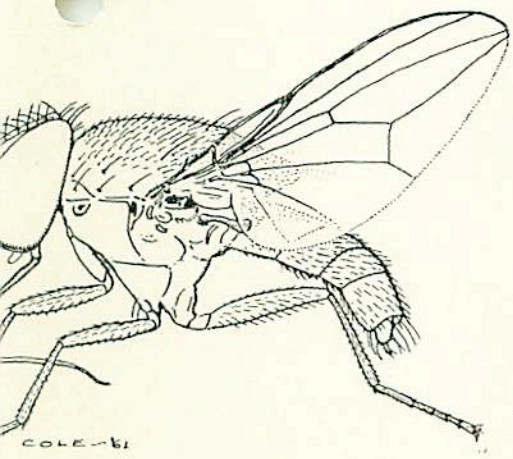
Cole, 1963

### Rhicnoessa Loew

*ssa* Loew, 1862, 6: 174; Melander, 1952a: 200–209. der's quoted reference is a complete revision of our these flies. The group is merged with *Tethina* by h (1965 Catalog). These species are adapted for coastal sand dunes and the dry beach sand zone protectively colored, being cinereous, mostly pale, lly with milky hyaline wings. The many outwardly fronto-orbitals are noticeable. Various species fol- n the Atlantic to the Brazilian beaches and down fic shores to Argentina. Melander's paper being available, the species are merely listed alphabetic- type-species is *Tethina cinerea* Loew.

*ustipennis* Melander (1952a) was taken on the rthwest of Morro Bay, Calif., in June. *R. denudata* (1952a) was collected at the seashore dunes at ria, Calif., June to October; it is very small (1.5 l the anal angle of the wing is diminished. *R. hor-* Melander (1952a) was described from abundant gathered along the seashore, from Ilwaco, Wash., San ncisco, Calif. *R. lavendula* Melander was based on three type specimens found at Bal- Huntington Beach, Calif. Melander states: "The ion of pollen and ground color gives the impression y lavender tone." *R. prognatha* Melander (1952a) l on a holotype male taken on the dunes west of y, Calif., in September.

*rensis* Melander (1952a) was collected at Rocky the head of the Gulf of Calif., Sonora, Mexico; cimens were taken in April, in a salt marsh. *R.* (Cole) (1923a) was described in *Tethina,* from on the east shore of Baja Calif. We have not ex- e holotype since its description (1923), but para- rial has *two* long bristles over the front coxae, not eural as originally stated. Melander collected and good series along the seabeaches of Calif. to the he type locality. Besides having coarser vestiture, imens from Balboa, Laguna Beach, etc., are evi- same species as those from Baja Calif. *R. variseta* (1952a) was collected on the seabeaches of south- Melander described it as very nearly a counterpart of the Atlantic Coast.



. Eusiphona mira Coquillett. Family Milichiidae.

## MILICHIIDAE

These little flies have been shifted around and argued about to some extent. In 1913, when Melander and Malloch were publishing on the group, they were considered Agromyzidae. Twenty years later they were separated from the Agromyzidae in a group generally called Phyllomyzidae. We consider the group of genera entitled to family rank; most of the species are very small and black in color, often with whitish hyaline wings.

The wing costa has two breaks, a small one at the humeral crossvein and a more evident break at the end of the subcosta. The small postvertical bristles are convergent or parallel; anterior orbitals convergent, the others divergent, proclinate, or reclinate; interfrontals or rows of hairs present.

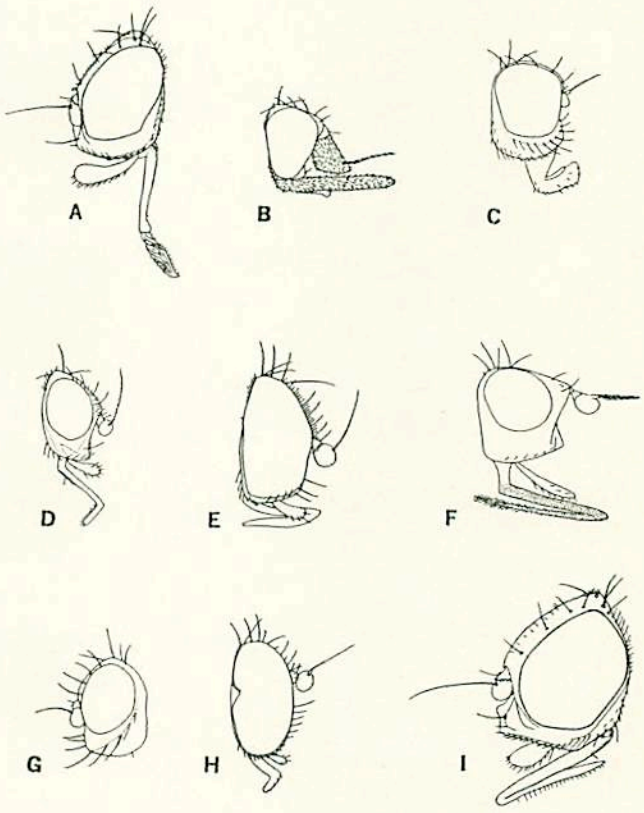



Figure 238. Heads of various Milichiidae. (A) Leptometopa (Hypaspistomyia, authors); (B) Phyllomyza hirtipalpis; (C) Hemeromyia nitida = washingtona; (D) Desmometopa M-nigrum; (E) Pholeomyia indecora; (F) Aldrichiomyza agromyzina; (G) Meonura vagans; (H) Milichiella lacteipennis; (I) Madiza glabra. (From the Curran Manual.)

The oral vibrissae are not well differentiated. Antennae usually small, but large in *Phyllomyza.* Proboscis often long and geniculate, but may be short. Mesonotum with one to four pairs of dorsocentral bristles; mesopleura and pteropleura with or without bristles. Second basal and anal cells small, the anal cell sometimes not well formed. Abdomen short, broad, with few if any bristles.

The habits of the species are not well known. As Curran

Cole, 1969



and Melander have noted, most of the specimens are collected only in dry weather and nearly always in full sunlight; many of them rest on logs and fences, or may be swept from grasses, and a few can be taken at windows in old houses and mill buildings. The anomalous genus *Carnus* Nitzsch (1911, Collin) has rudimentary wings and is parasitic on birds; some students place it in a separate family, the Carnidae.

### Key to the genera

(Adapted from Curran)

1. Posterior crossvein (m) absent....*Paramyia* Williston
   Posterior crossvein present..... 2
2. Costa ending at tip of third vein ($R_{4+5}$)..... 3
   Costa extending to tip of fourth vein ($M_{1+2}$)..... 4
3. Proboscis very long, chitinized, and geniculate; antennal arista thickened; frons square; palpi linear and porrect; presutural dorsocentral bristles present (South Dakota)..... .....(*Aldrichiella* Hendel) *Aldrichiomyza* Hendel
   Proboscis short; mesopleura with 2 or 3 bristles; discal cell minute; costa beyond $R_1$ usually with short, regular setae, except 2 Sabrosky species; third vein ($R_{4+5}$) ending in wing tip; face carinate between 2 subantennal depressions; anterior dorsocentral bristles lacking; postverticals parallel..... ..... *Meoneura* Rondani
   Proboscis short; in most characters allied to *Meoneura*, but the mesopleura bare (chloropid) ( = *Lasiosina* Becker)..... *Euchlorops* Malloch
4. (2) Costa with a deep excision at apex of subcostal vein; cruciate interfrontal bristles developed..... 5
   Costa broken, but excision not overlapping or extending into cell; interfrontal hairs present..... 7
5. Mesopleura with strong bristles; proboscis geniculate, but not unusually long; hind margins of eye entire; palpi slender; face narrow (neotropical).. ..... *Pholeomyia* Bilimek
   Mesopleura bare..... 6
6. Posterior margin of eye not excised at middle..... ..... *Milichia* Meigen
   Posterior margin of eye excised at middle; 1 or 2 pairs of dorsocentral bristles..... *Milichiella* Giglio-Tos
7. (4) First posterior cell (5R) narrowly open; frons long and narrow, with about 11 pairs of uniform fronto-orbitals; first vein ($R_1$) ends near middle of wing; 2 small dorsocentral and 3 humeral bristles present; head large, with narrow cheeks; proboscis long, slender, and geniculate; calypteres large.... ..... *Eusiphona* Coquillett
   First posterior (apical) cell widely open or only slightly narrowed; lacking most of above-mentioned characters..... 8
8. Bristles of head and thorax not strongly differentiated from hair; eyes long pilose; no vibrissae present; no fronto-orbital or scutellar bristles present; proboscis short (a genus now in Lonchaeidae)..... .....(*Arctobiella* Coquillett) *Dasiops* Rondani
   Bristles of head and thorax strong; eyes at most short haired ..... 9
9. Proboscis short, more or less fleshy, vibrissal angles not developed; face strongly carinate..... ..... *Hemeromyia* Coquillett
   Proboscis long and chitinized, geniculate; vibrissal angle distinct..... 10
10. Posterior tibiae flattened and broadened, especially so in male ..... 11
    Posterior tibiae not unusually flat and wide; lower edge of head rounded or short..... 13
11. Pteropleura with 1 or more bristles; first costal division bare; body polished; anterior upper fronto-orbital bristles proclinate, others reclinate (*Paramadiza* Malloch, *Mallochiella* Melander, *Hypaspistomyia* Hendel)..... *Leptometopa* Becker
    Pteropleura without bristles..... 12
12. Glossy black flies; frontal bristles weak..... .....(*Desmomyza* Curran) *Madiza* Fallén
    Dull-colored flies; frontal bristles strong, with 2 pairs diverging over eye; base of costa with bristly hairs; lower edge of head horizontal and long (*Platophrymia* Williston)..... *Desmometopa* Loew
13. (10) Eyes hairy; palpi large and projecting; third antennal segment large in male....*Phyllomyza* Fallén
    Eyes bare or nearly so; palpi not projecting; 5 or 6 pairs of orbital bristles..... 14
14. Apical scutellars convergent; third antennal segment very large; femora not enlarged; eyes vertically elongated..... *Neophyllomyza* Melander
    Apical scutellars divergent; third antennal segment not large; mid- and hind femora enlarged; palpi compressed; eyes rounded..... *Stomosis* Melander

## SUBFAMILY CARNINAE

### Hemeromyia Coquillett

*Hemeromyia* Coquillett, 1902: 190.

*H. obscura* Coquillett, the type-species, was taken near Las Vegas Hot Springs, N. Mex. (Barber). In his synopsis of 1913, Malloch redescribed the species from the types and noted specimens from Brewster Co., Texas. It is shining black, anterior margin of frons narrowly yellow, face and cheeks, and tarsi, yellow. Halteres with milky-white knobs.

*H. washingtona* (Melander) was described in *Paramadiza* Melander (1913) from Wash. specimens; the *nitida* of Malloch (1913), from Florissant, Colo. (Cockerell), is a synonym (Fig. 238C). The glossy black species has yellow halteres and yellow veins in the whitish wings. There are discal setulae on the mesonotum and a hind femoral preapical bristle. Sabrosky (1953) reported specimens of the rare fly reared from pupae found in a nest of *Peromyscus truei*, emerged April 19, at Santa Fe, N. Mex. Later records are from Idaho and Calif.

### Carnus Nitzsch

*Carnus* Nitzsch, 1818: 284, 305.

*C. hemapterus* Nitszch, the type-species, is the strange bird parasite mentioned in the introductory paragraphs. First found in Germany, there are records now from some eastern states, also west in Ariz. and Calif.

### Meoneura Rondani

*Meoneura* Rondani, 1856: 128.

The type-species is *Agromyza obscurella* Fallén. Melander (1913) recognized the European *vagans* (Fallén) as the only species in the Northwest (Fig. 238G). Malloch (1913) discussed and keyed out *vagans* and what he took

to be *lacteipennis* Fallén. Sabrosky (1959a) made an intensive study of the genus and came up with 12 species, some new and some described by Collin in 1930, with the true *vagans* listed only from Michigan, so we have quite a different concept of the group.

Sabrosky calls attention to several characters possessed by *Meoneura*, the little "filth fly." There is an unusual variation in the postvertical bristles, these being cruciate in two species, slightly diverging in the other species. The discal cell is very small, anterior and posterior crossveins approximated; the costa extends to tip of third vein ($R_{1+5}$). In general, we are not listing species described after 1957, but the species described by Collin and identified by Sabrosky in 1959 will be noted below.

*M. flavifacies* Collin (1930b), a small black fly, barely 1 mm. in length, turns out to be the *lacteipennis* Fallén of Malloch. It is known from the Pacific Northwest, ranging north into B.C. and Alaska. *M. lamellata* Collin (1930b) is a densely gray species, taken in nests of birds, in this country in nests of swallows at Big Delta, Alaska.

*M. seducta* Collin (1937b), which would trace to *obscurella* in some keys, is found to be widespread; Sabrosky records it from the Colorado Desert of Calif. and from Pullman, Wash. It has slender, elongate legs, with especially long basitarsi. *M. triangularis* Collin (1930b) has been collected in B.C., Wash., and Ore. It is small and black. The eastern "Agromyza tritici" of Fitch, a wheat pest, is presumably the *M. obscurella* of Fallén, according to recent studies of material.

## SUBFAMILY MADIZINAE

### Phyllomyza Fallén

*Phyllomyza* Fallén, 1810: 20.

There are three species in the eastern states (Fig. 238B), one of which has now been found out West. *P. securicornis* Fallén, the type-species, has in the 1965 Catalog been reported from B.C. and Alta. Some species appear to be associated with ants.

### Neophyllomyza Melander

*Neophyllomyza* Melander, 1913a: 243–244.

The type-species is *N. quadricornis* Melander. There is a West Indian species, *magnipalpus* Williston. Paired cruciate bristles are present along the middle of the frons; frontoorbitals extending to the antennae, upper ones diverging, lower ones converging; one pair of large dorsocentral bristles.

*N. nitens* Melander (1913) was described from an Idaho specimen. It has the anal cell rudimentary; tarsi yellow. *N. quadricornis* Melander (1913) was first taken by Melander at Bellingham, Wash. In the types the anal cell is lacking; the tarsi are blackish. The species is now known to have a wide range. Malloch's *approximata* (1913a) is a synonym.

### Stomosis Melander

*Stomosis* Melander, 1913a: 242.

Sabrosky (1958) found that Williston's species *innominata*, described in 1896 from specimens taken on St. Vincent, West Indies, was a prior name for *Desmometopa luteola* Coquillett, a species Melander designated as type of his *Stomosis*.

The types of *luteola* came from the State of Tabasco in Mexico. Sabrosky (1958) reported *innominata* to be widespread in some eastern states, south to Costa Rica; there is a record from Ariz.

### Madiza Fallén

*Madiza* Fallén, 1810: 19; Hennig, 1937: 52–55.

There are three Palaearctic species, including type-species *glabra*, a little Holarctic fly found from B.C. south to Nev. The name *Madiza* has been used in a different sense in the Chloropidae. *Desmomyza confusa* Curran (1934a) is a synonym.

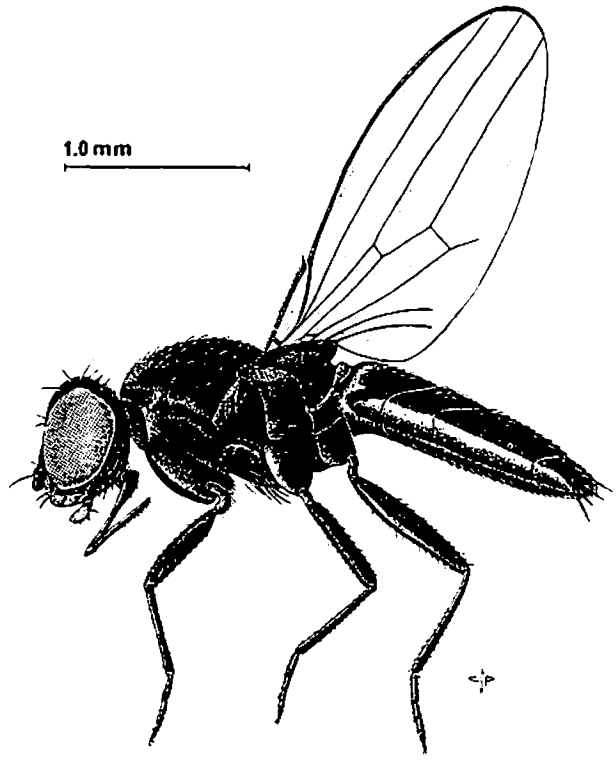



Figure 239. Leptometopa halteralis (Coquillett). (Drawing by Papp).

### Leptometopa Becker

*Leptometopa* Becker, 1903: 188.

The type-species is *rufifrons* Becker. At least four other generic names have been used here, including *Paramadiza* set up by Malloch for *halteralis* (Figs. 238A, 239).

*L. halteralis* (Coquillett) is a common species in the Pacific Northwest, and the range is B.C. to Mexico, east to Florida. The fly is polished black, with black halteres, yellowish palpi and hind tarsi; wings whitish hyaline, with pale yellow veins.

*L. latipes* (Meigen), European in origin, is widespread in our eastern states. Melander and Cole took the fly in Wash. The species does not have the interfrontal cross-bristles located on specialized stripes; frons red anteriorly; cheeks yellow. Howard reared the fly from human excrement.

### Desmometopa Loew

*Desmometopa* Loew, 1866: 184; Melander, 1913a: 241.

The generic characters were summarized by Mik in 1898. Mik also stated that a species in New Guinea had the interesting habit of clinging in pairs on the back of an asilid fly while the latter was flying; such cases of phoresie in flies are rare.

The type-species was designated by Coquillett as *Agromyza m-atrum* Meigen = *sordida* (Fallén). This species has been identified from B.C., Idaho, and Ore.

The European *D. m-nigrum* (Zetterstedt) has been taken in Ariz. and Calif. (Fig. 238D). *D. sordida* (Fallén) is wholly black, including palpi, legs, and halteres. *D. tarsalis* Loew is largely eastern and neotropical, with a Calif. record. In these little flies the interfrontal cross-bristles are located on evident stripes, which form a letter M on the black frons.

## SUBFAMILY MILICHIINAE

### Pholeomyia Bilimek

*Pholeomyia* Bilimek, 1867: 903; Malloch, 1913r: 134–135; Melander, 1913a: 238–239; Sabrosky, 1959: 316–331.

Most of these species are eastern in their range. The type-species is *P. leucozona* Bilimek. The head is large in the ♂; postverticals proclinate and diverging. The type-species was taken in caves at Cacahuamilpa, Mexico.

*P. expansa* Aldrich (1925c) is known from the types, taken on Mt. Lowe, in southern Calif. *P. indecora* (Loew) is the largest of the known species and most commonly collected. It is uniformly black-brown; it differs from other described species in having three to five, rather than two, pairs of dorsocentral bristles. The range is east, and B.C. south to Calif. and Nev.

### Eusiphona Coquillett

*Eusiphona* Coquillett, 1897: 49; Melander, 1913a: 240; Sabrosky, 1955: 169–173.

There is a remarkable resemblance here to a small tachinid fly, even to the rather large calypteres. Coquillett eventually placed the genus in the Agromyzidae. The type-species is *E. mira* Coquillett

*E. flava* Sabrosky (1953b) is quite similar to *mira* in structure, but yellow in color. The type was taken at Kanab, Utah. *E. mira* Coquillett was based on specimens from Indiana and Colo.; Melander listed the species from New England. We have specimens taken near Pullman, Wash., and T[illegible] Forks, Mont., August. Although a small fly by most standards, its length of 5 mm. looms up in the world of milichiids. It is quite distinct in several characters (see Fig. 237). The general coloration is dull black; face and cheeks white pruinose, the frons golden.

### Milichiella Giglio-Tos

*Milichiella* Giglio-Tos, 1895: 367; Malloch, 1913n: 131–133; Melander, 1913a: 239.

The *Ophthalmomyia* of Williston (1896) is a synonym. Type-species, *Tephritis argentea* Fabricius (misidentified) = *tosi* Becker. Our species are shining black; thorax devoid of pollen, and usually with two pairs of dorsocentral bristles (Figs. 238H, 240).

The eastern *M. arcuata* (Loew) is listed from Ariz., the eastern *bisignata* Melander (1913) is recorded from N. Mex. *M. lacteipennis* (Loew) was described from Cuban specimens; it is rather common and widely distributed. We took the species in Calif. and Ore. There are records from African, Oriental, and Australian regions. The species has a black abdomen, black palpi, and milky hyaline wings. Sabrosky (1965 Catalog) makes *nigrella* Cole a synonym, but

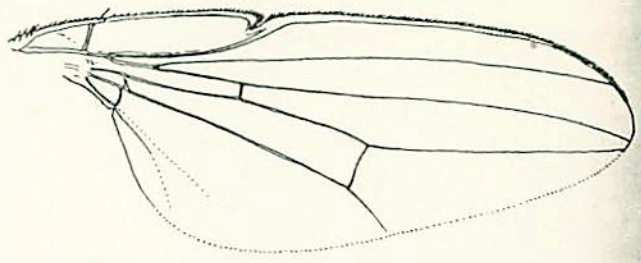


Figure 240. Wing of Milichiella nigrella Cole. This was considered distinct from Loew's lacteipennis by Aldrich.

that species (checked by Aldrich) has hyaline wings. There is also a *M. nitida* Hendel, described from Calif. material; this species also with abdomen black, the palpi red, except tip.

## Genera Transferred to Other Families

### Euchlorops Malloch

We have followed the suggestion of Sabrosky and transferred this little genus to the Chloropidae (Malloch, 1913).

### Arctobiella Coquillett

The genus is now transferred to the family Lonchaeidae; the name is in synonymy under *Dasiops* Rondani.

## CANACEIDAE

These are small flies, generally about 3 mm. in length, which might easily be mistaken for their companions on the seashore, the Ephydridae. The species are not common in the West; only specialized collecting will reveal them. Curran, when writing his North American Diptera (1934), had not seen specimens of *Canace*; he presents a key to six gen-

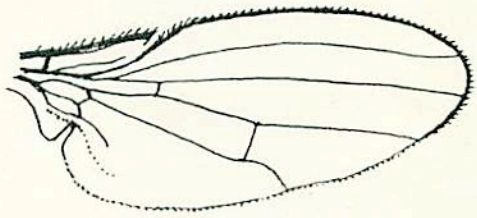


Figure 241. Wing of Canace sp. Family Canaceidae. (From the Curran Manual.)

era, five of which are foreign.

*Canace* and its relatives differ from the Ephydridae, also the similar chloropids and drosophilids, in possessing a small but distinct anal cell. The costa is not broken at the humeral crossvein (it is weakened in most ephydrids), but there is a wide break at the end of the first vein ($R_1$); subcosta dis-