Key to the Families of Northern European Spiders

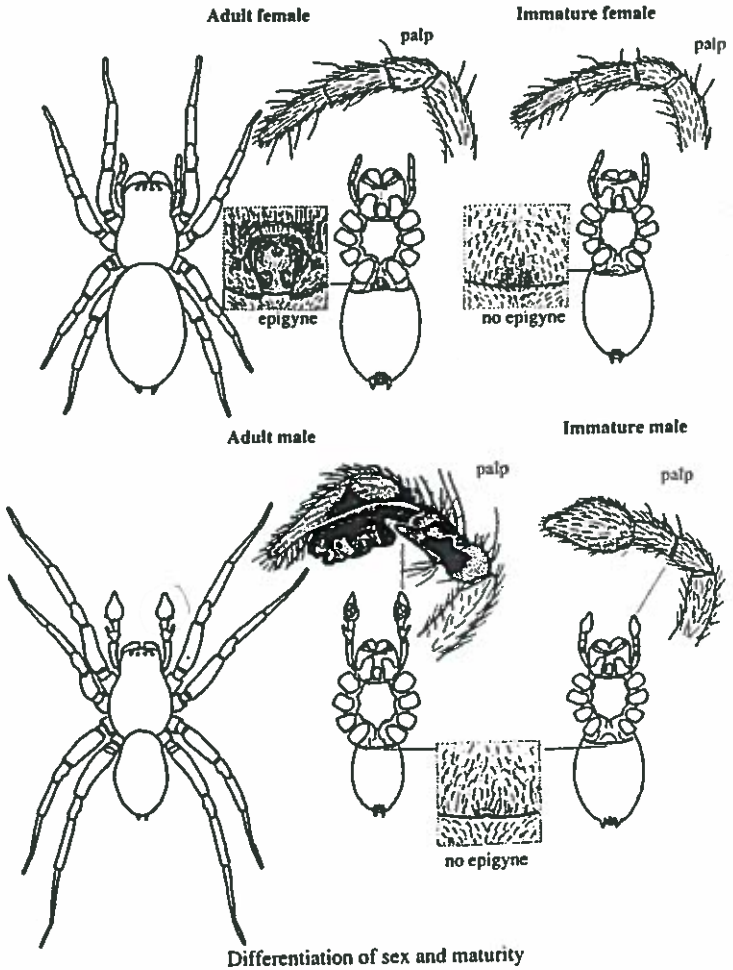
The complete newcomer to spiders may initially just compare the specimen with the colour plates and sometimes come up with the correct identification; the experienced arachnologist will seldom use the keys at all. Between these two extremes, the key should enable a specimen to be tracked down to the correct family in an ordered sequence. There is nothing particularly clever or 'scientific' in slavishly using a key and if you can find a quicker, alternative route to the family, genus, genitalia and final identification, then use it! However, in addition to being an aid to identification, the key presents concise details of the characters of each family and it can be a useful exercise to work through it, even though the specimen has been identified by general appearance alone. As far as possible, the key utilises easily visible structures, and is designed to work whether using a stereomicroscope on preserved specimens indoors, or a field microscope/lens in the field (see p. 32). Where characters are not fairly easily seen with the lens in the field, the symbol ♣ is followed by alternative guidelines, including any web structure. The latter is dealt with in more detail under Webs (p. 61) and reference to this will in any case be of use in the field. Some spiders are identifiable to species level using the naked eye or a hand lens. Others will require the use of a low-power field microscope or higher-power stereomicroscope for full identification, although it will still be possible to place them in the correct family or genus. When using the key, it is important to start at the beginning and work through systematically. The key is partly dichotomous, but sometimes several alternatives are given, one after the other, partly to avoid confusion and partly to avoid undue repetition of 'spider not like this'. Any terms used which you do not understand will be found in The Structure of Spiders (p. 12) or in the Glossary (p. 371), but the accompanying illustrations should largely avoid any confusion. The size of a spider is measured from the front of the carapace to the hind tip of the abdomen and the ranges given relate to adults only. Identification to species level usually requires examination of the secondary sexual organs, which are visible externally. The female epigyne is on the underside of the abdomen; the *left* male palp is illustrated for each species – usually from the outside, sometimes from below. Before starting the key proper, it is necessary to determine the sex and maturity of the specimen, since problems may arise with immatures. Remember, some large specimens may be immatures of large species; some tiny specimens may be adult.

Preliminary Examination – Sex and Maturity

1. Tarsus of palp not swollen or modified in any way — 2
   Tarsus of palp swollen or modified into complex structures — 3

2. Underside of abdomen with epigyne (a sclerotized structure or projecting tongue) in the midline, just in front of epigastric fold. — ADULT FEMALE
   No such epigyne structure visible — 4

3. Swollen tarsus of palp smooth, with no projections — IMMATURE MALE
   Tarsus with various projecting structures — ADULT MALE



Differentiation of sex and maturity

4a. Spider with only six eyes, grouped closely — FOLLOW MAIN KEY FROM 7

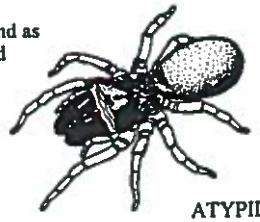
4b. Spider with chelicerae as long as carapace — FOLLOW MAIN KEY FROM 1

4c. Spider not like this and not like the colour illustrations of *Pachygnatha* and *Tetragnatha* (Plate 26) — IMMATURE FEMALE

If your specimen is immature, it may still be possible to identify it to family or genus level, but any measurements given in the key will not apply. A small Δ in the key

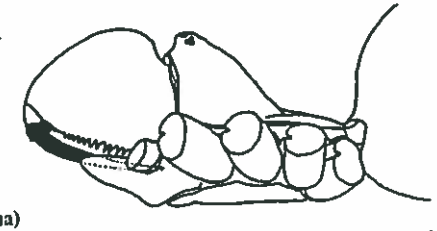
The Family Key

1. Chelicerae massive, projecting forwards and as long as carapace; articulated for upward and downward (pick-axe) movement. Posterior spinners with three segments
Suborder ORTHOGNATHA (Mygalomorphae) Only two species in region; appearance unmistakable

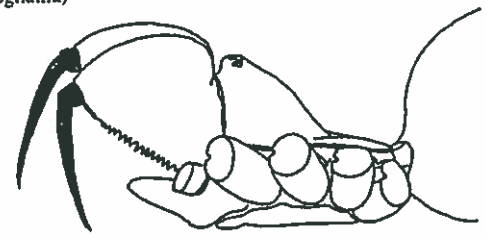


ATYPIDAE p. 76

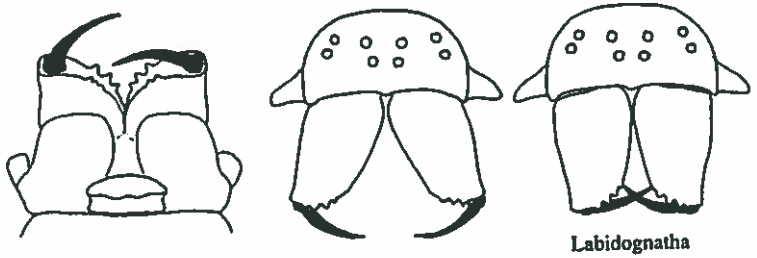
eyes



Atypidae
(Orthognatha)



Chelicerae large, small or projecting, but articulated for inward and outward (pincer) movement. Posterior spinners never with more than two segments
Suborder LABIDOGNATHA (Araneomorphae) 2

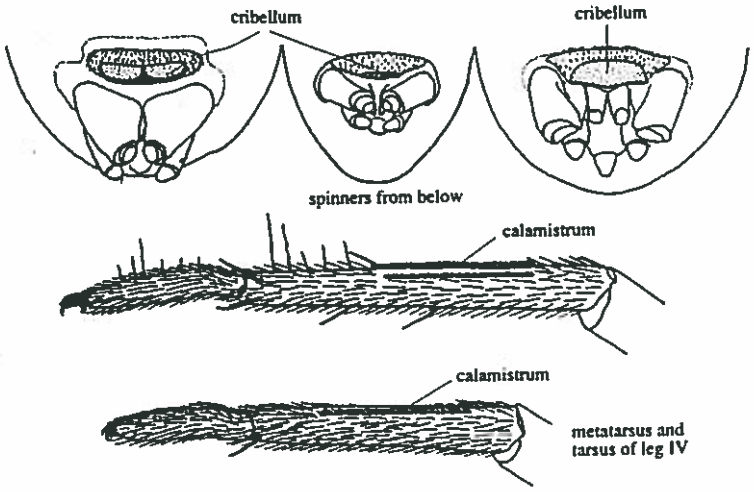


Labidognatha

2. Cribellum present anterior to spinners (reduced in male). Female with calamistrum on metatarsus IV

Cribellate spiders 3

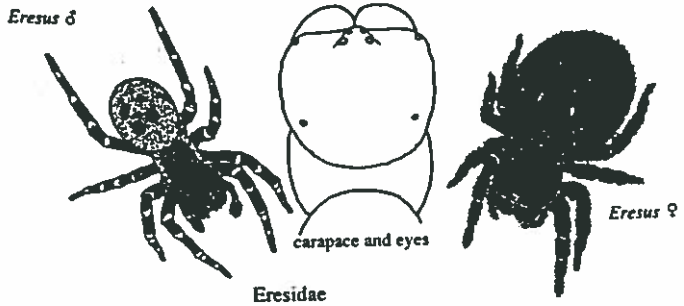
8 These structures visible only in larger species; all cribellate species appear on Plates 1 and 2; webs of commonest species composed of woolly cribellate silk which appears bluish when fresh (Webs, p. 62–4).



Cribellum and calamistrum absent 7

3. Head region large, bulbous: characteristic eye arrangement. Female velvety black; male abdomen scarlet with black spots

ERESIDAE p. 78

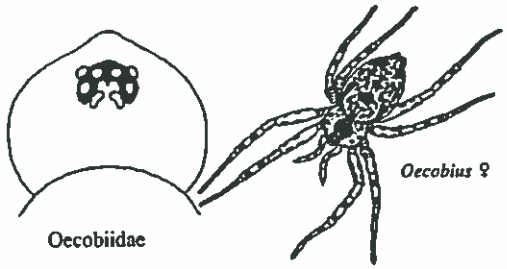


Eresidae

Not as above 4

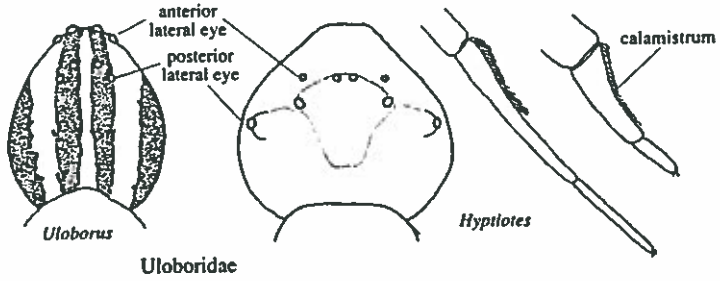
4. Eyes grouped closely together; posterior medians irregular in shape. Anal tubercle with fringe of long curved hairs. Pale yellowish spider with black markings. Adults 2–2.5mm in length (illustration next page)

OECOBIIDAE p. 89

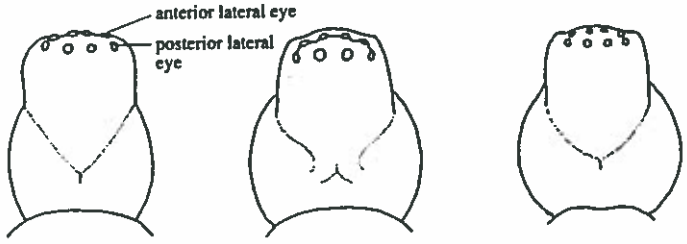


Not as above 5

5. Anterior and posterior lateral eyes widely separated; metatarsus IV and calamistrum curved when viewed from side
ULOBORIDAE p. 90

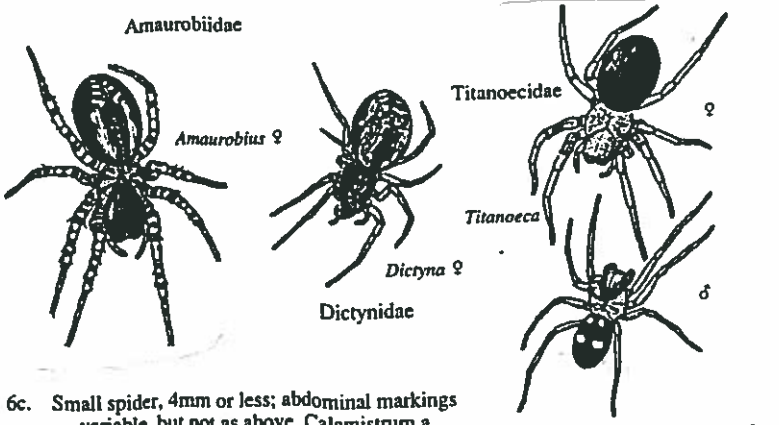


Anterior and posterior lateral eyes close together 6



6a. Fairly large spider, 5–15mm. Abdominal pattern broadly similar in all species. Calamistrum with double row of bristles (illustration next page)
AMAUROBIIDAE p. 78

6b. Abdomen either unicolorous brown-grey with no markings whatsoever, or clearly marked with two pairs of light blotches
△ TITANOECIDAE p. 81

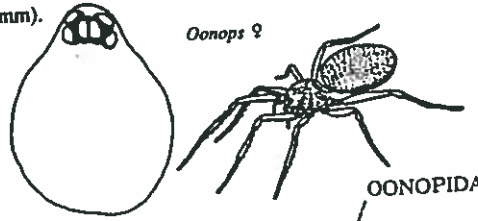


6c. Small spider, 4mm or less; abdominal markings variable, but not as above. Calamistrum a single row of bristles
DICTYNIDAE p. 82

7. Spider with only six eyes, easily seen from above, in a fairly compact group. Male palpal organs relatively simple; no epigyne in adult female.
Haplogyne spiders 8

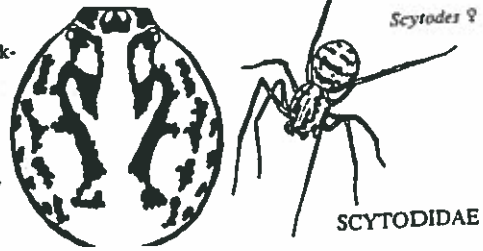
Spider with eight eyes, sometimes in rows together (laterals may be touching), sometimes widely separated (with some not easily seen at first). Male palpal organs relatively more complex; adult female with epigyne
Entelegyne spiders 9

8a. Small spider (1.5–2mm). Uniformly pale yellow or pinkish red. Eyes in compact group which is almost as wide as head



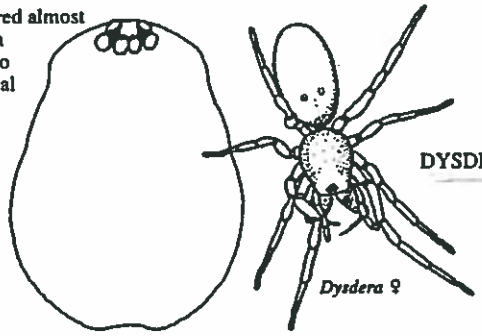
OONOPIDAE p. 91

8b. Whole spider marked clearly with black on pale yellow background. Carapace appears almost circular from above and humped up from side and is roughly the same size as abdomen



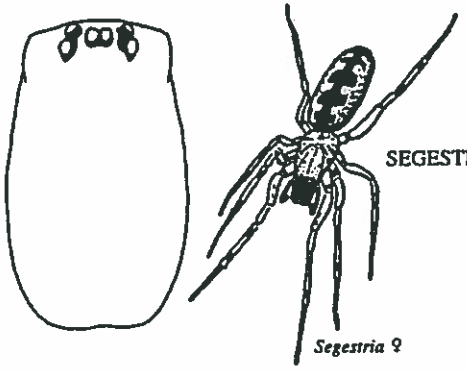
SCYTODIDAE p. 92

8c. Eyes clustered almost to form a circle. No abdominal pattern



DYSDERIDAE p. 93

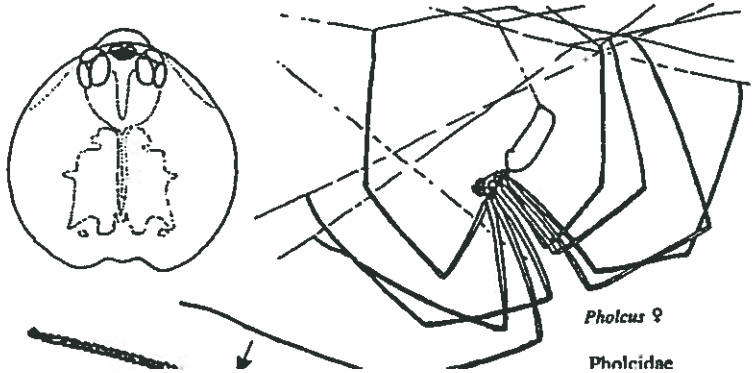
8d. Eyes in three groups of two. Abdomen usually with clear pattern



SEGESTRIIDAE p. 96

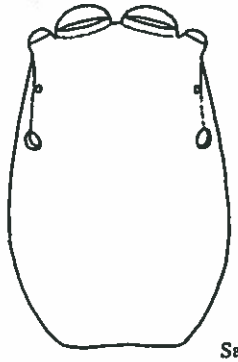
9a. Carapace almost circular; as wide as long. Anterior median eyes much smaller than the rest, which are arranged closely in two groups of three. Legs extremely long; tarsi with flexible false segments

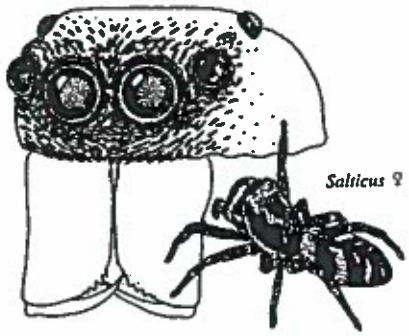
PHOLCIDAE p. 98



9b. Carapace square-fronted; four large eyes on the front, a smaller pair one each side further back, and a scarcely visible pair one each side between front and rear eyes

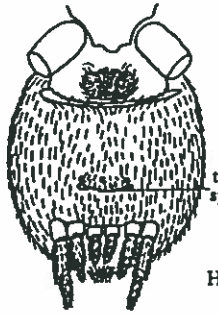
SALTICIDAE p. 179


Salticidae

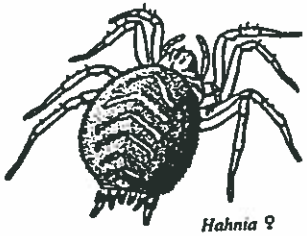


9c. Spinners arranged in a transverse row. Tracheal spiracles one-third to half-way from spinners to epigastric fold. Small spider

HAHNIIDAE p. 253

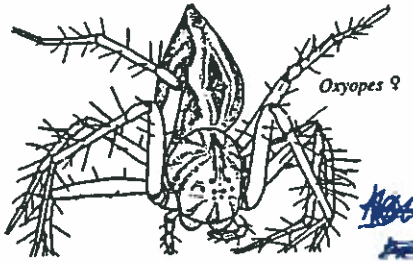


Hahniidae



9d. Eyes arranged in hexagonal pattern; small anterior medians may not be visible from directly above. Very long leg spines

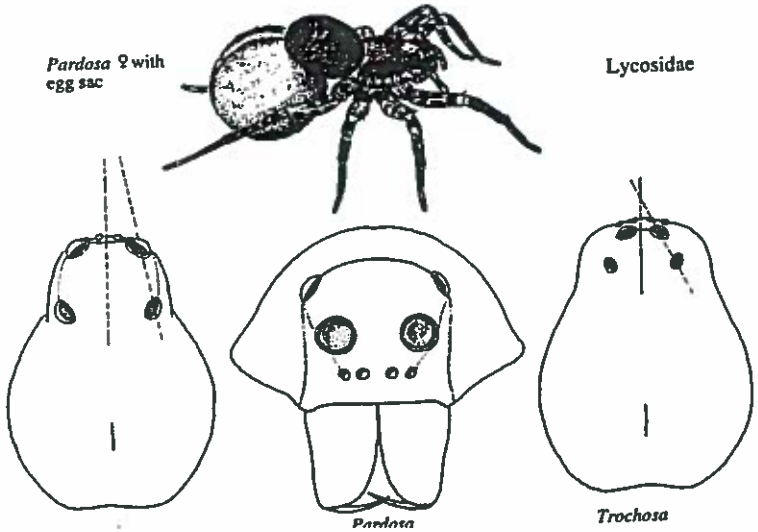
OXYOPIDAE p. 206



9e. Anterior spinners much larger than the rest and arising from a large, pale, cylindrical projection. Anterior median eyes larger than the rest; posterior medians small and irregular. Upper surface of abdomen dark; under surface pale ZODARIIDAE p. 100

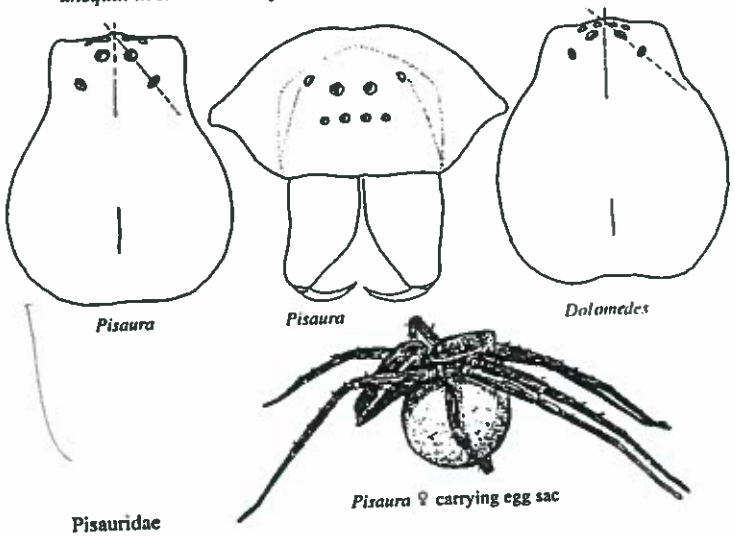
Zodariidae

9f. Front face of carapace with a row of four small, equal-sized anterior eyes, not easily seen from above; above and behind these a larger pair of posterior median eyes and further back a pair of posterior lateral eyes of the same size. From in front, they sometimes appear as three separate rows. From above, a line through the median and lateral eyes of the posterior row crosses the midline ahead of the carapace LYCOSIDAE p. 209



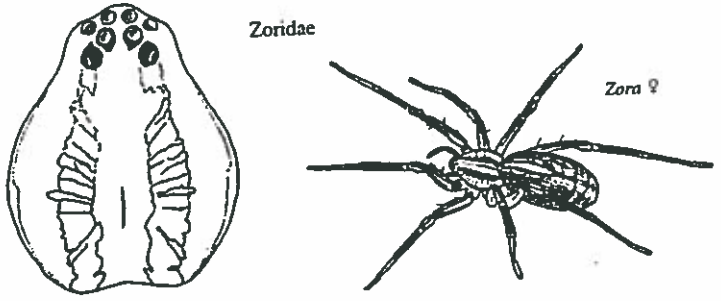
Lycosidae

9g. Front face of carapace with a row of four small, equal-sized anterior eyes, easily seen from above; above and behind these a slightly larger pair of posterior median eyes, and further back a pair of posterior lateral eyes of the same size. From in front they appear as two rows. From above, a line through the median and lateral eyes of the posterior row crosses the midline on or behind the front of the carapace PISAURIDAE p. 236
Note: *Textrix* (Agelenidae) has recurved posterior eyes *unequal* in size and conspicuous long spinners.



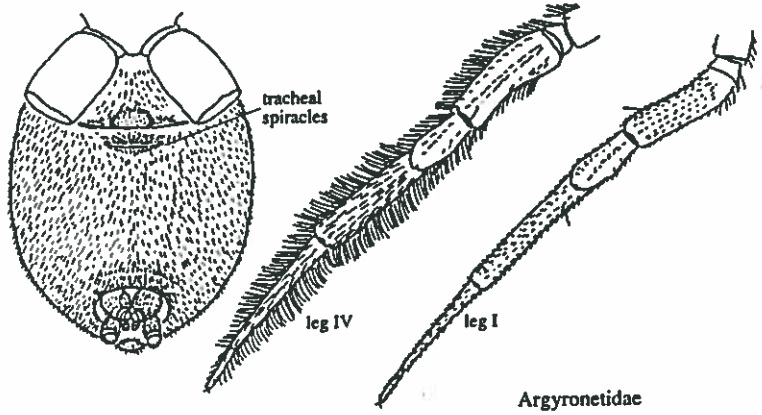
Pisauridae

9h. Front slope of carapace with a row of four eyes which are roughly the same size as those in the strongly recurved posterior row. Eyes closely grouped; separated by scarcely more than their diameters. Carapace pale yellowish with a pair of brown bands running longitudinally ZORIDAE p. 144



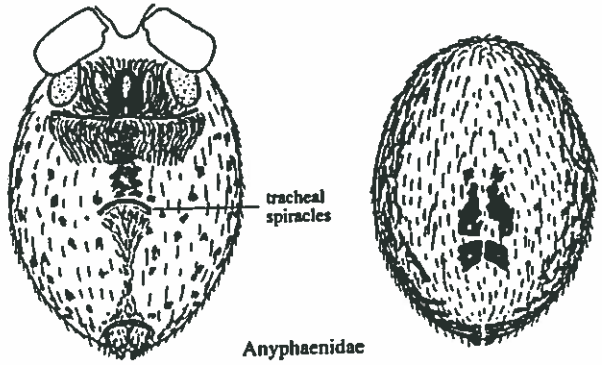
Zoridae

9i. Legs III and IV furnished thickly with long, fine hairs, contrasting markedly with legs I and II which have sparse, very short hairs. Tracheal spiracles just behind epigastric fold. The only known species has an almost entirely submerged, aquatic existence — ARGYRONETIDAE p. 238



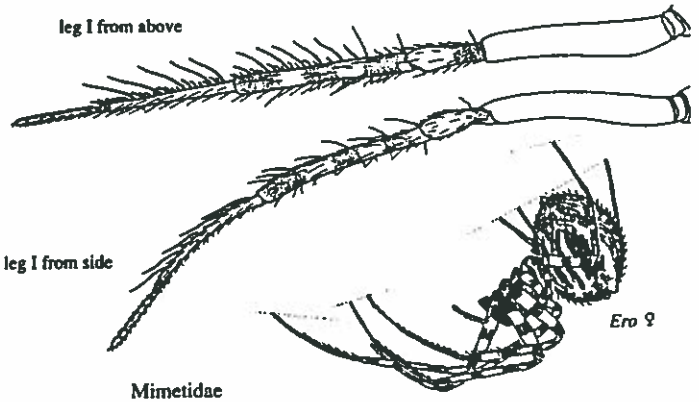
Argyronetidae

9j. Tracheal spiracles easily visible half-way between spinners and epigastric fold. Dorsal surface of abdomen marked with distinctive dark patches — ANYPHAENIDAE p. 146



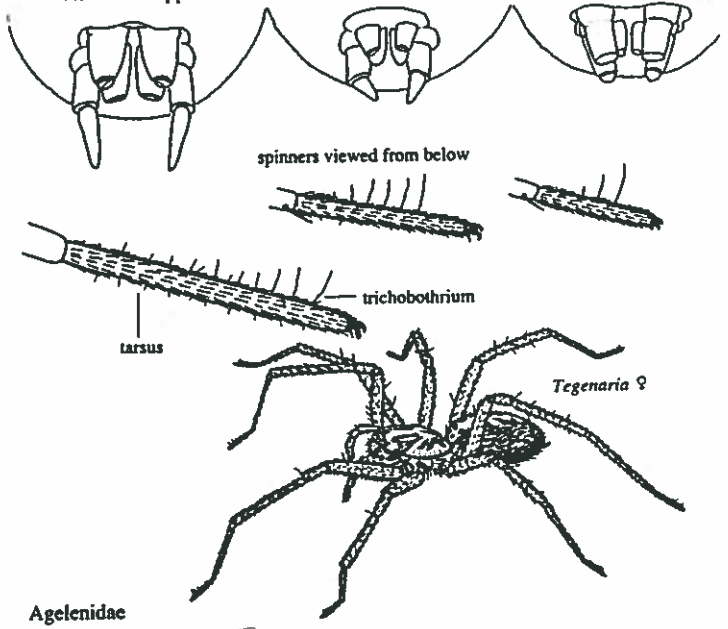
Anyphaenidae

9k. Legs I and II, viewed from above, with a series of prominent curved spines on the inner surface, pointing forwards. Set between these are smaller curved spines. Viewed from the side, the metatarsi appear curved. One to three pairs of small tubercles are present on the abdomen but may be difficult to see (see illustrations at top of next page) — MIMETIDAE p. 257



Mimetidae

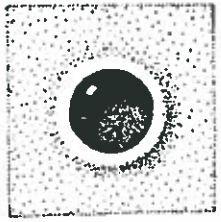
9l. Posterior spinners longer than anteriors and of two segments. Median spinners easily visible. A series of trichobothria, of increasing length, present on each tarsus, which also has 3 claws. ♂ In females of *Cryphoeca* these features are difficult to see, but the single, small species has a highly distinctive appearance in both sexes (Plate 20). — AGELENIDAE p. 240



Agelenidae

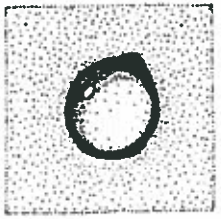
10 - NOT AS ABOVE

10. Eyes black and beady when each viewed from directly above (occasionally dark blue-grey) and usually surrounded by a paler area



11

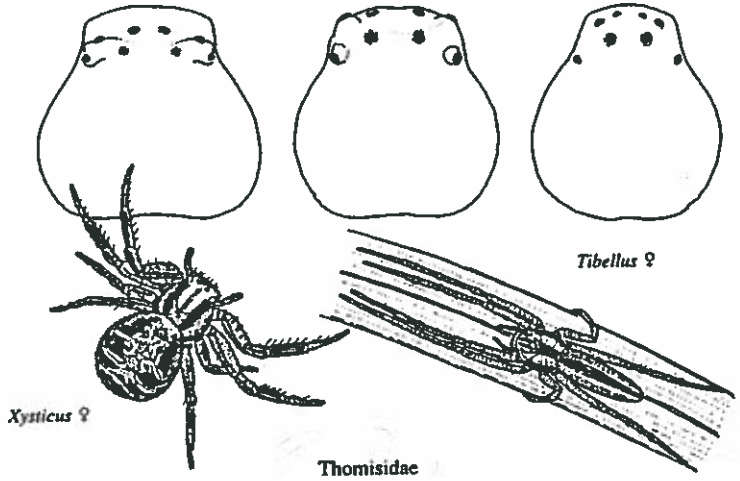
Eyes pale or pearly when each viewed from above (apart from anterior medians, which may be darker) and often surrounded by a ring of black pigment



12

11. Posterior row of eyes, viewed from above, recurved (curved backwards); sometimes almost straight, but never procurved (curved forwards). Many species crab-like, with legs I and II longer and stouter than the rest; others not at all crab-like

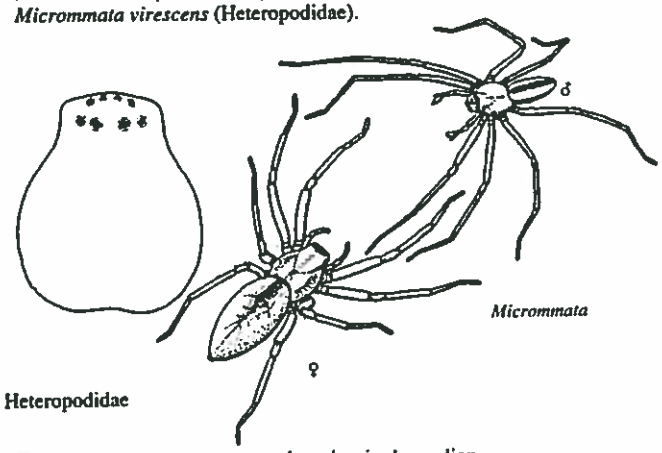
THOMISIDAE p. 147



Thomisidae

Posterior row of eyes, viewed from above, slightly procurved. All eyes ringed with white. Female

§ Look carefully at the eyes; the extremely hairy male of the European species *Heriaeus hirtus* (Thomisidae) is sometimes hastily misidentified as that of *Micrommata virescens* (Heteropodidae).



Heteropodidae

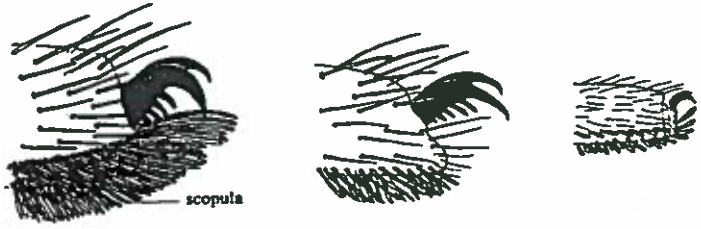
12. Tarsi with three claws, an upper pair and a single median claw, easily visible and not obscured by tufts of hair; sometimes also with auxiliary foot claws

15

Araneidae Theridiidae Linyphiidae

Tarsi with only two claws which may be partly obscured by tufts of hair

13

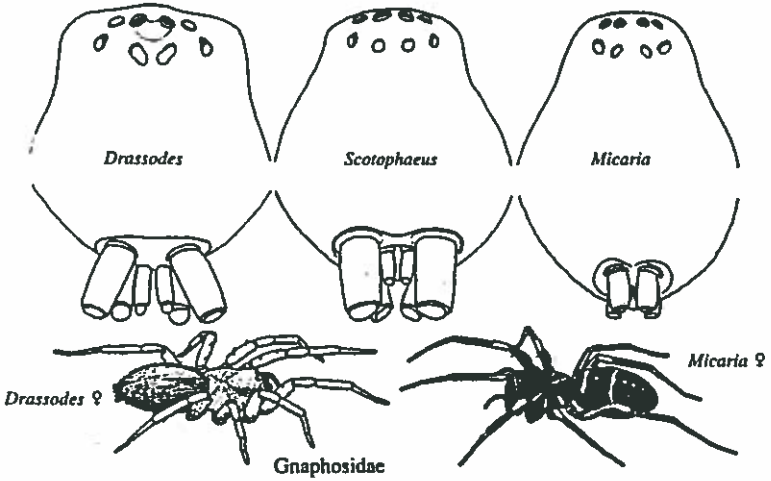


§ The claws may be visible with a lens in larger species but impossible to see in others. If the spider has been found in a web used for catching prey, it will

silken cell with no snare, *and* if it has a cylindrical body with mousy hairs or iridescence, then it will almost certainly have only two claws. The families in the rest of the key with only two claws are on Plates 2–6 (Gnaphosidae, Clubionidae, Liocranidae) and a quick glance at these should enable you to proceed. If the specimen looks like none of these, it may be a web spinner on the loose (especially males), or could be a three-clawed species which has abandoned web-spinning altogether.

13. Anterior spinners cylindrical, slightly longer than posteriors, and separated so that median spinners are easily visible between them (from below). Posterior median eyes usually oval or irregular in shape (circular in *Scotophaeus* and some *Zelotes*) GNAPHOSIDAE p. 101

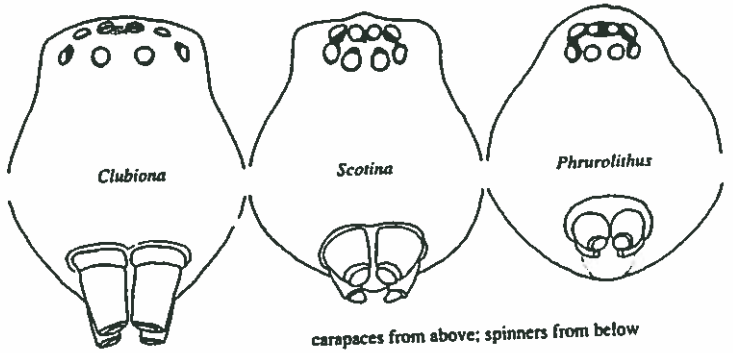
carapaces from above; spinners from below



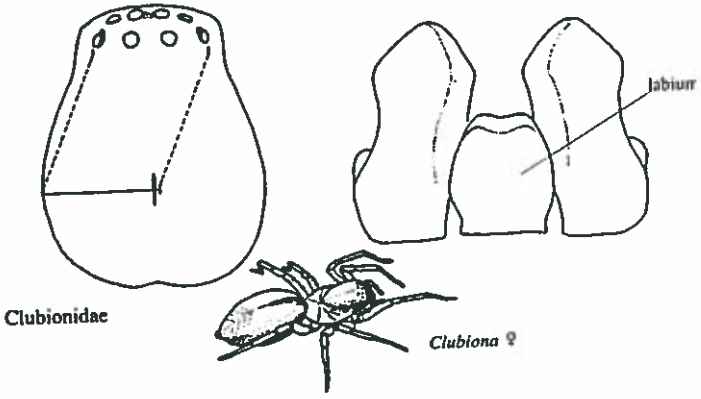
♀ Spinners easily seen with a lens in most species, but not in *Micaria* where the characteristic eyes are also too small to see properly. These iridescent, rather ant-like spiders (illustration here and on Plate 5) are easily recognisable in the field but you should also check the specimen with illustrations of *Phrurolithus* (Plate 6) and *Steatoda phalerata* (Plate 23).

Anterior spinners cylindrical or conical, and close together, obscuring the median spinners. Posterior spinners often slightly longer and occasionally of two segments. Posterior median eyes circular (see illustrations at top of following page) 14

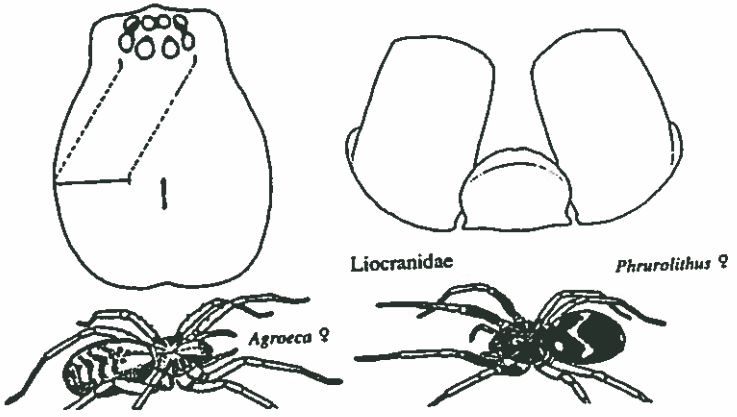
14. Total width of eye group at least half the width of carapace at its widest point. Labium appreciably longer than broad (see illustrations on following page) CLUBIONIDAE p. 124



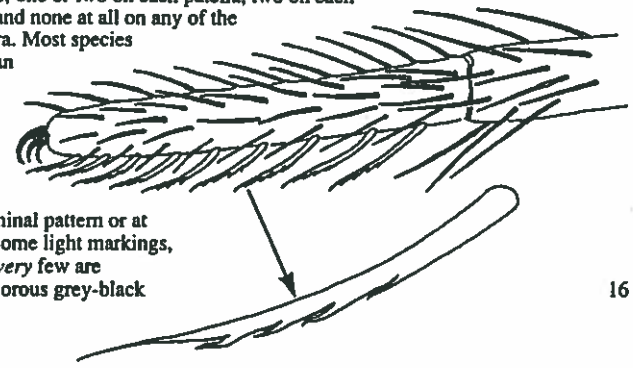
carapaces from above; spinners from below



Total width of eye group less than half the width of carapace at its widest point. Labium as broad as long LIOCRANIDAE p. 136



15. Tarsus IV with a comb of serrated bristles on the under (ventral) surface (See note, §, below). Legs with very few spines; one or two on each patella, two on each tibia and none at all on any of the femora. Most species with an

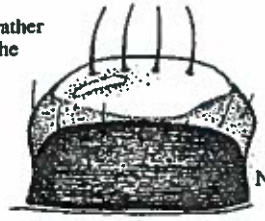


abdominal pattern or at least some light markings, but a *very* few are unicolorous grey-black 16

Tarsus IV with no comb of serrated bristles. Legs, in well-patterned species, generally with many spines and with at least one, prolaterally, on femur I, but many species with a unicolorous grey-black abdomen have very few spines (see below) 17

§ The comb of serrated bristles can be very difficult to see even at high magnification in small species and in males, so the following will help whether using a lens or microscope. If the specimen has been found on an orb web or a sheet web (perhaps supported by criss-cross threads), follow the key from 17. If from a three-dimensional web mainly composed of haphazard criss-cross threads (and no well-developed sheet) then just follow 16 in the key. If the specimen has one or more spines on femur I, then it has no tarsal comb and you should follow the key from 17. If there are no spines on femur I and the specimen has an abdominal pattern then check the illustrations of *Pachygnatha* (Plate 26), *Cyclosa conica* (Plate 29) and *Frontinellina* (Plate 32), all of which have no tarsal comb; go straight to the main text if the specimen matches one of these. The rare *Neriene radiata* (p. 368) lacks femoral spines but has an unmistakable web (p. 74). If it is none of these then follow the key from 16. If the spider is grey or black-bodied with no trace of pattern or light markings, it *may* have a tarsal comb but only if it belongs to the genera *Dipoena* (Plate 21, p. 268), *Robertus* (Plate 25, p. 293), *Phalcomma* (p. 295), *Theonoe* (p. 295) or the species *Enoplognatha thoracica* (p. 290); continue in the main text if the specimen matches. If it is none of these, it is a 'money spider' (part of the family Linyphiidae) so go straight to p. 345. Although the above is a diversion from the key, it is worth pursuing since it will acquaint you with two very common pitfalls at the outset.

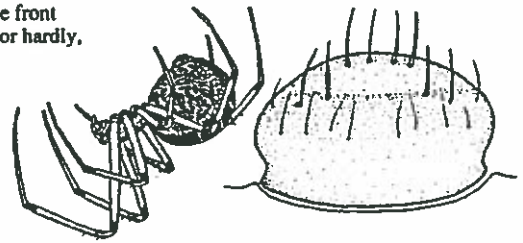
16. Labium with the front margin rather swollen and sausage-like. The single species has a highly characteristic appearance (Plate 25 *Nesticus cellulanus*) and genitalia which are easily identified with a lens



NESTICIDAE p. 296

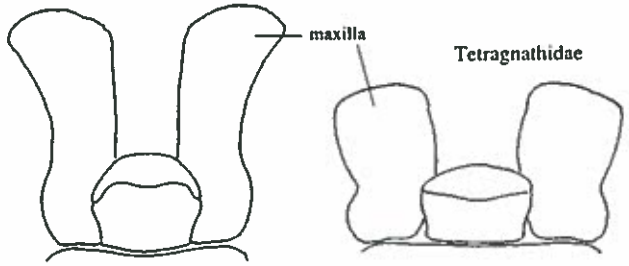
Labium with the front margin not, or hardly, swollen

Theridion ♀



THERIDIIDAE p. 260

17. Maxillae much longer than broad (since they often project ventrally, you may need to view them slightly from behind). Most species spin orb webs; some spin no web as adults TETRAGNATHIDAE p. 298



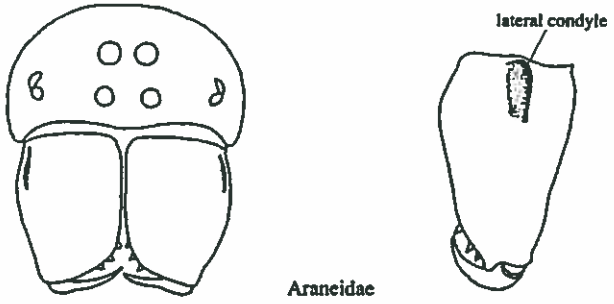
Maxillae not, or scarcely, longer than broad 18

18. Small spider (adults 1.5–3mm); abdomen globular, almost completely spherical; distinctly silver with reticulations and other marks. Femur I, viewed from the side, twice as thick as femur IV. A single rare species (Plate 25 *Theridiosoma gemmosum*). (Check maturity and *all* characters; small spiderlings of some orb-weavers bear some resemblance and other species may have *some* of these features.) Web is a horizontal orb web pulled taut so that it resembles an umbrella turned inside out (p. 68). THERIDIOSOMATIDAE p. 297

Spider, although perhaps with some of these characters, not having them all 19

19. Viewed from in front, clypeus height generally less than twice the diameter of an anterior eye (except in *Cercidia prominens*, Plate 28). Chelicerae usually with a lateral condyle but no stridulating ridges. Tarsi with three claws and auxiliary foot claws (see 12, above) Spinners of orb webs

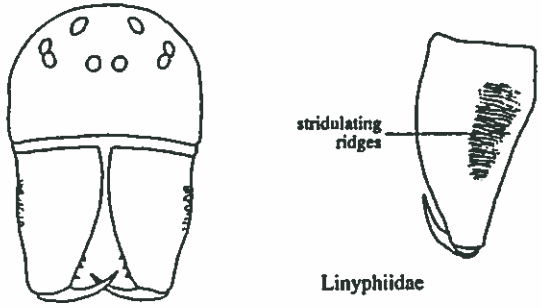
ARANEIDAE p. 310



Araneidae

Viewed from in front, clypeus height generally greater than twice the diameter of an anterior eye (except in *Tapinopa longidens* and *Poeciloneta variegata*, Plate 30). Chelicerae often with stridulating ridges laterally, but no lateral condyle. Tarsi with three claws, but no auxiliary foot claws. Some species have a clear abdominal pattern and spin sheet webs which they run on the underside of; others have a unicolorous grey-black abdomen ('money spiders') and some of these spin tiny sheet webs.

LINYPHIIDAE p. 339

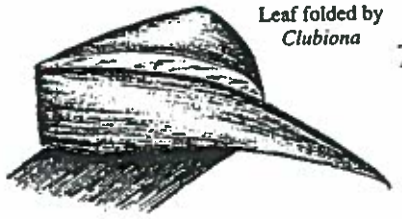


Linyphiidae

Egg Sacs

Once the female has laid a batch of eggs, an attempt is made to protect them from the elements, and from predators and parasites. Perhaps the simplest protection is given in *Scytodes* (p. 93) and *Pholcus* (p. 98) where the female ties the eggs in a loose bundle of fine threads and carries them around. These spiders live inside buildings and are not exposed to the elements. Other species, with a nomadic lifestyle, make substantial silk egg sacs which they carry around with them. Such sacs may be opened periodically and given fluid from the mother's mouth; they may also be turned regularly, oriented towards the sun if in need of heat, and finally may be opened by the female to allow the spiderlings to escape. In the Lycosidae (Plates 16–18, p. 209) the egg sac is attached to the spinners and, later, the newly hatched spiderlings spend their first week of life clustered together on their mother's abdomen. The Pisauridae (Plate 19, p. 236) carry their large egg sac under the front of the body, holding it with chelicerae and palps. Before the young hatch, their mother spins a silk nursery tent (see Webs p. 66), hangs the sac up inside, and stands guard near the base. Later, she opens the sac when the young are ready to emerge. Some nocturnal wanderers and tube-dwellers make their egg sacs within the tube or a silken cell and remain with the sac until the young emerge, often caring for them until they themselves die. Many other species (e.g. of the families Zoridae, Oxyopidae, Thomisidae) fasten their egg sacs down and stand guard over them. Many of the Theridiidae guard their egg sacs or roll them about; many such sacs are pale and spherical, some coloured blue or strangely shaped (Plate 25). *Theridion bimaculatum* and the tiny *Theridion bellicosum* both carry their relatively huge white egg sac attached to the spinners, as does *Nesticus cellulanus* (Nesticidae, p. 296). Many of the Linyphiidae may be found with their egg sacs which, again, vary in shape, size and number; some are plastered down in the form of a flat sheet, others spherical and woolly and some papery with a fried-egg shape. Many are abandoned, the female laying several batches in different sites. Some of the Araneidae guard their egg sacs for a while, but many females die in the autumn, soon after laying, and the eggs are left unattended until they hatch the following spring. It follows then that some egg sacs are identifiable by means of the female which is carrying or guarding them. Other sacs may have been abandoned deliberately, or the female may have died. Many of these are not particularly distinctive and cannot be reliably identified unless the eggs are hatched and reared. However, a number of egg sacs, some deliberately abandoned, have a highly distinctive appearance and are identifiable, at least to genus level, in the field. Indeed, the egg sacs of *Ero* and *Agroeca* are more often seen than the spiders.

Species of *Clubiona* (p. 124) have a highly characteristic way of folding a leaf tip to form a strong foundation structure for their silken cell. Although the female is



Egg sacs of *Zelotes*