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A key to the genera of the flower flies (Diptera: Syrphidae) of the Neotropical Region including descriptions of new genera and species and a glossary of taxonomic terms

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Volume 3, Number 3 of the Contributions incorporates a key to the Neotropical flower fly genera along with descriptions of new genera and species. A glossary to the morphological terms used in flower fly taxonomy is included.

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A key to the genera of the flower flies (Diptera: Syrphidae) of the Neotropical Region including descriptions of new genera and species and a glossary of taxonomic terms

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CONTENTS

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Abstract

A key to the Neotropical flower fly genera (Diptera: Syrphidae) is presented. Two new genera (*Xela* Thompson & Vockeroth, type *alex* Thompson; *Ohmyia* Thompson, type *omya* Thompson), 9 new species (*Eupeodes rojasi* Marnef (Chile), *Orthonevra chilensis* Thompson (Chile), *Xela alex* and *margarita* Thompson (Brazil), *Ohmyia omya* Thompson (Peru), *Palpada megafemur* Thompson (Brazil), *P. lindneri* Thompson (Argentina), *P. suprarufa* (Ecuador), *Macrometopia maculipennis* Thompson (Colombia, Peru)) are described. Five new synonyms (*Allograptina* Enderlein 1938 = *Argentinomyia* Lynch 1891, *Rhysops* Williston 1907 = *Argentinomyia* Lynch 1891, *Eristalis concolor* Philippi 1865 = *Eristalinus aeneus* Scopoli 1763), *Argentinomyia grandis* Lynch 1892 = *Argentinomyia longicornis* (Walker 1837), *Rhysops lopesi* Fluke 1945 = *Argentinomyia testaceipes* Lynch 1891 and two new combination (*Talahua palliata* (Fluke) and *Macrometopia montensis* (Hull)) are proposed. A glossary to the morphological terms used in flower fly taxonomy is included.

Introduction

Flower flies are found throughout the New World tropics. They breed in a wide range of habitats; some aid in nutrient re-cycling and others are predators of various pests. Almost all are pollinators as adults. Due to their diverse life-cycles, the group is a good indicator of the health of tropical forests. This paper documents the basic classification now being used. This information will be useful to scientists studying flies, and to action agency personnel charged with identifying flies.

The neotropics are rich in flower flies. At present, more than 1,600 species belonging to 60 genera are known from the neotropics, but this is probably half the true number of species (about 300 new species are currently known to me). From the Palaearctic Region, the next largest fauna, only some 1,590 species in 120 genera (Peck 1988) are known, and this number is not likely to increase by more than ten per cent. What is known of the flower fly diversity in the neotropics was summarized in a species catalog (Thompson, *et alia* 1976). The systematic work since then is summarized below. A key to genera of Neotropical Syrphidae is presented as a taxonomic introduction to the fauna. Two new genera and 11 new species are described and two genera previously unknown for the region are reported.

The catalog to the flower fly fauna of the Americas south of the United States covers the literature to 1972 with the last *Zoological Record* being checked was 1968. The literature on Neotropical flower flies from that date to 1999 is here listed (last *Zoological Record* checked was 1998). This literature reports some 2 new genera, 2 new subgenera, 49 new species and 63 new synonyms. A few comprehensive revisions (*Callicera* (Thompson 1980), *Eristalis* (Thompson 1997b), *Milesia* (Hippa 1990), *Paragus* (Vockeroth 1986), *Spilomyia* (Thompson 1997a) and *Sterphus* (Thompson 1973); genera of tribe Xylotini (Hippa 1978) and one regional study (West Indian flower flies (Thompson 1981)) were published. The BioSystematic Database of World Diptera provides up-dated nomenclatural data on flies and can be found at the Diptera World-Wide-Web site at the Systematic Entomology Laboratory site (http:\\www.sel.barc.sel.gov) and on the annual Diptera Data Dissemination Disk.

The key covers the flower flies of the Neotropical Region. The following genera included in the *Catalogue of the Diptera of Americas south the United States* (Thompson, *et alia* 1976) are considered to belong to Nearctic Mexico and are excluded from the key: *Blera, Chamaesyrphus, Cheilosia, Chrysotoxum, Erizona (Megasyrphus), Helophilus, Lejops (Asemosyrphus, Polydontomyia), Melanostoma,* and *Sphaerophoria*. The characters and terms used in the key are defined and illustrated in the glossary. Following the key, there are notes on the key and on various taxa, including several new ones.

The style of the key follows that of the *Manual of Nearctic Diptera* with one addition. The number of new species known, but not yet described is indicated in parens after the number of described species in the comments. Specimens of these undescribed species are either in the Canadian National Collection, Ottawa, or United States National Collection, Washington.

The sequence of the couplets may seem unsual to some. Couplets have been arranged so as to reduce to a minimum the amount of eye movement need to read them (ergonomic design). The dichotomus key evolved from the indented key, which in turned evolved from the method used by Linnaeus, who grouped species by distinctive characters and placed related species together. Hence, tradition required that the first alternative of a couplet either lead to a name or to numerical reference to the next couplet and couplets were arranged according to the classification used. This arrangement forces the eye to jump over the second alternative when the first alternative is the appropriate one. Also the arrangment of couplets in a traditional key may increase the amount of page-turning in long keys. The proper use of the dichotomous format is to reduce the amount of eye movement and page turning in long keys. The eye should read keys like normal text, that is, from line to line, only jumping lines when required. To minimize eye movement only a few simple rules need to be followed. A couplet can lead to 1) two names, 2) a name and numerical reference to another couplet or 3) numerical references to two other couplets. So, for case one, there are no problems. For case 2, always place the name first and the numerical reference always should be to the next higher number. For case 3, the first alternative always lead to the higher numerical reference (couplet) and the second alternative has a numerical reference to the next (adjacent) couplet. This ensures minimal eye movement. Only one other rule is needed to minimize large jumps (page turning). That is, to place those couplets which parse the taxa into the largest subsets first. Finally, the vertical justification of page is left unjustified so as to prevent the division of couplets across pages.

Key to the Neotropical Genera and Subgenera of Syrphidae

1. Postpronotum bare; male abdomen with 5 unmodified pregenital segments; tergum 5 visible in dorsal view 10
— Postpronotum pilose; male abdomen with 4 unmodified pregenital segments; tergum 5 not visible in dorsal view 2

2. Antenna with terminal style 35
— Antenna with subbasal dorsal arista 3

3. Vein R4+5 strongly sinuate; metafemur usually with basoventral patch of black setulae 39
— Vein R4+5 straight, not or only slightly sinuate; meta femur without such setulae . 4

4. Arista plumose, with pile at least 3 times as long as basal diameter of arista 52
— Arista bare or pubescent, with pile never more than twice as long as basal diameter of arista 5

5. All femora with strong short ventral spinose setae 54
— Femoral spinose setae, if present, restricted to metafemur; pro- and mesofemora never with spinose setae 6

6. Postmetacoxal bridge complete 58
— Postmetacoxal bridge incomplete, with a membranous area ventroposterior to bases of metacoxae 7

7. Vein M1 recurrent or perpendicular; cell R4+5 with obtuse or rectangular apex . . 65
— Vein M1 processive, directed apically; cell R4+5 with acute apex 8

8. Anepisternum uniformly raised, not differentiated into a flattened anterior and a convex posterior part; antennal pits broadly separated; mesonotum with a large flaplike extension above wing base (notal wing shield); body densely punctate, with punctures large . . . . . *Nausigaster* Williston
10 (2) spp.; arid areas, southern USA to northern Argentina; Curran 1941, Carrera *et alia* 1947b
— Anepisternum clearly differentiated into a flat anterior part and convex posterior part; notal wing shield absent; antennal pits usually confluent, rarely narrowly separated; body usually not punctate; if punctate, then antennal pits confluent 9

9. Eye bare 72
— Eye pilose 68

10. Anterior anepisternum usually with some distinct short pile posterodorsally; metathoracic pleuron usually with some long erect or subappressed pile ventral to spiracle; *always* with pile on one of these two places 27
— Anterior anepisternum bare; metathoracic pleuron bare 11

11. Face and scutellum black in ground color 13
— Face and/or scutellum partially pale in color, usually yellow or yellowish brown in ground color 12

12. Metasternum pilose 32
— Metasternum bare 18

13. Abdomen petiolate, petiole much narrower than thorax; face without tubercle, flat . . . . . *Leucopodella* Hull
10(4) spp.; tropics, Mexico to Brazil; Thompson 1981 (key).
— Abdomen oval or with parallel sides, never narrower than thorax; face tuberculate 14

14. Antennal pits confluent; metathoracic pleuron with fine subappressed pile ventrad of spiracle; katepisternum with pile patches continuous anteriorly. Face straight; metacoxa with a pile tuft at posteromedial apical angle . . . . . *Xanthandrus* Verrall
12 spp.; tropics, Texas to northern Argentina; Fluke 1937 (key).
— Antennal pits separated; metathoracic pleuron bare; katepisternum with pile patches usually broadly separated throughout 15

15. Face greatly produced anteriorly, with a very prominent and abrupt tubercle, sparsely pollinose and without punctate shiny (bare) maculae; head as long or longer than high; small, entirely dark flies, 7 mm or less . . . . . *Tuberculanostoma* Fluke
4(2) spp.; montane, Venezuela to Peru; Fluke 1943 (key).
— Face straight or slightly produced anteriorly, with a low and indistinct tubercle, frequently densely pollinose and with small shiny (bare) maculae which appear like puncta; head higher than long; frequently large flies, with pale colored markings . 16

16. Face frequently produced anteriorly, densely pollinose and with puncturelike bare maculae or ripples; antenna always short, with scape segment never more than twice as long as broad; male legs at least with strong black setae on protibia; abdomen without pale color maculae, with silvery-grey pollinose maculae . . . . . *Platycheirus (Carposcalis)* Enderlein
15 spp.; north Temperate, south to Chile & Argentina; Fluke 1945 (key).
— Face straight, not produced anteriorly, usually uniformly pollinose, rarely with shiny (bare) punctate maculae; abdomen frequently with pale colored maculae 17

17. Metacoxa with pile posteromedially on apical angle . . . . . *Talahua* Fluke
2 spp.; Ecuador; Fluke 1945 (key).
— Metacoxa bare posteromedially . . . . . *Argentinomyia* Lynch Arribálzaga
15 (4) spp.; tropics, Mexico to northeastern Argentina; Fluke 1945 (key).

18. Eye bare 24
— Eye pilose 19

19. Tergum 1 well developed, especially on disc where it is frequently 1/2 as long as tergum 2 and always extends well beyond scutellum, sublaterally about 3/4 as long as tergum 2; terga minutely punctate; length 7.5 mm or less . . . . . *Paragus* Latreille
1 sp., *haemorrhous* Meigen; South to Costa Rica; Vockeroth 1986
— Tergum 1 greatly reduced, on disc frequently almost linear and practically covered by scutellum, sublaterally at most 1/2 as long as tergum 2; terga not punctate; length 7.5 mm or more, usually about 10 mm 20

20. Wing very sparsely microtrichose, on apical 1/3 with extensive bare areas; male eye with distinctly demarked area of larger facets dorsally . . . . . *Scaeva* Fabricius
5 spp.; montane, Peru to Chile; Shannon & Aubertin 1933, Dusek & Laska 1985 (key).
— Wing densely and uniformly microtrichose at least on apical 1/3, without bare areas along veins; male eye without distinctly demarked areas of larger facets dorsally . 21

21. Calyter with ventral lobe pilose, with many long, rather coarse, erect yellow pile dorsally, especially on posteromedian portion . . . . . *Syrphus* Fabricius
    8 (1) spp.; north temperate, montane, south to Chile; Fluke 1942 (key); *poecilogaster* Philippi and some specimens of *octomaculatus* Walker key here.
— Calyter with ventral lobe bare, without long pile 22

22. Alula extensively bare anteriorly; katepisternum with anterodorsal corner pilose, with a tuft of long pile; face parallel-sided ventrally . . . . . *Notosyrphus* Vockeroth
    1 sp., *golbachi* Fluke; southeastern Brazil to northeastern Argentina.
— Alula entirely microtrichose; katepisternum with anterodorsal corner bare; face at least slightly broadened ventrally 23

23. Wing entirely microtrichose; terga 3 & 4 each with a pair of oval, transverse or very slightly oblique, yellow maculae . . . . . *Syrphus* Fabricius
    8 (1) spp.; north temperate, montane, south to Chile; Fluke 1942 (key); an undescribed species from Chile keys here.
— Wing partially bare basomedially, with cells R, BM and CuP narrowly bare basoanteriorly; terga 3 & 4 each with a pair of sublinear, distinctly oblique, yellow maculae . . . . . *Dasysyrphus* Enderlein
    (2) spp.; north temperate, south to Costa Rica, southeastern Brazil.

24. Metafemur without spinose setae; vein M1 at most slightly sinuate; vein R4+5 usually straight or nearly so, if distinctly sinuate, then postmetacoxal bridge incomplete and/or abdomen oval 26
— Metafemur with distinct anteroventral and posteroventral rows of spinose setae on apical 1/2; vein M1 very abruptly and strongly sinuate; vein R4+5 slightly to strongly sinuate; postmetacoxal bridge complete; abdomen strongly petiolate 25
    Ceriomicrodon will key here if the microscopic postpronotal pile is overlooked. *Cerioimicrodon* will not agree fully with either alternative.

25. Vein R4+5 strongly sinuate; 1st tergum produced laterally into a strong spur; upper occipital cilia reduced to a single row . . . . . *Salpingogaster* (s.s.) Schiner
    31 (4) spp.; tropics, widespread; Sack 1920 (revision), Curran 1941 (key).
— Vein R4+5 only slightly sinuate; lst tergum not produced into a spur; upper occipital cilia in 3-4 rows . . . . . *S.* (*Eosalpingogaster* Hull)
    3 spp.; see above.

26. Calyter with ventral lobe pilose, with long, rather coarse, erect yellow pile dorsally, especially on posteromedian portion . . . . . *Syrphus* Fabricius
    8 (1) spp.; north temperate, montane, south to Chile; Fluke 1942 (key).
— Calyter with ventral lobe bare, without long pile 29

27. Metasternum pilose or eye pilose . . . . . *Ocyptamus* Macquart
    See next couplet.
— Metasternum bare and eye bare 28

28. Eye with distinct triangular emargination on posterior margin which is at or dorsal to level of insertion of antenna; facial tubercle well developed, beginning immediately ventral to antennal bases and sometimes laterally compressed; face often produced anteriorly, sometimes strongly so; abdomen usually oval, with at least a weak premarginal sulcus, never strongly petiolate or very long and thin; wing never with dark markings; male genitalia with sclerotized, very short to long triangular process arising from fused surstylar apodemes and projecting caudadly between bases of surstyli; aedeagus simple, unsegmented . . . . . *Toxomerus* Macquart
143 (10) spp.; widespread, Canada to Chile & Argentina; Hull 1943a (key).

— Eye with posterior margin with emargination usually indistinct or shallow and rounded, if distinct and subtriangular, then situated ventral to level of antennal insertion; facial tubercle usually very weak, never as described above, if distinct, then there is a strong concavity between it and antennal bases; face never produced anteriorly; abdomen usually petiolate, frequently very long and thin, rarely parallel-sided, never oval; wing frequently with dark markings; male genitalia without sclerotized process projecting between bases of surstyli, with at most a weak semimembranous process in this position; aedeagus complex, segmented . . . . . *Ocyptamus* Macquart
297 spp.; widespread, Canada to Chile & Argentina; Curran 1941 (key), Hull 1949b (key).

29. Thorax without yellow maculae except on scutellum . . . . . *Pseudodoros* Becker
1 (1) sp., *clavatus* Fabricius; widespread, Wisconsin, south to Argentina, not Chilean.

— Postpronotum yellow; mesonotum with lateral yellow vitta at least in front of suture; anepisternum and katepisternum partially yellow; frequently pleuron more extensively yellow 30

30. Vein R4+5 strongly sinuate. Face not produced anteriorly, with antennal bases slightly anterior to oral margin; oral opening less than twice as long as broad; abdomen oval, with strong premarginal sulcus . . . . . *Dideomima* Vockeroth
1 (1) sp., *coquilletti* Williston; Arizona to Costa Rica.

— Vein R4+5 straight or nearly so; abdomen petiolate or parallel-sided, without premarginal sulcus 31

31. Face strongly produced anteriorly, with oral margin greatly anterior to antennal bases; oral opening 3 or more times as long as broad; antenna short, with scape and basoflagellomere only slightly longer than broad . . . . . *Allograpta* Osten Sacken
71 (20) spp.; widespread, tropics and temperate areas; Fluke 1942 (key); *Antillus* and *Rhinoprosopa* groups key here.

— Face vertical, not produced anteriorly, with antennal bases slightly anterior to oral margin; oral opening less than twice as long as broad; antenna elongate, with scape and basoflagellomere twice as long as broad . . . . . *Argentinomyia* Lynch Arribálzaga
15 (4) spp.; tropics, Mexico to northeastern Argentina; Fluke 1945 (key); *octomaculatus* Enderlein keys here.

32. Eye pilose . . . . . *Scaeva* Fabricius
5 spp.; montane, Peru to Chile & Argentina; Shannon & Aubertin 1933, Dusek & Laska 1985 (key); *penai* Dusek & Laksa keys here.

— Eye bare 33

33. Abdomen without a premarginal sulcus; mesonotum often with a well-defined bright yellow lateral or sublateral vitta extending at least from postpronotum to suture; face often produced anteriorly so that oral opening may be more than 3 times as long as broad . . . . . *Allograpta* Osten Sacken
71 (20) spp.; widespread, tropics and temperate areas; Fluke 1942 (key).
— Abdomen with a distinct strong premarginal sulcus, extending from middle of tergum 2 to end of tergum 5; mesonotum entirely dark or at most obscurely yellowish pollinose laterally; face not strongly produced anteriorly; oral opening not more than 2 1/2 times as long as broad 34

34. Wing very sparsely microtrichose, with extensive bare areas on apical 1/3; male genitalia very large, projecting as a blunt cylinder beyond remainder of abdomen, visible in dorsal view . . . . . *Eupeodes* (s.s.) Osten Sacken
1 sp., *volucris* Osten Sacken; probably not Neotropical, Enderlein's species from Colombia is based on a mislabeled specimen.
— Wing densely and uniformly microtrichose at least on apical 1/3, without bare areas along veins apically; male genitalia small, retracted under apex of abdomen, scarcely visible in dorsal view . . . . . *E. (Metasyrphus)* Matsumura
2 spp., North Temperate, montane, south to Chile.

35. Eye pilose; scutellum with ventral fringe; crossvein r-m basal to middle of cell DM . . . . . *Callicera* Panzer
1 sp., *poultoni* Verrall; montane, Mexico to Costa Rica; Thompson 1980 (revision).
— Eye bare; scutellum without ventral fringe; crossvein r-m apical to middle of cell DM 36

36. Frontal prominence elongate, at least as long as scape; postmetacoxal bridge incomplete 38
7 spp.; widespread, not Chilean; Curran 1941 (key)
— Frontal prominence absent or very short, much shorter than scape 37

37. Postmetacoxal bridge complete . . . . . *Polybiomyia* Shannon
15 spp.; widespread, not Chilean; Curran 1941 (key).
— Postmetacoxal bridge incomplete, with a membranous area dorsoposteriorly to bases of metacoxae . . . . . *Sphiximorpha* Rondani
24 spp.; widespread, not Chilean; Curran 1941 (key).

38. Abdomen petiolate, ... *Monoceromyia* Shannon
7 spp.; widespread, not Chilean; Curran 1941 (key).
— Abdomen elongate, only slighlty constricted, branous area dorsoposteriorly to bases of metacoxae . . . . . *Ceriana* Rondani
1 sp.; *cacia* Walker, Mexico to Costa Rica.

39. Cell R1 closed and petiolate 46
— Cell R1 open 40

40. Arista plumose, with pile many times longer than basal diameter of arista; vein R4+5 only slightly sinuate; metafemur without basoventral patch of setulae . . . . . *Sericomyia (Arctophila* Schiner)
1 (1) sp., *meyersi* Fluke; North Temperate, south to Costa Rica; *meyersi* keys here.
— Arista bare; vein R4+5 strongly sinuate; metafemur with a basoventral patch of black setulae 41

41. Eye bare 43
— Eye pilose 42

42. Basoflagellomere broader than long; wing without dark anterior margin; male eyes dichoptic or narrowly touching; metafemur swollen, usually greatly so . . . . . *Mallota* Meigen
13 (3) spp.; north temperate, montane, south to Peru; pilose eyed species (*colombii* Macquart, *intermedia* Hull, *inversa* Shannon, *nigra* Shannon, *rubicunda* Curran and *salti* Curran) key here.
— Basoflagellomere longer than broad, usually twice as long as broad; wing usually dark anteriorly; male eyes broadly holoptic; metafemur never greatly swollen, rarely slightly so . . . . . *Quichuana* Knab
25 (4) spp.; tropics, Mexico to Peru & northern Argentina; Hull 1946a (key).

43. Ocellar triangle normal size, small; frons not very broad; mesonotum usually not vittate; male frequently holoptic 45
— Ocellar triangle extremely large; frons very broad in both sexes; mesonotum yellow pollinose vittate; male dichoptic 44

44. Frons greatly swollen below; ocellar triangle obtuse, with anterior ocellus close to base of triangle; metafemur swollen; metatibia with ventromedial carina on basal 1/3 or more; face yellow or strongly produced anteroventrally . . . . . *Dolichogyna* Macquart
11 (2) spp.; montane, Colombia to Chile & Argentina; Fluke 1951a (revision).
— Frons not greatly swollen; ocellar triangle approximately equilateral; metafemur and metatibia simple; face with black medial vitta and not produced . . . . . *Ohmyia* Thompson, new genus
1 sp., *omya* Thompson; Peru.

45. Thorax densely pilose; mesonotum without distinctive pollinose ground patterns; wing usually hyaline, never with dark anterior margin; frontoantennal region not greatly produced . . . . . *Mallota* Meigen
13 (3) spp.; north temperate, montane, south to Peru; bare-eyed species (*aberrans* Shannon, *analis* Macquart, *bequaerti* Hull, *margarita* Williston, *mystacica* Fluke, *sackeni* Williston and *smithi* Williston) key here.
— Thorax sparsely pilose, with pile usually short and scattered; mesonotum usually with distinctive pollinose vittae and/or fasciae; wing dark anteriorly; frontoantennal region usually greatly produced forward, subconical to conical . . . . *Habromyia* Williston
12 (3) spp.; widespread, Central America, south to northern Chile & Argentina; Curran 1934b (key).

46. Postalar tuft absent; eye without maculation; anepimeron with dorsomedial triangular portion bare 48
— Postalar tuft present; eye with maculae; anepimeron with dorsomedial triangular portion pilose 47

47. Eye punctate . . . . . *Eristalinus* (s.s.) Mik
1 sp., *aeneus* Scopoli; introduced into Chile?, see below.
— Eye fasciate and punctate . . . . . *E.* (*Eristalodes* Mik)
1 sp., *taeniops* Wiedemann; introduced into Chile, see below.

48. Face drawn out into a long slender porrect snout . . . . . *Lycastrirhyncha* Bigot
5 spp.; tropics, Mexico to Brazil; Doesburg 1966 (key).
— Face not produced into a such a snout 49

49. Katepimeron pilose 51
— Katepimeron bare 50

50. Eye bare; thorax usually with maculae of opaque tomentose pile . . . . . *Meromacrus* Rondani
39 (2) spp.; widespread, but not Chilean; southeastern USA to northern Argentina; Hull 1942 (key).
— Eye pilose; thorax without tomentose pile . . . . . *Eristalis (Eoseristalis)* Kanervo
4 (2) spp.; montane & south temperate, south to Chile & Argentina; Thompson 1997b (revision).

51. Meron and metaepisternum with pile anterior to and/or ventral to metathoracic spiracle; eye usually without contrasting vittae or pile; wing frequently microtrichose . . . . . *Palpada* Macquart
102 (8) spp.; widespread, USA to Chile & Argentina; Curran 1934b (key).
— Meron and metaepisternum without any pile around spiracle; eye with contrasting vittae of light and dark colored pile; wing bare . . . . . *Eristalis (Eristalis)* Latreille
1 sp., *tenax* Linnaeus; introduced, temperate areas only, southeastern Brazil to Chile & Argentina; Thompson 1997 (revision).

52. Eye bare; meron without pile anterior to metathoracic spiracle . . . . . *Sericomyia* (*Arctophila* Schiner)
1 (1) sp., *meyersi* Fluke; north temperate, south to Costa Rica; a new species from Costa Rica keys here.
— Eye pilose; meron with a patch of long pile anterior to metathoracic spiracle . . . 53

53. Face with medial and 2 lateral tubercles; posterior anepimeron pilose; notopleuron enlarged and produced posteriorly . . . . . *Ornidia* Lepeletier & Serville
4 spp.; widespread, mainly tropical areas; Thompson 1990 (revision).
— Face with only a medial tubercle; posterior anepimeron bare; notopleuron normal, not produced . . . . . *Copestylum* Macquart
315 (100) spp.; widespread, Canada to Chile & Argentina; Curran 1939 (key), 1953 (key *esuriens* group); Fluke 1951b (key *scutellata* group).

54. Face with tubercle in both sexes; antenna greatly elongate, always with basoflagellomere more than twice as long as broad, frequently with scape and pedicel elongate . . . . . *Lepidomyia* Loew
14 (3) spp.; tropics, Texas, south to Peru & northern Argentina; Hull 1946b (key).
— Face with tubercle only in male; female with face concave; antenna short, with basoflagellomere oval or subquadrate, always less than twice as long as broad, with pedicel and scape never elongate . . . . . *Myolepta* Newman
12 (4) spp.; widespread; Fluke & Weems 1956 (key); Thompson 1968 (key, *Protolepidostola* group).

55. Face pilose; oral margin evenly rounded, usually not notched anteriorly; anterior tentorial pit small, round; vein R+5 frequently with an appendix into apical cell . 58
— Face bare; oral margin notched anteriorly; anterior tentorial pit elongate, not forming a small round pit; vein R4+5 never with an appendix 56

56. Metafemur without spinose setae; face straight with a projecting epistoma; vein M1 recurrent; cell R4+5 with obtuse apex . . . . . *Austroascia* Thompson & Marnef
1 sp., *segersi* Thompson & Marnef; Chile.
— Metafemur with ventrolateral rows of strong short black spinose setae; face with either a tubercle or a prominent medial carina, never with a projecting epistoma; vein M1 processive, directed outwardly; cell R4+5 with acute apex 57

57. Occiput with a row of short strong black spinose setae; basoflagellomere elongate, more than twice as long as broad; face carinate; Metafemur swollen; mesonotum with 2 pairs of transverse yellow pollinose fasciae . . . . . *Ceriogaster* Williston
    10 (4) spp.; tropics, widespread; Hull 1943b (key). For pragmatic reasons, I accept the narrow classification of *Sterphus* as proposed by Hippa (1978). However, I still hold that the *fascithorax* group is derived from a *Sterphus (Crepidomyia)* ancestor.
— Occiput with only thin normal pile; basoflagellomere orbicular, about as long as broad; face tuberculate; metafemur slender; mesonotum without transverse fasciae . . . . . *Valdiviomyia* Vockeroth
    6 (1) spp.; Chilean; Sedman 1965; *darwini* Shannon keys here.

58. *Either* vein M1 processive, directed outwardly and cell R4+5 with acute apex; **or** face with a distinct tubercle under antennae; metasternum underdeveloped, bare . . . . . *Aristosyrphus* Curran
    8 (2) spp.; Central America to Brazil.
— Never with vein M1 processive, either straight or slightly recurrent; face without a tubercle under antenna 59

59. Abdomen petiolate; metasternum under developed, reduced to thin line, bare . . . . . *Mixogaster* Macquart
    17 (3) spp.; eastern USA, south to Brazil; Hull 1954 (revision), Carrera & Lenko (1958).
— Abdomen usually not petiolate, oval to elongate; if petiolate, then metasternum well developed, not reduced, and usually pilose 60

60. Scape very short, only as long as broad; antenna inserted dorsally on head, at or above dorsal margin of eye; mouthparts absent; male basoflagellomer with multiple furcations . . . . . *Masarygus* Brèthes
    1 (1) sp., *planifrons* Brèthes; Brazil to Argentina.
— Scape long, much longer than broad; antenna inserted medially, much ventral to dorsal margin of eye; mouthparts usually present; male basoflagellomere usually normal, not multiply furcate, at most with only two branches 61

61. Anepimeron bare; antenna short, only about 1/2 as long as face; abdomen oval . . . . . *Paragodon* Thompson
    2 spp.; Mexico to Surinam; Thompson 1969 (key).
— Anepimeron pilose; antenna usually long, usually longer than 1/2 as long as face; if shorter, then abdomen elongate 62

62. Antenna short, less than 1/2 as long as face; scape never more than twice as long as broad; abdomen elongate, with parallel sides; vein R4+5 without an appendix into cell R4+5 . . . . . *Paramicrodon* de Meijere
    2 (2) spp.; tropics, Central America to Peru & Brazil.
— Antenna long, always longer than 1/2 as long as face; scape always much more than twice as long as broad; abdomen frequently oval or petiolate; vein R4+5 frequently with an appendix into cell R4+5 63

63. Katepimeron pilose; abdomen petiolate . . . . . *Rhopalosyrphus* Giglio-Tos
    2 (2) spp.; southern USA to northern Argentina; Capelle 1956 (key)
— Katnepimeron bare; abdomen variable 64

64. Abdomen petiolate, with 2nd segment cylindrical, longer than thorax; thoracic pile very short and strongly appressed; postpronotum, anterior anepisternum and metasternum appearing bare even under high magnification . . . . . *Ceriomicrodon* Hull
— Abdomen variable; if petiolate, then 2nd segment shorter than thorax; thoracic pile longer, erect; postpronotum, anterior anepisternum and metasternum usually with long distinct pile . . . . . *Microdon* Meigen
145 (20) spp.; widespread; Curran 1941 (key).

65. Wing bare; anepimeron pilose; meron with long pile anterior to metathoracic spiracle; eye pilose . . . . . *Copestylum* Macquart
315 (100) spp.; widespread, Canada to Chile & Argentina; Curran 1939 (key), 1953 (key *esuriens* group); Fluke 1951b (key *scutellata* group); *Pseudotachina* Hull keys here.
— Wing extensively microtrichose; anepimeron and meron bare 66

66. Eye bare; basoflagellomere elongate, at least twice as long as broad; antenna usually elongate . . . . . *Orthonevra* Macquart
11 (4) spp.; widespread. The genera of Microdontinae will key here if the postmetacoxal bridge was overlooked in couplet 6.
— Eye sparsely or densely pilose; basoflagellomere orbicular or oval, less than twice as long as broad; antenna short 67

67. Crossvein r-m basal to middle of cell DM; vein M1 once angulate; propleuron bare; head fitting very close to thorax, thus occiput reduced laterally to a thin line, mesothoracic spiracle hidden from lateral view and postpronotum greatly reduced . . . . . *Alipumilio* Shannon
4 (4) spp.; tropics, Mexico to northeastern Argentina; Vockeroth 1964 (key).
— Crossvein r-m apical to middle of cell DM; vein M1 twice angulate; propleuron pilose; head not as above, occiput broad on dorsal 1/3, mesothoracic spiracle visible laterally and postpronotum normal . . . . . *Eumerus* Meigen
1 sp., *tuberculatus* Rondani; introduced into Colombia; Collin 1920 (key)

68. Face yellow, bare; metafemur with ventrolateral short strong black spinose setae; metatarsus with ventral oblique ctenidia . . . . . *Chromocheilosia* Hull & Fluke
3 (1) spp.; Chilean; Shannon & Aubertin 1933 (key).
— Face dark, metallic blue to black, pilose; metafemur without or with only a few spinose setae; metatarsus without such ctenidia 69

69. Oral margin notched anteriorly; anterior tentorial pit elongate, not forming a small pit 71
— Oral margin evenly rounded, not notched anteriorly; anterior tentorial pit small, round 70

70. Anterior anepisternum pilose, with a row of long erect pile posterior to mesothoracic spiracle; katepimeron pilose . . . . . *Trichopsomyia* Williston
11 (4) spp.; widespread, not Chilean; Fluke 1937 (key).
— Anterior anepisternum bare; katepimeron bare . . . . . *Pipiza* Meigen
4 spp.; Chilean; Shannon & Aubertin 1933 (key).

71. Crossvein r-m crossvein apical to middle of cell DM; cell R4+5 with a very short petiole, shorter than humeral crossvein; metasternum bare; katepisternum with pile divided into ventral and dorsal patches . . . . . *Macrometopia* Philippi
    3 spp.; montane, Colombia to Chile & Argentina; this paper.
— Crossvein r-m basal to middle of cell DM; cell R4+5 with a long petiole, much longer than humeral crossvein; metasternum pilose; katepisternum continuously pilose, not with separate ventral and dorsal patches . . . . . *Notiocheilosia* Thompson
    1 sp., *nitescens* Shannon & Aubertin; Chilean.

72. Face drawn out into a long porrect snout; costa and vein R4+5 ending well posterior to apex . . . . . *Rhingia* Scopoli
    2 spp.; widespread, not Chilean.
— Face not produced into a snout; costa and vein R4+5 ending at or anterior to apex of wing 73

73. Antenna elongate, much longer than face; scape more than 3 times as long as broad . . . . . *Cacoceria* Hull
    2 spp.; Mexico to Peru.
— Antenna short, only as long as or shorter than face; scape never more than twice as long as broad 74

74. Metasternum pilose, with pile as long as those on metacoxa 87
— Metasternum bare 75

75. Scutellum without a ventral pile fringe; crossvein r-m basal, at basal 1/8 of cell DM; face concave; male dichoptic . . . . . *Chamaesphegina* Shannon & Aubertin
    2 (1) spp.; Chilean.
— Scutellum with a ventral pile fringe; crossvein r-m at or apical to basal 1/3 of cell DM 76

76. Metatarsus with long oblique ctenidia on basal 2/3 or more of basal 3 tarsomeres; thorax with strong black bristles on scutellum, postalar callus, and usually notopleuron; face yellow; crossvein r-m usually at basal 1/3 of cell DM . . . . . *Chromocheilosia* Hull & Fluke
    3 (1) spp.; Chilean; Shannon & Aubertin 1933 (key).
— Metatarsus without such combs, with ctenidia restricted to apex of tarsomeres or absent; thorax without strong black bristles, rarely with weak scutellar bristles; face usually dark in ground color and crossvein r-m at or apical to middle of cell DM 77

77. Face straight, with distinct carinae; rarely with oral margin slightly produced . . . . . *Sterphus* (*Crepidomyia* Shannon)
    30 (1) spp.; widespread, Mexico to Chile & Argentina; Thompson & Hippa 1994 (key).
— Face either concave or tuberculate, never straight 78

78. Metafemur spindle shaped, greatly enlarged on apical 1/2, slender on basal 1/2 and apex . . . . . *Sterphus* (*Telus* Thompson)
    1 sp., *telus* Thompson; Ecuador
— Metafemur usually slender, if enlarged, then uniformly enlarged 79

79. Metathoracic spiracle large, as large as or larger than basoflagellomere; male holoptic and with a large spina on metatrochanter . . . . . *Sterphus* (*Sterphus* Philippi)
2 spp., Chilean; Thompson 1973 (key).
— Metathoracic spiracle small, much smaller than basoflagellomere; male without spina on metatrochanter and usually dichoptic 80

80. Cell R4+5 with a long petiole, as long as or longer than humeral crossvein 82
— Cell R4+5 with a short petiole, shorter than humeral crossvein 81

81. Scutellum with apical flatten rim; wing without dark anterior margin, uniformly smoky black; face concave; abdomen elongate; shiny metallic blue flies . . . . . *Philippimyia* Shannon
1 sp., *cyanocephala* Philippi; Chilean.
— Scutellum evenly rounded, without flatten rim; face tuberculate in male, concave in female; wing with apical anterior half dark brown; abdomen elongate or petiolate; not metallic blue flies, wasp and hornet mimics . . . *Odyneromyia* Shannon & Aubertin
2 spp.; Chilean.

82. Face usually with a tubercle; if without facial tubercle, then either with strongly constricted abdomen or wing bicolored, with anterior margin dark and posterior part hyaline 85
— Face concave; abdomen not strongly constricted and wing never bicolored 83

83. Body strongly and distinctly punctate; basoflagellomere elongate, more twice as long as scape and pedicel together; katepisternum continuously pilose; face shiny bluish black; wing completely microtrichose; crossvein r-m basal, basal to middle of cell DM . . . . . *Xela* Thompson & Vockeroth
2 spp.; Brazilian; this paper.
— Body not punctate or only very indistinctly so; basoflagellomere oval or quadrate, only about as long as scape and pedicel together; katepisternum discontinuously pilose, with pile separated by a broad bare medial area into ventral and dorsal pile patches . . 84

84. Crossvein r-m distinctly basal to middle of cell DM; male dichoptic . . . . . *Hemixylota* Shannon & Aubertin
3 spp.; Chilean; Shannon & Aubertin 1933 (key).
— Crossvein r-m at or apical to middle of discal cell; male holoptic . . . *Xylota* Meigen
(7) spp.; north temperate, south to Costa Rica.

85. Abdomen oval, with 2nd tergum wider than 3rd tergum; male and female with tuberculate faces; male narrowly dichoptic, with eyes separated by aristal width only; crossvein r-m at middle of cell DM; alula broad, microtrichose . . . . . *Sterphus (Sterphus* Philippi)
1 sp., *stimulans* Thompson; Costa Rica to Bolivia; *Pia* Philippi probably keys here; see below.
— Abdomen petiolate or parallel-sided, with 3rd tergum wider or as wide as 2rd tergum 86

86. Crossvein r-m apical, beyond middle of cell DM; alula broad, microtrichose; male and female faces non-dimorphic, subcarinate, with oral margin slightly produced anteriorly; male holoptic . . . . . *Mutillimyia* Hull
1 sp., *auricaudata* Williston; Mexico
— Crossvein r-m basal, at or basal to middle of cell DM; alula narrow, about as wide as cell BM, bare; male and female faces dimorphic; male face tuberculate, female face concave; male dichoptic, with eyes broadly separated . . . *Valdiviomyia* Vockeroth
6 (1) spp.; Chilean; Sedman 1965.

87. Cell R1 closed and petiolate . . . . . *Milesia* Latreille
2 spp.; southeastern Canada, south to Panama; Hippa 1990 (revision).
— Cell R1 cell open 88

88. Anterior anepisternum pilose; metafemur with a single small ventroapical spina . . . . . *Spilomyia* Meigen
4 (2) spp.; Canada south to Central America, southeastern Brazil to northern Argentina; Thompson 1996 (key).
— Anterior anepisternum bare; metafemur simple or with a ventroapical bifid dens or lateral lamina 89

89. Crossvein r-m with a long appendix . . . . . *Stilbosoma* Philippi
2 spp.; Chilean
— Crossvein r-m without an appendix 90

90. Metafemur with a large ventroapical lateral bifid triangular lamina . . . . . *Senogaster* Macquart
1 sp., *dentipes* Fabricius; Amazonia.
— Metafemur without such a lamina 91

91. Cell R4+5 with a long petiole, with petiole longer than crossvein h 95
— Cell R4+5 with a very short petiole, with petiole much shorter than crossvein h . . 92

92. Scutellum without a sulcus; vein M1 and crossvein dm-cu disjunctive, not continuous; vein M2 present; metafemur simple; male dichoptic; large (about 20 mm), robust, long pilose flies . . . . . *Flukea* Etcheverry
1 sp., *vockerothi* Etcheverry; Chilean.
— Scutellum with a distinct premarginal sulcus; vein M1 and crossvein dm-cu continuous; vein M2 absent; male holoptic; smaller flies, less than 15 mm 93

93. Metasternal sclerite not divided; metafemur swollen, with ventral strong short ventral spinose setae . . . . . *Myolepta* Newman
If the femoral spinose setae were overlooked in couplet #5, then *Myolepta* will run here. See couplet #53.
— Metasternal sclerite divided by a membranous band; metafemur without ventral spinose setae 94

94. Face, frontal triangle (♂) and ventral frons (♀) pilose; metafemur simple, not swollen nor with processes . . . . . *Meropidia* Hippa & Thompson
3 spp.; Colombia, Ecuador, Bolivia; Hippa & Thompson 1983 (key).
— Face, frontal triangle and ventral frons bare; metafemur greatly swollen, with apicolateral ventral carina or lamina . . . . . *Tropidia* Meigen
6 spp.; Chile & Argentina; Shannon & Aubertin 1933 (key).

95. Scutellum without ventral fringe; wing extensively bare, with microtrichia almost completely absent on basal 2/3 or more, very sparse and scattered on apical 1/3 or less; metathoracic pleuron pilose, with some fine pile ventral to spiracle . . . . . *Syritta* Lepeletier & Serville
1 sp., *flaviventris* Macquart; southeastern Brazil, Chile & Argentina; Thompson *et alia* 1990 (key).
— Scutellum with a ventral pile fringe; wing extensively microtrichose, apical 1/2 or more densely microtrichose, with only limited bare areas on basal 1/3 or less; metathoracic pleuron bare 96

96. Body strongly and distinctly punctate; katepisternum continuously pilose; crossvein r-m basal, basal to middle of cell DM and at level of end of sc vein; cell CuP with a long petiole, with petiole much longer than petiole of cell R4+5; abdomen oval; small, compact, bluish black flies . . . . . *Xela* Thompson & Vockeroth
2 spp.; Brazilian; this paper.
— Body not punctate or only very indistinctly so; katepisternum discontinuously pilose, with pile separated by a broad bare medial area into ventral and dorsal pile patches; crossvein r-m medial, at or beyond middle of cell DM and beyond level of end of sc vein 97

97. Face indistinctly tuberculate, not carinate nor concave; abdomen oval; large, robust bumble bee mimic, all long pilose flies 99
— Face concave and subcarinate; abdomen elongate; small narrow flies, not bumble bee mimics nor largely orange pilose 98

98. Basoflagellomere oval, only as long as broad; face straight; metathoracic spiracle large, about as large as basoflagellomere . . . . . *Sterphus* (*Crepidomyia* Shannon)
30 (1) spp.; widespread, Mexico to Chile & Argentina; Thompson & Hippa 1994 (key); *cybele* group keys here, see Hippa & Thompson 1995 (key).
— Basoflagellomere elongate, longer than broad; face slightly but distinctly concave in profile; metathoracic spiracle small, much smaller than basoflagellomere . . . . . *Chalcosyrphus* (*Neplas* Porter)
29 spp.; tropics, Arizona to northeastern Argentina; Curran 1941 (key).

99. Vein M1 and crossvein dm-cu disjunctive, not continuous; M2 present; cell CuP with a long petiole, with petiole much longer than petiole of cell R4+5 . . . . . *Aneriophora* Stuardo & Cortes
1 sp., *aureorufa* Philippi; Chilean.
— Vein M1 and crossvein dm-cu continuous; M2 absent; cell CuP with a short petiole, with petiole as long as or shorter than petiole of cell R4+5 . . . . . *Criorhina* Meigen
3 (3) spp.; Central America.

Notes on Key

Some genera run to different exit points. As an aid to users, the species or species group which runs to different exits are identified in the notes after each entry. A couple of genera are variable in key characters, such as those which have bare or pilose-eyed species (*Chromocheilosia, Mallota*), or the character states are difficult to interpret (*Ocyptamus, Sericomyia, Toxomerus, Xela*); these taxa are run both ways in the key. *Ceriomicrodon* may run to couplet 24 as the postpronotum under low magnification may appear to be bare. *Ceriomicrodon* does not match either alternative as it lacks spinose metafemur, but has a petiolate abdomen and postmetacoxal bridge and the wing venation is quite different. If care

is not used in checking for the postmetacoxal bridge (couplet 6), microdontine flies will run to *Orthonevra*.

Ocyptamus and *Toxomerus* are among the most specious and common taxa found in the New World. Unfortunately, the couplet distinguishing them may be difficult to use. While these genera can always be distinguished by the characters of the male genitalia, other characters may seem to overlap. Species of the *Ocyptamus, Calostigma* species group, for example, are usually misidentified as *Toxomerus*. Even the experts have made mistakes. Hull described one *Toxomerus* species in what is now called *Ocyptamus* (*Baccha ophiolinea* Hull) and Enderlein described three *Ocyptamus* species in what is now called *Toxomerus* (*Antiops limbus* Enderlein, *Hybobathus quadrilineatus* Enderlein and *Mesogramma trilineatum* Enderlein). So until one becomes familiar with these two taxa, one should always check their determinations against identified vouchers.

Two genera are not placed in the key. One, *Nothomicrodon* Wheeler (1924: 243), is based on an unusual larval form found in a nest of *Azteca trigona* Emery (Hymenoptera: Formicidae). *Nothomicrodon* probably belong to the family Phoridae. The other is *Pia* Philippi. The original description (Philippi 1865: 742), herein translated, does not provide sufficient characters to precisely place the group and the type species remains unknown. My guess is that *Pia cyanea* Philippi is a species similar to *Sterphus stimulans*, and if so, then *Pia* should not be recognized.

Notes on Taxa

Pia Philippi

Body broad, flattened, with short hair, shiny. Eyes bare, contiguous in male. Face with oral margin prominent, antennae inserted on prominence and with tubercle below. Antenna short, 1st segment short, 3rd suborbicular, arista bare. Wings with marginal cell open, submarginal cell foot-shaped ["pediformis" for closed and petiolate?], submarginal vein not at all sinuous. Posterior femora slender and unarmed, posterior tibiae slightly arcuate.

From the last genus [*Penium* = *Pipiza*] differs by almost bare body, bare eyes, and different tubercle on face. The false vein is completely absent.

Pia cyanea Philippi

Azure, face yellow, densely pubescent, and black, bare, shiny except for antennal prominence; antennae orange; wings scarcely smoky; stigma cell yellowish; body beneath and legs black. Length of body 3 1/2 lines, wing-span 8 lines.

Male brought back by the illustrious Landbeck from the Illapel expedition.

Vertex and occiput bluish black, shiny, covered with black forward directed bristles. Face pale yellow, with some short erect white bristles on the frontal tubercle, otherwise covered with fine decumbent hairs except for the tubercle below the antennae and the mouth-edge which are black, bare and shiny. Cheeks black and, like the anterior mouth-edge, sparsely covered with short white hairs. Scutum, scutellum and abdomen unusually shiny, a magnificent steel blue, even though covered with short erect black small hairs; on the scutum with 2 narrow gray stripes that are close together in front but diverge posteriorly, and which hardly occupy half the anterior length. Abdomen broad, elongate oviform. Wing veins black, region of stigma yellow. Femora covered with rather long white hairs, tibia and tarsus with similar but decumbent hairs. Claws small, black; halter blackish.

Argentinomyia Lynch Arribalzaga

Argentinomyia was described for a single new species, *testaceipes* from Argentina. Lynch later described a second species, *grandis*, also from Argentina. The principal character Lynch based his new genus on was the elongate antenna, a character usually found only among the microdons (subfamily Microdontinae) and some ceriodines (tribe Ceriodini). In 1976 I (Thompson in Thompson *et alia* 1976) considered the name to be the senior synonym for *Aristosyrphus* Curran. I have now examined the type of *grandis* and find it to be a synonym of *Rhysops longicornis* (Walker 1837)(**new synonym**). The type of *testaceipes* is apparently lost as it could not be found in Museo Argentino de Ciencias Naturales "Bernardino Rivadavia," Buenos Aires. The identity of *grandis* made me reconsider the identity of *testaceipes*, which I now believe is the senior synonym of *Rhysops lopesi* Fluke (**new synonym**), and my obviously erroneous synonymy of *Aristosyrphus*. *Argentinomyia* is the senior synonym for the genus now called *Rhysops* Williston and *Aristosyrphus* Curran is restored as the valid name of the microdon group.

Argentinomyia is a distinctive endemic Neotropical group, and, like other Neotropical flower fly radiation, includes a diverse array of species. The genus group name, *Allograptina* Enderlein (1938: 226), was based on one (**new synonym**). *Argentinomyia octomaculatus* (Enderlein), the type species of *Allograptina*, has an partially orange face, orange scutellum and orange lateral margins to scutum, which lead us (Thompson, *et alia*, 1976: 39) to tentative place it in the Syrphini. However, on examination of the holotype, the structure of the head is clearly *Argentinomyia*.

Talahua Fluke

Fluke erected *Talahua* as subgenus of Melanostoma to accommodate a single species (*fervida* Fluke) from Ecuador with greatly enlarged male genitalia. This species is quite distinct from *Melanostoma*, lacking the reduced metasternum and simple aedeagus. Hence, we (Thompson *et alia* 1976) elevated the group to full generic status. *Melanostoma palliatum* Fluke, another aberrant species from Ecuador, was placed by us (Thompson *et alia* 1976) in *Xanthandrus* as it also lack the distinctive autapomorphies of *Melantostoma*. However, this species, which has normal-sized male genitalia, better fits the characteristics of *Talahua* than *Xanthandrus* and is here transferred (**new combination**).

Eupeodes (Metasyrphus) rojasi Marnef, **new species**

Male.—Head: Face yellow except narrow brown medial vitta, sparsely white pollinose except shiny medially, yellowish white pilose except with black pile intermixed on tubercle and laterad to antenna; gena yellow, shiny, bare anteriorly, black, white pollinose and pilose posteroirly; frontal lunule brown except yellowish medially; frontal triangle yellow, yellowish white pollinose, black pilose; vertical triangle black, black pilose; occiput black, densely white pollinose, white pilose except with a few black cilia intermixed on dorsal 1/5. Antenna orange ventrally, blackish brown dorsally, black pilose; arista brownish orange; basoflagellomere oval, about 3 times as long as pedicel, about 2/3 as broad as long.

Thorax: dark bluish black; scutum dark bluish black except yellowish on notopleuron, mesial to wing and postalar callus, sparsely grayish pollinose, yellow pilose; pronotum densely yellowish gray pollinose; scutellum yellow, black pilose except some yellow pile basolaterally, with ventral fringe yellow; pleuron sparsely grayish white pollinose, yellowish

white pilose; spiracular fringes, squama and plumula yellowish white; halter yellow. Legs: coxae and trochanters blackish brown, yellow pilose except with black pile intermixed apically; pro- and mesofemora yellow except basal 1/3 blackish brown, yellow pilose except for some black pile intermixed posteriorly; metafemur brownish black except apical 1/3 yellow, black pilose; pro- and mesotibiae yellow, yellow pilose; metatibia brownish orange, black pilose; protarsus brown except apical tarsomere orange, yellow pilose; mesotarsus orange on basotarsomere and apical tarsomere, brown elsewhere, yellow pilose; metatarsus brownish orange on basotarsomere and apical tarsomere, black elsewhere, black pilose. Wing: hyaline, microtrichose except bare basomedially as figured (Fig. 21).

Abdomen: black with yellow maculate pattern as figured (Fig. 19); 1st tergum bluish black, sparsely gray pollinose, yellow pilose; 2nd tergum black except for large yellow basolateral macula, with yellow macula isolated by black from lateral margin, black pilose except yellow pilose on macula and basolaterally; 3rd tergum black except for large yellow fascia, black pilose except yellow pilose on fascia; 4th tergum black except for large yellow fascia and apical margin, black pilose except yellow pilose on fascia; 5th tergum yellow except for basomedial narrow black fascia, black pilose; 1st sternum yellow except for small medial brown macula, long yellow pilose; 2nd sternum yellow except for large triangular black medial macula, long yellow pilose; 3rd sternum yellow except for large triangular black medial macula, long yellow pilose with short appressed black pile intermixed medially; 4th sternum yellow except for small brown medial macula, short appressed black pilose; 5th sternum yellow, appressed black pilose; terminalia yellow except 8th sternum largely black, black pilose. Male gentialia as figured (Fig. 20).

Female.—Similar to male; frons yellow pollinose laterally, brownish black pollinose medially, black pilose; vertex black, shiny except pollinose on ocellar triangle, black pilose; abdominal maculae not as sinuate

Holotype male.—CHILE, Valparaiso, 21 January 1960, S. Rojas, deposited in collection of the Suestacion Experimental La Cruz, La Cruz, Valparaiso, Chile.

Paratypes: same data as holotype (4 ♂ 17 ♀ USNM, Marnef, La Cruz); Santiago, Rinconada Maipu, 450 m., 27 April 1966, Malaise trap, N. Hichina & M. E. Irwin (2 ♂ 3 ♀ USNM, CAS, CNC); same data, 12 May 1966 (2 ♀ USNM, CNC); same data, 23 May 1966 (1 ♀ CNC); same data, 24 May 1966 (3 ♀ USNM, CNC, CAS); same data, 27-29 May 1966 (1 ♀ CNC). ARGENTINA. Catamarca: Ao El Pintado, s La Vina, 650 m, 27-29 Sept 1968, L. E. Pena (2 ♂ CNC); Jujuy, 15 km s Jujuy, 1100 m, 20 Oct 1958, L. E. Pena (1 ♂ CNC). ECUADOR: Azuay, Gualaduisa Road, 2150 m, 9 March 1965, L. E. Pena (1 ♂ CNC); Banos, Tunguraqua, 2-4 July 1965, L. E. Pena (1 ♂ CNC); Bolivar, Chota River, Carchi, 2000 m, 10 July 1965 (17 ♂ USNM, CNC); Taguando River, Northwest of Ibarra, 1650 - 1900 m, 9 June 1965 (5 ♂ USNM, CNC); Carchi, El Angel, 2700 m, 23-25 June 1965, L. E. Pena (1 ♂ CNC), 10 km sw Tulcan, 2900 m, 28 June 1965, L. E. Pena (1 ♂ CNC); Imbabura, Yaguarcocha, 3 km n Ibarra, 1950 m, 8-9 June 1965, L. E. Pena (1 ♂ CNC); Pichincha, 2 km w Cayambe, 2300 m, 7 June 1965, L. E. Pena (1 ♂) CNC). PERU. Cuzco, 5 km s Pisac, 2850 m, 22 Febr, D. M. Wood (1 ♂ CNC).

This new species description was prepared years ago for a joint publication on the flower flies of Chile. As this species is an important predator of the woolly apple aphid (*Eriosoma lanigerum* Hausmann), I have included Marnef's description here rather than delay it further.

The species is named after Sergio Rojas, the administrator of the Subestacion Experimental La Cruz, who collected, reared and provided much of the type series.

Eristalinus Mik

Eristalinus is an Old World group, of which a few species have been introduced into the New World (Thompson, *et alia* 1990) and now the south temperate region. *Eristalinus aeneus*, a species which will breed in brackish waters, was introduced and is now widespread in North America, ranging from Ontario to Maine, south to California, Texas and Florida. It has recently been discovered in southern Australia and New Zealand (Thompson, in preparation). It apparently was once introduced into Chile. While I have seen no specimens from Chile, *Eristalis concolor* Philippi was clearly based on a specimen of *aeneus* Scopoli (**new synonymy**). *Eristalinus (Eristalodes) taeniops* (Wiedemann) has been recently collected in Chile in 2 locations (**new distribution record**).

Xela Thompson & Vockeroth, **new genus**

Metallic blue punctate flies (Fig. 12). Head: Face concave, straight above oral margin, then obliquely produced anteriorly, broad, as broad as long, occupying about 1/2 head width, broadly short pilose laterally; gena narrow, only about 1/3 as broad as long; anterior tentorial pit short, extending along ventral 1/4 of eye; facial stipes indistinct; frontal prominence distinct, at middle of head; antennal pits confluent; frons of female broad, about as broad at antenna as long, long, about 1/3 longer than face, with slightly convergent sides above, about 3/4 as broad at vertex as at antenna; ocellar triangle medium sized, occupying medial 1/3 of vertex, not protuberant; occiput reduced laterally on ventral 2/3. Eye bare. Antenna elongate, about as long as face; basoflagellomere elongate, about twice as long as broad; arista bare.

Thorax: Short and broad, slightly broader than long; postpronotum pilose; anepisternum differentiated into flattened anterior 1/2 and convex posterior 1/2, with anterior 1/2 bare but covered with thick velvetlike microtrichiae; katepisternum continuously pilose, pile not separated into patches; notal wing shield absent; katepimeron bare, but with microtrichiae; metasternum pilose; plumula elongate; postmetacoxal bridge incomplete; scutellum with apical marginal sulcus, with a reduced ventral pile fringe; legs simple; mesocoxa bare posteriorly. Wing: Cell R4+5 blunt apically; vein M1 oblique except perpendicular on anterior 1/4 and at junction with vein R4+5; spurious vein absent; crossvein r-m distinctly basal to middle of cell DM, usually at basal 1/3 or less.

Abdomen: very short, broad, without marginal sulcus, strongly curved ventrally at 3rd segment, with apical segments directed anteriorly; sterna not reduced; lst abdominal spiracle embedded in metapleuron.

Type-species, *Xela alex* Thompson.

Xela belongs to the subfamily Eristalinae and tribe Eumerini. Phenotypically and probably phylogenetically most closely related to *Alipumilio* Shannon, and differs from that genus by its bare eye, blunt cell R4+5, differentiated anepisternum, simple metaleg, and lack of notal wing shield. Unfortunately, only females are known of *Xela*. The best characters for phylogenetic placement are those of the male genitalia. This genus was independently recognized by Vockeroth and Thompson some 25 years ago. We agreed to wait until the male was discovered before describing the group and who ever got the first male would describe the genus. Due to the pressing need for an identification key to the Neotropical

flower fly genera, I have welshed on the agreement. However, the name should be attributed to both of us as Vockeroth equally contributed to the diagnosis and naming of this taxon.

Xela is arbitrary combination of letters derived from the nickname of Dr. Charles Paul Alexander and is to be considered feminine. The name of the genus and the two included species are dedicated to Alex and Mabel Alexander, the most productive team of systematists ever. They described close to 11,000 new species, including some 10,000 crane flies, in addition to providing numerous catalogs and monographic treatments. Their publications total more some 1,017 titles, totaling over 20,000 pages and includes some 15,000 of his own figures. In the early years recognition was credited to Alex, but in later years authorship was shared for some works. Alex, however, personally proclaimed to all that he could not have achieved his record of publication and new taxa described without his faithful teammate, Mabel Margarita. So, we dedicate this genus to the Alexanders and the two included species to each team member.

Key to the species of *Xela*

1. Antenna orange; frontal prominence not greatly produced; wing hyaline; crossvein r-m at level of end of subcosta; 4th costal section shorter than 5th . . . . . *margarita*
— Antenna black; frontal prominence greatly produced; wing bicolored, dark brown basally, light brown apically; crossvein r-m slightly beyond end of subcosta; 4th costal section equal to 5th . . . . . *alex*

Xela alex Thompson, **new species**

Iridescent bluish black. Head: Shiny; face, gena, frons, and ventral 1/2 of occiput white pilose; rest of head black pilose; antenna black, black pilose.

Thorax: Shiny, black pilose; halter, plumula black; calyter with ventral lobe white, dorsal lobe black. Wing: basal 1/2 dark brown, apically orangish brown, microtrichose; lst vein long, making 4th costal section as long as 5th.

Abdomen: Shiny, white pilose, except grayish black pollinose on lst and basomedial 2/3 of 2nd tergum, black pilose on basolateral corner of 2nd tergum and basal 1/2 of 3rd tergum.

Holotype female.—BRAZIL, Santa Catarina, Nova Teutonia, 27°11' South, 52°23' West, November 1967, Fritz Plaumann, from his personal collection and to be deposited in Museu de Zoologia, Universidade de Sao Paulo. Paratypes: same locality and collector, but with following dates, November 1966 1 ♀ (CNC), November 1969 1 ♀ (CNC), December 1972, 1 ♀ (USNM), November 1971, 1 ♀ (USNM). PARAGUAY, San Bernardino, 6 Dec, K. Fiebrig S. V. 1 ♀ (ZMHU).

The species group name is based on the nickname of Dr. Charles Paul Alexander and is to be treated as a noun in apposition.

Xela margarita Thompson, **new species**

Female.—Same as *alex* except as noted in key.

Holotype female.—BRAZIL, Sao Paulo, Cantareira, Chapadao, November 1946, Barretto, deposted in Museu de Zoologia, Universidade de Sao Paulo.

The species group name is based on the middle name of the wife of Dr. Alexander, and is to be treated as a noun in apposition.

Ohmyia Thompson, **new genus**

Fig. 11.

Head: Face yellow except for brown median vitta, broad, as broad as long, occupying about 1/2 head width, concave beneath antenna, with large low medial tubercle, pollinose and pilose laterally, shiny and bare medially; gena broad, as broad as long; anterior tentorial pit short extending along ventral 1/4 of eye; facial stipes indistinct; frontal prominence distinct, at dorsal 3/5 of head; frontal lunule large, black; frons broad, about 3/4 as long as broad at antenna, with slightly convergent sides dorsally, about 2/3 (male) or 4/5 (female) as broad at vertex as at antenna, pollinose and pilose; vertex square, as long as broad, pollinose and pilose; ocellar triangle equilateral, large; eyes bare, broadly dichoptic in male; antenna short, about 1/3 as long as face; basoflagellomere oval; arista bare, about 1 1/2 times as long as antenna.

Thorax: slightly broader than long (1.1), long pilose; mesonotum with pollinose vittae; katepisternum continuous pilose; metasternum pilose; katepimeron bare; anepimeron with dorsomedial and posterior portions bare; metathoracic pleuron with some pile venter to spiracle; metathoracic spiracle large, about twice as large as basoflagellomere; plumula elongate; scutellum without apical sulcus, with ventral pile fringe. Legs: Simple; mesocoxa bare posteriorly; metatibia transverse apically, not carinate. Wing: Cell R1 open; stigmatic crossvein absent; cell R4+5 with short petiole, shorter than humeral crossvein.

Abdomen: Oval, about 2/3 as broad as long.

Type-species, *Ohmyia omya* Thompson.

Within the current classification of flower flies, *Ohmyia* falls into the subtribe Helophilina of tribe Eristalini, subfamily Eristalinae. Among the genera of Helophilina, *Ohmyia* is most closely related to either *Helophilus* or *Lejops*. The lack of stigmatic crossvein suggests a relation with *Helophilus*, and the enlarged ocellar triangle and broadly dichoptic males suggest a relation with *Lejops* (*Asemosyrphus*). *Ohmyia* is distinct from all other helophiline flower flies by the following combination of characters: 1) broadly dichoptic males; 2) enlarged ocellar triangle; 3) stigmatical crossvein absent; and 4) metatibia simple, without basoventral or apical carina.

Ohmyia is arbitrary combination of letters derived from the colloquial english expression, "Oh, my" and is to be considered feminine.

Ohmyia omya Thompson, **new species**

Male.—Head: Face yellowish white and yellowish white pollinose except for shiny brown medial vitta on ventral 4/5, white pilose; gena shiny brown on anterior 1/2, black and white pollinose posteriorly, white pilose; frontal lunule brownish black; frons orange, yellowish white pollinose, black pilose except for some white pile basolaterally; vertex black, yellowish gray pollinose, black pilose; occiput black, yellowish white pollinose, white pilose except for some black cilia on dorsal 1/4. Antenna black.

Thorax: Postpronotum orange, yellow pollinose and pilose; mesonotum black, gray and yellow pollinose, black pilose except yellow pilose between postpronota and anterior to base of wings; yellow pollinose areas in form of a medial, pair of submedial and lateral vittae; postalar callus brownish orange, gray pollinose, black pilose; scutellum orange, sparsely white pollinose, black pilose on disc, yellow pilose marginally; pleuron black, gray polli-

nose; propleuron yellow pilose; mesopleuron mainly yellow pilose, with some black pile dorsally; anepimeron black pilose with some marginal yellow pile; katepisternum yellow pilose; halter, calyter orange; plumula white; calypter fringes white. Legs: Coxae, trochanters black, gray pollinose, black pilose except white pilose basolaterally on procoxa; femora black except orange on apical 1/3, black pilose except yellow pilose posterobasally; tibiae brownish orange on basal 1/2, black apically, black pilose; tarsi black, black pilose. Wing: Hyaline, microtrichose.

Abdomen: 1st segment black, gray pollinose, yellow pilose; 2nd tergum yellow except for black basomedial triangle on basal 2/3, dull yellow pollinose, yellow pilose except black pilose on apical 1/4; 3rd tergum yellow except for brown apical 1/4, dull yellow pollinose except shiny apical 1/4, yellow pilose except black pilose on apical 1/4; 4th tergum yellow on basolateral 1/3, brown elsewhere, dull yellow pollinose except shiny apical 1/3, yellow pilose except black pilose on apicomedial 1/2; genitalia brownish black, yellow and black pilose (Fig. 22).

Holotype male.— PERU, Lamayeque, 5 miles south of Chiclayo, 20 m, 17 January 1955, E. I. Schlinger and E. S. Ross, deposited in California Academy of Science, San Francisco.

Paratypes: PERU, Lamayeque, 5 miles south of Chiclayo, 20 m, 17 January 1955, E. I. Schlinger and E. S. Ross, 1 ♂ (USNM); Huacahina, ICA, E. Escomel, 1 ♂ 1 ♀ (AMNH); Canete, 15 September 1942 & 25 January 1942, E. J. Hambleton, 3 ♀ (USNM); Huacahina near ICA, Dec 1951, W. Weyrauch, 1 ♂ 2 ♀ (WKW 6139, CNC), Pucusana, July 1951, W. Weyrauch, 2 ♀ (WKW 6647, CNC); Banos de Boza bei Chancay, Jan 1953 (1 ♂ WKW 6139-A); ICA, Huacahina, Dec 1951, L. Gozales (1 ♂ VA 2511-68, CNC). CHILE, Arica, 5 Nov 1902, W. Schnuse (1 ♀ SMT).

The specific name, omya, is an arbitrary combination of letters derived from the colloquial english expression, "Oh, my" and is to be treated as indeclinable.

Palpada megafemur Thompson, **new species**

Male.—Head: Face black except brownish tubercle, white pollinose except shiny medial vitta on ventral 2/3, yellow pilose; gena black, shiny on anterior 1/2, white pollinose elsewhere, white pilose; frontal lunule orange; frontal triangle black, yellow pollinose and pilose; vertical triangle black, gray pollinose except black pollinose ocellar triangle, yellow pilose; occiput black, grayish white pollinose, yellow pilose; antenna orange, orange pilose; eye white pilose.

Thorax: Black except yellow scutellum; postpronotum yellowish brown pollinose, yellow pilose; mesonotum yellow pilose except black pilose on postalar callus and mesiad to that callus, yellowish brown pollinose on anterior 1/2 except for a narrow black pollinose fascia behind postpronotum, sparsely gray pollinose on posterior 1/2 except for narrow black pollinose fasciae between wings and anterior to scutellum; scutellum yellow except narrowly black on base, yellow pilose; pleuron gray pollinose, yellow pilose; calyter, plumula and halter orange; mesothoracic spiracular fringe brownish white; metathoracic spiracular fringe dark brown. Legs: Coxae, trochanters black, gray pollinose, yellow pilose; femora black except becoming brownish to orange on apical 1/4, shiny except mesofemur sparsely gray pollinose on apical 2/3, black pilose except yellow pilose on basoposterior 3/4 of pro- and mesofemora and basoanterior 3/4 of metafemur; tibiae orange, orange pilose except black pilose ventrally on mesotibiae; tarsi orange, black pilose; metafemur (Fig. 23) greatly

enlarge, ventral margin sinuate, with a large ventral tubercle on basoposterior 1/3; metatibia with anteroventral carina which is prolonged into a posteroventral apical spur. Wing: Light brown, microtrichose except bare as follows: posterobasal 1/4 of 2nd costal cell, anterior to Rs, basal 1/2 of cell R, anterobasal 1/5 of cell CuP and anterior to axillary vein.

Abdomen: 1st tergum black, gray pollinose; 2nd tergum yellow except for small basomedial triangular maculae; 3rd tergum yellow, with indistinct dark medial vitta, yellow pilose except for some black pile apicomedially; 4th tergum brownish black on basal 2.3, yellow apically, dark brownish black pollinose basomedially, light yellowish brown pollinose laterally, yellow pilose; 1st sternum black, gray pollinose, white pilose; 2nd and 3rd sterna yellow, white pollinose, white pilose; 4th sternum brownish black except yellow apical margin, gray pollinose, white pilose. Male genitalia (Fig. 24): orangish brown, yellow pilose.

Holotype male.—BRAZIL, Parana, Curitiba, 28 February 1976, H. S. Telford, Malaise Trap, to be deposited in Museu de Zoologia, Universidade de Sao Paulo.

Paratypes: Parana, Villa Velha, 9 October 1965, Mitchell & V. Graf, 1 ♂ (USNM); Parana, Campo Mourao, 8 December 1965, V. Graf & L. Azevedo, 1 ♂ (MZFUP); Sao Paulo, Rio Tamandua, Ribeirao Preto, December 1953, M. P. Barretto, 2 ♂ (MZUSP, USNM).

The species-group name, *megafemur*, is based on the enlarged metafemur and is to be considered a latin noun in apposition to the name of its genus.

Palpada megafemur is a member of the *scutellaris* group. In the last comprehensive key to the New World species of *Eristalis* (includes *Palpada*)(Curran 1934: 407), this species will run to *mirabilis* Hull, but is readily distinguished from that species and all other known *Palpada* species by its enlarged metafemur.

Palpada suprarufa Thompson, **new species**

Male.—Head: Face brownish yellow, gray pollinose, orange pilose; gena brownish black, gray pollinose, bare anteriorly, yellow pilose posteriorly; lunule large, shiny, orange; frontal triangle brownish yellow, light gray pollinose, orange pilose except for a few black pili anteromedially; vertical triangle black, brownish pollinose, orange pilose; eye contiguity twice as long as vertical triangle, about 4/5 as long as frontal triangle; eye densely brownish orange pilose; antenna orange, black pilose; arista bare; occiput brownish black, white pollinose, orange pilose.

Thorax: mainly black; postpronotum orange, gray pollinose, orange pilose; scutum black, black pollinose except broadly brownish orange and gray pollinose laterally, orange pilose except apices of some pili black and postalar callus black pilose on posterior 1/2; scutellum reddish orange, dull, orange pilose; pleura black, gray pollinose, reddish-orange pilose except pectus black pilose; calypter brownish black; plumula brownish orange. Wing: hyaline, bare; tegula and basicosta black pilose. Legs: coxae and trochanters black, black pilose; femora black except apices narrowly orange, black pilose; protibia black, black pilose; mesotibia brownish orange, black pilose; metatibia flatten, broad, black, black pilose, with pile on dorsal edge forming ciliate brush; tarsi orange, orange pilose.

Abdomen: Dorsum mainly reddish orange, black only on 1st, narrowly basomedially and medially on 2nd and with a black triangular basomedial macula on 3rd tergum, reddish

orange pilose; sterna brownish blac, gray pollinose, white pilose except black pilose on 4th sternum; male genitalia shiny black, black pilose.

Female.-similar to male except for normal sexual dimorphism and: front orange, orange pilose; 5th tergum black, black pilose.

Holotype male.—ECAUDOR, S Otavalo, 3100-3300 m, 8-9 January 1971, L. E. Pena, deposited in Museu de Zoologia, Universidade de Sao Paulo, Sao Paulo.

Paratypes: ECUDATOR. Quito: E Papallacta, 2900 m, January 1971, L. E. Pena, 1 ♀ (MZUSP); Pichincha, 28 miles south Quito, 22 February 1955, E. I. Schlinger & E. S. Ross, 1 ♀ (CAS); Pimo (N. Canar), 3200 m, 10-12 December 1970, L. E. Pena, 1 ♂ (USNM).

The species-group name, *suprarufa*, is based on the appearance of the species (the big red one) and is to be considered a latin adjective in agreement with the name of the genus.

Palpada suprarufa is a member of the *vinetorum* group. In the last comprehensive key to the New World species of *Eristalis* (includes *Palpada*)(Curran 1934: 407), this species runs to couplet #54, *testaceicornis* (= *mexicana*), but is quite distinct from *mexicana*. *Palpada suprarufa* is related to *ruficeps* Macquart and *bistellata* Hull. These 3 species belong to the *vinetorum* species group, but differ from all other members of that group in having the wing completely bare. They share with the other members of the group the pilose posterior anepimeron and flatten ciliate metatibia, both characters lacking in the members of the *agrorum* group (the bare wing species). The differences among these species are outlined in the following couplets.

Key to the species of related to *Palpada ruficeps*

1. Metatarsus black; pleuron entirely yellow to orange pilose; calypter orange; scutellum and scutum laterally yellow to orange, orange pilose (Colombia to Peru) . . *ruficeps*
— Metatarsus pale, orange to red; pleuron at least black pilose on ventral 1/3 of katepimeron; calypter dark, brownish to black 2

2. Scutum and scutellum black, black pilose; abdomen black except for large quadrate yellow macula on 2nd tergum (Costa Rica to Peru) . . . . . *bistellata*
— Scutellum, postpronotum and scutum laterally reddish orange; mesonotum and scutellum entirely reddish orange pilose; 2nd thru 4th terga red except for narrow basomedial black vitta (Ecuador) . . . . . *suprarufa*

Palpada lindneri Thompson, **new species**

Figs. 16-18.

Female.—Head: Black; Face shiny except white pollinose under antenna, yellow pilose; gena white pollinose, yellow pilose; frontal lunule brownish; frons shiny on ventral 1/2, brown pollinose on dorsal 1/3, yellow pollinose medially, yellow pilose; vertex yellow pilose and pollinose; occiput white pollinose ventrally becoming yellow dorsally, yellow pilose; antenna brown, black pilose; basoflagellomere oval, with small basomedial sensory pit on inner side; arista orange; eye bare except for 2 dense fascia of short black pile.

Thorax: Mainly black; postpronotum orange, orange pilose; mesonotum yellow pilose, yellowish gray pollinose except for shiny vittae on posterior 1/2 and slightly darker brown pollinose medially on anterior 1/2 to accentuate a pair of submedial pollinose vittae; shiny vittae consist of a narrow medial vitta, broader submedial vittae and narrow supraalar vittae; postalar callus orange, orange pollinose, orange pilose; scutellum orange, shiny except

orange pollinose medially, orange pilose; pleuron grayish white pollinose, yellow pilose; katepisternum generally pilose, pile not separated into patches; ampulla, plumula, calyter and halter all orange. Legs: Coxa black, grayish white pollinose, yellow pilose; trochanters orange, shiny, yellow pilose; pro- and meso legs orange, shiny, yellow pilose except with black pile intermixed on apical 1/2; metafemur swollen, dark brown except paler orange on base and apex, yellow pilose except with black pile intermixed ventrally and on dorsoapical 1/2; protibia orange on basal 1/3, brown apically, yellow pilose basally, black pilose elsewhere; mesotibia orange except slightly yellower on base and browner on apex, yellow pilose except with some intermixed black pile apically; metatibia brown except yellow on base and orange on apex, swollen, transverse apically, yellow pilose on basal 1/3, black pilose elsewhere, with distinct pile fringes; protarsus brownish orange, yellow and black pilose; meso- and metatarsi orange, yellow pilose. Wing: Epaulet, basicosta orange pilose; stigmatic crossvein distinct; hyaline and bare except brownish and microtrichose on apical 1/2; microtrichose on apical 1/2 of cell R1, cell R2+3, cell R4+5, and cell DM, apical 1/3 of cell R, sparsely on apical 1/2 of cell BM and cell CuP, sparsely on cell CuA1.

Abdomen: Dorsum black except yellow apical margins of 2nd thru 4th tergum; lst tergum gray pollinose, white pilose; 2nd tergum gray pollinose medially on basal 2/3, dark brownish pollinose along anterior margin of yellow apical margin, yellow pilose; 3rd and 4th terga shiny on basal 1/2, dark brownish pollinose medially, yellow on apical 1/2, yellow pilose except for some black pile apically; 5th tergum shiny medial 1/3, gray pollinose elsewhere, black pilose.

Holotype female.—Bolivia. Santa Cruz: San Jose de Chiquitos (17°51' S 60°47'W), October 1925, E. Lindner, Deutsches Chaco Expedition, deposited in Senckbergishes Museum, Frankfurt am Main. The actual locality label reads "San Jose N-Arg, X.25 Lindner, D. Chaco-Expedt." However, it is clear from Lindner's description of his travels that this locality is actually in Bolivia (Lindner 1928).

Paratype: Male.—Argentina. Dept. Resistencia, Chaco, Oct-Dec 1935, J. B. Daguerro (MACN).

This very distinctive species is based a specimen found in the Sack Collection and labeled by him as "*Eristalis fasciatus* Mg." *Eristalis fasciatus* Meigen is a junior synonym of *Eristalinus megacephalus* (Rossi), a widespread tropical Old World species, quite unlike *Palpada lindneri*. *Palpada lindneri* is easily distinguished from all Neotropical *Palpada* species by its distinctive abdominal pattern. In the last comprehensive key to the New World species of *Eristalis* (*sensu lato*, includes *Palpada*)(Curran 1934: 407-411), *lindneri* runs to *distinguenda* Wiedemann and is distinguished from this species by its microtrichose wings. Vockeroth (*in litt.*, also Thompson 1981: 147) suggested that the species of *Palpada* can be divided into three groups. *Palpada lindneri* belongs to *vinetorum* group as the wings are microtrichose apically, but it lacks the apicolateral tooth on the metatibia.

Orthonevra chilensis Thompson, **new species**

Male.—Head: metallic steel blue; face straight except ventral 1/5 produced anteriorly, strongly rugose, shiny except for white pollinose triangular macula laterad to antenna, with this macula widely separated from antennal base, white pilose; gena shiny, rugose, white pilose; frontal triangle shiny, rugose, white pilose; frontal lunule smooth; vertical triangle black, black pilose; dichoptic, eyes separated by about width of anterior ocellus; occiput

white pollinose, white pilose, with pollenosity sparse dorsally and ventrally; eye brown, with a distinct medial dark [purple in life?] vitta, may have an additional zig-zag fascia on anteromedial face, otherwise without pattern. Antenna orange, except basoflagellomere more brownish on apical 2/3; scape and pedicel subequal, about as long as broad; basoflagellomere elongate, about 3 times as long as scape.

Thorax: metallic steel blue; pile short and appressed, white on steel blue areas, black on darker areas; mesonotum with darker blackish blue submedial and sublateral vittae; squama and plumula white; halter orange. Legs: white pilose, sparsely grayish pollinose, metallic bluish black except tibiae and basotarsomere brownish orange and apical tarsomeres brownish black. Wing: brownish, densely microtrichose, venation as figured.

Abdomen: metallic steel blue; dorsum extensively dull black pollinose, shiny on lateral 1/4 of 1st tergum, in form of basolateral maculae on basal 1/2 of 2nd and 3rd terga, and lateral 1/3 of 4th tergum; sterna shiny, white pilose. Male genitalia: as figured.

Holotype male.—Chile. Vina del Mar, 4 April 1917, P. Herbst, deposited in Naturhistorische Museum, Wien.

Paratypes. Chile. Coquimbo: Tilama, El Naranjo, October 1967, 4 ♂ 5 ♀ (UCS, USNM), January 1969, 3 ♀ (UCS, USNM).

Macrometopia Philippi

While *Macrometopia* is clearly a valid genus, I am unsure whether all the species here included in it form a monophyletic group. The two newly included species share with *atra* Philippi, the type species, the characteristic pilose eyes, an unique attribute among the members of the tribe Milesiini, as well as other characters, such as pleural pile patterns. Unfortunately, these newly included species are known only from the female sex, so various critical characters of the male genitalia can not be verified. These species, however, share one distinctive trait: They are rarely collected and are restricted to the high elevations (paramo?) in the Andes.

Key to the species of *Macrometopia*

1. Face bare; scutellum orange; tibiae orange; wing brownish apically; thorax and abdomen golden pilose (Venezuela) . . . . . *montensis*
— Face pilose; scutellum dark, bluish black; thorax and abdomen white and black pilose 2

2. Wing hyaline, extensively microtrichose; scutellum without pile tufts; tibiae extensively orange, rarely with apical 1/3 or less dark; calyter margin and fringe white (Chile, Argentina) . . . . . *atra*
— Wing brown maculate, extensive bare; scutellum with medial tufts of black pile; tibiae extensively black, only basal 1/8 orange; calyter margin and fringe black (Colombia) . . . . . *maculipennis*

Macrometopia montensis (Hull), **new combination**

Nosodesus montensis Hull, 1938: 122. Type-locality: Venezuela, Aragua, Colonia Tevor, 6000-7000 ft. Holotype ♀ Carnegie Museum, Pittsburgh.

When the Catalogue of Neotropical Syrphidae was prepared the status of this species was unknown (Thompson, *et alia* 1976: 122). I have examined the unique type of *montensis*

Hull, which is in poor condition. The species belongs to *Macrometopia* Philippi. *Nosodesus* is a synonym of *Dolichogyna* Macquart (Thompson 1972: 134).

Macrometopia maculipennis Thompson, **new species**

Female.—Head: Metallic steel blue; face sparsely white pollinose except on tubercle and along oral margin, white and black pilose, with tubercle large and prominent; gena white and black pilose, white pollinose; frontal lunule dark brownish orange; frons shiny except medial 1/3 white pollinose, black pilose except white on pollinose area; vertex shiny, black pilose; occiput white pollinose and pilose, with some black pile on dorsal 1/6; eye long black pilose; antenna black, black pilose; basoflagellomere trapezoid, with a large basomedial sensory pit on inner side.

Thorax: Mesonotum largely shiny, white pollinose anteriorly, with a pair of interrupted medial white pollinose vittae, with a pair of supraalar white pollinose vittae, with a pair of white pollinose maculae at mesial ends of transverse suture, black pilose except with white pile anteriorly and on notopleuron; postalar callus black pilose except for some white pile anteriorly and laterally; scutellum shiny, with dense medial tufts of black pile, with rest of disc black pilose, with white pile anteriorly and laterally, with a dense ventral fringe of white pile; pleuron sparsely white pollinose, white pilose except with black pile intermixed on anepisternum and between pro- and mesocoxae; halter orange with brown head; calyter white with black margin and fringe; plumula black. Legs: bluish black except orange femoral-tibial joints and apices of pro- and mesotibiae, black pilose except for white pile posterobasally on mesofemur and anteriorly and ventrally on metafemur. Wing: Hyaline and microtrichose except for brown maculae and bare area as figured.

Abdomen: Shiny except sparsely pollinose on 1st segment and sterna; dorsum black pilose except white pilose on laterally on lst tergum, basolaterally on 2nd tergum, on basal 1/3 of 3rd tergum, and basal 1/2 of 4th and 5th terga; venter white pilose except black on 5th sternum.

Holotype female.—COLOMBIA, West Cordillera, Monte Soccore, 3800 m., Fassl deposited in British Museum (Natural History), London.

Paratype: a female with same data (USNM); PERU ["Nord Peru"], Huancabamba, 3000 m, H. Rolle V. 1 ♀ (ZMHU).

Macrometopia maculipennis is named for its patterned wings.

Glossary of characters and terms used in flower fly taxonomy

Most of the characters used in the key are the well known traditional ones and some are herein identified by reference to figures 1-10. More detailed information about these characters and others, as well as illustrations of them, can be found in the following basic references: Williston, 1887: 272-278; Shannon, 1922: 117-120, 1926a: 6-7; Hull, 1949: 259-268; Vockeroth, 1969: 17-23; Thompson, 1972: 77-84, 201, 1981: 13, 35-37; Hippa 1986; Speight 1987; Vockeroth & Thompson 1987: 713-717. Of these, the best and most comprehensive study of external morphology is that by Speight (1987). While the characters are the same, the nomenclature for them varies widely among these works. I have standardized on the nomenclature used in the new *Manual of Nearctic Diptera* (McAlpine 1981) except for a few words. I have used the classic Latin terms instead of their english equivalent as this makes my nomenclature more international. For examples, instead of "hairy," I have used *pilose*; instead of "band," *fascia*; instead of "stripe," *vitta*; instead of "upper," *dorsal*; instead of "fore, mid and hind" for legs and/or their components, *pro*, *meso* and *meta* are used; *et cetera*. This glossary equates the various terms used in flower fly literature with those used here. Terms in boldface are considered appropriate, inappropriate terms are in normal typeface.

abdomen. The posterior division of the insect body.

abdominal margin (Vockeroth 1969: 20) or "margined" (Curran 1925: 16) refers to the condition of having a premarginal sulcus on the abdomen.

aedeagal apodeme. A elongate rod anterior to and articulating with the aedeagus, where the attached muscles cause the motion of the aedeagus.

aedeagus. The male phallic organ, the median structure of the male genitalia, surrounded by hypandrium. In Syrphidae, articulating with the hypandrium dorsally and ventrally and laterally with the superior lobes (parameres).

alula is a broad lobe on the posterior base of the wing. The size, shape and vestiture of the alula are useful species characters.

anal cell. Same as cell CuP.

anal lobe is the area of the wing posterior to cell CuP. This area is frequently reduced in species with petiolate abdomens. The presence of absence of microtrichia on various areas of the anal lobe is a useful species character.

anatergum. The posterodorsal plate of the mesothoracic pleuron. The laterotergite (in part) of earlier authors. In some groups (*Allobaccha*) with a tuft of long pile.

anepimeron. Same as pteropleuron of earlier authors. Three distinct areas are recognized for taxonomic purposes: anterior, posterior and dorsomedial portions. The anterior portion is always pilose, the posterior is occassionally pilose and dorsomedial is only pilose in some eristaline genera (*Eristalinus*).

anepisternum. The anterodorsal plate of the mesothoracic pleuron. Mesopleuron of earlier authors. In Syrphidae, the anepisternum is differentiate into a flattened anterior portion and a convex posterior portion. The pilosity of these areas vary, forming a critical generic character.

antecoxal piece (Shannon, 1922: 120). Same as metasternum.

antenna. A multisegmented sensory organ situated anteriorly on the head between the frons dorsally and the face ventrally. The shape of the antenna is one of the most widely used

character for recognition of genera; within genera the shape is usually constant, but antennal color does vary. The antenna consists of four major parts: the scape, pedicel, basoflagellomere and arista (*q.v.*). Traditionally, these were referred to as segments.

antennal prominence (Curran 1925: 14). Same as frontal prominence.

antennifer. A special term used for the frontal prominence in some taxa of the tribe Cerioidini where the frontal prominence is greatly elongate and very narrow.

anterior (adv. anteriorly). Adjective (adverb) meaning before, in front, toward the head end. Opposite of posterior. See Orientation.

anterior crossvein. Same as crossvein r-m.

anterior mesonotal [pile] collar (Vockeroth 1969: 18) refers to a transverse row of erect long pile on the anterior edge of the mesonotum. The collar is found in *Asarkina* and various species groups of *Ocyptamus*.

anterior tentorial pit. See tentorium.

apical (adv. apically). Adjective (adverb) meaning toward apex. See Orientation.

apical cell. Same as cell R4+5.

apical crossvein. Same as vein M1.

appendix. A supplementary extension of a crossvein or vein.

arcuate. Adjective for a macula or fascia which is slightly curved. The adjective lunulate is used for a more deeply curved macula. See Markings.

arista. The apical flagellomeres are usually reduced to a bristle-like structure, termed the arista. In most syrphids, the second and third flagellomeres are very small and only the fourth is greatly elongate; together they are termed the arista. In some groups (*Argentinomyia*), the third flagellomere is elongate. The usual number of flagellomeres in syrphids is three, not two as erroneously stated by McAlpine (1981: 16). The arista varies in its insertion point from dorsobasal to apical and may be bare, pectinate or plumose. See Antenna.

aristomere. The flagellomeres that make up the arista are sometimes referred to as aristomeres.

armature. Armature can consist of both extension of the exoskeleton and vestitute (*q.v.*), but discussion is here limited to large multicellular extensions of the exoskeleton. The terminology used for armature of flower flies, especially of their legs, has been inconsistent with that used for other insects. For example, various authors refer to the metacoxal spur when spine is appropriate and use spines for setae. Following Snodgrass (1935: 69, also Torre-Bueno (Nichols 1989)), spine and spur are restricted to large elongate extension of the exoskeleton, which either articulate (spurs) or not (spines), but because these terms have been misused so extensively in flower fly literature, I will henceforth use their latin equivalents (**calcar** for spur, **spina** for spine). Other non-articulating forms of armature are: dentis (teeth), liminae (plates) and carinae (ridges). A **dens** (tooth) differs from a spina in being short, only as long as broad or shorter than broad, whereas spinae and calcaris are much longer than broad. **Carina** is sharp low ridge, which when greatly extended so as to become large, thin extension, is termed **lamina** (plates). A **ctenidium** (comb) is a closely set series of spinae. **Tubercle** is a large rounded protuberance of the exoskeleton.

axillary lobe (Hull 1949: 260). Same as alula.

axillary vein (Hull 1949: 260). Same as vein A2.

band. Same as fascia.

bare. The condition of lacking pile, or when referring to the surface of the wing, lacking microtrichia. See vestiture.

barrette. Same as katepimeron.

basal (adv. basally). Adjective (adverb) meaning toward the base. See Orientation.

basal cells. Use cell R and BM.

basale. Same as epandrium (q.v.).

basicosta is a small scale-like structure anterior to the base of the vein C. Humeral plate of Speight (1987: 159).

basitarsis. Same as basotarsomere.

basoflagellomere. The third antennal segment of classical authors, but not a true segment. The first flagellomere is always greatly enlarged and varies greatly in shape. The shape is used extensively as a generic and specific character. See Antenna.

basotarsomere. The first tarsomere.

beaded as an adjective referring to the abdomen (Shannon 1926b). Same as abdomen with premarginal sulcus.

bristle. Same as seta.

calcar (pl. calcaris, adj. calcarate). An articulating elongate extension of the exoskeleton. In syrphids, this term is usually restricted to an apicoventral extension of the metafemur, such as in *Spilomyia* or the apical extensions of the scutellum, such as in *Microdon*. Spur of Snodgrass and Torre-Bueno. See armature.

calypter (pl. calypteres). The membrane connecting the thorax to posterior base of the wing forms two lobes, the calypteres. When the wing is folded, the calypteres are likewise, with the lobe attached to the thorax is referred to as the ventral calypter as it is lower in position and, the other lobe, the dorsal calypter, is upper in position. As a concession to standardization, the term calypter is used for squama. As Osten Sacken (1896, 1897) explain a century ago, the squama is the earlier (defined by Linnaeus 1758: 584) and more general term (hence, appropriate) for these structures, but as calypter became in more general use as the basis of the common terms for the two major groups of higher flies (acalypterates and calypterates), specialists (such as McAlpine) on those groups have insisted on standardizing on the specialized term, which is unique to Diptera.

carina (pl. carinae, adj. carinate). A sharp raised ridge-like extension of the exoskeleton. See armature.

cells. The cells of the wing are labelled on figure and are referred to by the name of the vein that forms the anterior margin of the cell.

cephalad. Same as anterior.

ceratostylate. An adjective introduced by Crampton (1942: 42) for a terminal arista which is short and thick, such as found in *Callicera* and Cerioidini.

cercus (pl. cerci). Plate laterad to the anus.

cheek. Same as gena. While cheek as used in classical dipterology is not the same as the morphological region termed gena, gena is used as its equivalent. Cheek was (and now gena is) used for the area ventrad of the eye.

cilia is the term used for the long, distinct pile found on the occiput.

claw. Apicodorsal projections on the apex of the tarsus.

comb. Same as ctenidium.

compound eye. Same as eye.

costal sections. The vein costa can be viewed as a series of sections defined by the various veins and crossvein that terminate in the costa. So, the first costal section is the area between base of the costa and crossvein bc, the second between bc and end of vein SC, third between end of vein SC and vein R1, fourth between vein R1 and R2+3 and the fifth between vein R2+3 and vein R4+5.

coxa (pl. coxae). The basal segment of the leg.

crossvein is a short vein connecting long veins and are referred to by the names of the two veins connected (lowercase) separated by a hyphen, such as crossvein r-m.

cubital cell. Same as cell CuA1.

dens (pl. dentis, adj. dentate). A large non-articulating extension of the exoskeleton that is as wide or wider than high. Same as tooth (teeth). See armature.

dichoptic is the condition when the eyes are separated. Females are always dichoptic, males may be dichoptic. The alternative condition is holoptic (*q.v.*).

discal cell. Same as cell dm.

distal. Same as apical.

dorsal (adv. dorsally, dorsad). Adjective (adverb) meaning of or belonging to upper surface. Opposite of ventral. See Orientation.

ejaculatory apodeme. Median sclerotized structure of the sperm pump to which the muscle are attached. In shape, ranges from a simple short rod to a triangular plate to umbrella-shape piece.

emarginate. An adjective used in phrases such as "scutellum emarginate" or "abdomen emarginate." This condition is here referred as "scutellum with premarginal sulcus." See premarginal sulcus.

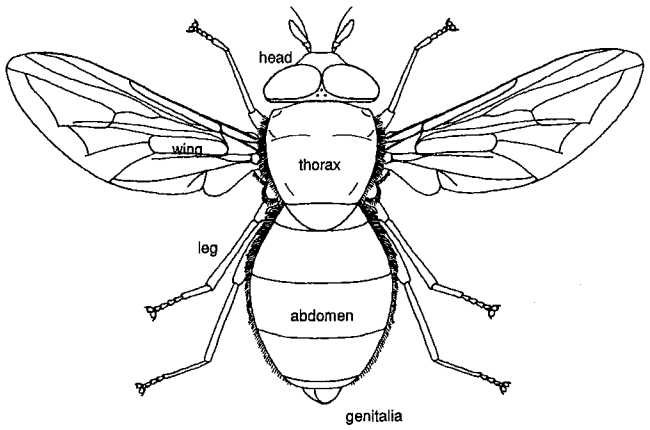

Fig. 1. Body parts, dorsal view.

epandrium is the dorsal sclerite (9th tergum) of the male genitalia to which the surstyli are attached. Speight (1987: 166) to avoid controversy caused by using terms linked to particular theories of origins of genitalic sclerites uses basale for the epandrium and theca for hypandrium.

epaulet. Same as tegula.

eye is the term used for the large compound eye that occupies most of the side of the head. The small simple eyes on the vertex are referred to as ocelli (*q.v.*).

eye contiguity. In males, when the eyes are holoptic, the line of juncture is termed the eye contiguity. The length of this contiguity varies significantly in some genera (*Palpada*) and is a useful species character.

face. The anteroventromedial area of the head, bordered laterally by the eyes and genae, dorsally by antennae and frons, and ventrally by subcranial cavity where the mouthparts are situated. Sometimes there is a distinctly demarked region between the face and eyes, this area being the paraface (*q.v.*). The shape of the facial region is one of the most important characters for the higher classification of syrphids (see Thompson 1972: 77).

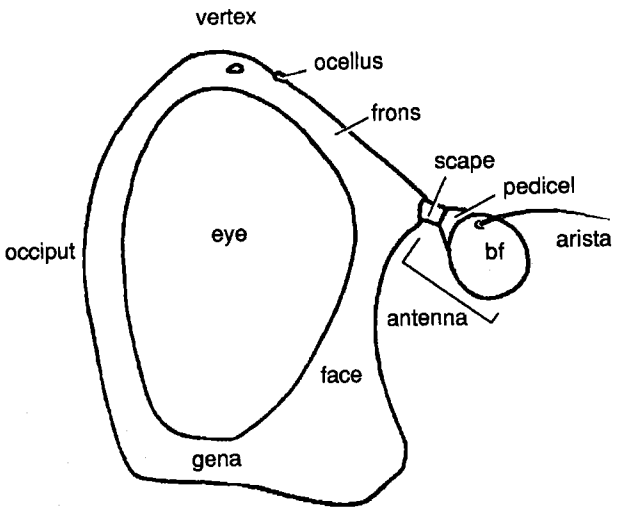

Fig. 2. Head parts, lateral view. bf = basoflagellomere.

facet. The cornea of the individual ommatidia which make up the compound eye.

facial groove. Same as anterior tentorial pit.

facial pit (Curran 1925: 14). Same as anterior tentorial pit.

facial stripes. Same as paraface.

facial tubercle. See tubercle.

fascia (pl. fasciae, adj. fasciate) is a transverse (lateral to lateral) line.

femur (pl. femora). The third segment of the leg.

fifth vein. Same as veins Cu (basally) and CuA1 (apically).

first antennal segment. Same as scape.

first basal cell. Same as cell R.

first vein. Same as veins R (basally) and R1 (apically).

first posterior cell. Same as cell R4+5.

flagellomere. A division of the flagellum. In Syrphidae and most higher flies (Muscamorpha), the first flagellomere is greatly enlarged (usually, but incorrectly referred to 3rd segment. See basoflagellomere) and the apical flagellomeres are reduced to a bristle-like structure, called the arista (q.v.).

flagellum. The third segment of the antenna. The flagellum is divided into flagellomeres.

flange. Same as lamina. See armature.

fourth vein. Same as Vein M.

frons. The anterodorsomedial area of the head, bounded laterally by the eyes, dorsally by the vertex, and ventrally by the antennae. The anterior edge is usually differentiated and term the lunule.

front. Same as frons.

frontal lunule. Same as lunule.

frontal prominence. In some syrphids, the region (face and frons) around the bases of the antennae is produced anteriorly, the result is termed the frontal prominence (frontal tubercle of Speight (1987: 145). In some cerioidines (tribe Cerioidini), where the frontal prominence is well developed as an elongate pedicel, the term antennifer is used.

frontal triangle. In males, when the eyes are holoptic, the frons forms a triangle area here called the frontal triangle. The shape of this triangle varies greatly and is used as a species character.

frontal tubercle. Same as frontal prominence.

gena (pl. genae) is the lateral area of the head ventrad to the eyes, anterior to the occiput and posterior to the face. The term is used as equivalent to the cheek and represents the ventrad area to the eyes, which is a larger area than the precisely defined morphological region.

genitalia. The reproductive structures.

hair (adj. hairy). Same as pile.

halter (pl. halteres). The modified second wing that consists of the base, pedicel (stem) and capitulum (head).

head. The anterior division of the insect body.

holoptic is the condition when the eyes are contiguous dorsally. Males are usually holoptic. The alternative is dichoptic (*q.v.*).

humeral crossvein. A crossvein between the costa and subcosta veins at the basal of the wing. Same as crossvein h.

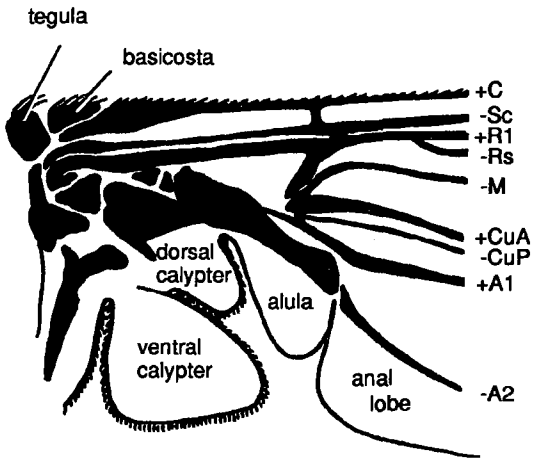

Fig. 3. Wing base,dorsal view.

humeral plate. Same as basicosta.

humerus. Same as postpronotoum.

hyaline. Transparent. When hyaline is used to described a wing, it means without a dark pattern except the stigma may be dark.

hypandrium is the ventral sclerite of the male genitalia. Called theca by Speight (1987: 166).

hypopleuron. As used by Curran (1934: 489, 486), the hypopleuron corresponds to the ventroposterior port of the meron and metaepisternum.

Incisure. In some syrphids, such as Palpada lindneri (fig. 18), the posterior margins of some of the abdominal terga become semimembraneous and are differently colored, usually yellow. Hence, the phrase "abdominal incisures yellow" is used (Williston 1887: 288).

katatergum is the dorsoposterior plate of the mesothoracic pleuron anteroventrad of the anatergum. Katatergite of McAlpine, laterotergite (in part) of earlier authors.

katepimeron is the posteroventral plate of the mesothoracic pleuron, dorsad of the meron. Frequently the demarcation between the katepimeron and meron is weak. The katepimeron is occassionally pilose. Barrette of earlier authors.

katepisternum is the anteroventral plate of the mesothoracic pleuron. Sternopleuron of earlier authors.

lamina (pl. laminae, adj. laminate). A large thin extension of the exoskeleton. Plate or flange of various authors. See armature.

lateral (adv. laterally, laterad). Adjective (adverb) meaning of the side, away from the center. Opposite of medial. See Orientation.

lateral facial strip (Shannon, 1922: 118). Same as paraface.

lateral postnota. Used by Speight (1987: 159) for the anatergum and katatergum.

laterotergite. Same as anatergum. Sometimes used in the pleural for both katatergum and anatergum (Speight 1987).

leg. The ventrolateral locomotion organs.

length. See size.

lingula. An apicomedial projection on the venter of the hypandrium.

lunulate. An adjective for macula which is crescent-shaped. Less strongly curved maculae are described as arcuate. See Markings.

lunule is the area of different texture on the anterior edge of the frons. This area is usually shiny, bare and frequently differently colored than the rest of the frons.

macula (pl. maculae) is any kind of marking that is not a vitta or fascia, The term is usually used with adjectives to describe the mark, such as arcuate, lunulate, rectangular, punctate and triangular (*q.v.*).

marginal cell. Same as cell R1.

markings (pattern). Flower flies usually display intricate bright color patterns, made up of various kinds of markings. These markings of are three basic types: fasciae, maculae and vittae (bands, marks and stripes). Various adjectives, such as arcuate, lunulate, punctate, etc., are used to more precisely define these markings.

medial. Adjective meaning of the middle, towards the central. Opposite of lateral. See Orientation.

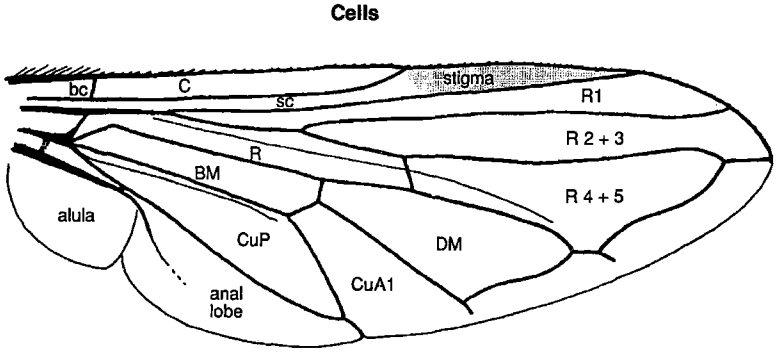

Fig. 4. Cells of wing, dorsal view.

Mediastinal cell (Hull 1949: 260). Same as 2nd costal cell.

meron is the posteroventral plate of the mesothoracic pleuron ventrad to katepimeron. The demarcation between these two plates is usually indistinct. The meron is bare except the posterior margin anterior to the posterior spiracle may be pilose (see posterior spiracular fringe).

meropleuron (meropleurite) is the term for the fusion plate of the katepimeron and meron. Same as hypopleuron of earlier workers.

meso-. A prefix used to indicate the middle (mid) leg or its components, such as mesotibia.

mesonotal [pile] collar. Some syrphine groups (*Asarkina, Ocyptamus*) have a transverse row of longer and more erect pile, which Vockeroth (1969: 18) termed the anterior mesonotal collar.

mesonotum is the term for the dorsal part of the mid thoracic segment and includes both the scutum and scutellum. Frequently incorrectly used for just the scutum.

mesoanepisternum. Same as anepisternum.

mesoanepimeron. Same as anepimeron.

mesopleuron. Same as anepisternum.

Mesoscutellar lobe. Same as scutellum.

Mesoscutum. Same as mesonotum.

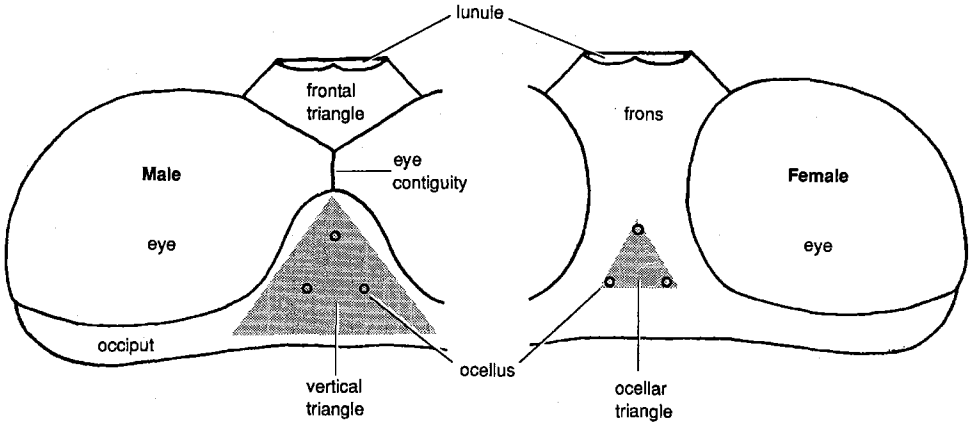

Fig. 5. Head parts, dorsal view.

meta-. A prefix used to indicate the last (hind) leg or its components, such as metafemur.

metapleuron of Curran (1934: 489) and others is a combination of the katatergum and anatergum. This term is also used sometimes for metathoracic pleuron.

metathoracic spiracular pile patch (Thompson 1972: 83). Same as posterior spiracular fringe.

metasternum. The area anterior to metacoxa and ventrad to the meron. The presence or absence of pile on the metasternum as well as the degree of development of the metasternum are important characters for the higher classification of syrphids. As noted

by Speight (1987: 158) and others, the metasternum is not the appropriate morphological term for this structure, which is more properly the metabasisterno-precoxite, a term which Speight admits is not likely to be met with general approval. Hence, he introduced the new term premetacoxite. As all taxonomic work has used metasternum since Shannon introduced it, this usage is accepted here.

metathoracic pleuron. The lateral portions of the reduced third thoracic segment. Only the metepimeron and metepisternum may provide taxonomic characters.

metepimeron. The posterior portion of the metathoracic pleuron.

metepisternum. The anterior portion of the metathoracic pleuron.

microtrichose (noun, microtrichium (singular), microtrichia (plural)). Small pile-like extension of exoskeleton. See vestiture.

notopleuron is the anterolateral region of the scutum bounded by postpronotum anteriorly and transverse suture.

ocellar triangle is a region on vertex defined by the ocelli. The ocellar triangle is a subregion of the vertical triangle, not synonymous with it.

Notal wing lamina. A large flap-like extension of the mesonotum covering the base of the wing. Found only in some merodontine genera (*Nausigaster*).

Notal wing shield (Thompson 1972). Same as notal wing lamina.

ocellar tubercle. Same as ocellar triangle.

ocellus (pl. ocelli). One of the three simple eyes present dorsally between the larger compound eyes.

occiput. The posterior area of the head, limited anteriorly by the eyes, dorsally by vertex and ventrally by genae. In some groups, the occiput may be uniformly swollen (*Microdon* (*Rhoga*)) or swollen dorsal (*Rhopalosyrphus*). In other groups, the nature of the vestiture on the lateral portions of occiput is an important species group character (see Thompson 1981: 35). Speight (1987: 145) used the term post-ocular orbit for the lateral portion.

orbital strips. Same as paraface.

orientation. A fly or any object can be divided by three planes, the horizontal, sagittal and transverse planes, each plane being 90 degrees to the other. While there are numerous terms to describe orientation, only 4 pairs of terms are really all that are necessary: anterior - posterior, apical - basal, dorsal - ventral and lateral - medial (*q.v.*).

paraface (parafacial, adj). In some flower flies, the anterior tentorial arms are elongate and separate off a narrow strip from the face. This area, paraface, is usually very narrow, pilose and pollinose, whereas the face is frequently bare and shiny. McAlpine (1981) uses the term "para-

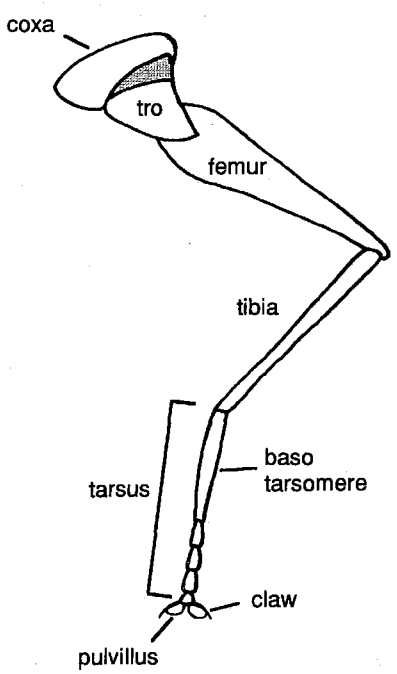

Fig. 6. Leg part, lateral view

facial," but as this is an adjective, the noun is preferred in most sentence constructions. Speight (1987: 144) use the term orbital strips.

paramere of McAlpine (1981) is the superior lobe (*q.v.*).

pectus. A descriptive term used for the ventral area of the thorax, including the ventral half of the katepisternum, metasternum and ventral portion of meron (Williston 1887: 288, Curran 1934: 488).

pedicel. The second segment of the antenna, situated between the scape and flagellum. This term is sometimes used for the frontal prominence.

petiole, petiolate. A petiole is a stem and petiolate is an adjective meaning having a stem. In syrphid taxonomy, these terms are used in reference to various cells of the wing and to the shape of the abdomen.

pile (pilis (singular), adj. **pilose**). The latin noun for hair, pilis the singular and pilose for the adjective. Pilose is the condition of having hairs. See vestiture.

plate. Same as lamina. See armature.

pleurotergite. Same as katatergum.

plumula. A fringed posterior extension of the dorsal edge of anepimeron, which lies ventral to the calypter.

pollinose (pollen (singular)). The condition of being covered with opaque material that may appear like fine powder or dust. The material is microtrichia. In syrphids, the term pollinose is used generally for any body area (except wing) covered by microtrichia. See vestiture.

postalar callus is the posterolateral region of the mesoscutum separated from the scutum proper by a broad shallow furrow.

postalar pile tuft is situated on postalar ridge anterior to the postalar callus and posterior to the wing base.

posterior (adv. posteriorly). Adjective (adverb) meaning behind, in back, away from head end. Opposite of anterior. See Orientation.

posterior cell. Same as cell R4+5.

posterior crossvein. Same as crossvein dm-cu.

posterior lobe [of wing] (Hull 1949: 260). Same as alula.

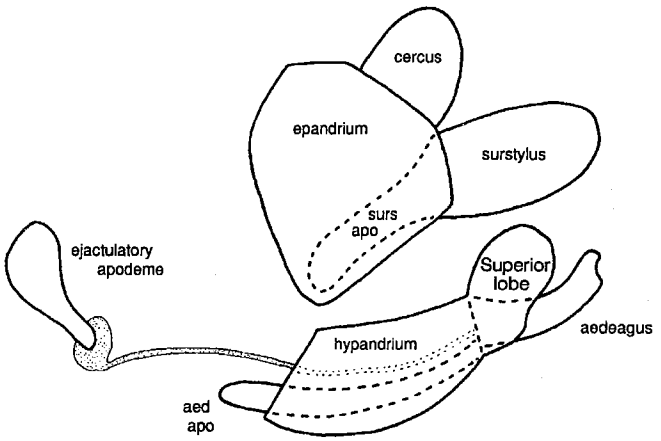

Fig. 7. Male genitalia parts, lateral view

posterior spiracular fringe is a row or patch of long pile anterior to and / or ventrad of the posterior spiracle. The character was introduced by Thompson (1972: 83) as the metathoracic spiracular pile patch.

postmetacoxal bridge is a sclerotized band that extends the metathoracic pleura from one side to the other. The exact nature of the structure is not known, but the bridge occurs in microdontines, some syrphines and eristalines. Except for the microdontines, this bridge tends to be correlated with petiolate abdomens and enlarged metafemora.

post-ocular orbit. A term for the lateral portion of the occiput.

postpronotum is a distinct plate on the anterolateral corner of the mesonotum. Humerus of traditional authors.

premarginal sulcus. A shallow groove (farrow) mesial to the margin of a sclerite. In flower flies, premarginal sulci are commonly found on the scutellum and abdomen. The term **lira** is used for the bead-like ridge that is formed by the sulcus. In earlier literature, the presence of the sulcus was referred to by stating that the structure was "emarginate or margined," such as abdomen margined or emarginate.

premetacoxite. Same as metasternum.

presutural area, callus, depression. Same as notopleuron, notopleural callus or depression.

pro-. A prefix used to indicate the first (fore) leg or its components, such as profemur.

pronotum is the dorsal part of the anterior most thoracic segment. The pronotum is greatly reduced in Diptera. Only the posterior portion is distinct in flies (see postpronotum). Sometimes pronotum is used as synonymous with postpronotum.

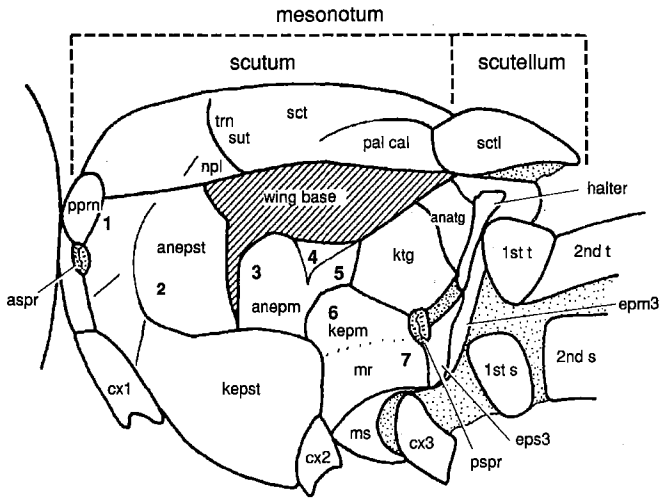

Fig. 8. Thorax and base of abdomen, parts, lateral view.
1 = anterior anepisternum; 2 = posterior anepisternum; 3 = anterior anepimeron; 4 = dorsomedial anepimeron; 5 = posterior anepimeron; 6 = katepimeron; 7 = area where the posterior spiracular fringe is found; 1st T, 2nd T = terga, first and second; 1st S, 2nd S = sterna, first and second; anatg = anatergum; anepm = anepimeron; anepst = anepisternum; aspr = anterior spiracle; cx1, cx2, cx3 = coxa, fore, mid and hind; epm3 = metaepimeron; eps3 = metaepisternum; ktg = katatergum; kepm = katepimeron; kepst = katepisternum; mr = meron; ms = metasternum; pal cal = postalar callus; pprn = postpronotum; pspr = posterior spiracle; sctl = scutellum; sct = scutum; trn sut = transverse suture.

proximal. Same as basal.

pruinose. Same as pollinose. See vestiture.

pteropleuron. Same as anepimeron. Pteropleuron of Curran (1934: 489) is a combination of mesoanepimeron, mesokatepimeron and meron.

pubescent is an adjective referring to having very long dense microtrichia, which appears like velvet. Sometimes a sclerite may appear to be pilose because the pubescence is long, but closer inspection should reveal the lack of alveoli (sockets, pits) at the base of the microtrichia. See vestiture.

pulvillus is the apicolateral pad on the apex of the tarsus.

punctum (pl. puncta) refers to a small round pit or hole in the integument.

punctate is an adjective used to modify macula to refer to a round spot. Rarely the adjective is used to refer to the integument (as in genus *Nausigaster*) or to pollinose areas (as on the face of *Carposcalis* species), in these cases it means that the integument or the pollinosity has small round pits.

rim refers to a bead-like ridge which is created by a shallow pre-marginal furrow. Same as lira.

scale is a broadly flattened pilis (hair).

scape. The basal or first segment of the antenna.

scutellar fringe. Same as ventral scutellar fringe.

scutellum is the posterior part of the notum. In flies, scutellum is accepted to apply to the mesoscutellum only. The shape, pile and color of the scutellum offer valuable species characters. The apicoventral margin of the scutellum frequently has pile and such pile is referred to as the "ventral scutellar fringe" (*q.v.*). The dorsoapical margin of the scutellum may appear to have a rim, which is created by a premarginal sulcus or furrow (see rim).

scutum. The large anterior portion of the notum. In flies, scutum is accepted to apply to the mesoscutum.

second antennal segment. Same as pedicel.

second basal cell. Same as cell BM.

second posterior cell (Hull 1949: 260). Same as cell DM.

second vein. Same as vein R2+3.

seta (pl. setae, adj. setate). A long thick macrotrichium. Bristles of various authors. See vestiture.

setula (pl. setulae, adj. setulate). A short think macrotrichium. See vestiture.

size. Syrphids do vary in size, especially the predaceous syrphines due to larval food consumption. Hence, accuracy in measurements need not be high and is usually only whole millimeters. The usual size measurements are body and wing length: Wing length is measured from the basicosta to apex; body length from tip of antenna to tip of abdomen.

spiracle. In Diptera, there are only two thoracic spiracle, the meso and metathoracic spiracles, which are for convenience referred to as the anterior and posterior spiracles. The thoracic spiracles are mainly used as landmarks to identify the various parts of the pleuron. However, in some eristaline groups, the size of the posterior spiracle varies and is used as a generic characters.

spina (pl. spinae, adj. spinate, spinose). A non-articulating elongate extension of the exoskeleton. Spine of Snodgrass and Torre-Bueno. See armature.

spine. Same as a seta, usually described as "short spinose seta." The term usually is used for seta found apicoventrally on metafemur of Milesiine syrphids, such as in the genus *Xylota*. Also, used for elongate non-articulating extensions of the exoskeleton. See armature.

spot. Same as macula.

spur. Same as calcar. See armature. Sometimes spur has been used in reference to wing venation. Spur in this sense is a short supplementary extension to a vein or crossvein, which is here referred to as an appendix (*q.v.*).

spurious vein. The sclerotization of the convexity between the radial and medial field of the wing appears like a vein and is termed the spurious vein.

squama. Same as calypter.

sternopleuron. Same as katepisternum.

sternite. Same as sternum.

sternum (pl. sterna). The ventral plate of an abdominal segment. While McAlpine (1981) recommends the use of sternite as the remaining plate in Diptera is only part of the whole, I have accepted the reasoning of Snodgrass (1935, 1963) and followed the tradition of Crampton and have used the sternum.

stigmal (stigmatical) **crossvein**. A thickening of the wing membrane in the stigmal area which appears like a crossvein.

stripe. Same as vitta.

style is a term for the arista when the arista is thick (stout) and apical (terminal) in position. Speight (1987: 166) uses style for the surstylus.

subapical cell (Hull 1949: 260). Same as cell R4+5.

subepaulet. Same as basicosta.

submarginal cell. Same as cell R2+3.

subscutellar fringe. Same as ventral scutellar fringe.

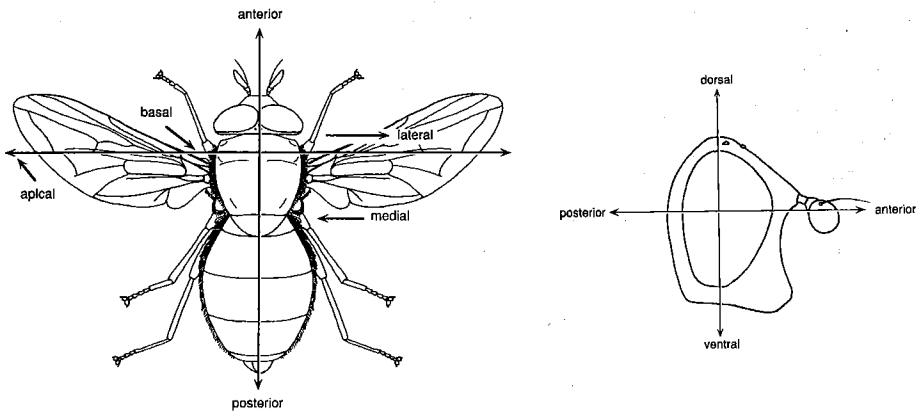

Fig. 9. Orientation of a fly, dorsal and lateral views.

sulcus (sulci, sulcate). A groove or shallow depression of purely functional origin. In flower flies, the scutellum and abdomen frequently have premarginal sulci (*q.v.*)

superior lobe. This is the paramere of McAlpine (1981). The use of paramere in the Manual was enforced by editorial policy. There is no clear evidence to suggest that the articulating structure laterad to the aedeagus in syrphids is the paramere, it may be a gonopod. In some syrphid groups (microdontines), this structure is missing, in others it is articulating (syrphines) or fused to the hypandrium (most eristalines). Until the exact homology of parts of the male genitalia can be worked out, I prefer to use the neutral term originally introduced by Metcalf (1921) for this structure.

surstylus (pl. styli). The clasping organs of the male genitalia.

surstylar apodeme is a plate ventrad to the cercus, is surrounded by the epandrium, dorsally articulates with or is fused to the surstyli, and ventrally articulates with the dorsoanterior margin of the hypandrium.

tarsus (pl. tarsi). The fifth part of the leg.

tarsomere (pl. tarsomeres). The parts of the tarsus.

tegula is a large scale-like structure at the anterior base of the wing, the color of which is a useful species character among the eristalines.

tenth sternum is the same as surstylar apodeme.

tentorium is an invagination of the exoskeleton for form a support structure for the head. Where the exoskeleton is invaginated, pits are formed. These pits are either oval or elongate.

tergite. Same as tergum.

tergum (pl. terga). The dorsal plate of an abdominal segment. As explained under sternum, I prefer to use the tergum instead of tergite.

terminal. Same as apical.

terminalia. Same as genitalia.

theca. Same as hypandrium.

third antennal segment. Same as basoflagellomere.

third vein. Same as vein R4+5.

thorax. The second (middle) division of the insect body.

tibia (pl. tibiae). The fourth part of the leg.

tomentose is an adjective used to refer to very thick and opaque pile as found in the genera *Meromacrus* and *Quichuana*.

tooth (teeth). Same as dens (dentis). See armature.

transverse sulcus. Same as transverse suture.

transverse suture. A transverse sulcus that runs across the mesonotum just anterior to bases of the wings. Speight (1987: 154) correctly notes that as this feature is intra-scutal, the proper term is sulcus, not suture. However, the traditional taxonomic usage is retained here.

trochanter. The small second part of the leg, connecting the coxa to the femur.

tubercle (adj. tuberculate). The face is frequently produced anteromedially into a distinct swelling, termed the tubercle. The presence or absence of a tubercle is frequently used

as a generic character and the shape as a species character. Tubercle is used for small distinct rounded protuberance elsewhere, such as on the metafemur.

unmarginate as in "abdomen unmarginate." This condition is referred to as "abdomen with premarginal sulcus." See premarginal sulcus.

vein M1. When vein M2 is present (usually as a short spur vein at the apicoposterior corner of cell R4+5), then clearly the apical crossvein of earlier authors is vein M1. When vein M2 is lost, then the crossvein should be referred to as the last section of vein M. However for consistency, I always refer to the vein closing cell R4+5 as vein M1.

veins. The names for the veins follows the "Comstock-Needham" system as interpreted and presented by McAlpine (1981) and labelled in figure.

ventral (adv. ventrally, ventrad). Adjective (adverb) meaning of or belonging to lower surface. Opposite of dorsal. See Orientation.

ventral scutellar fringe. The ventral surface of the scutellum may have long pile, which is referred to as the ventral scutellar fringe or scutellum with ventral fringe.

vertical bump (Curran 1925: 14). Same as ocellar triangle.

vertical triangle. In males when the eyes are holoptic, the vertex forma a triangular area, termed the vertical triangle. The shape of this triangle can vary greatly and is used as a species group character in *Ocyptamus* (Thompson 1981).

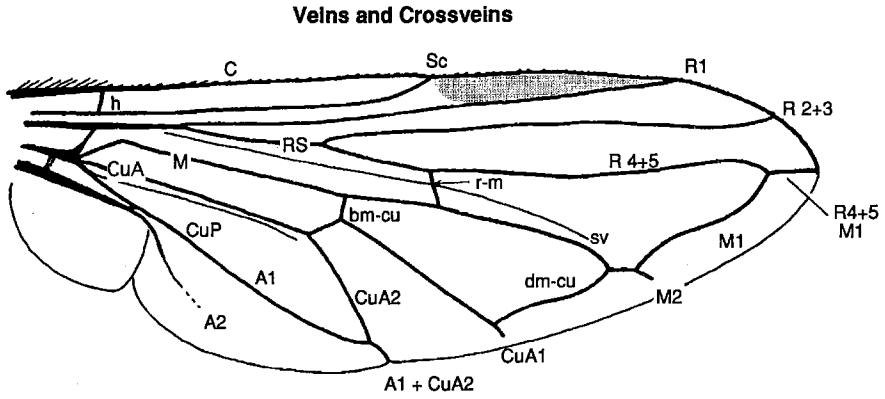

Fig. 10. Veins of wing, dorsal view.

vertex is the dorsal most portion of the head, bounded by the frons anteriorly, the eyes laterally and the occiput posteriorly. The ocellar triangle is within the vertex. The vertex is frequently of different color, pollinosity and pile than the frons.

vestiture. The integument of flies is covered with two basic types of vestiture: microtrichia and macrotrichia. While there are only these two fundamental types, the form of each varies greatly, giving raise to a long complex history of conflicting terminology. Microtrichia have been referred to as tomentum, pubescence, pruinescence, pollinosity, etc. Macrotrichia includes setae (bristles), pile (hair) and setulae (spines). Macrotrichia differ from microtrichia as they are connected to nerves and are surrounded at the base

by a membranous alveolus (socket). I have followed Linnaeus and earlier dipterists and have standardized on the following terms for the various types of vestiture found in syrphids. Macrotrichia are divided into three kinds based on thickness and length: setae are long and thick; setulae are short and thick; and pile is used for long or short thin macrotrichia. Pile is pleural, with pilis singular, and pilose, the adjective. Sometimes adjectives are used to described specialized pile, such as tomentose pile, for the specialized thick, opaque pile found in the genera *Meromacrus* and *Quichuana*. Only two terms are used for microtrichia even though microtrichia can vary greatly in shape. Microtrichia (usually as the adjective, microtrichose) are used from the vestiture of the wing membrane. Pollen (usually as the adjective, pollinose) is used for the microtrichia on body.

villis (pl. villi). Same as wing microtrichium. See vestiture.

vitta (pl. vittae, adj. vittate) is an anterior to posterior (longitudinal) line. See Markings.

wing is the large dorsolateral membranous flight organ.

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Literature cited

Aguilera P., A. & Pacheco V., C.
1995 Determinacion de depredadores del pulgon del avellano europeo, *Myzocallis coryli* (Goeze) (Homoptera: Aphididae) en la IX region de Chile. *Revta Chil. Entomol.* 22: 17-19.

Arroyo, M. T. K., Primack, R. & Armesto, J.
1982 Community studies in pollination ecology in the high termperate Andes of Central Chile. I. Pollination mechanisms and altitudinal variation. *Amer. J. Bot.* 69: 82-97.

Capelle, K. J.
1956 The genus *Rhopalosyrphus*, with a description of a new species from Arizona. *J. Kansas Entomol. Soc.* 29: 170-175.

Carrera, M. & Lenko, K.
1958 Descrição de duas espécies novas de *Mixogaster* (Diptera, Syrphidae) e observações sôbre o inquilinismo de uma delas em ninhos de *Iridomyrmex humilis*, a "formiga argentina". *Studia Entomol.* 1: 465-486.

Carrera, M., Lopes, H. de S. & Lane, J.
1947 Contribuição ao conhecimento dos "Microdontinae" neotrópicos e descrição de duas novas espécies de "*Nausigaster*" Williston (Diptera, Syrphidae). *Revta Brasil. Biol.* 7: 471-486.

Collin, J. E.
1920 *Eumerus strigatus* Fallen and *tuberculatus* Rondani (Diptera, Syrphidae). *Entomol. mon. Mag.* (3)6: 102-106, pl. 3.

Crampton, G. C.
1942 The external morphology of the Diptera. *State Conn. State Geol. Nat. Hist. Surv., Bull.* 64: 10-165.

Curran, C. H.
1925 Contribution to a monograph of the American Syrphidae from north of Mexico. *Kansas Univ. Sci. Bull.* (1924) 15: 7-216.
1934a *The families and genera of North American Diptera.* 512 pp. New York
1934b Diptera of Kartabo, Bartica District, British Guiana. *Bull. Amer. Mus. Nat. Hist.* 66: 287-532.
1939 Synopsis of the American species of *Volucella* (Syrphidae; Diptera). Part I. Table of species. *Amer. Mus. Novit.* 1027, 7 pp.
1941 New American Syrphidae. *Bull. Amer. Mus. Nat. Hist.* 78: 243-304.
1951 Synopsis of the North American species of *Spilomyia* (Syrphidae, Diptera). *Amer. Mus. Novit.* 1492, 11 pp.
1953 Notes and description of some Mydaidae and Syrphidae. *Amer. Mus. Novit.* 1645, 15 pp.

Doesburg, P. H. van
1966 Syrphidae from Suriname. Additional records and descriptions. *Stud. Fauna Suriname (Natuurwet. Stud. Suriname)* 9 (25): 61-107.

Dusek, J. & Laska, P.
1985 A review of the genus *Scaeva* Fabricius (Diptera: Syrphidae) with the description of a new species from Chile. *Acta entomol. bohemoslovaca* 82: 206-228.

Enderlein, G.
1938 Beiträge sur Kenntnis der Syrphiden. *Sitzber. Gesell. Naturf. Freunde, Berlin* 1937: 192-237.
Fish, D. & Beaver, R. A.
1978 A bibliography of the aquatic fauna inhabiting Bromeliads (Bromeliaceae) and Pitcher plants (Nepenthaceae and Sarraceniaceae). *Proc. Ant-Mosquito Assoc. 49th Meeting* :12-19.
Fluke, C. L.
1937 New South American Syrphidae (Diptera). *Amer. Mus. Novit.* 941, 14 pp.
1942 Revision of the Neotropical Syrphini related to *Syrphus* (Diptera, Syrphidae). *Amer. Mus. Novit.* 1201, 24 pp.
1943 A new genus and new species of Syrphidae (Diptera) from Ecuador. *Ann. Entomol. Soc. Amer.* 36: 425-431.
1945 The Melanostomini of the Neotropical Region (Diptera, Syrphidae). *Amer. Mus. Novit.* 1272, 29 pp.
1951a The genus "*Dolichogyna*" (Diptera, Syrphidae). *Acta Zool. Lilloana* 12: 465-478.
1951b Syrphid flies related to *Volucella scutellata* Macquart. *Amer. Mus. Novit.* 1503, 33 pp.
Fluke, C. L. & Weems, H. V., Jr.
1956 The Myoleptini of the Americas (Diptera, Syrphidae). *Amer. Mus. Novit.* 1758, 23 pp.
Freitas, C. D.
1983 Estudos sôbre os Syrphidae neotrópicais. 1. Redescrição de *Pseudodorus clavatus* (Fabricius, 1974)(Diptera). *Revta brasil. Biol.* [1982] 42: 583-587.
1989 Descrição da femea, genitalia do macho e larva de *Ocyptamus sativus* (Curran 1941) (Diptera: Syrphidae). *Mem. Inst. Oswaldo Cruz, Rio de Janeiro* 84 (suppl. 4): 219-22.
Garces González, G. & Rodriguez Velázquez, D.
1994 Nuevos registros de sírfidos (Diptera: Syrphidae) para Cuba. *Revta Biol. Trop.* 42: 386-387.
Gerdes, C.
1975 A new species of Ecuadorean *Toxomerus* (Diptera: Syrphidae). *Entomol. News* [1974] 85: 279-283.
1975 Notes on types of *Toxomerus* (Diptera: Syrphidae). *Entomol. News* 86: 13-22.
Guppy, P. L.
1913 Life-history of syrphid fly predaceous on froghopper nymphs. *Bull. Dept. Agric. Trinidad & Tobago* 12: 159-161.
1914 Breeding and colonizing the syrphid. *Bull. Dept. Agric. Trinidad & Tobago* 13: 217-223, pls. 1-2.
Harbach, R. E.
1974 A new Neotropical syrphid fly, *Mesograpta apegiensis* (Diptera: Syrphidae). *Proc. Entomol. Soc. Washington* 76: 31-34.
1984 A new species of *Toxomerus* (Diptera, Syrphidae) from Brazil with notes on three related species. *Proc. Entomol. Soc. Washington* 86: 840-844.
Hippa, H.
1978 Classification of Xylotini (Diptera: Syrphidae). *Acta Zool. Fennica* 156, 153 pp.

1986 Morphology and taxonomic value of the female external genitalia of Syrphidae and some other Diptera by new methodology. *Annales zool. fenn.* 23: 307-320.
1990 The genus *Milesia* Latreille (Diptera, Syrphidae). *Acta Zool. Fenn.* 187, 226 pp.

Hippa, H. & Thompson, F. C.
1983 *Meropidia*, a new genus of flower flies (Diptera: Syrphidae) from South America. *Papeis avuls. Zool. S. Paulo* 35: 109-115.
1994 Revision of the *Sterphus cybele* species group (Diptera: Syrphidae). *Proc. Ent. Soc. Wash.* 96: 483-495.

Hogue, C. L. & Miller, S. E.
1981 Entomofauna of Cocos Island, Costa Rica. *Atoll Res. Bull.* 250, 28 pp. [no syrphids]

Hull, F. M.
1938 Exotic forms of syrphid flies. *Ann. Carnegie Mus.* 27: 121-128, pl. 8.
1942 The flies of the genus *Meromacrus*. *Amer. Mus. Novit.* 1200, 19 pp.
1943a The genus *Mesogramma*. *Entomol. Amer.* 23: 1-41.
1943b The genus *Ceriogaster* Williston (Syrphidae). *Revta Soc. Entomol. Argentina* 12: 138-140.
1946a The genus *Quichuana* Knab. *Amer. Mus. Novit.* 1317, 17 pp.
1946b The genus *Lepidostola* Mik. *Amer. Mus. Novit.* 1326, 15 pp.
1949a The morphology and inter-relationship of the genera of syrphid flies, recent and fossil. *Trans. zool. Soc. London* 26(4): 257-408.
1949b The genus *Baccha* from the New World. *Entomol. Amer.* 27 [1947]: 89-291.
1954 The genus *Mixogaster* Macquart (Diptera: Syrphidae). *Amer. Mus. Novit.* 1652, 32 pp.

Jiron, L. F. & Gonzalez, I. M.
1990 *Index of entomological publications of Costa Rica updated to 1985.* i-xiii, 13-433 pp. Univ. Costa Rica, San Jose

Jiron, L. F. & Hedstrom, I.
1985 Pollination ecology of Mango (*Mangifera indica* L.) (Anacardiaceae) in the neotropical Region. *Turrialba* 35: 269-277.

Lagrange, E. B.
1986 Notas sobre el genero *Palpada* Macquart, 1834 (Diptera Syrphidae). *Neotropica (La Plata)* 32: 97-103.
1987 Una nueva especie del genero *Palpada* Macquart, 1834 (Insecta, Diptera, Syrphidae). *Neotropica (La Plata)* 33: 41-44.
1989 Revision de las especies Argentinas del grupo *scutellaris* del genero *Palpada* Macquart, 1834 (Diptera, Syrphidae). *Neotropica (La Plata)* 35: 15-34.
1990a Revision de las especies Argentinae del grupo *agrorum* del genero *Palpada* Macquart, 1834 (Diptera, Syrphidae). *Revta Asoc. cien. nat. Litoral* 21: 3-40.
1990b Las especies Argentinas del genero *Meromacrus* Rondani (Diptera, Syrphidae). *Revta bras. Ent.* 34: 489-498.
1992a Revision de las especies Argentinas del grupo *vinetorum* del genero *Palpada* Macquart 1834 (Ditpera, Syrphidae). *Revta Soc. ent. Argentina* 50: 145-166.
1992b Dos especies nuevas del genero *Dolichogyna* (Diptera: Syrphidae). *Neotropica (La Plata)* 38: 119-126.

Lindner, E.
1928 Die Ausbeute der Deutschen Chaco-Expedition. Diptera. Einleitung, I. Trypetidae und II. Pterocallidae. *Konowia* 7: 24-36.

Linnaeus, C.
1758 *Systema naturae per regna tria naturae, secundum classes, ordines, genera, species, cum caracteribus, differentiis, synonymis, locis.* Ed. 10, Vol. 1. 284 pp. L. Salvii, Holmiae [=Stockholm].

Maes, J.-M.
1989 Catalogo de los Insectos controladores biologicos en Nicaragua. Volumen I. Insectos depredadores (Primera Parte). *Revta Nicarag. Entomol.* 8: 1-106.

Maier, C. T.
1987 New distributional and rearing records for Neotropical flower flies (Diptera: Syrphidae). *Proc. Entomol. Soc. Washington* 89: 369.

Maldonado Capriles, J. & Berrios, A.
1977 The immature stages of *Copestylum vacuum* (F.) (Diptera: Syrphidae), a new record for Puerto Rico. *J. Agric. Univ. Puerto Rico* 6: 395-399.

McAlpine, J. F.
1981 Morphology and Terminology — Adults. Pp. 9-63. In McAlpine, J. F., *et alia* (eds.), *Manual of Nearctic Diptera.* Vol. 1, vi + pp. 1-674. Res. Br., Agric. Canada, Monogr. 27.

Metcalf, C. L.
1921 The genitalia of male Syrphidae: their morphology, with especial reference to its taxonomic significance. *Ann. Ent. Soc. Amer.* 14: 169-214.

Nichols, S. W. (compiler)
1989 *The Torre-Bueno glossary of Entomology.* Revised Edition. xvii + 840 pp. New York Entomological Society, New York

Olesen, J. M.
1991 *Trigona*-mimicking hoverflies (Diptera: Syrphidae) in the Amazonian rainforest? *Brit. J. Ent. Nat. Hist.* 1991: 47.

Oram, D. A.
1991 [*Syrphus octomaculatus* (Walker)(Syrphidae) from Falkland Islands.] P. 38. In Chandler, P. J. (compiler), Diptera. Pp. 35-38. In 1990 Annual Exhibition, Imperial College, London SW7—27 Ocotber 1990. *Brit. J. Ent. Nat. Hist.* 4: 19-61.

Osten Sacken, C. R.
1896 Notice on the terms: Tegula, antitegula, squama and alula, as used in Dipterology. *Berlin. Ent. Zeitg* 1896: 285-288.
1897 On the terms Calyptratae and Acalyptratae, calypta and calyptra, as they have been used in entomology. (A supplement to my article: Notice on the terms: Tegula, antitegula, squama and alula in the Berl. Ent. Zeitschr. 1896, p. 285-288). *Berlin Ent. Zeitg* (1896) 41: 328-388.

Peck, L. V.
1988 Family Syrphidae. Pp. 11-230. In Soos, A. (ed.), *Catalogue of Palaearctic Diptera.* Vol. 8, Syrphidae - Conopidae. 363 pp. Akademiai Kiado, Budapest.

Philippi, R. A.
1865 Aufzählung der chilenischen Dipteren. *Verhandl. K.-k. Zool. Bot. Gesell. Wien 15 (Abhandl.)*: 595-782.

Ramirez García, E.
1997 Syrphidae. Pp. 371-373. *In* González Soriano, E., Dirzo, R. & Vogt, R. C. (eds.), *Historia natural de Los Tuxtlas.* Universidad Nacional Autónoma de México, México. xiii + 648 pp.

Reiss, F. & Schacht, W.
1983 Die Typen der von J. B. v. Spix und C. F. Ph. v. Martius gesammelten und von M. Perty bescrieben Dipterenarten (Insecta) in der Zoologischen Staatssammlung München. *Spixiana (Suppl.)* 9: 307-312.
Robinson, G. S.
1984 *Insects of the Falkland Islands: A checklist and bibliography.* ii + 38 pp. British Museum (Natural History), London
Sack, P.
1920 Die Gattungen *Salpingogaster* Schiner und *Meromacrus* Rondani. *Zool. Jahrb., Abt. System., Geog. Biol. Tiere* 43: 235-272.
Schmid, R.
1969 Notes on the reproductive biology of *Asterogyne martiana* (Palmae). Part I - Inflorescence and floral morphology: Phenology. Part II - Pollination by syrphid flies. *Principes* 14: 3-9, 39-49.
Sedman, Y. S.
1965 The genus *Valdivia* Shannon. *Proc. Entomol. Soc. Washington* 67: 197-201.
1975 A preliminary report on the Syrphidae (Diptera) of Belize, with the description of a new species. *Entomol. News* 86: 199-206.
Seifert, R. P.
1975 Clumps of *Heliconia* inflorescences as ecological islands. *Ecology* 56: 1416-1422.
Seifert, R. P. & Seifert, F. H.
1976a A community matrix analysis of *Heliconia* insect communities. *American Naturalist* 110: 461-483.
1976b Natural history of insects living in inflorescences of two species of *Heliconia*. *J. New York Entomol. Soc.* 84: 233-242.
Shannon, R. C.
1922 A revision of the Chilosini (Diptera, Syrphidae). *Ins. Insc. Menstr.* 10: 117-145.
1926a Review of the American xylotine syrphid-flies. *Proc. U. S. natn. Mus.* 69(9), 52 pp.
1926b The chrysotoxine syrphid-flies. *Proc. U. S. natn Mus.* 69(11), 20 pp.
Shannon, R. C. & Aubertin, D.
1933 Syrphidae. *Diptera of Patagonia and South Chile.* Brit. Mus. (Nat. Hist.) VI (3): 120-170.
Snodgrass, R. E.
1935 *Principles of insect morphology.* ix + 667 pp. McGraw-Hill, New York.
1963 A contribution toward an encyclopedia of insect anatomy. *Smithsonian misc. coll.* 146 (2), vi + 48 pp.
Speight, M. C. D.
1987 External morphology of adult Syrphidae (Diptera). *Tijdschr. Entomol.* 130: 141-175.
Telford, H. S.
1975 The Syrphidae of Puerto Rico. *J. Agric. Univ. Puerto Rico* 57: 217-246.
Thompson, F. C.
1968 The placement of the subgenus *Protolepidostola* Hull (Diptera: Syrphidae) with description of two new species. *J. Kansas Entomol. Soc.* 41: 270-277.
1969 A new genus of microdontine flies (Diptera: Syrphidae) with notes on the placement of the subfamily. *Psyche* 76: 74-85.

1972 A contribution to a generic revision of the Neotropical Milesinae (Diptera: Syrphidae). *Arq. Zool., Sao Paulo* 23: 73-215.
1973 Review of the genus *Sterphus* Philippi (Diptera: Syrphidae). Part I. *Entomol. Amer.* 46: 185-240.
1973 De Geer's exotic *Musca* species (Diptera: Syrphidae and Calliphoridae). *Proc. Entomol. Soc. Washington* 75: 354-356.
1974 Corrections and restrictions of the type localities of some Neotropical Syrphidae (Diptera). *Revta Brasil. Entomol.* 18: 1-7.
1974 Description of the first known Ethiopian *Myolepta* species, with a review of the subgeneric classification of *Myolepta* (Diptera: Syrphidae). *Ann. Natal Mus.* 22: 325-334.
1975 Notes on the status and relationships of some genera in the tribe Milesiini (Diptera: Syrphidae). *Proc. Entomol. Soc. Washington* 77: 291-305.
1980 The North American species of *Callicera* Panzer (Diptera: Syrphidae). *Proc. Entomol. Soc. Washington* 82: 195-211.
1981 The flower flies of the West Indies (Diptera: Syrphidae). *Mem. Entomol. Soc. Washington* 9, 200 pp.
1982 Syrphidae. Pp. 464-465. In Hurlbert, S. H. & Villalobos-Fugueroa, A. (eds.), *Aquatic biota of Mexico, Central America and the West Indies: (being a compilation of taxonomic bibliographies for the fauna and flora of island waters of Mesoamerica and the Caribbean region)*. San Diego State Univ., San Diego xv + 529 pp.
1988 Syrphidae (Diptera) described from unknown localities. *J. New York Entomol. Soc.* 96: 200-229.
1990 The flower fly genus *Ornidia* (Diptera: Syrphidae). *Proc. Entomol. Soc. Washington* 93: 248-261.
1997a *Spilomyia* flower flies of the New World (Diptera: Syrphidae). *Mem. Entomol. Soc. Washington* 18: 261-272.
1997b Revision of the *Eristalis* flower flies of the Americas south of the United States (Diptera: Syrphidae). *Proc. Entomol. Soc. Washington* 99: 209-237.

Thompson, F. C., Fee, F. D. & Berzark, L. G.
1990 Two immigrant synanthropic flower flies (Diptera: Syrphidae) new to North America. *Entomol. News* 101: 69-74.

Thompson, F. C. & Marnef, L.
1977 *Austroascia segersi*, a new genus and species (Diptera: Syrphidae). *Papeis Avulsos Zool., S. Paulo* 31: 1-6.

Thompson, F. C., Vockeroth, J. R. & Sedman, Y. S.
1976 Family Syrphidae. *A Catalogue of the Diptera of the Americas south of the United States* 46, 195 pp.

Vockeroth, J. R.
1964 The genus *Alipumilio* Shannon (Diptera: Syrphidae). *Canad. Entomol.* 96: 922-924.
1969 A revision of the genera of the Syrphini (Diptera: Syrphidae). *Mem. Entomol. Soc. Canada* 62, 176 pp.
1973 Three additional synonyms of *Allograpta* (Diptera: Syrphidae). *Canad. Entomol.* 105: 1101-1104.

1983 Nomenclatural notes on Nearctic Syrphinae, with description of new species *Syrphus* and keys to Nearctic species of *Didea*, *Epistrophe*, s. str., and *Syrphus* (Diptera: Syrphidae). *Canad. Entomol.* 115: 175-182.

1986 Revision of the New World species of *Paragus* Latreille (Diptera: Syrphidae). *Canad. Entomol.* 118: 183-198.

1990 Revision of the Nearctic species of *Platycheirus* (Diptera, Syrphidae). *Canad. Entomol.* 122: 659-766.

Vockeroth, J. R. and F. C. Thompson

1987 52. Family Syrphidae. Pp. 52-743. In McAlpine, J. F., *et alia* (eds.), *Manual of Nearctic Diptera.* Vol. 2, vi + pp. 675-1332. *Res. Br., Agric. Canada, Monogr.* 28.

Wheeler, W. M.

1924 Two extraordinary larval myrmecophiles from Panama. *Proc. Nat. Acad. Sci.* 10: 237-244.

Williston, S. W.

1887 Synopsis of the North American Syrphidae. *Bull. U. S. natn. Mus.* 31, xxx + 335 pp. (1886).

Zumbado, M. & Thompson, F. C.

1997 Neuvas especies de *Sterphus* (Diptera: Syrphidae) de Costa Rica con notas sobre otras especies presentes en Costa Rica. Southwest. Entomol. 22: 79-90.

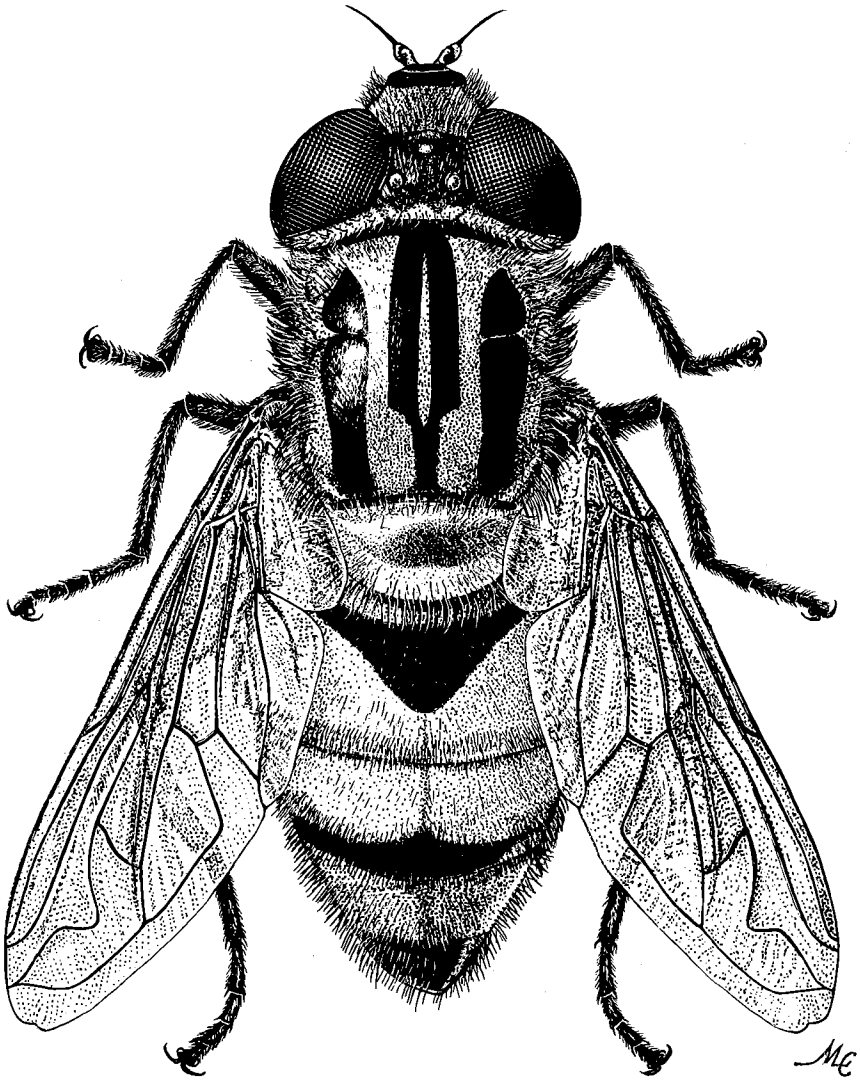


Fig. 11. Habitus, dorsal. *Ohmyia omya* Thompson.

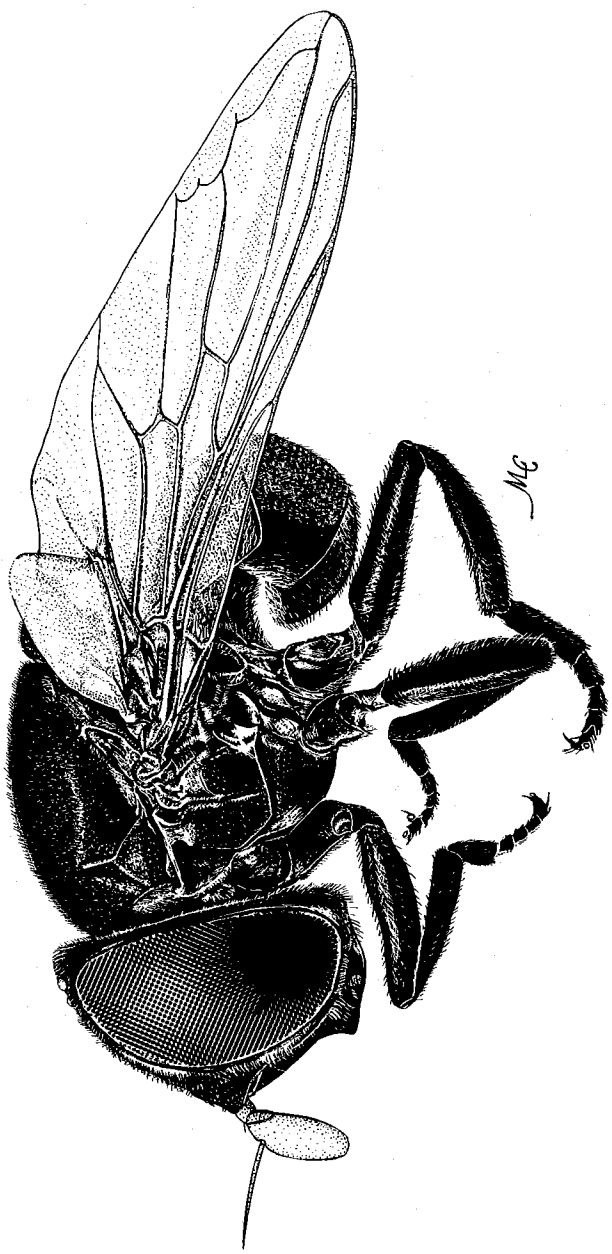
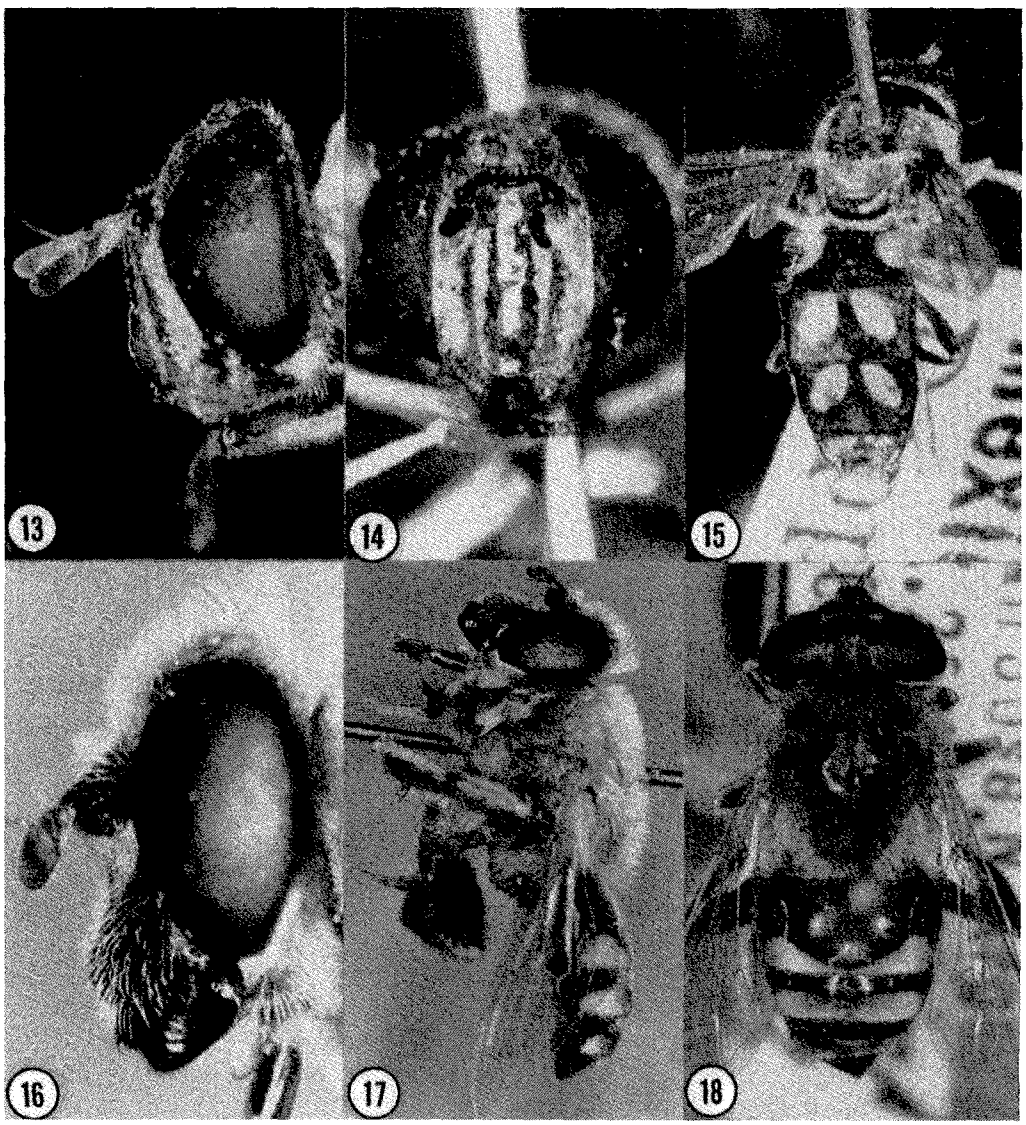
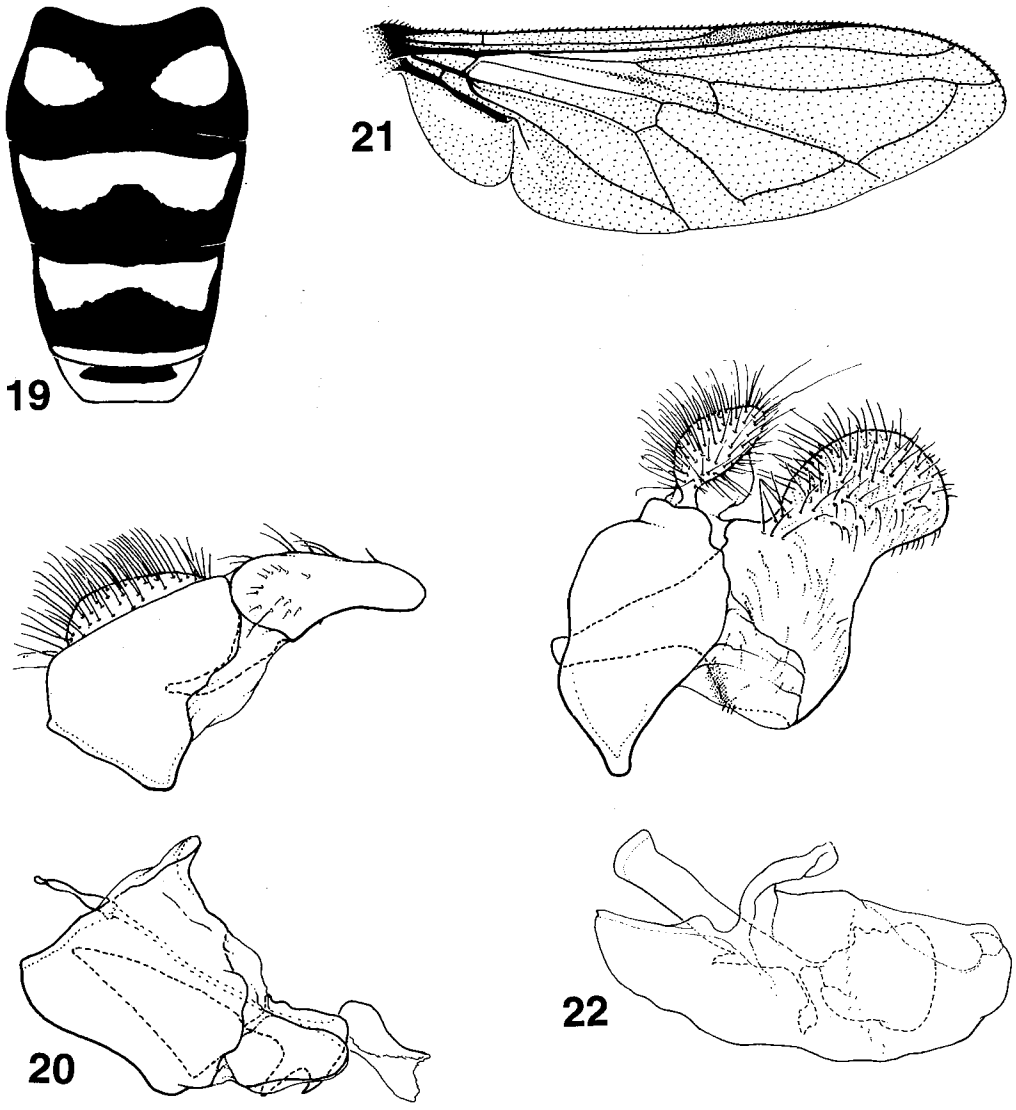


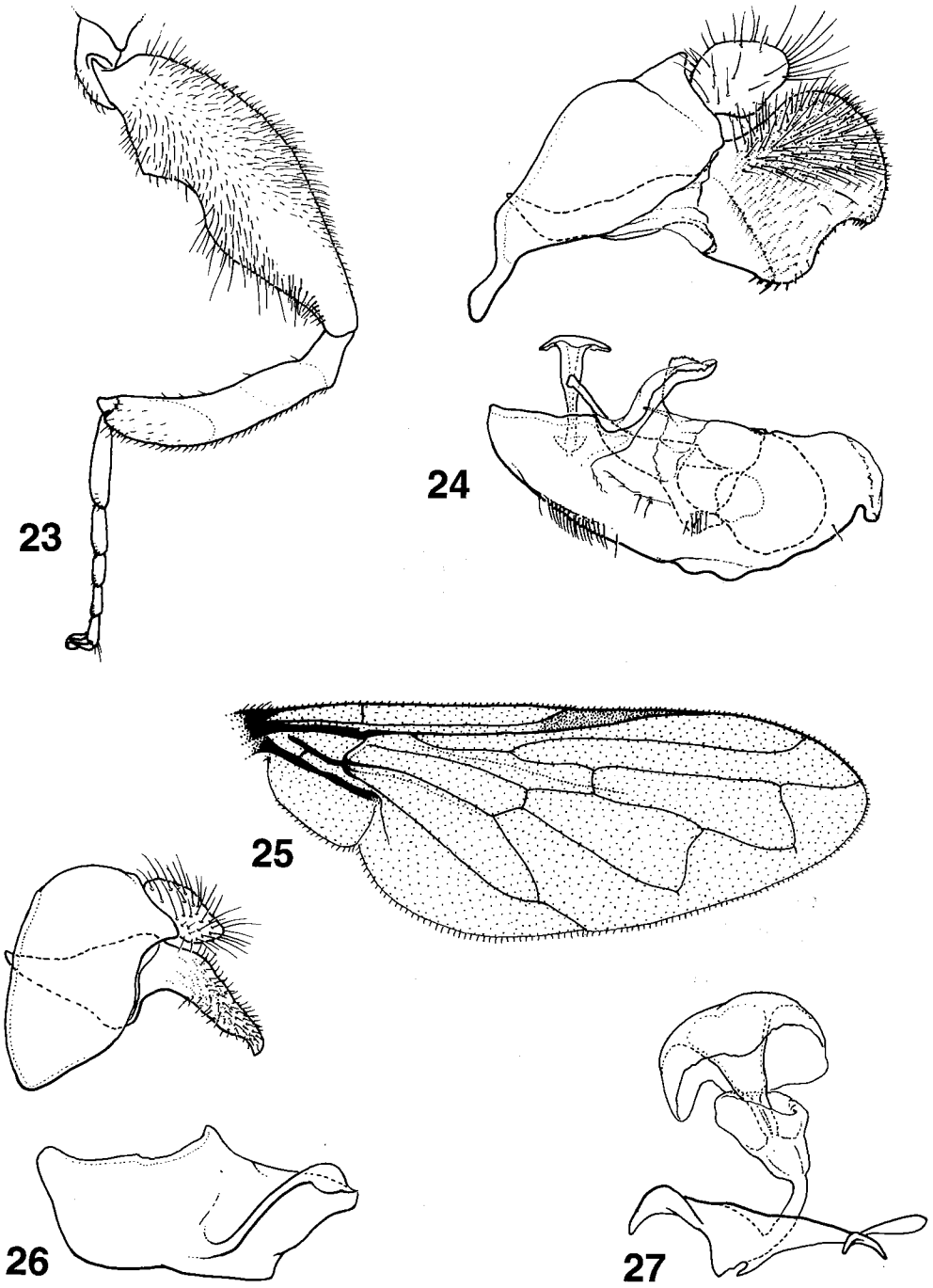
Fig. 12. Habitus, lateral. *Xela alex* Thompson.



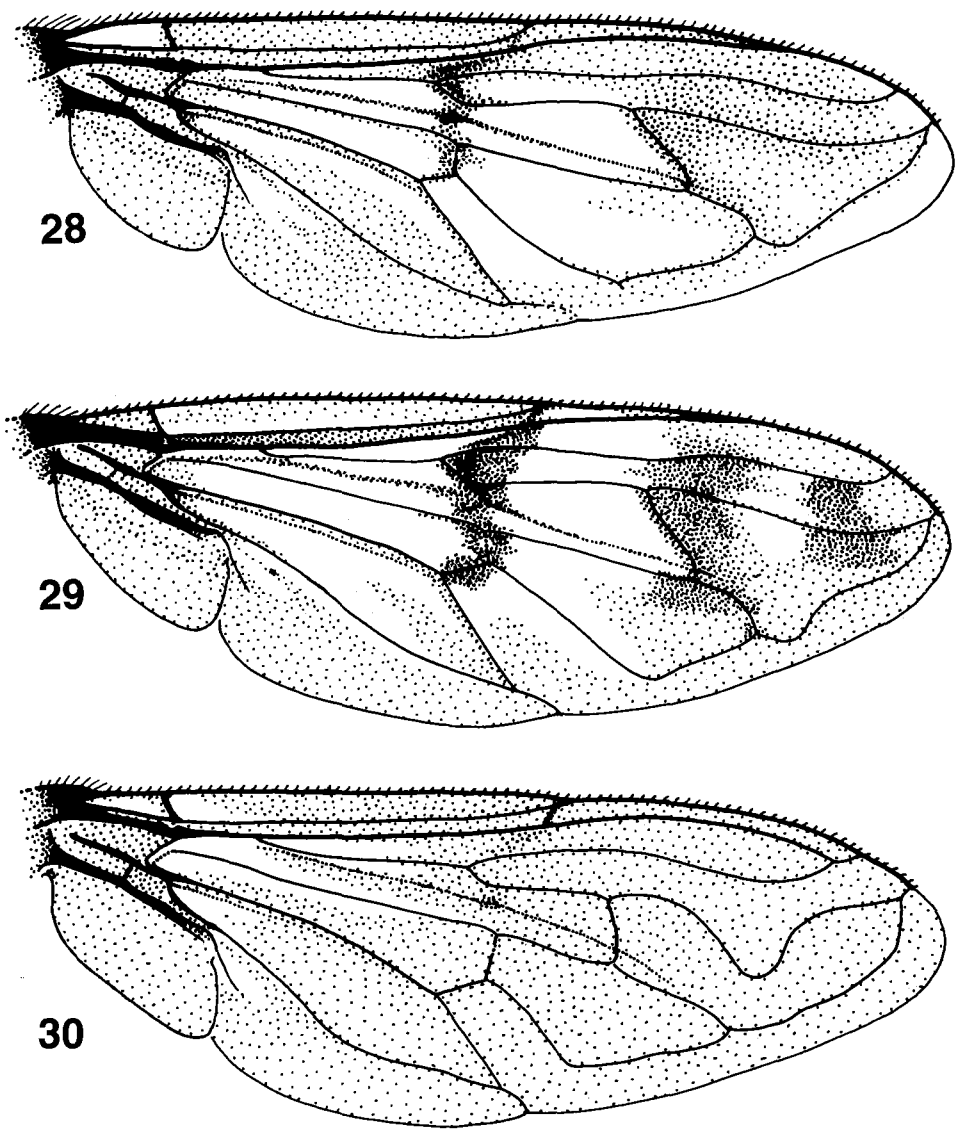
Figs. 13-18. 13-15, *Rhysops octomaculatus* (Enderlein), holotype. 13. Head, lateral view; 14. Head, frontal view; 15. Habitus, posterior view. 16-18, *Palpada lindneri* Thompson, holotype. 16. Head, lateral view; 17. Habitus, lateral view; 18. habitus, dorsal view.



Figs. 19-22. 19-21, *Metasyrphus rojasi* Marnef, holotype. 19. Abdominal pattern, dorsal view; 20. Male genitalia, lateral view; 21. wing, dorsal view. 22. *Ohmyia omya* Thompson, male genitalia, lateral view.



Figs. 23-27. 23-24, *Palpada megafemur* Thompson. 23. Meta femur, lateral view; 24. male genitalia, lateral view. 25-27. *Orthonevra chilensis* Thompson, holotype. 25. wing, dorsal view; 26. Male genitalia, lateral view; 27. Aedeagus and ejaculatory apodeme, lateral view.



Figs. 28-30. 28-30, wings, dorsal view. 28. *Macrometopia montensis* (Hull), holotype. 29. *Macrometopia maculipennis* Thompson, holotype. 30. *Palpada megafemur* Thompson.