

a subscutellar fringe, bright pollinose markings, and tuberculate faces in males, and the absence of thoracic bristles. *Chamaesphegina* was first placed in with the spheginines when Enderlein described his *Desmetrum* (a synonym) and this action was repeated independently by Hull (1949), who did not know that *Desmetrum* was a synonym of *Chamaesphegina*.

The Spheginina is a predominantly Holarctic group with only the monotypic genus *Chamaesphegina* found greatly beyond the bounds of the northern temperate zone. *Chamaesphegina* is restricted to the Chilean Subregion of South America. The Chrysogasterina are worldwide in distribution, although the Ethiopian chrysogasterines appear to be limited to the genus *Orthonevra*. Four genera of the Chrysogasterina are found in the Neotropical Region: one genus and another subgenus, *Lepidomyia* and *Myolepta* (*Protolepidostola*), are wide-spread in the tropical areas; whereas the rest of the chrysogasterine genera are restricted to the temperate Andes. The phylogenetic relationships of these Neotropical genera are tentatively suggested (Diag. 4).

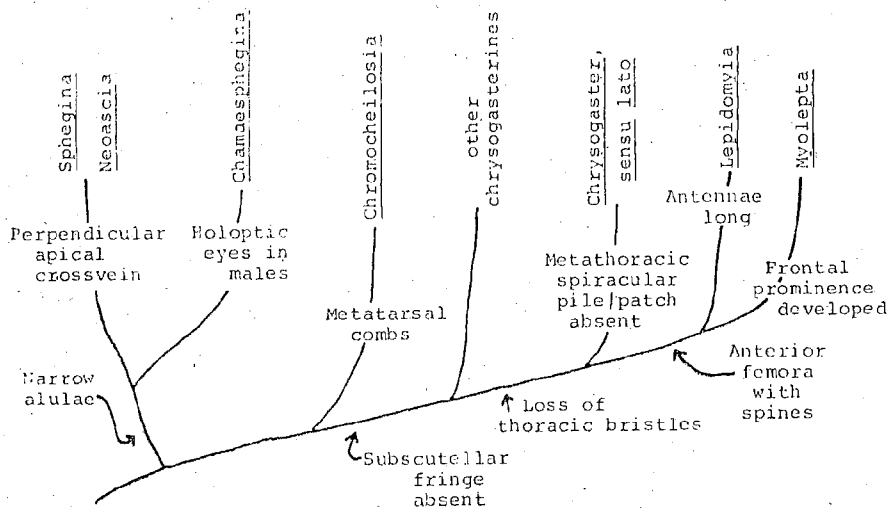


Diagram 4, Phylogeny of the Neotropical Chrysogasterini.

KEY TO THE NEOTROPICAL GENERA OF CHRYSOGASTERINI

1. Apical crossvein recessive or vertical, forming either a right or an obtuse angle with third vein (r4+5) (Fig. 32) *Orthonevra* Macquart
- Apical crossvein directed outward, forming an acute angle with third vein (Fig. 23) 2
2. Anterior four femora armed with ventral spines 3
- Anterior four femora unarmed, without ventral spines 4

3. Antennae elongate, longer than or as long as face; third antennal segment elongate, more than twice as long as wide
 *Lepidomyia* Loew
 Antennae short, never as long as face; third antennal segment short and oval *Myolepta* Newman
4. Hind basal three tarsal segments with ventral longitudinal combs (Fig. 42); eyes usually pilose
 *Chromocheilosia* Hull and Fluke
 Hind tarsi without ventral longitudinal combs; eyes bare
 *Chamaesphegina* Shannon and Aubertin

Genus *Lepidomyia* Loew

(Fig. 8, 40)

Lepidomyia Loew, 1864, Berlin. Ent. Zeitschr. 8:69. Type-species, *Lepidomyia calopus* Loew, 1864 (monotypy).

Head: short, higher than long; face tuberculate in both sexes, frequently with two median tubercles, produced slightly downward, with scattered scales or hairs; facial grooves short, extending to level of tubercle; facial stripes wide; frontal prominence not differentiated, slightly above middle of head; front of male long, longer than eye contiguity; front of female broad, about a third broader at antennae than long, about as long as face, with convergent sides above; ocellar triangle small, before posterior margin of the eyes, usually protuberant; occiput reduced laterally, just a mere line along upper third of head, flattened. Eyes flattened with metallic patterns in life, holoptic in male. Antennae long, longer than face; third segment more than twice as long as broad.

Thorax: as long as broad, with very short pile and scales; meso-anepisterna with anterior portion with upper posterior corner pilose; meso-katepisterna with separate dorsal and ventral pile patches; meropleurae bare except for a patch of pile in front of metathoracic spiracle; scutellum frequently triangular and produced into dorsal thorn-like protuberance. Legs: all femora swollen and with two ventral lateral rows of short spines; hind tibiae with a basal ventral short spine. Wings: apical cell acute; anterior crossvein at basal third of discal cell; sometimes with spurs on apical crossvein.

Abdomen: oval to elongate, indistinctly emarginate.

Material examined: 16 (15); *calopus* Loew*, *dionysiana* D'Andretta and Carrera* (HT), *ortalina* van der Wulp*, *perpolita* Johnson* (HT), *pulchra* Williston* and *similis* Williston*.

Discussion: *Myolepta* and *Lepidomyia* are distinguishable from all other syrphids by the presence of strong ventral spines on all

femora. *Lepidomyia* can be separated from *Myolepta* by its: long antennae which are longer than the face, and presence of facial tubercle in the female. *Lepidomyia* is wide-spread throughout the Neotropical Region and extends into the southern Nearctic Region.

Genus *Myolepta* Newman

(Fig. 39)

Myolepta Newman, 1838, Ent. Mag. 5:373. Type-species, *Musca luteola* Gmelin, 1790 (monotypy).

Head: Face usually dark, with distinct tubercle in male, straight to slightly concave and with strongly projecting epistoma in female, bare; facial grooves short, extending along lower third of eyes; facial stripes distinct, pilose; frontal prominence distinct, slightly above middle of head; front of male short, one-half as long to as long as eye contiguity; front of female broad to narrow as long to one and a half times as long as face, with sides convergent above; ocellar triangle slightly before posterior margin of eyes, vertical triangle ranging from as long as to twice as long as eye contiguity; occiput usually normal except reduced in *Protolepidostola*. Eyes holoptic or narrowly dichoptic in male. Antennae short, shorter than face; third segment large, not elongate.

Thorax: usually longer than broad; with short pile; meso-anepisterna with anterior portion with upper posterior corner pilose; meso-katepisterna with separate dorsal and ventral pile patches; meropleurae usually bare except in *luteola* with a patch of pile in front of metathoracic spiracle and barrettes pilose; metasterna usually pilose, bare in *strigilata*; scutellum usually with distinct apical emarginate rim. Legs: all femora swollen and with two ventral lateral rows of short spines. Wings: apical cell closed at wing margin; anterior crossvein at middle of cell.

Abdomen: oval to elongate, not emarginate.

Discussion: *Myolepta* with its ventral spines on all femora can hardly be confused with any other syrphid genus except its sister-group *Lepidomyia*. *Myolepta* is distinguished from *Lepidomyia* by its: short antennae which are shorter than the face, and concave face in the female. Thompson (1968) has provided a key for the separation of *Myolepta* and its related genera and has discussed the subgeneric division of the genus. Fluke and Weems (1956) have provided a key to all the New World species of *Myolepta*. Thompson has described two more species (both of subgenus *Protolepidostola*) since that revision and provided a new key to the species of the subgenus *Protolepidostola*. The species of *Myolepta* are found throughout most of the world but are completely absent from Ethiopian and Australian Regions. The

Neotropical myoleptas of the typic subgenus are restricted to the temperate Andes of South America. However, the type species of *Protolepidostola* and one other species of this subgenus were described from Brazil, which suggests that *Protolepidostola* not only differs structurally from *Myolepta*, s. s., but differs in its adaptation to the tropical climate.

KEY TO THE SUBGENERA OF MYOLEPTA NEWMAN

1. Head short, occiput reduced laterally; small compact flies
..... *Protolepidostola* Hull
- Head normal, not short; occiput not reduced laterally; not compact
flies *Myolepta* Newman

Subgenus *Myolepta* Newman

Head: not short, about as high as long; face broad, straight with a strongly projecting epistoma in the female, tuberculate in male; frontal prominence at upper two-thirds of the head; front of female broad, usually as broad at antennae as long; front of male short; occiput normal not reduced as in *Protolepidostola* or *Lepidomyia*. Eyes holoptic or narrowly dichoptic in male.

Thorax: as long as or longer than broad; with pile ranging from normal hair type to flattened scales.

Abdomen: oval to elongate.

Material examined: 21(9); *haemorrhoidalis* (Philippi)*, *luteola* (Gmelin), *nascia* (Hull)*, *nigra* Loew and *strigilata* Loew.

Discussion: Shannon in 1922 described the genus *Eumyiolepta* for those members of *Myolepta* with scales on the thorax and abdomen. He designated *M. strigilata* Loew as the type of the group. In 1941 Hull erected *Sarolepta* for a new species, *dolorosa*, which had an intermediate form of pile on the thorax. However, a few years (1949) later he synonymized his genus under *Myolepta*. Thus, it is clear that the type of pile on the thorax and abdomen of myoleptine flies ranges all the way from normal hairs to short and flattened opaque scales. For this reason I feel myoleptine groups should not be recognized solely on the basis of pile types. *Sarolepta* and *Eumyiolepta* do not differ structurely from *Myolepta*. Therefore I do not consider these valid groups.

Subgenus *Protolepidostola* Hull

Protolepidostola Hull, 1949, Trans. Zool. Soc. London 26:333 (as a subgenus of *Lepidostola*). Type-species, *Lepidostola scintillans* Hull, 1946 (original designation).

Small compact flies with scale-like pile on some parts of the body.

Head: very short, compressed longitudinally, twice as high as long; face narrow, about as long as wide, deeply concave in female, tuberculate in male; frontal prominence at middle of head; front of female narrow, occupying less than one-third of head width, about one and one-third as long as face, with an impressed medial groove on upper three-fourths, distinctly punctate on either side of this groove, with sides only slightly convergent above; front of male about twice as long as eye contiguity; ocellar triangle of male long; occiput reduced laterally, just a mere line along the upper one-half of eyes, flattened. Eyes very large, occupying two-thirds or more of head width. Antennae: third segment short, oval, about twice as long as second segment.

Thorax: short and compact, with scales, with ventral meso-katepisternal pile patch reduced to only a few hairs in between medial suture, with scutellum without an apical emarginate rim. Wings: with the spurious vein absent.

Abdomen: short and compact.

Material examined: 3(3); *evansi* Thompson* (HT), *problematica* Thompson* (HT) and *scintillans* (Hull)* (HT).

Genus *Orthonevra* Macquart

(Fig. 32, 38)

Orthonevra Macquart, 1829, Mem. Soc. Roy. Sci. Agr. Arts Lille 1827/1828:188. Type-species, *Chrysogaster elegans* Meigen, 1822 (monotypy).

Head: higher than long; face without a distinct tubercle in either sex, with scattered scales or hairs, frequently with strigae extending from eyes to middle of face; facial grooves extending to level of the produced epistoma, ending in a distinct pit; facial stripes indistinct; lower face and epistoma distinctly produced forward; frontal prominence not differentiated, above middle of head; front of male slightly swollen, usually with a distinct indentation above the antennal bases, usually about as long as eye contiguity; front of the female broad, as broad at antennae as long, about as long as face, with convergent sides above, strongly rugose, with a median longitudinal groove or carina; ocellar triangle small, at posterior margin of eyes, not protuberant; occiput reduced on upper third of head. Eyes with metallic patterns in life, holoptic in male. Antennae vary from short to long, third segment variable, usually much longer than broad.

Thorax: longer than broad, with short pile; meso-anepisterna with anterior portion having upper; posterior corner pilose; meso-katepisterna with separate dorsal and ventral pile patches; meropleurac

bare; scutellum with distinct apical emarginate rim. Legs: all femora swollen; hind femora with two ventral lateral rows of short spines; hind tibiae without ventral lateral rows of short spines; hind tibiae without ventral spines or knife-edge. Wings: frequently with brown patterns; apical cells obtuse; apical crossvein recessive on its upper portion; anterior crossvein always distinctly before middle of discal cell.

Abdomen: oval, flattened dorsoventrally, not emarginate, with the disc opaque and the sides shiny.

Material examined: ?(6) *anniae* Sedman, *bellula* Williston, *chalybeata* (Meigen), *gewgew* Hull (HT), *nigrovittata* Loew (CTs), *nitida* (Wiedemann), *parva* (Shannon), *pictipennis* (Loew) (CTs), *pulchella* (Williston), *robusta* (Shannon), *sonorensis* (Sedman) and *stigmata* (Williston).

Discussion: *Orthonevra* is usually considered as a subgenus of *Chrysogaster*. Wirth *et al.* (1965) have raised another subgenus of *Chrysogaster*, *Chrysosyrphus*, to full generic status and this action leaves the typic genus, *Chrysogaster*, a polyphyletic group. Sedman (1959), who has studied the male genitalia of *Chrysogaster*, s. l., states that 1) *Orthonevra* is derived from a *Chrysogaster* like ancestor and 2) *Chrysosyrphus* is apparently intermediate between *Chrysogaster* and *Orthonevra*. Thus, if one is to consider the phylogenetic intermediates as a distinct genus, the extremes must also be considered separate genera. I feel on the basis of external characters and the male genitalia, all three of these subgenera are sufficiently distinct to be recognized as separate genera. The interrelationships and distinctions of these three genera are indicated by the following characterization:

Chrysogaster, s. s.: 1) aedeagus simple, without distinct ejaculatory process but weakly developed ejaculatory hood; 2) 3rd antennal segment oval, 2nd with long bristle-like hairs; 3) male frons only slightly puffed out; and 4) apical crossvein forming an acute angle with third vein.

Chrysosyrphus: 1) aedeagus intermediate, with distinct ejaculatory process but weakly developed ejaculatory hood; 2) 3rd antennal segment oval 2nd with long bristle-like hairs; 3) males frons only slightly puffed out; and 4) apical crossvein forming an acute angle with third vein.

Orthonevra: 1) aedeagus complex, with distinct ejaculatory hood and process; 2) 3rd antennal segment elongate, 2nd without bristle-like hairs; 3) male frons not puffed out but rugose; and 4) apical crossvein forming a right or obtuse angle with third vein.

As for the other subgenera of *Chrysogaster*, s. l., it is probable that the two Palearctic subgenera, *Lejogaster* and *Liochrysogaster*, are also distinct and should be raised to generic status. I have seen two new species from New Caledonia which agree with the description of *Plesia* and *Hemilampira* (two Australian subgenera), respectively and these species definitely deserve full generic status; and Bezzi's Ethiopi-

an *Orthonevra* with pilose eyes clearly do not belong to any of the described genera or subgenera related to *Orthonevra*. In short, I strongly suspect most subgenera and a few odd species now listed under *Chrysogaster*, s. l., probably represent distinct genera.

Eight species of *Chrysogaster*, s. l., have been described from the Neotropical Region. Of these eight species, five were described from the temperate Andes (*labyrinthops* Hull, *neotropica* Shannon, *nitida* Wiedemann, *shannoni* Curran and *quadristriata* Shannon and Aubertin) and are *Orthonevra*, two of them (*lugubris* Jaenicke and *annulifera* Bigot) do not belong with the genera related to *Chrysogaster*, and one species (*argentina* Brèthes) has not been available for study. There is no available keys to the Neotropical species of *Orthonevra*. However, Sedman (*in litt.*) is currently working on a revision of the Neotropical species.

Genus *Chromocheilosia* Hull and Fluke

(Fig. 10, 11, 41, 42)

Chromocheilosia Hull and Fluke, 1950, Bul. Amer. Mus. Nat. Hist. 94:306 (as a subgenus of *Cheilosia*). Type-species, *Chilosia bicolor* Shannon and Aubertin, 1933 (original designation).

Head: about one-third higher than long; face yellowish orange, with distinct tubercle in male, straight and with strongly projecting epistoma in female, bare, as long as broad; facial grooves short, extending along lower third of eyes; facial stripes distinct, pilose; frontal prominence low, slightly above middle of head; antennal pits confluent; front of male one-half as long as eye contiguity; vertical triangle about one-half as long eye contiguity, longer than broad at occiput; front of female about as long as face, one-third longer than broad, with sides convergent above, one-third broader at antennae than at ocellar triangle; ocellar triangle before posterior margin of eyes. Eyes usually pilose (sparsely pilose in female of *incerta*), holoptic in male. Antennae short, almost two-thirds as long as face; third segment large, orbicular; arista bare, about twice as long as antenna.

Thorax: about as long as broad; with mesonotal bristles; mesokatepisterna with separate dorsal and ventral pile patches; mero-pleurae bare except for barrettes being pilose in *bicolor*; metasterna bare; scutellum with strong ventral pile fringe, without apical emarginate rim. Legs: hind femora swollen, with two lateral ventral rows of strong spines; hind tibiae with sharp ventral knife-edge on basal one-half; hind tarsi with ventral longitudinal combs on basal three segments. Wings: apical cell petiolate, with petiole about one-half as long as anterior crossvein; anterior crossvein at basal third of discal cell.

Abdomen: oval to elongate, not emarginate.

Material examined: 3(3); *bicolor* Shannon and Aubertin* (HT); *incerta* Shannon and Aubertin* (PTs); *pubescens* Shannon and Aubertin* (PTs).

Discussion: The species of *Chromocheilosia* were first described as cheilosine flies not chrysogasterines. Shannon and Aubertin (1933) in their study of the Syrphidae of Southern Chile and Patagonia described four species in the genus *Cheilosia* Meigen. At that time they noted the close interrelationship among three of the species (*Chromocheilosia*) and the distinctiveness of the fourth (*Notiocheilosia*). They also indicated that they were uncertain as to the limits of *Cheilosia* and thereby the placement of their species. Since then no one has re-examined the species involved until now. Hull and Fluke merely made the distinctiveness of these flies official by naming a special subgenus for them. In their (Hull and Fluke, 1950) review of the North American species of *Cheilosia* they created the subgenus *Chromocheilosia* "for those truly aberrant antipodal *Cheilosia*e, of which there are several species, that are in large part bright, pale orange in color", and designated *Cheilosia bicolor* as the genotype. It is surprising that the significance of the unusual characteristics of *Chromocheilosia* which are the complete antithesis of those of *Cheilosia* were not recognized. The peculiar coloration and geographic distribution of *Chromocheilosia*, Hull and Fluke's characters, clearly indicate that *Chromocheilosia* is not a subgenus of *Cheilosia* but a valid genus. The characteristics of *Chromocheilosia* are not peculiar and the species of *Chromocheilosia* are not aberrant when one considers the genus as belonging to the tribe Chrysogasterini. In 1968 I (Thompson, 1968) raised the group to generic level and placed it in the Myoleptini.

The presence of a scutellar fringe and thoracic bristles indicates that *Chromocheilosia* is the most primitive genus in the Chrysogasterina. The strongly sexually dimorphic face and the short petiolate apical cell suggests that *Myolepta* is the closest related group. The fact that *Myolepta luteola* (Gmelin) (European) and *Chromocheilosia bicolor* are the only two chrysogasterine flies that have pile on the barrette may be another indication of this relationship. The ventral longitudinal combs on the hind tarsal segments appears to be unique among the syrphids.

Genus *Chamaesphegina* Shannon and Aubertin

(Fig. 23)

Chamaesphegina Shannon and Aubertin, 1933, Dipt. Patagonia S. Chile 6:145. Type-species, *Chamaesphegina argentifacies* Shannon and Aubertin, 1933 (original designation).

Head: about one-fourth higher than long; face yellowish pollinose, bare, concave, with slightly projecting epistoma; facial grooves very short, not extending above level of oral margin; frontal prominence

low, slightly above middle of head; antennal pits narrowly separated above; front of female about twice as long as broad, with slightly convergent sides above, as long as face; ocellar triangle slightly before posterior margin of eyes. Eyes bare, holoptic in males. Antennae short, about one-half as long as face; third antennal segment orbicular; arista bare, about one and one-half times as long as antenna.

Thorax: about twice as long as broad, with short pile; meso-katepisterna with separate dorsal and ventral pile patches; meropleurae bare; metasterna bare; scutellum with a pair of apical bristles, with distinct apical emarginate rim. Legs: simple except for minute ventral spines on hind femora. Wings: elongate, as long as whole fly; apical cell petiolate; anterior crossvein strongly basal, at basal one-eighth of discal cell; alula narrow, narrower than second basal cell.

Abdomen: elongate, not emarginate, about twice as long as wide, parallel-sided.

Material examined: 2(2); *argentifacies* Shannon and Aubertin* (PTs).

Discussion: The non-constricted abdomen and the acute apical cell place *Chamaesphegina* as the primitive sister group to the rest of the Spheginina. Shannon and Aubertin in the original description stated that the group was probably allied to *Hemixylota*. Their statement confuses me since the group is clearly allied to *Sphegina* and this is what their name reflects also (*chamae* - from the Greek meaning dwarf and *Sphegina*). *Hemixylota*, with its scutellar fringe, lack of strong femoral spines and the developed metasterna, is far removed from *Chamaesphegina*.

Desmetrum Enderlein has not been seen but it appears to be a synonym of *Chamaesphegina*. The original description agrees perfectly with *Chamaesphegina*. Fluke (1956) also considers this group a synonym, and Hull (1949) suggested the possibility of such a synonymy. The original description of *Desmetrum* Enderlein is based on the male with I have not studied. The only important differences between the sexes is in the nature of the frontal region of the head, due to the fact that the male is holoptic and the female dichoptic.

TRIBE EUMERINI

Head: face pilose, usually concave except tuberculate in *Nausigaster*; oral margin notched; antennal pits usually confluent except separate in *Nausigaster*; ocellar triangle before posterior margin of eyes; eyes pilose, usually narrowly holoptic in male except in *Nausigaster* broadly holoptic. Antennae short, shorter than face; arista usually bare except with very short pubescences in *Alipumilio*.

Thorax: pro-epimera usually pilose except with pubescence in *Alipumilio*; pro-anepisternum pilose; meso-anepisterna with anterior

portion pilose; meso-anepimera with posterior portion bare; meropleurae bare; metasterna pilose except bare in *Nausigaster*; metathoracic pleurae bare except epimera pilose in *Nausigaster*; scutellum with distinct flattened emarginate crenate rim, usually without ventral pile fringe except in *Merodon*, *Azpeytia*, and *Psilota*. Legs: hind femora with ventral spines except in some *Nausigaster*. Wings: apical cell usually obtuse except in *Nausigaster* and *Psilota*; apical crossvein usually recessive except in *Nausigaster* and *Psilota*.

Abdomen: oval to suboval, not constricted, with first abdominal spiracle free, not embedded in metaepimeron.

Discussion: The tribe Eumerini is easily distinguished from most milesine taxa by its pilose anterior meso-anepisterna. The only other milesine taxa with the anterior meso-anepisterna pilose are Volucellina, *Trichopsomyia*, *Spilomyia*, *Milesia*, and *Temnostoma*. The eumerines can be separated from both the volucellines and *Trichopsomyia* by their scutellum with its apical emarginate rim and hind femoral spines and from the three genera of Milesini by their recessive apical crossvein. The reduced and modified first abdominal sternite along with its free spiracle is a unique specialization found only in the eumerines.

The tribe Eumerini as considered here is a greatly enlarged concept from that previously recognized (Hull, 1949; Wirth *et al.*, 1965). *Merodon* from the old Eristalinae, *Psilota* and *Alipumilio* from the old Cheilosinae, along with *Nausigaster*, formerly Nausigasterinae, have been combined with the old Eumerinae. All these taxa which are now combined were formerly considered to be aberrant taxa not closely related to any other groups. By grouping all these taxa together with some previously overlooked characters one forms a rather homogeneous tribe. Not only are the adults very similar as indicated by the below character table (Appendix I) but the larvae also appear to be very similar in habits and structure. The larvae of Eumerini are short-tailed maggots which breed in rotten bulbs or plant exudates. Hartley (1961 and 1965) has shown that the larvae of *Eumerus* and *Merodon* are very similar. Carrera *et al.* (1947) described the larvae of *Nausigaster*. Miller (1921) has described a New Zealand species of *Psilota* in great detail. Hill (1921) has mentioned the presence of *Psilota* larvae in the putrid exudate of a *Mastotermes darwincensis* nest. I have received a series of a new species of *Alipumilio* from Brazil which is labelled as reared from the pitch of *Araucaria australis*.

The phylogenetic position of the Neotropical members of the tribe Eumerini is rather difficult to determine at the present time because so little is known about the character of some of the Oriental and Ethiopian taxa. However, the Neotropical members of the tribe share a couple of unique specializations which may suggest that they form a separate group within the tribe. *Alipumilio* and *Nausigaster* are the only two syrphid taxa which do not have the meso-anepisterna diffe-

rentiated into a flat anterior portion and convex posterior portion. Also *Alipumilio* and *Nausigaster* are the only milesine taxa that are strongly and distinctly punctate. However, both these Neotropical genera share another unique specialization with *Eumerus*, the notal wing shield. These unique characters may be combined to suggest the following phylogenetic arrangement for the tribe as a whole (Diag. 5).

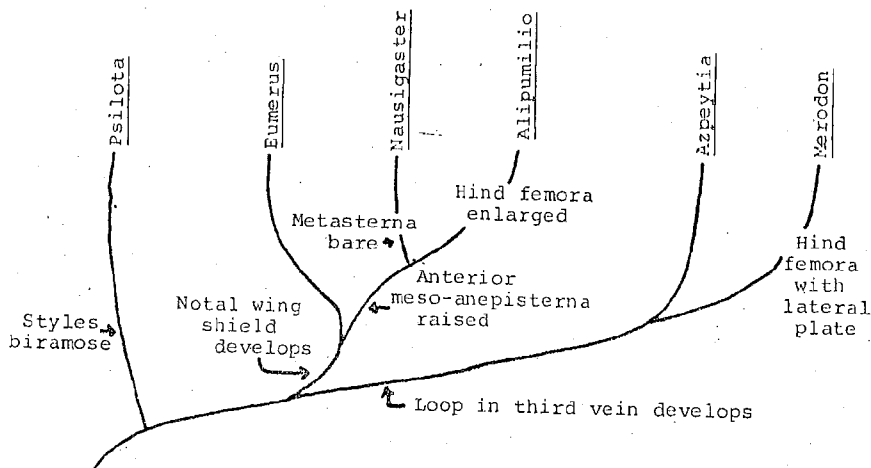


Diagram 5, Phylogeny of the Eumerini.

KEY TO THE NEOTROPICAL GENERA OF EUMERINI

- 1. Apical crossvein recurrent (Fig. 33); face concave (Fig. 18); antennal pits confluent *Alipumilio* Shannon
- Apical crossvein directed outwards (Fig. 29); face tuberculate; antennal pits separated *Nausigaster* Williston

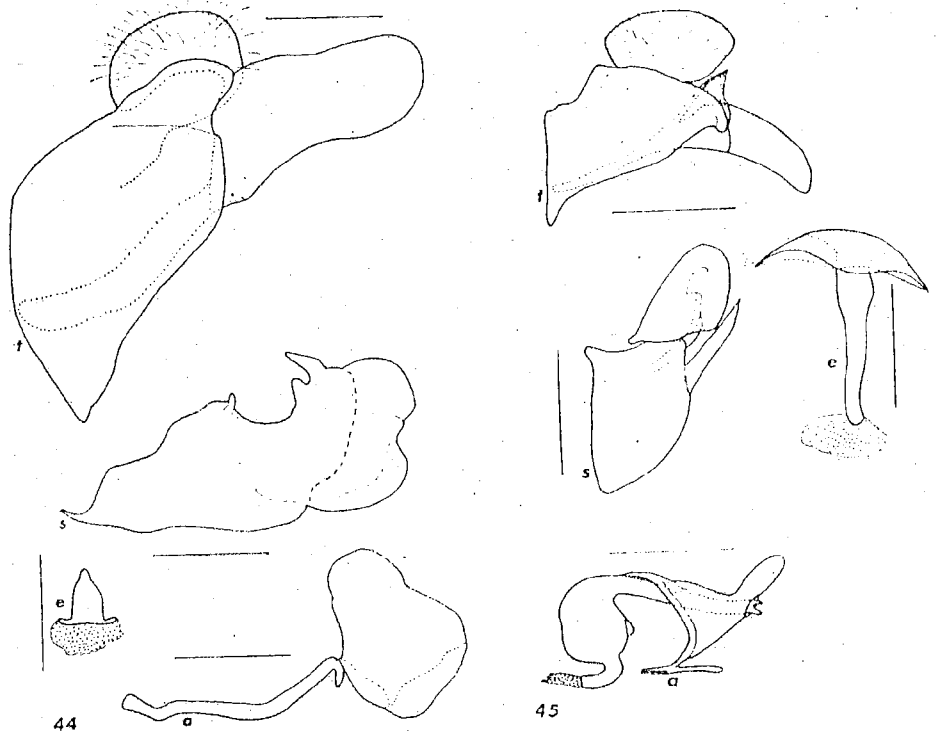
Genus *Alipumilio* Shannon

(Fig. 18, 33, 46, 47)

Alipumilio Shannon, 1927; Proc. U.S. Nat. Mus. 70(9):12. Type-species, *Alipumilio femoratus* Shannon, 1927 (original designation).

Head: much higher than long, short; face short, concave, with a projecting epistoma; facial grooves short extending to slightly above level of epistoma; facial stripes not differentiated; frontal prominence distinct, at middle of the head; antennal pits connected; front of male large, about one-third broader at antennae than long, as long as the face, about four times as long as the eye contiguity; vertical triangle

of male long, about five times as long as eye contiguity; front of female narrow, more than twice as long as broad at antennae, long, about twice as long as face, with slightly convergent sides above, punctate, with a distinct medial line running from ocellar triangle to just above antennae; ocellar triangle small, not protuberant; occiput greatly reduced, not visible laterally. Eye pile very short, thick, dense. Antennae short; third segment suboval to oval, as long as or longer than first two segments; arista with very short fine pubescences.



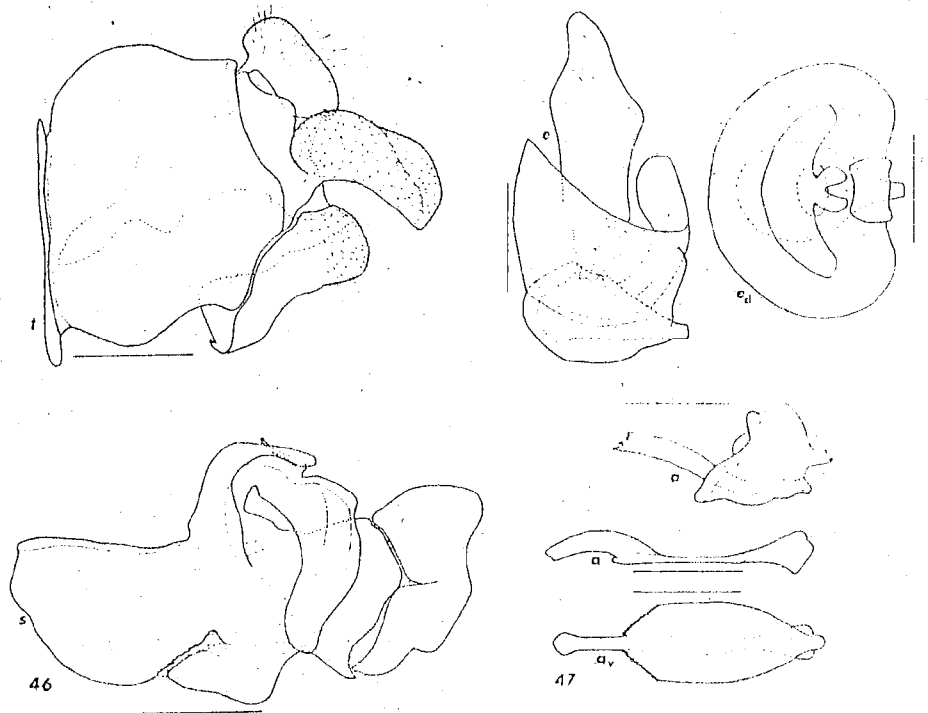
Male genitalia. 44, *Ornidia obesa*; 45, *Nausigaster tuberculata* Carrera, Lopes & Lane. a, aedeagus and apodeme; e, ejaculatory apodeme; s, sternum 9; t, tergum 9; all lateral view.

Thorax: very short and broad, almost twice as broad as long; meso-katepisterna with small dorsal pile patches; scutellum without ventral pile fringe; plumulae long elongate. Legs: hind femora greatly swollen and armed ventrally with two lateral rows of short spines; hind tibiae arcuate. Wings: apical cell obtuse; apical crossvein strongly recurrent; spurious vein absent; anterior crossvein always distinctly before middle of discal cell.

Abdomen: very short, broad, not emarginate, strongly curved down and forward at the third segment, sternites greatly reduced.

Material examined: 4(4); *avispas* Vockeroth* (HT), *pullatus* Vockeroth* (HT) and four new species.

Discussion: *Alipumilio* is readily separated from *Nausigaster*, the only other Neotropical eumerine, by its 1) concave face; 2) confluent antennal pits; 3) enlarged hind femora; and 4) recessive apical crossvein. *Alipumilio* can be separated from all other syrphid taxa by the unique characters it shares with *Nausigaster* (see above discussion under the tribe) and its unusually enlarged swollen hind femora and concave face. Also, *Alipumilio*, *Nausigaster*, and *Eumerus* have a unique lateral project of the mesonotum which partly covers the base of the wing (called the notal wing shield).



Male genitalia of *Alipumilio* species 1 Thompson (HT). 46. s, sternum 9; t, tergum 9; all lateral view; 47, aedeagus and apodeme; e, ejaculatory apodeme; all lateral view except a_v ventral view and e_d dorsal view.

Alipumilio appears destined to be a large genus although it is quite rare in collections. Shannon described the genus from a single female collected by Darwin on the Amazon. For some forty years, this was the only known specimen of the genus, but recently Vockeroth (1964) uncovered three more specimens representing three new

species. One of Vockeroth's species was from Mexico and the other two were from Peru. During the course of this revision, seven more specimens of the genus were discovered in various collections. These seven specimens, including one series of four specimens reared from pine pitch, represented four more new species. Thus, in all, only a dozen specimens of *Alipumilio* are presently known and these represent nine species, which range from Argentina in the south to Mexico in the north. Vockeroth (1964) has provided a key to the described species.

Genus *Nausigaster* Williston

(Fig. 29, 45)

Nausigaster Williston, 1883, Trans. Amer. Ent. Soc. 11:33. Type-species, *Nausigaster punctulata* Williston, 1883 (monotypy).

Head: slightly higher than long; face with a distinct tubercle, deeply concave under antennae and above tubercle, not produced greatly below tubercle, without a projecting epistoma; facial grooves short, extending to the level of epistoma; facial stripes not differentiated; frontal prominence distinct, at middle of head; antennal pits widely separated; front of male small, about as long as eye contiguity; vertical triangle long, varying from as long as eye contiguity to twice as long; front of female as long as face, about one-fourth longer than broad at antennae, with a median tubercle, with strongly convergent sides above; ocellar triangle small, usually protuberant; occiput slightly swollen laterally, punctate. Eye pile fine, short and widely scattered. Antennae short, about one-half as long as face; third segment round, swollen, longer than first two segments; arista thin, inserted dorsally at middle of third segment.

Thorax: about as broad as long with short thick pubescences, with only dorsal meso-katepisternal pile patches, without subscutellar fringe, with very short, broadly rounded plumulae. Legs: simple. Wings: usually with brown patterns; apical cells acute; apical crossvein strongly directed outward on apical portion; anterior crossvein at basal third of discal cell.

Abdomen: elongate, drooping, flexed at end of second segment where there is a strongly transverse crease; sides and apical end greatly produced downward and somewhat inward, producing a large ventral cavity; lateral margins distinct, end in the form of small lobes on either side of apex; sternites not reduced.

Material examined: 14(7); *bonariensis* Arribalzaga*, *clara* Curran, *curinervis* Curran, *geminata* Townsend, *punctulata* Williston, *scutellaris* Adams, *texana* Curran, *tuberculata* Carrera, Lopes and Lane*, and *unimaculata* Townsend.

Discussion: The strongly punctate exoskeleton of *Nausigaster* will clearly separate the genus from all other syrphid taxa. Although *Alipumilio* is also punctate, the punctures of *Alipumilio* are not as large or as numerous as those in *Nausigaster*. *Nausigaster* has the head punctate all over whereas in *Alipumilio* the head punctures are restricted to the front of the female only. The other characters of value in distinguishing *Nausigaster* from *Alipumilio* and other milesine taxa have been discussed under *Alipumilio*. About 14 species of *Nausigaster* have been described and Curran (1941) has provided a key to all but three of the more recently described species of the genus. The genus is distributed from Argentina in the south to the southern border of the United States in the north. The numbers of species are about equally divided between the Nearctic and Neotropical regions but the Nearctic species are restricted to the tropical portion of the region. The restricted range of the Nearctic species along with the *Nausigaster's* extensive range in the Neotropical region strongly suggests that the genus had a Neotropical origin.

TRIBE CERIOIDINI

Wasp-mimics with very short appressed hairs, each hair arising from a distinct but very small puncture.

Head: face with sparse short pile, broad, usually as broad as high, straight, with a low median tubercle near oral margin; cheeks broad, usually as broad as long or broader; oral margin notched anteriorly; facial grooves elongate, extending about half the length to frontal prominence; facial stripes indistinct; antennal pits confluent; frontal prominence at upper third or higher of head, ranging from undifferentiated condition to many times longer than broad; front of male excluding frontal prominence short, usually about as long as eye contiguity; front of female excluding frontal prominence short, usually less than one-half as long as face, broad, always broader at antennae than long, with convergent sides above; vertical triangle short, equilateral; ocellar triangle usually before posterior margins of eyes; occiput thickened posteriorly behind ocellar triangle. Eyes bare, holoptic in male. Antennae long, at least as long as face; third segment tapering to a point, always with terminal style instead of arista.

Thorax: longer than broad, with very short appressed pile; meso-anepisterna with anterior portion with upper half pilose; meso-katepisterna with separate dorsal and ventral pile patches; meso-anepisterna with posterior portion bare; meropleurae bare; metathoracic pleurae bare; metasterna developed, always with a few short distinct hairs; postmetacoxal bridge complete or incomplete; plumulae usually absent, present in a few Australian species; scutellum without a ventral pile fringe and without distinct apical emarginate rim. Legs: simple except with hind femora slightly swollen and with ventral spines. Wings: long, pointed, with anterior margin always broadly darkened; marginal cell broadly open; apical cell closed at wing margin; third vein usually

looped into apical cell, frequently with an appendix; anterior crossvein always beyond middle of discal cell, usually at outer third of discal cell; stigmatic crossvein well-developed.

Abdomen: elongate or constricted, never oval.

Discussion: As presently construed, the tribe Cerioidini consists of only the genus *Ceriana*.

Ceriana, sensu lato contains a large number of highly varied wasp mimics which some workers, notably Shannon (1925 and 1927) and Hull (1949), have placed in a number of different genera. However, the characters used by Shannon and Hull, such as length of antennae and frontal prominence, abdominal shape and postmetacoxal bridge, are the type of attributes involved in forming the mimetic appearance of these flies. Thus convergence rather than common ancestry is a distinct possibility for *Ceriana*. Riek (1954), the only person who has done a detailed study of the genus using genitalic characters, has shown that the traditional characters of Shannon *do not* divide the Australian *Ceriana* into genera along phylogenetic lines. Riek has suggested that until the world species of *Ceriana* can be studied for genitalic characters, it is best to consider all the species as belonging to one genus, *Ceriana*. Since many of the world species of *Ceriana* are very rare in collections and unavailable for study, and the restricted Neotropical *Ceriana* fauna is an inappropriate basis for a revision, I have followed Riek's advice and leave all species of Cerioidini in one genus for the present.

Genus *Ceriana* Rafinesque

(Figs. 17, 28, 48)

Ceriana Rafinesque, 1815, *Analyse Nat. tab. Univers corps organises*: 131 (new name for *Ceria* Fabricius, not Scopoli). Type-species, *Ceria clavicornis* Fabricius, 1794 (automatic) = *Musca conopsoides* Linné, 1758.

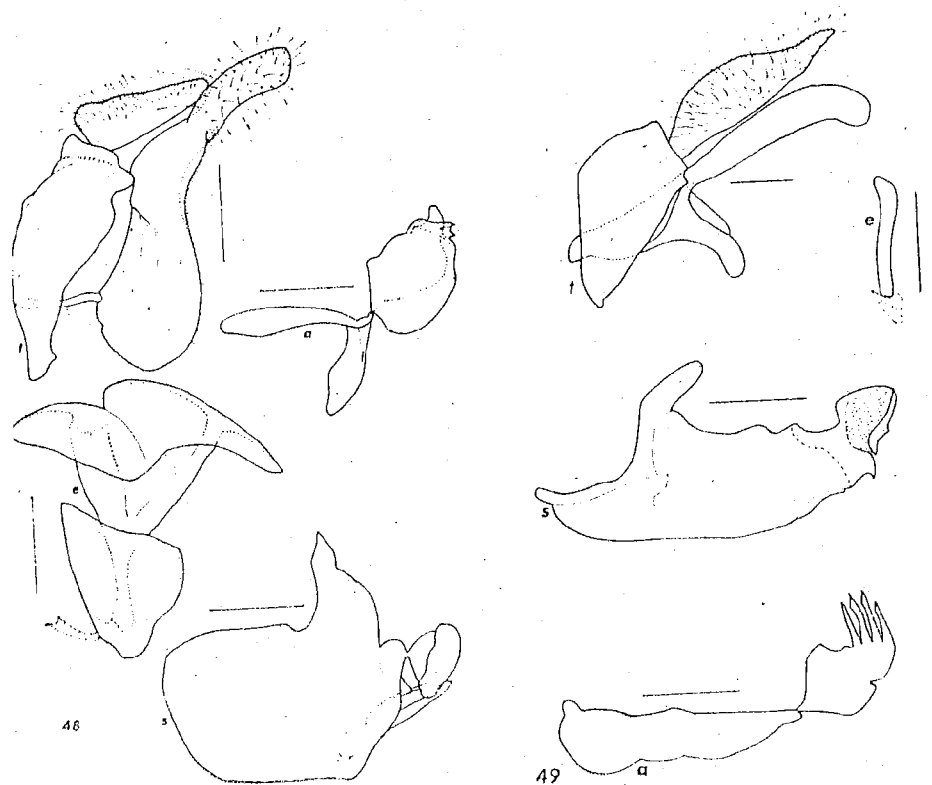
Generic description — same as tribe.

Material examined: 176 (46) *abbreviata* Loew, *acra* Curran*, *anco-ralis* Coquillett, *barbipes* Loew*, *bassleri* Curran*, *bigotii* Williston*, *brauerii* Williston*, *capitis* Curran*, *conopsoides* Linné, *daphnaeus* Walker*, *facialis* Kertész*, *nigripennis* Williston* (HT), *shannoni* Lane & Carrera* (PTs), *signifera* Loew, *superba* Williston* (HT), *tridens* Loew, *travassosi* Lane & Carrera* (HT), *wulpfi* Williston* and *tricolor* Loew*.

Discussion: *Ceriana* is separated readily from all other syrphids by having: 1) a terminal style on the antenna and 2) the anterior

crossvein beyond the middle of the discal cell. *Callicera* and *Macropelocera* are the only other syrphid genera with terminal styles on the antennae but both of these genera have the anterior crossvein before the middle of the discal cell. Besides the above characters, *Ceriana* can be distinguished by its general habitus. Cerioidines are wasp mimics except for a few Australian species that mimic sawflies. The wasp appearance of having: 1) no body hairs, 2) constricted abdomens, 3) two pairs of wings, and 4) long antennae, is achieved in *Ceriana* by having: 1) body hairs greatly shortened and appressed, 2) abdomen constricted and/or with a pair of yellow lateral spots near the base of abdomen, 3) anterior margin of wing dark, and 4) either long antennae or frontal prominence greatly produced. Some of the cerioidines have also evolved a mechanism for folding their single pair of wings in such a way as to appear similar to the wasp's four folded wings (see Riek, 1954, for details).

Curran (1941) has provided a key to the Neotropical *Ceriana* but it includes less than one-half of the described species. However, *Ceriana*



Male genitalia. 48, *Ceriana travassosi* Lane & Carrera (HT). 49, *Dolichogyna abrupta* Hine. a, aedeagus and apodeme; e, ejaculatory apodeme; s, sternum 9; t, tergum 9; all lateral view.

because of their distinctive mimetic appearances are easily recognized from their original descriptions. Shannon (1927) states that for more than 120 described species there have been less than 10 synonyms!

TRIBE ERISTALINI

Head: face usually with a tubercle except in *Dissoptera* and *Keda*, never strongly sexually dimorphic, densely pilose on sides; oral margin notched anteriorly; facial grooves elongate; antennal pits confluent; ocellar triangle distinctly before posterior margin of eyes. Antennae short; rarely elongate, usually shorter than face; third segment usually small, orbicular, rarely elongate; arista basal, usually bare, rarely sparsely pilose on basal half, usually longer than antenna.

Thorax: pro-anepimera pilose; pro-katepisterna pilose frequently with a few short spines; meso-anepisterna with anterior portion bare; metasterna pilose; postmetacoxal bridge incomplete; plumulae usually present and elongate except absent in *Xenozoon*; scutellum usually without apical emarginate rim except in *Orthoprosopa*, *Solenaspis* and *Dolichomerus*. Legs: hind femora with basal setal patches and usually ventral spines. Wings: anterior crossvein at or beyond middle of discal cell except before in *Xenozoon*; third vein usually forming a strong loop or kink in apical cell except in *Xenozoon*; apical and discal cells usually without external appendices on outer posterior corners; stigmatic crossvein usually present.

Abdomen: oval, rarely elongate and never constricted.

Discussion: The basal setal patch on the hind femur will readily distinguish the eristalines from all other syrphid taxa except *Merodon*. *Merodon* can be easily distinguished by its pilose anterior meso-anepisterna. The strongly looped third vein also serves as a good characteristic for the eristalines. However, care must be used with this looped third vein character since a few milesine genera, such as *Korinchia*, also have a distinctly looped third vein. Eristalini is traditionally broken down into two subtribes based on whether the marginal cell is open or closed, Helophilina and Eristalina, respectively. Both of these subtribes are world-wide in distribution and are well distributed in the Neotropical Region.

KEY TO THE NEOTROPICAL GENERA OF THE ERISTALINI

1. Marginal cell (R1) open (Fig. 30) Helophilina 6
- Marginal cell closed (Fig. 31) Eristalina 2
2. Face drawn out into a long slender porrect snout
- *Lycastrihumcha* Riort

3. Thorax with marking of opaque tomentum; eyes bare
 *Meromacrus* Rondani
 Thorax without marking or tomentum; eyes pilose or bare.
 4
4. Barrettes bare *Eoseristalis* Kanervo
 Barrettes pilose 5
5. With pile in front of and/or beneath metathoracic spiracle; eyes
 without contrasting stripes of pile; wings frequently micro-
 trichose *Palpada* Macquart
 Without any pile around metathoracic spiracle; eyes with con-
 trasting stripes of pile; without microtrichia
 *Eristalis* Latreille
6. Eyes pilose 7
 Eyes bare 8
7. Third antennal segment deeper than long; anterior part of wing
 usually not dark *Mallota* Meigen
 Third antennal segment longer than deep, usually twice as long
 or longer than deep (except *cestus* Hull only 1.5 as long as
 deep); anterior part of wing usually dark .. *Quichuana* Knab
8. Ocellar triangle extremely large; front very broad (Figs. 13,
 14) 9
 Ocellar triangle normal size, small; front not very broad 10
9. Front greatly swollen below; ocellar triangle obtuse, anterior
 ocellus close to the base of the triangle (Fig. 13)
 *Dolichogyna* Macquart
 Front not greatly swollen; ocellar triangle equilateral (Fig. 14)
 *Ascosyrphus* Bigot
10. Thorax densely pilose, without distinct pollinose ground patterns
 *Mallota* Meigen
 Thorax with scattered pile, not dense pile, usually with distinct
 pollinose stripes and bands 11
11. Fronto-antennal region usually greatly produced forward, subconi-
 cal to conical (Fig. 21); anterior edge of wing dark; males
 holoptic or narrowly dichoptic *Habromyia* Williston
 Fronto-antennal region not greatly differentiated, not subconical;
 wings hyaline, anterior edge not dark; males broadly dichoptic
 *Helophilus* Meigen

Genus *Dolichogyna* Macquart

(Figs. 13, 49)

Dolichogyna Macquart, 1842, Mem. Soc. Roy. Sci. Agr. Arts Lille 1841 (1):125. Type-species, *Dolichogyna fasciata* Macquart, 1842 (monotypy).

Nosodepus Speiser, 1913, Jb. Nassau. Ver. Naturk. Wiesbaden 66:131. Type-species, *Nosodepus minotaurus* Speiser, 1913 (monotypy).
New Synonymy.

Head: face yellow, broad, slightly broader than long, occupying more than one-half head width, shallowly concave beneath antennae, with a large very low medial tubercle, pollinose and pilose on sides, shiny and bare medially; cheeks narrow in profile, longer than broad; facial grooves short, extending along lower fourth of eyes; facial stripes indistinct; frontal prominence low, at upper third of head; front yellow, pollinose, puffed-out, with frontal lunule very large, in males more strongly narrowed posteriorly; vertex black, pollinose, rectangular, more than twice as wide as long; ocellar triangle very broad at base, more than three times as broad at base as long. Eyes bare, broadly dichoptic in male. Antennae very short, less than one-fourth as long as face; third segment quadrate; arista bare, more than twice as long as antenna.

Thorax: broader than long, long pilose, with longitudinal light pollinose stripes on mesonotum; meso-katepisterna continuously pilose from ventral margin to dorsal margin; meso-anepimera with posterior portion bare; meso-pleurae bare; metathoracic spiracle large, two to three times as large as third antennal segment; plumulae elongate and unbranched. Legs: Hind femora swollen; hind tibiae slightly arcuate, without apical spur. Wings: marginal cell open; apical cell with a short petiole, with petiole shorter than stigmatic crossvein; stigmatic crossvein present.

Abdomen: oval to suboval with paired lateral light colored spots on dorsum.

Material examined: 7(7); *abrupta* Hine* and *chilensis* (Guérin)*.

Discussion: The habitus of *Dolichogyna* with its 1) very broad face and front in both sexes, 2) vittate mesonotum and 3) spotted abdomen readily distinguishes the genus from all other syrphid taxa. *Aemosyrphus* and *Arctosyrphus* are similar in that they both have very broad ocellar triangles and fronts in both sexes but they have quite different color markings. Also these two genera have small facial tubercles, longer antennae and dark faces, whereas *Dolichogyna* has a large facial tubercle, short antennae and a yellow face. *Dolichogyna* is confined to the Andes of South America. Seven species have been