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A catalog of the Chamaemyiidae of Chile (Diptera: Lauxanioidea)

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Abstract

A catalog of the Chamaemyiidae of Chile is provided. We present all valid names and synonyms for the 14 species and eight genera and subgenera distributed in the country, including information about name, author, year of publication, page number, type-species, type depository, type locality and references. The chamaemyiid fauna of Chile is small, with the largest genus, *Ortalidina* Blanchard having only five species. Species of the subgenus *Xenoleucopis* Malloch of the genus *Leucopis* Meigen (even if referred to only as "sp.") are the most cited due to their apparent potential as biological control agents, or the many works recording their biology. The geographical distribution of the different species was compiled from bibliographic data and revised collections.

Key words: Acalyptratae, Andean Region, silver flies

Resumen

Se proporciona un catálogo de los Chamaemyiidae de Chile. Se presentan todos los nombres válidos y sinónimos para las 14 especies y ocho géneros y subgéneros distribuidos en el país, incluyendo información sobre el nombre, autor, año de publicación, número de página, especie tipo, depósito del tipo, localidad tipo y referencias. La fauna de Chamaemidos de Chile es pequeña, siendo el género más diversificado, *Ortalidina* Blanchard con sólo cinco especies. Las especies del subgénero *Xenoleucopis* Malloch, del género *Leucopis* Meigen (aunque sólo se haga referencia a ellas como "sp."), son las más citadas debido a su aparente potencial como agentes de control biológico, o a los numerosos trabajos que registran su biología. La distribución geográfica de las distintas especies se recopiló a partir de datos bibliográficos y de colecciones revisadas.

Palabras claves: Acalyptratae, Región Andina, moscas plateadas

Introduction

Chamaemyiidae (Fig. 1) are a cosmopolitan (except Antarctica) family of acalyptrate flies comprising 33 extant genera and subgenera and almost 350 valid species (Gaimari & Havill 2021), with 38 species in 13 genera and subgenera in the Neotropics (Gaimari 2010). The family is divided into two subfamilies, Cremifaniinae and Chamaemyiinae, with the latter divided into two tribes Chamaemyiini and Leucopini. Only one fossil species is known, the cremifaniine *Procremifania electrica* Hennig (1965: 116) from Baltic amber. The Chamaemyiidae chapter (Gaimari 2010) in the second volume of the *Manual of Central American Diptera* includes a key to all New World genera and subgenera, supplemented by Gaimari (2020) and Gaimari & Havill (2021). This chapter, along with Gaimari (2021), reviews the morphology, classification, biology, immature states, and economic significance of the family. Their economic significance is related to their being predators as larvae, attacking plant-feeding sternorrynchous Hemiptera, particularly Aphidoidea and Coccoidea. For the Neotropical Region, the family can be identified using the key in Buck *et al*. (2009) and verified by the diagnosis in Gaimari (2010).

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FIGURE 1. Adult male of a Chilean species of *Ortalidina*. Photo by Stephen A. Marshall, used with permission.

The goal of this paper is to provide an updated catalog of the Chamaemyiidae of Chile with references and additional information for each genus and species, including information given for unidentified species and in unpublished theses and dissertations, to give a more complete look at the known biology of the family in Chile. This supplements the catalogs of Reed (1888a, b) (which included only one species, treated in Ortalidae) and Stuardo Ortiz (1946) (which included two species treated as Chamaemyiidae and one treated as *incertae sedis* within Otitidae), noting that the chamaemyiids were not treated in Papavero's series *A Catalogue of the Diptera of the Americas south of the United States*. Despite this, Steyskal's (1968) treatment of Otitidae did include one Chilean chamaemyiid species, *Ortalidina cellularis* Blanchard, treated as an unplaced genus and species.

Material & methods

For each species, the Chilean distribution is given by region and province (from north to south) and localities (alphabetically) when such data are available from the literature and from specimens in collections. Distributions outside of Chile are given after the Chilean distribution and are more general. The host records give the prey species and host plant as far as is known. References are given for each name as presented, while distributions and host records are given under the current valid name record. The references are geared towards particular treatments of the Chilean fauna and important general references, but beyond those, only selected references are provided for extra-limital works.

Acronyms used for location of primary types follow Evenhuis (2023):

CNC: Canadian National Collection of Insects, Arachnids & Nematodes, Ottawa, Canada.
MACN: Museo Argentina de Ciencias Naturales "Bernardino Rivadavia", Buenos Aires, Argentina.
MNHN: Muséum National d'Histoire Naturelle, Paris, France.
MZLU: Lund Museum of Zoology, Lund University, Lund, Sweden.
NHMUK: The Natural History Museum, London, United Kingdom.
NMID: National Museum of Ireland, Dublin, Ireland.
ZIN: Zoological Institute of the Russian Academy of Sciences, St. Petersburg, Russia

Eight valid genera and subgenera and 14 valid species of Chamaemyiidae are recorded from Chile (Table 1), noting that 1) *Chamaemyia* Meigen is here recorded without any described species for the country, 2) several of the genera have host and biological information for unidentified species (e.g., referring to them as "sp."), and 3) one particular *nomen nudum* ("Xenoleucopis olalguiagay") has been cited many times in the literature, even recording its biology, but it is not a valid name and may be referable to multiple species.

TABLE 1. Valid genera and species of Chamaemyiidae found in Chile.

Ortalidina Blanchard
- *apaxa* (Cogan)
- *australis* (Malloch)
- *cellularis* Blanchard
- *macalpinei* (Cogan)
- *reducta* (Cogan)

Echinoleucopis Gaimari & Tanasijtshuk
- *nigrolinea* Gaimari & Tanasijtshuk

Leucopis Meigen

subg. *Leucopella* Malloch
- *chileana* McAlpine

subg. *Leucopis* Meigen
- *ninae* Tanasijtshuk

subg. *Xenoleucopis* Malloch
- *cortesi* Blanchard
- *nigripes* Malloch

Melaleucopis Sabrosky
- *ortheziavora* Sabrosky

Neoleucopis Malloch
- *obscura* (Haliday)
- *setigera* (McAlpine)
- *tapiae* (Blanchard)

Catalog of the Family CHAMAEMYIIDAE Hendel, 1910, of Chile

Subfamily CHAMAEMYIINAE Hendel

Tribe CHAMAEMYIINI Hendel

Genus *CHAMAEMYIA* Meigen

CHAMAEMYIA Meigen, 1803: 278. Type-species: *Chamaemya elegans* Panzer, 1808: 12 (subsequent designation, I.C.Z.N., 1968: 16). **Note**—Genus misspelled by Panzer (1808).

OCHTIPHILA Fallén, 1823: 9. Type-species: *Ochtiphila aridella* Fallén, 1823: 10 (subsequent designation, Westwood, 1840: 151).

ESTELIA Robineau-Desvoidy, 1830: 635. Type-species: *Estelia herbarum* Robineau-Desvoidy, 1830: 635 (subsequent designation, Coquillett, 1910: 540).

spp.

Chamaemyia spp. **References**—None. **Host Records**—None. **Distribution**—Chile. **Note**—Specimens of multiple species from various collections have been examined by the first author, representing first records for this genus in Chile.

Genus *ORTALIDINA* Blanchard

ORTALIDINA Blanchard, 1854b: 455. Type-species: *Ortalidina cellularis* Blanchard (monotypy). **References**—Reed, 1888: 309 (catalog, as Ortalidae); Stuardo Ortiz, 1946: 132 (catalog, as Otitidae); Steyskal, 1968: 23 (catalog, as unplaced genus); Gaimari, 2010: 1000 (biology), 1001 (classification), 1004 (in key), 1005 (status as chamaemyiid), 2012: 44 (summary, species, figures).

TOROPAMECIA Cogan, 1978: 230. Type-species: *Acrometopia punctata* Coquillett, 1902 (original designation). **References**—Tanasijtshuk, 1986: 55 (distribution), 69 (classification), 1992: 204/71 (Figure 5 [cladogram]), 207/74 (in key), 214/81 (Figures 22 –25 [male genitalia of *T. reticulata* (Johnson)], 26 [pregenital sclerites of *T. reticulata* (Johnson)]), 214/82 (diagnosis), 2003: 168 (distribution), 169 (classification), 170 (Figure 1 [cladogram]), 171 (comment); McAlpine, 1987: 967 (in key); Gaimari, 2010: 1001 (comment), 1005 (comment), 2012: 44 (synonymy).

***apaxa* (Cogan)**

Toropamecia apaxa Cogan, 1978: 235–236. Type locality: Chile, Tarapacá, Azapa. Holotype male, CNC (examined). **References**—Cogan, 1978: 231 (in key); Gaimari, 2010: 1004 (in key), 2012: 44 (nomenclature), 45 (Figure 12 [habitus, holotype male]).

Ortalidina apaxa. **References**—Gaimari, 2012: 44 (combination). **Distribution**—Chile: Región de Arica y Parinacota: Arica Province (Azapa). **Host Records**—None.

***australis* (Malloch)**

Acrometopa australis Malloch, 1933: 382. Type locality: Chile, Concepción. Holotype female, NHMUK (examined). **References**—Stuardo Ortiz, 1946: 150 (catalog); Gaimari, 2012: 44 (note genus misspelling).

Acrometopia australis. Correct genus spelling. **References**—Gaimari, 2012: 45 (Figure 13 [habitus, holotype female]).

Toropamecia australis. **References**—Cogan, 1978: 231 (in key), 233 (combination); Gaimari, 2012: 44 (nomenclature).

Ortalidina australis. **References**—Gaimari, 2012: 44 (combination). **Distribution**—Chile. Región del Biobío: Concepción Province (Concepción). Región de Los Lagos: Chiloé Province (Ancud). **Host Records**—None.

***cellularis* Blanchard**

Ortalidina cellularis Blanchard, 1854b: 455. Type locality: Chile, Santa Rosa. Lectotype male, MNHN (examined). **References**—Blanchard, 1854a: Dipteros Lám. 5 (Figure 11a [habitus dorsal], b [antenna], c [wing, pattern removed]); Reed, 1888a: 309 (catalog, as Ortalidae), 1888b: 35 (catalog, as Ortalidae); Stuardo Ortiz, 1946: 132 (catalog, as *incertae sedis* in Otitidae); Steyskal, 1968: 23 (catalog, as unplaced species in Otitidae); Gaimari, 2010: 1005 (comment), 2012: 45 (Figure 10 [habitus, lectotype male]), 46 (lectotype designation), 2021: 1808 (Figure 70 [egg]). **Distribution**—Chile. Región de Los Lagos: Chiloé Province (Dalcahue) **Host Records**—None.

Toropamecia grossa Cogan, 1978: 234. Type locality: Chile. Chiloé, Isla Chiloé, Dalcahue. Holotype male, CNC (examined). **References**—Cogan, 1978: 231 (in key); Gaimari, 2012: 44 (synonymy) 45 (Figure 11, holotype male).

***macalpinei* (Cogan)**

Toropamecia macalpinei Cogan, 1978: 236. Type locality: Chile, Malleco, Liucura. Holotype male, CNC (examined). **References**—Cogan, 1978: 231 (in key); Gaimari, 2012: 46 (nomenclature), 47 (Figure 19 [habitus, holotype male]).

Ortalidina macalpinei. **References**—Gaimari, 2012: 46 (combination). **Distribution**—Chile. Región de La Araucanía: Malleco Province (Liucura). **Host Records**—None.

***reducta* (Cogan)**

Toropamecia reducta Cogan, 1978: 236. Type locality: Chile, Malleco, 1500 m. Holotype male, CNC (examined). **References**—Cogan, 1978: 231 (in key); Gaimari, 2012: 48 (Figure 23 [habitus, holotype male]), 49 (nomenclature).

Ortalidina reducta. **References**—Gaimari, 2012: 49 (combination). **Distribution**—Chile. Región de La Araucanía: Malleco Province (Curacautín, Río Blanco). **Host Records**—None.

Tribe LEUCOPINI Hendel, 1928

Genus *ECHINOLEUCOPIS* Gaimari & Tanasijtshuk

ECHINOLEUCOPIS Gaimari & Tanasijtshuk, 2001: 313. Type-species: *Leucopina ceroplastophaga* Blanchard, 1938: 360 (original designation). **References**—Gaimari & Tanasijtshuk, 2001: 313 (in key), 316 (key to species); Tanasijtshuk, 2003: 168 (distribution), 169 (classification), 170 (Figure 1 [cladogram]), 174 (comment); Gaimari, 2010: 1000 (biology), 1001 (morphology), 1003 (in key), 2012: 42 (comment), 2021: 1783 (morphology); Ross *et al*., 2012: 98 (biology); Gaimari & Havill, 2021: 27 (in key).

***nigrolinea* Gaimari & Tanasijtshuk**

Echinoleucopis nigrolinea Gaimari & Tanasijtshuk, 2001: 325. Type locality: Chile, La Cruz, Valp[araís]o. Holotype male, CNC (examined). **References**—Gaimari & Tanasijtshuk, 2001: 314 (Figure 1H [abdomen], 316 (in key), 323 (Figure 11A–E [male genitalia], 11F–G [female terminalia], 326 (biology, Figure 12 [cladogram]); Cooper *et al*., 2003: 10 (type data). **Distribution**—Chile. Región de Coquimbo: Elqui Province (Vicuña). Región de Valparaíso: Quillota Province (La Cruz), Valparaíso Province (Valparaíso). Región Metropolitana de Santiago: Santiago Province (Quebrada de la Plata). **Host Records**—*Ceroplastes ceriferus* infesting *Baccharis rosmarinifolia* (Gaimari & Tanasijtsuk 2001).

sp.

Leucopis sp. **References**—Rojas, 2005: 87 (biology). **Host Records**—*Ceroplastes* sp., egg sac. **Note**—The genus placement is assumed based on the recorded host, as voucher specimens were neither located nor examined. The only other chamaemyiid genus in the Neotropics known to attack *Ceroplastes* wax scales is *Chamaeleucopis* Gaimari, 2012, which is known from Brazil.

Genus *LEUCOPIS* Meigen

LEUCOPIS Meigen, 1830: 133. Type-species: *Leucopis puncticornis* Meigen, 1830: 133 (subsequent designation, Westwood, 1840: 151). **References**—Malloch, 1933: 380 (comment, larval habits), 381 (in key), 383 (redescription), 384 (key to subgenera); Stuardo Ortiz, 1946: 150 (catalog); Sabrosky, 1957: 115 (in key); McAlpine, 1960: 52 (note), 54 (in key), 1987: 967 (in key); Tanasijtshuk, 1986: 201 (revision, Palaearctic species), 1992: 204/71 (Figure 5 [cladogram]), 228/75 (in key), 228/98 (diagnosis), 229/96 (Figures 74 [head of *L. atritarsis* Tanasijtshuk], 75 [wing of *L. atritarsis* Tanasijtshuk], 76–77 [male genitalia of *L. atritarsis* Tanasijtshuk], 78 [male pregenital sclerites of *L. atritarsis* Tanasijtshuk], 2003: 167 (distribution), 169 (classification), 170 (Figure 1 [cladogram]), 174 (comment); Gaimari & Tanasijtshuk, 2001: 313 (in key); Gaimari, 2010: 1003 (in key), 1005 (comment); Ross *et al*., 2012: 98 (biology); Evenhuis & Pape, 2019: 77 (nomenclature); Gaimari & Havill, 2021: 27 (in key), 28 (in key).

Subgenus *LEUCOPELLA* Malloch

LEUCOPELLA Malloch, 1927: 576. Proposed as subgenus. Type-species: *Leucopis africana* Malloch, 1927: 576 (original designation). **References**—Malloch, 1933: 384 (in key); McAlpine, 1960: 52 (note), 54

(in key); Gaimari & Raspi, 2002: 241 (revision, northeastern African species); Tanasijtshuk, 2003: 174 (classification); Gaimari, 2010: 1000 (biology), 1002 (in key), 2021: 1793 (biology); Ross *et al*., 2012: 98 (biology); Gaimari & Havill, 2021: 26 (in key).

***chileana* McAlpine**

Leucopis chileana McAlpine, 1960: 54. Type locality: Chile, Santiago, Los Martenes (Maitenes). Holotype male, CNC (examined). **References**—McAlpine, 1960: 56 (Figures 1 [head and thorax, lateral], 2 [male genitalia], 3 [male abdomen, dorsal], 4–5 [male genitalia]); Gaimari & Raspi, 2002: 241 (comment); Gaimari, 2021: 1808 (comment). **Distribution**—Chile. Región Metropolitana de Santiago: Cordillera Province (Los Maitenes). [also: Argentina; Ecuador]. **Host Records**—None.

Subgenus *LEUCOPIS* Meigen

***ninae* Tanasijtshuk**

Leucopis ninae Tanasijtshuk, 1966: 234. Type locality: Kazakhstan, Aksay, in vicinity of Alma-Ata [Almaty]. Holotype male, ZIN (examined). **References**—Tanasijtshuk, 1984: 228 (catalog), 1986: 272 (redescription, Figures 522–524 [male genitalia]), 2003: 176 (biology); Stary *et al*., 1993: 360 (biological control, released in 1992 in Chile against *Diuraphis noxia*); Ripa *et al*., 1995: 428 (biological control, released in 1992–1993 on Easter Island against black citrus aphid, *Toxoptera aurantia*); Gaimari & Turner, 1996a: 649 (description, immature stages), 650 (Figures 1, 7 [egg]), 652 (Figures 10, 15 [larvae], 16 [puparium]), 654 (Figures 18, 21 [larvae], 655 (Figures 24 (larva), 27 [puparium], 656 (Figures 29, 32, 35 [larvae], 658 (Figures 38, 41, 42, 45 [cephalopharyngeal skeleton], 659 (Figures 50–51 [cephalic structures, larvae], 52 [cephalopharyngeal skeleton, puparium], 661 (Figures 54, 55, 57 [larval spiracles], 59 [puparial spiracles]), 661 (Figures 62, 64, 66 [larvae]), 1996b: 667 (biology), 1996c: 365 (biology, rearing), 1997: 155 (biology); Vargas, 1998: 16 (biological control, released in 1903–1997 in Chile against aphids); Gaimari & Havill, 2021: 28 (in key), 31 (biology, catalog). **Distribution**—Chile (introduced). Región de Coquimbo: Elqui Province (Vicuña). Región de Valparaíso: Quillota Province (La Cruz); Los Andes Province (Los Andes); San Felipe de Aconcagua Province (Putaendo); Isla de Pascua Province (Easter Island—introduced but not recovered). Región de Ñuble: Diguillín Province (Chillán). [also: southern Europe (widespread); North Africa; central Asia (widespread); China; Canada (introduced); USA (introduced); South Africa (introduced)]. **Host Records**—In Chile, released as a biological control agent against *Diuraphis noxia* infesting cereals and *Toxoptera aurantia* on *Citrus*, in addition to *Aphis fabae*, *Brevicoryne brassicae*, *Myzus dirhodum*, *Myzus persicae*, *Rhopalosiphum maidis*, *Rhopalosiphum padi* and *Schizaphis graminum*. Polyphagous species, attacking many aphidoid and coccoid Hemiptera throughout its distribution.

Leucopis begimbetovae Tanasijtshuk, 1966: 235. Type locality: Kazakhstan, Alma-Athkar. Holotype male, ZIN (examined). **References**—Tanasijtshuk, 1984: 228 (catalog, synonymy), 1986: 272 (as synonym).

sp.

Leucopis sp. **References**—Zúñiga, 1985: 183 (biological control, endemic species reared at Santa Cruz, Chile, 1972). **Host Records**—None. **Note**—It is unknown whether this is referring to one of the species in a different subgenus or other leucopine genus, as voucher specimens neither located nor examined.

Subgenus *XENOLEUCOPIS* Malloch

XENOLEUCOPIS Malloch, 1933: 384. Proposed as subgenus. Type-species: *Leucopis cilifemur* Malloch, 1933: 384 (original designation). **References**—Malloch, 1933: 384 (in key); Stuardo Ortiz, 1946: 150 (catalog); McAlpine, 1960: 52 (note), 54 (in key); Tanasijtshuk, 1986: 181 (revision, Palaearctic species), 2003: 169 (distribution), 174 (classification), 175 (comment); Gaimari & Havill, 2021: 27 (in key), 31 (biology).

***cortesi* Blanchard**

Leucopis (*Xenoleucopis*) *cortesi* Blanchard, 1964: 141. Type locality: Chile, Quillón, provincia de Ñuble. Syntypes (18) male (no mention of females, but some of the 18 may be females), MACN (some examined). **References**—Blanchard, 1964: 135 (Figure 1c [head, frontal view]), 142 (Figure 4 [wing]), 143 (biology). **Distribution**—Chile. Región de Ñuble: Diguillín Province (Quillón). **Host Records**—*Pseudococcus* sp. (complex *gahani, citri, maritimus*) infesting oranges, *Citrus* spp.

***nigripes* Malloch**

Leucopis (*Xenoleucopis*) *nigripes* Malloch, 1933: 385. Type locality: Argentina, L. Nahuel Huapi (Eastern End). Holotype male, NHMUK (examined). **References**—Stuardo Ortiz, 1946: 150 (catalog). **Distribution**—Chile. Región de Valparaíso: Quillota Province (Hijuelas). Región de La Araucanía: Malleco Province (Angol); Región de Los Lagos: Llanquihue Province (Casa Pangue). [also: Argentina. Neuquén Province.]. **Host Records**—None.

Leucopis nigripes. **References**—Salas *et al*., 2011: 49 (biology, predator of *Icerya purchasi* (Maskell) on citrus).

olalquiagay

Xenoleucopis olalquiagay. *Nomen nudum*. Voucher specimens in MACN (not examined). **References**—Yudelevich, 1950: 85 (biology), 86 (biology, comparison with *Leucopis bella* Loew, 1866), figure (dorsal habitus); Zúñiga, 1985: 183 (biological control, endemic species reared at Santa Cruz, Chile, 1953, 1959, 1960, 1968); López, 1991: 12 (biology, native species); Artigas, 1994: 801 (biology), 805 (biology); Saá, 2004: 13 (biology), 26 (native species), 28 (biological control). **Host Records**—*Planococcus citri* infesting chirimoyo mediante (*Annona cherimola*), *Pseudococcus calceolariae* and *Pseudococcus longispinus* infesting *Citrus*, *Pseudococcus viburni* infesting *Vitis vinifera*, *Pseudococcus* spp. **Note**—Author given as Blanchard.

Xenoleucopis olalquiagai. Misspelling of *nomen nudum*. **References**—Caltagirone, 1957: 23, 48 (biology, name with "*n. n.*", likely referring to it as a *nomen nudum*); Rojas, 2005: 32 (biology), 123 (in list); Mercadal, 2008: 15 (biological control); Parals Bonay, 2015: 24 (biological control); Escudero-Colomar, 2021: 32 (biological control), 66 (biology).

spp.

Leucopis sp. **References**—Ripa *et al*., 1995: 428 (biological control, released in 1990–1994 on Easter Island against mealybugs). **Host Records**—mealybugs. **Distribution**—Chile. Región de Valparaíso: Isla de Pascua Province (introduced, establishment unknown). **Note**—Voucher specimens neither located nor examined.

Leucopis sp. **References**—Ripa *et al*., 2008b: 187 (biology, morphology). **Host Records**—*Phenacoccus* spp. **Note**—Voucher specimens neither located nor examined.

Leucopis sp. **References**—Artigas, 1994: 794 (biology); Rojas, 1987: 27 (biology); Prado, 1991: 45 (biology), 112 (biology); Ripa *et al*., 1999: 58 (larva, biology), 126 (biology), 2008b: 186 (biology), 187 (biology, morphology); 2008c: 196 (biology); Escudero-Colomar *et al*., 2021: 32 (biological control). **Host Records**—*Planococcus citri* infesting *Citrus*. **Note**—Voucher specimens neither located nor examined.

Leucopis sp. **References**—Artigas, 1994: 801 (biology); Prado, 1991: 46 (biology), 112 (biology); Ripa *et al*., 1999: 61 (biology), 126 (biology), 2008a: 200 (biology), 201 (Figures 8-179 [adult], 8-180 [larva]), 202 (Figure 8-181 [puparia, parasite emergence holes]), 2008b: 186 (biology), 187 (biology, morphology); Saá, 2004: 13 (biology); Olivares *et al*., 2014: 27 (biology), 28 (Foto 11 [adult]); Escudero-Colomar *et al*., 2021: 32 (biological control), 117 (biology), 142 (biology), 166 (biology). **Host Records**—*Pseudococcus calceolariae* infesting *Citrus*. **Note**—Voucher specimens neither located nor examined.

Leucopis sp. **References**—Artigas, 1994: 805 (biology); Prado, 1991: 46 (biology), 112 (biology); Ripa *et al*., 1999: 64 (biology), 126 (biology), 2008b: 186 (biology), 187 (morphology); Escudero-Colomar *et al*., 2021: 32 (biological control), 118 (biology), 143 (biology), 167 (biology). **Host Records**—*Pseudococcus longispinus* infesting *Citrus*. **Note**—Voucher specimens neither located nor examined.

Leucopis sp. **References**—Artigas, 1994: 808 (biology); Prado, 1991: 46 (biology), 112 (biology). **Host Records**—*Pseudococcus maritimus* infesting *Vitis vinifera*. **Note**—Voucher specimens neither located nor examined.

Leucopis sp. **References**—Artigas, 1994: 798; Prado, 1991: 46 (biology), 112 (biology); Ripa *et al*., 1999: 67 (biology, Foto 95 [larvae and pupae *in situ*]), 126 (biology), 2008b: 186 (biology), 187 (biology, morphology); Rojas, 2005: 32 (biology), 33 (figure [adult], comment), 95 (figure [third instar and puparium], figure [adult]), 123 (in list); Ripa & Rojas, 1990: 84 (biology), 85 (effective control agent); Ripa & Rojas, 2008: 203 (biology); Luppichini & Ripa, 2010: 27 (biology, Foto 7 [adult]); Rodríguez, 2017: 89 (biology); Escudero-Colomar *et al*., 2021: 32 (biological control), 143 (biology), 167 (biology). **Host Records**—*Pseudococcus viburni* infesting *Vitis vinifera*. **Note**—Voucher specimens neither located nor examined. Also, host records sometimes referred to using the synonymous name *Pseudococcus affinis*.

[**Note**—All are listed here as members of the subgenus *Xenoleucopis* due to their biology as predators of coccoids, as well as the adult photographs in some of the references. Some or all of these records may refer to the same species. Study of voucher specimens, if they exist, will be necessary to associate which are the same, and which species they represent. Where there are multiple references for a given record, this reflects only the specific host recorded, not evidence that they are the same species. They are in order by host species.]

Genus *MELALEUCOPIS* Sabrosky

MELALEUCOPIS Sabrosky, 1957: 114. Type-species: *Melaleucopis ortheziavora* Sabrosky, 1957: 116 (original designation). **References**—Sabrosky, 1957 115 (in key), 116 (key); McAlpine, 1960: 52 (note), 54 (in key); Tanasijtshuk, 1986: 55 (distribution), 69 (classification), 77 (biology), 1992: 200/66 (note), 201/67 (morphology), 204/71 (Figure 5 [cladogram]), 207/74 (in key), 223/93 (diagnosis), 62 [pregenital sclerites, *M. simmondsi* Sabrosky, 1957], 2003: 168 (distribution), 169 (classification), 170 (Figure 1 [cladogram]), 174 (comment); Gaimari, 2012: 43 (comment); Ross *et al*., 2012: 98 (biology); Gaimari, 2021: 1799 (biological control); Gaimari & Havill, 2021: 26 (in key).

ortheziavora Sabrosky

Melaleucopis ortheziavora Sabrosky, 1957: 116. Type locality: Peru, Yauca. Holotype male, USNM (examined). **References**—Beingolea, 1957: 118 (biology, immatures, distribution), 110 (Figures 1 [eggs], 2 [third instar], 3–4 [puparium], 5 [adult], 6 [wing], 1965: 1 (biology), 19 (biology), 20 (detailed biological study, Figures 1 [eggs], 2 [third instar]. 3–4 [puparium], 5 [adult], 6 [wing]), 21 (Figure 9 [eggs, larvae, adult, parasite], 25 (parasites); Sabrosky, 1957: 116 (in key); McAlpine, 1960: 54 (note); Tanasijtshuk, 1986: 40 (biology), 1992: 223/93 (note), 224/91 (Figures 60–61 [male genitalia]. **Distribution**—Chile. Región de La Araucanía (see Note). [also: Peru]. **Host Records**—*Insignorthezia insignis* (Browne) infesting olives; *Praelongorthezia olivicola* (Beingolea) infesting olives, *Olea europaea*, and infesting *Citrus*. **Note**—The report of this species by Artigas (1994) does not specifically state that it is in Chile, but rather, states that the host ortheziid species is present in Chile, and this fly is among the predators of the ortheziid. However, the first author has verified specimens of this species from the region indicated.

sp.

Melaleucopis sp. **References**—Bobadilla *et al*., 1999: 120 (biology, distribution), 121 (Figures 3 [eggs], 4 [puparia]), 122 (Figure 5 [adult]). **Distribution**—Chile. Región de Arica y Parinacota: Parinacota Province. Región de la Araucanía. **Host Records**—*Orthezia* sp. infesting *Origanum vulgare*, feeding within ovisacs. **Note**—Voucher specimens neither located nor examined. The host record of *Orthezia* may be referring to one of the other genera that were the result of recent changes to ortheziid classification. It is likely that this record refers to *Melaleucopis ortheziavora*.

Genus *NEOLEUCOPIS* Malloch

NEOLEUCOPIS Malloch, 1921: 357. Proposed as subgenus of *Leucopis* Meigen. Type-species: *Leucopis pinicola* Malloch, 1921 (original designation). **References**—Malloch, 1933: 384 (in key, as subgenus); McAlpine, 1960: 52 (note), 54 (in key), 1971 (revision, as subgenus), 1987: 967 (in key, as subgenus); Tanasijtshuk, 1986: 166 (revision, as subgenus, Palaearctic species), 1992: 204/71 (Figure 5 [cladogram]), 207/75 (in key), 225/96 (diagnosis, status as genus), 226/93 (Figures 67–69 [male genitalia, *N. atratula* (Ratzeburg, 1844)], 70 [pregenital sclerites, *N. atratula* (Ratzeburg, 1844)], 2003: 167 (distribution), 169 (classification), 170 (Figure 1 [cladogram]), 174 (comment); Gaimari & Tanasijtshuk, 2001: 313 (in key); Gaimari, 2010: 1000 (biology), 1001 (immatures), 1003 (in key); Ross *et al*., 2012: 97 (biology); Gaimari, 2021: 1795 (Figures 18 [lateral habitus], 19 [dorsal head, thorax]); Gaimari & Havill, 2021: 26 (in key), 33 (biology).

***obscura* (Haliday)**

Leucopis obscura Haliday, 1833: 173. Type locality: Ireland. Lectotype male, NMID (not examined). **References**—González & Rojas, 1966: 139 (biological control, released in 1945 in Chile against *Pineus boerneri*, establishment unknown); Zúñiga, 1985: 182 (biological control, released in 1945 in Chile against *Pineus boerneri*, established); Mills, 1990: 32 (biology), 34 (biological control, released in 1945 in Chile against *Pineus laevis* [=*P. boerneri*], good control); Artigas, 1994: 468 (biological control against *Pineus boerneri*); Kidd & Jervis, 1997: 50 (biological control, released in Chile against *Pineus boerneri*, substantial control); Vargas, 1998: 16 (biological control, released in 1903–1997 in Chile against *Pineus boerneri*); Day *et al*., 2003: 105 (biological control); Rojas, 2005: 120 (in list, with author given as Haldeman).

Leucopis (*Neoleucopis*) *obscura*. **References**—McAlpine, 1971: 1852 (in key), 1854 (Figures 1–2 [head], 7, 10 [abdomen]), 1856 (Figures 13–16 [male genitalia]), 1860 (redescription), 1861 (lectotype designation); Tanasijtshuk, 1986: 167 (redescription), 168 (Figures 261–262 [male genitalia]); Greathead, 1995: 86 (biology, biological control), 87 (discussion).

Neoleucopis obscura. **References**—Brown & Clark, 1956: 272 (combination, biological control), 273 (Figures 1 [egg], 4 [first, second, third instars], 7 [puparium], 10 [adult]), 274 (Figures 13 [cephalopharyngeal skeleton, first instar], 15 [cephalopharyngeal skeleton, second instar], 17 [cephalopharyngeal skeleton, third instar], 19 [posterior spiracle, third instar], 21 [puparium]), 275 (larval descriptions), 277 (puparial description), 278 (adult redescription), 1957: 533 (biology, biological control); Tanasijtshuk, 1992: 225 (status); Gaimari *et al*., 2011: 155 (comment); Ross *et al*., 2012: 98 (biology); Gaimari & Havill, 2021: 2 (comment), 26 (in key), 34 (biology, catalog). **Distribution**—Chile. [also includes Europe; North America (introduced); Hawaii (introduced)]. **Host Records**—Various species of *Adelges* on *Abies*, including *Adelges prelli* infesting *Abies alba*, *Adelges piceae* infesting *Abies balsamea*, *Adelges* sp. infesting *Abies nordmanniana*; various species of *Pineus* infesting *Pinus*, including *Pineus pini* infesting *Pinus sylvestris, Pineus strobi* infesting *Pinus cembra*, and *Pineus boerneri*. **Note**—In Chile, this species was introduced as a biological control agent against *Pineus boerneri* in 1945.

Leucopis hyalipennis Zetterstedt, 1848: 2715. Type locality: Sweden, Gottland, Fårö Island, Ulla hau [Gottlandia, Olle Hau]. Lectotype male, MZLU (not examined). **References**—McAlpine, 1971: 1860 (synonymy), 1861 (lectotype designation).

Leucopis olivacea Meijere, 1928: 75. Type locality: Netherlands. Lectotype male, ZMAN (examined). **References**—Tanasijtshuk, 2004: 228 (catalog); Jong, 2000: 155 (type information); Gaimari & Havill, 2021: 33 (synonymy, lectotype designation).

***setigera* (McAlpine)**

Leucopis (*Neoleucopis*) *setigera* McAlpine, 1971: 1872. Type locality: Chile, Estancia Camerón, SE, Bahía Inútil, Tierra del Fuego. Holotype male, CNC (examined). **References**—McAlpine, 1971: 1852 (in key), 1854 (Figures 5 [abdomen], 11 [male genitalia]).

Neoleucopis setigera. **References**—Tanasijtshuk, 1992: 225 (combination, implied by genus status); Gaimari & Havill, 2021: 27 (in key), 35 (catalog). **Distribution**—Chile. Región de Magallanes y la Antártica Chilena: Tierra del Fuego Province (Estancia Camerón). **Host Records**—None.

***tapiae* (Blanchard)**

Leucopis tapiae Blanchard, 1964: 137. Type locality: Argentina, Nahuel Huapi, Bariloche, Isla Victoria and Balcarce. Syntypes (22) males and females, MACN (some examined). **References**—Blanchard, 1964: 135 (Figure 1c [head, frontal view]), 136 (in key), 137 (Figure 2 [wing]; Mills, 1990: 32 (biology).

Leucopis (*Neoeucopis*) *tapiae*. **References**—McAlpine, 1971: 1852 (in key), 1856 (Figures 22–23 [male genitalia]), 1858 (Figure 30 [egg]), 1863 (redescription), 1864 (Figure 37 [female terminalia]); Tanasijtshuk, 1986: 171 (as synonym of *Leucopis atratula* (Ratzeburg, 1844)); Greathead, 1995: 84 (biology, biological control), 87 (discussion).

Neoleucopis tapiae. **References**—Tanasijtshuk, 1992: 225 (combination, implied by genus status); Ross *et al*., 2012: 101 (biology); Gaimari, 2021: 1799 (biological control); Gaimari & Havill, 2021: 2 (comment), 8 (specimen), 27 (in key), 35 (biology, catalog). **Distribution**—Chile. [also: Argentina. Neuquén Province; Europe; North America (western); Hawaii; New Zealand; Malawi; South Africa; Burundi; released with unknown establishment in Kenya and Tanzania]. **Host Records**—*Pineus pini* infesting *Pinus radiata*, *Pineus strobi* infesting *Pinus strobus* and *Pinus sylvestris*, *Pineus cembrae* infesting *Pinus cembra*, *Pineus laevis* infesting *Pinus sylvestris* and *Pinus radiata*, *Pineus orientalis* infesting a species of *Pinus*, *Pineus boerneri* infesting *Pinus patula*, *Pineus havrylenkoi* infesting a species of *Pinus*. **Note**—Although described from Argentina, this species is likely native to North America or Europe and has been introduced elsewhere, including Chile and Argentina along with *Pinus radiata* nursery stock shipped to Chile and Argentina from California in the 19th century (McAlpine, 1971). The species seems to occur wherever *Pinus sylvestris* has been introduced, which would suggest a European origin.

Agromyza chermivora Kaltenbach 1843: 197. Type locality: Germany. Type sex and repository unknown. **References**—Ratzeburg 1844: 204 (as *Musca*); McAlpine, 1971: 1863 (in synonymy list as *nomen nudum*); Tanasijtshuk, 1984: 231 (synonymy list).

Leucopis atratula, *sensu* Fulmek, *nec* Ratzeburg, 1844: 170. **References**—Fulmek, 1912: 211 (Figures 1 [wing], 2 [antenna]), 212 (Figures 3–4 [larvae]), 213 (Figures 5–6, [larvae]); McAlpine, 1971: 1863 (synonymy list); Tanasijtshuk, 1984: 231 (synonymy list), 1986: 171 (synonymy list).

Leucopis obscura, *auct*., *nec* Haliday. **References**—McAlpine, 1971: 1863 (synonymy list); Tanasijtshuk, 1986: 171 (syonymy list).

Leucopis (*Neoleucopis*) sp. aff. *atratula* Ratzeburg, 1844: 170. **References**—Tanasijtshuk 1961: 436 (Figure 6A [male genitalia], 6B [thorax], 6C–D [head]); McAlpine, 1971: 1863 (synonymy list).

Leucopis obscura. Misidentification. **References**—Culliney *et al*., 1988: 142 (biological control); Nakao *et al*., 1981: 426 (biological control); Funasaki *et al*, 1988: 116 (biological control); Greathead, 1995: 87 (clarified misidentification).

sp.

Leucopis sp. **References**—Riegel, 1968: 209 (biological control, biology). **Host Records**—*Pineus boerneri* infesting *Pinus radiata*, *Pinus canariensis* and *Pinus halepensis*. **Note**—It is very likely that this record is in reference to *Neoleucopis tapiae* but cannot be verified as voucher specimens neither located nor examined.

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