S. macropus* (Walker), *Sepedonea guianica* (Steyskal), and *S. isthmi* (Steyskal).

Key words: Acalyptratae, catalog, catalogue, Colombia, distribution, Neotropical, Neotropics, snail-killing flies, taxonomy

Introduction

The Sciomyzidae are a family of acalyptrate flies of worldwide distribution, with 543 extant species (Murphy 2014) and 14 described subspecies in 63 genera and 13 fossil species in five genera (Vala *et al.* 2012, 2013).

Traditionally the family has been considered to comprise two subfamilies, Salticellinae and Sciomyzinae (Marinoni & Mathis 2000, Barker *et al.* 2004). More recently, DNA analyses by Tóthová *et al.* (2012) showed it to comprise three subfamilies: Phaeomyiinae, Salticellinae, and Sciomyzinae.

Sciomyzidae is one of the best known families of Diptera. The species are considered to be “true malacophages” and are classified into 15 different behavioral groups (Knutson & Vala 2011). The biology of 241 species in 41 genera is known, with only three species not being associated with molluscs (Vala *et al.* 2013). Sciomyzids that prey on non-operculate aquatic snails hold promise to control species of gastropods that act as intermediate hosts of diseases such as fascioliasis and schistosomiasis (Berg & Knutson 1978, Barker *et al.* 2004).

Although 274 species in 37 genera are found in the Western Hemisphere (Murphy 2014), the sciomyzid fauna of Central and South America remains relatively unknown, comprising 103 species in 25 genera, with only seven species in five genera having been recorded from Colombia (Table 1). This low number results from lack of information about specimens in collections and lack of collecting in Colombia. Many species known from adjacent countries (Panama, Venezuela, and Ecuador) likely occur in Colombia but have yet to be collected.

Acronyms used for the depositories

BMNH—Natural History Museum, London, UK

CU—Cornell University, Ithaca, New York, USA

MNHN—Muséum national d’Histoire naturelle, Paris, France

USNM—U.S. National Museum of Natural History, Washington, DC, USA

List of abbreviations

biol.—biology
biol. control—biological control
cat.—catalogue
distr.—distribution
imm. stages—immature stages
kar.—karyotype
key imm.—key to immature stages
mon.—monotypy
nom. nud.—nomen nudum
orig. des.—original designation
preocc.—preoccupied
redesc.—redescription
refs.—references
syn.—synonymy
F (f#)—Female
M (m#)—Male

The references (“Refs.”) for each taxon include only the most important publications, i.e. those providing revisions, identification keys, detailed descriptions, type notes, catalogues, etc.

Catalogue of Sciomyzidae of Colombia

“**Sciomyzides**” Fallén, 1820

Family “**Sciomyzidae**” Macquart, 1846

Subfamily **Sciomyzinae** Schiner, 1862

Tribe **Sciomyzini** Cresson, 1920

Genus **Pherbellia** Robineau-Desvoidy

Pherbellia Robineau-Desvoidy 1830: 695. Type species, *Pherbellia vernalis* Robineau-Desvoidy 1830: 696 (mon.)—*Musca punctata* Fabricius 1794: 347 (preocc. Poda 1761: 116—*Sciomyza schoenherri* Fallén 1826: 13). Refs.: Knutson *et al.* 1976: 4 (cat.); Marinoni & Mathis 2000: 163-191 (cladistic analysis of the family), figs. 11, 76, 169, 220, 221 (antenna, male terminalia); Barker *et al.* 2004; Knutson & Vala 2011; Vala *et al.* 2013.

Melina Robineau-Desvoidy 1830: 695 (preocc. Retzius 1788: 22). Type species *Melina riparia* Robineau-Desvoidy 1830: 695 (mon.)—*Sciomyza dubia* Fallén.

Chetocera Robineau-Desvoidy 1830: 697 (Coquillett 1910: 567)

Graphomyzina Macquart 1835: 558. Type species *elegans* Macquart 1835: 559 (orig. des.)—*Sciomyza limbata* Meigen 1830: 17.

Notopherbellia Malloch 1933: 311. Type species *chiloensis* Malloch 1933: 311 (mon.).

Sciomyza of authors, not Fallén 1820.

guttata (Coquillett) 1901: 615 (*Sciomyza*) [Cresson 1920: 48 (as *Melina*, subgenus *Graphomyzina*) Steyskal 1965: 686 (*Pherbellia*), but not stated as new combination]. Type locality: U.S.A., Texas. F (USNM). Distr.: U.S.A. (Texas: Austin, Cameron Co.); Mexico (Chiapas, Distrito Federal Tamaulipas); Bahamas; Jamaica (St. Ann); Colombia (Valle del Cauca [Palmira]); Peru (Loreto: San Antonio). Refs.: Knutson *et al.*, 1976: 4 (cat.); Vala *et al.*, 2013: 85.

Tribe **Tetanocerini** Steyskal, 1965

Genus **Dictya** Meigen

Dictya Meigen, 1803: 277. Type species, *Musca umbrarum* Linnaeus, 1758: 599 (by designation of Cresson, 1920: 70) (Traditional usage pending submission of proposal to I.C.Z.N. for fixation of type species). Refs.: Becker, 1919: 189; Knutson *et al.*, 1976: 6 (cat.); Marinoni & Mathis, 2000: 163-191 (cladistic analysis of the family), figs. 20, 84, 174, 239-241 (antenna, male terminalia); Barker *et al.*, 2004; Knutson & Vala, 2011; Vala *et al.*, 2013.

Monochaetophora Hendel 1900: 355. Type species, *Musca umbrarum* Linnaeus, 1758: 599 (mon.).

bergi Valley, 1977 *in* Valley & Berg, 1977: 3. Type locality: Costa Rica: San José Prov., San Antonio–Desamparados. M F (CU). Distr.: Costa Rica (Cartago, San José); Colombia (Valle del Cauca). Refs.: Knutson *et al.*, 1976: 6 (cat.); Vala *et al.*, 2013: 97.

Genus **Perilimnia** Becker

Perilimnia Becker, 1919: 189. Type species, *albifacies* Becker, 1919: 189 (mon.). Refs.: Knutson *et al.*, 1976: 8 (cat.); Marinoni & Mathis, 2000: 163-191 (cladistic analysis of the family), figs. 18, 82, 129, 172, 233-235 (antenna, male terminalia); Barker *et al.*, 2004; Knutson & Vala, 2011; Vala *et al.*, 2013.

Notosciomyza Malloch, 1933: 313. Type species, *dubia* Malloch (orig. des.)—*albifacies* Becker, 1919: 189.

albifacies Becker, 1919: 189. Type locality: Ecuador, Cuenca. M F (MNHNP). Distr.: Colombia (Cundinamarca, Nariño, Putumayo); Ecuador (Azuay, Cotopaxi, El Oro, Napo, Pichincha); Peru (Cusco, Lima); Bolivia (La Paz); Brazil (Rio Grande do Sul); Uruguay (Montevideo); Argentina (Tucumán, Jujuy, Corrientes, Córdoba, Mendoza, Buenos Aires, Rio Negro, Chubut, Santa Cruz, La Rioja); Chile (Valparaíso, Malleco, Atacama, Coquimbo, Aconcagua, Santiago, Maule, Concepción, Osorno, Llanquihue, Aysén, Magallanes). Refs.: Steyskal, 1953: 75; 1963: 123; Boyes *et al.*, 1969: 338 (kar.); Kaczynski *et al.*, 1969: figs. 1, 2, 6, 11–19, 29–34, 41–48 (male genitalia, biol., imm. stages, distr.); Knutson *et al.*, 1976: 8 (cat.); Vala *et al.*, 2013: 110.

Genus **Sepedomerus** Steyskal

Sepedomerus Steyskal, 1973: 144. Type species, *Sepedon macropus* Walker, 1849 (orig. des.). Refs.: Knutson *et al.*, 1976: 9 (cat.); Marinoni & Mathis, 2000: 163-191 (cladistic analysis of the family), figs. 50, 113, 159, 202, 320-321 (antenna, male terminalia); Barker *et al.*, 2004; Knutson & Vala, 2011; Vala *et al.*, 2013.

bipuncticeps (Malloch), 1933: 299, fig. 55a (*Sepedon*). Type locality: Argentina, Buenos Aires, La Plata City. F (BMNH). Distr.: Panama (Panama); Colombia (Valle del Cauca (El Morgan, Cali)); Brazil (Acre, Goiás, Minas Gerais, Paraná, Rio Grande do Sul); Paraguay (Villarrica, Guaira); Uruguay (Montevideo, Colón); Argentina (Distrito Federal, Chaco, Buenos Aires, La Plata, Catamarca). Refs.: Knutson *et al.*, 1976: 9 (cat.); Vala *et al.*, 2013: 113.

macropus (Walker), 1849: 1078, fig. 556 (*Sepedon*). Type locality: Jamaica. M (BMNH). Distr.: U.S.A. (Texas); Cuba; Jamaica; Puerto Rico; Tobago; Trinidad; Mexico; Guatemala; Honduras; Nicaragua; Costa Rica; Panama; Colombia; Ecuador; Peru. Refs.: Malloch, 1914: 323 (syn.); Malloch, 1933: 300, fig. 55b (*Sepedon*); Steyskal, 1951: 276, pl. 5, fig. 24 (male hind femur and tibia); Chock *et al.*, 1961 (biol. control); Neff & Berg, 1966 (biol., imm. stages, distr.); Boyes *et al.*, 1969: 344 (kar.); Knutson *et al.*, 1976: 10 (cat.); Vala *et al.*, 2013: 113.

Genus **Sepedonea** Steyskal

Sepedonea Steyskal, 1973: 145. Type species, *Sepedon lindneri* Hendel, 1932: 99 (orig. des.); Refs.: Knutson *et al.*, 1976: 10 (cat.); Marinoni & Mathis, 2000: 163-191 (cladistic analysis of the family), figs. 51, 114, 160, 203, 322-324 (antenna, male

terminalia); Barker *et al.*, 2004; Marinoni & Mathis, 2006 (cladistic analysis of the species in the genus); Knutson & Vala, 2011; Vala *et al.*, 2013.

guianica (Steyskal), 1951: 295, pl. 4, fig. 18 (*Sepedon*). Type locality: “Guyane” [French Guiana], Maroni, Comoro Is. [=Comoro Is., Maroni R.]. M (BMNH). Distr.: Colombia (Valle del Cauca); Venezuela (Cojedes); French Guiana (Maroni R.); Surinam (Paramaribo); Brazil (Distrito Federal, Espirito Santo, Goiás, Minas Gerais, Paraíba, Paraná, São Paulo); Argentina (Tucumán). Refs.: Steyskal 1973:145 (list); Knutson *et al.* 1976: 11 (cat.); Knutson & Valley 1978: 198 (review); Freidberg *et al.* 1991: 10 (key adult), 11 (key imm.), 16 (redesc.); figs 7, 40-45, 97, 110, 113, 116, 126, 135, 138, 141; Marinoni & Mathis 2006: figs. 16, 29, 40; Vala *et al.* 2013: 121.

isthmi (Steyskal) 1951: 291, pl. 4, fig. 20 (*Sepedon*). Type locality: Panama, Canal Zone, Corozal. M (USNM). Distr.: Panama (Canal Zone, Corozal, Juan Mina); Trinidad (Caroni River, Port-of-Spain); Venezuela (Aragua, Cojedes, Carabobo); Colombia (Valle); Bolivia (Rurrenabaque); Brazil (Amazonas, Goiás, São Paulo). Refs.: Steyskal, 1973: 145 (list); Knutson *et al.*, 1976: 11 (cat.); Knutson & Valley, 1978: 197 (biol. and imm. stages); Freidberg *et al.*, 1991: 9 (key adult), 11 (key imm.), 21 (redesc.), figs. 6, 9, 14-16, 52-57; Marinoni & Mathis, 2006: figs. 18, 31, 40.

vau Mello & Brecht 1978a: 212 [*nom. nud.*] [Freidberg *et al.* 1991: 16 as Mello & Brecht 1978(b): 1459].

TABLE 1. Sciomyzidae species recorded from Colombia.

Subfamily	Tribe	Genus	Species	Author
Sciomyzinae	Sciomyzinae	<i>Pherbellia</i>	<i>guttata</i>	(Coquillett, 1901)
	Tetanocerini	<i>Dictya</i>	<i>bergi</i>	Valley, 1977
		<i>Perilimnia</i>	<i>albifacies</i>	Becker, 1919
		<i>Sepedomerus</i>	<i>bipuncticeps</i>	(Malloch, 1933)
	<i>macropus</i>		(Walker, 1849)	
	<i>Sepedonea</i>	<i>guianica</i>	(Steyskal, 1951)	
		<i>isthmi</i>	(Steyskal, 1951)	

References

- Barker, G.M., Knutson, L., Vala, J.-C., Coupland, J.B. & Barnes, J.K. (2014) Overview of the biology of marsh flies (Diptera: Sciomyzidae), with special reference to predators and parasitoids of terrestrial gastropods. In: Barker, G.M. (Ed.), *Natural Enemies of Terrestrial Molluscs*. CABI Publishing, Wallingford, pp. 159–255.
<http://dx.doi.org/10.1079/9780851993195.0159>
- Becker, T. (1919) Diptères. Brachycères. In: *Ministère de l'Instruction Publique, Mission du Service géographique de l'Armée pour la mesure d'un Arc de Méridien équatorial en Amérique du Sud, sous le contrôle scientifique de l'Académie des Sciences, 1899–1906. Vol. 10. Fasc. 2.* Gauthier-Villard, Paris, pp. 163–215, pls. 14–17.
<http://dx.doi.org/10.5962/bhl.title.980>
- Berg, C.O. & Knutson, L. (1978) Biology and systematics of the Sciomyzidae. *Annual Review of Entomology*, 23, 239–258.
<http://dx.doi.org/10.1146/annurev.en.23.010178.001323>
- Boyes, J.W., Knutson, L.V., Jan, K.Y. & Berg, C.O. (1969) Cytotaxonomic studies of Sciomyzidae (Diptera: Acalyptratae). *Transactions of the American Microscopical Society*, 88 (3), 331–356.
<http://dx.doi.org/10.2307/3224701>
- Chock, Q.C., Davis, C.J. & Chong, M. (1961) *Sepedon macropus* (Diptera: Sciomyzidae) introduced into Hawaii as a control for the liver fluke snail, *Lymnaea ollula*. *Journal of Economic Entomology*, 54 (1), 1–4.
- Coquillett, D.W. (1901) New Diptera in the U.S. National Museum. *Proceedings of the United States National Museum*, 23, 593–618.
<http://dx.doi.org/10.5479/si.00963801.23-1225.593>
- Coquillett, D.W. (1910) The type-species of the North American genera of Diptera. *Proceedings of the United States National Museum*, 37, 499–647.
- Cresson, E.T. Jr. (1920) A revision of the Nearctic Sciomyzidae (Diptera, Acalyptratae). *Transactions of the American Entomological Society*, 46, 27–89 + 3 pls.
- Fabricius, J.C. (1794) *Entomologia systematica emendata et aucta. Secundum. Classes, ordines, genera, species adjectis*

- synonymis, locis, observationibus, descriptionibus. Vol. 4. Proft. et. Torch., Hafniae, [6] + 472 + [5] pp.*
- Fallén, C.F. (1820) *Sciomyzides Sveciae*. Litteris Berlingianis, Lundae, 16 pp.
- Fallén, C.F. (1826) *Supplementum Dipterorum Sveciae*. Litteris Berlingianis, Lundae, 16 pp.
- Freidberg, A., Knutson, L. & Abercrombie, J. (1991) A revision of *Sepedonea*, a neotropical genus of snail-killing flies (Diptera: Sciomyzidae). *Smithsonian Contributions to Zoology*, 506, i–iii + 1–48.
<http://dx.doi.org/10.5479/si.00810282.506>
- Hendel, F. (1900) Untersuchungen über die europäischen Arten der Gattung *Tetanocera* im Sinne Schiner's. Eine dipterologische Studie. *Verhandlungen der Zoologisch-Botanischen Gesellschaft in Wien*, 50, 319–358.
- Hendel, F. (1932) Die Ausbeute der deutschen Chaco-Expedition 1925/26. – Diptera. (Fortsetzung). XXX–XXXVI. Sciomyzidae, Lauxaniidae, Tanypezidae, Lonchaeidae, Tylidae, Drosophilidae, Milichiidae. *Konowia*, 11 (1 & 2), 98–114 & 115–145.
- Kaczynski, V.W., Zuska, J. & Berg, C.O. (1969) Taxonomy, immature stages, and bionomics of the South American genera *Perilimnia* and *Shannonia* (Diptera: Sciomyzidae). *Annals of the Entomological Society of America*, 62 (3), 572–592.
- Knutson, L., Steyskal, G.C., Zuska, J. & Abercrombie, J. (1976) 64. Family Sciomyzidae. In: Papavero, N. (Ed.), *A Catalogue of the Diptera of the Americas South of the United States*. Museu de Zoologia, Univ. São Paulo, Brazil, 24 pp.
- Knutson, L.V. & Vala, J.-C. (2011) *Biology of Snail-Killing Sciomyzidae Flies*. Cambridge Univ. Press, Cambridge, xix + 506 pp.
<http://dx.doi.org/10.1007/s10841-012-9487-y>
- Linnaeus, C. (1758) *Systema naturae per regna tria naturae. Vol. 1. 10th Edition*. Salvii, Holmia, 824 pp.
- Knutson, L. & Valley, K. (1978) Biology of a neotropical snail-killing fly, *Sepedonea isthmi* (Diptera: Sciomyzidae). *Proceedings of the Entomological Society of Washington*, 80 (2), 197–209.
- Macquart, J. (1835) Histoire Naturelle des Insectes. Diptères, Tome deuxième. In: Roret, N.E. (Ed.), *Collection des Suites à Buffon*. Librairie Encyclopédique de Roret, Paris, pp. 1–703, pls. 1–24.
<http://dx.doi.org/10.5962/bhl.title.14274>
- Macquart, J. (1846) Diptères exotiques nouveaux ou peu connus. [Ier] Supplément. *Mémoires de la Société des Sciences, de l'Agriculture et des Arts de Lille*, 1844, 133–364, pls. 1–20.
- Malloch, J.R. (1914) Synonymical notes on North American Sciomyzidae. *Canadian Entomologist*, 46 (9), 323–324.
<http://dx.doi.org/10.4039/ent46323-9>
- Malloch, J.R. (1933) Acalyptrata. Sciomyzidae. In: *Diptera of Patagonia and South Chile. Part VI. Fasc. 4*. British Museum (Natural History), London, pp. 296–323, text figs. 55–57, pl. VII.
- Marinoni, L. & Mathis, W.N. (2000) A cladistic analysis of Sciomyzidae (Diptera). *Proceedings of the Biological Society of Washington*, 113, 162–209.
- Meigen, J.W. (1803) Versuch einer neuen Gattungs-Eintheilung der europäischen zweiflügeligen Insekten. *Magazin für Insektenkunde*, 2, 259–281.
- Meigen, J.W. (1830) *Systematische Beschreibung der bekannten europäischen zweiflügeligen Insekten. Vol. 6*. H. W. Schultz, Hamm, xi + 401 pp., 12 pls. [pls. 55–66]
- Mello, D.A. & Brecht, A. (1978a) Distribuição geográfica de Sciomyzidae (Diptera: Insecta) no distrito federal e em algumas regiões de outros estados do Brasil. *Ciência e Cultura*, 30 (2), 212–215.
- Mello, D.A. & Brecht, A. (1978b) Estudos populacionais de cinco espécies de Sciomyzidae (Diptera-Insecta) no norte de Formosa, Goiás. *Ciência e Cultura*, 30 (12), 1459–1464.
- Murphy, W.L. (2014) *Dictya behrmani*, a new species of snail-killing fly (Diptera: Sciomyzidae) from Indiana. *Proceedings of the Entomological Society of Washington*, 11 (1), 91–97.
- Neff, S.E. & Berg, C.O. (1966) Biology and immature stages of malacophagous Diptera of the genus *Sepedon* (Sciomyzidae). *Virginia Agricultural Experiment Station Bulletin*, 566, 1–113.
- Poda, N. (1761) *Insecta Musei Graecensis, quae in Ordines, Genera et Species Juxta Systema Naturae Caroli Linnaei Digessit*. Typus Haeredum Widmanstadii, Graecii, [viii] + 127 pp., 2 pls. [Facsimile-Edition. Ed. W. Junk. No. 19, W. Junk, Berlin, 1915]
- Retzius, A.J. (1788) *Dissertatio historico-naturalis sisters nova Testaceorum genera. quam...praeside...A. J. Retsio...defert L. M. Philipsson, etc.* Lundae, iv + 23 pp.
- Robineau-Desvoidy, J.B. (1830) Essai sur les Myodaires. [Cl. des] Sci. Math. et Phys., Mém. présentés par divers Savants. *Académie Royal des Sciences de l'Institut de France*, Series 2, 2, 1–813. [Paris]
- Schiner, I.R. (1862) Vorläufiger Commentar zum dipterologischen Theile der “Fauna Austriaca”, mit einer näheren Begründung der in derselben aufgenommenen neuen Dipteren-Gattungen. IV. *Wiener Entomologische Monatschrift*, 6, 143–152.
- Steyskal, G.C. (1951a [1950]) The genus *Sepedon* Latreille in the Americas (Diptera: Sciomyzidae). *Wasmann Journal of Biology*, 8 (3), 271–297.
- Steyskal, G.C. (1953) Notes on a collection of Argentine Sciomyzidae. *Acta Zoologica Lilloana*, 13, 73–75.
- Steyskal, G.C. (1965) The subfamilies of Sciomyzidae of the world (Diptera: Acalyptratae). *Annals of the Entomological Society of America*, 58 (4), 593–594.
- Steyskal, G.C. (1973) A new classification of the *Sepedon* group of the family Sciomyzidae (Diptera) with two new genera. *Entomological News*, 84 (5), 143–146.

- Tóthová, A., Rozkosny, R., Knutson, L., Kuty, S.N., Wiegmann, B.M. & Meier, R. (2013) A phylogenetic analysis of Sciomyzidae (Diptera) and some related genera. *Cladistics*, 29 (4), 404–415.
<http://dx.doi.org/10.1111/cla.12002>
- Vala, J.-C., Murphy, W.L., Knutson, L. & Rozkošný, R. (2012) A cornucopia for Sciomyzidae (Diptera). *Studia dipterologica*, 19 (1–2), 67–137.
- Vala, J.-C., Murphy, W.L., Knutson, L. & Rozkošný, R. (2013) Corrigenda for the publication “A cornucopia for Sciomyzidae (Diptera).” *Studia dipterologica*, 20 (2), 183–188.
- Valley, K.R. & Berg, C.O. (1977) Biology and immature stages of snail-killing Diptera of the genus *Dictya* (Sciomyzidae). *Search Agriculture Entomology 18 (Ithaca)*, 7 (2), 1–44.
- Walker, F. (1849) List of the Specimens of Dipterous Insects in the Collection of the British Museum, Part 4. British Museum, London, pp. 689–1172.
<http://dx.doi.org/10.5962/bhl.title.20821>