20. Metapleuron bare ventrad to spiracle; metasternum variable. Vein R₄+₅ straight or sinuate. Size and shape variable

21. Metapleuron with a tuft of fine pile ventrad to spiracle; metasternum pilose; vein R₄+₅ distinctly sinuate (Fig. 21). Large species with broad flattened abdomens with distinct marginal sulcus

22. Scutum with at most a poorly defined dull yellow pollinose lateral vitta; background black

23. Abdomen without marginal sulcus

24. Vein R₄+₅ strongly sinuate (Fig. 24)

3.5. Family SYRPHIDAE

25. Anepisternum black; scutellum unicolorous brown; abdomen strongly convex in cross section, distinctly petiolate
   RETURN to couplet 18

- Anepisternum yellow posteriorly; scutellum at least brightly yellow posteriorly; abdomen nearly flat

26. Basoflagellomere elongate, from 1.6 to 2.0 times as long as broad; male hind trochanter with ventral calcar; wing hyaline, extensively bare, bare on basal 2/3 and only sparsely microtrichose on apical 1/3; scutellum entirely yellow; eye bare
   2 spp.; North Africa, Middle East, China and Far East.
   - Basoflagellomere oval, at most only 1.3 times as long as broad; male trochanter simple; wing usually dark anteriorly, extensively microtrichose, with moderate bare areas on basal 1.3, densely microtrichose on apical 1/3; scutellum always broadly black basally; eye bare or pile

27. Mesonotum and katepisternum with sharply defined bright yellow maculae, not pollinose
   Xanthogramma Schiner
   17 spp.; widespread; Violovitsh 1975b.
   - Mesonotum and katepisternum with at most a diffuse pollinose yellow maculae
     Epistrophe (Epistropheella Dušek et Láška)
     2 spp.; widespread.

28. Subscutellar fringe absent or nearly so on at least median 1/3, present but sparse laterally. Male terminalia extremely large, globose; tergite 9 as wide as abdomen (Fig. 90)
   Sphaerophoria Lepeletier et Serville
   48 spp.; widespread.
   - Subscutellar pile fringe complete, well-developed, moderately dense (Fig. 41). Male terminalia small, inconspicuous; tergite 9 at most 1/3 as wide as abdomen

29. Metasternum bare
   5 spp.; widespread.
   - Metasternum pilose
     2 spp.; China and Far East.

30. Wing without transverse dark fascia, unmarked except for stigmal darkening or rarely with costal area longitudinally darkened and with dark anteroapical spot
   Allograpta Osten Sacken

31. Wing fascia broad, about 1/3 wing length in width, extending to posterior margin; sparsely pilose flies with Syrphus–like abdominal pattern of broad transverse yellow fascia
   Dideopsis Matsumura
   1 sp., D. aegrotata (Fabricius); China and Far East.
   - Wing fascia narrow, not more than 1/6 wing length in width, and not extending to posterior wing margin; pilose flies without typical Syrphus-like abdominal pattern
32. Bombus–like flies with tergites 1 to 3 black and abdomen bright red to yellow apically; face yellow; wing membrane almost entirely trichose
   1 sp., E. (E.) syrphoides (Fallén); widespread.
   \[ \text{Eriozona (Eriozona Schiner)} \]
   - Flies not Bombus–like, tergite 3 and base of tergite 2 pale yellow or grey, rest of tergites black; face yellow with broad black median vitta; wing with basal cells usually extensively bare
   1 sp., L. (L.) lucorum (Linnaeus); widespread.
   \[ \text{Leucozona (Leucozona Schiner)} \]

33. Metasternum pilose
   46
   - Metasternum bare
   34

34. Eye bare or very nearly so
   42
   - Eye distinctly pilose
   35

35. Tergite 1 greatly reduced, frequently almost linear on disc and practically covered by scutellum, sublaterally at most 1/2 as long as tergite 2 (Fig. 57); tergites not punctate. Length 6.7 mm or more
   37
   - Tergite 1 well–developed, especially on disc where it is frequently 1/2 as long as tergite 2 and always extends well beyond scutellum, sublaterally about 3/4 as long as tergite 2 (Fig. 58); tergites minutely punctate. Length 7.5 mm or less
   36

36. Eye with pile arranged in 3 more or less vertical vittae or contrasting colour. Scutellum black with apex narrowly yellow or reddish
   32 spp.; widespread including North Africa; Goeldlin 1976.
   \[ \text{Paragus (Paragus Latreille)} \]
   - Eye with pile of nearly uniform colour, not forming vittae of contrasting colour. Scutellum entirely black
   6 spp.; widespread including North Africa; Goeldlin 1976.
   \[ \text{Paragus (Pandasyophthalus Stuckenber)} \]

37. Wing with microtrichia very sparse and scattered, with extensive bare areas on apical 1/3 (Fig. 22). Male eye with well–defined area of enlarged facets dorsally
   \[ \text{Scæeva Fabricius} \]
   - Wing with at least apical 1/3 densely and uniformly trichose, without bare areas along veins (Fig. 23). Male eye without well–defined area of enlarged facets dorsally
   38

38. Tergite 2 with large subquadrate grey or yellow maculae that are much larger than pale maculae on tergites 3 and 4
   5 spp.; widespread; Stackelberg 1929.
   \[ \text{Leucozona (Ischyrosyrphus Bigot)} \]
   - Tergite 2 with oval or transverse yellow maculae that are smaller than pale markings on tergites 3 and 4, or tergite 2 entirely black
   39

39. Abdomen without sulcus, slender and parallel–sided or narrowly oval
   18 spp.; widespread.
   \[ \text{Melangyna (Melangyna Verrall)} \]
   - Abdomen with weak but distinct marginal sulcus, oval
   40
40. Katepisternum with dorsal and ventral pile patches separated posteriorly; abdominal maculae yellow or grayish, always very densely pollinose; face densely gray pollinose; eye densely and uniformly pilose ________ Betasyrphus Matsumura
   - Katepisternum with dorsal and ventral pile patches narrowly to broadly joined posteriorly; abdominal maculae bright yellow, at most very slightly pollinose; if face densely pollinose, then eye distinctly pilose on dorsal 1/2 only ___________ 41

41. Eye uniformly pilose throughout or nearly so ________ Dasysyrphus Enderlein
   26 spp.; widespread; Peck 1974.
   - Eye with dense pile on dorsal half, nearly bare on ventral half
     22 spp.; widespread.

42. Vein R₄₊₅ distinctly sinuate (Fig. 23) ________ Eupeodes (Lapposyrphus Dušek et Láska)
   1 sp., E. (L.) lapponicus (Zetterstedt); widespread.
   - Vein R₄₊₅ straight or nearly so ___________ 43

43. Abdomen without sulcus. Face often with distinct dark medial vitta. Slender species with parallel–sided abdomen
 ___________ 45
   - Abdomen with at least a faint trace of marginal sulcus on tergites 3, 4 or 5. Face with at most an obscure dark medial vitta. Broader species with oval or suboval abdomen ___________ 44

44. Katepisternum with dorsal and ventral pile patches narrowly joined posteriorly. Tergum 4 with entire yellow fascia see couplet 41.

Epistrophe (Epistrophe Walker), part

Figs 5.64–69. Adult Syrphidae, male heads (except 68 female), lateral view. 64: Psaros abdominalis (Fabricius); 65: Psarochilosis djakonovi Stackelberg; 66: Macroplecogaster paradoxus Stackelberg; 67: Ischyroptera bipilosa Pokorny; 68: Taeniochilosis atriseta Oldenberg; 69: Endoiasmyia formosana (Shiraki) (after Shiraki 1930).
3.5. Family SYRPHIDAE

- Katepisternum with dorsal and ventral pile patches broadly separated. Tergite 4 with yellow fascia divided into two maculae
  see couplet 27.

Epistrophella (Epistrophella Dušek et Láska), part

45. Hind coxa with tuft of pile at posteromedial apical angle (as in Fig. 48). Pale abdominal maculae transverse, maculae of tergites 2–4 always separated. Face usually with black median vitta, rarely entirely yellow
  see couplet 39.

Melangyna (Melangyna Verrall), part

- Hind coxa without pile tuft posteromedially. Pale abdominal maculae oblique, sometimes confluent. Face entirely yellow
  see couplet 29.

Melangyna (Melangyna Frey), part

46. Eye bare or very nearly so

49

- Eye distinctly and usually very densely, pilose

47

47. Eye distinctly but sparsely pilose; hind coxa without pile tuft; vein R_{4+5} straight or nearly so

Eupeodes (Metasyrphus Matsumura)


- Eye very densely pilose; hind coxa with a tuft of pile posteromedially; vein R_{4+5} variable, sometimes distinctly sinuate

48

48. Vein R_{4+5} distinctly sinuate (Fig. 25); face yellow with black median vitta; tergite 4 at least half black, with broad incised yellow transverse fascia on anterior half

Eriozona (Megasyrphus Dušek et Láska)

3 spp.; widespread; Peck 1974.

- Vein R_{4+5} straight or only very slightly sinuate; face entirely yellow; tergite 4 usually yellow or reddish with narrow black transverse or oblique fascia, rarely extensively black

Dideoides Brunetti

3 spp.; Iran, China and Far East.

49. Face entirely black; abdomen elongate, slender, without marginal sulcus (Fig. 90); male terminalia greatly enlarged, globose, with tergite 9 as broad as preabdomen

Sphaerophoria Lepeletier et Serville, part

1 sp. runs here, S. nigra Frey; see couplet 28.

- Face partly or entirely yellow; male terminalia usually small and inconspicuous, if enlarged, then tergite 9 much narrower than preabdomen

50

50. Vein R_{4+5} distinctly sinuate (Fig. 25)

Eriozona (Megasyrphus Dušek et Láska), part

see couplet 48.

- Vein R_{4+5} straight or nearly so

51

51. Abdomen with strong distinct marginal sulcus extending clearly from middle of tergite 2 to end of tergite 5. Katepisternum with dorsal and ventral pile patches very nearly confluent anteriorly, distinctly separated posteriorly

Eupeodes (Metasyrphus Matsumura), part

see couplet 47.
3.5. Family Syrphidae

- Abdominal tergites 1 and 2 without pits in males

- Metepisternal lobe 3

52. Metatarsus I with a lateral row of setae in males

53. Metatarsus I without a lateral row of setae in males

54. Arista 5

55. Face not as broad as long

56. Face not as broad as long

57. Mesoscutum rugose

58. Arista 9
Abdomen with very weak indistinct marginal sulcus that begins on tergite 3 or 4. Katepisternum with pile patches broadly separated anteriorly, narrowly joined posteriorly.  

Epistrophe (Epistrophe Walker), part see couplet 41.

52. Metepisternum with some fine subpressed pile; katepisternum with pile patches broadly separated posteriorly, joined anteriorly (Fig. 42). Hind coxa with tuft of pile at posteromedial apical angle (as in fig. 48)  

Xanthandrus Verrall  
3 spp.; widespread including North Africa.

52. Metepisternum bare; katepisternal pile patches broadly separated throughout (as in Fig. 45). Hind coxa without posteromedial apical pile tuft

53. Metasternum greatly reduced, with deep posterior incision laterally so that sclerotized portion consists of a median diamond-shaped area with narrow anterior and lateral strips (Fig. 46). Face not produced below, with small tubercle. Male legs slender, without bristles, pile tufts or modified pile  

Melanostoma Schiner  
19 spp.; widespread including North Africa.

53. Metasternum entire (Fig. 47). Face variable, almost straight with weak tubercle or moderately or strongly produced forward ventrally. Male sometimes with legs modified, either broadened, or with special bristles, pile tufts or modified pile

54. Arista plumose, with pile more than twice as long as arista width; abdomen petiolate, with 2nd tergite narrower than 3rd; male hind tibia modified  

Platyccheirus (Spazigaster Rondani), part see couplet 18.

54. Arista bare or pubescent, with pile less than twice as long as arista width; abdomen parallel-sided or oval, with 2nd tergite as wide or wider than 3rd; male hind tibia simple

55. Eye pilose; antenna elongate, as long as face; basoflagellomere elongate, more than 5 times as long as broad; male dichoptic  

Platyccheirus (Pseudoplatycheirus Doesburg)  
1 sp., P. (Ps.) pederi Doesburg; Russia (Pamir) and China (Karakorum Mts).

55. Eye bare; antenna usually short, shorter than face; basoflagellomere usually not more than twice as long as broad; male holoptic

56. Face greatly produced anteriorly; antenna elongate, with basoflagellomere about 4 times as long as broad  

"Tuberculanostoma" Fluke  
1 sp., T. solitariurn Doesburg; China (Karakorum Mts).

56. Face not greatly produced anteriorly

57. Mesonotum smooth or with puncta finer and more widely scattered, not producing a distinct rugose appearance; legs partially pale

57. Mesonotum distinctly and finely rugose; rugose appearance due to large and closely set puncta, puncta set in irregular rows; legs black

58. Arista bare, inserted near middle of basoflagellomere; face wider ventrally, with sides divergence ventrally; abdomen with pale maculae  

Platyccheirus (Rohdendorfia Smirnov)  
4 spp.; high montane areas, Central Europe to Pamir; Stackelberg 1965, Violovitsk 1984, Claussen 1988.
- Arista pubescent, with short, appressed pile, inserted basally; face not distinctly wider ventrally, with sides approximately parallel; abdomen entirely black
  
  Platycheirus (Syrphochelis Stackelberg)
  
  1 sp., P. (S.) claviventris Strobl; Europe; Claussen 1987.

59. Wing shorter than abdomen; abdomen broad or mostly red or black with 2 yellow maculae on 3rd tergite
  3 spp.; widespread.

- Wing longer than abdomen; abdomen narrow, not with such abdominal pattern

60. Male fore femur posteriorly on at least apical 1/2 with row of stiff straight black setae, with last seta longer and with its apex strongly curved
  Platycheirus (Pachysphyria Enderlein)
  3 spp.; widespread, including Arctic.

- Without such chaetotaxy
  Platycheirus (Platycheirus Lepeletier et Serville)
  60 spp.; widespread, including Arctic; Nielsen 1981; Ohara 1980, 1984; Dušek and Láska 1982; Speight and Goeldlin 1990.

61. Anterior anepisternum with long erect pile

- Anterior anepisternum bare

Figs 5.76–79. Adult Syrphidae, details of thorax, lateral view. 76: Episyrophus (Asiobaccha) nubilipennis (Austen); 77: Melissaeva cinetella (Zetterstedt); 78: Allobaccha bergi Carran; 79: Allobaccha apicalis (Loew).
3.5. Family SYRPHIDAE

62. Katepimeron bare; male with distinct conically produced frontal prominence; hind trochanter of male simple
   34 spp.; widespread; Violovitsh 1988.

   - Katepimeron pilose at least anteriorly; male with frontal prominence very short; hind trochanter of male often with ventral spur

   63. Vein Sc ending opposite or before crossvein R-M; cell r4+5 truncate apically; vein M1 joining
   vein R4+5 perpendicularly
   34 spp.; widespread; Lucas 1976.

   - Vein Sc ending beyond crossvein R-M; cell r4+5 acute apically; vein M1 progressive apically,
   joining vein R4+5 at acute angle

64. Male coxae and trochanters without calcars. Female basoflagellomere much longer than wide;
frons with conspicuous lateral pollenese maculae
4 spp.; widespread; Claussen, Goedlín and Lucas 1994.

   - Male coxae and trochanters with calcars. Female basoflagellomere not, or only slightly longer
than wide; frons with very small and inconspicuous pollenese maculae or none
Heringia (Neocenedon Goffe)
11 spp.; widespread; Stackelberg 1952a (as Cnemodon), Delucchi and Pschorn-Walcher 1955.

65. Abdomen with tergites 2 and 3 well developed and subequal in length, 4th minute and barely
visible dorsally

   - Terga 2 to 4 well developed and subequal in length
5 spp.; widespread.

66. Vein R4+5 with medial appendix extending into cell r4+5 (Fig. 28)

   - Vein R4+5 without an appendix; antenna short, shorter than face
Not Palaearctic; 1 sp., P. nigripennis (Sack), Taiwan.

67. Eye and face pilose (Fig. 9). Crossvein R-M before middle of discal cell. Subscutellar fringe
present
10 spp.; widespread; Zimina 1986, Speight 1991b.

   - Eye bare and face usually bare. If face pilose, then crossvein R-M beyond middle of discal cell.
Subscutellar fringe absent

68. Crossvein R-M beyond middle of discal cell. Antenna long; scape three to four times as long
as wide; basoflagellomere shorter than scape and pedicel together

   - Crossvein R-M before middle of discal cell. Antenna short; scape about as long as wide; ba-
soloflagellomere large and longer than scape and pedicel together

69. Metasternum and first abdominal sternite bare; subscutellar fringe absent; scutellum with dis-
tinct bristles; basoflagellomere large, oval (Fig. 10); arista bare; sternopleural pile patches sepa-
rated

   - First abdominal sternite pilose and usually metasternum bare
70. Basoflagellomere greatly elongate dorsally; terminal antennal style very short, less than 1/10 as long as basoflagellomere, bare (Fig. 66); anterior anepisternum pilose; thorax without bristles

Macroplecoecera Stackelberg

- Basoflagellomere short, oval; arista elongate, more than 4 times as long as basoflagellomere, densely pilose (Figs 6768); anterior anepisternum bare

4 spp.; Central Asia and China; Kuznetzov 1990.

71. Thorax with bristles

- 1 sp., T. atriseta (Oldenberg); high montane areas, Central Europe.

72. Frontal prominence at least as long as scape (Fig. 12)

- Frontal prominence absent or much shorter than scape

73. Taeniochilosis Oldenberg

74. Ischryoptera Pokorny

Figs 5.80–88. Adults Syrphidae, male heads, lateral view (except 83 anteroventral and 84 laterooblique). 80: Sericomia lappona (Linnaeus); 81: Pocota personata (Harris); 82: Microdon mutabilis (Linnaeus); 83: Pipta noctiluca (Linnaeus); 84: Portevinia maculata (Fallén); 85: Volucella bombylans (Linnaeus); 86: Criorchina floccosa (Meigen); 87: Portevinia maculata (Fallén); 88: Blera fallax (Linnaeus) (after Verrall 1901).
73. Eye pilose  
   2 spp.; Far East.  
   - Eye bare  
     5 spp.; Europe, Far East.

74. Vein R₄₊₅ with a appendix into cell R₄₊₅. Abdomen not petiolate  
   17 spp.; widespread including North Africa.  
   - Vein R₄₊₅ without appendix. Abdomen petiolate  
     3 spp.; China and Far East.

75. Vein M₁ usually processive anteriorly (Figs 35, 37–38). If slightly recessive, then arista plumose  
   or cell r₂₊₃ petiolate. Anepisternum bare anteriorly  
   - Vein M₁ recessive anteriorly (Figs 29, 34, 36). Anepisternum with anterior flattened portion  
     pilose; arista bare; cell r₂₊₃ open at wing margin

76. Eye bare. Antenna elongate, with pedicel elongate, as long or longer than basoflagellomere; arista elongate, with apex expanded in male; female face distinctly tuberculate; anepimeron with triangular area pilose; hind femur without apicolateral ventral triangular plate  
   Platyntochaetus Wiedemann  
   5 spp.; Spain, North Africa; Bezzi 1924.  
   - Eye pilose or bare. If eye bare, then pedicel shorter, anepimeral triangle pilose. Arista never  
     with flared apex; face never tuberculate

77. Hind femur with apicolateral ventral triangular plate (Fig. 97); anepimeron with triangular area  
   pilose  
   - Hind femur only slightly swollen, willthout ventral plate; anepimeron with triangular area bare

78. Scutellum long, narrow, about 4 times as long as broad, as wide as head; vein R₄₊₅ sinuate;  
   apical portion of vein M without external spurs  
   1 sp.; A. shirakii Harkmans; Japan.  
   - Scutellum more quadrate, about 2 times as long as broad, with its width less than that of head;  
     vein R₄₊₅ straight or sinuate; apical portion of vein M with external spurs  

79. Male dichoptic  
   3 spp.; Caucasus, Turkey and Altai.  
   - Male holoptic  
     95 spp.; widespread including North Africa; Harkmans 1993.

80. Cell r₁ petiolate, closed before reaching wing margin (Figs 33–35)  
   - Cell r₁ open at wing margin (Figs 36–38)

81. Arista plumose (Fig. 85)  
   - Arista bare
82. Metasternum bare. Hind femur without anterobasal patch of short dense black setulac. Male holoptic, female face concave
   3 spp.; China and Far East.
   - Metasternum pilose. Other characters variable

83. Hind femur swollen, with a large apicoventral triangular plate, without distinct anterobasal setulac (Fig. 94); metasternum with a basal membraneous seam. Male holoptic, face carinate (Fig. 8). Female face concave
   1 sp. runs here, T. fasciata Meigen; widespread.
   - Hind femur without apicoventral plate, with anterobasal patch of short dense black setulac; metasternum without a seam. Male holoptic or dichoptic, face tuberculate. Female face tuberculate or straight

84. Postalar pile tuft present (Fig. 74)
   - Postalar pile tuft absent

Figs 5.89–92. Adult males of Syrphidae. 89–91: habitus; 89: Baccha elongata (Fabricius); 90: Sphaerophoria scripta (Linnaeus); 91: Doros profugus (Harris). 92: Portevinia maculata (Fallén), abdomen, dorsal view (after Verrall 1901).
3.5. Family SYRPHIDAE

85. Eye bare 88
   - Eye pilose; katepimeron bare 86

86. Wing partly bare on basal 1/3 86
   - Wing entirely microtrichose; mesonotum usually with yellow or grey pollinose vittae or fasciae 87

87. Male dichoptic; 1st and 2nd sternites fused laterally; mesonotum with obscure gary pollinose vittae 86
   1 sp., P. (P.) sibirica Stackelberg; boreal, Europe to Siberia; Thompson 1997.
   - Male holoptic; 1st and 2nd sternites separate; mesonotum usually with a distinct yellow to gray pollinose pattern (Fig. 2) 87
   3 spp.; widespread including North Africa.

88. Katepimeron pilose; hind basitarsis with globuliferous pile basoventrally; male holoptic 88
   5 spp.; widespread including North Africa.
   - Katepimeron bare; hind basitarsis without such pile; male dichoptic 89

89. Pterostigma elongate, not simulating a crossvein, at most slightly darkened basally (Fig. 37); abdomen oval, usually with large orange maculae on 2nd tergite 90
   18 spp.; widespread; Violovitsh 1979a.
   - Pterostigma very short, simulating a crossvein (Fig. 38). Abdomen oval to slender, variable in colour 90

90. Face extensively black in background colour, pale pollinose laterally but shiny black medially 91
   - Face pale, yellow to orange in background colour and completely pale pollinose 92

91. Hind tibia truncate apically, with ventral carina restricted to basal half or less, with apical half rounded ventral (Fig. 56) 92
   7 spp.; widespread; Thompson 1997.
   - Hind tibia produced apicoventrally as an acute or rounded spur, with ventral knife-edged carina on basal half, carina continuing less distinctly posteroventrally to or almost to tibial apex (Fig. 55) 92
   13 spp.; widespread.

92. Face produced anteroventrally, almost straight, without distinct tubercle (Fig. 13) 92
   1 sp., L. (A.) willingii (Smith); boreal, Europe to Siberia.
   - Face not produced anteroventrally, with large distinct tubercle 93
     see couplet 86.

93. Metasternum pilose 93
   - Metasternum bare. Hind femur without anterobasal patch of short dense black setulae 94

96

85

84

83

82

81

80

79
94. Vein R$_{4+5}$ with last section long, longer than crossvein H; arista shorter than maximal facial width; face concave in both sexes; female front entirely pollinose

Palumba (Palumba Rondani)

2 spp.; Italy, Caucasus.

- Vein R$_{4+5}$ with last section short, less than half as long as crossvein H; arista longer than maximal facial width; male face tuberculate; female face concave; female front shiny on ventral 1/3

Palumba (Korinchia Edwards)

2 spp.; China.

95. Hind femur without anterobasal patch of short dense black setulae, with a preapical anteroventral tooth-like process

Milesia Latreille

10 spp.; widespread; Hippi 1990.

- Hind femur with anterobasal patch of short dense black setulae, without apicoventral tooth

96. Katepimeron pilose (Figs 70–71, 73); other sclerites frequently partly pilose

Katepimeron, anepimeron on posterior half, meron, and metepisternum all bare (Fig. 72)

97. Postalar pile tuft present (Fig. 74); metallic green to purple flies

Pseuderistalis Shiraki

2 spp.; China and Far East.

- Postalar pile tuft absent; not metallic flies

39 spp.; widespread including North Africa.

98. Eye with dark maculae or vitiae. Anepimeron with triangular area ventrad to wing base pilose (Fig. 71); postalar pile tuft present (Fig. 74)

Eristalis (Ecseristalis Kanervo)

101.

Figs 5.93–97. Adult Syrphidae, male hind legs, anteroventral view. 93: Xylota segnis (Linnaeus); 94: Tropidia scita (Harris); 95: Brachypalpus (B.) laphriformis (Fallén); 96: Syritta pipiens (Linnaeus); 97: Merodon equestris (Fabricius) (after Verrall 1901).
3.5. Family SYRPHIDAE

99. Meron bare posteroventrally, without pile anterior or ventral to spiracle (Fig. 73); eye pilose; wing bare
   2 spp.; widespread including North Africa.
   - Meron pilose posteroventrally, with pile anteroventrally to spiracle; eye bare; wing partially microtrichose

100. Front with strongly rugose area dorsal to antenna; male holoptic Phytomia Guérin-Méneville
   2 spp.; China and Far East.
   - Front not rugose; male dichoptic
     2 spp.; Afrotropical, not Palaeartic.
   Simoides Loew
   - Eye fasciate and punctate
     1 sp., E. (E.) taeniops Wiedemann, Mediterranean to Pakistan.

101. Eye punctate

102. Male dichoptic
   1 sp., E. (E.) sepulchralis Linnaeus, widespread.
   - Male holoptic
     14 spp.; widespread including North Africa.
   - Eye punctate

103. Cell r1 petiolate; apical crossvein strongly recessive (Fig. 34); katepimeron pilose
   - Cell r1 open, not petiolate; apical crossvein perpendicular or slightly recessive; katepimeron bare
   Volucella Geoffroy

104. Eye bare

105. Vein M1 processive; anterior anepisternum bare; scutellum without medial concavity; male holoptic
   4 spp.; China and Far East.
   - Vein M1 recurrent or perpendicular; anterior anepisternum pilose at least posterodorsally;
     scutellum with medial concavity; male dichoptic
   Endoiasimyia Bigot
   - Vein R4+5 with apical section longer than crossvein R-M; hind tibia with short strong black spines on anterior surface; anepisternum, postalar callus, and scutellum with strong bristles; face of male with tubercle
     3 spp.; widespread.
   Brachypa (Hammerschmidttia Schummel)
108. Vein R_{4+5} strongly sinuate; male dichoptic
    1 spp., *P. oberthueri* Hervé-Bazin; Russia (Transbaikalia to Far East).
    - Vein R_{4+5} straight or only moderately sinuate

109. Anepimeron bare posteriorly; abdomen usually yellow fasciate
    - Anepimeron with a patch of pile on posterior half; abdomen without yellow fasciae, either entirely black or yellow basally in ground colour

110. Abdomen black in ground colour, with long pile
    3 spp.; Europe.
    - Abdomen yellow basally in ground colour, with short pile
      1 sp., *P. decipiens* (Hervé-Bazin); Far East.

111. Face greatly produced ventrally, projecting more than 1/2 eye length below eye, yellow
    2 spp.; Caucasus and Siberia.
    - Face not produced greatly, projecting less 1/2 eye length below eye, usually with black medial vitta (Fig. 80)
      8 spp.; widespread; Stackelberg 1927.

112. Vein M_{1} strongly biangulate, recessive anteriorly, forming an acute angle with vein R_{4+5} (Fig. 29); anterior anepisternum pilose
    - Vein M_{1} not biangulate, usually processive or perpendicular anteriorly, forming a right or obtuse angle with vein R_{4+5}

113. Eye bare
    - Eye pilose

114. Vein M_{1} processive; scutellum without medial concavity; male holoptic
    - Vein M_{1} recurrent or perpendicular; scutellum with medial concavity; male dichoptic. Anterior anepisternum pilose at least posterodorsally; face tuberculate
      *Graptomyza* Wiedemann, part see couplet 105.

115. Anterior anepisternum pilose; scutellum with distinct marginal sulcus. Face without a tubercle, straight, with a projecting epistoma (Fig. 15)
    11 spp.; widespread including North Africa; Violovish 1980c.
    - Anterior anepisternum bare; scutellum without apical sulcus, evenly convex apically. Face usually tuberculate, without a projecting epistoma
116. Bristles absent; face black, usually concave, rarely with at most a small tubercle in males; subcutellar fringe absent. Chrysogaster Meigen
   20 spp.; widespread including North Africa; Stackelberg 1959.
   - Bristles present on thorax; face either yellow or with distinct tubercle; subcutellar fringe present

117. Crossvein R-M at or beyond middle of discal cell. Antennal sockets confluent; face yellow with black median vitta. Legs yellow. Ferdinandia Rondani
   5 spp.; widespread.
   - Crossvein R-M before middle of discal cell. Antennal sockets separated; face black. Legs usually mostly black
     303 spp.; widespread including North Africa.
     Cheilosia Meigen

118. Anterior anepisternum pilose posterodorsally; femora usually with distinct ventroapical spines; vein R₄₅ with last section much less than half as long as crossvein H or absent; cell r₄₅ closed at wing margin, not petiolate. Metasternum pilose or bare. Myolepta Newman
   12 spp.; widespread including North Africa.
   - Anterior anepisternum bare; anterior femora without distinct ventral spines. If hind femur with ventral spines, then vein R₄₅ with last section longer than crossvein H and usually longer than crossvein R-M

119. Subcutellar fringe absent or nearly so
   128
   - Subcutellar fringe present (as in Fig. 41)
   120

120. Face produced into a long posterior snout, without tubercle (Fig. 16); costa and vein R₄₅ ending well posterior apex of wing. Rhinia Scopoli
   5 spp.; widespread.
   - Face not so produced, usually tuberculate; costa and vein R₄₅ ending at or anterior to apex of wing
   121

121. Vein R₄₅ with last section shorter than crossvein H and at most half as long as crossvein R-M
   127
   - Vein R₄₅ with last section longer than crossvein H and usually longer than crossvein R-M
   122

122. Abdomen elongate, strongly petiolate; 2nd tergite narrower than 3rd tergite, about 1/3 as wide as scutellum; anepimeron pilose; laterotergite dorsally with a patch of long pile (Far East only). Allobaccha Curran, part
   see couplet 15.
   - Abdomen parallel-sided to oval, never distinctly petiolate; 2nd tergite as wide as 3rd tergite, wider than scutellum; anepimeron bare; laterotergite without long pile
   123

123. Face yellow laterally; arista bare (Fig. 17); male broadly dichoptic. Pelecocera (Chamaesyrphus) Mik
   6 spp.; widespread including North Africa.
124. Face pilose laterally; male frons bare; female face straight with a projecting epistoma; scutellum without distinct bristles. 3 spp.; Arctic; Violovitch 1978; Kassebeer 1995. Chrysosyrphus Sedman

- Not with all characters in combination; face usually bare; female (male also) with strong tubercle; male frons pilose; scutellum usually with strong bristles. Psarochilosis Stackelberg

125. Male broadly dichoptic; frons projecting beyond facial tubercle (Fig. 65); abdomen extensively red. 1 sp., P. djonovii Stackelberg; Siberia.

- Male holoptic; frons not strongly produced; abdomen black. Psarochilosis Stackelberg

126. Face with distinct tubercle; abdomen without grey pollinose maculae. Cheilosia Meigen, part see couplet 117.

- Face with indistinct tubercle (Fig. 87); abdomen with distinct grey pollinose maculae (Fig. 92). Portevinia Goffe

3 spp.; widespread.

127. Vein R4+5 with last section subequal to crossvein H; cell r5 with distinct petiole; hind femur without ventroapical spines; metasternum bare. Lejota Rondani

6 spp.; boreal, Europe to Siberia, Japan; Violovitch 1980.

- Vein R4+5 with last section much less than half as long as crossvein H or absent; cell r5 closed at wing margin, not petiolate; hind femur with distinct ventroapical spines; metasternum pilose. Myolepta Newman, part see couplet 118.

128. Abdomen parallel-sided or oval; alula at least as wide as cell bm (Fig. 31). Face variable. Postmetacoxal bridge absent

- Abdomen petiolate; alula narrower than width of cell bm (Figs 26, 30). Face concave or nearly straight, never tuberculate nor produced on ventral half. Postmetacoxal bridge usually entire or nearly so

129. Vein M1 either perpendicular and forming a right angle with vein R4+5 or with its apical portion slightly recessive (Fig. 31); basoflagellomere usually much longer than wide; face oblique, nearly straight (Fig. 20); katepisternum usually pilose; male broadly dichoptic

- Vein M1 oblique, forming an acute angle with vein R4+5 (Fig. 30); basoflagellomere oval, at most as long as wide; face convex (Fig. 4); katepisternum bare

130. Postmetacoxal bridge absent; metasternum pilose; male holoptic. Chalcosyrphus (Spieginoides Szilády)

1 sp., Ch. (S.) obscurus (Szilády); Hungary to Siberia.

- Postmetacoxal bridge entire (Fig. 52); metasternum bare; male broadly dichoptic
131. First abdominal sternite distinct, strongly sclerotized, subquadrate, pilose

**Sphegina** (Sphegina Meigen)

34 spp.; widespread; Stackelberg 1953a, 1956; Violovitsh 1980d (Siberian spp.); Thompson and Torp 1986 (European spp.).

- First abdominal sternite absent or present, but if present, much weaker than second sternite, very slender and bare

**Sphegina** (Asiosphegina Stackelberg)

10 spp.; widespread; Stackelberg 1953a, 1956; Violovitsh 1980d (Siberian spp.); Thompson and Torp 1986 (European spp.).

132. Postmetacoxal bridge complete

10 spp.; widespread; Stackelberg 1955a, 1965.

- Postmetacoxal bridge incomplete

7 spp.; widespread; Stackelberg 1955a, 1965.

133. Face and scutellum pale, orange to yellow; legs and abdomen extensively pale; vein R₄+₅ with last section short, subequal to crossvein H

**Brachyopa** (Brachyopa Meigen), part

see couplet 107.

- Face and scutellum black, usually with a metallic luster; legs and abdomen mostly black or dark metallic; vein R₄+₅ with last section of variable length

134

134. Frontal prominence distinct, longer than scape (Fig. 64); antenna elongate, as long as face; male dichoptic; arista thick, inserted on apical half of basoflagellomere. Face and frons smooth

**Psarus** Latreille

1 sp., *P. abdominalis* (Fabricius); Europe.

- Frontal prominence absent; antenna short, usually shorter than face; arista thin, inserted on basal half of basoflagellomere

135

135. Vein R₄+₅ with last section less than half as long as crossvein R-M; male dichoptic; female face and frons smooth

see couplet 127.

- Vein R₄+₅ with last section subequal to or longer than crossvein R-M; male holoptic; female face or frons or both sometimes rugose

136

136. First abdominal sternite entirely pollinose; vein M₁ usually processive, rarely with apical portion recessive; basoflagellomere oval, at most 1.4 times as long as wide; metasternum bare

**Chrysogaster** Meigen, part

see couplet 116.

- First abdominal sternite shiny, metallic; if partially pollinose, then apical crossvein strongly recessive (Fig. 32)

137

137. Abdomen dull medially; male holoptic; metasternum usually pilose

**Orthonevra** Macquart

32 spp.; widespread including North Africa; Stackelberg 1953b, 1965; Violovitsh 1979b.

- Abdomen entirely shiny

138

138. Male broadly dichoptic; metasternum pilose; radial sector with short bristles

**Lejogaster** Rondani

4 spp.; widespread.
– Male holoptic; metasternum bare; radial sector without bristles  
  1 sp., L. przewalski Stackelberg; China.  
  
Liochrysogaster Stackelberg

139. Cell r₁ petiolate, closed before wing margin  
  see couplet 94.  
  
– Cell r₁ open to wing margin

Milesia Latreille, part

140. Anterior anepisternum pilose; hind femur slender, with a slender preapical anteroventral tooth-like process; large robust flies, mimicking wasps and hornets  
  17 spp.; widespread including North Africa; Stackelberg 1958.  
  
Spilomyia Meigen

– Anterior anepisternum usually bare. If pilose, then hind femur unarmed

141. Katepisternum with separate dorsal and ventral pile patches; gena and ventral part of face usually bare. If face pilose, body entirely black. Body variable in appearance

– Katepisternum continuously pilose along posterior margin; gena and ventral half of face pilose; body with bright yellow pollinose markings; flies mimicking wasps

142. Alula narrow, only as wide as 2nd costal cell; abdomen distinctly petiolate; 2nd tergite always constricted basally; face concave; anterior anepisternum bare. Far East only

Takaonomya Hervé-Bazin

2 spp.; Far East.

– Alula broad, much broader than cell bm; abdomen oval, not petiolate; 2nd tergite not constricted basally; face and anterior anepisternum variable. Widespread

Temnostoma Lepeletier et Serville

9 spp; widespread including North Africa.

143. Metasternum bare

– Metasternum pilose, with pile as long as or longer than that of hind coxa

144. Wing almost bare on basal 2/3, very sparsely microtrichose on apical 1/3; metepisternum with a patch of fine pile; hind femur greatly enlarged, with an anteroventral spinose ridge on apical 1/3 (Fig. 96)  
  6 spp.; widespread including North Africa.

– Wing entirely microtrichose or with just moderate bare areas on basal 1/3 or slightly more, densely and uniformly microtrichose on apical 1/3; metepisternum pilose or bare; hind femur variable

145. Hind femur with an apicoventral triangular process (Fig. 94); metasternum large, with a basal membranous seem (Fig. 50)  
  1 sp. runs here, T. scita (Harris); widespread.  
  
Tropidia Meigen, part

– Hind femur without apicoventral process

146. Face produced ventrally, usually tuberculate; gena broad (Figs 86, 88). Body either with long pile or with bright yellow pollinose markings

147. Face concave, sometimes subcarinate, not tuberculate; gena narrow (Figs 11, 81). Body with short and sparse pile, without bright yellow pollinose markings
3.5. Family SYRHIDAE

147. Face shiny, sparsely pilose; male hind femur with subbasal tubercle

**Chalcosyrphus** (Chalcosyrphus Curran)

1 sp., *Ch. (Ch.) tuberculiferum* (Stackelberg); Siberia, Far East.

- Face pollinose, bare; male hind femur not as such

148. Abdomen greatly elongate, about twice as long as scutum and scutellum together; abdomen unicolorous, deep violet black

**Chalcosyrphus** (Xylotomima Shannon)

10 spp.; widespread; Hippa 1968.

- Abdomen shorter, only 1.5 times as long as scutum and scutellum or shorter; abdomen otherwise

149. Mesonotum with distinct pattern of thick short pilose vittae; hind femur incrassate, with apicoventral carina rising abruptly basally, apex not curved posteriorly

**Chalcosyrphus** (Syrittosyrphus Hippa)

1 sp., *Ch. (S.) shirakii* Hippa; China and Far East.

- Mesonotum without vittate pattern; hind femur normal

150. Alula narrow, narrower than width of cell bm; katepisternum bare; crossvein R-M basal, at basal 2/5 of discal cell

**Chalcosyrphus** (Spheginoidea Szilády), part

- Alula broad, broader than width of cell bm; katepisternum pilose; crossvein R-M apical, at or beyond middle of discal cell

151. Hind femur with strong irregularly spaced spinose pile; sexes strongly dimorphic in colouration

**Chalcosyrphus** (Dimorphoxylotota Hippa)

1 sp.; *Ch. (D.) eumerus* (Loew); Russia, China.

- Not so

152. Aedeagus without dorsal notch

5 spp.; widespread.

**Chalcosyrphus** (Xylotina Hippa)

- Aedeagus with dorsal notch

6 spp.; widespread.

**Chalcosyrphus** (Xylotodes Shannon)

153. Antenna greatly elongate, much longer than face. Thorax and abdomen with distinct yellow pollinose markings. Body with short and sparse pile; flies mimicking wasps

**Sphecomyia** Latreille

1 sp., *S. vesiformis* Gorski; widespread.

- Antenna short, shorter than face. Thorax and abdomen without yellow pollinose markings. Body with long pile; flies mimicking *Bombus* or other bees

**Criorthina** Meigen

17 spp.; widespread; Stackelberg 1955b (as Penthesilea), Violovitsh 1974b.

- Male holoptic; anepimeron bare; basoflagellomere oval, about as deep as long

**Matsumia** Shiraki

2 spp; Far East.
155. Vein R₄₊₅ with last section not more than 1/3 as long as crossvein H

156. Face black in background colour, rarely slightly yellowish ventrally

157. Hind femur with a pair of apicoventral spurs
   1 sp., *M. hervei* (Shiraki); Far East; Hippa 1978b.

158. Abdomen either black and at least partly black pilose or black with clear yellow markings on tergites 2–4 or red on 4–5

159. Face tuberculate; scutellum without subscutellar fringe; metasternum not developed (as in Fig. 49)

160. Crossvein R-M slightly before middle of discal cell; abdomen broadly oval; subscutellar fringe present or absent; male narrowly dichoptic

161. Head triangular in anterior view (Fig. 18); face extensively shiny; gena broad, much broader than metathoracic spiracle; basoflagellomere kidney-shaped, broader than long; hind femur greatly enlarged, arcuate (Fig. 95)

162. Frontal prominence normal; aedeagus with short ejaculatory process

163. Subscutellar fringe present and face black in background colour; abdomen black, without pale markings; face concave (Fig. 81). Large robust long-pilose flies, mimicking Bombus

**Macrozelima** Stackelberg

**Blera** Billberg

**Caliprobola** Rondani

**Hadromyia** (Chrysosomidia) Curran

**Lejota** Rondani, part sec couplet 127.

**Brachypalpus** Macquart

**Xylota** (Xylota Meigen)

**Xylota** (Brachypalpoides Hippa)

**Pocota** Lepeletier et Serville
3.5. Family SYRPHIDAE

- Subscutellar fringe absent or face partly yellow in background colour; abdomen often with yellow markings; face tuberculate, not concave (Fig. 88). Smaller, barer flies, not mimicking Bolfus Blera Billberg, part see couplet 158.

Larvae

1. Antennal-maxillary organs mounted on a two-stage fleshy tapering projection (Fig. 101); this projection sometimes divided medially almost to base

- Antennal-maxillary organs mounted on a single-stage fleshy projection (Fig. 99) 2

2. Mouth hooks reduced, pale or apparently absent

- Mouth hooks present at apex of mouth, black downwardly projecting, in lateral view usually protruding from mouth (Figs 98–99) 3

3. Anal segment ends in flattened disc OR if tapering toward tip, with 2 or 3 pairs of lappets (fleshy tapering projections) (Fig. 104)

- Anal segment tapering towards tip, with 4 pairs of lappets; middle pair of lappets divided into 2 small projections 4

4. Dorsal lip (areas between mouth hooks at base of antennal-maxillary organs) covered in transverse rows of setae

- Dorsal lip lacking rows of setae

   In bulbs and roots of live plants.

- Anus parallel to longitudinal axis of body; body ends with posterior spiracular process in center of flat inclined disk fringed with setae

   In bulbs and roots of live plants.

- Anus transverse to longitudinal axis of body

   Mycophagous, in fruiting bodies of macrofungi; in decaying roots of herbaceous plants; leaf-miners; cambium-feeders through bark of pine trees; tunnelling in roots and stems of herbaceous plants.

5. Larva hemispherical in cross-section, with a narrow band of setae round entire margin of body except for a notch on anterior margin through which prothorax protrudes; setal band level with ventral surface; prothorax and mesothorax very narrow and usually withdrawn completely into metathorax (view from ventral surface)

   In and around ant nests, predators of ant larvae and pupae.

- Larva without this combination of characters 7

6. Larva with colour pattern made up from: pigments in haemolymph and/or variously coloured fat bodies and markings on integument; anal segment with tip rounded, bearing sensilla (Fig. 103); tip of prothorax with a pair of triangular-shaped sclerotized hooks; prothorax and mesothorax narrow and retractable into metathorax; usually free-living on plants

   Microdon Meigen

- Larva without this combination of characters 8