Identification key to the subfamilies of Ichneumonidae (Hymenoptera)

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Notes on the key, April 2015

This key to ichneumonid subfamilies should be regarded as a test version and feedback will be much appreciated (emails to g.broad@nhm.ac.uk). Many of the illustrations are provisional and more characters need to be illustrated, which is a work in progress. Many of the scanning electron micrographs were taken by Sondra Ward for Ian Gauld's series of volumes on the Ichneumonidae of Costa Rica. Many of the line drawings are by Mike Fitton. I am grateful to Pelle Magnusson for the photographs of *Brachycyrtus ornatus* and for his suggestion as to where to include this subfamily in the key. Other illustrations are my own work.

Morphological terminology mostly follows Fitton *et al.* (1988). A comprehensively illustrated list of morphological terms employed here is in development.

In lateral views, the anterior (head) end of the wasp is to the left and in dorsal or ventral images, the anterior (head) end is uppermost.

Identifying ichneumonids

Identifying ichneumonids can be a daunting process, with about 2,400 species in Britain and Ireland. These are currently classified into 32 subfamilies (there are a few more extralimitally). Rather few of these subfamilies are reconisable on the basis of simple morphological character states, rather, they tend to be reconisable on combinations of characters that occur convergently and in different permutations across various groups of ichneumonids. This is not to say that ichneumonid subfamilies are unrecognisable. Most subfamilies are easily recognisable by their overall appearance, once a little experience is gained, but this lack of discrete characters for each subfamily results in a long key. Previous keys, such as those of Perkins (1959) and Townes (1969*a*), have tried to key out subfamilies at single couplets and produced rather unworkable key couplets with many 'ifs' and 'buts'. Wahl's (1993) key to world subfamilies was a great improvement but will still be found to contain grey areas where it is difficult to know if you have chosen the correct half of a couplet. With this key I have tried to rely on rather simple characters (and with a restricted geographical remit) with the result that most of the larger subfamilies will key out in several places. The alternative is long and unwieldy key couplets that attempt to cover all the exceptions.

Recognition of Ichneumonoidea

Gauld & Bolton (1988) and Goulet & Huber (1993) provide good keys to superfamilies and families of Hymenoptera. Ichneumonoidea, comprising the families Ichneumonidae and Braconidae, can generally be recognised by the wing venation (costal cell of the leading edge of the fore wing more-or-less obliterated by the close apposition of veins *C* and *Sc+R+Rs*) and the long, simple antennae (usually with more than 16 segments). Another particularly useful character for recognising ichneumonoids are the very poorly sclerotised, almost membranous sternites, forming the venter of the metasoma. Other parasitoid and aculeate groups usually have the sternites as well sclerotized as the dorsal tergites. Note that there is an exception within Ichneumonidae: *Agriotypus* has the sternites as sclerotized as the tergites.

The first key below separates the two families Ichneumonidae and Braconidae, before the main key to ichneumonid subfamilies.

Separation of Braconidae and Ichneumonidae in Britain and Ireland

1 – Wings present and not reduced (apparently capable of sustained flight) (macropterous)..... **2**
– Wings absent or reduced (not projecting beyond tergite 1 of metasoma[1]) (apterous, micropterous or brachypterous (Figs xxx)) **5**
2(1)– Fore wing vein 2*m-cu* present (Fig.1) ..... **Ichneumonidae** (most)
– Fore wing vein 2*m-cu* absent (Figs 2,5,6) **3**

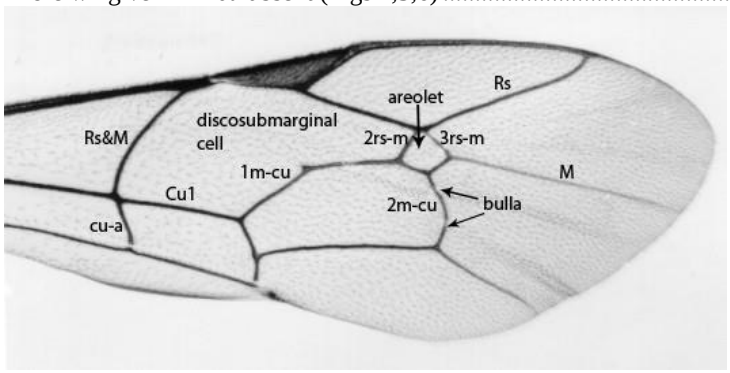


Fig.1 Fore wing, Ichneumoninae

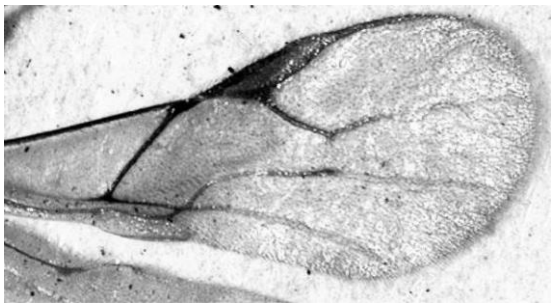


Fig.2 Fore wing, *Aphidius* (Braconidae)

3(2)– Tergites 2 and 3 fused, forming a syntergite (the apparent second tergite) which bears two pairs of spiracles (Fig.4); fore wing usually with first discal and first submarginal cells separated by vein *Rs+M* ..... **Braconidae** (most)
– Tergites 2 and 3 separated by a distinct suture, with a pair of spiracles on each tergite (Fig.3); fore wing usually with a large discosubmarginal cell (vein *Rs+M* absent) (Figs 1,7) (but a very few genera with aberrant venation, cf. Figs 5,6) **4**

[1] One species (*Sphecophaga vesparum* Curtis) sometimes brachypterous with wings extending to half the length of the metasoma.

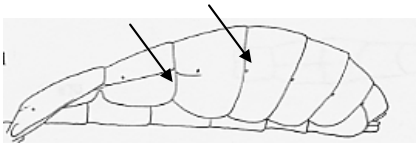


Fig.3 Metasoma, Ichneumonidae

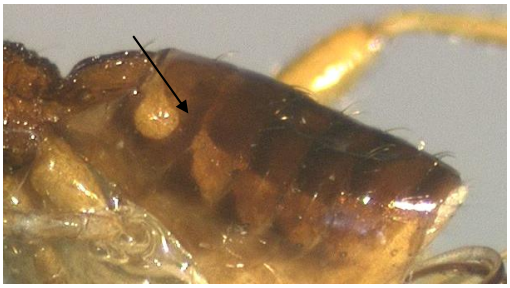


Fig.4 Metasoma, *Chasmodon* (Braconidae)

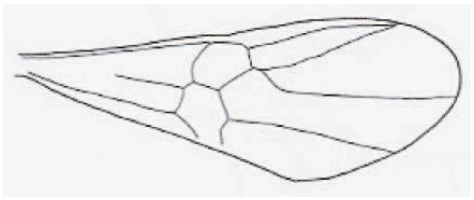


Fig.5 Fore wing, *Hybrizon*

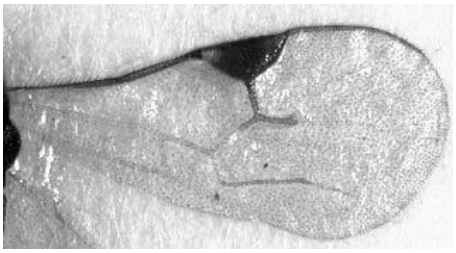


Fig.6 Fore wing, *Neorhacodes*

4(3)– Hind wing venation reduced, no enclosed sub-basal cell present (nervellus absent) (Fig.7) ....**Braconidae** (some Aphidiinae)

– Hind wing with enclosed sub-basal cell (nervellus present) (cf. Fig.8)**Ichneumonidae** (a few)

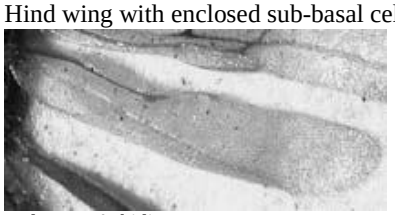


Fig.7 Hind wing, *Aphidius*

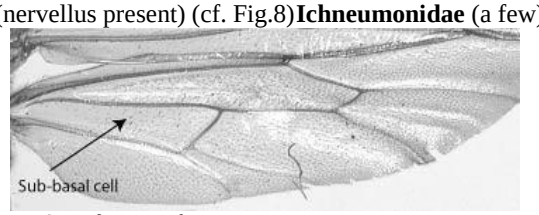


Fig.8 Hind wing, *Ichneumon*

5(1)– Tergite 1 with spiracles behind the middle; with the tergite and sternite fused anteriorly and the sternite extending beyond the middle of the tergite (Fig. 9) .....**Ichneumonidae** (a few)[2]

– Tergite 1 with spiracles at or in front of the middle; with the tergite and sternite fused into a long petiole or with the sternite separated from the tergite by a flexible suture and not reaching the middle of the tergite (Fig. 10)..... **6**

[2] But including some frequently collected species of *Gelis* (Cryptinae).

Fig.9 First metasomal segment, *Gelis*

Fig.10 First metasomal segment, *Chasmodon*

6(5) – Face and clypeus forming uniform, convex surface, mandibles normal (Fig.11); tergites 2 and 3 separated by a distinct suture, with a pair of spiracles on each tergite (Fig.3)..... ..... **Ichneumonidae** (a few)

– Face and clypeus separated by a groove, mandibles sometimes exodont (splayed outwards and not meeting when closed (Fig.12)); tergites 2 and 3 usually fused, forming a syntergite (the apparent second tergite), which bears two pairs of spiracles (Fig.4), but tergites separate in Aphidiinae .....**Braconidae** (a few)[3]

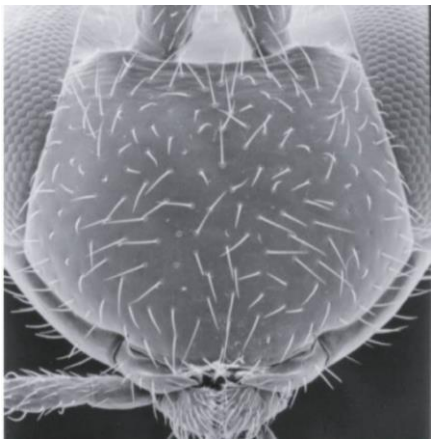


Fig.11 Face, *Orthocentrus*

Fig.12 Head, *Chasmodon*

[3] Flightless braconids in Britain and Ireland can be found in the subfamilies Alysiinae, Aphidiinae, Blacinae, Doryctinae, Orgilinae and Pambolinae.

Key to the identification of British subfamilies of Ichneumonidae

1 – Wings present and not reduced (apparently capable of sustained flight) (macropterous)..... **2**
– Wings absent or reduced (i.e. incapable of flight), usually not projecting beyond tergite 1 of metasoma[4] (apterous, micropterous or brachypterous) **99**
2(1)– Fore wing vein 2*m-cu* absent (Figs13-15)..... **3**
– Fore wing vein 2*m-cu* present (Fig.16) **6**

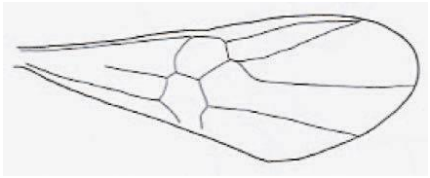


Fig.13 Fore wing, *Hybrizon*

Fig.14 Fore wing, *Neorhacodes*

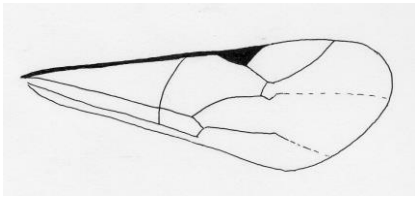


Fig.15 Fore wing, *Aclastus*

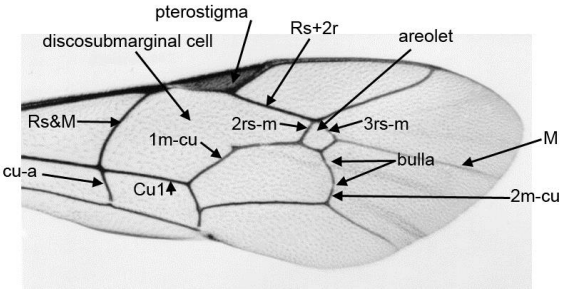


Fig.16 Fore wing, Ichneumoninae

3(2)– Fore wings with veins *Rs* and *M* not fused in the position of the areolet, cross vein 2*rs-m* (cf. Fig.16) present, but may be very short; discosubmarginal cell large, longer than wide (Fig.15) **4**
– Fore wings with veins *Rs+2r* and 1*m-cu* fused over a short distance so that there is no areolet and no *rs-m* cross veins; discosubmarginal cell small and rather square (Figs 13,14)..... **5**
4(3)– Clypeus wide with row of regular strong setae along rim (Fig.17); fore wing veins thickened around 2*rs-m*, this cross vein very short (cf. Fig.18)..... **Tersilochinae** (a few)
– Clypeus barely wider than high, margin without row of setae; fore wing veins around 2*rs-m* not thickened, *rs-m* cross veins distinct (Fig.15)..... **Cryptinae** (a few)[5]

[4] One species (*Sphecophaga vesparum* Curtis) sometimes brachypterous with wings extending to half the length of the metasoma, *Orthizema graviceps* with wings sometimes extending to apex of 2nd tergite; wing cells look shortened in these species and they are incapable of flight. A few macropterous ichneumonids (particularly Anomaloninae) have rather short wings (mainly an artefact of the very long metasoma) but the venation is normal-looking.
[5] Only three species (one of *Aclastus*, two of *Gnypetomorpha*) should key out here.

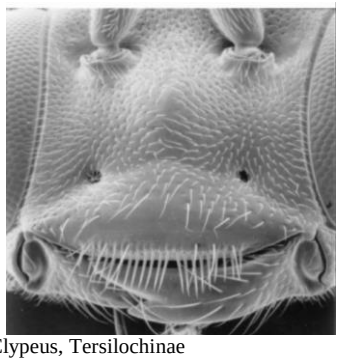


Fig.17 Clypeus, Tersilochinae

Fig.18 Fore wing, *Barycnemis*

5 (3)– Tergites 1-3 with granular sculpture and transverse impressions just behind the middle, these impressions with longitudinal striation (Fig.19); sclerotized part of sternite 1 not reaching spiracle; mandible normal, with two teeth.....**Tersilochinae** (*Neorhacodes*)[6]

– Tergites 1-3 lacking obvious sculpture and transverse impressions; sclerotized part of sternite 1 reaching beyond spiracle (cf. Fig.3); mandibles vestigial, lacking teeth..... **Hybrizoninae**[7]

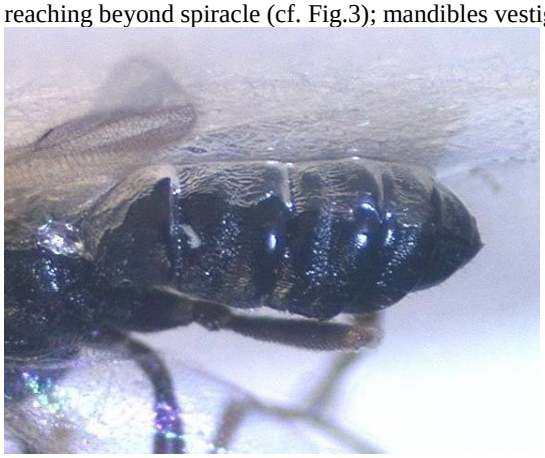


Fig.19 Metasoma, *Neorhacodes*

6(2)– Mesoscutum with conspicuous transverse rugae across much of surface (Fig.20) **7**

– Mesoscutum lacking transverse rugae **8**

[6] Just one British species (*Neorhacodes enslini* (Ruschka)), usually included in the subfamily Neorhacodinae, but this small group of three genera has recently been synonymised within Tersilochinae.

[7] Often referred to as Paxylommatinae.

Fig.20 Mesoscutum, *Rhyssa*

Fig.21 Mesoscutum, *Pseudorhyssa*

7(6)– Occipital carina medio-dorsally absent (Fig.22); fore wing vein *cu-a* distal to *Rs&M* (Fig.24) .....**Rhyssinae**

– Occipital carina medio-dorsally complete (Fig.23); fore wing vein *cu-a* opposite *Rs&M* (Fig.25) ..... **Poemeniinae** (*Pseudorhyssa*)[8]

[8] Just one British species (*Pseudorhyssa alpestris* (Holmgren)).

Fig.22 Occiput, *Rhyssa*

Fig.23 Occiput, *Pseudorhyssa*

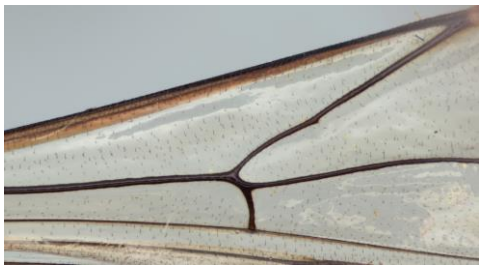


Fig.24 Fore wing, *Rhyssa*

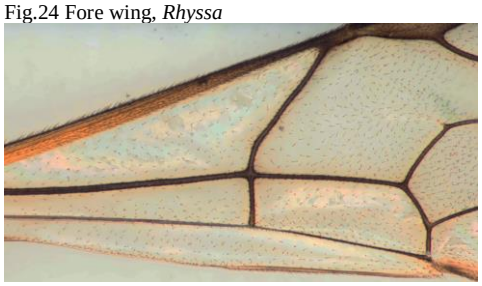


Fig.25 Fore wing, *Pseudorhyssa*

8(6)– Spiracle of tergite 1 at the posterior third of the tergite, tergite lacking deep glymmae (may have superficial pits around or posterior to mid-length); sclerotized part of sternite 1 extending to the posterior third of the segment (Fig.26), sometimes the suture between sternite and tergite obsolete (Fig.26); metasomal segment 1 narrow basally and widened apically (Fig.27)..... **9**

Fig.26 First metasomal segment, Ophioninae, lateral

Fig.27 First metasomal segment, Ichneumoninae, dorsal

– Spiracle of tergite 1 around the middle of the tergite or in the anterior half, if a little beyond the middle then tergite with deep glymmae (elongate, pit-like structures) laterally; sclerotized part of sternite 1 **usually** not extending beyond the middle of the tergite (Figs 28,29), **if** extending beyond the middle **then** the spiracle is around the mid-length of the tergite; metasomal segment 1 either gradually widened apically or more parallel-sided..... **29**

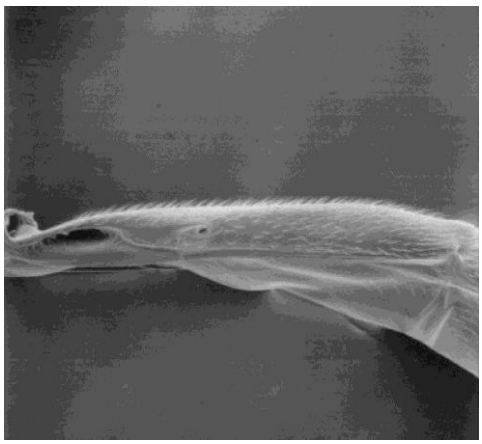


Fig.28 First metasomal segment, Tryphoninae

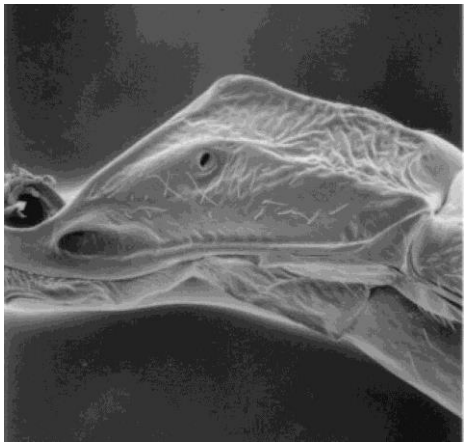


Fig.29 First metasomal segment, *Pimpla*

9(8)– Fore wing lacking areolet **and** the remaining *rs-m* vein is apical to vein 2*m-cu*, thus discosubmarginal cell extending beyond 2*m-cu* (Fig.30).....**10**

– Fore wing with or without an areolet, if without then *rs-m* vein is basal to (cf. Fig.31) or opposite vein 2*m-cu*, thus discosubmarginal cell not extending beyond 2*m-cu*.....**12**

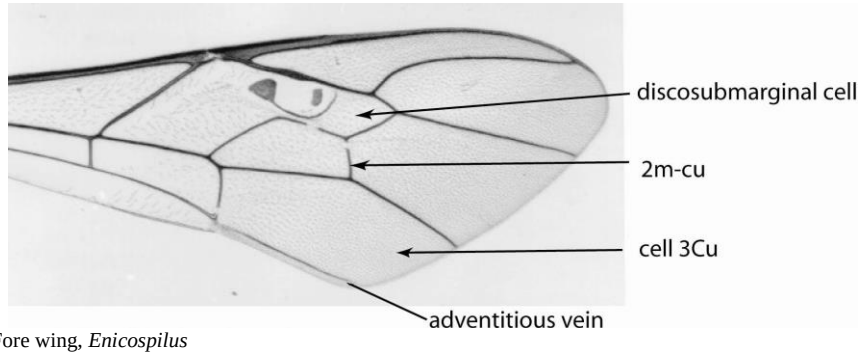


Fig.30 Fore wing, *Enicospilus*

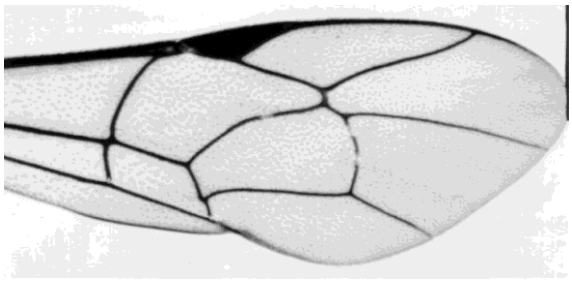


Fig.31 Fore wing, *Cylloceria*

10(9)– Fore wing with an adventitious vein in cell 3*Cu* (Fig.30), parallel to wing margin; body entirely pale orange-brown or pale orange-brown with copious black markings; ovipositor barely extends beyond the metasomal apex.....**Ophioninae**

– Fore wing lacking an adveniititious vein; head and mesosoma with ground colour black or brown, sometimes with paler markings; ovipositor obviously projecting beyond the metasomal apex **11**

11(10)– Propodeum lacking regular areas defined by carinae, covered in reticulate sculpturing (Fig.32), one species with sculpturing very fine and mid tibia with one spur; wing veins normal around vein *rs-m*; clypeus without a fringe of setae, sometimes with a median, apical tooth ....**Anomaloninae** (a few)

– Propodeum with some reagular areas defined by carinae (Fig.33), lacking reticulate sculpture; mid tibia always with two spurs; wing veins thickened around 2*rs-m*, this cross vein very short (cf. Fig.34); clypeus with a fringe of regular, closely spaced, strong setae on the apical edge (Fig.35), never with a tooth ..... **Tersilochinae** (a few)

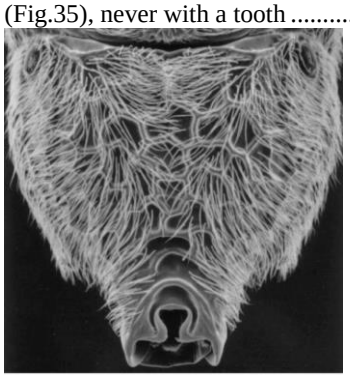


Fig.32 Propodeum, Anomaloninae

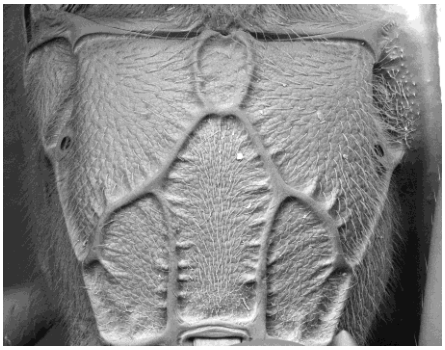


Fig.33 Propodeum, Tersilochinae

Fig.34 Fore wing, *Barycnemis*

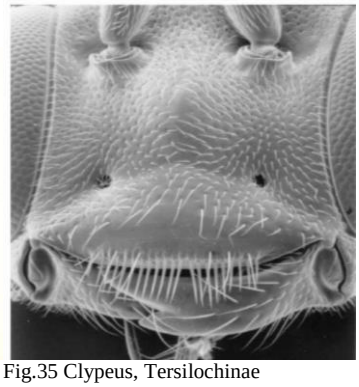


Fig.35 Clypeus, Tersilochinae

12(9)– Propodeum lacking regular areas defined by carinae but instead with reticulate or areolate sculpture (Fig.32); ovipositor 'pinched' apically, producing an abruptly finer point (Fig.36) .....**Anomaloninae**

– Propodeum with carinae delimiting regular areas (cf. Fig.33) or if lacking carinae then not with reticulate or areolate sculpture; ovipositor with a nodus, notch or plain apically, narrowed but not 'pinched'.....**13**

Fig.36 Ovipositor, *Agrypon*

13(12)–Mesosoma short, hunched, almost round in profile (Fig.37); fore wing vein *cu-a* separated from *Rs&M* by more than half the length of *cu-a* (Fig.38); hind wing with vein *rs-m* conspicuously longer than *Rs* (Fig.39); first metasomal tergite and sternite fused, no trace of a suture visible; sclerotized bridge between metasomal socket and hind coxal socket at least equal to width of coxal socket ..... **Brachycyrtinae**[9]

– Mesosoma longer, not hunched; fore wing vein *cu-a* much closer to *Rs&M*; hind wing vein *rs-m* shorter than *Rs*; first metasomal tergite and sternite with at least a suture between them; sclerotized bridge between metasomal socket and hind coxal sockets narrower **14**

Fig.37 *Brachycyrtus ornatus* mesosoma

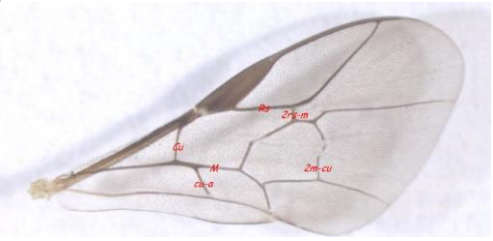


Fig.38 Fore wing, *Brachycyrtus ornatus*

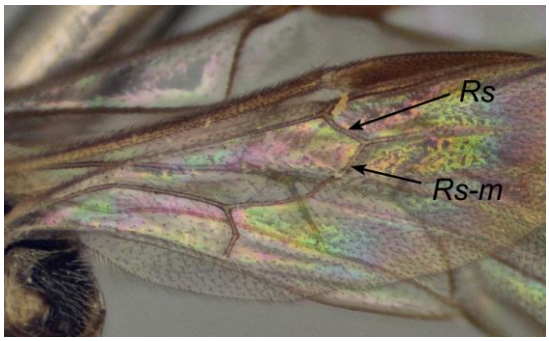


Fig.39 *Brachycyrtus ornatus* hind wing

[9] Not currently known from Britain or Ireland but the single European species, *Brachycyrtus ornatus* Kriechbaumer, has recently been found as far north as southern Sweden (P. Magnusson, pers. comm.) and is a potential colonist.

14(13)– Mesopleuron with a sternaulus, a groove originating near the **antero-ventral** corner of the mesopleuron, running usually for at least half of its length (Fig.40), or sometimes running more or less ventrally, near the edge of the mesosternum **15**

– Mesopleuron without sternaulus but sometimes (some Tersilochinae) with a diagonal groove originating near higher up the anterior edge of the mesopleuron (Fig.41) **16**

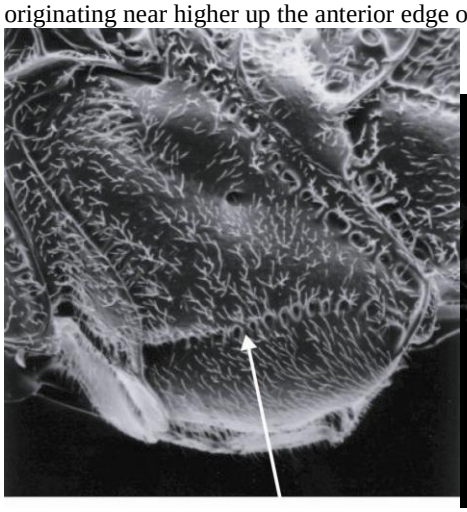


Fig.40 Mesopleuron, Cryptinae

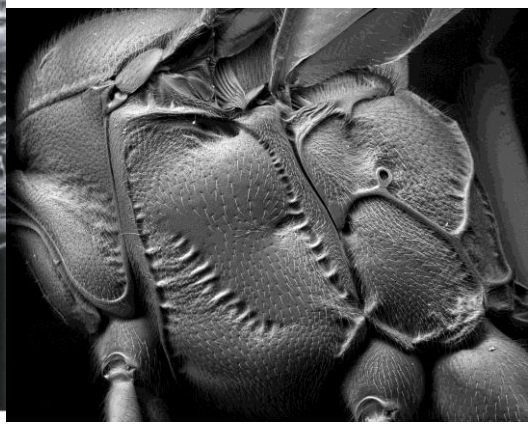


Fig.41 Mesopleuron, Tersilochinae

15(14)– Clypeus broad and flat, apically truncate, weakly (cf. Fig.42) or not separated from face; female with ovipositor sheaths stiff and straightl; either with lower tooth of mandible much shorter than upper tooth and area superomedia of propodeum large (c. ⅓ of propodeum width), indented posteriorly, roughly heart-shaped viewed anteriorly (*Dicaelotus*), or mandibles very large with two prominent teeth, face and clypeus forming uniformly convex surface (*Listrodromus*) .... **Ichneumoninae** (a few)

– Clypeus always narrower and obviously convex, apically rounded and separated from the face by a well-defined groove (Fig.43); female with ovipositor sheaths thinner and flexible; lower tooth of mandible usually as long as the upper tooth, sometimes shorter, sometimes longer but mandible not massive; area superomeda small, not indented posteriorly .**Cryptinae** (most)[10]

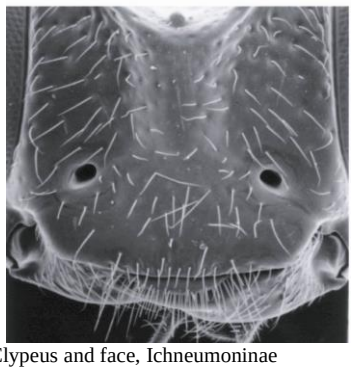


Fig.42 Clypeus and face, Ichneumoninae

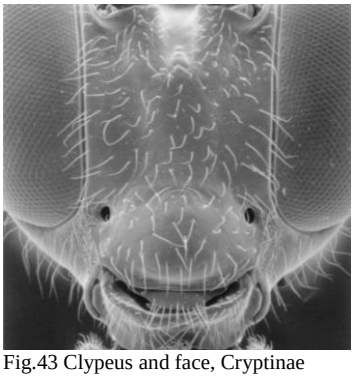


Fig.43 Clypeus and face, Cryptinae

[10] *Thymaris* species should key out to the other part of the key at couplet 7 but if not they could be confused with Cryptinae because of the long sternaulus. Tergite 1 of *Thymaris* has deep glymmae laterally.

16(14)–Hind wing with vein *M+Cu* strongly curved and spectral or absent basally (Fig.44); laterotergite of tergite 3 not separated by a crease, pendant **17**

– Hind wing with vein *M+Cu* fully sclerotized, often weakly curved or straight (cf. Fig 45); laterotergite of tergite 3 usually separated by a crease **18**

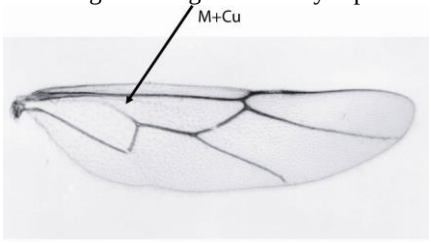


Fig.44 Hind wing, Tersilochinae

Fig.45 Hind wing, *Ichneumon*

17(16) – Fore wing either with areolet present or, if absent, veins around vein 2*rs-m* normal; clypeus without fringe of setae; tarsal claws pectinate, at least basally (Fig.46) .... **Tersilochinae** (*Astrenis* and *Phrudus*)[11]

– Wing veins thickened around vein 2*rs-m*, 2*rs-m* almost obliterated (Fig.34); clypeus with a fringe of regularly, closely spaced, strong setae on the apical edge (Fig.35); tarsal claws usually simple (cf. Fig.47)..... **Tersilochinae** (most)

Fig.46 Fore tarsal claw, *Phrudus*

Fig.47 Fore tarsal claw, *Megastylus*

18(16)-Clypeus apically produced into a strong, median point (Fig.48)..... **19**

– Clypeus not produced into a point, although sometimes with a small tooth **20**

[11] Keyed out separately here as the *Phrudus* group of genera have, until very recently, been treated as belonging to the subfamily Phrudinae.

Fig.48 Clypeus and face, *Sphinctus*

19(18)–Hind tibia with one spur; tarsal claws pectinate (cf. Fig.49); fore tibia without a strong apical tooth; metasoma black and yellow-striped (Fig.51) ..... **Tryphoninae** (*Sphinctus*)[12]

– Hind tibia with two spurs; tarsal claws simple; fore tibia with strong apical tooth (cf. Fig.50); metasoma black ..... **Metopiinae** (*Ischyrocnemis*)[13]

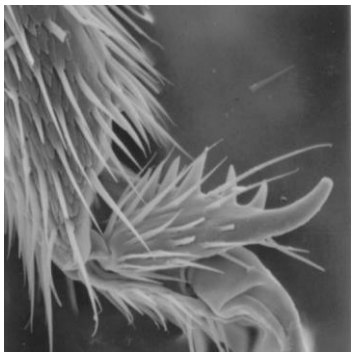


Fig.49 Fore tarsal claw, Tryphoninae

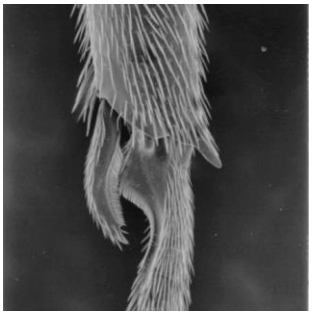


Fig.50 Fore tibial tooth

[12] Just one very rare species in Britain (*Sphinctus serotinus* Gravenhorst).
[13] One very rare species in Britian (*Ischyrocnemis goesi* Holmgren).

Fig.51 Anterior metasoma, *Sphinctus*

20(18)–Hind tibia with one spur; antenna clavate (flagellum club-shaped, apical flagellar segments wider than long) (cf. Fig.52).....**Metopiinae** (*Periope*)[14]

– Hind tibia with two spurs; antenna not clavate.....**21**

Fig.52 Clavate antennal flagellum, *Brachycyrtus*

21(20)–Fore wing vein 2*m-cu* with one bulla (cf. Fig.53).....**22**

– Fore wing vein 2*m-cu* with two bullae (if bullae hard to distinguish from the rest of the vein, their positions indicated by folds in the wing membrane) (cf. Fig.54).....**26**

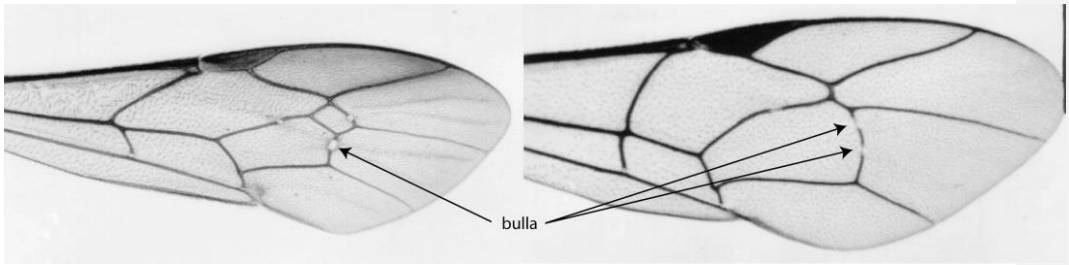


Fig.53 Fore wing, *Metopius*

Fig.54 Fore wing, *Cylloceria*

[14] Because *Periope auscultator* (Haliday) (the only British species in the genus) could conceivably be keyed out either way at couplet 7, it has been accommodated in both halves of the key.

22(21)– Antennae with 12 flagellomeres; labrum conspicuously exposed below clypeus (Fig.55) .... **Adelognathinae** in part[15]

– Antennae with more than 16 flagellomeres; labrum inconspicuous, a short part exposed below clypeus **23**

Fig.55 Head, *Adelognathus*, labrum arrowed

23(22)– Maxillary palps elongate, extending beyond mid coxae; clypeus apically flattened (Fig.56); posterior transverse carina of the mesosternum absent; ovipositor very short, not extending beyond the tip of the metasoma; ovipositor sheaths broad, about as wide as long; tarsal claws not pectinate..... **Oxytorinae**

– Maxillary palps not or barely extending to the mid coxae; clypeus uniformly convex or elevated medially as a ridge, not apically flattened; posterior transverse carina of the mesosternum usually complete (Fig.57); female with ovipositor extending beyond the tip of the metasoma; ovipositor sheaths thinner, even on shortest ovipositor at least twice as long as wide; tarsal claws usually pectinate..... **24**

[15] *Adelognathus dorsalis* (Gravenhorst) will key out here.

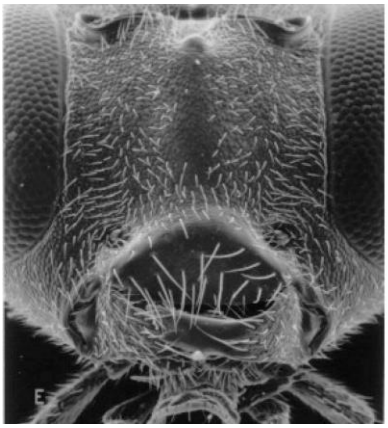


Fig.56 Clypeus and face, *Oxytorus*

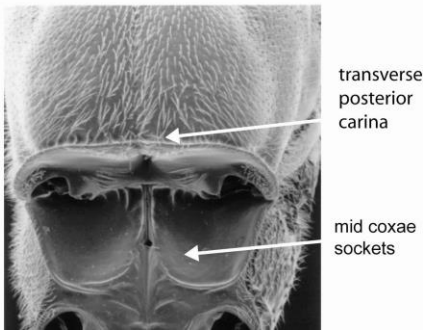


Fig.57 Mesosternum (legs removed), Campopleginae

24(23)–Clypeus transverse, 3-4x as wide as deep, with a swollen ridge across the middle (Fig.58),apical edge very thin; fore tibia with tooth on apical, outer margin ....**Ctenopelmatinae** (a few Ctenopelmatini)

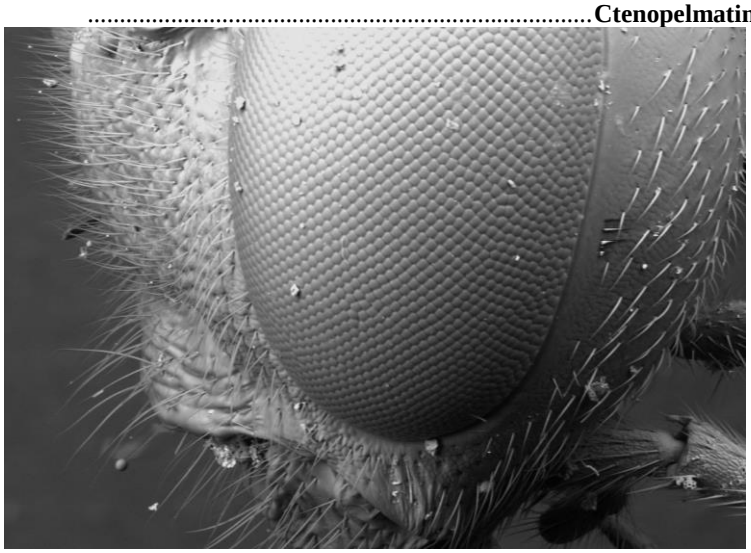


Fig.58. Face, lateral, *Xenoschesis* (Ctenopelmatinae: Ctenopelmatini)

– Clypeus not so transverse, at most about 2x as wide as deep, uniformly convex, lacking a median swelling or thin edge.....**25**

25(24)–Hind tibia with a common insertion of spurs and socket (Fig.49); tergite 2 with varied sculpture but never longitudinal striation; clypeus weakly separated from face, silvery setae conspicuous (Fig.61); fore wing pterostigma narrow (Fig.63) head usually black [one common species with yellow on the face (Fig.65), if so then check hind tibial spurs; never with hind femoral tooth] ..... **Campopleginae**

– Hind tibia with a sclerotized bridge between the spurs so that they insert into separate sockets (Fig.60); tergite 2 with longitudinal striation; clypeus separated from face, more convex in lateral view (Fig.62); fore wing pterostigma broad (Fig.64) head often with ground colour pale brown, with darker markings, or at least with conspicuous yellow marks on face (Fig.65 [one widespread species with ventral tooth on hind femur (Fig.66)] ..... **Cremastinae**

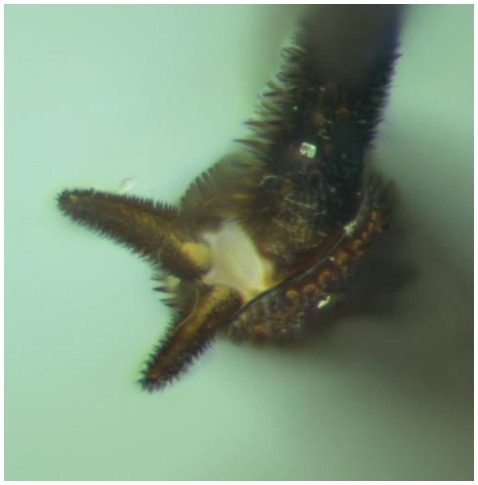


Fig.59 Hind tibia and spurs, Campopleginae

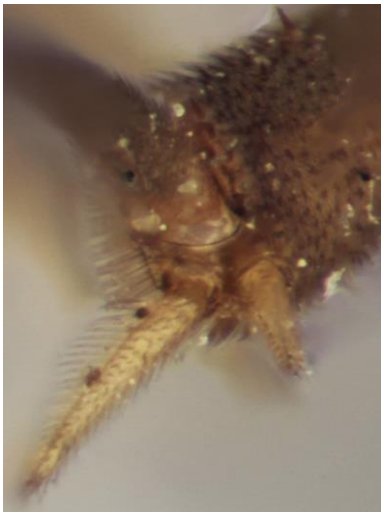


Fig.60 Hind tibia and spurs, Cremastinae

Fig.61 Head, frontal (left) and lateral (right) views, *Dusona*

Fig.62 Head, frontal (left) and lateral (right) views, *Pristomerus*

Fig.63 Fore wing pterostigma, *Dusona*

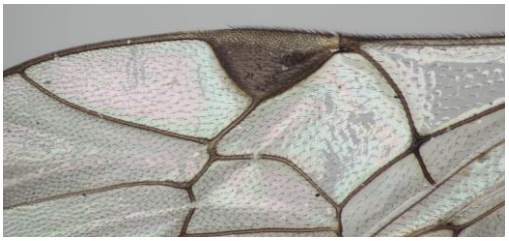


Fig.64 Fore wing pterostigma, *Pristomerus*

Fig.65 Head, frontal view, *Cremastus*

Fig.66 Hind femur, *Pristomerus*

26(21)– Malar space with suture consisting of a thinly impressed line connecting clypeus and eye; clypeus not or hardly wider than deep; mandibles thin and strongly narrowed towards the apex (cf. Fig.67); eyes sometimes strongly convergent ventrally..... a few **Orthocentrinae**[16]

[16] The genera *Gnathochorisis* and *Symplecis* will key out here.

– Malar space with no suture or a rather weakly defined band of fine sculpture, not an impressed line; clypeus wider than deep, usually markedly so; mandibles not thin or strongly narrowed apically (cf. Fig.68) but often twisted so that they may look thin in anterior view; eyes not convergent ventrally **27**

Fig.67 Face with malar suture arrowed, *Megastylus*

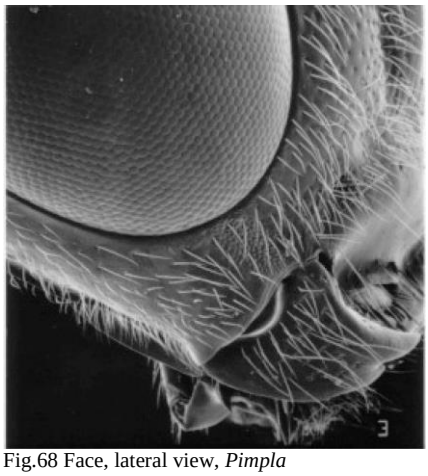


Fig.68 Face, lateral view, *Pimpla*

27(26)–Fore tibia with a weak apical, distal tooth (cf. Fig.69); clypeus wider than high and strongly convex, often with a transverse ridge; fore wing with areolet pointed anteriorly with a short to long stalk..... **Ctenopelmatinae** (a few Ctenopelmatini and Euryproctini)

– Fore tibia without a tooth apically; clypeus either flat or convex but about as wide as high, lacking a swollen ridge; fore wing with areolet quadrate or pentagonal, without an anterior stalk **28**

Fig.69 Fore tibia, tooth on outer side, Mesoleiini

28(27)–Clypeus wide and flat, truncate apically and weakly separated from the face; labrum usually exposed as a thin strip with long setae (Fig.70); tergite 2 with thyridiae and gastrocoeli often deeply impressed (Fig.72); fore wing pterostigma usually uniformly coloured, sometimes paler proximally but not sharply differentiated; mandibles usually with the lower tooth shorter than the upper and the mandible twisted; female with ovipositor sheaths stiff and straight..... ..... **Ichneumoninae** (most)

– Clypeus convex and apically rounded, separated from the face by a groove (cf. Fig.71); labrum usually concealed, lacking long setae; tergite 2 with thyridiae small and superficial; pterostigma often with a paler proximal corner (Fig.73); mandibles with the lower tooth usually the same

length as the upper tooth but sometimes a little shorter; mandible not twisted; female with ovipositor sheaths thinner and flexible..... **Cryptinae** (a few)

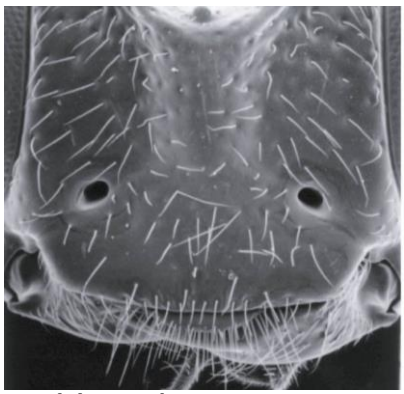


Fig.70 Face and clypeus, Ichneumoninae

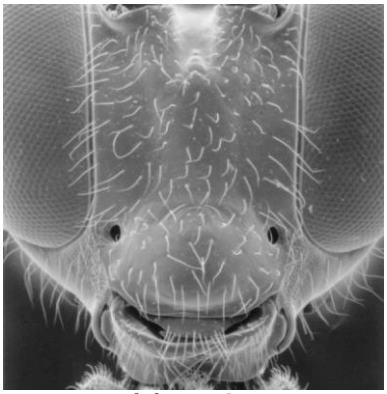


Fig.71 Face and clypeus, Cryptinae

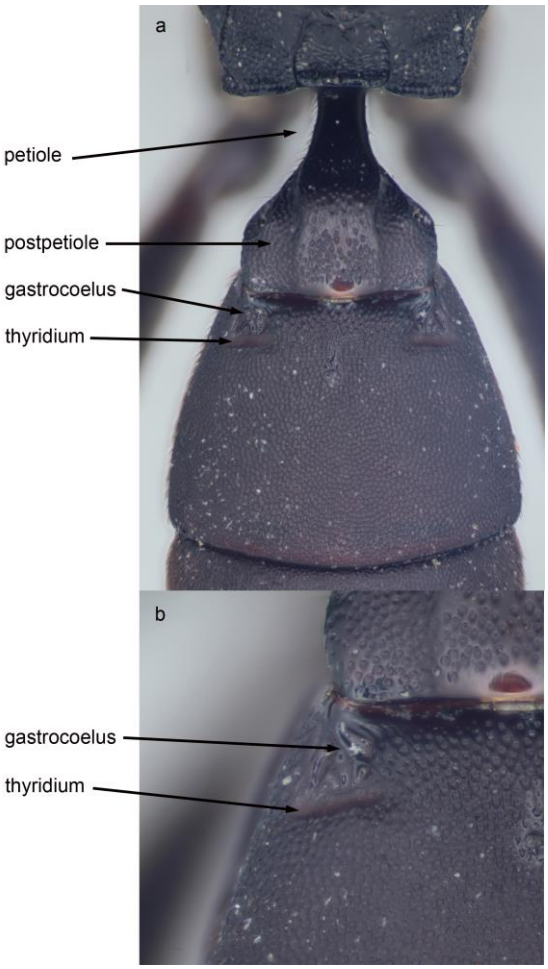


Fig.72 Tergites 1 and 2, *Virgichneumon*

Fig.73 Fore wing pterostigma, *Gelis*

29(8)–Female, **and** with egg(s) conspicuously hanging from the lower valves of the ovipositor ....**Tryphoninae** (some)

– Male, or female with no eggs hanging from the ovipositor.....**30**

30(29)– Antenna with 12 or 13 flagellomeres; labrum conspicuously exposed below the clypeus (Fig.74); fore wing vein 2*m-cu* with one bulla (Fig.75).....**Adelognathinae** (most)

– Antenna with more than 13 flagellomeres, usually with more than 16; if labrum conspicuously exposed below the clypeus then antenna with more than 16 flagellomeres; fore wing vein 2*m-cu* with one or two bullae **31**

Fig.74 Head, *Adelognathus*, labrum arrowed

Fig.75 Fore wing, *Adelognathus*

31(30)– Either hind or mid tibiae (or both) with no spur or one spur **32**

– Hind and mid tibiae each with two spurs.....**34**

32(31)–Face with carinae delimiting a shield-shaped area (Fig.76) [mid tibia with one spur, hind tibia with two].....**Metopiinae** (*Metopius*)

– Face without carinae delimiting a shield-shaped area.....**33**

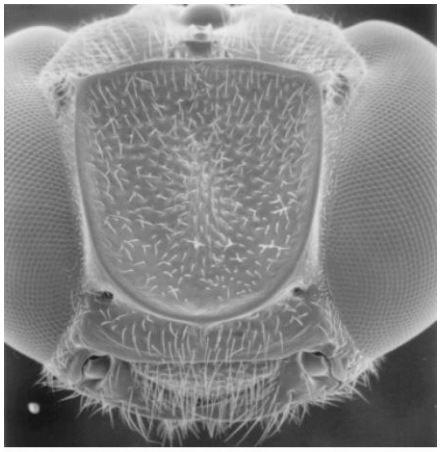


Fig.76 Face, *Metopius*

33(32)–Hind tibia lacking spurs, mid tibia with one spur; antennae not clavate, all flagellomeres longer than wide..... **Tryphoninae** (Exenterini)

– Hind tibia with one spur, mid tibia with two; antennae clavate, penultimate and several preceding flagellomeres wider than long ..... **Metopiinae** (*Periope*)

34(31)–Mesopleuron with sternaulus across at least ½ of its length (cf. Fig.77).....**35**

– Mesopleuron without a sternaulus or with a short sternaulus extending less than a third of the length of the mesopleuron **36**

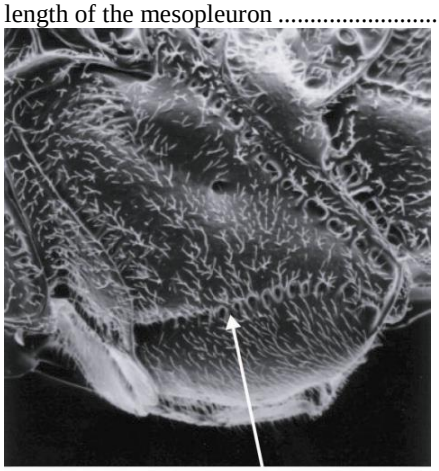


Fig.77 Mesopleuron, Cryptinae

Fig.78 First metasomal segment, Oedemopsini

35(34)–Tergite 1 with deep glymmae laterally (Fig.78); clypeus with apical row of regularly spaced setae ..... **Tryphoninae** (some Oedemopsini)

– Tergite 1 without glymmae; clypeus without apical row of regularly spaced setae..... .....a few **Cryptinae**

36(34)–Pronotum dorsally with a forwards-projecting, bilobed flange (Fig.79); male with central flagellomeres expanded, much wider than long (Fig.80); female with ovipositor tiny, vestigial, separate valves not discernible .....**Eucerotinae** (*Euceros*)[17]

– Pronotum lacking bilobed flange; antennae not medially expanded; female with ovipositor longer, always with lower and upper valves discernible **37**

[17] Confirmatory characters, in combination: fore wing vein 2*m-cu* with one bulla; clypeus barely separated from face; pronotal epomia absent; submetapleural carina of propodeum expanded into an anterior flange.

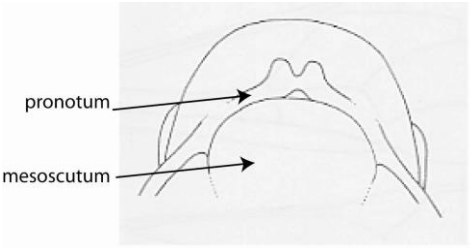


Fig.79 Pronotum, *Euceros*

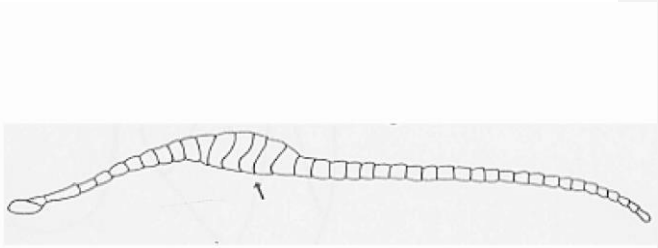


Fig.80 Antenna, *Euceros* ♂

37(36)–Fore wing with regularly rhombic (diamond-shaped), relatively large areolet (Fig.81); metasomal tergite one with deep glymmae (Fig.82) **38**

– Fore wing areolet, if present, irregularly rhombic, petiolate (stalked anteriorly), triangular or pentagonal; tergite one with or without deep glymmae **39**

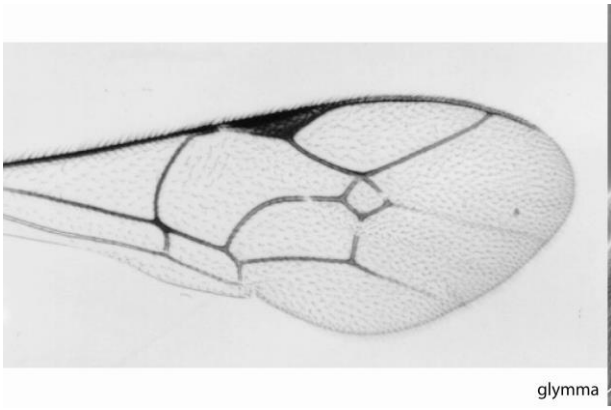


Fig.81 Fore wing, *Mesochorus*

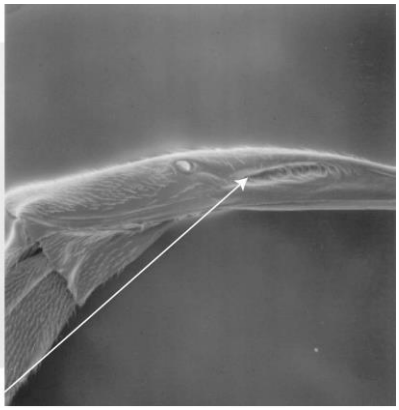


Fig.82 First metasomal segment, *Mesochorus* (anterior to the right)

38(37)–Fore tarsus with 2nd to 4th tarsomeres short, obviously foreshortened compared to 5th segment (Fig.83); malar space long, about 2x the basal width of the mandibles (Fig.84); female with ovipositor sheaths mostly concealed and male with parameres almost completely concealed ..... **Metopiinae** (*Scolomus*)[18]

– Fore tarsus with all segments longer than wide, not foreshortened compared to 5th tarsomere; malar space shorter, typically as long as the basal breadth of the mandible; female with ovipositor sheaths projecting stiffly (Fig.85); male with parameres elongate, rod-like (Fig.86) ..... most **Mesochorinae**

[18] One very rare species in Britain (*Scolomus borealis* (Townes)).

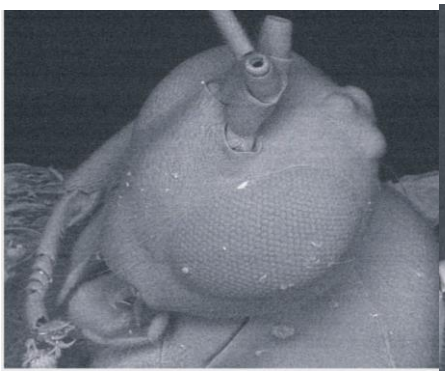


Fig.83 Fore tarsus and face, *Scolomus*

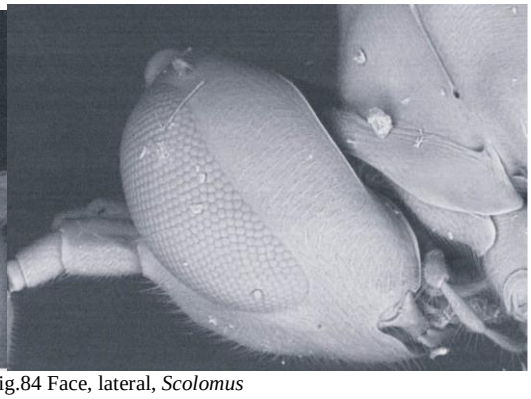


Fig.84 Face, lateral, *Scolomus*

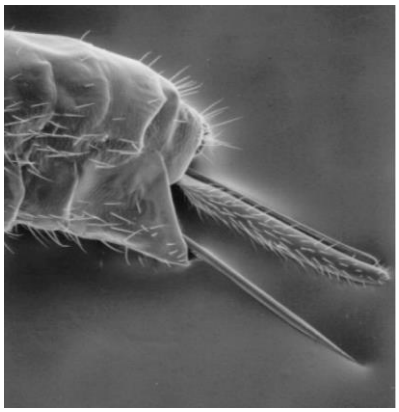


Fig.85 Ovipositor and sheaths, *Mesochorus*

Fig.86 Male parameres, *Mesochorus*

39(37)– Female with ovipositor sheaths projecting stiffly (cf. Fig.85); male with parameres elongate, rod-like (cf. Fig.86); tarsal claws pectinate; clypeus not separated from face by a groove; glymmae near the middle of the tergite; large (wing length ~16mm), pale orange-brown nocturnal species..... **Mesochorinae** (*Cidaphus*)

– Female with ovipositor sheaths not projecting or thinner, flexible-looking; male with parameres wider than long, usually concealed; tarsal claws often not pectinate; **if** large, pale orange-red nocturnal species **then** clypeus separated from face by a weak groove, glymmae basal, separated from each other only by a translucent partition, and ovipositor not projecting beyond the metasomal apex **40**

40(39)–Clypeus not separated from face, the whole surface forming a slightly convex (Fig.87) or bulging (Figs 88,89) surface..... **41**

– Clypeus separated from face by a groove or transverse impression (cf. Fig.90), the whole surface not strongly bulging..... **45**

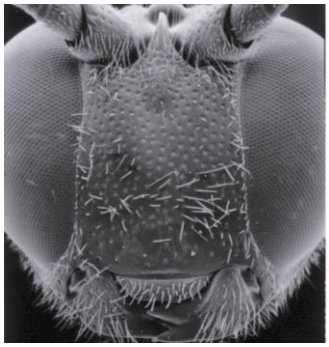


Fig.87 Face, *Colpotrochia*

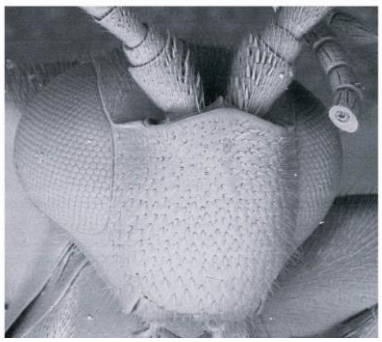


Fig.88 Face, *Stethoncus*

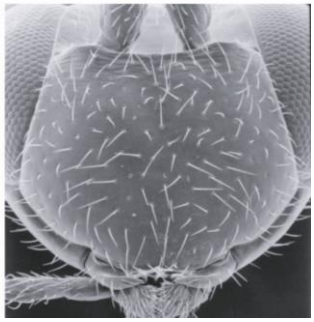


Fig.89 Face, *Orthocentrus*

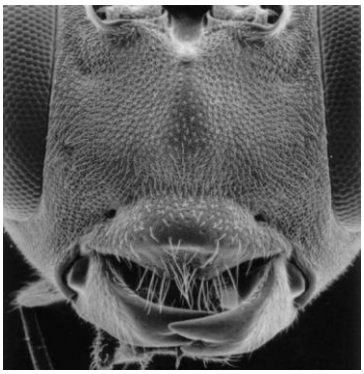


Fig.90 Face, Banchinae

41(40)–Eyes with conspicuous, long setae over entire surface; female tarsal claws with a lobe (cf. Fig.91).....**Pimplinae** (*Schizopyga*)

– Eyes bare, or with very inconspicuous setae; female tarsal claws lacking a lobe, sometimes pectinate, otherwise bare (Fig.92) **42**

Fig.91 Hind tarsal claw with lobe, Pimplinae: Ephialtini

Fig.92 Hind tarsal claw, *Megastylus*

42(41)–Fore tarsus with 2nd to 4th tarsomeres short, obviously foreshortened compared to 5th segment (cf. Fig.93), often as wide as or wider than long; fore trochantellus often not differentiated from femur; top of face almost always in the form of a triangular projection between the antennal sockets (Fig.94) or occasionally a transverse ridge (Fig.95); 1st metasomal tergite with a pair of strong median longitudinal carinae.....**Metopiinae**

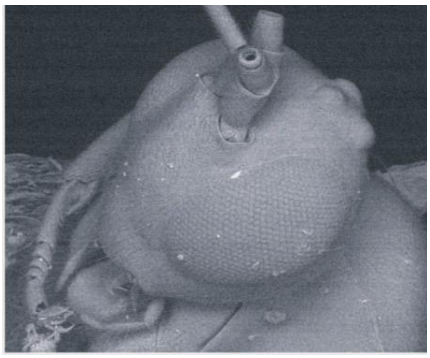


Fig.93 Fore tarsus and face, *Scolomus*

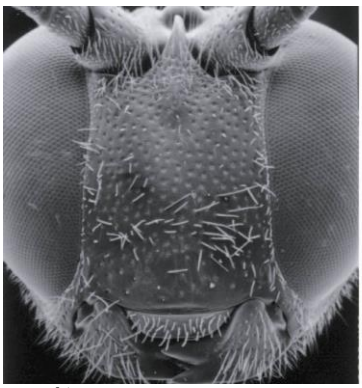


Fig.94 Face, *Colpotrochia*

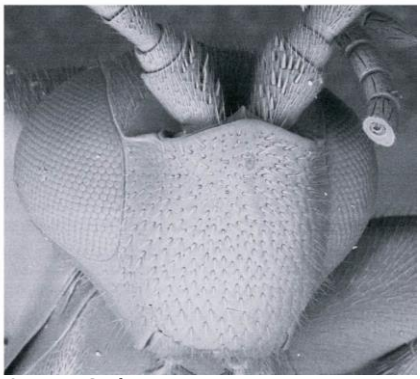


Fig.95 Face, *Stethoncus*

– Fore tarsus with all segments longer than wide, not foreshortened; fore trochantellus differentiated from femur; face with upper edge simple; 1st metasomal tergite often without a pair of strong median longitudinal carinae **43**

43(42)–Scape of antenna rather cylindrical, about 3x as long as wide (Fig.96); malar space long (space between eye and mandibles 3-4x as long as the width of the mandible base) and with a well-defined suture (Fig.98); mandibles small, thin, narrowed apically, lower tooth shorter than upper tooth; tarsal claws simple..... **Orthocentrinae** (*Orthocentrus* group)

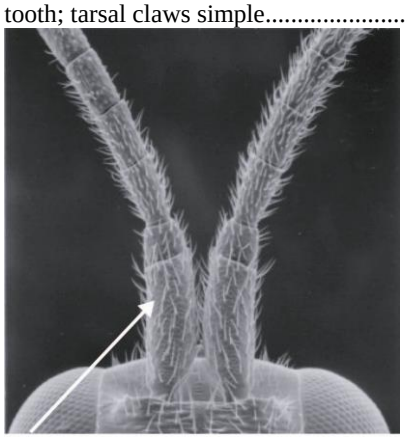


Fig.96 Scape, *Orthocentrus*

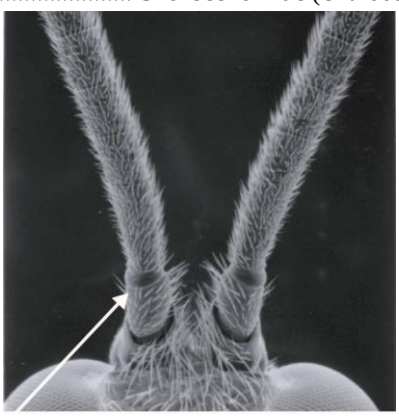


Fig.97 Scape, Metopiinae

– Scape of antenna more globose, from 1-2x as long as wide (Fig.97); malar space shorter (not more than 1.5x as long as basal breadth of mandible) and lacking a suture; mandibles robust, not strongly narrowed apically **44**

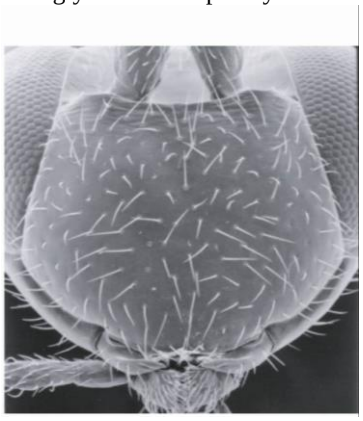


Fig.98 Face, *Orthocentrus*

44(43)– Both sexes: mesoscutum shining, unsculptured, with notauli distinct and thin (Fig.99); metasomal tergite one heavily sculptured (granulate/rugose); tarsal claws simple; female with all flagellomeres wider than long and face protruding forwards at about 50° relative to vertical axis of head (Fig.100) ..... **Cylloceriinae** (*Hyperacmus*)[19]

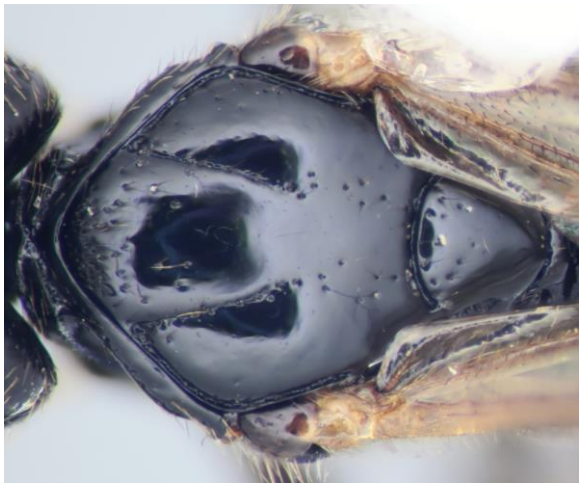


Fig.99 Mesoscutum, *Hyperacmus*

[19] One uncommon species in Britain (*Hyperacmus crassicornis* (Gravenhorst)).

Fig.100 Head, *Hyperacmus*

– Mesoscutum sculptured, notauli vague; metasomal tergite one polished or weakly sculptured; tarsal claws pectinate; both sexes with all flagellomeres longer than wide and face not at all protuberant.....**Ctenopelmatinae** (*Rhorus*)

45(40)–Metasoma with grooves delimiting a triangular or rhombic pattern on at least tergites 2-4 (Figs 101-103); submetapleural carina often expanded anteriorly into a deep lobe (Fig.103, left arrow) **46**

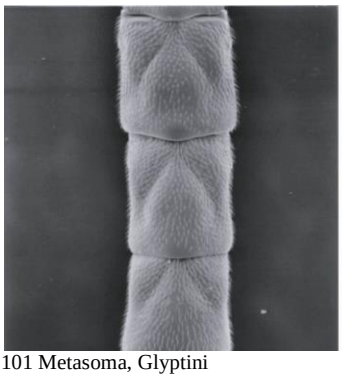


Fig.101 Metasoma, Glyptini

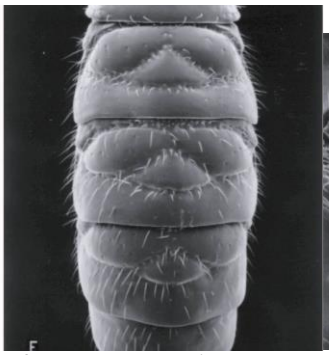


Fig.102 Metasoma, *Lycorina*

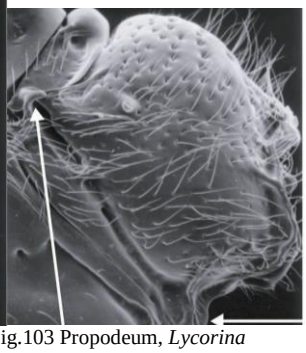


Fig.103 Propodeum, *Lycorina*

– Metasoma without grooves delimiting a triangular pattern on tergites 3-4, at most with grooves cutting off the corners of tergites 2 and 3 with a wide space between them anteriorly, and in these cases with submetapleural carina not expanded anteriorly into a deep lobe.....**48**

46(45)–Metasoma with grooves delimiting a rhombic pattern; submetapleural carina not expanded; fore tarsal claws with fifth segment broader than previous, arolium (pad) projecting beyond claws, claws with basal lobe; female ovipositor lacking obvious teeth or notch ....**Pimplinae** (*Zatypota*)

– Metasoma with grooves delimiting a triangular area (Figs 101-103); submetapleural carina expanded anteriorly into a lobe; tarsal claws with fifth segment not broadened, arolium not projecting, claws simple or pectinate, not lobed; female ovipositor with dorsal notch or ventral teeth.....**47**

47(46)–Metasoma lacking transverse grooves, triangular areas not defined posteriorly and reaching the anterior edge of the tergites (Fig.101); propodeum with or without posterior transverse carina, sometimes with area superomedia weakly demarked with carinae; metapleuron not produced

posteriorly into a ‘catch’; female ovipositor lacking obvious teeth and with a dorsal apical notch ..... **Banchinae** (Glyptini)

– Metasoma with distinct transverse grooves and triangular area near the centre of the tergite (Fig.102); propodeum with most carinae present and with the metapostnoum produced posteriorly into a ‘catch’ that overlies the anterior end of the propodeum (Fig.103, left arrow); female ovipositor with obvious teeth..... **Lycorininae** (*Lycorina*)[20]

48(46)–1st metasomal segment with sclerotized part of sternite extending to at least 0.75 length of 1st tergite, with spiracles near or a little before mid-length (Figs 104-106); tergite roughly parallel-sided, narrow, rather cylindrical **49**

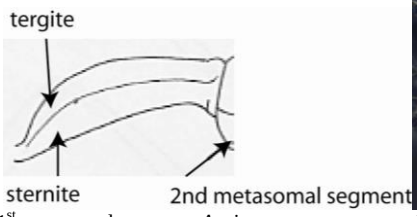


Fig.104 1st metasomal segment, *Agriotypus*


Fig.105 1st metasomal segment, *Diacritus*

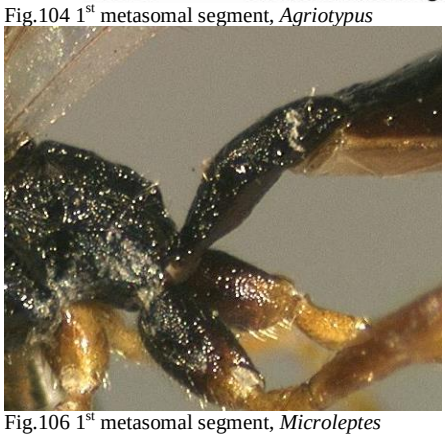


Fig.106 1st metasomal segment, *Microleptes*

– 1st metasomal segment with sclerotized part of 1st sternite usually not extending to far behind the spiracle; tergite almost always widened beyond the base, broader, not cylindrical **52**

49(48)–Metasomal sternites heavily sclerotized, metasoma rather cylindrical; scutellum with long backwards-directed spine; thorax covered in silvery hairs; metasoma all dark .... **Agriotypinae**[21]

– Metasomal sternites (except 1st) membranous and folded in under the tergites, metasoma rather flattened; scutellum lacking spine; thorax not pubescent, any hairs inconspicuous; metasoma sometimes with pale bands **50**

50(49)–Fore wing with obliquely quadrate areolet; metasomal tergites from the 2nd onwards with pale apical bands ..... **Diacritinae**[22]

– Fore wing with areolet absent; metasomal tergites uniformly coloured..... **51**

Comment [GB1]: Change if Alomya is taken out earlier.

[20] One rare species in Britain (*Lycorina triangulifera* Holmgren).
[21] One species in Britain (*Agriotypus armatus* Curtis), associated with flowing water, where the female searches for caddis pupae under water.
[22] One, widespread, species in Britain (*Diacritus aciculatus* (Vollenhoven)).

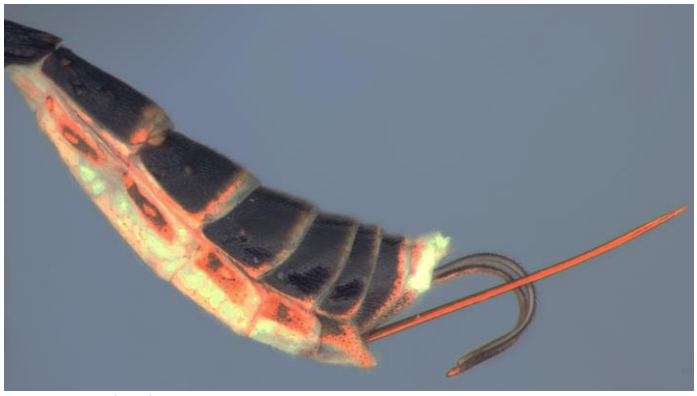


Fig.105 Metasoma, *Diacritus*

51(50)–Face, in anterior view, squared-off ventrally owing to sides of face ending ventrally in strong 'corners' at the mandible base (Fig.106); labrum not visible; antennae on a slightly to strongly projecting facial shelf; mandible weakly divided into two teeth or appearing unidentate; hind tibia with apical, slanted row of dense setae (Fig.107); 1st tergite with spiracles at mid-point; female with ovipositor very short and mostly concealed, with a large, triangular hypopygium, almost reaching to metasomal apex (Fig.108).....**Microleptinae**

– Face, in anterior view, not squared-off ventrally; labrum visible, semicircular; antennae not on a projecting facial shelf; mandible strongly divided into two teeth; hind tibia without an apical row of dense setae (cf. Fig.109); 1st tergite with spiracles in anterior third; female with ovipositor projecting beyond metasomal apex, hypopygium short .....**Orthopelmatinae**

Fig.106 Face, *Microleptes*

Fig.107 Hind tibia, *Microleptes*

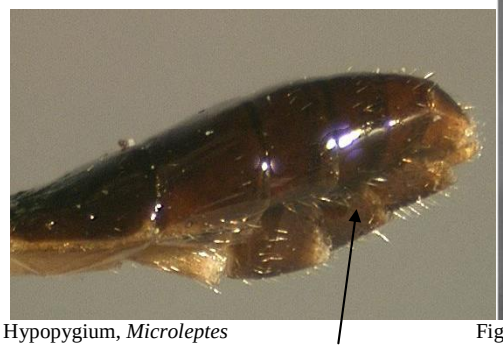


Fig.108 Hypopygium, *Microleptes*

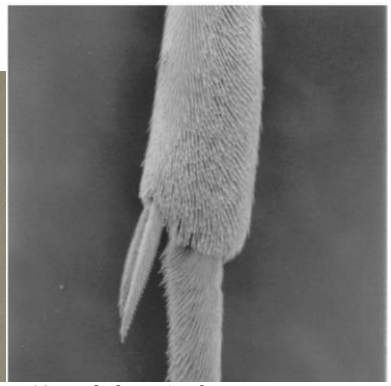


Fig.109 Hind tibia, *Pimpla*

52(48)– Female: first flagellomere of antenna very long and slender, c.7-10x as long as apically wide (Fig.110) (ovipositor long with subapical notch, sometimes very inconspicuous (Fig.111)); male: deep, semi-circular notches on sub-basal flagellomeres (Fig.112).....most **Cylloceriinae**

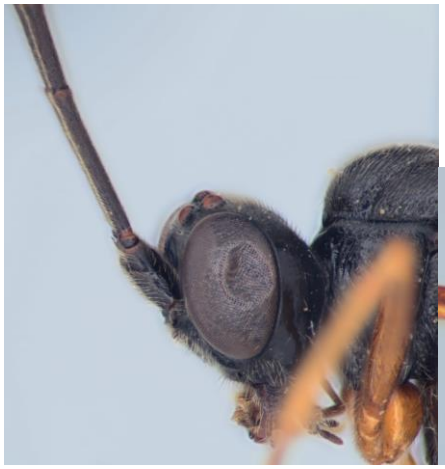


Fig.110 Antenna, *Cylloceria*

Fig.111 Ovipositor, *Cylloceria*

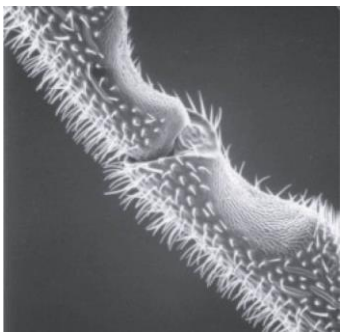


Fig.112 Male flagellum, *Cylloceria*

– First flagellomere not so elongate (ovipositor various) or, if elongate, ovipositor with apical teeth and lacking notch; male without deep, semi-circular excavations on flagellomeres **53**

53(52)– Hind wing with vein *cu-a* meeting *Cu*1 much closer to vein *M* than vein *A* (Fig.113) **54**

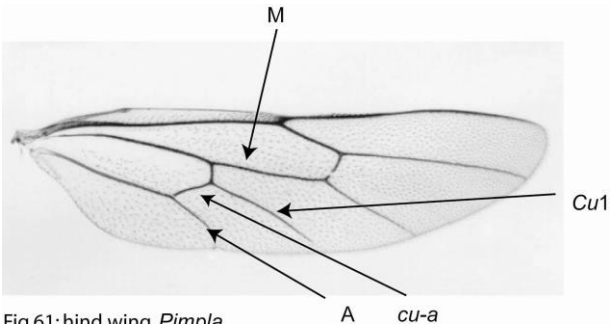


Fig.113 Hind wing, *Pimpla*

– Hind wing with vein *cu-a* meeting *Cu*1 closer to vein *A* than vein *M* (Fig.114), or only slightly closer to vein *M*, or distal abscissa of *Cu*1 absent (Fig.115) **62**

Fig.114 Hind wing, *Ichneumon*

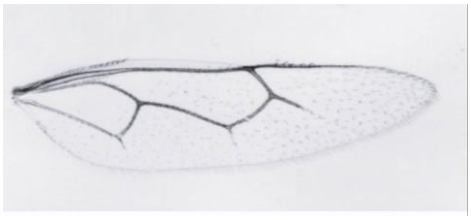


Fig.115 Hind wing, *Cu*1 absent

54(53)–Epicnemial carina absent..... **55**
– Epicnemial carina present ventrally and usually laterally (Fig. 116) **57**

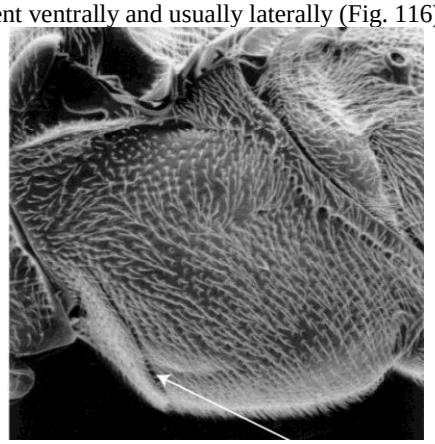


Fig.116 Mesopleuron, epicnemial carina arrowed

55(54)–Tarsal claws pectinate; mandible with upper tooth wider than lower tooth and indented so that mandible appears weakly tridentate (cf. Fig.117); fore tibia lacking spines; scutellum usually with a small, apical spine pointing backwards .. **Banchinae** (*Banchus* and *Rhynchobanchus*)
– Tarsal claws simple or with a single accessory tooth (Fig.118); mandibles unidentate or bidentate; fore tibia often with small, scattered spines, much thicker than surrounding setae; scutellum lacking spine..... **56**

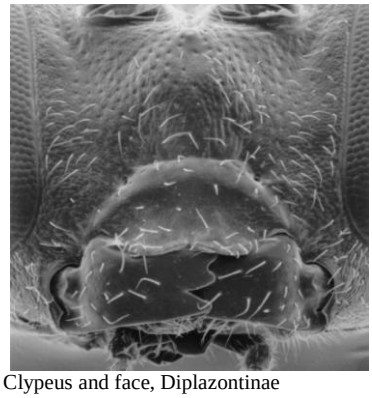


Fig.117 Clypeus and face, Diplazontinae

Fig.118 Claw with tooth, Acaenitinae

56(55)–Mandible unidentate, chisel-like, or with the lower tooth longer than upper; fore tibia with small, scattered spines; female hypopygium small, not reaching metasomal apex .... most **Poemeniinae**

– Mandible bidentate, lower tooth not longer than upper; fore tibia without spines; female hypopygium extending to or, more often, beyond (Fig.119) metasomal apex..... ..... some **Acaenitinae**

Fig.99 Hypopygium, Acaenitinae

57(54)–Propodeum with strong, straight median and lateral longitudinal carinae but no transverse carinae; clypeus with a weak median tooth; female with ovipositor down-curved and with very weak teeth along much of the ventral surface (Fig.120) .....**Collyriinae**

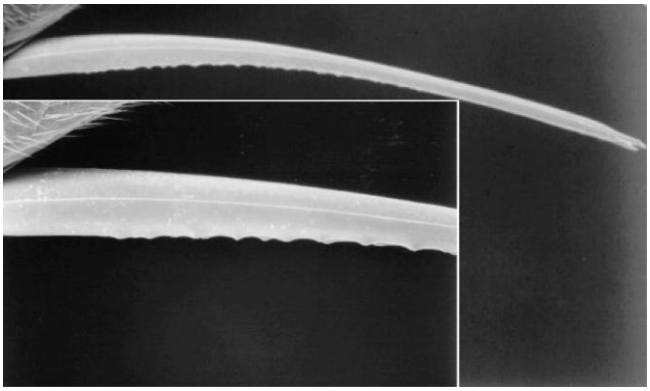


Fig.120 Ovipositor, *Collyria* (detail inset)

– Propodeum without strong, straight longitudinal carinae, with a transverse carina, traces of area superomedia, or entirely lacking carinae; clypeus lacking tooth, sometimes with median indentation; ovipositor straight or kinked downwards at the tip, with or without strong teeth apically, never with weak teeth along much of the ventral surface..... **58**

58(57)– Mandibles strongly twisted, lower tooth scarcely or not visible when looking face-on; tergite one with deep glymmae (Fig.121); female with ovipositor short (not more than half metasoma length), simple, lacking notch or teeth, rigid; male with genitalia large and extruded; predomiantly pale, orange-brown species ..... **Tryphoninae** (*Netelia*)

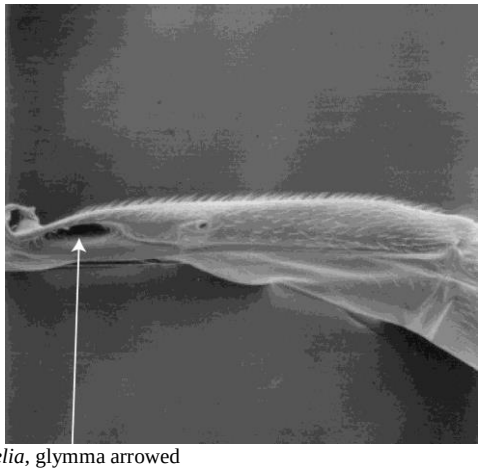


Fig.121 1st metasomal tergite, *Netelia*, glymma arrowed

– Mandibles not twisted, both teeth visible when looking face-on; tergite one often with shallow glymmae or lacking them; female with ovipositor with apical teeth ventrally or notch dorsally, or if lacking all features then long and flexible; male with genitalia inconspicuous; predominantly black species, with or without paler markings..... **59**

59(58)– Clypeus flattened (Fig.122), and sometimes notched, apically; female hypopygium short, ovipositor with ventral apical teeth (eg. Fig.124) **or** fore tibia with an apical tooth (and ovipositor with a notch); 1st metasomal tergite sometimes sharply rising medially, with dorsal carinae and heavily sculptured (Fig.123), or sometimes flattened and shining..... **60**

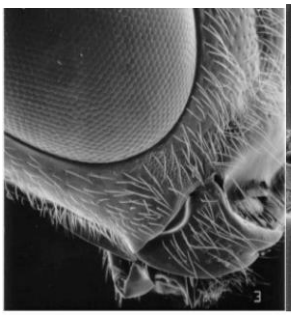


Fig.122 Head, lateral, *Pimpla*

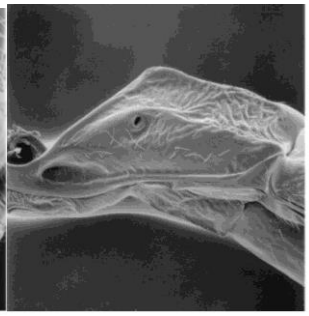


Fig.123 1st metasomal segment, *Pimpla*

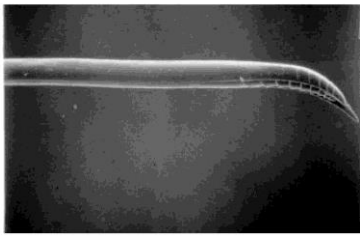


Fig.124 Ovipositor, *Apechthis*

– Clypeus convex apically, sometimes swollen sub-apically into a ridge; female ovipositor with dorsal notch (Fig.125) or plain (Fig.126), hypopygium extending to the metasomal apex or beyond; 1st metasomal tergite flat or gently curved dorsally, lacking dorsal carinae; tergite not shining, with microsculpture **61**

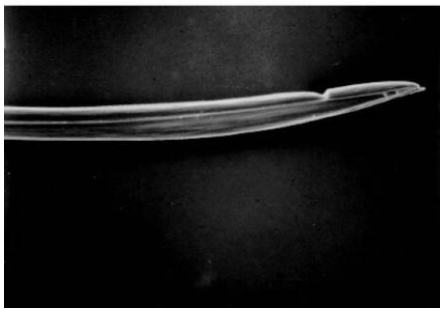


Fig.125 Notched ovipositor

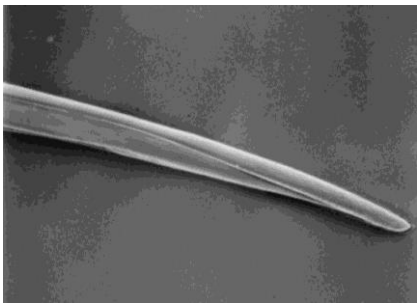


Fig.126 Plain ovipositor

60(59)–Fore tibia lacking apical tooth; fore wing vein 2*m-cu* with two bullae; female with ovipositor clearly exserted beyond the metasomal tip, with ventral, apical teeth (cf. Fig.124) .... some **Pimplinae**

– Fore tibia with a small, apical tooth on the outer margin; fore wing vein 2*m-cu* almost always with one bulla; female with ovipositor usually short, not longer than apical depth of metasoma, with dorsal notch (cf. Fig.125) ..... some **Ctenopelmatinae**

61(59)– Propodeum with only posterior transverse carina dorsally, or lacking carinae (cf. Fig.127); areolet large, roughly triangular; female with hypoygium roughly triangular in outline, not extending beyond metasomal apex; last visible tergite not noticeably longer than preceding tergite; female with ovipositor short, not extending more than 2x apical depth of metasoma, with a dorsal notch (cf. Fig.125); male claws lacking sub-apical accessory tooth, often pectinate ..... **Banchinae** (*Exetastes*)

Fig.127 Propodeum, Banchinae

– Propodeum usually with more carinae; areolet absent or small and stalked anteriorly; female with long hypopygium, usually extending beyond the metasomal apex (Fig.129), if not extending beyond apex, hypopygium narrowed apically or last visible tergite longer than preceding tergite and extended; ovipositor long, extending beyond metasoma by two thirds length of metasoma or more, without notch, sometimes with feeble teeth; male fore and mid claws often with sub-apical accessory tooth (Fig.128)..... some **Acaenitinae**

Fig.128 Claw, Acaenitinae

Fig.129 Hypopygium, Acaenitinae

62(53)–Mandible with upper tooth divided, thus appearing tridentate (Fig.130) [fore tibia without apical tooth, epomia absent]; 1st metasomal tergite often square, sometimes rectangular, straight-sided from near base to apex..... **Diplazontinae**

– Mandible with upper tooth undivided, mandible bidentate [if appearing vaguely tridentate then fore tibia with an apical tooth and epomia present (Fig.131), 1st tergite long and narrow]; 1st metasomal tergite rarely square, often widened apically..... **63**

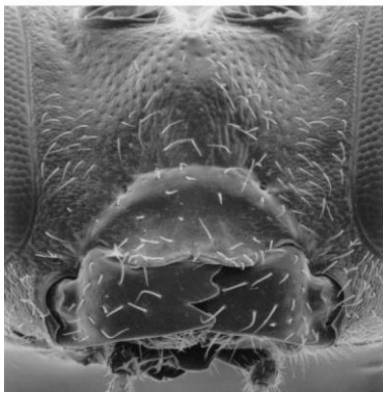


Fig.130 Clypeus and face, Diplazontinae

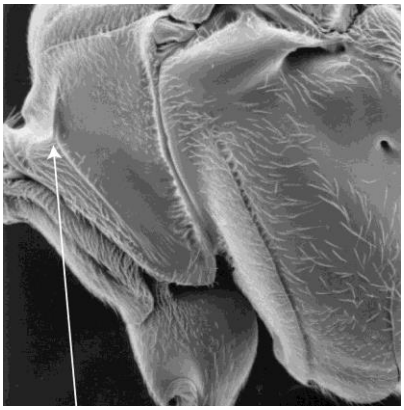


Fig.131 Pronotum with epomia (arrowed)

63(61)–Tarsal claws pectinate **64**
– Tarsal claws not pectinate (but may have basal lobes, or an apical accessory tooth) **69**

64(63)–Propodeum with submetapleural carina not expanded anteriorly into a lobe **65**
– Propodeum with submetapleural carina expanded anteriorly into a lobe (cf. Fig.132)..... **68**

Fig.132 Propodeum, *Lycorina*

65(64)–Propodeum with either the posterior transverse carina or no carinae; fore tibial spur long with comb only reaching to half the length (**either** with twisted mandibles and predominantly pale orange-brown **or** with straight mandibles, mostly black and female ovipositor with a conspicuous nodus) .....**Tryphoninae** (Phytodietini)
– Propodeum with at least traces of anterior transverse and longitudinal carinae; fore tibia usually with obvious tooth on outer, apical surface; fore tibial spur with comb reaching more than half the length **66**
66(65)–Fore wing vein 2*m-cu* with one bulla; fore tibia with apical tooth on outer edge .... some **Ctenopelmatinae**
– Fore wing vein 2*m-cu* with two bullae; fore tibia with or without apical tooth on outer edge **67**
67(66)–Clypeus with apical row of evenly spaced setae; fore tibia lacking a tooth; clypeus lacking a median notch.....**Tryphoninae** (some Tryphonini)

– Clypeus lacking apical row of evenly spaced setae; fore tibia with apical tooth on outer edge; clypeus often with a median notch ..... **Ctenopelmatinae** (very few Mesoleiini)

68(64)–Propodeum largely carinate, area superomedia present; mandibles thin, narrowed apically; clypeus about as wide as deep, apically slightly flattened and shiny; female: ovipositor with *dorsal*, apical teeth; male: face mostly yellow ..... **Stilbopinae** (*Panteles*)[23]

– Propodeum dorsally with only posterior transverse carina; mandibles broader, not narrowed apically; clypeus wider than deep, not flattened and shiny apically; female: ovipositor with dorsal notch, no teeth; male: face always black centrally, often entirely black except for red clypeus .....some **Banchinae**

69(63)–Female: hypopygium long and narrow apically (Fig.129), extending far beyond metasomal apex; male: fore and mid tarsal claws with small accessory tooth (Fig.128); both sexes: areolet absent and discosubmarginal cell extending slightly beyond vein 2*m-cu* (cf. Fig.30) ..... **Acaenitinae** (*Arotes*)[24]

– Female: hypopygium shorter, not extending beyond metasomal apex; male: fore and mid tarsal claws lacking accessory tooth, although may have a basal lobe (Fig.133); both sexes: areolet present or absent, when absent discosubmarginal cell not extending beyond vein 2*m-cu*... **70**

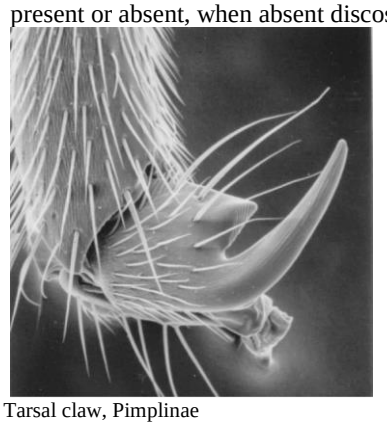


Fig.133 Tarsal claw, Pimplinae

70(69)–Propodeum lacking dorsal carinae except for strong, evenly curved posterior transverse carina; submetapleural carina strong, usually expanded as a lobe anteriorly; clypeus strongly convex sub-basally, flatter apically..... **Banchinae**

– Propodeum with different pattern of carinae; submetapleural carina not expanded anteriorly, sometimes weak; clypeus usually evenly convex, sometimes convex very basally and then flat **71**

71(70)–Fore wing vein 2*m-cu* with one bulla..... **72**

– Fore wing vein 2*m-cu* with two bullae, or bullae difficult to define as vein has zig-zag at this point..... **82**

72(71)–Female (if ovipositor not visible, hypopygium is obvious in outline and metasomal apex appears to be enclosed in sclerotized tergites and sternites)..... **73**

– Male..... **76**

73(72)–Hypopygium large, roughly triangular in outline, reaching almost to the metasomal apex (cf. Fig.134); ovipositor very short, not extending beyond the metasomal apex..... **74**

– Hypoygium small, not reaching metasomal apex, not triangular in outline; ovipositor usually extending beyond the metasomal apex..... **77**

[23] One rare species in Britain and Ireland (*Panteles schuetzeanus* (Roman)).
[24] One rare species in Britain (*Arotes albicinctus* Gravenhorst).

Fig.134 Hypopygium, *Microleptes*

74(73)–Maxillary palps elongate, extending beyond mid coxae; clypeus subtly flattened apically (Fig.135); labrum not exposed; ovipositor sheaths as wide as long.....**Oxytorinae**

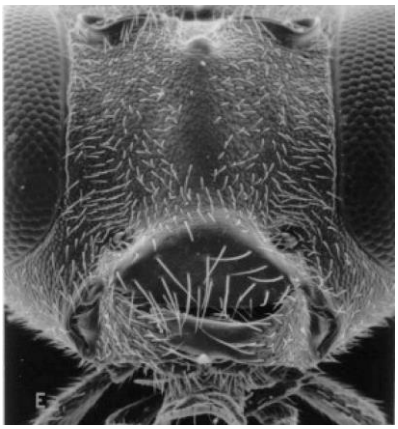


Fig.135 Clypeus and face, *Oxytorus*

– Maxillary palps not or barely extending to the mid coxae; clypeus either uniformly convex or abruptly declivous apically; labrum exposed; ovipositor sheaths thin.....**75**

75(74)–Mandibles broad and straight, not tapered apically; apical edge of clypeus concave, clypeus with abrupt declivity (Fig.136).....**Cryptinae** (*Sphecophaga*)[25]

[25] One species in Britain (*Sphecophaga vesparum* (Curtis)), a parasitoid of *Dolichovespula* pupae in their nests.

Fig.136 Clypeus and face, *Sphecophaga*

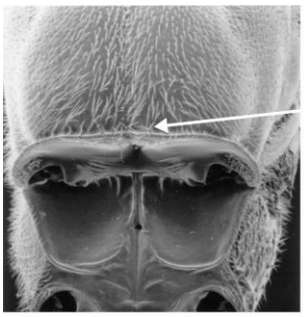
– Mandibles thin and narrowed apically; apical edge of clypeus convex, clypeus uniformly convex ..... **Orthocentrinae** (*Hemiphanes*)

Fig.137 Clypeus and face, *Hemiphanes*

76(72)– Propodeum with a single posterior or median transverse carina; fore tibia lacking a tooth; **either** fore tibia inflated and propodeal carina 'V'-shaped (*Helcostizus*) **or** mesosternum with complete posterior transverse carina and areolet 1.5x as long as broad (if not closed, 3*rs-m* indicated by bend of vein) (*Ateleute*) ..... some **Cryptinae**

– Propodeum usually with at least traces of longitudinal carinae, never one 'V'-shaped transverse carina; fore tibia with an apical tooth; fore tibia not inflated, posterior transverse carina of mesosternum absent or incomplete; areolet absent or not as wide as long **77**

77(73)–Clypeus with the apical ⅓ abruptly declivous, apex of clypeus concave and labrum revealed ..... some **Cryptinae**
– Clypeus not as above and labrum usually not revealed **78**
78(77)–Mandibles down-curved, so revealing small labrum; mandibles thin, narrowed apically, lower tooth 0.5x length of upper tooth ..... **Orthocentrinae** (*Hemiphanes*)
– Mandibles straight, labrum not revealed; mandibles stout, not narrowed, lower tooth rarely shorter than upper, sometimes longer **79**
79(78)-Mesosternum with complete posterior transverse carina (cf. Fig.138); areolet 1.5x as long as broad (if not closed, 3*rs-m* indicated by bend of vein and areolet still discernibly 1.5x as long as broad); distal abscissa of hind wing vein *A* (see Fig.139) missing..... **Cryptinae** (*Ateleute*)[26]
– Posterior transverse carina of mesosternum absent or incomplete; areolet absent or not as wide as long; distal abscissa of hind wing vein 1*A* present, at least as a stub (Fig.139) **80**



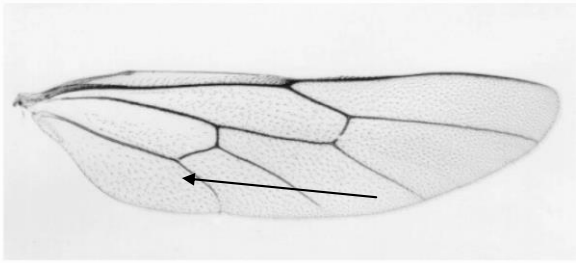


Fig.138 Mesosternum (legs removed), Campopleginae Fig.139 Hind wing, *Pimpla* vein *A* arrowed

80(79)–Fore tibia without an apical tooth; maxillary palps elongate, extending beyond mid coxae; clypeus subtly flattened apically (Fig.135)..... **Oxytorinae** (*Oxytorus*)
– Fore tibia with an apical tooth; maxillary palps short, not or barely extending to the mid coxae; clypeus either uniformly convex or raised sub-apically **81**
81(80)–Scape and pedicel of antenna same size; antenna with 14 flagellomeres; tergite 2 with laterotergite not separated by a crease ..... **Phrudinae** (*Pygmaeolus*)[27]
– Scape longer than pedicel; antenna with 16 or more flagellomeres; tergite 2 separated from laterotergite by a crease ..... most **Ctenopelmatinae**
82(71)–Female **83**
– Male **91**
83(82)–Ovipositor with dorsal notch or featureless..... **84**
– Ovipositor without a notch, with ventral teeth apically, sometimes with a nodus [if the ovipositor cannot be seen as it is small and concealed by the sheaths, go to **88**] **89**

84(83)–Ovipositor without a notch, featureless (Fig.140)..... **85**
– Ovipositor with a dorsal, sub-apical notch (Fig.141) **87**

[26] One widespread species in Britain (*Ateleute linearis* Förster).
[27] One rare species in Britain (*Pygmaeolus nitidus* (Bridgman)).

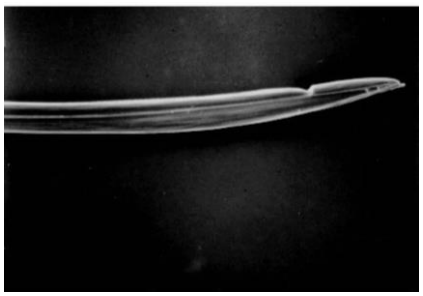


Fig.140 Notched ovipositor

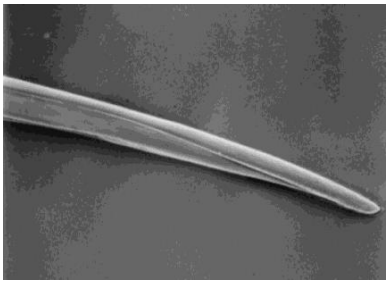


Fig.141 Plain ovipositor

85(84)–Fifth tarsal segment expanded, broader than other tarsal segments, with pulvillus projecting beyond claws **or** ovipositor slender, upcurved, projecting well beyond metasoma; claws with basal lobe (Fig.142) ..... some **Pimplinae**

– Fifth tarsal segment the same width as other segments, not widened, pulvillus not projecting; ovipositor straight or, if upcurved, stout, no longer than height of metasomal apex; claws lacking lobe, sometimes pectinate **86**

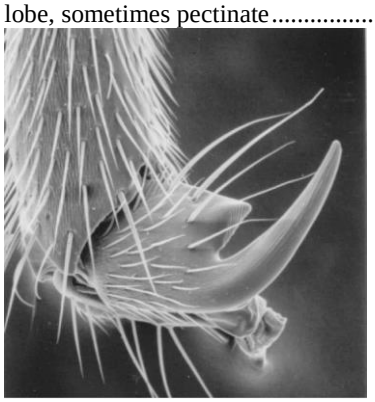


Fig.142 Tarsal claw, Pimplinae

86(85)–Clypeus small, about as wide as long, convex but apex slightly flattened and shiny; mandibles thin and apically narrowed; hypostomal and occipital carinae meet at mandibular base; body mostly punctate; face often covered in long, dense, silvery hairs ..... **Stilbopinae** (*Stilbops*)

– Clypeus usually wider than long, not apically flattened and shiny; mandibles broad, not narrowed; hypostomal and occipital carinae usually meet away from mandibular base; body not mostly punctate; face not covered in long, dense, silvery hairs ..... some **Tryphoninae**

87(84)–Ovipositor at least half the length of the metasoma ..... some **Orthocentrinae**

– Ovipositor much less than half the length of the metasoma **88**

88(87)–Mandibles thin and apically narrowed (Fig.143), often with lower tooth much shorter than upper; fore tibia without an apical, distal tooth; hind tibia with apical, inner fringe of closely spaced setae (Fig.144); small, fragile species..... some **Orthocentrinae**

Fig.143 Head, *Megastylus*

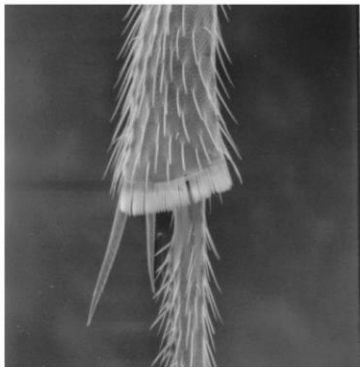


Fig. 144 Hind tibia, *Megastylus*

– Mandibles broad, not narrowed, lower tooth not much shorter than upper tooth; with an apical, distal tooth; fore tibia usually without apical, inner fringe of closely spaced setae; medium-sized, robust species..... **Ctenopelmatinae** (a few Mesoleiini)

89(82)–Areolet present and pentagonal; fore trochantellus not differentiated from femur (only trochanter present between femur and coxa (Fig.145); clypeus covered in stiff hairs (Fig.146; mandible widened in apical half, lower tooth larger than upper (Fig.147) .....**Alomyinae**

Fig.145 Fore femur, trochanter, *Alomya*

Fig.146 Face, lateral, *Alomya*

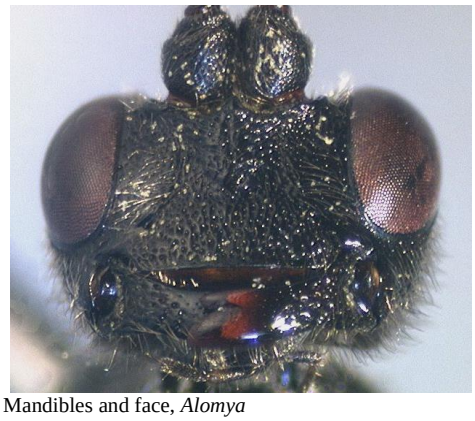


Fig.147 Mandibles and face, *Alomya*

– Areolet absent or present and obliquely quadrate; fore trochantellus present; clypeus without stiff hairs; mandible otherwise.....**90**

90(89)–First tergite and sternite fused, glymmae absent (Fig.148); with one of the following characters: hind femur with a large ventral tooth (Fig.149); **or** mandible with a single tooth (Fig.150); **or** frons with a median horn (Fig.151) .....**Xoridinae**

Fig.148 First metasomal segment, *Ischnoceros*

Fig.149 Hind femur, *Odontocolon*

Fig.150 Face, *Xorides*

Fig.151 Head, *Ischnoceros*

– First tergite and sternite separate, shallow glymmae present; with none of the above characters; often with basal lobes on tarsal claws (Fig.152)..... some **Pimplinae**

Fig.152 Tarsal claw, Pimplinae

91(82)–Areolet present and pentagonal; fore trochantellus not differentiated from femur; clypeus covered in stiff hairs; mandible widened in apical half, lower tooth larger than upper (Figs 145-147) ..... **Alomyinae**

– Areolet absent or present and obliquely quadrate; fore trochantellus present; clypeus not covered in stiff hairs; mandible not widened in apical half **92**

92(91)–Mandibles thin and narrowed apically; clypeus about as wide as high **93**

– Mandibles broad, not narrowed apically; clypeus wider than deep, sometimes with a median notch **95**

93(92)–Clypeus slightly flattened apically and shiny; body predominantly punctate; face often covered in dense, silvery setae ..... **Stilbopinae** (*Stilbops*)

– Clypeus not flattened apically; body not punctate; facial setae sparse, not unusually dense... ..... **94**

94(93)–Face yellow, rest of body black or dark brown ..... **Cylloceriinae** (*Allomacrus*)[28]

– Face not yellow (usually brown) **or**, if yellow, mandible twisted and lower tooth minute or missing; rest of body not black (usually mid-brown) ..... some **Orthocentrinae**

95(92)–First tergite and sternite fused, glymmae absent; with one of the following characters: hind femur with a large ventral tooth; **or** mandible with a single tooth; **or** frons (above antennal sockets) with a median horn/projection (Figs 148-151) ..... **Xoridinae**

– First tergite and sternite separate, glymmae present (Fig.153); with none of the above characters; sometimes with basal lobes on tarsal claws..... **96**

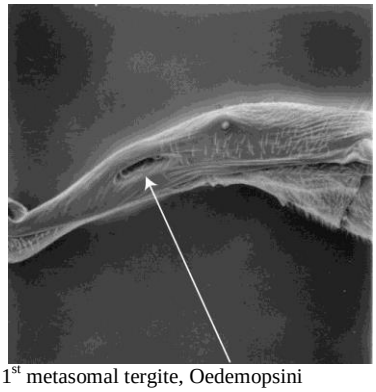


Fig.153 1st metasomal tergite, Oedemopsini

96(95)–First tergite narrow basally, widened apically; notauli strong, extending to middle of mesoscutum ..... **Tryphoninae** (Oedemopsini)

[28] One, fairly widespread, species in Britain (*Allomacrus arcticus* (Holmgren)).

– First tergite not markedly narrow basally when compared to rest of tergite; notauli weak or absent **97**

97(96)–Clypeus with an apical row of closely spaced setae; fore tibia without an apical, distal tooth; 5th tarsomere not almost as broad as long; no lobes on tarsal claws; fore wing sometimes with a zig-zag bulla in the half of 2*m-cu* directly below areolet ..... some **Tryphoninae**

– Clypeus without an apical row of closely spaced setae; fore tibia sometimes with an apical, distal tooth; 5th tarsomere sometimes almost as broad as long; sometimes with lobes on tarsal claws; fore wing without a zig-zag bulla in half of 2*m-cu* below areolet..... **98**

98(97)–Fore tibia with apical, distal tooth; 5th tarsomere not broadened, arolium not projecting; no lobes on tarsal claws..... **Ctenopelmatinae** (a few Mesoleiini)

– Fore tibia without apical, distal tooth; 5th tarsomere sometimes broader than others, arolium projecting beyond claws; sometimes with basal lobes on tarsal claws ..... some **Pimplinae**

99(1)– Clypeus not separated from the face, whole surface strongly convex (Fig.154) and with groove-like malar furrow (arrowed); spiracle of 1st metasomal tergite at about mid-length ..... **Orthocentrinae** (*Stenomacrus*)

– Clypeus separated from face by a suture, face in profile flat / slightly convex with broader or non-existent malar furrow; spiracle of 1st metasomal tergite usually in posterior third (Fig.155) **100**

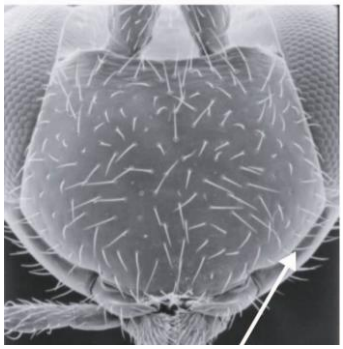


Fig.154 Face, *Orthocentrus*

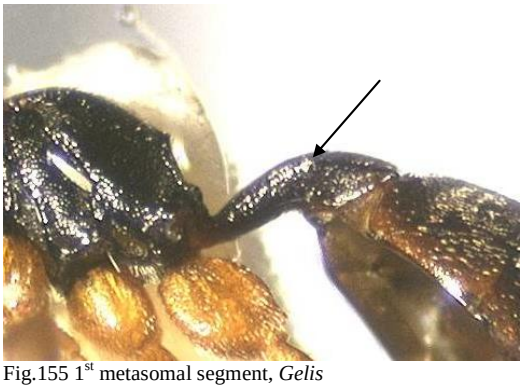


Fig.155 1st metasomal segment, *Gelis*

100(99)–Clypeus wide and flat, apical edge flat; thyridiae of second metasomal tergite deeply impressed at anterior edge (Fig.156 arrowed); posterior transverse carina of mesosternum present laterally and medially; brachypterous females ..... **Ichneumoninae**[29]

– Clypeus not more than 1.5x as wide as deep, convex; thyridiae of second metasomal tergite small, not deeply impressed; brachypterous or apterous, male or female..... **Cryptinae**[30]

[29] Only some ♀♀s of *Ichneumon oblongus* Schrank should key out here.

[30] All three cryptine tribes have brachypterous representatives. Horstmann (1993) provides keys to the genera and species with brachypterous females, Schwarz (1994) provides an updated key to brachypterous females of *Gelis*. Apterous individuals will always belong to *Gelis*, *Thaumatogelis* or *Polyaulon*, most specimens will be found to be *Gelis* species. Schwarz (2001, 2002) keys out females of *Thaumatogelis* and *Gelis*, respectively. Schwarz (1995) keys out the genera with apterous females.

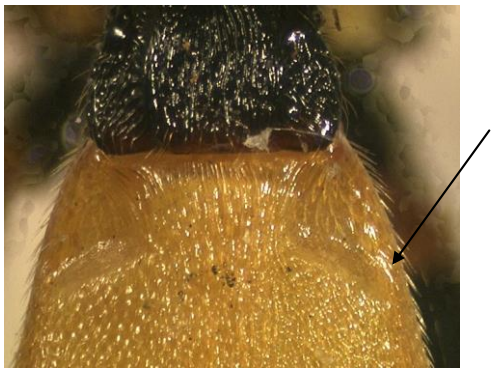


Fig.130 2nd metasomal tergite, *Ichneumon*

Notes on subfamily group names:

As well as a trend towards an increasing number of better defined subfamilies, various subfamilies have been given different names by different authors. The following table lists the names that will be found most frequently in the literature.

Current valid name	Perkins (1959)	Townes (1969-1971)	Wahl (1993)	Others
ACAENITINAE	Part of PIMPLINAE			
ADELOGNATHINAE				
AGRIOTYPINAE				AGRIOTYPIDAE
ALOMYINAE		Part of ICHNEUMONINAE	Part of ICHNEUMONINAE	
ANOMALONINAE	Part of OPHIONINAE	ANOMALINAE		
BANCHINAE	LISSONOTINAE			
CAMPOPLEGINAE	Part of OPHIONINAE	PORIZONTINAE		
COLLYRIINAE				
CREMASTINAE	Part of OPHIONINAE			
CRYPTINAE		GELINAE	PHYGADEUONTINAE	HEMITELINAE
CTENOPELMATINAE		SCOLOBATINAE		
CYLLOCERIINAE	Part of PLECTISCINAE	Part of MICROLEPTINAE		
DIACRITINAE	Part of PIMPLINAE	Part of EPHIALTINAE		
DIPLAZONTINAE				
EUCEROTINAE	EUCERATINAE	Part of TRYPHONINAE		
HYBRIZONINAE		Non-ICHNEUMONIDAE	PAXYLOMMATINAE	PAXYLOMMATIDAE
ICHNEUMONINAE				
LYCORININAE				
MESOCHORINAE				
METOPIINAE				
MICROLEPTINAE	Part of PLECTISCINAE	Part of MICROLEPTINAE		
***Neorhacodes* group (TERSILOCHINAE)**	Part of LISSONOTINAE	Part of BANCHINAE	NEORHACODINAE	
OPHIONINAE				
ORTHOCENTRINAE	Part of PLECTISCINAE and part of MICROLEPTINAE	ORTHOCENTRINAE		HELICTINAE (in part)
ORTHOPELMATINAE				
OXYTORINAE	Part of PLECTISCINAE	Part of MICROLEPTINAE		
***Phrudus* group (TERSILOCHINAE)**	PHRUDINAE	PHRUDINAE	PHRUDINAE	
PIMPLINAE	Part of PIMPLINAE	Part of EPHIALTINAE		
POEMENIINAE	Part of PIMPLINAE	Part of EPHIALTINAE		
RHYSSINAE	Part of PIMPLINAE	Part of EPHIALTINAE		
STILBOPINAE		Part of BANCHINAE		
TERSILOCHINAE	Part of OPHIONINAE			
TRYPHONINAE				
XORIDINAE				

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