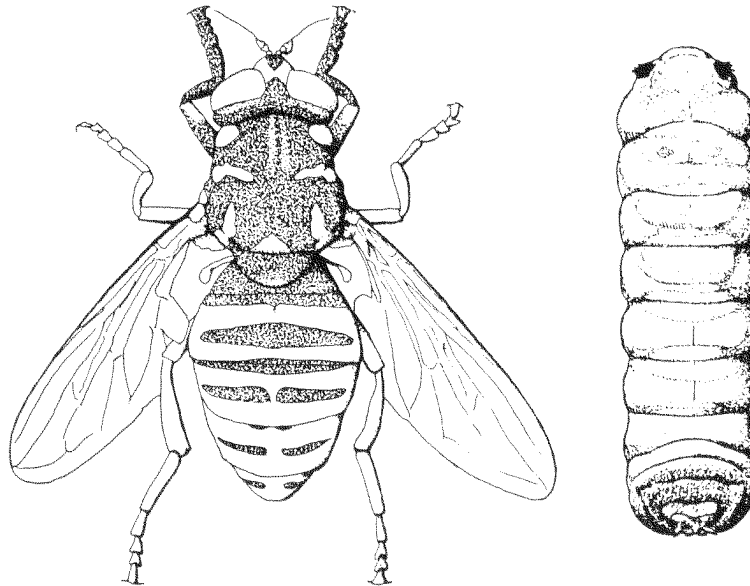


StN KEY FOR THE IDENTIFICATION OF THE GENERA OF EUROPEAN SYRPHIDAE 2020

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1 INTRODUCTION

The identification key presented here is to the genera of European Syrphidae and Microdontidae. No grouping is made of genera in subfamilies or tribes. While every effort has been made to ensure that the key is as self-contained and accurate as possible it is not suggested that it be used in isolation from other literature on identification of European syrphid genera. That literature includes both alternative keys and sources of coloured photos of a wide range of European syrphid species – a coloured photo can be a great help in indicating whether a given genus contains species resembling a specimen one is trying to identify. A wide range of examples of coloured photos of different European syrphid genera can be found at:

<http://cyrille.dussaix.pagesperso-orange.fr/>

Various syrphid genera are represented in Europe by no more than one species. For these genera, the StN key to genera provides a mechanism for identification to species level and the name of the European species is given in the generic key, following the name of the genus. A genus for which an StN key to the European species exists is indicated in the key to genera following the name of the genus, by the phrase “*see StN key to European species*”. Those keys can be found in the StN volume of Keys to Species (Speight and Sarthou, 2017). The StN Species Accounts volume (Speight, 2020) provides additional information on identification of each species, including sources of figures of the male terminalia, sources of coloured illustrations of the adult fly etc., and suggestions (where appropriate) of features to use in separating species. The StN Syrphid Portraits volume (Speight and de Courcy Williams, 2020) is essentially a partner volume to the Key to Genera, providing coloured photos of representative species of each of the European syrphid genera.

There is unfortunately no standard set of English-language terms used for morphological features in taxonomic literature on Syrphidae. Contrasting accounts are provided by Thompson (1999) and Speight (1987). Section 3 of the present volume provides a Glossary of the terms used for morphological features in the StN keys, together with figures showing those features.

2 KEY TO THE GENERA OF SYRPHIDAE & MICRODONTIDAE KNOWN IN EUROPE

2.1 Introduction

The European syrphid genera keyed out as adults in recent major works are listed in Appendix 1. Among those works, the key to Palaearctic genera by Thompson and Rotheray (1998) is the most comprehensive, but omits the genera *Claussenia*, *Copestylum*, *Cryptopipiza*, *Katara*, *Melanogaster*, *Pseudodoros*, *Pseudopelecocera* and *Riponnensia*, that have been added to the European list of genera more recently. The key presented here is based on that of Thompson and Rotheray (1998) but includes those additional genera, and has the non-European genera included in their key removed. Various other alterations have also been made, with the intention of both improving the key and making it easier to use.

An alphabetical list of the morphological features used in the key is provided in Section 2.3, together with the abbreviations used for them in the figures which illustrate them in Section 3. The list of features also cites the number of each figure in which each feature is labelled. An alphabetical list of the abbreviations is given in Section 2.4, with the names of the features to which the abbreviations refer.

The figures used here are nearly all derived from those of Speight (1987), somewhat modified. A wider range of morphological features are labelled (by means of abbreviations) in the figures than are referred to in the key. For the names of the additional features Section 3.4 should be consulted.

Where the word “PHOTO” appears in the key to genera, following the features used to characterise a genus, it indicates that there is a coloured photo of one or more species representative of that genus in the StN Syrphid Portraits volume (Speight and de Courcy Williams, 2020).

2.2 Key

2.21 Key January 2020

- 1** Humeral callus (Figures 13, 14: hc) entirely, or almost entirely, concealed from view by the closely-apposed head capsule (Figure 43a), and without any hairs (patches of dusting may be present), as can be seen when the head is removed (Figures 43b, 45a: hc) or tipped forward (Figure 43c: hc); male: tergite 5 visible in dorsal view **9**
---- humeral callus (Figures 12, 15: hc) mostly visible and with hairs, the hairs can be dense (Figure 44a: hc) or sparse (Figures 44c, 44d: hc), when dense they can largely obscure the callus, but parts of it remain hairless (Figures 44b, 45b: hc); the hairs can also be extremely short, but nonetheless remain distinct; male: tergite 5 not visible dorsally **2**
- 2** Antennae with terminal style or thick, apical arista (Figure 9) **54**
---- antennae with dorsal arista, which is thin and usually basal, never apical (Figures 7, 8, 10) **3**
- 3** Vein R4+5 sinuate (Figure 18) **60**
---- vein R4+5 straight or nearly so, not sinuate (Figures 17, 20, 21) **4**
- 4** Arista plumose, with hairs (rays) at least 3 times as long as basal diameter of arista **77**
---- arista bare or pubescent, with hairs never more than twice as long as basal diameter of arista **5**
- 5** Anteroventral extremity of the head distinctly dorsal to the ventral edge of the eye AND projecting forward for a distance equal to, or longer than, the maximum width of an eye (Figure 6a); PHOTO (eyes bare; cross-vein r-m before the middle of the discal cell, as in Figure 17; thorax with bristles; body length 7 – 11 mm) **Rhingia** (see *StN key to European species*)
---- anteroventral extremity of the head ventral to the ventral edge of the eye or slightly dorsal to the ventral edge of the eye AND projecting forward for a distance no greater than half the maximum width of an eye **6**
- 6** Eyes bare; crossvein r-m usually oblique, within apical half of discal cell, frequently strongly oblique and extending into outer third of discal cell (Figures 18u, 18v); if r-m located beyond middle fifth of discal cell (as in Figure 21), then thorax without bristles; metasternum often strongly developed **108**
---- eyes bare or pilose; if eyes bare, then crossvein r-m usually perpendicular (i.e. at a right angle to the anterior margin of the wing, as in Figure 18b), usually before middle of discal cell, neither strongly oblique (except in *Ferdinandea*, *Lejota*: Figures 18n, 18r) nor extending to outer third or more of the anterior margin of the discal cell (Figures 18f, 18j, 18p); if r-m is located beyond middle fifth of discal cell, then thorax with distinct bristles; metasternum never strongly developed **7**
- 7** Antenna elongate, with first segment (scape) and usually also third segment (basoflagellomere) more than 2.5 times as long as wide (Figure 10); mesanepisternite 1 pilose; postmetacoxal bridge narrow but complete; vein R4+5 with an appendix (Figure 20) into cell po; eyes bare; PHOTO (body length 8 – 14.5 mm)
..... **Microdon** (see *StN key to European species*)
---- antenna usually short; first segment usually at most twice as long as wide; third segment usually rounded or oval; if first segment more than twice as long as wide, postmetacoxal bridge absent; mesanepisternite 1 pilose or bare; postmetacoxal bridge usually absent or incomplete, but if present then broad; vein R4+5 never with an appendix into cell po **8**
- 8** Margin of buccal cavity constricted anteriorly, to form an almost rectangular or digitate extension of variable length (Figure 3); facial groove, more-or-less parallel with the eye margin, extending dorsally from the small anterior tentorial pit (c.f. Figure 3); eyes and face pilose or bare; subcutellar fringe present or absent **83**
----margin of buccal cavity evenly rounded, both anteriorly and posteriorly; anterior tentorial pit not accompanied by a facial groove; eyes and face densely pilose; subcutellar fringe present **47**
- 9** Antennae elongate, sometimes longer than head, segment 3 (basoflagellomere) at least three times as long as broad, first (scape) and second (pedicel) segments often longer than broad; abdomen strongly convex dorsally,

strongly margined, usually with postero-lateral angles of tergites projecting; PHOTOS (body length 9 – 17 mm)	<i>Chrysotoxum</i> (see StN key to European species)
----- antennae short, shorter than head, third segment at most twice as long as broad, first and second segments not longer than broad; abdomen variable but without postero-lateral angles of tergites projecting	10
10 Calypterae (Figure 19) with lower lobe pilose on dorsal surface, especially on postero-medial portion; PHOTO (body length 7 – 13 mm)	<i>Syrphus</i> (see StN key to European species)
----- calypterae (Figure 19) bare (except for fringe of hairs on margin)	11
11 Mesanepisternite 1 (Figure 14) without hairs (may have patches of micropile)	14
----- mesanepisternite 1 Figure 14) with hairs (the hairs as long as, or longer than, the third tarsomere of the fore leg), at least postero-dorsally	12
12 Wing margin with a series of minute, closely spaced, black marks on posterior margin: hind coxa without an apical tuft of hairs at postero-medial angle; eyes bare; abdomen suboval to petiolate	13
----- wing margin without such spots; hind coxa with apical tuft of hairs at postero-medial angle; eyes bare or pilose; metasternum bare; abdomen oval; PHOTO (body length 6 – 11 mm)	<i>Parasyrphus</i> (see StN key to European species)
13 Metasternum (Figure 16, mtb) hairy; PHOTO (body length 8 – 12 mm)	<i>Episyrphus</i> (1 European sp., <i>E. balteatus</i> (Degeer))
----- metasternum (Figure 16, mtb) bare; PHOTOS (body length 8 – 11 mm)	<i>Meliscaeva</i> (see StN key to European species)
14 Abdomen parallel-sided to oval, never distinctly petiolate	18
----- abdomen elongate, strongly petiolate; 2nd tergite narrower than 3rd tergite	15
15 Wing cells along anterior margin of wing, plus marginal and submarginal cells, almost clear, except for stigma (Figure 18w); mesoscutum entirely dark, without longitudinal yellow stripes	16
----- wing cells along anterior margin of wing, plus marginal and submarginal cells, infuscated, from wing base to wing tip (Figure 18x); mesoscutum with longitudinal yellow stripe on each side, along lateral margins; PHOTO (body length 12.5 – 18 mm)	<i>Doros</i> (see StN key to European species)
16 Face and frons entirely black (may also be heavily dusted grey) down to level of facial tubercle (ft, Figure 1), but may be yellowish ventrally, along upper mouth edge	17
--- face yellow laterally, from above antennal insertions down to upper mouth edge, with a black, median, dorso-ventral black stripe PHOTO (tergite 2 with a pair of small pale marks at approximately its mid length; body length 9.5 – 11.5 mm)	<i>Pseudodoros</i> (1 European sp., <i>P. nigricollis</i> Becker)
17 Arista bare; abdomen greatly elongate, narrow; 2nd and 3rd tergites (Figures 29, 30: t2 , t3) much narrower than scutellum; PHOTO (tergite 2 without pale marks; body length 7 – 11 mm)	<i>Baccha</i> (1 European sp., <i>B. elongata</i> (Fab.))
----- arista (Figures 7, 8: a) plumose, with hairs more than twice as long as arista width; abdomen shorter, broader; 2 nd . tergite as broad as or broader than scutellum; 3 rd . tergite always broader than scutellum; PHOTO (body length 7 – 8 mm)	<i>Spazigaster</i> (1 sp., <i>S. ambulans</i> (Fab.), part: the abdomen is petiolate in the female, which runs to this couplet; the male, with a more parallel-sided abdomen, can run to couplet 43)
18 Face and scutellum (Figures 13, 14, 15: msl) entirely black in background colour; abdomen without marginal groove; metasternum bare; eyes bare	41
----- face, OR scutellum, or both, at least partly yellow or yellowish brown in background colour, both never entirely black; in doubtful cases eyes pilose; abdomen, metasternum, and eyes variable	19
19 Metapleural episternum (Figure 14: mts) bare ventral to spiracle; metasternum variable; vein R4+5 straight or sinuate; size and shape variable	20
----- metapleural episternum (Figure 14: mts) with a tuft of fine hairs ventral to spiracle; metasternum pilose; vein R4+5 sinuate; abdomen broad and flattened, with distinct marginal groove; PHOTO (body length 7 – 16 mm)	<i>Didea</i> (see StN key to European species)

20 Mesoscutum (Figures 12, 13, 14: ms) with at most a poorly defined, dull yellow, pollinose, lateral, longitudinal stripe	26
---- mesoscutum (Figures 12, 13, 14: ms) with a sharply defined, shining, yellow or whitish yellow, lateral or sublateral, longitudinal stripe, extending at least from humeral callus (postpronotum) to transverse suture of mesoscutum	21
21 Abdominal tergites without longitudinal groove along their lateral margins	25
---- abdomen with at least a weakly marked, shallow, longitudinal groove along the lateral margins of tergites 4 and 5, often strong on tergites 3-5	22
22 Mesopleur (mesopleural anepisternite 2: Figure 14: ma2) black; scutellum unicolorous brown; abdomen strongly convex in cross section, distinctly petiolate	RETURN to couplet 17
---- mesopleur yellow posteriorly; scutellum at least brightly yellow posteriorly; abdomen nearly flat	23
23 Antennal segment 3 (basoflagellomere) elongate, from 1.6 to 2.0 times as long as broad; male hind trochanter with ventral spur (cf Figure 24); wing hyaline, extensively bare, bare on basal 2/3 and only sparsely microtrichose on apical 1/3; scutellum entirely yellow; eye bare; PHOTO (body length 9 – 11 mm)	Ischiodon (see <i>StN key to European species</i>)
---- antennal segment 3 oval, at most only 1.3 times as long as broad; male trochanter simple; wing usually infuscated anteriorly, extensively microtrichose, with moderately large bare areas on basal 1/3, densely microtrichose on apical 1/3; scutellum always broadly black basally; eye bare or pilose	24
24 Mesoscutum and sternopleuron (mesopleural katepisternum: Figures 14, 15: mk) with sharply defined, bright yellow marks, not pollinose; PHOTO (body length 8.5 – 14 mm)	Xanthogramma (see <i>StN key to European species</i>)
---- mesoscutum and sternopleuron with at most diffuse, pollinose yellow marks; PHOTOS (body length 9 – 14 mm)	Epistrophe (part: see also couplets 36 and 40) (see <i>StN key to European species</i>)
25 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; PHOTOS (body length 5 – 11 mm)	Sphaerophoria (part: see also couplet 39)
---- subscutellar fringe of hairs complete, well-developed, moderately dense; male terminalia small, inconspicuous; tergite 9 at most 1/3 as wide as abdomen; PHOTO (body length 6 – 10 mm)	Meligramma (part: see also couplet 37) (see <i>StN key to European species</i>)
26 <i>Bombus</i> -like flies with tergites 1 to 3 black and with dense, bright red, orange, yellow or white hairs on apical tergites; PHOTO (face yellow; wing membrane almost entirely microtrichose; wing with distinct brown fascia extending from costa to at least across crossvein r-m; body length 13 – 15 mm)	Eriozona (1 sp., <i>E. syrphoides</i> (Fallen))
---- flies not <i>Bombus</i> -like (wing without brown fascia except in some <i>Leucozona</i> species).....	27
27 Metasternum (Figure 16: mtb) pilose	38
---- metasternum (Figure 16: mtb) bare	28
28 Eyes bare or very nearly so	35
---- eyes distinctly pilose	29
29 Tergite 1 greatly reduced, frequently almost linear on disc and practically covered by scutellum; sublaterally at most 1/2 as long as tergite 2; tergites not punctate.; length 6.7 mm or more	30
---- 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; tergites minutely punctate; PHOTOS (body length 3.5 – 8 mm)	Paragus
30 Wing with microtrichia very sparse and scattered, with extensive bare areas on apical 1/3; male eye dorsally with well-defined area of enlarged facets; PHOTO (body length 8 – 16 mm)	Scaeva (except <i>S. mecogramma</i> : see couplet 33) (see <i>StN key to European species</i>)
---- wing with at least apical 1/3 densely and uniformly trichose, without bare areas along veins; male eye without well-defined area of enlarged facets	31

- 31** Tergite 2 with a more-or-less uninterrupted, pale (whitish yellow, grey or blue-grey), transverse band across the entire width of the tergite and occupying at least three-quarters of the length of the tergite (postero-medially, this band may be partly interrupted by a narrow black stripe) or entirely pale grey and heavily dusted; PHOTOS (body length 9 – 15 mm) *Leucozona* (see StN key to European species)
 ---- tergite 2 with a pair of widely separated whitish-yellow marks which rarely occupy more than half the length of the tergite, or tergite 2 entirely black **32**
- 32** Abdominal tergites without longitudinal, marginal groove; abdomen slender and parallel-sided or narrowly oval **34**
 ---- abdominal tergites with weak but distinct, longitudinal, marginal groove; abdomen oval **33**
- 33** Sternopleuron (mesopleural katepisternum: Figures 14, 15: mk) bare antero-dorsally; alula entirely covered in microtrichia; PHOTO (body length 5 – 11 mm) *Dasysyrphus*
 ---- sternopleuron with long hairs antero-dorsally; alula with large area bare of microtrichia (body length 8 – 11 mm) *Scaeva mecogramma* Bigot (see also couplet 30 and StN key to European species of *Scaeva*)
- 34** Face with a median, dorso-ventral, black stripe; hind coxa with an apical group of hairs at postero-median angle; sternites black-marked; PHOTOS (body length 6 – 10 mm) *Melangyna* (part: see also couplet 37) (see StN key to European species)
 ---- face without median, dorso-ventral black stripe; hind coxa bare apically, at postero-median angle; sternites uniformly dusted grey, without black marks (body length 9 – 10 mm) *Epistrophe* *coronata* (Rondani)
- 35** Vein R4+5 (Figure 18a) distinctly sinuate; PHOTO (body length 8 – 11 mm) *Lapposyrphus* (1 sp., *L. lapponicus* (Zetterstedt))
 ---- vein R4+5 straight or nearly so **36**
- 36** Tergites without longitudinal, marginal groove; face often with distinct, dark, median, dorso-ventral stripe; slender species with abdomen parallel-sided **37**
 ---- abdomen with at least a faint trace of a longitudinal, marginal groove on tergites 3, 4 or 5; face with at most an obscure, dark, median, dorso-ventral stripe; broader species with abdomen oval or suboval; PHOTO (body length 9 – 14 mm) *Epistrophe* (part: see also couplets 24 and 40) (see StN key to European species)
- 37** Hind coxa with an apical group of hairs at postero-median angle; pale marks on tergites transverse, those on tgs. 2-4 always separated; face usually with black, median, dorso-ventral stripe, rarely entirely yellow PHOTOS (body length 6 – 10 mm) *Melangyna* (part: see couplet 34) (see StN key to European species)
 ---- hind coxa bare postero-medially; pale marks on tergites usually oblique, but less obviously so when confluent; face entirely yellow, except in *M.cingulata*; PHOTO (in which the face is almost entirely black, with a small yellowish mark on each side; body length 6 – 10 mm) *Meligramma* (part: see also couplet 25) (see StN key to European species)
- 38** Eyes bare or very nearly so **39**
 ---- eyes distinctly and densely pilose; PHOTO (body length 12 – 14 mm) *Megasyrphus* (1 sp. *M.erraticus* (L.))
- 39** Face entirely black; abdomen elongate, slender; tergites without lateral, longitudinal, marginal groove; male terminalia greatly enlarged, globose, with epandrium (also known as the basale or tergite 9) almost as broad as the abdomen *Sphaerophoria* (part: 1 sp. *S. nigra* Frey; see also couplet 25)
 ---- face partly or entirely yellow; male terminalia usually small and inconspicuous, if enlarged, then epandrium much narrower than the abdomen **40**
- 40** Margins of abdominal tergites with strong, distinct, longitudinal, groove extending clearly from middle of tergite 2 to apex of tergite 5; sternopleuron (mesopleural katepisternum) with dorsal and ventral patches of hairs very nearly confluent anteriorly, distinctly separated posteriorly; PHOTOS (body length 6 – 13 mm) *Eupeodes* (see StN key to Atlantic zone species)
 ---- margins of tergites with very weak, indistinct, longitudinal groove on tergites 3 and 4 or tergite 4 only; sternopleuron with dorsal and ventral patches of hairs broadly separated anteriorly, narrowly joined posteriorly; PHOTOS (body length 9 – 14 mm) *Epistrophe* (part: see also couplets 24, 36) (see StN key to European species)

- 41** Sternopleuron (mesopleural katepisternum, Figures 14, 15: mk) with dorsal and ventral patches of hairs patches widely separated posteriorly, joined anteriorly; hind coxa with apical tuft of hairs at posteromedial angle; PHOTO (body length 9.5 – 12 mm) *Xanthandrus*
 ---- sternopleural patches of hairs widely separated throughout; hind coxa without apical tuft of hairs **42**
- 42** Metasternum greatly reduced, so that sclerotised portion consists of a median, diamond-shaped area narrowing both anteriorly and posteriorly; face not produced below, with small tubercle; male legs slender, without bristles, tufts of hairs or modified hairs; PHOTOS (body length 5 – 9 mm) *Melanostoma*
 ---- metasternum entire(cf Figure 16: mtb); face variable, almost straight with weak tubercle or moderately or strongly produced antero-ventrally; male usually with legs modified, either broadened, or with special bristles, tufts of hairs or modified hairs **43**
- 43** Arista plumose, with hairs more than twice as long as aristal width; abdomen slightly petiolate, with 2nd tergite narrower than 3rd; male hind tibia modified; PHOTO (body length 7 – 8 mm)
 *Spazigaster* (1 sp., *S.ambulans* (Fab.)), part: in the male the abdomen is almost parallel-sided, so that it can run to this couplet; the abdomen is distinctly petiolate in the female which thus runs to couplet 17)
 ---- arista bare or pubescent, with hairs less than twice as long as aristal width; abdomen parallel-sided or oval, with 2nd tergite as wide as, or wider than, 3rd (except for some males of *Platycheirus scutatus*, in which the abdomen can be slightly petiolate); male hind tibia simple **44**
- 44** Mesoscutum smooth or with punctures finer and more widely scattered, not distinctly rugose; legs partially pale **45**
 ---- mesoscutum distinctly and finely rugose; rugosity due to large and closely set puncta, the puncta set in irregular rows; legs black **46**
- 45** Wing shorter than abdomen; abdomen broad and mostly red, or black with 2 yellowish marks on the 3rd. tergite PHOTOS (body length 8 – 10mm) *Pyrophaena* (see *StN key to European species*)
 ---- wing longer than abdomen; abdomen narrow, not with such a pattern of abdominal markings; PHOTOS (body length 5 – 11 mm) *Platycheirus* and *Meligramma cingulata* (Egger) (part)
- 46** Arista bare, inserted near middle of third antennal segment (basoflagellomere); face wider ventrally, with sides divergence ventrally; abdomen with pale maculae; PHOTO (body length 8 – 8.5 mm)
 *Rohdendorfia* (1 sp. *R.alpina* Sack)
 ---- arista pubescent, with short, adpressed hairs and inserted basally; face not distinctly wider ventrally, with sides approximately parallel; abdomen entirely black; PHOTO (body length 7 mm)
 *Syrphocheilosia* (1 sp., *S.claviventris* (Strobl))
- 47** Mesopleur with mesanepisternite 1 (Figure 14: ma1) bearing long, erect hairs **53**
 ---- mesanepisternite 1 bare **48**
- 48** Barette (Figures 14, 15: br) bare; male with distinct, conically produced, frontal prominence; hind trochanter of male simple; PHOTO (body length 5 – 11 mm) *Pipiza*
 ---- barette with hairs, at least anteriorly; male with or without conically-produced frontal prominence; hind trochanter of male often with ventral spur (Figure 24) **49**
- 49** Vein Sc ending opposite or before crossvein r-m (Figures 18b, 18c) **50**
 ---- vein Sc ending beyond crossvein r-m (Figure 18d); at the tip of M1 the angle between M1 and R4+5 is less than 90° (on the wing-base side of the junction) **51**
- 50** Apical portion of vein M1 curved strongly towards costal margin of wing (Figure 18b), so that, at its tip, the angle between M1 and R4+5 is 90° or more (on the wing-base side of the junction); median lobe of the lunule usually without long hairs; PHOTO (male trochanters without spurs; body length 4.5 – 9 mm) *Pipizella*
 ---- at the tip of M1 the angle between M1 and R4+5 (Figure 18c) is less than 90° (on the wing-base side of the junction); ventral extremity of the median lobe of the lunule with long hairs; PHOTO (sometimes missing in the female) ; (body length 6.5 – 7.5 mm) *Claussenia* (1.sp., *hispanica* (Strobl))
- 51** Median lobe of the lunule (Figure 1: l) without long hairs; male: frons conically produced (male antennal segment three no longer than deep; male coxae and trochanters without spurs); female: frons with distinct dust

- spots, ant.seg.3 no longer than deep, wing with distinct brown blotch *Cryptopipiza* (1 sp., *C.notabila* (Violovitsh))
 ----- ventral extremity of the median lobe of the lunule with long hairs; male: frons not produced (male antennal segment three often longer than deep; male hind trochanters often with spurs); female: frons with or without dust spots, ant.seg.3 variable, but when no longer than deep the wing is without a brown blotch **52**
- 52** Antennal segment 3 more than 1.5x as long as deep; male trochanters without spurs; female antennal segment 3 more than 2x as long as deep; PHOTO (body length 5 – 8 mm) *Heringia*
 ----- antennal segment 3 less than 1.5x as long as deep; male hind trochanters with spurs (Figure 24); PHOTO (body length 4 – 8.5 mm) *Neocnemodon*
- 53** Abdomen with tergites 2 and 3 well developed and subequal in length, 4th minute and barely visible dorsally ; PHOTO (body length 4.5 – 6 mm) *Triglyphus* (see *StN* key to European species)
 ----- tergites 2-4 well developed and subequal in length; PHOTO (body length 4.5 – 8 mm) *Trichopsomyia* (see *StN* key to European species)
- 54** Eyes and face hairy; crossvein r-m before middle of discal cell; (Figure 18e); subcutellar fringe present; PHOTO (body length 10 – 18 mm) *Callicera* (see *StN* key to European species)
 ----- eyes bare and face usually bare; if face with hairs, then crossvein r-m beyond middle of discal cell; subcutellar fringe absent **55**
- 55** Crossvein r-m beyond middle of discal cell (Figure 21); first antennal segment (scape) three to four times as long as wide, third segment (basoflagellomere) shorter than segments one (scape) and two (pedicel) together **58**
 ----- crossvein r-m before middle of discal cell (Figure 18f); first antennal segment (scape) about as long as wide, third segment (basoflagellomere) large and longer than segments one and two together **56**
- 56** Facial tubercle distinct, facial profile concave between facial tubercle and mouth edge (Figure 46a) (male: eyes meet on frons; tergites entirely black; cross-vein r-m located on wing apical to the point where vein Sc meets the costa (Figure 46i); PHOTO (body length 7 – 9mm) *Ischyroptera* (1 sp., *I.bipilosa* Pokorny)
 ----- facial tubercle not developed (Figure 46d) (male: eyes separated on frons) **57**
- 57** At the level of the antennal insertions face narrower than the width of an eye at the same level; PHOTO (tergites with yellow markings; body length 4 – 9 mm) *Pelecocera* (part: see also couplet 94)
 ----- at the level of the antennal insertions face wider than an eye at the same level (tergites with yellow markings in the male, entirely dark brown in the female) *Pseudopelecocera* (1 European sp., *P. latifrons* Loew)
- 58** Frontal prominence (Figure 4: frt) at least as long as 1st. antennal segment; PHOTO (body length 8.5 – 15 mm) *Ceriana* (see *StN* key to European species)
 ----- frontal prominence absent or much shorter than antennal segment one **59**
- 59** Eyes distinctly hairy, the hairs more than 2x as long as a posterior ocellus; tergite 2 parallel-sided; PHOTO (body length 15 mm) *Primocerioides* (1 sp., *P. regale* Violovitsh)
 ----- eyes bare or with sparse hairs shorter than a posterior ocellus; lateral margins of tergite 2 concave; PHOTO (body length 10 – 15 mm) *Sphiximorpha* (see *StN* key to European species)
- 60** At its apex wing vein M1 usually meeting vein R4+5 at an acute angle (Figure 18i) , or arista plumose, or cell m petiolate (Figures 18j, 18k: **m**); mesopleur with mesanepisternite 1 (Figure 14: **ma1**) bare anteriorly **63**
 ----- at its apex, vein MI meeting vein R4+5 at 90° or more (Figures 18g, 18h); hairs across entire width of antero-dorsal, flattened portion of mesanepisternite 1; arista bare; cell m open at wing margin (Figures 18g, 18h: **m**) **61**
- 61** Eyes bare; antennae elongate, with segment 2 elongate, as long as or longer than third segment (basoflagellomere); arista elongate, with apex expanded in male; female face distinctly tuberculate; hind femur without triangular apico-ventral flange; PHOTO (body length 11 – 14 mm) *Platynochaetus*
 ----- eyes hairy or bare; if eyes bare, then antennal segment 2 shorter; arista never with flared apex; face never tuberculate **62**
- 62** Apical part of ventral surface of hind femur with two rows of stout spines, one row antero-lateral, the other row postero-lateral, located on the surface of the femur except in a small number of species, in which the antero-lateral row of spines is carried on a curved flange that is deepest at about the mid-point of its length; PHOTOS (the

postero-lateral row of spines is absent in <i>E.latitarsis</i> , in which the antero-lateral row is located on the ventral surface of the femur; body length 4 – 12 mm)	Eumerus
---- apical part of the ventral surface of hind femur with one row of stout spines, carried on a triangular, antero-lateral flange that is deepest at its inner end (i.e. closest to the base of the femur), the spines often few in number or very short, in extreme cases represented by only a single, digitate spike carried on a rudimentary flange (e.g. <i>M.aeneus</i> group), or so reduced that the outer margin of the flange appears merely undulating; PHOTOS (body length 5 – 23 mm)	Merodon
63 Cell m open at wing margin (Figure 18j)	64
---- cell m petiolate, closed before reaching wing margin (Figure 18k)	75
64 Arista plumose	79
---- arista bare	65
65 Hind femur without distinct, anteroventral setulae, swollen, with a large, apicoventral, triangular flange; metasternum with a basal membranous seam; male holoptic; face carinate; female face concave	Tropidia , non-European species
---- dense patch of short, black setulae anteroventrally, at extreme base of hind femur (can be difficult to see in cases where the surface of the femur is itself black); hind femur without apicoventral flange; metasternum without a seam; male holoptic or dichoptic, face tuberculate; female face tuberculate or flat	66
66 Eyes bare	69
---- eyes hairy; barette (mesopleural katepimeron) bare	67
67 Wing partly bare on basal 1/3; PHOTO (body length 11 – 19 mm)	Mallota (part: see also couplet 73) (<i>see StN key to European species</i>)
---- wing entirely covered in microtrichia; mesoscutum usually with yellow or grey pollinose stripes or patches	68
68 Male dichoptic (i.e. eyes separated on frons, cf Figure 2); 1st and 2nd sternites fused laterally; mesoscutum with obscure, grey, pollinose, longitudinal stripes	Parhelophilus (part: 1 sp., <i>P. sibirica</i> Stackelberg; see also couplet 71) (<i>see StN key to European species</i>)
---- male holoptic (i.e. eyes meeting on frons, cf Figure 1); 1st and 2nd sternites separate; mesoscutum usually with a distinct yellow to gray pollinose pattern; PHOTO (body length 9 – 15 mm)	Myathropa
69 Upper part of hypopleuron, between the lower part of the pteropleuron and the posterior thoracic spiracle (Figure 48), with long, scattered, crinkled hairs (“barette”/hypopleural ridge undeveloped); basitarsis (Figure 22: bt) of hind leg with globuliferous hairs basoventrally; male holoptic; PHOTO (body length 10.5 – 14 mm)	Mesembrius (1 sp., <i>M.peregrinus</i> (Loew))
---- upper part of hypopleuron, between the lower part of the pteropleuron and the posterior thoracic spiracle, without hairs but often densely grey-dusted (barette/hypopleural ridge developed, but usually shallow); hind basitarsus without globuliferous hairs; male dichoptic	70
70 Face with a median, brightly-shining, dorso-ventral stripe, bare of dusting (this stripe is black except in <i>Helophilus trivittatus</i> , where it is yellow; it is confined to the lower part of the face in <i>Lejops</i>)	72
---- face uniformly pale (yellowish) and pollinose over the entire surface, though often only thinly dusted medially	71
71 Tibia (Figure 22: ti) of hind leg with a postero-lateral black mark both at the tip and in the basal half; PHOTO (body length 7 – 11 mm)	71a
---- hind tibia with a postero-lateral black mark only in the apical half; PHOTO (body length 8 – 12 mm)	Parhelophilus (part: see also couplet 68) (<i>see StN key to European species</i>)
71a Lower part of face (Figure 47a) produced, but not conical or pointed, its upper margin extremely convex; in lateral view, distance from anterior extremity of head to closest point of eye margin about equal to maximum width of an eye; hind femur with dorsal surface continuously yellow from base, for three-quarters of its length; PHOTO (body length 7 – 11 mm)	Anasimyia (<i>see StN key to European species</i>)
---- lower part of face (Figure 47b) in lateral view conically produced, narrowing apically almost to a point, its upper margin almost straight from immediately below antennal insertions to the upper mouth edge; in lateral view, distance from anterior extremity of head to closest point of eye margin distinctly greater than maximum width of an	

eye; hind femur dorsally black across middle third; PHOTO (body length 8 – 10mm)	
.....	<i>Eurimyia</i> (1 sp., <i>E. lineata</i> (Fabricius), until recently included in <i>Anasimyia</i>)
72 Pterostigma modified to take the form of a raised cross-vein (as in Figure 21), no wider than the adjacent wing veins; PHOTO (body length 9 – 13 mm)	<i>Lejops</i> (1 sp., <i>L. vittatus</i> (Mg.))
---- pterostigma in the form of a pigmented patch of wing membrane (as in Figures 17, 18), not raised above the general wing surface and both broader and less defined than the adjacent wing veins	73
73 Face with a distinctly demarcated (though low) facial tubercle; PHOTO (body length 11 – 19 mm)	<i>Mallota</i> (part: see also couplet 67) (<i>see StN key to European species</i>)
---- face without a distinct tubercle (cf Figure 44d)	74
74 Tergites with large, pale (yellowish) marks on tergite 2 and spots or transverse bars of grey dusting (rarely much reduced or missing) on tergites 3 and 4; PHOTO (body length 9 – 17 mm)	<i>Helophilus</i> (<i>see StN key to European species</i>)
---- tergite 2 without pale marks; tergites 3 and 4 entirely black and shining, undusted (body length 8 – 10 mm)	<i>Arctosyrphus</i> (1 sp., <i>A. willingii</i> (Smith))
75 Metasternum hairy	76
---- metasternum bare; hind femur without antero-basal patch of short, dense, black setulae (vein R4+5 with its last section longer than crossvein h: Figure 47d; arista shorter than maximal facial width; face concave in both sexes: Figure 47c; female frons entirely pollinose; PHOTO (body length 11 – 13 mm)	<i>Palumbia</i>
76 Eyes with dark marks or stripes; PHOTO (body length 7 – 14 mm)	<i>Eristalinus</i> (<i>see StN key to European species</i>)
---- eyes unicolorous; PHOTO (body length 8 – 16 mm)	<i>Eristalis</i> (<i>see StN key to European species</i>)
77 Barette (Figures 14, 15: br) hairy PHOTO (body length 12 – 22 mm)	<i>Volucella</i> (<i>see StN key to European species</i>)
---- barette bare	78
78 Cell m petiolate; vein M1 strongly recessive (Figure 18y); PHOTO (body length 7.5 – 10.5 mm)	<i>Copestylum</i> (1 recently-established species known in Europe, <i>C. melleum</i> (Jaenicke), originating in N America)
---- cell m open, not petiolate; vein M1 perpendicular or slightly recessive	79
79 Metasternum hairy; subscutellar fringe present	81
---- metasternum bare; subscutellar fringe absent	80
80 Vein R4+5 with apical section longer than crossvein r-m; hind tibia with short strong black spines on anterior surface; mesopleural anepisternum, postalar callus, and scutellum with strong bristles; face of male with tubercle ; PHOTO (body length 5.5 – 12 mm)	<i>Hammerschmidtia</i> (<i>see StN key to European species</i>)
---- vein R4+5 with apical section shorter than crossvein r-m (Figure 18i); hind tibia without spines; thorax with at most very weak bristles; face of male without tubercle; PHOTO (body length 5 – 11 mm)	
81 Pteropleuron (Figures 14, 15: me) bare posteriorly	82
---- pteropleuron with a patch of hairs on its posterior half (body length 13 – 20 mm)	<i>Sericomyia</i> s.g. <i>Arctophila</i> (<i>see StN key to European species</i>)
82 Face greatly produced ventrally, projecting more than 1/2 eye length below eye, yellow (body length 11.5 – 14 mm)	<i>Sericomyia</i> s.g. <i>Conosyrphus</i> (<i>see StN key to European Sericomyia species</i>)
---- face not produced greatly, projecting less 1/2 eye length below eye, usually with black median stripe; PHOTO (body length 12 – 18 mm)	<i>Sericomyia</i> s.g. <i>Sericomyia</i> (<i>see StN key to European species</i>)
83 Vein M1 strongly biangulate, and with a short hang-vein at each angle (Figure 18h), or hind femora with apico-ventral flange (cross-vein r-m distal to middle of discal cell, or mesopleur hairy)	61
---- vein M1 not biangulate, hang-veins one or none and hind femora without apico-ventral flange	84
84 Eyes bare	87
---- eyes hairy	85

- 85** Mesanepisternite 1 (Figure 14: ma1) hairy; scutellum with distinct transverse groove apically; face without a tubercle, straight, with a projecting mouth edge; PHOTO (cross-vein r-m basal to middle of discal cell; body length 7 – 9 mm) *Psilota* (see StN key to European species)
 ---- mesanepisternite 1 bare; scutellum evenly convex apically, without transverse apical groove; face usually tuberculate, without a projecting mouth edge **86**
- 86** Crossvein r-m at or beyond middle of discal cell (Figure 18n); antennal sockets confluent; face yellow with black median stripe; legs yellow; PHOTO (body length 7 – 13.5 mm)
 ---- crossvein r-m before middle of discal cell (Figure 18o); antennal sockets separated; face black; legs usually mostly black; PHOTOS (body length 4.5 – 15 mm)
 ---- *Ferdinandea* (see StN key to European species)
 ---- *Cheilisia* (part: see also couplet 91) (see StN key to males of European species of *Nigrocheilosia*)
- 87** Mesanepisternite 1 (Figure 14: ma1) hairy posterodorsally; femora usually with distinct ventro-apical spines; vein R4+5 either meeting vein M1 at the costa or with last section much less than half as long as crossvein h (Figure 18l); metasternum hairy or bare; PHOTOS (body length 6 – 12 mm)
 ---- mesanepisternite 1 bare; anterior femora without distinct ventral spines; if hind femur with ventral spines, then R4+5 with last section longer than crossvein h (Figure 18m) and usually longer than crossvein r-m **88**
 ---- *Myolepta*, European species (see also couplet 96)
- 88** Subscutellar fringe absent or nearly so (a few distinct hairs may be present) **97**
 ---- subscutellar fringe present, at least across median third of width of scutellum **89**
- 89** Vein R4+5 with last section shorter than crossvein h and at most half as long as crossvein r-m (Figure 18l) **96**
 ---- vein R4+5 with last section as long as or longer than crossvein h (Figures 18f, 18m) and usually longer than crossvein r-m **90**
- 90** Facial tubercle distinct (Figures 46e, g, k, l) **91**
 ---- facial tubercle undeveloped (Figures 46c, d) or vestigial (Figure 46b) **93**
- 91** Facial sulcus visible to above level of facial tubercle, reaching half or more of distance between anterior tentorial pit and antennal insertions; PHOTOS (body length 4.5 – 15 mm)
 ---- facial sulcus abbreviated, visible for at maximum one third of distance between anterior tentorial pit and antennal insertions and not reaching level of facial tubercle **92**
 ---- *Cheilisia* (part: see also couplet 86) (see StN key to European *Nigrocheilosia* species)
- 92** Antennal segment 2 with bristly black hairs anterodorsally, longer than the depth of antennal segment 2; antennae located in upper third of head (Figures 46e, g); hind femur without spinose hairs ventrally (body length 7 – 9 mm) *Chrysosyrphus*, males
 ---- hairs on dorsal surface of antennal segment 2 all shorter than height of antennal segment 2; hind femur with spinose hairs ventrally; PHOTO (body length 6 – 8 mm) *Melanogaster* males (see also couplet 107)
- 93** Lunule greatly enlarged, semi-circular, its median length greater than half of its maximum width (Figure 46n); legs predominantly black, all femora only narrowly yellow apically (male eyes meeting on frons; abdomen with large, distinct, rectangular patches of grey polinosity) PHOTO (body length 8 – 10 mm)
 ---- lunule distinctly less than half as long as its maximum width **94**
 ---- *Portevinia* (1 European species, *P. maculata* (Fallén))
- 94** Frons without striae; legs predominantly yellow, all femora yellow at the base and fore femur almost entirely yellow (second antennal segment with hairs on dorsal margin all shorter than segment is deep; male eyes separated; face either black or partly yellow/yellow-brown (Figures 46b, c); abdomen often with whitish-yellow or yellow/yellow-brown markings; body length 4–9 mm)
 ---- frons with parallel striae (Figure 46m); legs black **95**
 ---- *Pelecocera* (part, see also couplet 57) (see StN key to European species)
- 95** Second antennal segment with hairs on dorsal surface shorter than the depth of the segment; hind femur with spinose hairs ventrally (antennae located within lower two-thirds of head; face entirely black; tergites entirely black; body length 6 – 8 mm) female *Melanogaster* (see also couplet 107)

- second antennal segment with apico-dorsal bristly hairs as long as (or longer than) the second antennal segment is deep; hind femur without spinose hairs ventrally (antennae located within upper third of head; face entirely black; tergites entirely black; body length 7 – 9 mm)..... female *Chrysosyrphus*
- 96** Vein R4+5 with last section subequal to crossvein h; cell po of wing with distinct petiole; hind femur without ventroapical spines; metasternum bare *Lejota*, non-European species (see also couplet 102)
 ---- vein R4+5 with last section absent or much less than half as long as crossvein h; cell po closed at wing margin, not petiolate; hind femur with distinct ventroapical spines; metasternum hairy
 *Myolepta*, non-European species (see also couplet 87)
- 97** Abdomen parallel-sided or oval; alula (Figures 18, 19: al) at least as wide as 2nd basal cell; face variable; post-metacoxal bridge absent **100**
 ---- abdomen petiolate; alula narrower than width of 2nd basal cell (Figure 18p: al); face concave or nearly straight, not tuberculate or produced on ventral half; postmetacoxal bridge usually entire or nearly so **98**
- 98** Vein M1 at its apex meeting vein R4+5 at an angle of 90° or more (Figure 18p); antennal segment 3 usually much longer than wide; face oblique, nearly straight; sternopleuron (Figures 14, 15: me) usually hairy; male broadly dichoptic; PHOTO (body length 4 – 7 mm) *Neoascia*
 ---- vein M1 at its apex forming an acute angle with vein R4+5 (Figure 18q); third antennal segment oval, at most as long as wide; face convex; sternopleuron bare **99**
- 99** Postmetacoxal bridge absent; metasternum hairy; male holoptic (body length 6 – 9 mm)
 *Chalcosyrphus* (part: 1 sp., *C. obscurus* (Szilady): the abdomen in this species is only weakly petiolate, so it may also run to couplet 114) (see *StN key to European species*)
 ---- postmetacoxal bridge entire; metasternum bare; male broadly dichoptic; PHOTO (body length 5 – 8.5 mm)
 *Sphegina* (see *StN key to males of European species*)
- 100** Head with a distinct frontal tubercle (cf Figure 4, frt), longer than the ocellar triangle and longer than antennal segment 1; PHOTO (antennae elongate, with the arista inserted on the apical half of the third segment; abdominal tergites extensively orange; body length 8.5 – 10 mm) *Psarus* (1 sp., *P. abdominalis* (Fabricius))
 ---- head without a frontal tubercle **101**
- 101** Parts of the head, thorax (at least part of the scutellum) and abdomen yellow-brown; PHOTO (body length 5 – 11 mm) *Brachyopa* (part: see also couplet 80) (see *StN key to European species*)
 ---- head, thorax and abdomen without pale areas, black, brassy or dark brown **102**
- 102** Vein R4+5 with last section less than half as long as crossvein r-m (Figure 18r); male dichoptic; female face and frons smooth; PHOTO (body length 8 – 10 mm)
 *Lejota* (1sp., *L. ruficornis* (Zett.) (see also couplet 96 and *StN key to species*)
 ---- vein R4+5 with last section subequal to or longer than crossvein r-m (Figures 18s, 18t); male usually holoptic; female face or frons, or sometimes both, rugose **103**
- 103** Basal section of radial vein with some long hairs on dorsal surface **104**
 ---- basal section of radial vein bare **105**
- 104** Spines or spinose hairs present apico-ventrally on hind femora; PHOTO (body length 7 – 9 mm)
 *Riponnensia*
 ---- hind femora without spines or spinose hairs apico-ventrally; PHOTO (body length 5 – 8 mm)
 *Lejogaster* (see *StN key to European species*)
- 105** Sternite 1 undusted, brightly shining; wing vein M1 in most species with point of branching of M2 from M1 slightly distal to junction of M1 with R4+5 (Figure 18si), but variable in some species (e.g. *O. brevicornis*) so that the point of branching of M2 from M1 can be basal to junction of M1 with R4+5 (Figure 18sii); lateral margins of tergite 1 brightly shining; PHOTO (body length 4 – 7.5 mm) *Orthonevra*
 ---- sternite 1 entirely grey-dusted, dull; point of branching of M2 from M1 basal to junction of M1 with R4+5 (Figure 18t); lateral margins of tergite 1 matt, for at least anterior ¼ of length of tergite **106**

- 106** Long, pale, recumbent hairs across the median $\frac{1}{3}$ of the width of tergite 2; arista orange/red (antennae located within ventral two thirds of head); PHOTO (body length 6 – 9 mm) *Chrysogaster* (see StN key to European species)
 ----- only short/very short hairs across the median $\frac{1}{3}$ of the width of tergite 2; arista dark brown/black **107**
- 107** Apical section of wing vein R4+5 much less than 2x as long as cross-vein r-m and reaching the wing margin at the apical extremity of the wing (Figure 18t); alula less than 3x as long as wide (facial tubercle developed in male, absent in female, eyes meeting on frons in male; ventral surface of femur 3 with spinose hairs) PHOTO (body length 6 – 8 mm) *Melanogaster* (part: see also couplets 92, 95)
 ----- apical section of wing vein R4+5 twice as long as cross-vein r-m and reaching the wing margin anterior to the apical extremity of the wing (Figure 46j); alula more than 3x as long as wide (face with distinct facial tubercle in male and female; eyes separated in male; body length 9 mm) *Katara* (1 sp., *K. connexa* Vujčić & Radenković)
- 108** Cell m petiolate, closed before reaching wing margin (Figure 18u); PHOTOS (body length 14 – 25 mm) *Milesia* (see StN key to European species)
 ----- cell m open to wing margin (Figure 18v) **109**
- 109** Mesanepisternite 1 (Figure 14: ma1) hairy; hind femora slender, anteroventrally with a slender, preapical spike; large robust flies, mimicking vespid wasps; PHOTO (body length 9 – 24 mm) *Spilomyia*
 ----- mesanepisternite 1 usually bare; if this sclerite is hairy the hind femora are without projections **110**
- 110** Sternopleuron (Figures 14, 15: mk) with separate dorsal and ventral hair patches; genae (Figures 5, 6: g) and ventral part of face usually bare; if face hairy, body entirely black; body variable in appearance **111**
 ----- sternopleuron (mesopleural katapisternum) with the dorsal and ventral hair patches joined posteriorly; genae and ventral half of face hairy; body with bright yellow pollinose markings; flies mimicking vespid or crabronid wasps; PHOTO (body length 12 – 18 mm) *Temnostoma* (see StN key to European species)
- 111** Thoracic metasternum hairy, the hairs as long as, or longer than, those on the hind coxa **112**
 ----- thoracic metasternum bare **116**
- 112** Wing almost bare on basal $\frac{2}{3}$, very sparsely microtrichose on apical $\frac{1}{3}$; mesanepisternite 1 (Figure 14: ma1) with a patch of fine hairs postero-dorsally; hind femur greatly enlarged, with an anteroventral spinose ridge on its apical $\frac{1}{3}$; PHOTO (body length 7 – 9 mm) *Syritta* (see StN key to European species)
 ----- wing entirely covered in microtrichia or with just moderate bare areas on basal $\frac{1}{3}$ or slightly more, densely and uniformly microtrichose on apical $\frac{1}{3}$; mesanepisternite 1 hairy or bare; hind femur variable **113**
- 113** Hind femur with an apicoventral triangular process; metasternum large, with a basal membranous seam; PHOTO (mesanepisternite 1 bare; body length 7 – 12 mm) *Tropidia* (see StN key to European species)
 ----- hind femur without an apicoventral process **114**
- 114** Face produced ventrally, usually tuberculate; genae (Figures 5, 6: g) broad; body either with long hairs or with bright yellow, pollinose markings **115**
 ----- face concave, sometimes subcarinate, not tuberculate; genae narrow; body with short and sparse hairs, without bright yellow, pollinose markings; PHOTOS (body length 7 – 15.5 mm) *Chalcosyrphus* (part: see also couplet 99) (see StN key to European species)
- 115** Antennae greatly elongate, much longer than face; thorax and abdomen with distinct, yellow, pollinose markings; body with short and sparse hairs; flies mimicking vespid wasps (body length 15 – 18 mm) *Sphecomyia* (1 sp., *S. vespiformis* Gorski)
 ----- antennae short, shorter than face; thorax and abdomen without yellow pollinose markings; body with long hairs; flies mimicking *Bombus* or other bees; PHOTO (body length 8 – 18.5 mm) *Criorhina* (see StN key to European species)
- 116** Face mostly or entirely bright to dull yellow, at most with dark median stripe (and genae partly black beneath the eyes) **117**
 ----- face black in background colour, rarely slightly yellowish ventrally **118**
- 117** Abdomen black dorsally and at least partly black haired, or black with clear yellow markings on tergites 2-4, or red on tergites 4-5; tergites may be partly metallic black; PHOTO (body length 9 – 13 mm) *Blera* (see StN key to European species)

---- abdomen dorsally metallic, shining, with brassy yellow hairs, but without yellow or red markings; PHOTO (body length 13 – 16 mm) *Caliprobola* (1 European sp., *C.speciosa* (Rossi))

118 Head elliptical in anterior view; third antennal segment longer than broad; hairs on general body surface of short to moderate length, those on scutellar disc no longer than 1.2x the median length of the scutellum **119**

---- head triangular in anterior view; antennal segment 3 kidney-shaped, deeper than long; hairs on general body surface very long, those on scutellar disc including many that are more than 2x as long as the median length of the scutellum (tergite 3 medially with either upstanding or more-or-less recumbent hairs that are longer than ½ the basal depth of the hind tibia in lateral view) **120**

119 Frontal prominence normal (Figure 44d); tergite 3 medially with very short (shorter than ¼ the basal depth of the hind tibia, in lateral view), black, recumbent hairs along the entire length of the tergite; male: aedeagus with short ejaculatory process; PHOTO (body length 8 – 17 mm) *Xylota* (see *StN key to European species*)

---- frontal prominence greatly produced; tergite 3 entirely pale-haired; male: aedeagus with greatly elongate ejaculatory process; PHOTO (body length 12 – 15 mm) *Brachypalpoidea* (1 sp. *B.lenta* (Meigen)) (see *StN Chalcosyrphus key for separation of B.lenta from Chalcosyrphus piger*)

120 A *Bombus* mimic; thorax and abdomen with transverse bands of pale (white, yellow or orange) and black hair; abdomen broad; hind femora neither thickened nor arcuate; hind tibiae not keeled ventrally; PHOTO (body length 13 – 16 mm) *Pocota* (1 sp. *P.personata* (Harris))

---- bee mimics; thorax and abdomen without transverse bands of pale (white, yellow or orange) hair; hind femora arcuate and thickened; hind tibiae keeled baso-ventrally; PHOTO (body length 11 – 15.5 mm) *Brachypalpus* (see *StN key to European species*)

2.22 Alternative key to the European genera of Pipizini, December 2018

The long, outstanding hairs which occur on the anterior, flattened part (mesanepisternite 1: Figure 14, ma) of the thoracic mesopleur, in the genera *Trichopsomyia* and *Triglyphus*, are used to separate these genera from other genera of the Pipizini known in Europe. But these hairs are difficult to see, and especially difficult to see on specimens being examined in alcohol. Further, they are easily confused with the much shorter hairs found on the same sclerite in, for instance, some species of *Pipiza*. For those reasons an alternative key to European genera of Pipizini is offered below, which does not use the hairs on mesanepisternite 1 as a primary feature in distinguishing the genera.

1 Abdomen with tergites 2 and 3 well developed and subequal in length, 4th minute and barely visible dorsally angles (mesopleur with mesanepisternite 1 (Figure 14: ma1) bearing long, erect hairs); PHOTO (body length 4.5 – 6 mm) *Triglyphus* (see *StN key to European species*)

---- tergites 2 - 4 well developed and subequal in length **2**

2 Antennal segment 3 less than 2x as long as deep **3**

---- antennal segment 3 at least 2x as long as deep (often more than 2x as long as deep) **7**

3 Barette (Figures 14, 15: br) bare; male with distinct, conically produced, frontal prominence; hind trochanter of male simple (ventral margin of lunule bare); PHOTO (body length 5 – 11 mm) *Pipiza*

---- barette with hairs, at least anteriorly; male with or without conically-produced frontal prominence; hind trochanter of male often with ventral spur (Figure 24) **4**

4 Ventral margin of lunule with hairs medially (wings hyaline; male hind trochanters with spurs (Figure 24); PHOTOS (body length 4 – 8.5 mm) *Neocnemodon*

---- ventral margin of lunule bare (male hind trochanters without spurs) **5**

5 Wing with distinct brown blotch, medially; male with conically produced frons; female with large dust spots on frons and entirely black tergites (antennal segment 3 only slightly longer than deep; body length 7.5 – 9mm) *Cryptopipiza* (1 sp., *C.notabila* (Violovitsh))

---- wing unmarked; male without conically produced frons; female with narrow, almost linear dust spots on frons or large, pale markings on tergite 2 (mesanepisternite 1 (Figure 14: ma1) bearing long, pale, erect hairs) **6**

6 Antennal segment 3 only slightly longer than deep (body length 6 – 8mm) *Trichopsomyia joratensis* (Goeldlin)

---- antennal segment 3 more than 1.5x as long as deep (body length 5 – 6mm) *Trichopsomyia lucida* (Meigen) (part)

7 Vein Sc ending opposite or before crossvein r-m (Figures 18b, 18c) **8**

- vein Sc ending beyond crossvein r-m (Figure 18d); at the tip of M1 the angle between M1 and R4+5 is less than 90° (on the wing-base side of the junction) **9**
- 8** Apical portion of vein M1 curved strongly towards costal margin of wing (Figure 18b), so that, at its tip, the angle between M1 and R4+5 is 90° or more (on the wing-base side of the junction); median lobe of the lunule usually without long hairs; PHOTO (male trochanters without spurs; body length 4.5 – 9 mm) *Pipizella*
- at the tip of M1 the angle between M1 and R4+5 (Figure 18c) is less than 90° (on the wing-base side of the junction); ventral extremity of the median lobe of the lunule with long hairs (sometimes missing in the female); PHOTO (body length 6.5 – 7.5 mm) *Claussenia* (1.sp., *hispanica* (Strobl))
- 9** Wing vein M1 apically making an acute angle with R4+5 (Figures 18c, 81d) **10**
- wing vein M1 apically meeting R4+5 almost at right angles (mesanepisternite 1 (Figure 14: ma1) bearing long, erect hairs); PHOTO (body length 6 – 7mm) *Trichopsomyia flavitarsis* (Meigen)
- 10** Ventral margin of lunule usually with hairs medially (sometimes absent, especially in the female); male hind basitarsus more than 4x as long as wide and with no hairs in anterodorsal fringe longer than basitarsus is wide; female with frontal dust spots occupying two thirds of the width of the frons and without any pale marks on tergites; PHOTOS (body length 5 – 8mm) *Heringia heringi* (Zetterstedt)
- ventral margin of lunule entirely bare; male hind basitarsus less than 4x as long as wide and with hairs in anterodorsal fringe including some longer than the basitarsus is wide; female with frontal dust spots occupying less than half of the width of the frons and with large, pale marks or complete transverse pale band on tergite 2 (mesanepisternite 1 (Figure 14: ma1) bearing long, pale, erect hairs) (body length 5 – 6mm) *Trichopsomyia lucida* (Meigen) (part)

2.3 Morphological terms referred to in the key, together with the codes used for them in the figures.

1st basal cell (wing): **b1** (Fig.18)

2nd basal cell (wing): **b2** (Fig.18)

2nd costal cell (wing): **co2** (Fig.18)

1st subcostal cell (wing): **sc** (Fig.18, and identifiable, but not labelled, in Fig. 29, as the wing cell containing the stigma, **stg**)

2nd tarsal segment (leg): **ta2** (Fig. 22)

aedeagus (male terminalia: abdomen): **ae** (Fig.35)

alula (wing): **al** (Figs. 18, 18p, 19)

anal cell (wing): **an** (Fig.18)

anal lobe (wing): **anl** (Fig.18)

antennal segment 1 (antenna)/scape: **s** (Figs. 8, 10)

antennal segment two (antenna)/pedicel: **p** (Figs. 8, 10)

antennal segment 3 (antenna)/basoflagellomere: **gl** (Figs. 8, 10)

antennal socket(s) (head): **ai** (Fig. 2)

antennal tubercle (head): **ftr** (Fig.4)

anterior ocellus (head): one of the three ocelli (or simple eyes), making, with the two posterior ocelli, the ocellar triangle on the vertex; not labelled, but identifiable in Fig.4, between the eyes, on the vertex, **v**

anterior tentorial pit (head): **att** (Fig.3), within the facial groove/facial sulcus, **fs**

arista (antenna): **a** (Figs. 7, 8)

aristal pile/rays (antenna): not figured; hairs on the arista

barette (thorax)/hypopleural ridge: **br** (Figs. 14, 15)

basitarsus (leg): **bt** (Figs. 22, 25)

calypterae (wing-base): **cal** (lower lobe), **cau** (upper lobe) (Fig. 19)

cell m (wing)/marginal cell: **m** (Fig. 18, 18j, 18k, 18u, 18v)

cell po (wing): **po** (Figs. 18, 21) (posterior cell of wing)

cell sm (wing): **sm** (Fig. 18) (submarginal cell of wing)

cercus, cerci (terminalia: abdomen): **ce** (Figs. 33-36, 39, 40)

claw (leg): **cl** (Fig. 26)

clypeus (head): **ac** (Figs. 1, 11)

compound eye (head): **e** (Figs. 1, 3)

costa (wing): **C** (Fig. 17)

costal margin (wing): not labelled; the anterior margin of the wing

coxa (leg): **cx** (Figs. 22, 24, 45a, 45b)

crossvein H (wing): not labelled, but identifiable in Fig. 18 as the cross-vein separating cell co1 from cell co2

crossvein r-m (wing): **r-m** (Figs. 17, 18b, 18c, 18d, 18e, 18f, 18h, 18i, 18n, 18o, 18r, 18s, 18t)

dichoptic eyes (head): compound eyes not meeting in mid-line, as in Figs. 2, 4, 5

discal cell (wing): **d** (Figs. 18, 18e, 18f, 18g, 18h, 18n, 18o)

dusting: area of usually pale, recumbent micro hairs, as in Fig. 42

dust spot: Fig. 42

epandrium (male terminalia: abdomen) **ba** (Figs. 32-36)

epistoma (head): upper mouth edge, not labelled, but identifiable in Figs. 1 and 2, as the part of the face immediately dorsal to the postclypeus, **pc**, and in Fig.3, as the lowest edge of the face medially, at the anterior extremity of the buccal cavity, **bc**

eye (head): **e** (Figs. 1,3)

face (head): **f** (Figs.1, 3)

facial groove (head): **fs** (Figs.2, 3)

facial prominence (head): **ft** (Figs.1, 6)

facial tubercle (head): **ft** (Figs.1, 6)

fascia (wing): not figured; dark (usually brownish) markings on the wing membrane

femur (leg): **fe** (Figs. 22, 23)

frons (head): **fr** (Figs.1, 2)

frontal dust spots (head): Fig. 42

frontal prominence (head): **frt** (Fig. 4)

gena/genae (head): **g** (Figs. 5, 6)

genital capsule (male terminalia: abdomen): hypopygium, Figs. 34-36

halter (thorax): **ha** (Figs. 14, 15, 41)

halter knob (thorax): expanded distal end of the haltere, not labelled, but visible in Figs. 14, 15

hang vein (wing): **hv** (Fig. 20)

holoptic eyes (head): compound eyes meeting in mid-line, as in Fig.1

humeral callus (thorax): **hc** (Figs. 12-14, 44b, 44c, 44d, 45a, 45b) (the humeral callus is comprised mostly of the postpronotal sclerite of the pronotum of the thorax, but posteriorly includes a small part of the mesonotum, a suture normally demarcating the junction between the pronotal and mesonotal elements)

humeral cross-vein (wing): **h** (Figs. 18l, 18m)

hypopleuron (thorax): **mr** (Figs. 14-16) (meropleurite)

hypopygium (male terminalia: abdomen): Figs. 34-36

laterotergite or lateral postnotal sclerite of mesonotum (thorax): **lt** (Fig. 14)

lower lobe of calypterae (wing): **cal** (Fig. 19)

lunule (head): **l** (Fig.1; also visible, but unlabelled, in Figs.2, 5, 6)

maculae: markings differing in colour from the background colour of a sclerite, e.g. pale marks on black abdominal tergites, black marks on a grey mesoscutum

male terminalia (abdomen): hypopygium (Figs. 34-36)

mediotergite (thorax): **mt** (Fig. 27)

mesanepisternite 1 (thorax): **ma1** (Fig. 14) (anterior mesanepisternum)

mesopleur/mesopleuron (thorax): **ma1 + ma2 + me + br + mk + mr** (Fig. 14)

mesopleural anepimeron (thorax): **me + br** (Fig. 14)

mesopleural anepisternum (thorax): **ma1 + ma2** (Fig.14); **ma** (Fig.15)

mesoscutum (thorax): **ms** (Figs. 12-14, 45a, 45b)

mesothoracic spiracle (thorax): the spiracle between the mesopleura and the metapleura; **sp** in Fig. 14

metapleural episternum (thorax): **mts** (Fig. 14)

metasternum (thorax): **mtb** (Fig. 16)

metathoracic spiracle (thorax): the spiracle originating between the metapleura and the sclerites of the 1st abdominal segment; not labelled, but visible in Figs. 14 and 15, embedded in the metathoracic epimeron, **mte**

microtrichia (wing): the minute hairs present on most of the wing membrane, in many syrphids

notopleural area (thorax): **ca** (Fig. 13)

occiput (head): not labelled; the posterior surface of the head

ocellar triangle (head): **ot** (Fig. 1)

ocellus (head): not labelled; one of the three simple eyes found on the ocellar triangle, **ot** (Fig.1) of the vertex

ommatidium/ommatidia (head): not figured; individual lenses of the compound eyes

oral margin (head): rim of the buccal cavity, **bc** (Fig. 3)

orbital strip (head): **os** (Figs. 3, 5, 6)

pedicel (antenna): **p** (Figs. 8, 10)

plumule (thorax): **pl** (Fig. 41)

postalar callus/calli (thorax): **sca** (Figs. 13, 14)

posterior ocellus (head): not labelled; one of the two posterior ocelli, located on the ocellar triangle, **ot** (Fig. 1); also visible on Figs. 2, 5 and 6

postmetacoxal bridge (thorax): **pocb** (Fig. 15)

postocular orbits (head): **oo** (Figs. 4,)

postocular region (head): **oo** (Fig. 4) + **pt** (Fig. 6)

propleura (thorax): **pe** + **ps** (Figs. 12, 14)

postpronotum (thorax): **pn** (Figs. 12-15)

proepimeral area (thorax): **pe** (Figs. 12, 14, 15)

proepimeron (thorax): **pe** (Figs. 12, 14, 15)

prothoracic spiracle (thorax): the spiracle originating between the propleura and the mesopleura; **sp** (Figs. 12, 45a, 45b)

pteropter/pteropter (thorax): **me** (Fig. 14) (upper part of mesepimeron/anepimeron)

pterostigma (wing): **stg** (Fig. 17)

R4 +5 (wing): **R4** + **5** (Fig. 17). Commonly referred to as a combination of branches 4 and 5 of the Radial vein (R4+5), this wing vein is more correctly recognised as branches 3 and 4 of the Radial Sector vein, together with a branch of the Median vein, M1. Common usage is applied in the keys, as R4+5.

radial vein (wing): **R** (Fig. 17)

r-m cross-vein (wing): **rm** (Fig. 17)

scape (antenna): **s** (Figs. 8, 10)

scutellar disc (thorax): not labelled; the dorsal surface of the scutellum

scutellum (thorax): **msl** (Figs. 13-15, 27)

setulae: short, stout spines (not figured)

sternite (abdomen): **st1**, **st2** etc (Figs. 29, 31-33, 37, 38)

sternopleuron (mesokatepisternum) (thorax): **mk** (Figs. 12, 14, 15, 16)

style (antenna): **cs** (Fig. 9)

subscutellar fringe (thorax): not figured; a fringe of hairs occurring on the ventral surface of the scutellum, close to its posterior margin

supra-alar bristles (thorax): bristles (not figured) just above the wing-base, on the mesoscutum anterior to the post-alar callus

surstyli (male terminalia: abdomen): **sy** (Figs. 33-36)

tarsus/tarsi/tarsal segments (leg): **ta2- ta5** (Figs. 22, 25, 26)

tarsomere (leg): **ta2- ta5** (Figs. 22, 26)

tergite (abdomen): **t1, t2** etc (Figs. 27, 29, 30, 37-40)

tibia/tibiae (leg): **ti** (Fig. 22)

transverse suture (thorax): **ts** (Figs. 13, 14)

trochanter (leg) : **tr** (Figs. 22-24)

upper mouth edge (head): not labelled; antero-dorsal edge of the buccal cavity, **bc** (Fig. 3)

vein M1 (wing): **M1** (Figs. 18b, 18c, 18h, 18i, 18p, 18q, 18s, 18t, 20)

vein M2 (wing): **M2** (Fig. 17, 18s, 18t)

vein R4+5 (wing): **R4+5** (Figs. 17, 18a, 18i, 18l, 18m, 18p, 18q, 18r, 18s, 18t). This wing vein is more correctly referred to as **Rs3+Rs4+M1**

vein Sc (wing): **Sc** (Fig. 17, 18b, 18c, 18d)

vena spuria (wing): **vsp** (Fig. 17)

vertex (head): **v** (Fig. 4)

vertical region (head): **v** (Fig. 4)

vertical triangle (head): **ot** (Fig. 1)

2.4 Alphabetical list of the codes used to label morphological features figured, together with the names of those features

The list includes the features which are labelled in the figures but not referred to in the key.

- a:** arista of antenna
- aa:** aedeagal apodeme of aedeagus of male genitalia
- ac:** anteclypeus
- ae:** aedeagus of *Microdon* male genitalia
- acs:** anterior cervical sclerite
- ai:** antennal socket/ antennal insertion
- al:** alula of wing
- am:** aristomere
- an:** anal cell of wing
- anl:** anal lobe
- ans:** anapleural suture of mesothoracic pleura
- att:** anterior tentorial pit (within the facial groove/facial sulcus, **fs**)
- au:** auxillia of pretarsus of leg
- ax1, etc.:** axillary sclerite 1, etc.
- b1, b2:** first and second basal cells of wings
- ba:** basale of hypopygium of male genitalia
- bat:** buccal arm of anterior tentorial sulcus
- bc:** buccal cavity
- br:** barrette/hypopleural ridge (probably the katepimeron of the mesothoracic pleura)
- bs:** prothoracic basisternum
- bt:** basitarsus of leg
- C:** costal vein of wing
- ca:** notopleural area/presutural callus of mesonotum of thorax
- cal:** lower lobe of calypterae of wing
- cau:** upper lobe of calypterae of wing
- ce:** cercus of terminal segment of abdomen
- cl:** claw of pretarsus of leg
- co1, co2:** first and second costal cells of wing
- cs:** style/ceratostyle of antenna
- CuA:** anterior cubitus vein of wing
- CuP:** posterior cubitus vein of wing
- cx:** coxa
- cx2:** coxal cavity of mid leg (i.e. hole made by removing the middle leg)
- cx3:** coxal cavity of hind leg (i.e. hole made by removing the hind leg)
- d:** discal cell of wing
- e:** compound eye

em: empodium of pretarsus of leg
f: face
fe: femur of leg
fr: frons
frt: frontal tubercle
fs: facial groove (facial sulcus)
ft: facial tubercle
fu: furca of labellum of labium
g: gena
gl: antennal segment three (first segment of flagellum of antenna)
h: humeral cross-vein
ha: haltere
hc: humeral callus (comprised mostly of the postpronotal sclerite of the pronotum of the thorax, but posteriorly including a small part of the mesonotum, a suture normally demarcating the junction between the pronotal and mesonotal elements)
hp: harpes of aedeagus of male genitalia
hpx: hypopharynx
hup: humeral plate of wing-base
hv: hang-vein
l: lunule
lcs: lateral cervical sclerite
ll: labellum
ln: lingula of theca of hypopygium of male genitalia
lr: labrum
lt: laterotergite/lateral postnotal sclerite of mesonotum
M: median vein of wing
M1- 4: branches of median vein of wing
m: marginal cell of wing/cell m
ma1, ma2: mesanepisternite 1 and mesanepisternite 2 of the mesothoracic pleura/mesanepisternite 1 and posterior mesanepisternite/anterior anepisternum and posterior anepisternum
map; mesofurcal pit
mcu: median-cubital cross-vein of wing
me: pteropleur/pteropleuron/mesepimeron (mesepimeral sclerite of mesothoracic pleura)
mk: sternopleuron (katepisternum of mesothoracic pleura)
mlt: mesonotal prescutum
mn: premental sclerite of the labium
mp: mesosternal presternum
mr: hypopleuron/meropleurite (of mesothoracic pleura)
ms: mesoscutum of mesonotum (often referred to incorrectly as the mesonotum)
msl: scutellum (scutellar lobe of mesonotum)

mt: mediotergite (median postnotal sclerite of mesonotum)
mtb: metasternum (basisternum of metathoracic sternum)
mte: epimeron of metathoracic pleura
mtes: epimeral spine of the metathoracic pleura
mtn: metathoracic notum/metanotum
mtpc: precoxale of metathoracic pleura
mts: metapleural episternum/episternum of metathoracic pleura
mtu: furcasternum of metathoracic sternum
mua: anterior mesosternal furcasternum
mub: posterior mesosternal furcasternum
mvs: mid-ventral thoracic suture
mx: maxillary stylet
mx: maxillary palp
oa: ocular arm of anterior tentorial sulcus
oo: post-ocular orbits
os: orbital strip of face
ot: ocellar triangle
p: antennal segment one/pedicel of antenna
pa: anteprototum of pronotum of thorax
pc: clypeus (postclypeus)
pcb: premetaxocal bridge
pcs: posterior cervical sclerite
pe: proepimeron of propleura/proepimeral area of thorax
pls: pleural suture of mesopleura
po: posterior cell of wing/cell po
pocb: post-metaxocal bridge
ps: proepisternum of propleura
pu: prothoracic furcasternum
R: radial vein of wing
rm: cross-vein r-m/radial-median cross-vein of wing
R2+3; R4+5: branches of the radial-sector vein of the wing. Commonly referred to as branches of the Radial vein (R2+3 and R 4+5), these wing veins are more correctly recognised as branches 1 - 4 of the Radial Sector vein, together with a branch of the Median vein, M1.
s: antennal segment 1/scape of antenna
sa: subalare
sap: supra-anal plate
Sc: vein Sc/subcostal vein of wing
sc: subcostal cell of wing
sca: postalar callus of mesonotum of thorax
se: sella of cervical organ

sep: sensory pit of 3rd antennal segment
sl: superior lobe of theca of male genitalia
sm: cell sm/submarginal cell of wing
sp: spiracle
ss: secondary sclerite
st1, st2, etc.: sternum of first abdominal segment, second abdominal segment, etc.
st2a: anterior sclerite of abdominal sternite 2
stg: pterostigma of wing
sy: surstylus of basale of hypopygium of male genitalia
t1, t2, etc.: tergite of first abdominal segment, second abdominal segment, etc.
ta2, ta5: tarsal segments of leg
tc: callus of 2nd tergite of abdomen
tg: tegula
th: theca of hypopygium of male genitalia
tho: thorax
ti: tibia of leg
tr: trochanter of leg
trc: trochanteral process of posterior mesocoxite of middle leg
ts: transverse sulcus/suture
tu: tubus of aedeagus of male genitalia
u: pulvillus of pretarsus of leg
v: vertex of head capsule
vg: ventral egg-guide
vs: vena spuria of wing

3 FIGURES OF MORPHOLOGICAL FEATURES REFERRED TO IN THE KEY

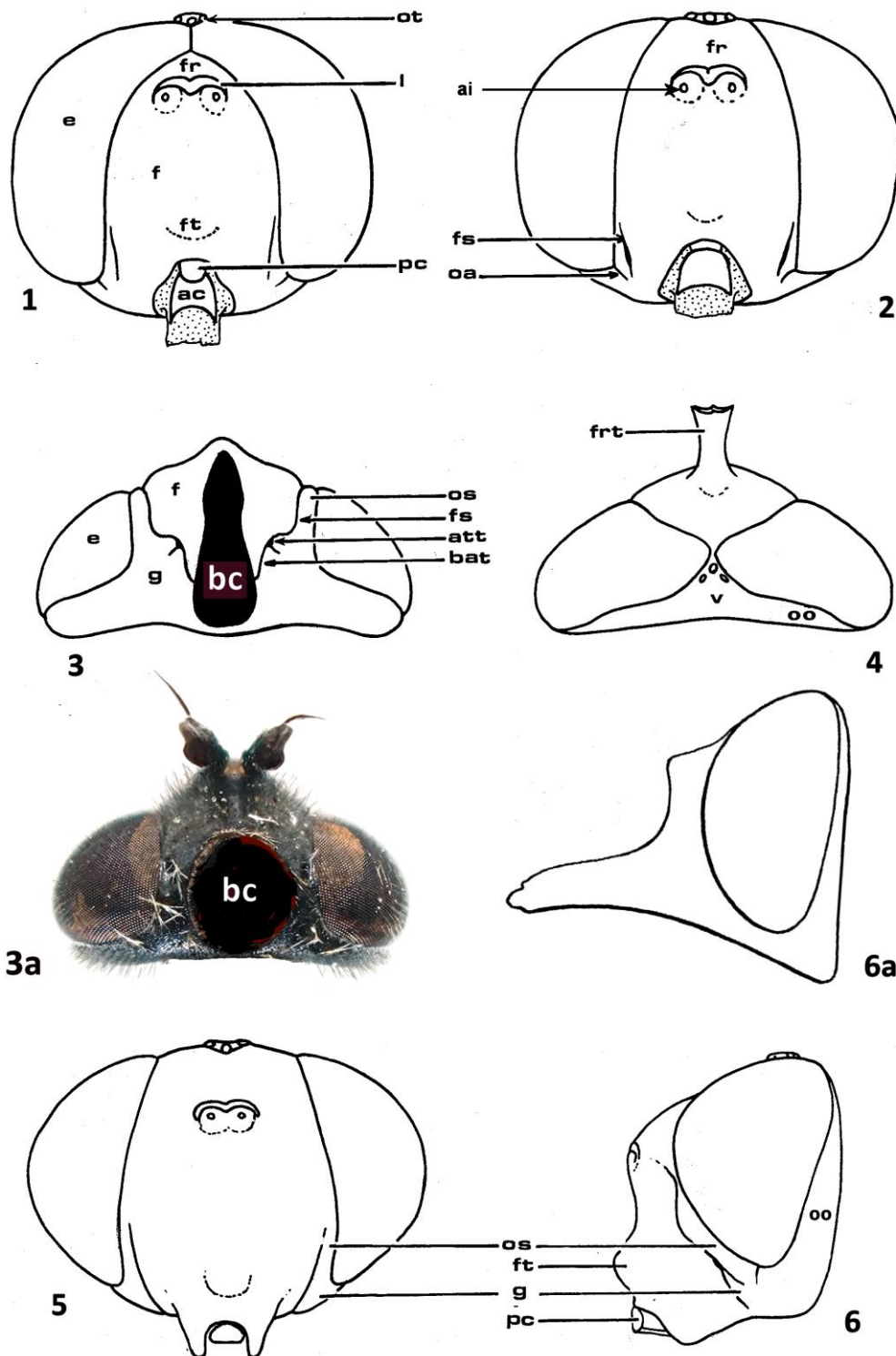


Fig. 1, *Syrphus ribesii*, male, head, anterior view. **Figs. 2, 3,** *S. ribesii*, female, head, anterior view (2) and ventral view (3). **Fig. 3a,** *Pipiza austriaca*, male, head, ventral view, semi-diagrammatic, to show round buccal cavity. **Fig. 4,** *Ceriana* sp., male, head, dorsal view. **Fig. 5,** *Eristalis tenax*, female, head, anterior view. **Fig. 6,** *Cheilosia grossa*, male, head, lateral view; **Fig. 6a,** *Rhingia campestris*, head, lateral view.

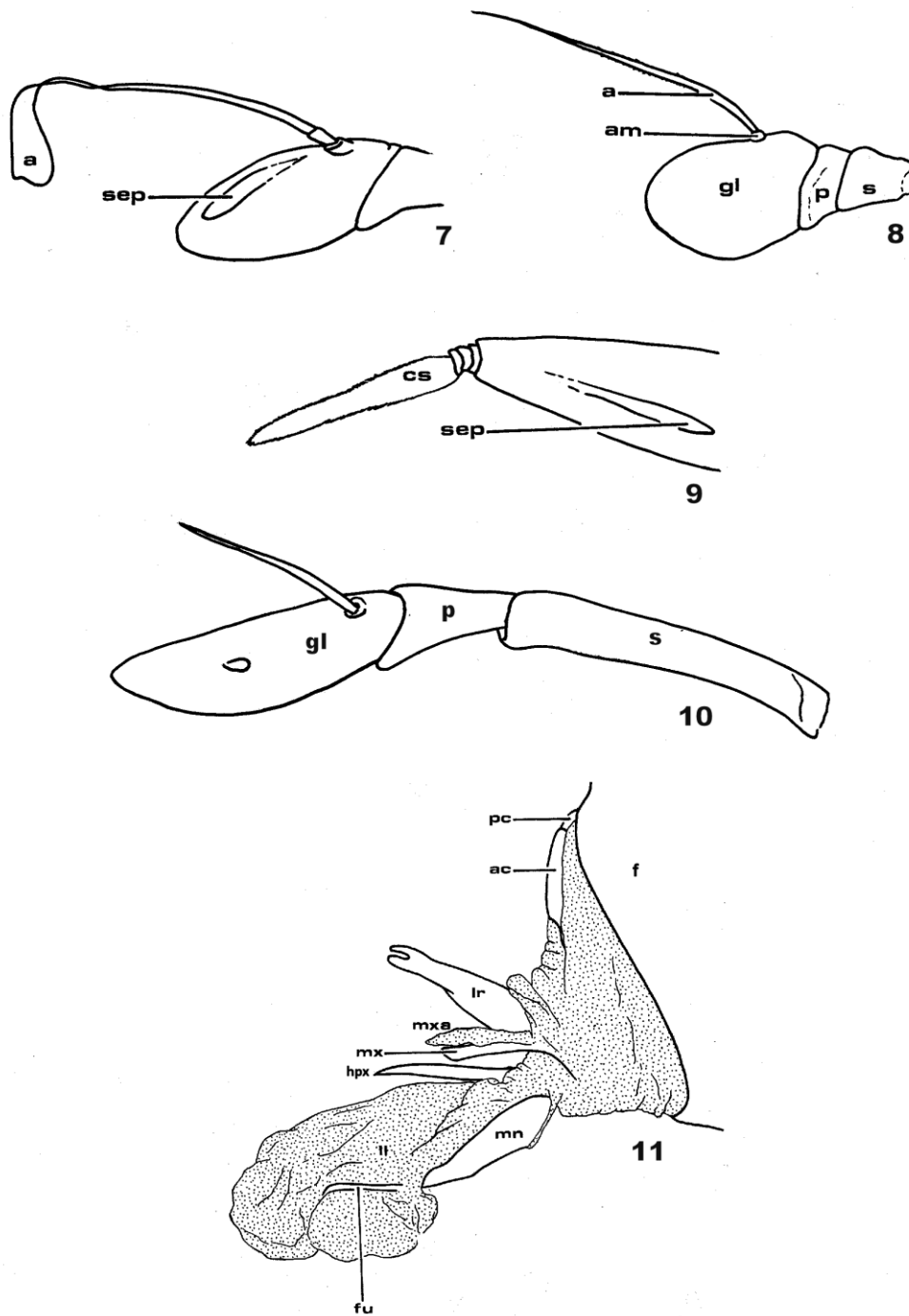


Fig. 7, *Platynochaetus setosus*, third antennal segment and arista, lateral view, outer side. **Fig. 8**, *Syrphus ribesii*, antenna, lateral view, outer side. **Fig. 9**, *Callicera aenea*, end of third antennal segment and arista, lateral view, inner side. **Fig. 10**, *Microdon mutabilis*, antenna, lateral view, outer side. **Fig. 11**, *Syrphus ribesii*, mouthparts, lateral view.

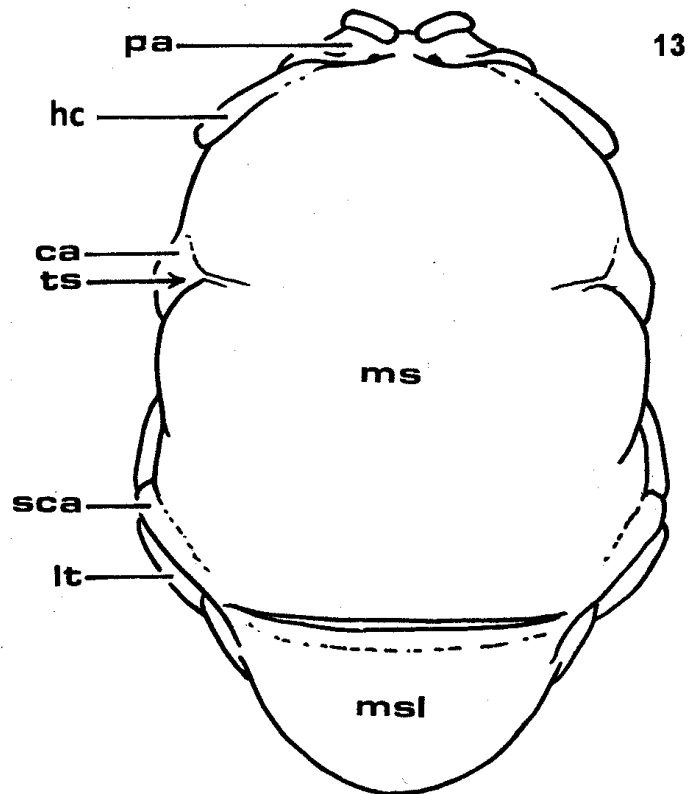
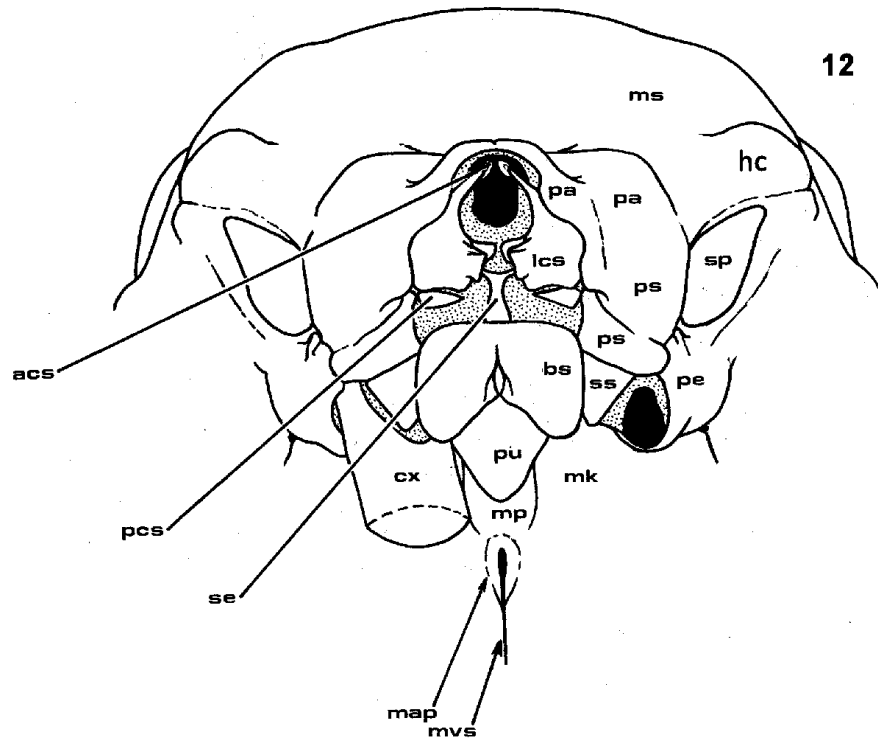


Fig. 12, *Eristalis tenax*, prothoracic region, anteroventral view. Figs 13, *Syrphus ribesii*, thorax, dorsal view.

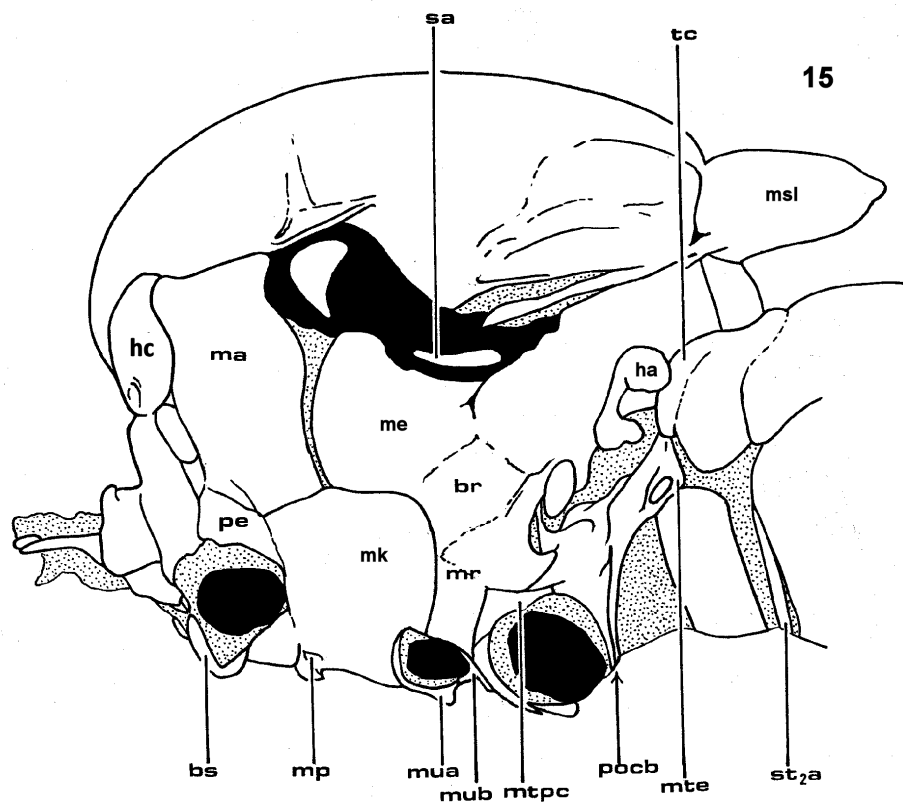
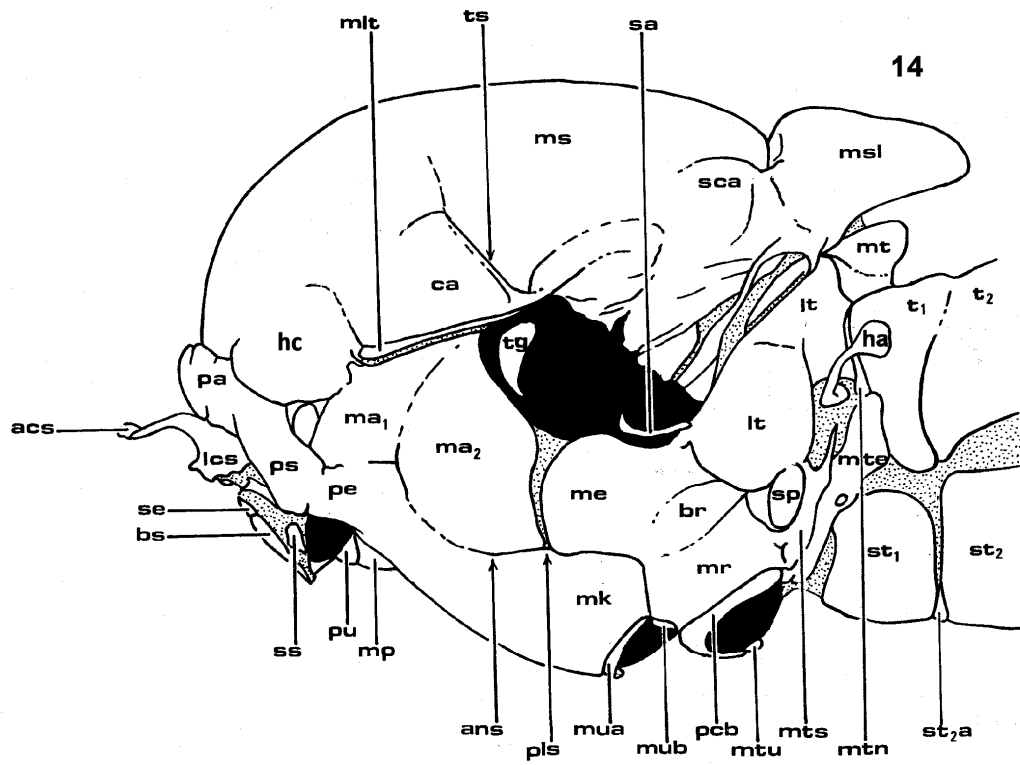


Fig. 14, *S. ribesii*, thorax, lateral view, left side. Fig. 15, *Microdon mutabilis*, thorax, lateral view, left side.

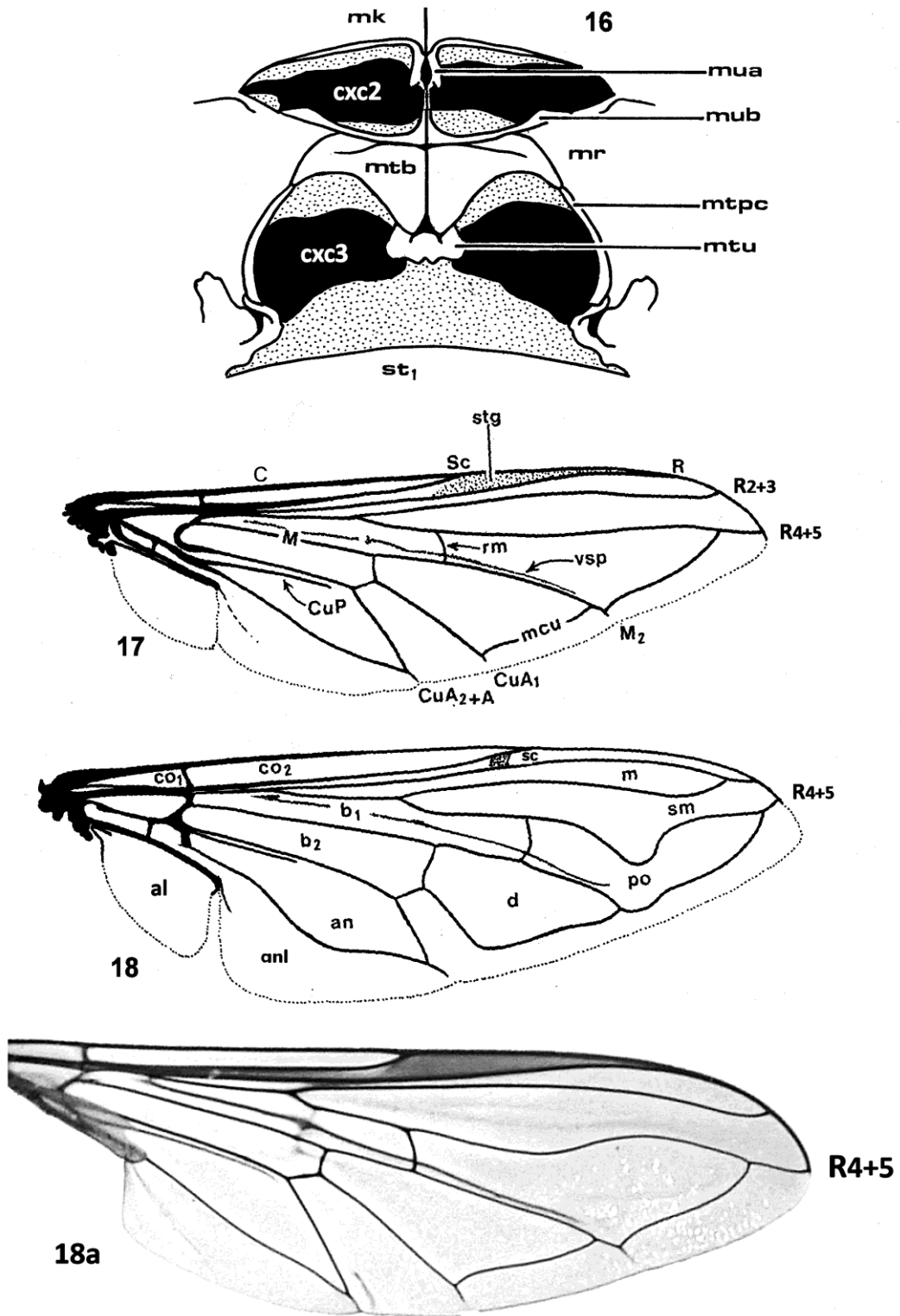


Fig. 16, *Eristalis tenax*, thorax, ventral view, showing meso- and meta-thoracic sclerites and anterior margin of sternite 1 of the abdomen. **Fig. 17,** *Syrphus ribesii*, right wing. **Fig. 18,** *Eristalis tenax*, right wing. **Fig. 18a,** *Lapposyrphus lapponicus*, right wing.

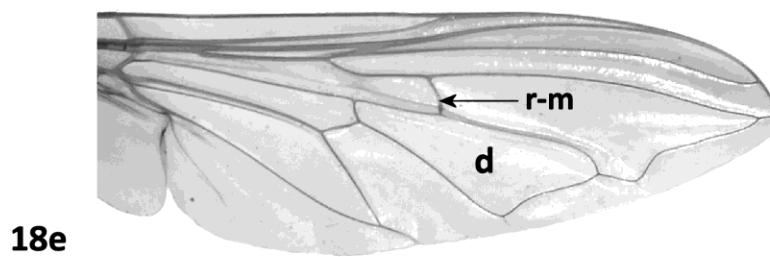
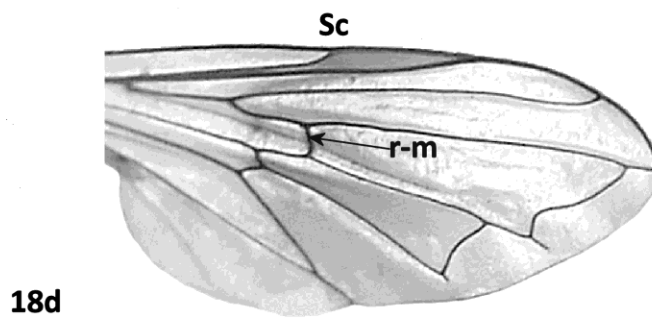
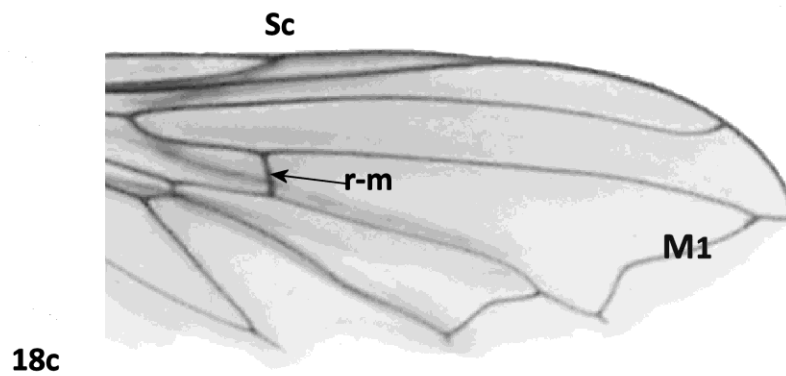
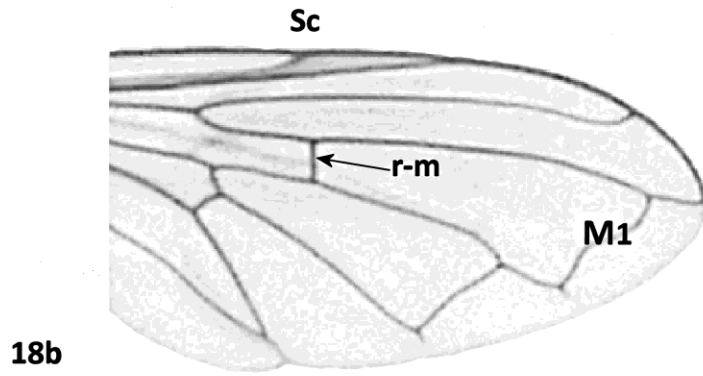


Fig. 18b, *Pipizella viduata*, right wing; **Fig. 18c**, *Claussenia hispanica*, right wing; **Fig. 18d**, *Heringia heringi*, right wing; **Fig. 18e**, *Callicera spinolae*, right wing.

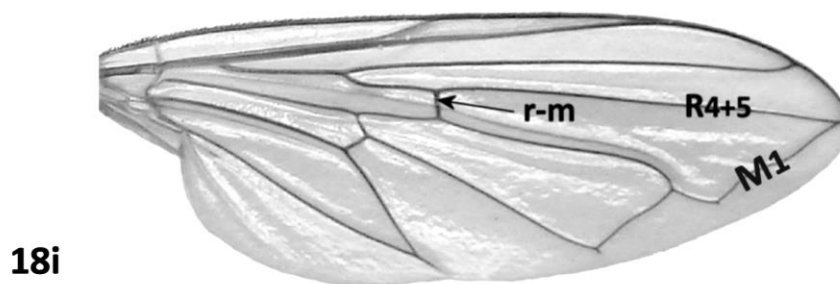
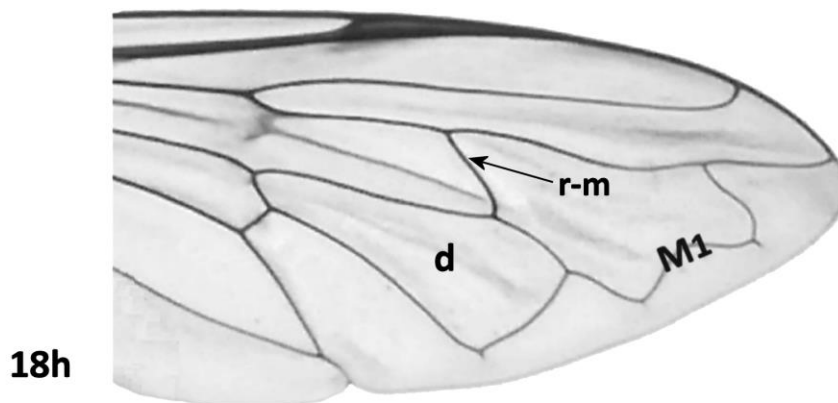
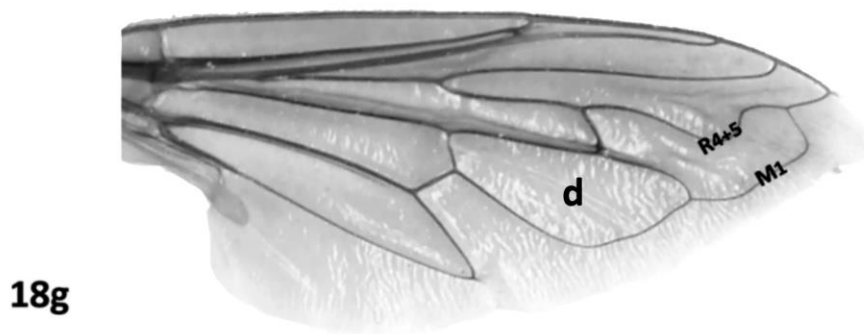
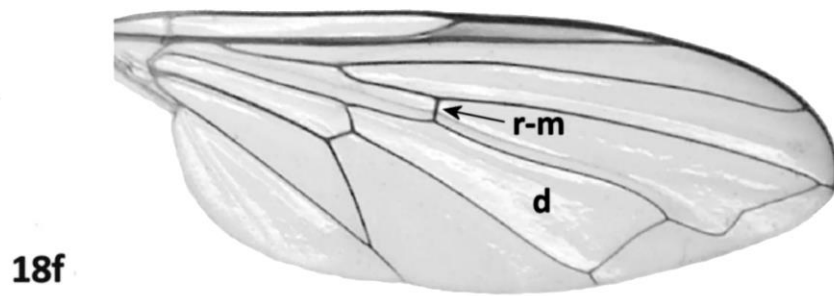


Fig. 18f, *Pelecocera caledonica*, right wing; **Fig. 18g**, *Merodon luteihumerus*, right wing; **Fig. 18h**, *Eumerus nudus*, right wing; **Fig. 18i**, *Brachyopa vittata*, right wing.

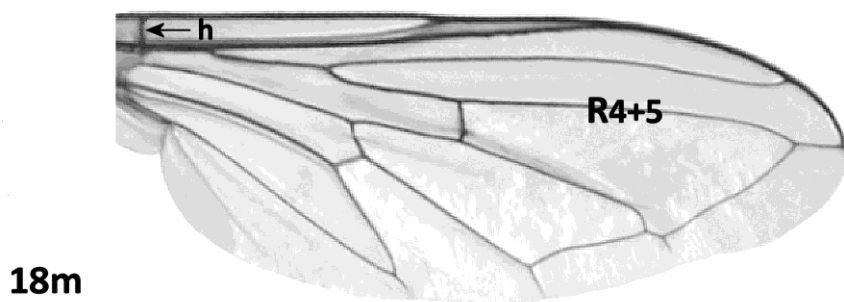
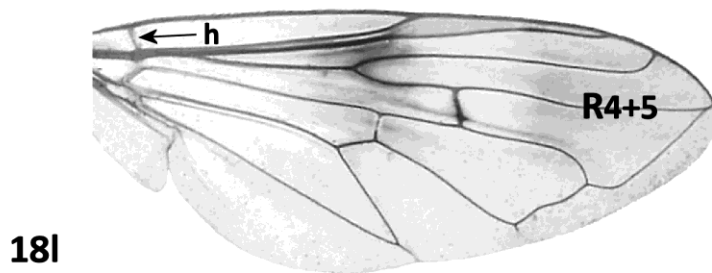
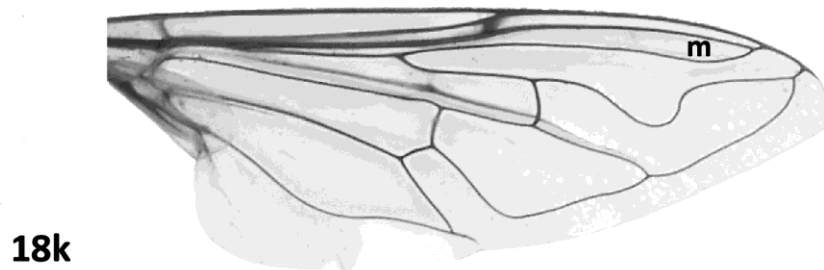
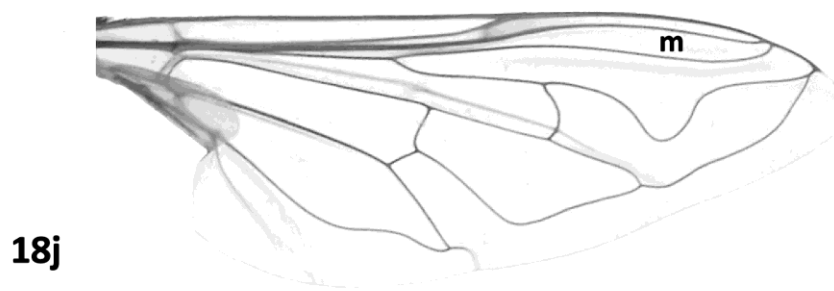


Fig. 18j, *Helophilus trivittatus*, right wing; **Fig. 18k**, *Eristalis nemorum*, right wing; **Fig. 18l**, *Myolepta vara*, right wing; **Fig. 18m**, *Portevinia maculata*, right wing.

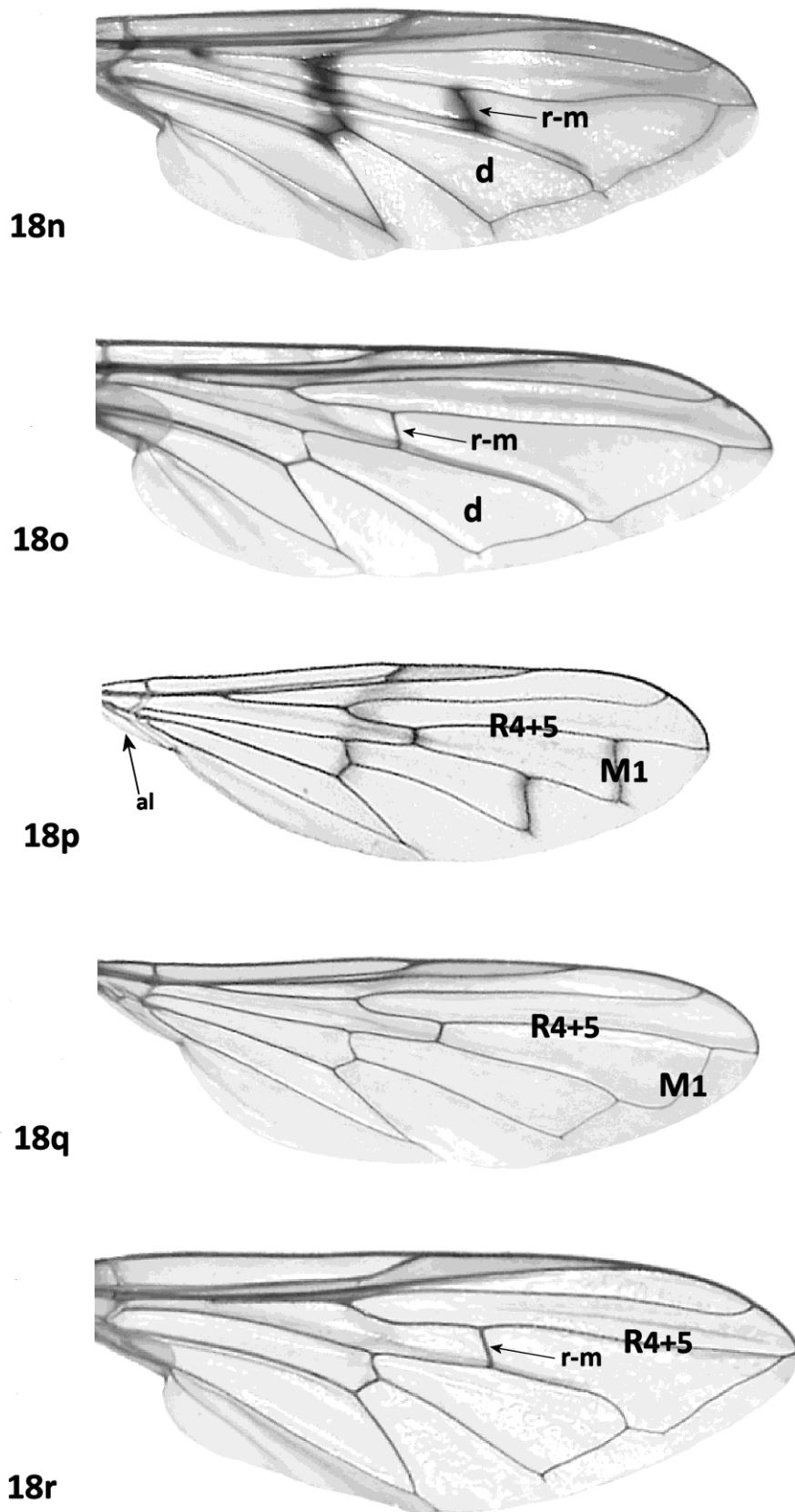


Fig. 18n, *Ferdinandea aurea*, right wing; **Fig. 18o**, *Cheilisia variabilis*, right wing; **Fig. 18p**, *Neoascia unifasciata*, right wing; **Fig. 18q**, *Sphegina varifacies*, right wing; **Fig. 18r**, *Lejota ruficornis*, right wing.

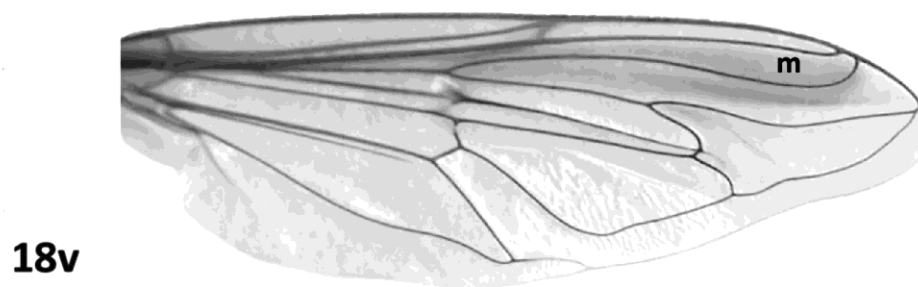
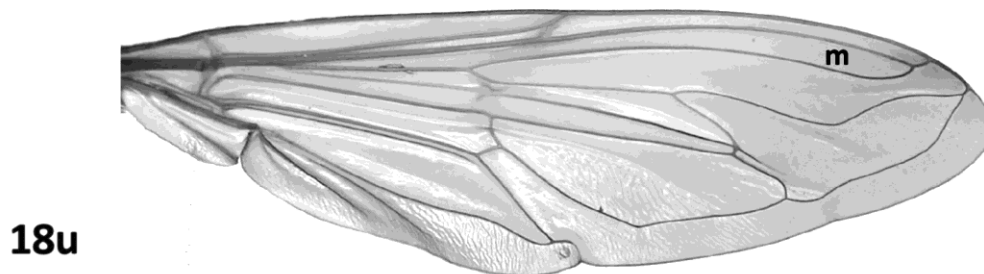
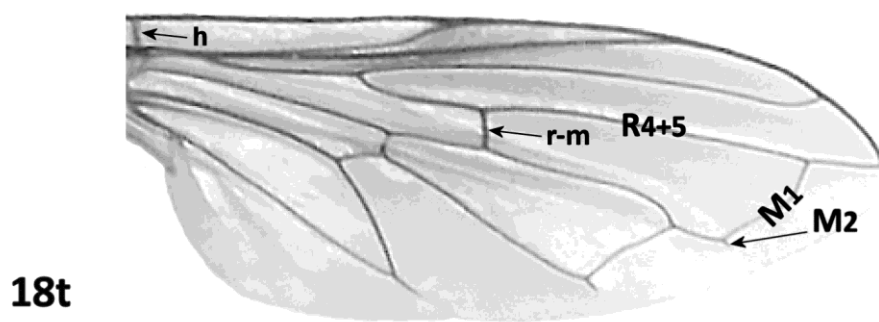
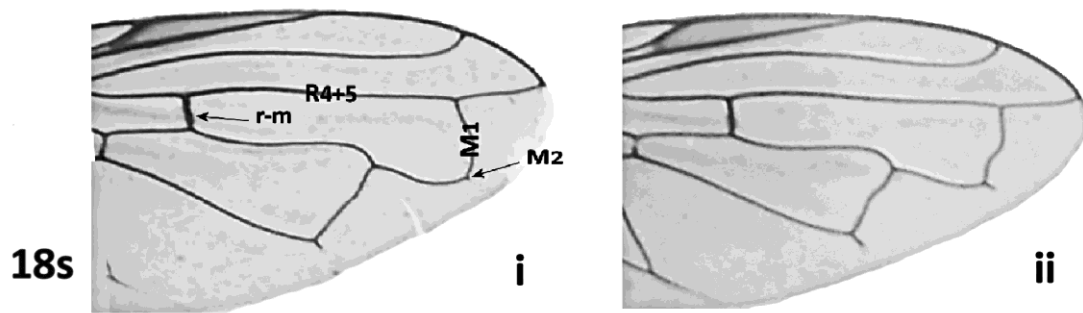


Fig. 18si, 18sii, *Orthonevra brevicornis*, wings to show variability in form of M1; **Fig. 18t**, *Melanogaster hirtella*, right wing; **Fig. 18u**, *Milesia crabroniformis*, right wing; **Fig. 18v**, *Spilomyia graciosa*, right wing.

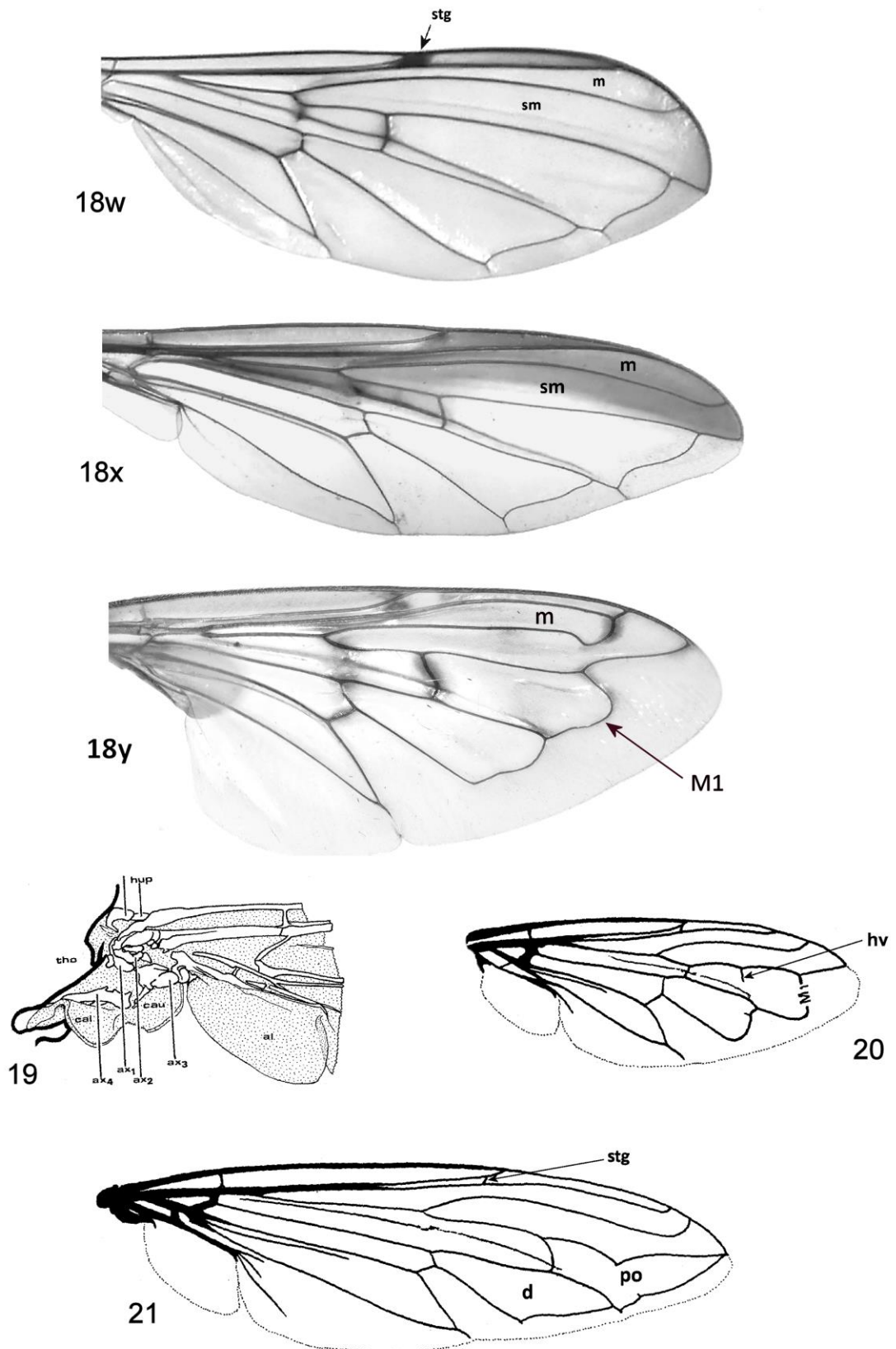
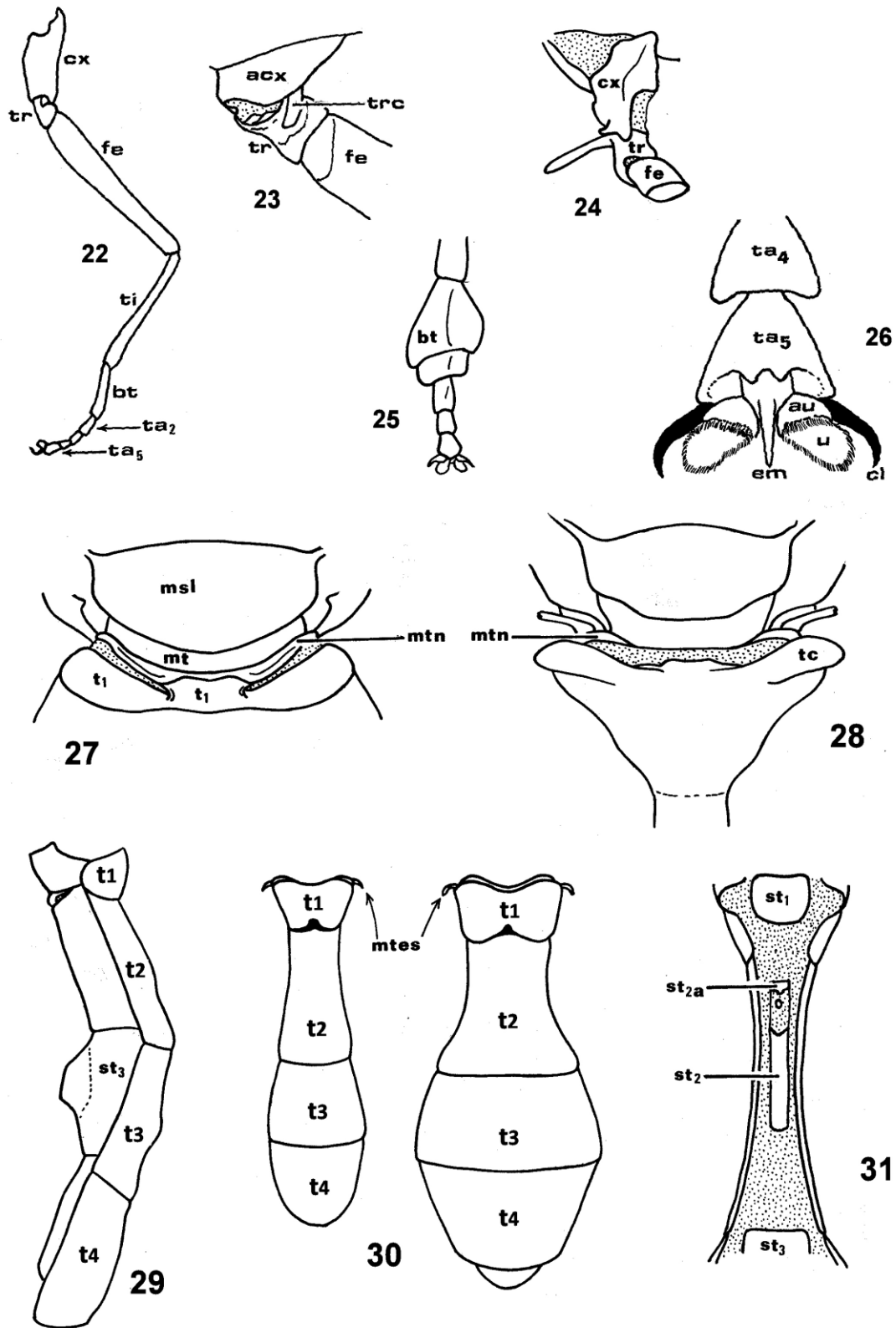


Fig. 18w, *Baccha elongata*, right wing; **Fig. 18x**, *Doros profuges*, right wing; **Fig. 18y**, *Copestylum melleum*, right wing; **Fig. 19**, *Syrphus ribesii*, axillary region of right wing. **Fig. 20**, *Microdon mutabilis*, right wing. **Fig. 21** *Ceriana* sp., right wing.



Figs. 22—23, *Syrphus ribesii*, left fore leg, anterior view (22); male, base of left mid leg, antero-lateral view (23). **Fig. 24**, *Neocnemodon latitarsis*, male, base of left hind leg, lateral view of outer side. **Fig. 25**, *Platycheirus manicatus*, male, tarsomeres of left fore leg, dorsal view. **Fig. 26**, *Microdon mutabilis*, pretarsus and last two tarsomeres of left hind leg, ventral view. **Fig. 27**, *Syrphus ribesii*, junction between thorax and abdomen, dorsal view. **Fig. 28**, *Ceriana* sp., junction between thorax and abdomen, dorsal view. **Fig. 29**, *Heringia latitarsis*, male, basal abdominal segments, lateral view, left side. **Fig. 30**, *Neoascia podagrica*, male (left) and female (right), abdomen, dorsal view. **Fig. 31**, *Sphegina clunipes*, female, base of abdomen, ventral view.

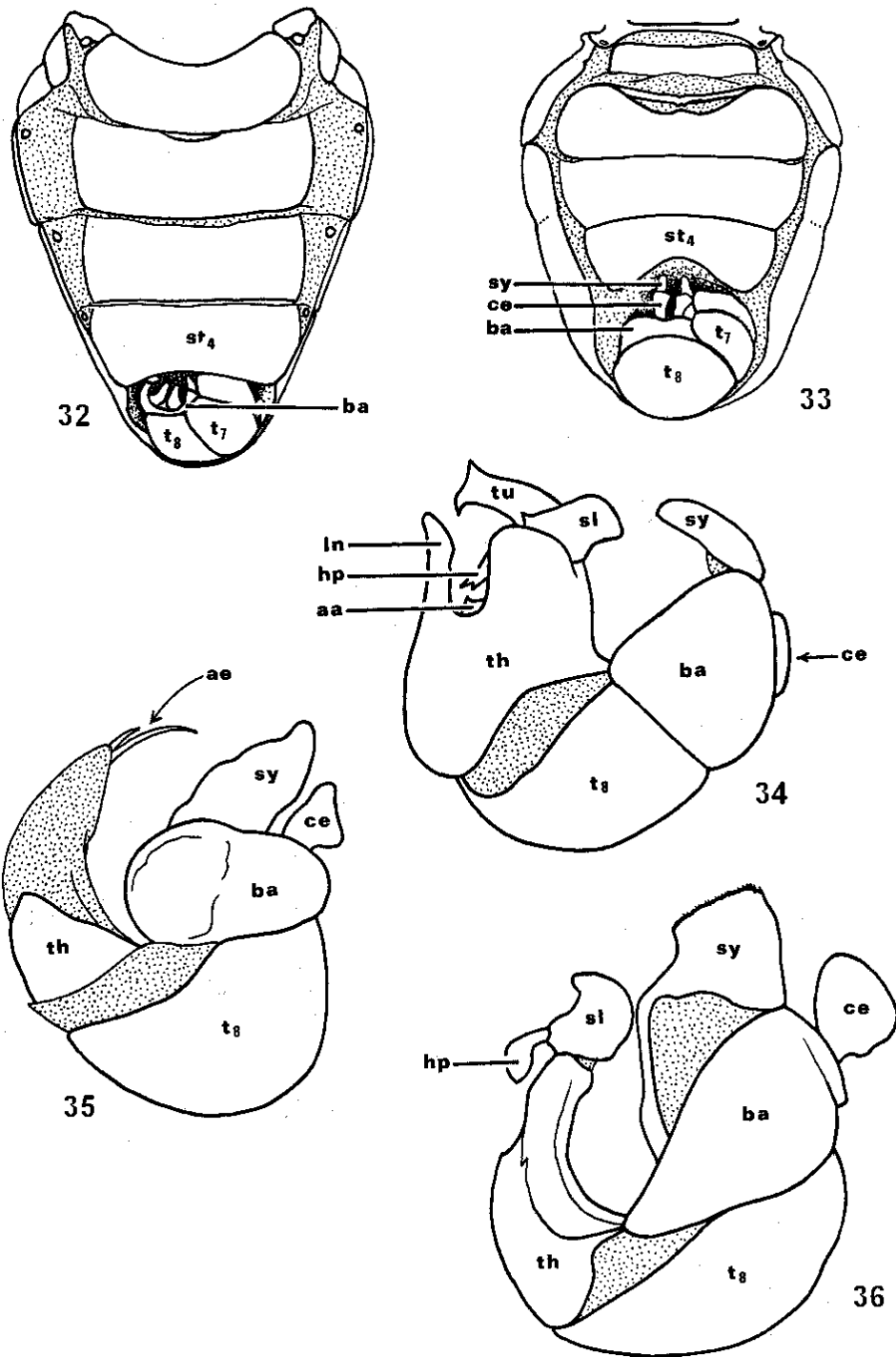


Fig. 32, *Eristalis tenax*, male abdomen, ventral view. **Fig. 33,** *Microdon mutabilis*, male abdomen, ventral view. **Fig. 34,** *Syrphus ribesii*, male, hypopygium, lateral view. **Fig. 35,** *Microdon mutabilis*, male, hypopygium, lateral view. **Fig. 36,** *Eristalis tenax*, male hypopygium, lateral view.

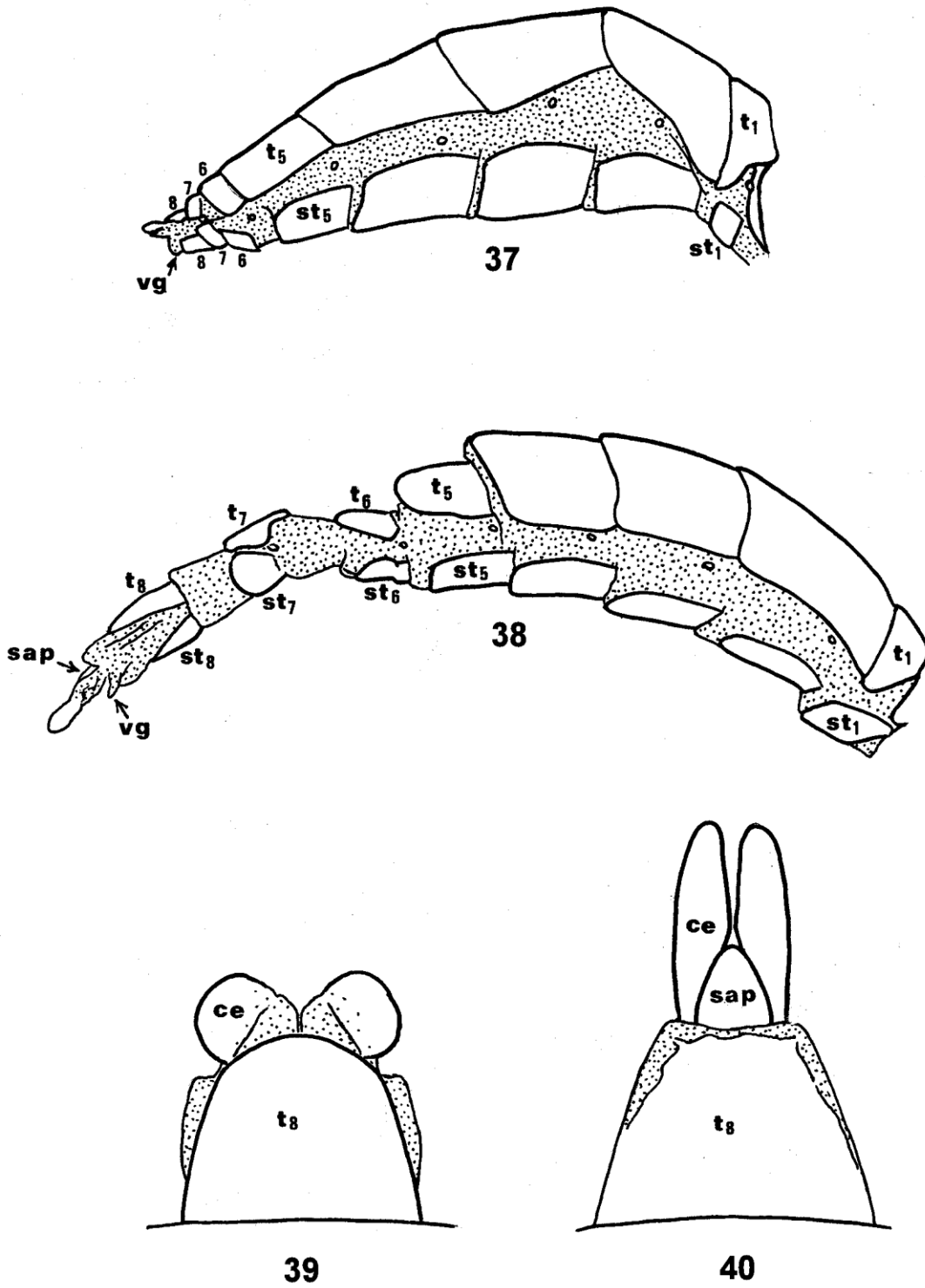


Fig. 37, *Syrphus ribesii*, female, abdomen, lateral view, right side. **Fig. 38,** *Sericomyia silentis*, female, abdomen, lateral view, right side. **Fig. 39,** *Syrphus ribesii*, female, terminalia, dorsal view. **Fig. 40,** *Microdon mutabilis*, terminalia, dorsal view.

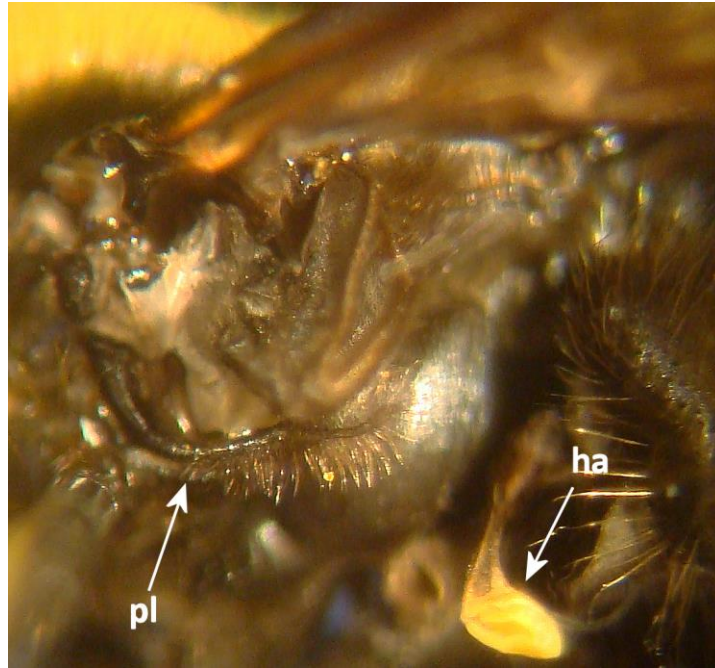


Fig. 41, *Xanthogramma* sp., side of thorax immediately ventral to wing-base, showing the plumule and the haltere.

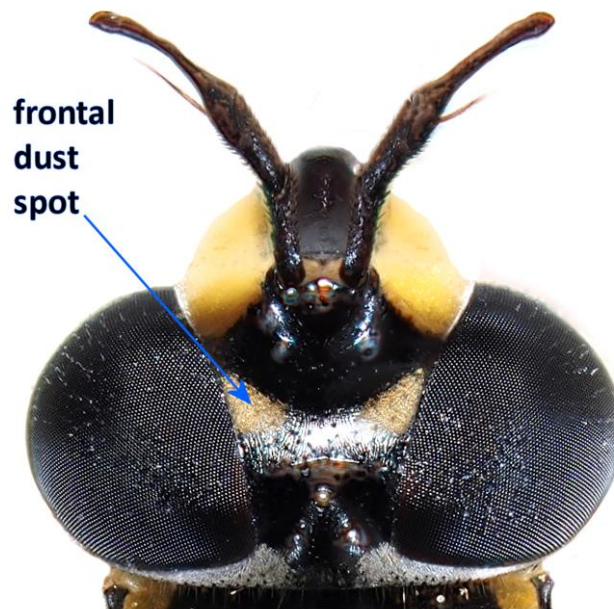


Figure 42: *Chrysotoxum vernale*, female, head, dorsal view showing frontal dust spots



Figure 43a: head and anterior part of thorax in dorsal view, *Scaeva pyrastris*



Figure 43b: anterior part of thorax in dorsal view, to show hairless humeral callus, *Scaeva pyrastris*



Figure 43c: head and anterior part of thorax, dorsal view, showing bare humeral callus exposed, *Episyrrhus balteatus*



Figure 43d: head and anterior part of thorax, side view, showing location of humeral callus, *Episyrrhus balteatus*



Figure 44a: head and anterior part of thorax, dorsal view, showing humeral callus with hairs, *Eristalis arbustorum*

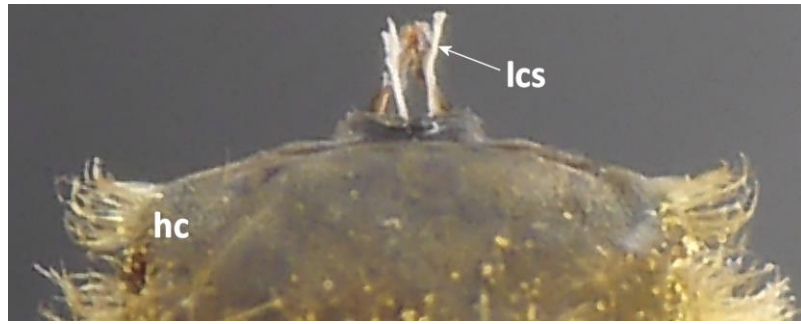


Figure 44b: anterior part of thorax, dorsal view, showing humeral callus with hairs, *Eristalis nemorum*



Figure 44c: head and anterior part of thorax, dorsal view, showing humeral callus with hairs, *Xylota segnis*

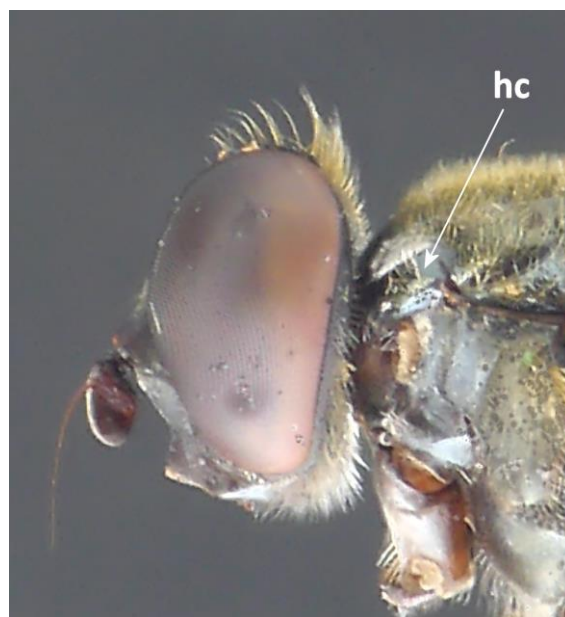


Figure 44d: head and anterior part of thorax, side view, showing humeral callus with hairs, *Xylota segnis*

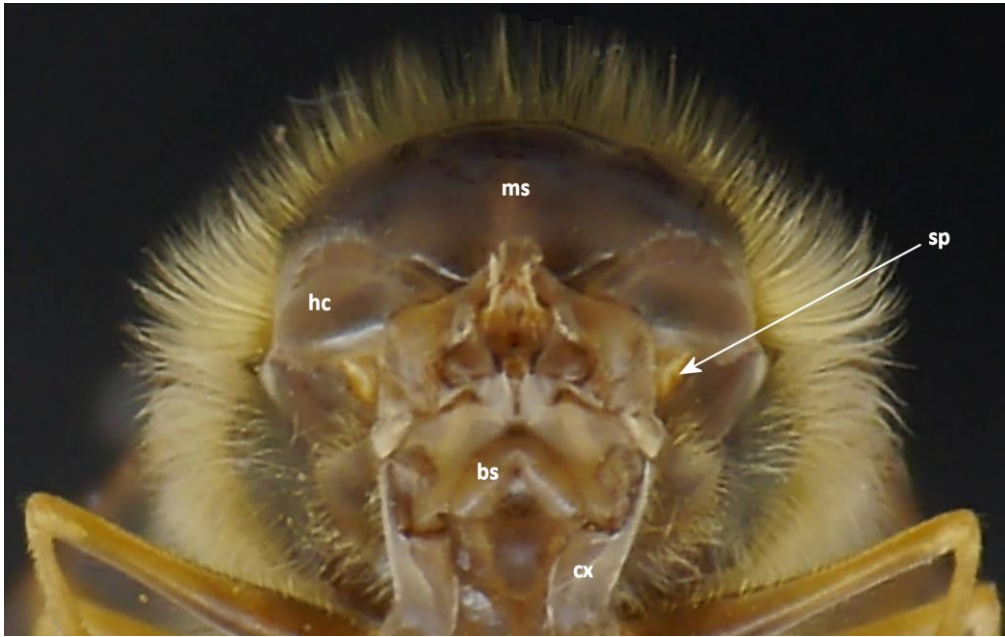


Figure 45a: thorax, anterior view, to show bare humeral callus, *Scaeva pyrastris*

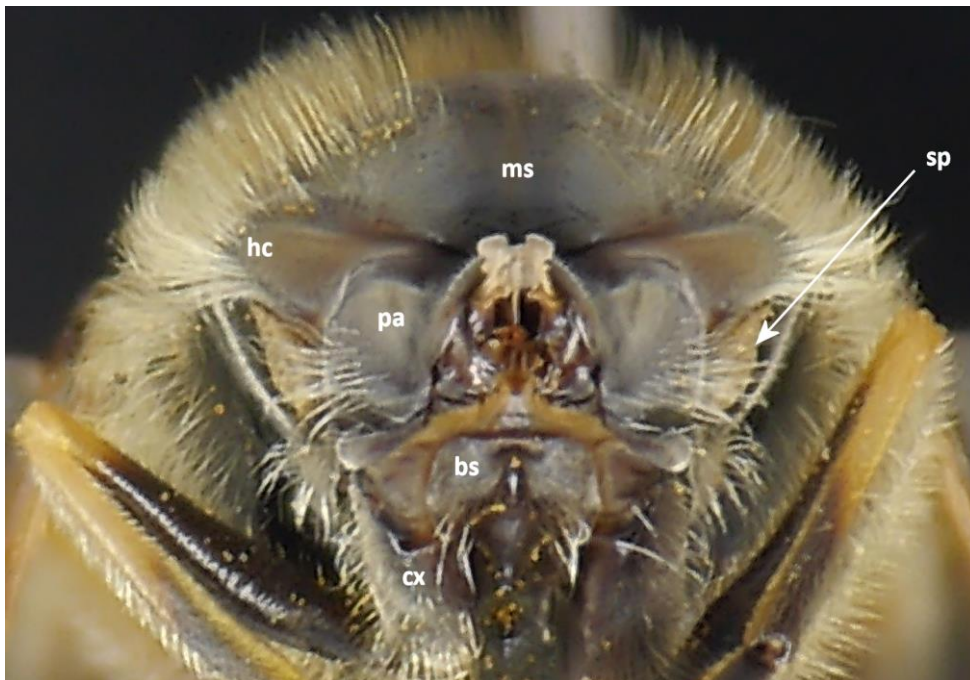


Figure 45b: thorax, anterior view, to show humeral callus with hairs, *Eristalis nemorum*

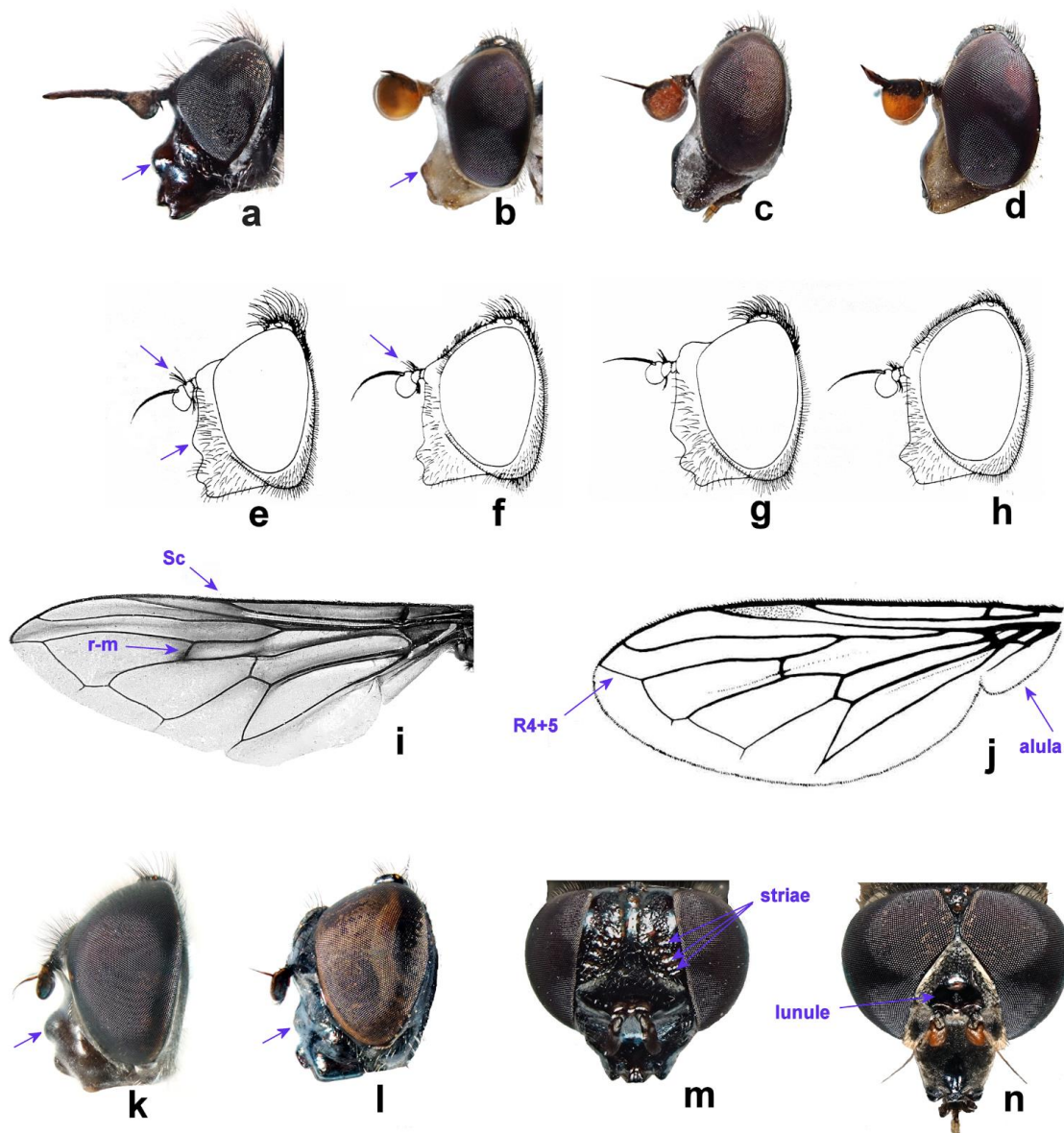


Figure 46:

- a:** *Ischyroptera bipilosa*, male, head, lateral view, arrow indicating facial tubercle;
b: *Pelecocera caledonica*, male, head, lateral view, arrow indicates rudimentary facial tubercle;
c: *Pelecocera pruinosomaculata*, female, head, lateral view, showing entirely black face and absence of facial tubercle;
d: *Pelecocera tricincta*, female, head, lateral view, showing absence of facial tubercle;
e, f: *Chrysosyrphus nasuta*, heads, lateral view (from Kassebeer, 1995), e: male, arrows indicating facial tubercle and long, bristly hairs on antennal segment two; f: female, showing absence of facial tubercle, arrow indicating long, bristly hairs on antennal segment two;
g, h: *Chrysosyrphus nigra*, heads, lateral view (from Kassebeer, 1995), g: male, showing facial tubercle and long, bristly hairs on antennal segment two; h: female, showing absence of facial tubercle and long, bristly hairs on antennal segment two;
i: *Ischyroptera bipilosa*, wing, arrows indicating r-m cross-vein and point where vein Sc meets the costa;
j: *Katara connexa*, wing (from Vujić *et al*, 2018), arrows indicating alula and apical section of vein R4+5;
k: *Cheilosia albitarsis*, male, head, lateral view, arrow indicating facial tubercle;
l, m: *Melanogaster hirtella*, heads, l, male, head lateral view, arrow indicating facial tubercle; m: female, antero-dorsal view, arrows indicating location of frontal striae;
n: *Portevinia maculata*, male, head, antero-dorsal view, arrow indicating lunule.

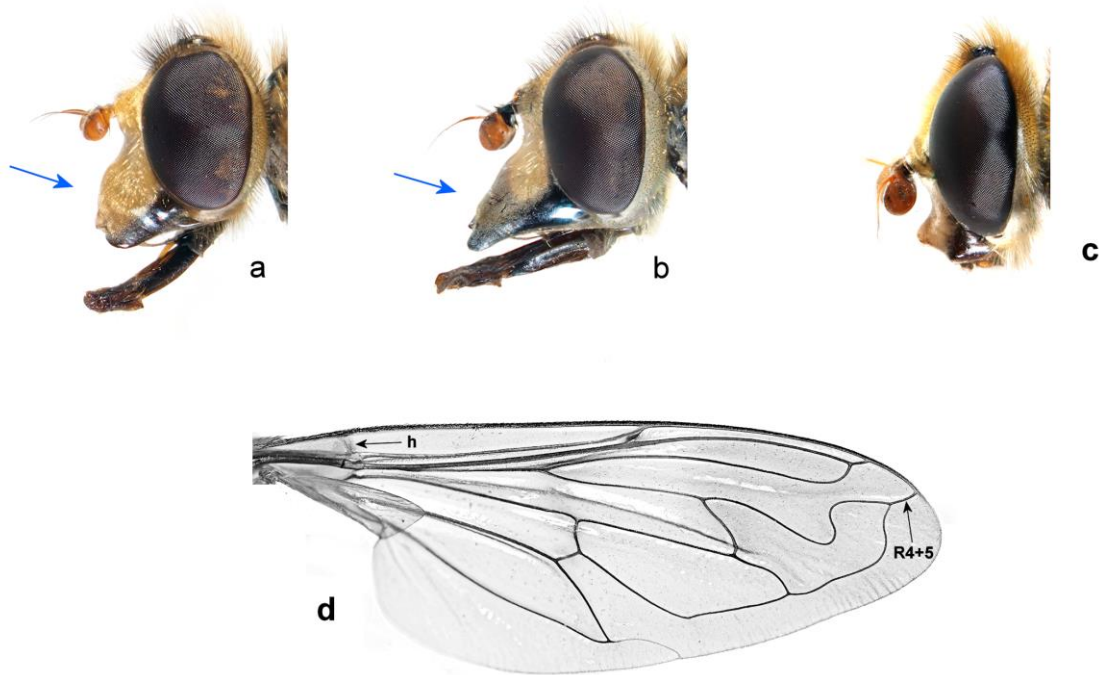


Figure 47:

a: Anasimyia lunulata, head, lateral view, arrow indicating short, rounded facial profile
b: Eurimyia lineata, head, lateral view, arrow indicating elongate, conical facial profile
c: Palumbia bellieri, female, head, lateral view, showing concave face
d: Palumbia bellieri, wing



Figure 48:

Mesembrius peregrinus, lateral view, showing location of pteropleuron (**me**) and (enlarged) the hairy, upper part of the hypopleuron (**mr**)

REFERENCES

- Ball, S.G., Stubbs, A.E., McClean, I.F.G., Morris, R.K.A., Falk, S.J. & Hawkins, R.D. (2002) *British Hoverflies: an illustrated identification guide, 2nd edition*, 469pp. British Entomological and Natural History Society.
- Bartsch, H., Binkiewicz, E., Rådén, A. & Nasibov, E. (2009a) Blomflugor: Syrphinae. *Nationalnyckeln till Sveriges flora och fauna*, DH53a. Artdatabanken, SLU, Uppsala. 406 pp.
- Bartsch, H., Binkiewicz, E., Klintbjer, A., Rådén, A. & Nasibov, E. (2009b) Blomflugor: Eristalinae & Microdontinae. *Nationalnyckeln till Sveriges flora och fauna*, DH 53b. Artdatabanken, SLU, Uppsala. 478pp.
- Bradescu, V. (1991) Les Syrphides de Roumanie (Diptera, Syrphidae), Clés de détermination et répartition. *Trav.Mus.Hist. nat. Grigore Antipa*, 31: 7-83.
- Haarto, A. & Kerppola, S. (2007) Finnish hoverflies and some species in adjacent countries. Otavan Kirjapaino Oy, Keuruu. 647pp.
- Speight, M.C.D. (1987) External morphology of adult Syrphidae (Diptera). *Tijds.Ent.*, 130: 141-175.
- Speight, M.C.D. (1988a) Syrphidae known from temperate Western Europe: potential additions to the fauna of Great Britain and Ireland and a provisional species list for N.France. *Dipterists Digest*, No.1: 2-35.
- Speight, M.C.D. (2020) Species accounts of European Syrphidae, 2020. *Syrph the Net, the database of European Syrphidae (Diptera)*, vol. 104, 314 pp., Syrph the Net publications, Dublin.
- Speight, M. C. D. and de Courcy Williams, M. (2020) European Syrphid Genera: Portraits of representative species 2020/ Portraits d'espèces représentatives de genres de Syrphidae Européens 2020. *Syrph the Net, the database of European Syrphidae (Diptera)*, Vol. 106, 104 pp, Syrph the Net publications, Dublin.
- Speight, M. C. D. and Sarthou, J.-P. (2017) StN keys for the identification of the European species of various genera of Syrphidae 2017/Clés StN pour la détermination des espèces Européennes de plusieurs genres des Syrphidae 2017. *Syrph the Net, the database of European Syrphidae (Diptera)*, Vol. 99, 139 pp, Syrph the Net publications, Dublin.
- Thompson, F.C. (1999) A key to the genera of the flower flies of the Neotropical Region with the description of two new genera and eight new species and a glossary of taxonomic terms. *Contr. Entomol. Intern.* 3: 319–378.
- Thompson, F.C. & Rotheray, G. (1998) Family Syrphidae. In: Papp, L. & Darvas, B. (eds.) *Contributions to a Manual of Palaearctic Diptera*, 3: 81-139. Budapest.
- Torp, E. (1994) Danmarks Svirrefluger (Diptera: Syrphidae). *Danmarks Dyreliv*, 6: 1-490. Apollo books, Stenstrup.
- Van Veen, M. (2004) *Hoverflies of Northwest Europe: identification keys to the Syrphidae*. 256pp. KNNV Publishing, Utrecht.
- Verlinden, L. (1991) Fauna van België: Zweefvliegen (Syrphidae).1-298. *Inst.Roy.Sci.Nat.Belg.*, Brussels.
- Violovitsh, N.A. (1986) Siberian Syrphidae (Diptera). Translation by van der Goot, V.S. & Verlinden, L. *Inst.Taxon.Zool. (Zool.Mus.)*, Amsterdam, Verslagen en Technische Gegevens, No.43: 1-228.
- Vockeroth, J.R. & Thompson, F.C. (1987) Syrphidae. In: McAlpine, J.F. (ed.) *Manual of Nearctic Diptera*, 2: 713-743. Agriculture Canada, Ottawa.

Appendix 1: Taxonomic literature: European genera keyed out in major works

Abbreviations used: T & R = Thompson and Rotheray; V & T = Vockeroth and Thompson

Authors:	StN	Haarto & Kerppola	Bradescu	T & R	Torp	van Veen	Verlinden	Violovitsch	V & T
Date of publication:		2007	1991	1998	1994	2004	1991	1986	1987
Language:		Finnish /English	French	English	Danish	English	Flemish/French	English	English
<i>Anasimyia</i>	1	1			1	1	1	1	
<i>Arctosyrphus</i>	1			1					1
<i>Baccha</i>	1	1	1	1	1	1	1	1	1
<i>Blera</i>	1	1	1	1	1	1	1	1	1
<i>Brachyopa</i>	1	1	1	1	1	1	1	1	1
<i>Brachypalpoidea</i>	1	1	1	1	1	1			
<i>Brachypalpus</i>	1	1	1	1	1	1	1	1	1
<i>Caliprobola</i>	1	1	1	1	1	1	1	1	
<i>Callicera</i>	1	1	1	1		1	1	1	1
<i>Ceriana</i>	1	1	1	1		1	1	1	1
<i>Chalcosyrphus</i>	1	1	1	1	1	1			1
<i>Cheilosia</i>	1	1	1	1	1	1	1	1	1
<i>Chrysogaster</i>	1	1	1	1	1	1	1	1	1
<i>Chrysosyrphus</i>	1	1		1		1		1	
<i>Chrysotoxum</i>	1	1	1	1	1	1	1	1	1
<i>Claussenia</i>	1								
<i>Copestylum</i>	1								
<i>Criorhina</i>	1	1	1	1	1	1	1	1	1
<i>Cryptopipiza</i>	1	1							
<i>Dasysyrphus</i>	1	1	1	1	1	1	1		1
<i>Didea</i>	1	1	1	1	1	1	1	1	1
<i>Doros</i>	1	1	1	1	1	1	1	1	1
<i>Epistrophe</i>	1	1	1	1	1	1	1		1
<i>Epistrophella</i>	1	1		1	1				
<i>Episyrphus</i>	1	1	1	1	1	1	1		
<i>Eriozona</i>	1	1	1	1	1	1	1	1	1
<i>Eristalinus</i>	1	1	1	1	1	1		1	1
<i>Eristalis</i>	1	1	1	1	1	1	1	1	1
<i>Eumerus</i>	1	1	1	1	1	1	1	1	1
<i>Eupeodes</i>	1	1	1	1	1	1	1		1
<i>Eurimyia</i>	1			1	1				
<i>Ferdinandea</i>	1	1	1	1	1	1	1	1	1
<i>Hammerschmidtia</i>	1	1	1	1		1		1	
<i>Helophilus</i>	1	1	1	1	1	1	1	1	1
<i>Heringia</i>	1	1		1	1	1	1	1	1
<i>Ischiodon</i>	1			1				1	
<i>Ischyroptera</i>	1		1	1					
<i>Katara</i>	1								
<i>Lapposyrphus</i>	1			1	1				
<i>Lejogaster</i>	1	1	1	1	1	1	1	1	
<i>Lejops</i>	1	1	1	1	1	1	1	1	
<i>Lejota</i>	1	1	1	1		1		1	1
<i>Leucozona</i>	1	1	1	1	1	1	1	1	1
<i>Mallota</i>	1	1	1	1	1	1	1	1	1
<i>Megasyrphus</i>	1	1	1	1	1		1		
<i>Melangyna</i>	1	1	1	1	1	1	1		1
<i>Melanogaster</i>	1	1				1			
<i>Melanostoma</i>	1	1	1	1	1	1	1	1	1
<i>Meligramma</i>	1	1		1	1				
<i>Meliscaeva</i>	1	1	1	1	1				1
<i>Merodon</i>	1	1	1	1	1	1	1	1	1
<i>Mesembrius</i>	1		1	1		1		1	
<i>Microdon</i>	1	1	1	1	1	1	1	1	1
<i>Milesia</i>	1		1	1		1		1	1

Authors:	StN	Haarto & Kerppola	Bradescu	T & R	Torp	van Veen	Verlinden	Violovitsch	V & T
Date of publication:		2007	1991	1998	1994	2004	1991	1986	1987
Language:		Finnish /English	French	English	Danish	English	Flemish/French	English	English
<i>Myathropa</i>	1	1	1	1	1	1	1	1	
<i>Myolepta</i>	1	1	1	1	1	1	1	1	1
<i>Neoascia</i>	1	1	1	1	1	1	1	1	1
<i>Neocnemodon</i>	1		1	1	1	1	1	1	1
<i>Orthonevra</i>	1	1	1	1	1	1	1	1	1
<i>Palumbia</i>	1			1					1
<i>Paragus</i>	1	1	1	1	1	1	1	1	1
<i>Parasyrphus</i>	1	1	1	1	1	1	1		1
<i>Parhelophilus</i>	1	1		1	1	1	1	1	1
<i>Pelecocera</i>	1	1	1	1	1	1	1	1	1
<i>Pipiza</i>	1	1	1	1	1	1	1	1	1
<i>Pipizella</i>	1	1	1	1	1	1	1	1	
<i>Platycheirus</i>	1	1	1	1	1	1	1	1	1
<i>Platynochaetus</i>	1			1					
<i>Pocota</i>	1	1	1	1	1	1	1	1	1
<i>Portevinia</i>	1	1	1	1	1	1		1	
<i>Psarus</i>	1	1	1	1		1	1		
<i>Psilota</i>	1	1	1	1		1	1	1	1
<i>Pyrophaena</i>	1		1		1		1	1	
<i>Rhingia</i>	1	1	1	1	1	1	1	1	1
<i>Riponnensia</i>	1	1				1			
<i>Rohdendorfia</i>	1		1	1				1	
<i>Scaeva</i>	1	1	1	1	1	1	1	1	1
<i>Sericomyia</i>	1	1	1	1	1	1	1	1	1
<i>Spazigaster</i>	1		1	1					
<i>Sphaerophoria</i>	1	1	1	1	1	1	1	1	1
<i>Sphecomyia</i>	1	1	1	1		1		1	1
<i>Sphegina</i>	1	1	1	1	1	1	1	1	1
<i>Sphiximorpha</i>	1	1	1	1		1	1		1
<i>Spilomyia</i>	1	1	1	1	1	1	1	1	1
<i>Syritta</i>	1	1	1	1	1	1	1	1	1
<i>Syrphocheilosia</i>	1			1					
<i>Syrphus</i>	1	1	1	1	1	1	1	1	1
<i>Temnostoma</i>	1	1	1	1	1	1	1	1	1
<i>Trichopsomyia</i>	1	1	1	1	1	1	1	1	1
<i>Triglyphus</i>	1	1	1	1	1	1	1	1	
<i>Tropidia</i>	1	1	1	1	1	1	1	1	1
<i>Volucella</i>	1	1	1	1	1	1	1	1	1
<i>Xanthandrus</i>	1	1	1	1	1	1	1	1	1
<i>Xanthogramma</i>	1	1	1	1	1	1	1	1	1
<i>Xylota</i>	1	1	1	1	1	1	1	1	1
European generic names not recognised in the StN database									
<i>Arctophila</i>		1	1	1	1	1	1		1
<i>Chamaesyrrhus</i>			1	1	1	1	1		1
<i>Conosyrphus</i>			1	1				1	
<i>Fagisyrrhus</i>		1			1				
<i>Ischyrosyrphus</i>			1	1	1		1	1	
<i>Lathyrophthalmus</i>									
<i>Olbiosyrphus</i>							1	1	
<i>Pachysphyria</i>					1				
<i>Pleskeola</i>								1	
<i>Spheginoides</i>			1	1				1	
European genera not covered by the StN database									