

A Catalog and Conspectus on the Family Coelopidae (Diptera: Schizophora)

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Introduction

The family Coelopidae, more commonly known as kelp flies, occurs primarily on maritime beaches in association with wrack where the larvae exploit stranded and rotting seaweed. Adults and larvae are sometimes very abundant in this habitat, especially on stranded kelp, which, as a result, is significantly reduced and recycled. Multiple species may share the same habitat, feeding on kelp in various conditions, such as state of decomposition. Adults vary considerably in form and size but are typically though not always broadly depressed (flattened), have strong legs, and are dark colored. Considerable intraspecific variation is often expressed, especially in overall size, including wing length, and setal characters. The variation is apparently a combination of genetic and environmental influences, especially nutrition (Hennig 1937, Butlin *et al.* 1982, McAlpine 1991). This plasticity in “traditional” characters has led to extensive splitting and has resulted, in some cases, in multiple descriptions and names for the same species.

Coelopidae occur almost exclusively in cool, temperate zones and currently include nearly 30 species worldwide. Species richness is disproportionately distributed, however, with nearly 80% of the genera and about 60% of the species occurring in the Australasian Region alone.

This catalog and conspectus are intended to encourage further research on all aspects of kelp flies. There are still undescribed species (we are aware of one from South Island, New Zealand), some species, such as those from the southern Afrotropical Region, need better resolution, the immature stages of most species are largely undocumented or unknown, and the phylogenetic relationships among the included taxa have only recently been investigated (McAlpine 1991, Meier & Wiegmann 2002). Although resolved better than most families of Schizophora, the current hypotheses of phylogenetic relationships for the taxa within the family are being actively investigated and undoubtedly will be further corroborated and more finely resolved as new evidence is analyzed and improved analytical tools are employed.

Zoological catalogs, checklists, and equivalent databases are indispensable tools for anyone needing a reference to a currently accepted name and frequently to other information relating to that taxon, such as bibliographic and distributional data. This is possible because most information is filed under a species' scientific name, which is the key to retrieval of information from the literature. The system is dynamic, however, and subject to interpretation. The taxonomic literature is constantly changing to reflect recent work, and some species are known by more than one name. Thus a complete listing of names, including synonyms, is an important starting point for locating information, whether as the basis for applied and basic research or simply to satisfy a curiosity.

The information included in a catalog is usually arranged in a logical and organized format that allows for its convenient and rapid conveyance—in short, a quick and easy storage and retrieval system. The format and amount of information presented varies greatly, however. Our use of the term catalog is intended to convey a more comprehensive treatment, including information on all valid names, synonyms, type species, and the status and deposition of primary types. The bibliographic section includes complete references (author, date, original citation), and distributional and other biotic information are also provided.

Regional catalogs, checklists, and faunal treatments have contributed significantly to the compilation of this catalog. The most recent of these for a given region or country are as follows:

Catalogs: Vockeroth 1965 (Nearctic); Steyskal 1967 (Neotropical); Cogan 1980 (Afrotropical); Gorodkov 1984a, 1984b (Palearctic); Mathis 1989 (Australasian/Oceanian).

Checklists: Morimoto 1989 (Japan); Bruyn 1991 (Belgium); Nowakowski 1991a, 1991b (Poland); Munari & Rivoecchi 1995 (Italy); Poole & Gentili 1996 (Nearctic Region); Chandler 1998a, 1998b (British Isles); Schumann 1999a, 1999b (Germany); Pakalniškis *et al.* 2000 (Lithuania); Meier & Petersen 2001 (Denmark); Beuk 2002 (Netherlands); Carles-Tolrá & Báez 2002 (Spain, Portugal).

Faunal Treatments: Aldrich 1929 (Nearctic); Séguy 1934 (France); Hennig 1937 (Palearctic); Stackelberg 1970 (European Russia); Ardö 1964 (South Africa); Cole 1969 (western North America); Harrison 1976 (Subantarctic islands), Vockeroth 1987 (Nearctic); McAlpine 1991 (Australian), 1998 (Palearctic).

Nomenclature: Sabrosky 1999 [discussion of the family-group names Phycodromidae, Malacomyiidae, and Coelopidae, and the need to preserve the latter through for the ICZN Commission].

Genetics: Gilburn *et al.* 1993; Gilburn & Day 1994.

Behavior: Egglshaw 1961; Arnaud 1983; Day *et al.* 1990; Pitafi *et al.* 1990; Gilburn & Day 1994; Day & Gilburn 1997; Crean & Gilburn 1998; Crean *et al.* 2000; Weall & Gilburn 2000; Dunn *et al.* 2001, 2002.

Ecology: Oldroyd 1954; Egglshaw 1960, 1961; Dobson 1974, 1976; Poinar 1977; Cullen *et al.* 1987; Rebelo 1987; McAlpine 1991; Blanche 1992; Phillips & Arthur 1994; Phillips *et al.* 1995a, 1995b; Leggett *et al.* 1996; Hodge & Arthur 1997.

Phylogeny: McAlpine 1991; Meier & Wiegmann 2002.

Abbreviations used in this catalog

To economize on space we have used acronyms for museums where primary type(s) are deposited. These acronyms are as follows:

AMS	Australian Museum, Sydney, Australia.
BMNH	British Museum (Natural History), London, United Kingdom.
BBM	Bernice P. Bishop Museum, Honolulu, Hawaii, USA.
CAS	California Academy of Sciences, San Francisco, USA.
CMC	Canterbury Museum, Christchurch, New Zealand.
MCSNM	Museo Civico di Storia Naturale de Milano, Milan, Italy.
MNHNP	Museum National d'Histoire naturelle, Paris, France.
MZUF	Museo Zoologico "La Specola," Florence, Italy.
NMI	National Museum of Ireland, Dublin, Ireland.
NMW	Naturhistorisches Museum, Wien, Austria.
NZAC	New Zealand Arthropod Collection, Landcare Research, Auckland, New Zealand.
PDD	Plant Diseases Division, Auckland, New Zealand.
USNM	formerly called United States National Museum, National Museum of Natural History, Smithsonian Institution, Washington, D.C., USA.
UZMC	Universitets Zoologiske Museum, Copenhagen, Denmark.
ZIL	Zoological Institute, University of Lund, Lund, Sweden.
ZMHU	Zoologisches Museum, Humboldt Universität, Berlin, Germany.

Diagnosis (synapomorphies, according to McAlpine (1991), are indicated with an asterisk): Adult. Small to large flies (body length 3.0-16.0 mm); often robust, squat, strongly depressed and setose; brown to blackish; occurring on seashores. *Head*: Vertex flat to shallowly convex; *postocellar

setae convergent. *Antenna decumbent; basoflagellomere subcircular; *distalmost seta of dorsal transverse series on scape enlarged, mesocline. Face slightly convex to concave, sclerotized; *parafacial prominence near epistomal margin. *Thorax*: Mesonotum stout, distinctly and broadly flattened; *scutum bearing distinct, medial series of setulae anteriorly; metepisternum usually bearing several short setulae ventrad of spiracle; *katepisternal seta anterocline to anterodorsocline; *posterior portion of katepisternal suture shallowly projected dorsally, forming an arc above katepisternal seta; katepisternum not produced posterodorsally to form a hypopleural channel; prosternum lacking precoxal bridge. Wing usually macropterous, hyaline to faintly infuscate; costa unbroken; subcosta complete; apical section of vein M not bent strongly forward, terminating posterior of wing apex; vein CuA_2+A_1 reaching posterior margin. *Apical tarsomeres broadly subtriangular with 2-3 setiferous teeth on apical margin. *Abdomen*: *Sternite 1 very short or vestigial. Male sternites 6-7 distinct, displaced asymmetrically; epandrium with 1 pair of basally articulated surstyli; basiphallus often stout, projected prominently; distiphallus slender, flexible, sometimes reduced. Female with 3-4 spermathecae, with or without terminal vesicles.

Egg. Undescribed; Phillips *et al.* (1995b) compared the sculpture of the chorion of eggs of two *Coelopa* species.

Third-instar larval. Typically maggot-like, cylindrical, anterior end tapered, posterior end generally broadly rounded; anterior spiracle on short process, fan-shaped, digitate, with one terminal opening per process; posterior spiracles separate, on short or elongate respiratory tubes, each spiracle with 3 slits, surrounded by a circlet of plumose hydrofuge hairs (not in fascicles); anal opening on protuberance, this sometimes subdivided into lobes that bear spines or starlike sclerites around anus.

Puparium. Dark brown, ovoid with a moderately rugose surface.

Adult kelp flies are similar to Dryomyzidae, Helcomyzidae and Sepsiidae (*Orygma*) and are distinguished from these and other families of the Sciomyzoidea by the generally compact, flattened, and setose appearance; the convergent postocellar setae, the flattened mesonotum; the complete wing venation with an unbroken costa and with vein CuA_2+A_1 reaching posterior margin; the anterocline to anterodorsocline katepisternal seta, and the usually setose metepisternum.

Biology. All stages of kelp flies live in stranded seaweeds, especially where extensive wrack beds of kelp, sea grasses, and other jetsam have accumulated. Adults are often abundant and sometimes are a nuisance to people at the beach. Adults are also attracted to certain organic solvents and can be a

pest at facilities where these solvents are produced or used. *Coelopa frigida* has been reared in the laboratory and used for genetic studies (Butlin & Day 1989, Butlin *et al.* 1982, 1984, Day *et al.* 1996). The ecology of kelp flies has been reviewed by Egglisshaw (1960), Dobson (1976), D. McAlpine (1991), Blanche (1992), Phillips & Arthur (1994), Phillips *et al.* (1995a, 1995b), Leggett *et al.* (1996), and Hodge & Arthur (1997).

Classification and nomenclature. For the last several decades, this family has gone almost exclusively under the name of Coelopidae, but earlier literature used Phycodromidae. Phycodromidae is based on the genus *Phycodroma*, which is a junior synonym of *Malacomyia*. As *Phycodroma* was synonymized with *Malacomyia* well before 1961, the family-group name Phycodromidae is unavailable (Article 40b of the International Code; see McAlpine 1991: 47). The family-group name Coelopidae, however, is based on a different genus than *Malacomyia*, and Malacomyiidae Czerny (1909) is an available but essentially unused name. The case to preserve the use of Coelopidae should be submitted to the ICZN (McAlpine 1989: 1450, Sabrosky 1999: 246). Use of Malacomyiidae as valid also requires a case be submitted to the ICZN (Art. 23.11).

Coelopidae are in the superfamily Sciomyzoidea and are similar and closely related to the Helcomyzidae, perhaps as the sister group (McAlpine 1991). McAlpine (1991) and Meier & Wiegmann (2002) have proposed the most recent and complete phylogenies for the family, using morphological data, and in the latter paper, also DNA sequences as evidence. Although the morphological evidence confirms the monophyly of the family (McAlpine identified nine synapomorphies, see diagnosis above), the DNA sequences were equivocal, especially regarding the position of the genus *Lopa*. *Lopa*, which is monotypic and morphologically divergent, is the basis for McAlpine's subfamily Lopinae and was sometimes positioned as the first divergence in the Coelopidae. Under other weighting regimes, however, *Lopa* sometimes diverged before the other Coelopidae and most of the outgroups being considered in the analysis (Helcomyzidae, Heterocheilidae, and Dryomyzidae). Meier and Wiegmann (2002: 401) suggested that DNA sequences of other genes might better resolve this ambiguity. Thus in the classification below, the subfamily Lopinae tentatively remains in the Coelopidae. Based on unpublished data and analysis from more recent DNA sequences, Meier (personal communication) has also indicated to us that the position of *Malacomyia* is problematic and it may be more closely related to *Coelopa*.

McAlpine's classification not only divided the Coelopidae into two subfamilies (Lopinae and Coelopinae), but within the Coelopinae, he also

recognized four tribes and 12 genera. McAlpine's classification is relatively finely divided (seven of the 13 genera are monotypic) and did not always accord with the "preferred" cladogram in Meier and Wiegmann's total-evidence analysis. In the classification below, both proposals were considered and resulted in the elimination of one tribe, the Ammini, by combining it with the tribe Coelopellini. Thus the subfamily Coelopinae now comprises three tribes, 12 genera, and 28 species.

Distribution. Species of Coelopidae largely have temperate distributions and reveal greatest diversity in the southern hemisphere, especially in the Australasian Region where most genera (10) and species (18) are found. The Neotropical Region is notable in lacking any species, and elsewhere only a few species are found in the tropics and subtropics. McAlpine (1991) recorded specimens of *Dasycoelopa australis* Malloch along the eastern coast of Australia into tropical zones (12°-34° S latitude) and also reported that a small number of related species in the genus *Coelopa* (*C. ursina* & *alluaudi*) are found on maritime beaches along the western Pacific and Indian Oceans. In temperate zones in both the northern and southern hemispheres, species have been found in cool to very cold environments, including subantarctic islands in the south and above the Arctic Circle in the north. McAlpine (1991) suggested that failure to rear *Coelopella curvipes* in the laboratory might have been due to that species' need for cool temperatures. Although an occasional adult is found inland, the family is only known to breed in wrack on maritime beaches and is apparently restricted to seashores.

Lopinae include a single genus, *Lopa* McAlpine, that has been found only in Australia. Of the subfamily Coelopinae, only *Coelopa*, *Coelopina* and *Malacomyia* are found in the northern hemisphere. The remaining genera and some species of *Coelopa* occur in the southern hemisphere.

Although some genera, such as *Coelopa*, are relatively widespread and are associated with maritime beaches in both the northern and southern hemispheres, most genera and species are more geographically circumscribed. This is especially apparent in the Australasian Region where there are 18 species in 10 genera that occur in Australia and/or New Zealand. The genera *Lopa*, *Amma*, *Dasycoelopa*, *Gluma*, *Rhis* and *This* are endemic to Australia. *Baeopterus* is endemic to New Zealand. *Chaetocoelopa*, *Coelopella*, and *Icaridion* are endemic Australasian genera living in both New Zealand and Australia, but only the first occurs on the Australian mainland. Seven species are known from New Zealand and its subantarctic islands, and of these, five are endemic and two have distributions that extend to Macquarie Island. The Australasian Region is the center for both generic and species diversity.

Table of genera

The following table lists the genera of Coelopidae in the order found in the catalog, with a summary of the number of species known from each zoogeographic region. The number in the total column is less than the sum of those in each region as species are known from more than one region.

TAXON	DISTRIBUTION						Total
	NE	NT	PA	AF	OR	AU	
Coelopa Meigen	4		3	4	2	1	10
Amma McAlpine						1	1
Baeopterus Lamb						2	2
Coelopella Malloch						1	1
Icaridion Lamb						3	3
Rhis McAlpine						2	2
This McAlpine						1	1
Chaetocoelopa Malloch						2	2
Coelopina Malloch	1	1					1
Dasycoelopa Malloch						1	1
Gluma McAlpine						3	3
Malacomyia Haliday			1				1
Lopa McAlpine						1	1
TOTALS	5	1	4	4	2	18	29
Subfamilies							2
Tribes							4
Genera							13

Identification. McAlpine (1991) published the only recent key to the genera of the world, and that paper is useful for understanding the family even though its focus is on the Australian fauna. Aldrich's (1929) revision of North American species of *Coelopa* and Malloch's (1933) summary of *Coelopa* are still useful for identifying New World species (see also Vockeroth 1987), and the Palearctic species can be identified by using Hennig (1937) and McAlpine (1998).

At the species level, considerable variation is demonstrated, especially in overall body size, degree of setation and in some cases, color. Recognition of this variation must be considered in making species-level identifications. In addition, some species, such as *Coelopa frigida* and *C. nebularum* Aldrich, are completely interfertile with no apparent pre- or postzygotic barriers (Laamanen *et al.* 2003). Their respective populations, however, are allopatric and at least one morphological character distinguishes them. For

the present, we are recognizing them as separate species while also acknowledging that these allopatric populations would be considered conspecific using some species definitions (Laamanen *et al.* 2003).

Key to genera and subgenera of Coelopidae

1. Wing much reduced; tarsal claws broadly compressed..... 2
- Wing fully developed; tarsal claws variable..... 3
2. Anepisternum with short, thick setulae; halter developed; wing with complete venation (New Zealand) *Baeopterus* (in part)
- Anepisternum bare; halter vestigial; wing with much reduced venation (New Zealand) *Icaridion* (in part)
3. Anepisternum with setulae or setae other than on posteroventral quarter, including a seta along posterior margin (may be shortened in large males); scutum and scutellum quite convex 4
- Anepisternum bare or setulose only on posteroventral quarter, without posterior marginal seta; other characters variable 7
4. Anepimeron setulose; midcoxa with medial plate produced into a posteriorly directed lobe (Australia) *Dasycoelopa*
- Anepimeron bare; midcoxa with medial plate without lobe 5
5. Hindtibia with 1 ventroapical spur; male forecoxa without posterior setae (Europe, North Africa) *Malacomylia*
- Hindtibia with 2 strong, unequal, ventroapical spurs; male forecoxa with a series of strong posterior setae or spines 6
6. Scape with outermost, dorsal setula conspicuously enlarged and incurved; face concave, prominent only on ventral margin and between antennal bases; scutellum narrow; intradorsocentral setulae in 7-11 mostly irregular rows; male sternite 5 at least half as long as sternite 4, almost symmetrical (Australia, New Zealand) *Chaetocoelopa*
- Scape with outermost dorsal setula not enlarged; face with weak, saddle-shaped, medial carina; scutellum relatively broad and rounded; intradorsocentral setulae in 3-5 rows, lateral rows very irregular; male sternite 5 short, very asymmetrical (western North America) *Coelopina* (in part)
7. Interfacetal setulae numerous; occipital surface of head convex, not fitted to thorax; hypopleuron bare (Australia) *Lopa*
- Eye bare or nearly so; occipital surface of head more or less broadly flattened, fitting closely against thorax; hypopleuron setulose posteriorly 8

- 8. Prosternum bare; arista shorter than greatest diameter of eye; 2 pairs of scutellar setae 9
- Prosternum setulose (rarely bare in diminutives of *Icaridion*, having arista longer than eye and usually with only 1 pair of scutellar setae)..... 10
- 9. Vibrissal angle prominent and bearing a moderately long vibrissal seta; postpronotum with 2 setae, these subequal; vein A_2 indistinguishable beyond alula; male surstylus deeply bilobed (Australia) *This*
- Vibrissal angle receding, bearing fine setulae only; normally 1 postpronotal seta present; vein A_2 present as an unpigmented crease beyond alula; male surstylus simple (Australia) *Rhis* (in part)
- 10. Midcoxa with medial plate produced into a pubescent lobe as prominent as anterior setulose lobe (reduced in *Coelopa stejneggeri*); forefemur with small, strongly spinescent basal anteroventral setulae; scutellum very broadly rounded; face usually much narrowed ventrally so that parafacial prominences (when distinct) are approximate (except in *Coelopa vanduzeei*) 11
- Midcoxa with medial plate not produced into a lobe; forefemur without such spinescent setulae; scutellum narrower, often subtriangular; face not markedly narrowed below 14
- 11. Anal cell (CuP) with posterodistal angle not more acute than anterodistal angle; postnotopleural ridge rounded; prosternum strongly bifurcate anteriorly; hindtibia with 2 apical spurs, dorsal spur larger (temperate Australia) *Gluma*
- Anal cell with posterodistal angle produced, markedly more acute than anterodistal angle; postnotopleural ridge with sharp edge; prosternum anteriorly entire or with slight, medial notch; hindtibial spurs not as above (if 2 then ventral spur larger)(north temperate zone, Africa, Indo-Pacific tropics) (genus *Coelopa*) 12
- 12. Subcosta without ventral setulae subgenus *Fucomyia*
- Basal section of subcostal bearing ventral setulae 13
- 13. Presutural intra-alar seta present; hindtibia with only 1 apical anteroventral spur; male: forefemur with many long, fine setulae onlysubgenus *Coelopa*
- Presutural intra-alar seta absent; hindtibia with 2-3 apical anteroventral spurs; male: forefemur with a dorsal series of large spine-like setae (smaller in diminutive examples), in addition to smaller such setae and few setulae subgenus *Neocoelopa*

14. Arista bare; subcosta with small setulae ventrally near humeral crossvein; hindfemur with thick, spinescent, anteroventral and posteroventral setae (New Zealand) *Baeopterus* (in part)
- Arista short-haired; subcosta bare; hindfemur ventrally with at most fine, poorly differentiated setae 15
15. Costa fading beyond vein R_{4+5} , not reaching vein M; postpronotal callus with 2 long setae; male forebasitarsus with 2 narrow, ventroapical processes; female sternite 4 divided in 2 (Australia).....
..... *Amma*
- Costa narrowed beyond vein R_{4+5} but distinct to vein M; postpronotal callus with at most 1 long seta; male forebasitarsus with 1 broad, ventroapical process; female sternite 4 undivided 16
16. Metasternum generally setulose; vein A_2 absent; apex of parafacial prominence microtomentose, not shiny; vibrissal area generally with 1 or few differentiated setae among setulae; male surstylus biramous (New Zealand, Macquarie Island) *Icaridion* (in part)
- Metasternum bare; vein A_2 visible beyond alula as an unpigmented crease; apex of parafacial prominence smooth, shiny; vibrissal area setulose but without slightly differentiated setae; male surstylus simple 17
17. Hindtibia with 1 terminal ventral spur (Australia) *Rhis* (in part)
- Hindtibia with 2 unequal terminal ventral spurs (Macquarie Island, New Zealand) *Coelopella*

Family Coelopidae Hendel

Coelopinae Hendel, 1910a: 112 [as a subfamily of the family Muscidae].

Type genus: *Coelopa* Meigen.

Coelopidae. Enderlein 1914: 310 [as a family]; Séguy 1934: 310 [fauna, France]; Hennig 1937: 1-38 [fauna, Palearctic], 1958: 585-589 [discussion, phylogenetic relationships], 1973: 56 [discussion]; Ardö 1964: 441 [fauna, South Africa]; Vockeroth 1965: 679-680 [catalog, Nearctic], 1987: 919-922 [fauna, Nearctic]; Steyskal 1967: 1 [catalog, Neotropics]; Cole 1969: 364 [fauna, western North America]; Stackelberg 1970: 173 [fauna, European Russia], 1988: 278-729 [English translation]; Harrison 1976: 126-130 [fauna, Subantarctic islands]; Cogan 1980: 610 [catalog, Afrotropics]; Gorodkov 1984a: 150, 1984b: 151-152 [catalog, Palearctic]; Mathis 1989: 563-564 [catalog, Australasia/Oceania]; McAl-

pine 1989: 1450 [review]; Morimoto 1989: 805 [checklist, Japan]; McAlpine 1991: 29-84 [revision, Australian species]; 1998: 333-340 [fauna, Palearctic]; Bruyn 1991: 132 [checklist, Belgium]; Nowakowski 1991a: 179, 1991b: 180 [checklist, Poland]; Munari & Rivosecchi 1995: 3 [checklist, Italy]; Poole & Gentili 1996: 127 [checklist, Nearctic]; Chandler 1998a: 130, 1998b: 131 [checklist, British Isles]; Sabrosky 1999: 94, 246 [nomenclatural status, need for the Commission's action]; Schumann 1999a: 144, 1999b: 153 [checklist, Germany]; Pakalniškis *et al.* 2000: 33 [checklist, Lithuania]; Meier & Petersen 2001: 192 [checklist, Denmark]; Beuk 2002: 246 [checklist, Netherlands]; Carles-Tolrá & Báez 2002: 156 [checklist, Spain, Portugal]; Meier & Wiegmann 2002: 393-407 [phylogeny].

Phycodromidae Loew, 1861: 89. Type genus: *Phycodroma* Stenhammar 1854 [= *Malacomyia* Haliday 1837].

Phycodromiinae. Lameere 1906: 138

Phycodromiidae. Lundstrom & Frey 1913: 18.

Malacomyiidae Czerny, 1909: 276. Type genus: *Malacomyia* Haliday 1837.

Subfamily COELOPINAE Hendel

Coelopinae Hendel, 1910a: 112 [family Muscidae]. Type genus: *Coelopa* Meigen.

Tribe Coelopini Hendel

Coelopini Hendel, 1910a: 112 [family Muscidae, as "Coelopinae"]. Type genus: *Coelopa* Meigen. McAlpine 1991: 29-84 [revision, first use as a tribe, Australian species]

Genus COELOPA Meigen

Coelopa Meigen, 1830: 8. Type species: *Musca frigida* of Meigen, not Fabricius, by monotypy [misidentification = *Coelopa pilipes* Haliday]. Stenhammar 1854: 291-295, 317-323 [review]; Schiner 1863: 319-320 [review, Palearctic fauna]; Becker 1905: 22 [catalog, Palearctic]; Aldrich 1905: 577 [catalog, Nearctic], 1929: 1-6 [revision, Nearctic species]; Séguy 1934: 311 [discussion, key to French species]; 1940: 231 [key]; 1941: 157 [key to subgenera]; Hennig 1937: 18 [review]; Malloch 1933: 342 [discussion, key

to subgenera]; Hardy 1957: 4144 [discussion of subgenera, list of combinations]; Vockeroth 1965: 679-680 [catalog, Nearctic]; Cole 1969: 364 [fauna, western North America, key to subgenera]; Stackelburg 1970: 173 [fauna, European Russia]; Cogan 1980: 610 [catalog, Afrotropics]; Gorodkov 1984b: 151-152 [catalog, Palearctic]; Mathis 1989: 563 [catalog, Australasia/Oceania]; Morimoto 1989: 805 [checklist, Japan]; Bruyn 1991: 132 [checklist, Belgium]; Nowakowski 1991b: 180 [checklist, Poland]; Poole & Gentili 1996: 127 [checklist, Nearctic]; Chandler 1998: 130 [checklist, British Isles]; Schumann 1999: 144 [checklist, Germany]; Pakalniškis *et al.* 2000: 33 [checklist, Lithuania]; Meier & Petersen 2001: 192 [checklist, Denmark]; Beuk 2002: 246 [catalog, Netherlands]; Carles-Tolrá & Báez 2002: 156 [checklist, Spain].

Caelopa. Misspelling. Westwood 1840: 144

Coelepa. Misspelling. Walker 1861b: 320.

NB: As first noted by Haliday (1838: 186), Meigen based *Coelopa* on a misidentification. *Musca frigida* of Meigen was renamed *pilipes* by Haliday and was retained in the genus *Coelopa*. Haliday erected a new genus, *Fucomyia*, for the true *frigida* of Fabricius. Under the ICZN (Art. 70.3), when an author discovers that a type species was misidentified, the author should select and thereby fix as type species the species that will best serve stability and universality. Thus, as the type species of *Coelopa* Meigen, we formally select and fix *Coelopa pilipes* Haliday, a species Haliday recognized and selected years ago.

Subgenus *Coelopa* Meigen

Coelopa Meigen, 1830: 8. Type species: *Musca frigida* of Meigen, not Fabricius, by monotypy [misidentification = *Coelopa pilipes* Haliday].

pilipes Haliday. **PA:** Denmark, Färoe Islands, France, Great Britain, Ireland, Netherlands, Russia (European Part), Spain, Sweden.

Coelopa pilipes Haliday, 1838: 186. New name for *frigida* of Meigen, not Fabricius. ST 2♂ MNHNP. Walker 1849: 1134 [synonymy, list, England]; Stenhammar 1854: 322-323 [review]; Schiner 1863: 320 [list, Great Britain, Sweden, Lappland, synonymy with *C. frigida*]; Becker 1905: 23 [catalog, Palearctic]; Scott 1920: 155 [natural history, figs. of puparium, terminal spiracle of third-instar larva]; Hennig 1937: 19 [review, figs. of larvae, puparia,

adult head and wing]; Meijere 1939: 161 [list, Netherlands]; Ringdahl 1941: 14 [list, Netherlands]; Brown 1944: 257 [list, Färoe Islands]; Taylor 1955b: 107 [abundance]; Egglisshaw 1961: 11-18 [mass migration flights]; Stackelburg 1970: 173 [fauna, European Russia], 1988: 278 [English translation]; Phillips & Arthur 1994: 154-163 [ecology]; Phillips *et al.* 1995a: 65-74 [ecology, role of temperature in competition], 1995b: 158-165 [ecology, description of egg]; Leggett *et al.* 1996: 1-11 [genetic effects of competition]; Hodge & Arthur 1997: 743-754 [behavior, asymmetric interactions]; Crean *et al.* 2000: 121-126 [behavior, mate choice]; Beuk 2002: 246 [checklist, Netherlands].

Coelopa pilipes pilipes. Séguy 1934: 308-313 [review, figs. of male terminalia, habitus of body].

Coelopa (Coelopa) pilipes. Hardy 1957: 43 [list]; Gorodkov 1984b: 151 [catalog, Palearctic]; Bruyn 1991: 132 [checklist, Belgium]; Nowakowski 1991b: 180 [checklist, Poland]; Chandler 1998a: 130 [checklist, British Isles]; Schumann 1999: 144 [checklist, Germany]; Carles-Tolrá & Báez 2002: 156 [checklist, Spain].

Coelopa pilipes. Meier & Petersen 2001: 192 [checklist, Denmark].

Coelopa pilipes var. *brevipilosa* Mercier, 1921: 163. France. Calvados. ST ? MNHNP. Mercier 1929: 282 [discussion]; Séguy 1934: 313 [review]; Hennig 1937: 20 [review].

Hippobosca marina Walker, 1849: 1134 [manuscript name, attributed to Montagu].

Musca frigida of Meigen [Not Fabricius]. Misidentification. Meigen 1830: 8; Becker 1902: 250 [notes on Meigen's collection].

Subgenus *Fucomyia* Haliday

Fucomyia Haliday, 1837: 280. Published in synonymy [first made available by use in Haliday 1838: 186]. Type species: *Musca frigida* Fabricius, by subsequent designation [Westwood 1840: 144]. Schiner 1863: 319 [questioned synonymy with *Coelopa*]; Hendel 1910b: 308 [synonymy with *Coelopa*]; Hennig 1937: 21 [review, as a genus]; Gorodkov 1984b: 152 [catalog, Palearctic].

Phycomyia Agassiz, 1846: 156, 288 [as a new name for *Fucomyia*].

aequatorialis Bezzi. **AF:** Somalia.

Coelopa aequatorialis Bezzi, 1892: 194. Somalia. HT ♀ MCSNM. Bezzi 1908: 193 [discussion]; Cogan 1980: 610 [catalog, Afro-tropics].

- Coelopa (Coelopa) aequatorialis*. Hardy 1957: 43 [generic combination, suggested to possibly be a synonym of *C. pilipes* Haliday].
- alluaudi** Séguy. **AF:** Madagascar. **AU:** Australia (Northern Territory, Queensland), Micronesia (Palau). **OR:** Japan (Ryukyu Islands), Philippines.
- Coelopa (Fucomyia) alluaudi* Séguy, 1941: 157. Madagascar. Region du sudest: Fort Dauphin. HT ♂ MNHNP.
- Coelopa (Coelopa) alluaudi*. Hardy 1957: 43 [generic combination, suggested to be related to *C. africana* Malloch].
- Coelopa alluaudi*. Cogan 1980: 610 [catalog, Afrotropics]; McAlpine 1991: 64-65 [review, Australia, Philippines, Ryukyu Islands, discussion of taxonomic status].
- Coelopa (Coelopa) palauensis* Hardy, 1957: 44. Palau. Ngurukdabel (Urukthapel) Island. HT ♂ BBM. Mathis 1989: 564 [Australasian/Oceanian catalog]. Syn. McAlpine 1991.
- dasyпода** Bezzi. **AF:** Namibia, South Africa (Northern Cape).
- Coelopa dasyпода* Bezzi, 1908: 191. Namibia. Itschabo Island (a guano island?), Lüderitzbaai (26°36.5'S, 15°08'E = Angra Pequena or Lüderitz Bay), Possession Island (27°01'S, 15°13'E); South Africa. Northern Cape: Port Nolloth (29°15'S, 16°52'E). ST ♂♀ MCSNM, USNM. Cogan 1980: 610 [catalog, Afrotropics].
- Coelopa (Coelopa) dasyпода*. Hardy 1957: 43 [generic combination].
- frigida** (Fabricius). **NE:** Canada (New Brunswick, Quebec), USA (Maine, Massachusetts, New York, Rhode Island). **PA:** Denmark, Färoe Islands, France, Great Britain, Iceland, Ireland, Japan, Lithuania, Netherlands, Norway, Poland, Russia (European Part), Spain, Sweden.
- Musca frigida* Fabricius, 1805: 307. Norway. Lappland. ST 2♂ UZMC [Aldrich 1930: 26].
- Coelopa frigida*. Haliday 1833: 167 [review]; Walker 1849: 1134 [synonymy, list, England, France, Alten]; Stenhammar 1854: 320-321 [review]; Schiner 1863: 319 [review, Sweden, England]; Holmgren 1883: 178 [list, Norra Gaskap, Skodde Bay, and Matotschkin Schar]; Mason 1890: 200 [list, Iceland]; Aldrich 1905: 577 [catalog, Nearctic]; Becker 1905: 22 [catalog, Palearctic]; Mercier 1929: 283-287 [comparison with *C. eximia*]; Séguy 1934: 313 [review, fig. of leg]; Hennig 1937: 25 [review, figs. of larvae, puparia, adult head, male and female terminalia]; Brown 1944: 257 [list, Färoe Islands]; Taylor 1955a: 97 [attracted to organic solvents]; Taylor 1955b: 107 [abundance]; Rimmert 1957: 788 [conspicuous]

- ity of *C. frigida*, *C. parvula*, and *C. eximia*]; Burnet & Thompson 1960: 85 [laboratory culturing]; Egglisshaw 1961: 11-18 [mass migration flights]; Stackelburg 1970: 173 [fauna, European Russia], 1988: 279 [English translation]; Cullen *et al.* 1987: 701-710 [dietary requirements]; Morimoto 1989: 805 [checklist, Japan]; Pitafi *et al.* 1990: 91-97 [behavior, mate choice]; Gilburn *et al.* 1993: 1788-1795 [genetics]; Gilburn & Day 1994: 159-165 [evolution of female choice]; Phillips & Arthur 1994: 154-163 [ecology]; Phillips *et al.* 1995a: 65-74 [ecology, role of temperature in competition], 1995b: 158-165 [ecology, description of egg]; Leggett *et al.* 1996: 1-11 [genetic effects of competition]; Poole & Gentili 1996: 127 [checklist, Nearctic]; Hodge & Arthur 1997: 743-754 [behavior, asymmetric interactions]; Crean *et al.* 2000: 121-126 [behavior, mate choice]; Meier & Petersen 2001: 192 [checklist, Denmark]; Beuk 2002: 246 [catalog, Netherlands]; Laamanen *et al.* 2003: 127-136 [species status]; Speight 2004: 48 [list, Ireland].
- Coelopa (Fucomyia) frigida*. Haliday 1838: 186 [key, synonymy]; Gorodkov 1984b: 152 [catalog, Palearctic]; Bruyn 1991: 132 [checklist, Belgium]; Nowakowski 1991b: 180 [checklist, Poland]; Chandler 1998a: 130 [checklist, British Isles]; Schumann 1999: 144 [checklist, Germany]; Pakalniškis *et al.* 2000: 33 [checklist, Lithuania]; Carles-Tolrá & Báez 2002: 156 [checklist, Spain].
- Fucomyia frigida*. Collin 1924: 203 [list, Reindeer Bay, Liefde Bay, Spitsbergen]; Ringdahl 1941: 14 [list, Netherlands]; Nielsen *et al.* 1954: 83 [list, Iceland, synonymy].
- Caelopa* [sic] *frigida*. Nielsen *et al.* 1954: 83 [in synonymy, credited erroneously to Mason 1890].
- Coelopa gravis* Haliday, 1833: 167. Ireland. Downshire: Holywood. ST ♂♀ NMI. Mason 1890: 200 [list, Iceland]; Aldrich 1929: 3 [review]. Syn. Haliday 1838.
- Fucomyia gravis*. Scott 1920: 156 [natural history, figs. of puparium, terminal spiracle in third-instar larva].
- Fucomyia frigida* var. *gravis*. Hennig 1937: 26 [review].
- Coelopa simplex* Haliday, 1833: 167. Ireland. Downshire: Holywood. ST ♂♀ NMI. Walker 1849: 1134 [list, England]. Syn. Haliday 1838.
- Coelopa parvula* Haliday, 1833: 167. Ireland. Downshire: Holywood. ST ♂♀ NMI. Haliday 1838: 186 [key]; Walker 1849: 1134 [list, England]; Schiner 1863: 320 [list, Sweden, Denmark, England]; Mason 1890: 200 [list, Iceland]; Aldrich 1905: 577 [catalog, Nearctic]; Becker 1905: 23 [catalog, Palearctic]. Syn. Haliday 1838.

- Fucomyia frigida* var. *parvula*. Hennig 1937: 27 [review]; Hardy 1957: 43 [list].
- Coelopa nitidula* Zetterstedt, 1847: 2473. Denmark, Germany, Norway, Sweden, Russia. ST ? ZIL. Stenhammar 1854: 321-322 [review]; Schiner 1863: 320 [list, Sweden, Denmark, England, synonymy with *C. parvula*]; Holmgren 1883: 178 [list, Norra Gaskap]. Syn. Hennig 1937.
- Coelopa eximia* Stenhammar, 1854: 318. Norway. Trondjem, north of [= "Nordre Trondhjems"]. ST ♂♀ ZIL. Schiner 1863: 320 [list, Sweden, England, synonymy with *C. frigida*]; Holmgren 1883: 178 [list, Norra Gaskap and Skodde Bay]; Becker 1905: 22 [catalog, Palearctic]; Mercier 1929: 283-287 [comparison with *C. frigida*]; Séguy 1934: 312-313 [review, fig. of leg]. Syn. Hennig 1937.
- nebularum** Aldrich. **NE:** USA (Alaska, California, Oregon, Washington). **PA:** Japan (Kuril Islands), Russia (Far East).
- Coelopa nebularum* Aldrich, 1929: 5. USA. Alaska: Pribilof Islands, St. Paul Island. HT ♂ USNM [USNM type number 41859]. Poole & Gentili 1996: 127 [checklist, Nearctic]; Crean *et al.* 2000: 121-126 [behavior, mate choice]; Laamanen *et al.* 2003: 127-136 [species status].
- Fucomyia frigida nebularum*. Hennig 1937: 28 [review, generic combination].
- Coelopa (Fucomyia) frigida* var. *nebularum*. Hardy 1957: 44 [list].
- Coelopa (Fucomyia) nebularum*. Malloch 1933: 343 [review]; Vockeroth 1965: 680 [catalog, Nearctic]; Cole 1969: 364 [fauna, western North America]; Gorodkov 1984b: 152 [catalog, Palearctic].
- orientalis** Macquart. **OR:** Indonesia (Java).
- Coelopa orientalis* Macquart, 1843: 166. Indonesia. Java. ST ? MNHNP. Becker 1910: 23 [listed as a synonym of *C. aequatorialis* Bezzi].
- stejnegeri** Aldrich. **NE:** USA (Alaska). **PA:** Russia (Far East).
- Coelopa stejneri* Aldrich, 1929: 5. USA. Alaska: Pribilof Islands. St. Paul Island. HT ♂ USNM [USNM type number 41860]. Hennig 1937: 21 [review]; Poole & Gentili 1996: 127 [checklist, Nearctic].
- Coelopa steinegeri*. Misspelling. Hendel 1932: 7 [comparison with *C. nigrovillosa*].
- Coelopa (Fucomyia) stejneri*. Malloch 1933: 343 [review]; Mathis 1989: 564 [interception on Hawaiian Islands, catalog, Australasia/Oceania].
- Coelopa (Coelopa) stejneri*. Hardy 1957: 43 [discussion]; Vockeroth 1965: 679 [catalog, Nearctic]; Gorodkov 1984b: 151 [catalog, Palearctic].

- Coelopa nigrovillosa* Hendel, 1932: 5. Russia. Kamtchatka. ST ♂ NMW. Syn. Hennig 1937.
- ursina*** (Wiedemann). **AF:** South Africa (Northern Cape, Western Cape).
Copromyza ursina Wiedemann, 1824: 59. South Africa. Western Cape: Cape of Good Hope [= "Prom. bon. sp."]. ST ♂ UZMC, ZMHU.
Coelopa ursina. McAlpine 1991: 64 [generic combination]; Crean & Gilburn 1998: 1405-1410 [sexual selection].
- Coelopa (Fucomyia) africana* Malloch, 1933: 343. South Africa. Northern Cape: Port Nolloth, Namaqualand. HT ♂ USNM. Cogan 1980: 610 [catalog, Afrotropics]. Syn. McAlpine 1991.
- Coelopa (Coelopa) africana*. Hardy 1957: 43 [generic combination]; Ardö 1964: 441 [discussion, possibly a synonym of *C. dasypoda* Bezzi].

Subgenus *Neocoelopa* Malloch

- Neocoelopa*** Malloch, 1933: 345. Type species: *Coelopa vanduzeei* Cresson, by original designation. Vockeroth 1965: 680 [catalog, Nearctic].
- vanduzeei*** Cresson. **NE:** USA (Alaska, California, Oregon, Washington).
Coelopa vanduzeei Cresson, 1914: 457. USA. California: San Diego, La Jolla. HT ♂ ANSP [ANSP type number 6077]. Aldrich 1929: 3 [review]; Kompfner 1974: 44-52 [description of third-instar larva and puparium, feeding ecology]; Poiner 1977: 81-86 [ecology]; Poole & Gentili 1996: 127 [checklist, Nearctic]; Crean *et al.* 2000: 121-126 [behavior, mate choice].
- Coelopa (Neocoelopa) vanduzeei*. Malloch 1933: 345. [Type species designation]; Hardy 1957: 44 [list]; Vockeroth 1965: 680 [catalog, Nearctic]; Cole 1969: 364 [fauna, western North America]; Arnould 1983: 245-249 [aggregation behavior].
- Coelopa frigida* of authors [not Fabricius]. Misidentification. Cole 1912: 156 [list]; Cole & Lovett: 1921: 320 [list, Oregon]
- Fucomyia vanduzeei*. Steyskal 1957: 68 [generic combination, synonymy, figs. of male terminalia].

Nomina dubia

- fumifera*** (Walker). **AU:** New Guinea.
Cotamba fumifera Walker, 1861a: 246. Indonesia. Irian Jaya: Manokwari [= Dorey]. ST ? BMNH [apparently lost]. Roháček 2001: 391 [transferred to Coelopidae].

glabra Walker. **PA:** England.

Coelopa glabra Walker, 1849: 1135. United Kingdom. England. ST ?
BMNH.

offendens Walker. **AU:** Australia (Tasmania).

Coelopa [sic] *offendens* Walker, 1861b: 320. Australia. Tasmania. ST
? BMNH [apparently lost]. McAlpine 1991: 64 [probably not a
Coelopidae].

Tribe Coelopellini McAlpine

Coelopellini McAlpine, 1991: 65. Type genus: *Coelopella* Malloch.

Ammini McAlpine, 1991: 48. Type genus: *Amma* McAlpine.

Genus AMMA McAlpine

Amma McAlpine, 1991: 76. Type species: *blancheae* McAlpine, by original designation.

blancheae McAlpine. **AU:** Australia (New South Wales, Victoria, South Australia, Tasmania, Western Australia).

Amma blancheae McAlpine, 1991: 76. Australia. New South Wales: Quarantine Bay, Twofold Bay. HT ♂ AMS. Blanche 1992: 27-34 [distribution, abundance].

Genus BAEOPTERUS Lamb

Baeopterus Lamb, 1909: 141. Type species: *robustus* Lamb, by monotypy. Hendel 1937: 185 [key]; Miller 1950: 101 [catalog, New Zealand]; Harrison 1959: 95 [review]; Mathis 1989: 563 [catalog, Australasia/Oceania].

Paeopterus [sic]. Lamb 1909: 139 [misspelling].

Protocoelopa Malloch, 1933: 345. Type species: *philpotti* Malloch, 1933, by original designation and monotypy. Séguy 1940: 231 [key]; Miller 1950: 102 [catalog, New Zealand]; Harrison 1959: 99 [review]. Syn. McAlpine 1991.

robustus Lamb. **AU:** New Zealand (Auckland Islands, Campbell Island).

Baeopterus robustus Lamb, 1909: 142. New Zealand. Campbell Island. LT ♂ BMNH [designated by Harrison 1959: 95]. Enderlein 1930a: 256 [list, Campbell and Ewing Islands]; Hendel 1937: 185 [generic key]; Miller 1950: 101 [catalog, New Zealand]; Harrison 1959: 95 [review, lectotype designation], 1964: 312 [discussion, Campbell

- Island, fig. of male terminalia], 1976: 126 [list, Auckland Islands, Campbell Island]; Mathis 1989: 563 [catalog, Australasia/Oceania].
- philpotti*** (Malloch). AU: New Zealand (Chatham Islands, Snares Islands). *Protocoelopa philpotti* Malloch, 1933: 346. New Zealand. Invercargill. HT ♂ USNM. Miller 1950: 102 [catalog, New Zealand]; Harrison 1959: 99 [review, syn. with *longipes* Hendel], 1976: 127 [list, Snares Islands, natural history].
- Baeopterus (Protocoelopa) philpotti*. Mathis 1989: 563 [generic combination; Australasian/ Oceanian catalog].
- Baeopterus longipes* Hendel, 1937: 192. New Zealand. HT ♂ NMW [apparently lost]. Miller 1950: 101 [catalog, New Zealand]. Syn. Harrison 1959.

Genus COELOPELLA Malloch

- Coelopella*** Malloch, 1933: 348. Type species: *plebeia* Malloch (= *Coelopa curvipes* Hutton), by original designation. Miller 1950: 101 [catalog, New Zealand]; Harrison 1959: 109 [review]; Hardy 1962: 967 [as a subgenus of *Coelopa*]; Mathis 1989: 564 [catalog, Australasia/Oceania]; McAlpine 1991: 70-74 [revision of Australian species].
- curvipes*** (Hutton). AU: Macquarie Island, New Zealand (Auckland Islands, Campbell Island, Chatham Islands, South Island).
- Coelopa curvipes* Hutton, 1902: 172. New Zealand. Auckland Islands. LT ♂ CMC [designated by Harrison 1959: 107]. Miller 1950: 101 [catalog, New Zealand]; Harrison 1976: 128 [discussion, Auckland Islands, Macquarie Island].
- Coelopa (Fucomyia) curvipes*. Malloch 1933: 343 [generic combination]; Harrison 1959: 107 [review, fig. of wing, lectotype designation]; Mathis 1989: 564 [catalog, Australasia/Oceania].
- Coelopa (Coelopa) curvipes*. Hardy 1957: 43 [list].
- Coelopa (Coelopella) curvipes*. Hardy 1962: 969-971 [review, generic combination, figs. of head, male and female terminalia, larva].
- Coelopella curvipes*. McAlpine 1991: 70-72 [revision].
- Coelopella plebeia* Malloch, 1933: 348. New Zealand. Invercargill. HT ♂ USNM. Miller 1950: 101 [catalog, New Zealand]; Harrison 1955: 218 [list, Campbell Island, Auckland Islands], 1959: 109 [review], 1976: 111 [synonymy]; Hardy 1962: 969 [review]; Mathis 1989: 564 [catalog, Australasia/Oceania]. Syn. Hardy 1962.
- Coelopa (Fucomyia) macquariensis* Womersley, 1937: 72. Australia. Macquarie Island (Stations 81 and 82). ST ? BMNH. Harrison

1959: 107 [synonymy]; Hardy 1962: 969-971 [discussion]; McAlpine 1991: 71 [listed as a nomen dubium]. Syn. Harrison 1959.
Coelopa macquariensis. Miller 1950: 101 [catalog, New Zealand].

Genus ICARIDION Lamb

Icaridion Lamb, 1909: 140. Type species: *nasutum* Lamb, by monotypy. Hendel 1937: 184 [key]; Miller 1950: 102 [catalog, New Zealand]; Harrison 1959: 96 [review]; Mathis 1989: 563 [catalog, Australasia/Oceania]; McAlpine 1991: 74 [revision].

debile (Lamb). AU: New Zealand (South Island, Auckland Islands, Antipodes Island, Campbell Island).

Coelopa debilis Lamb, 1909: 140. New Zealand. Campbell Island, Monument Harbour. LT ♂ BMNH [designated by Harrison 1959: 106]. Enderlein 1930a: 255 [list, Campbell Island]; Miller 1950: 101 [catalog, New Zealand]; Hardy 1957: 44 [list]; Harrison 1959: 108 [lectotype designation], 1964: 314 [discussion, Campbell Island, fig. of male terminalia], 1976: 129 [discussion, Auckland Islands, Campbell Island].

Coelopa (Fucomyia) debilis. Harrison 1959: 106 [review, lectotype designation, generic combination].

Icaridion debile. Mathis 1989: 563 [generic combination; catalog, Australasia/Oceania].

nasutum Lamb. AU: New Zealand (Antipodes Island, Auckland Islands, Campbell Island).

Icaridion nasutum Lamb, 1909: 141. New Zealand. Campbell Island, Monument Harbour. LT ♀ BMNH [designated by Harrison 1959: 98]. Enderlein 1930a: 255 [list, Campbell Island]; Hendel 1937: 184 [generic key]; Miller 1950: 102 [catalog, New Zealand]; Harrison 1955: 218 [discussion, Campbell Island], 1959: 98 [review, lectotype designation], 1964: 314 [discussion, Campbell Island], 1976: 126 [list, Auckland Islands, Campbell Island, Antipodes Island]; Mathis 1989: 563 [catalog, Australasia/Oceania].

nigrifrons Lamb. AU: Macquarie Island, New Zealand (Auckland Island, Campbell Island, South Island).

Coelopa nigrifrons Lamb, 1909: 140. Australia. Macquarie Island. LT ♂ BMNH [designated by Harrison 1959: 108]. Enderlein 1930b: 261 [list]; Miller 1950: 101 [catalog, New Zealand]; Hardy 1957: 44 [list]; Harrison 1959: 108 [lectotype designation], 1976: 129 [synonymy with *C. debile*].

Coelopa (Fucomyia) nigrifrons. Harrison 1959: 108 [review, lectotype designation]; Hardy 1962: 968-969 [review, figs. of head, male and female terminalia, larva, Macquarie Island].

Icaridion nigrifrons. McAlpine 1991: 74-76 [revision, generic combination].

Genus RHIS McAlpine

Rhis McAlpine, 1991: 65. Type species: *whitleyi* McAlpine, by original designation.

popeae (McAlpine). **AU**: Australia (Australian Capital Territory, New South Wales, South Australia, Tasmania, Victoria, Western Australia).

Coelopella popeae McAlpine, 1991: 72. Australia. Tasmania: South Arm (near Hobart). HT ♂ AMS.

Rhis popeae. **NEW COMBINATION**.

NB: We have transferred this species to the genus *Rhis* based on DNA evidence and the well-supported clade of *Rhis whitleyi* plus this species (Meier & Wiegmann 2002).

whitleyi McAlpine. **AU**: Australia (New South Wales, South Australia, Tasmania, Victoria).

Rhis whitleyi McAlpine, 1991: 65. Australia. Victoria: Bastion Point, Mallacoota. HT ♂ AMS.

Rhis whitley. McAlpine 1991: 65. Incorrect original spelling by current revision.

Genus THIS McAlpine

This McAlpine, 1991: 67. Type species: *canus* McAlpine, by original designation.

canus McAlpine. **AU**: Australia (Australian Capital Territory, New South Wales, Queensland, South Australia, Tasmania, Victoria, Western Australia).

This canus McAlpine, 1991: 68. Australia. New South Wales: Dee Why, near Sydney. HT ♂ AMS. Blanche 1992: 27-34 [distribution, abundance].

Tribe GLUMINI McAlpine

Glumini McAlpine, 1991: 53. Type genus: *Gluma* McAlpine.

Genus CHAETOCOELOPA Malloch

- Chaetocoelopa*** Malloch, 1933: 350. Type species: *Coelopa monstruosa* Hutton (= *Coelopa littoralis* Hutton), by original designation. Hendel 1937: 184 [key], 190-192 [discussion]; Miller 1950: 101 [catalog, New Zealand]; Harrison 1959: 100 [review]; Mathis 1989: 563-564 [catalog, Australasia/Oceania]; McAlpine 1991: 53-54 [revision Australian species; comments on status of "species"].
- littoralis*** (Hutton). AU: New Zealand (North and South Islands, Auckland Islands, Campbell Island, Chatham Islands, Snares Islands). *Coelopa littoralis* Hutton, 1881: 69. New Zealand. Dunedin or Wellington. LT ♂ CMC [designated by Harrison 1959: 101]. Hutton 1901: 80 [review], 1902: 172 [discussion]; Enderlein 1930a: 255 [list]; Hardy 1957: 44 [list]. *Coelopa litoralis*. Misspelling. Lamb 1909: 139. *Chaetocoelopa littoralis*. Malloch 1933: 350 [generic combination]; Miller 1950: 101 [catalog, New Zealand]; Harrison 1955: 217 [list, Auckland Islands], 1959: 101 [review, synonymy], 1976: 127 [list, Auckland Islands, Snares Islands]; Mathis 1989: 563 [catalog, Australasia/Oceania].
- Coelopa monstruosa* Hutton, 1901: 80. New Zealand. Fortrose: Southland. LT ♂ CMC [designated by Harrison 1959: 101]. Hardy 1957: 44 [list]; Harrison 1959: 101 [synonymy, lectotype designation]. *Chaetocoelopa monstruosa*. Malloch 1933: 350 [generic combination]; Hendel 1937: 192 [review]; Miller 1950: 101 [catalog, New Zealand]; Harrison 1955: 217 [list, Auckland Islands]. *Chaetocoelopa huttoni* Harrison, 1959: 103. New Zealand. Cornwallis. HT ♂ NZAC [originally in PDD, now in NZAC]. Mathis 1989: 563 [catalog, Australasia/Oceania]. Syn. McAlpine 1991.
- sydneyensis*** (Schiner). AU: Australia (Australian Capital Territory, New South Wales, Queensland, South Australia, Tasmania, Victoria, Western Australia). *Phycodroma sydneyensis* Schiner, 1868: 231. Australia. New South Wales: Sydney. LT ♂ NMW [designated by McAlpine 1991: 54]. *Chaetocoelopa sydneyensis*. Colless and McAlpine 1970: 724 [generic combination, figs. of head and wing]; Mathis 1989: 564 [catalog, Australasia/Oceania]; McAlpine 1991: 54 [revision, lectotype designation]; Blanche 1992: 27-34 [distribution, abundance].

Genus COELOPINA Malloch

Coelopina Malloch, 1933: 350. Type species: *Coelopa anomala* Cole, by original designation. Séguy 1940: 231 [key]; Vockeroth 1965: 680 [catalog, Nearctic]; Steyskal 1967: 1 [catalog, Neotropics]; Cole 1969: 364 [fauna, western North America]; Poole & Gentili 1996: 127 [checklist, Nearctic].

anomala (Cole). **NE:** USA (California). **NT:** Mexico (Baja California Norte).

Coelopa anomala Cole, 1923: 470. Mexico. Baja California Norte: Las Animas Bay. HT ♂ CAS [CAS type number 1346]. Hardy 1957: 44 [list]; Arnaud 1979: 333 [type catalog, CAS].

Coelopina anomala. Malloch 1933: 350 [generic combination]; Vockeroth 1965: 680 [catalog, Nearctic]; Steyskal 1967: 1 [catalog, Neotropics]; Cole 1969: 364 [fauna, western North America]; Sanders 1964: 22 [list, Mexico]; Poole & Gentili 1996: 127 [checklist, Nearctic].

Genus DASYCOELOPA Malloch

Dasycoelopa Malloch, 1933: 348. Type species: *australis* Malloch, original designation. Séguy 1940: 231 [key]; Mathis 1989: 564 [catalog, Australasia/Oceania]; McAlpine 1991: 54-56 [revision].

australis Malloch. **AU:** Australia (Lord Howe Island, New South Wales, Queensland).

Dasycoelopa australis Malloch, 1933: 349. Australia. Queensland: Townsville. HT ♂ USNM. Colless & McAlpine 1970: 724 [list]; Mathis 1989: 564 [catalog, Australasia/Oceania]; McAlpine 1991: 55-56 [revision]; Blanche 1992: 27-34 [distribution, abundance].

Genus GLUMA McAlpine

Gluma McAlpine, 1991: 56. Type species: *nitida* McAlpine, by original designation.

keyzeri McAlpine. **AU:** Australia (New South Wales, South Australia, Victoria, Western Australia).

Gluma keyzeri McAlpine, 1991: 57. Australia. South Australia: Victor Harbour (beach). HT ♂ AMS.

musgravei McAlpine. **AU:** Australia (Tasmania, Victoria).

Gluma musgravei McAlpine, 1991: 61. Australia. Victoria: Mallacoota, Bastion Point. HT ♂ AMS. Crean *et al.* 2000: 121-126 [behavior, mate choice].

nitida McAlpine. **AU:** Australia (New South Wales, South Australia, Tasmania, Victoria, Western Australia).

Gluma nitida McAlpine, 1991: 59. Australia. South Australia: Victor Harbour (beach). HT ♂ AMS. Crean *et al.* 2000: 121-126 [behavior, mate choice].

Genus MALACOMYIA Haliday

Malacomyza Haliday *in* Curtis, 1837: 280. Published in synonymy [first made available by use in Haliday 1838: 186]; preoccupied (Wesmael 1836). Type species: *Coelopa sciomyzina* Haliday, by subsequent designation [Haliday 1838: 186]. Hendel 1910b: 308 [synonymy with *Phycodroma*, discussion]; Meijere 1939: 161 [citation].

Malacomyia Haliday *in* Westwood, 1840: 144. Type species: *Coelopa sciomyzina* Haliday, by original designation. Hendel 1937: 184 [key]; Hennig 1937: 29 [review]; Gorodkov 1984a: 150 [catalog, Palearctic, as part of family Helcomyzidae]; Nowakowski 1991a: 179 [checklist, Poland]; Munari & Rivosecchi 1995: 3 [checklist, Italy]; Chandler 1998b: 131 [checklist, British Isles]; Sabrosky 1999: 185 [nomenclature]; Schumann 1999b: 153 [checklist, Germany]; Pakalniškis *et al.* 2000: 33 [checklist, Lithuania]; Meier & Petersen 2001: 192 [checklist, Denmark]; Carles-Tolrá & Báez 2002: 156 [checklist, Spain].

Phycodroma Stenhammar, 1854: 270. Type species: *Coelopa fucorum* Zetterstedt, by monotypy. Schiner 1862: 21 [review]; Séguy 1940: 231 [key].

Phycodromya. Misspelling. Rondani 1866: 48.

Phycodromia. Misspelling. Becker 1905: 21 [catalog, Palearctic].

sciomyzina (Haliday). **PA:** Azores, Canary Islands, Denmark, Great Britain, Ireland, Italy, Lithuania, Madeira, Netherlands, Poland, Russia (European Part), Spain, Sweden.

Coelopa sciomyzina Haliday, 1833: 167. Ireland. Downshire: Holywood. ST ? NMI. Walker 1849: 1134 [list, England]; Schiner 1863: 320 [list, Ireland].

Coelopa (*Malacomyza*) *sciomyzina*. Haliday 1838: 186 [key].

Phycodromya [sic] *scyomyzina*. Misspelling. Rondani 1866: 48 [list, Italy].

Phycodromia [sic] *sciomyzina*. Becker 1905: 22 [catalog, Palearctic].

Phycodroma sciomyzina. Séguy 1934: 311 [review]; Frey 1945: 67 [list, Azores, Madeira, and Canary Islands].

- Malacomyia sciomyzina sciomyzina*. Hennig 1937: 30 [review, fig. of head].
- Malacomyza sciomyzina*. Meijere 1939: 161 [list, Netherlands].
- Malacomyia sciomyzina*. Frey 1949: 32 [list, Madeira Island]; Stackelberg 1970: 173 [fauna, European Russia], 1988: 279 [English translation]; Gorodkov 1984a: 150 [catalog, Palearctic as part of family Helcomyzidae]; Nowakowski 1991a: 179 [checklist, Poland]; Munari & Rivosecchi 1995: 3 [checklist, Italy]; Chandler 1998b: 131 [checklist, British Isles]; Schumann 1999b: 153 [checklist, Germany]; Pakalniškis *et al.* 2000: 33 [checklist, Lithuania]; Meier & Petersen 2001: 192 [checklist, Denmark]; Beuk 2002: 246 [checklist, Netherlands]; Carles-Tolrá & Báez 2002: 156 [checklist, Spain]; Speight 2004: 49 [list, Ireland].
- Coelopa fucorum* Zetterstedt, 1847: 2474. Sweden. [= “Bahusiae (marine coast), Fucus”]. ST ? ZIL. Syn. Frey 1945.
- Phycodroma fucorum*. Schiner 1862: 21 [review, Sweden].
- Phycodromia fucorum*. Becker 1905: 21 [catalog, Palearctic].
- Malacomyza fucorum*. Frey 1937: 103 [list, Canary Islands], 1945: 67 [synonymy with *M. sciomyzina*].
- Malacomyia fucorum*. Frey 1958: 41 [list, Canary Islands].
- Phycodromia* [sic] *meridionalis*. Rondani, 1866: 48. Italy. Malta [= “ad littora Melitae capta”]. ST ? MZUF. Syn. Czerny 1909.
- Phycodromia* [sic] *meridionalis*. Becker 1905: 22 [catalog, Palearctic].
- Malacomyia sciomyzina meridionalis*. Hennig 1937: 31 [review]; Carles-Tolrá & Báez 2002: 156 [checklist, Spain].
- Malacomyia sciomyzina meridionalis*. Misspelling. Gorodkov 1984a: 150 [catalog, Palearctic, as part of the family Helcomyzidae].

Subfamily LOPINAE McAlpine

Lopinae McAlpine, 1991: 50. Type genus: *Lopa* McAlpine.

Genus LOPA McAlpine

Lopa McAlpine, 1991: 50. Type species: *convexa* McAlpine, by original designation.

convexa McAlpine. AU: Australia (South Australia, Western Australia).

Lopa convexa McAlpine, 1991: 50. Australia. Western Australia: Crystal Springs, 11 km W Walpole. HT ♂ AMS.

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