

SAWFLIES Sub-order Symphyta

Sawflies get their English name for the saw-like ovipositors of most females (see p. 218), although the horntails and a few others have drill-like ovipositors. The adults feed mainly on pollen, although some are partly carnivorous. Most fly weakly, usually by day. The larvae are almost all vegetarians, feeding openly on leaves or else tunnelling inside the plants. The free-living forms resemble the larvae of butterflies and moths, although they usually have more prolegs (see p. 218), but the tunnellers and some other larvae have greatly reduced legs. Some larvae induce gall-formation.

Megalodontes klugii Megalodontidae. Flat-bodied and fast-flying, mainly in sunshine. Antennae with flaps on the underside (see below). 5-8, usually on umbellifer heads. Larvae have no prolegs and live in communal webs on umbellifers. S & C.

▲ **Pamphilius sylvaticus** Pamphiliidae. One of several similar fast-flying, flattened insects. On flowers 5-7: usually active only in sunshine. Larva has no prolegs and lives in rolled leaves of hawthorn and other rosaceous trees.

▲ **Acantholyda erythrocephala** Male head black behind antennae. Flies rapidly in pinewoods 4-6. Larvae have no prolegs and live communally in webs among pine needles. Sometimes a forest pest on the continent. N & C.

▲ **Xyela julii** Xyelidae. Varied shades of brown, with filamentous antennae. Female has long, slender ovipositor. Weak-flying 3-6, often visiting birch catkins. Larva has many legs and lives in male pine cones. Common on heathland. N & C.

▲ **Xiphydria prolongata** Xiphydriidae. Long neck distinguishes this family. 6-8 in wooded habitats. Larva is almost legless and tunnels in willows and poplars.

▲ **X. camelus** is similar but lacks red on abdomen. It breeds in birch and alder.

▲ **Horntail Urocerus gigas** Siricidae. Named for prominent ovipositor: also called a wood-wasp, although it is harmless. 5-10, mainly in pinewoods but not uncommon on new housing estates, where adults emerge from building timbers. Flies in sunshine, with males usually around tree tops. Eggs are drilled into tree trunks and the almost legless larvae take 2 or 3 years to mature in the timber. The northern race (subspecies *taiganus*) has a black ovipositor sheath and male has more black on front of abdomen. There are several similar species in Europe.

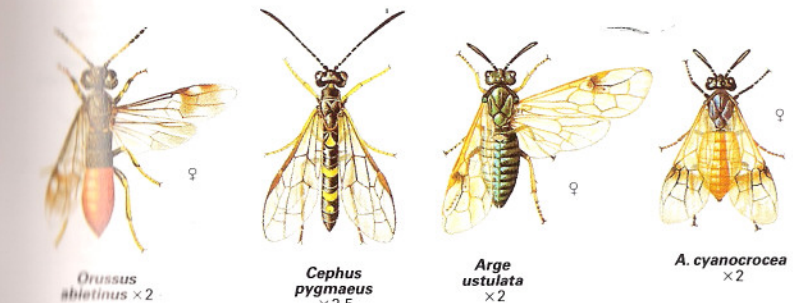
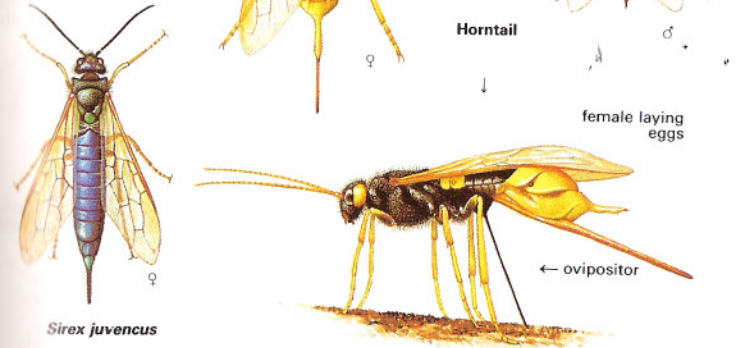
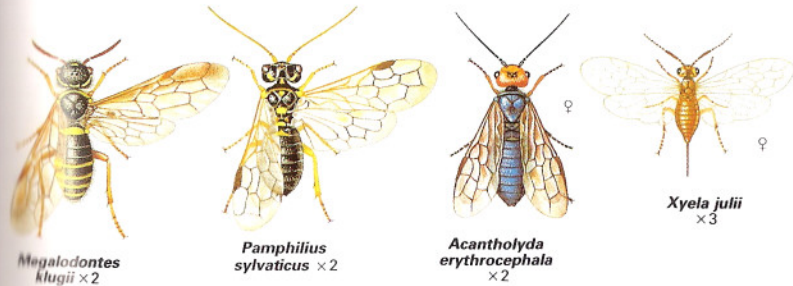
▲ **Sirex juvenus** Male resembles *Urocerus* but has no pale patch behind eye. Antennae usually reddish at base, but may be all black in north. 5th tarsal segment always yellow. 5-10 in coniferous forests. Larvae tunnel in pine trunks. ▲ **S. noctilio** is similar but antennae are always black and 5th tarsal segment brown. *Sirex* species are often called wood-wasps. Several species occur in B, but most specimens come from imported timber. *S. noctilio* is the commonest.

Orussus abietinus Orussidae. Antennae inserted below eyes (see below), not between them as in most sawflies: more slender in male. 5-8 in coniferous forests, but rare. Larva parasitises grubs of wood-boring beetles. No other sawfly has parasitic larvae. S & C.

Cephus pygmaeus Cephidae. One of several similar species, all with the slender bodies characteristic of the family. Yellow bands variable. Slow-flying 5-8. Common on flowers, especially yellow composites, in grassy places. The almost legless larvae tunnel in grass stems and are serious pests of cereals.

▲ **Arge ustulata** Argidae. Metallic blue or green: wings yellowish with yellow stigma. Antennae with only 3 segments, as in all this family, the 3rd segment being very long: less clubbed in male. 5-7. Slow-flying in scrubby places, mainly where damp. Larva is fully-legged and feeds on willows, birches, and hawthorn.

▲ **A. cyanocrocea** has yellow costa in forewing, with dark smudge extending right across the wing behind the stigma. Hind legs yellow with black tips: sometimes all black in south. 5-7, usually on umbellifers. Larva feeds on bramble.



ssp. *taiganus*



Orussus head



Antenna of *Megalodontes* with much enlarged section to show the flaps.

SAWFLIES

cuttly emerging from
ground one end
lid

mitae. A rare insect (the only European member of its
oally pear-shaped cell in the middle of the forewing and
stibus segments (4th segment forms a minute hook at
ens. N & C.

thorax metallic green like abdomen. Antennae usually
Larve, sometimes blackish. Fast-flying in grassy places 5-8:
vs feeds openly on scabious leaves.

male thorax green and antennae brownish at base and

s. Dark band around all wing-tips. Fast-flying with buzz-
Larva is plump, greyish or bluish green, and feeds on
ke cocoon in an underground chamber.

2. *lucorum* Hair may be very pale. 5-6 in hedgerows and
297 feeds on hawthorn and spins a tough, sausage-like
is way out with powerful jaws. The species seems to
eni years, possibly owing to widespread mechanical
are several similar species, not easy to distinguish.

onidae. Abdomen dull, sometimes with pale bands in
tha 9 segments: strongly feathered in male. 5-8 in
island flying little. Larvae feed freely on pine needles,
forest pest. There are several similar species.

largest sawfly family, with nearly 1000 European
ardin pests. Antennae usually 9-segmented. Larvae
hairs of prolegs: often gregarious. Many raise hind
hen alarmed (see p. 295). Some are slug-like with
Ciliroa cerasi on p. 295).

ne of several very similar species. Antennae with 10-12
yellow beneath. 5-10. Larva, greyish brown or black,
specially turnips.

el similar carnivorous species with large, asymmetrical
where it catches other small insects. Larvae feed on wild
ed plants.

rranges from orange to black: female commonly with
black and rest of abdomen red. 5-7. Larvae feed on
grass.

of black varies, and green fades soon after death. Stigma
ured. 5-7 in woods and scrubby places, usually on flow-
all insects. Larva is polyphagous on woody and herba-
similar species.

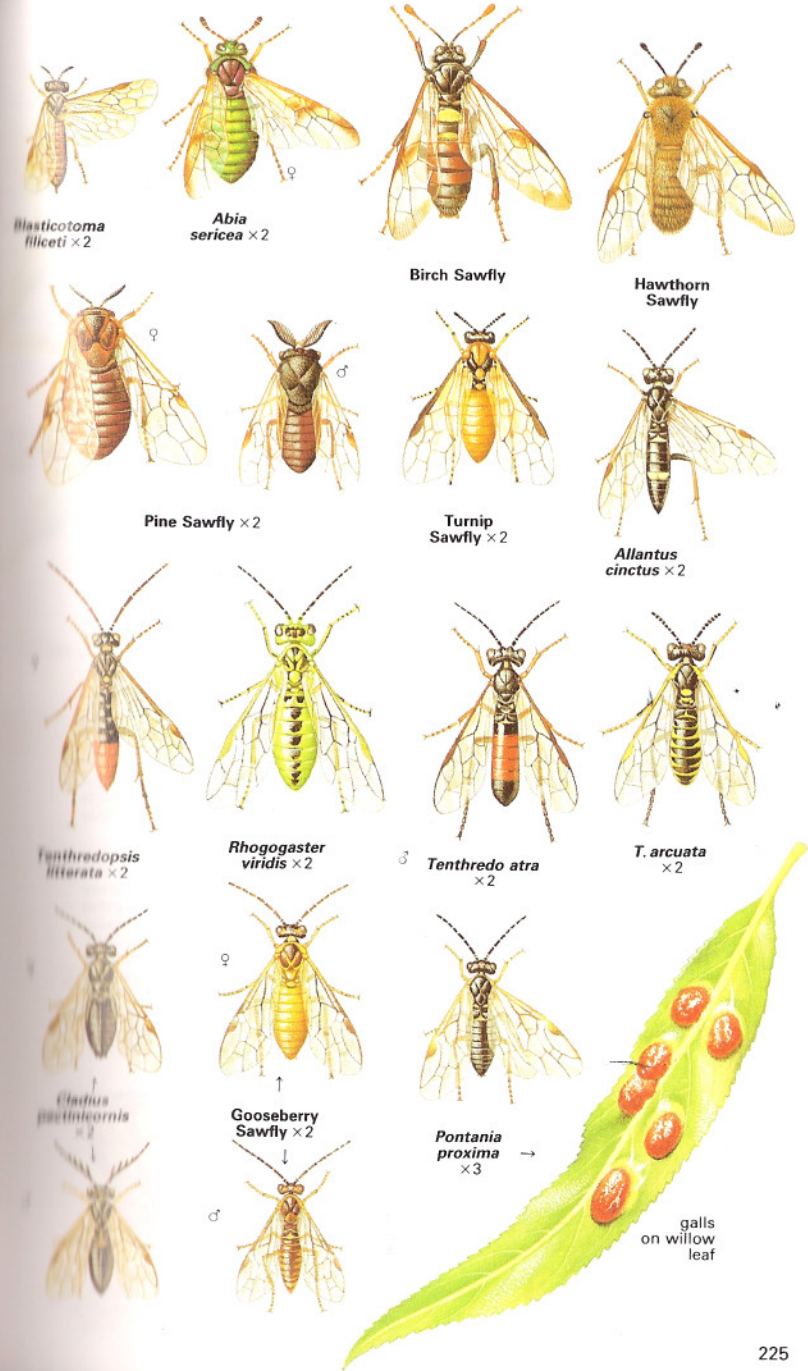
d stigma completely black. Female lacks red band on
wide range of herbaceous plants, including potato and
similar species (65 *Tenthredo* species in N & C).

every similar species with slightly clubbed antennae.
ellows. Flagellum of antenna entirely black. 4-8 in grassy
ver.

ntennae feathery, but much less so than in Pine Sawfly,
of the commonest sawflies. Larva is flat and green and
esides of rose leaves: also on strawberries and related
similar.

basii. The amount of black on male abdomen varies a
feeds on gooseberry and currant leaves, often stripping
y similar species (about 40 in B).

ver white or crack willows grow. Larva causes the devel-
the leaves (paler on white willow than on crack willow).
Pugates in the soil. N & C. There are many similar spe-
willows and salwos, either in galls or in rolled-up leaves.



WASPS, ANTS, and BEES Sub-order Apocrita

GALL WASPS Cynipidae. Small, ant-like insects with laterally compressed abdomen and distinctive venation. Sometimes wingless. Nearly all species induce gall-formation in plants, especially oaks. Female lays eggs in the plants, and when the eggs hatch the tissues swell up around the grubs to form the galls. The larvae thrive on the nutritious tissues without appearing to harm the host plants. Unilocular galls contain just one chamber and usually a single larva, while plurilocular galls contain several chambers, each with its own larva. The insects always pupate in the galls, and many spend the winter in the pupal stage. Many species have complex life cycles, involving the alternation of bisexual and parthenogenetic generations. Each generation causes its own kind of gall. The parthenogenetic females differ slightly from females of the sexual generation. A few gall wasps do not induce gall-formation, but lay eggs in the galls of other species: their grubs may deprive the rightful occupants of food and cause them to die. Many parasites, including chalcids and ichneumonids, also attack the gall wasp grubs. The insects emerging from a gall are thus not necessarily the gall causers.

- ▲ *Phanacis hypochoeridis* causes plurilocular galls in cat's-ear stems. The galls are unusual in that they start to swell before the eggs hatch. Gall mature 8-9. Adult 5-7. Life cycle normal.
- ▲ *Liposthenus glechomae* causes unilocular galls on ground ivy. Gall pea-sized, but several may coalesce. Gall mature 8-9. Adult 3-4. Life cycle normal.
- ▲ *Diastrophus rubi* attacks young bramble stems, usually spindly stems low down on the plants, causing plurilocular, cigar-shaped galls up to 15cm long. Gall mature 10-11. Adult 4-6. Life cycle normal.
- ▲ *Diplolepis rosae* causes the bedeguar gall or robin's pincushion on wild roses: a plurilocular gall with a hard woody centre. Gall matures late autumn. Adults fly 4-6. Males very rare: females lay eggs without mating. No alternation of generations.
- ▲ *D. eglanteriae* and ▲ *D. nervosa* resemble *rosae* but cause pea-like unilocular galls on the undersides of rose leaves. Those of *nervosa* are usually spiky and have been dubbed 'sputnik galls'. Both galls usually pink when mature in late summer. They fall to the ground in autumn and adults emerge in spring.
- ▲ *Neuroterus quercusbaccarum* causes common spangle galls on oak leaves in autumn. Galls fall to ground and parthenogenetic females emerge early in spring to lay eggs in oak buds. The new generation of grubs induces the formation of currant galls on young leaves and catkins 5-6. Male and female gall wasps emerge from these galls and, after mating, eggs are laid on the leaves, leading to a new generation of spangle galls. Silk button and smooth spangle galls also appear on oak leaves in autumn, caused by ▲ *N. numismalis* and ▲ *N. albipes* respectively. These insects resemble *quercusbaccarum* but galls of the sexual generation are inconspicuous swellings on young leaves.
- ▲ *Andricus kollari* induces unilocular marble galls on oak - green at first but brown and woody when mature 8-9. Parthenogenetic females emerge 9-10 and overwinter in sheltered spots before laying eggs in oak buds in spring. If eggs are laid on Turkey oak a bisexual generation is produced in little galls in the buds, but it is possible that the bisexual generation can be omitted and that the insect can produce a succession of parthenogenetic generations on pedunculate (common) oak or sessile oak. Artichoke galls are much-enlarged buds. They are caused by ▲ *A. fecundator*, which is similar to *kollari* but about half its size. The grub lives in a hard, egg-shaped inner gall that falls out when mature in the autumn. Parthenogenetic females emerge in spring and lay eggs in buds. The bisexual generation develops in tiny furry galls on male catkins 5-6.

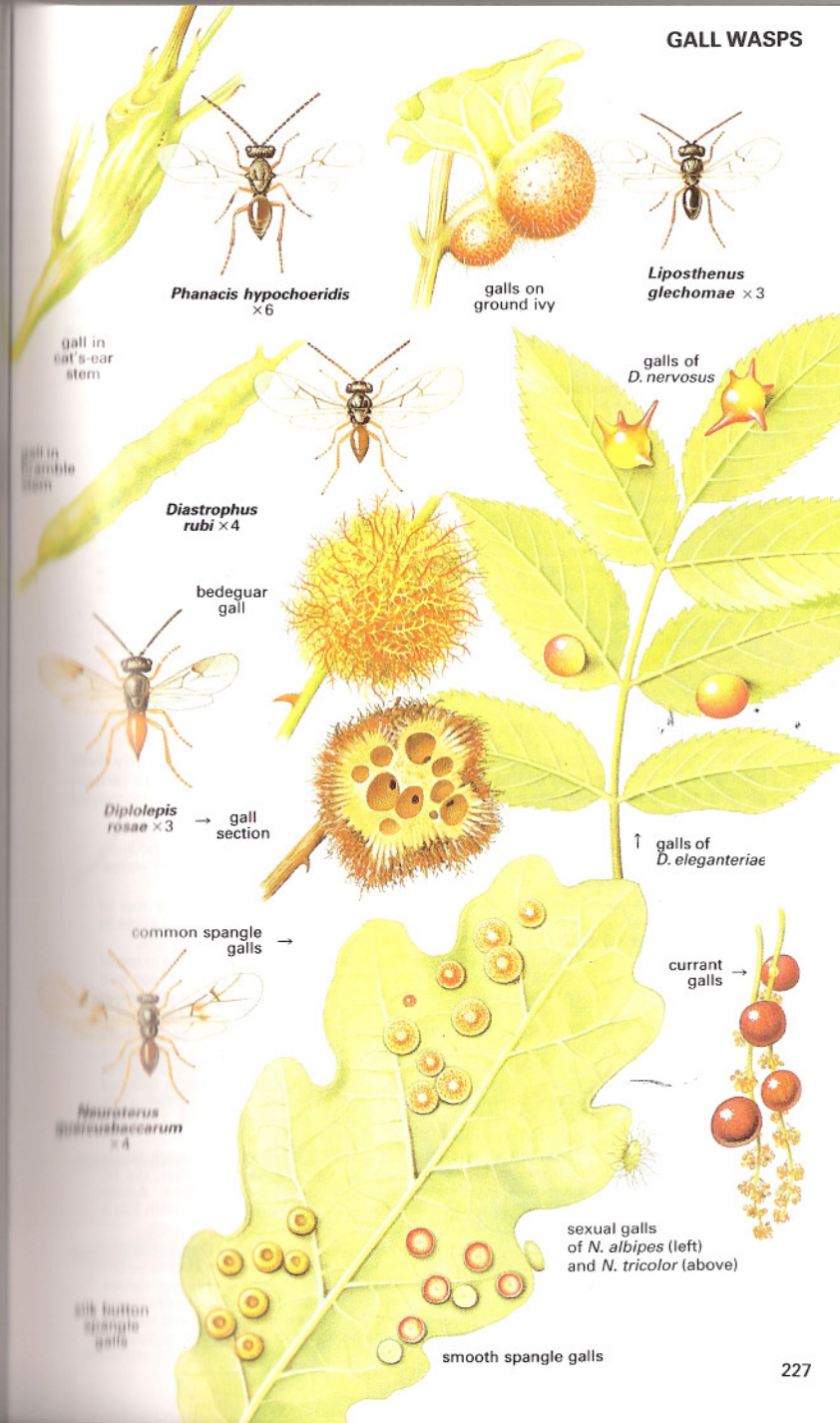
marble galls with adult *A. kollari*



artichoke galls



GALL WASPS



Phanacis hypochoeridis x6

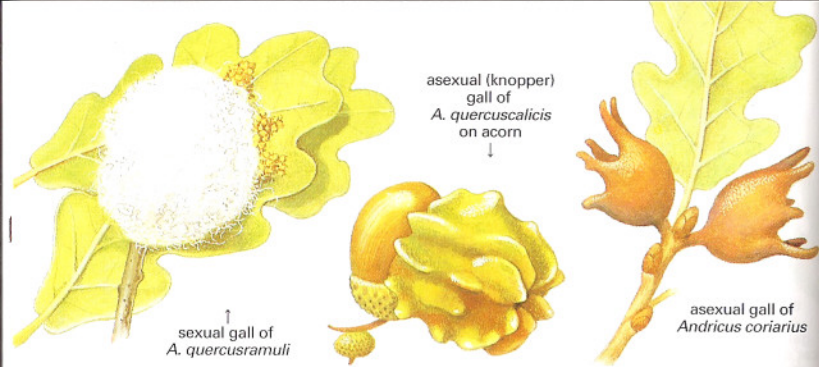
Liposthenus glechomae x3

Diastrophus rubi x4

Diplolepis rosae x3

Neuroterus quercusbaccarum x4

sexual galls of *N. albipes* (left) and *N. tricolor* (above)



▲ *Andricus quercusramuli* Cynipidae. Reddish brown with yellow legs. Males and females emerge 5-7 from cotton-wool-like galls that develop on male oak catkins. Parthenogenetic generation (rarely seen) develops in bud galls in early spring.

▲ *A. quercuscalicis* causes the knopper gall, a hard and irregular umbrella-like object on acorns. Larva is in a hard inner gall as in *A. fecundator* (p. 226). Parthenogenetic adults emerge 2-4. Bisexual generation induces galls on Turkey oak catkins.

A. coriarius induces spiky brown galls on downy oak and various other oaks in autumn. Only the parthenogenetic generation is known. S & C. ▲ *Cynips quercusfolii* causes the pale green to red cherry galls on the undersides of oak leaves in autumn. Parthenogenetic adults emerge 12-2 and lay eggs in buds, where bisexual generation induces purple or black galls in spring. ▲ *C. divisa* has a similar life history, but autumn galls are small yellow or red spheres with very hard walls. The much rarer *C. agama* has thin-walled galls.

▲ *Biorhiza pallida*. Males and females emerge from oak apples 6-7. The spongy, plurilocular galls contain many insects, but each gall contains only one sex. Females lay eggs on fine roots, where parthenogenetic generation develops in small brown galls. Parthenogenetic adults are wingless and emerge 2-4 of second year.

PARASITIC HYMENOPTERA

Hymenoptera, belonging to many different families, that spend their early lives inside or firmly attached to the young stages of other insects. The hosts remain alive until the parasites have grown up, but are eventually completely destroyed (see p. 219). Only a few of the families can be mentioned here.

△s *Evania appendigaster* Evaniidae. Gaster very small and attached to top of propodeum by very slender petiole: often waved flag-like, hence American name of ensign wasps. On flowers throughout summer. Larvae in oothecae of cockroaches.

△s *Gasteruption jaculator* Gasteruptionidae. Long, slender gaster attached to top of propodeum. Wings folded longitudinally at rest. On umbellifers in summer. Larvae in nests of solitary bees, feeding on grubs and stored food. N & C.

△s *Aulacus striatus* Aulacidae. Pear-shaped gaster attached to top of propodeum by short petiole. Long ovipositor. Around logs and tree trunks and on umbellifers and other flowers 6-9. Larva parasitises grubs of *Xiphidria camelus* (p. 222). N & C.

▲ *Torymus nitens* Torymidae. Hind coxa very large, as in whole family. Female uses long ovipositor to pierce young oak apples and other oak galls in summer. The grubs parasitise the gall wasp larvae. There are hundreds of similar metallic species in this and related families (collectively known as chalcids), all sharing the same simple wing venation and elbowed antennae. They are abundant in vegetation in summer.

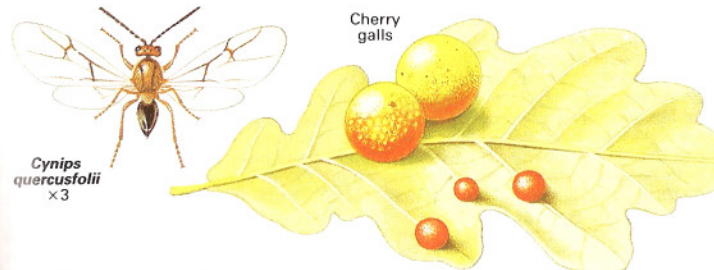
▲ *Pteromalus puparum* Pteromalidae. Hind coxa not much larger than others. Larvae parasitise pupae of white butterflies, the female inserting her eggs before pupal case hardens. Adults emerge in large numbers from each infested chrysalis, with 2 or 3 generations per year.

Leucospis gigas Leucospidae. One of the largest of the chalcids. Hind coxa very large: hind femur much swollen and strongly toothed. Wings folded longitudinally at rest. Ovipositor curved over back. Flies in summer. Largely parthenogenetic: males found only in certain populations in SE. Larvae feed on grubs of solitary bees, especially *Chalicodoma parietina* (p. 246). S & C.



Pteromalus emerging from host pupa

GALL WASPS, CHALCIDS and other parasites



Cynips quercusfolii ×3

Cherry galls



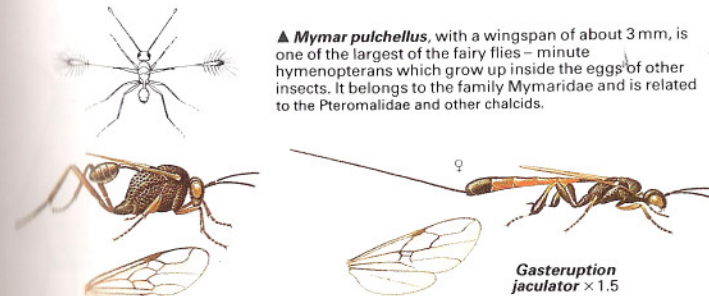
Biorhiza pallida ×4

galls of *C. divisa*

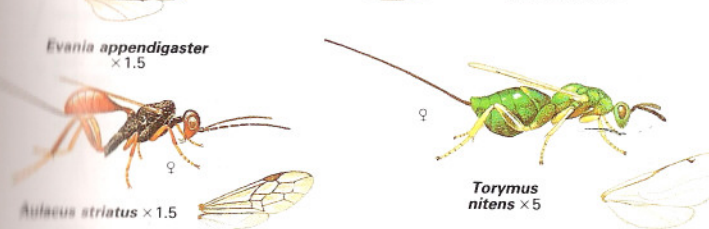
oak apple gall

asexual galls on oak roots

▲ *Mymar pulchellus*, with a wingspan of about 3 mm, is one of the largest of the fairy flies - minute hymenopterans which grow up inside the eggs of other insects. It belongs to the family Mymaridae and is related to the Pteromalidae and other chalcids.



Gasteruption jaculator ×1.5



Evania appendigaster ×1.5



Torymus nitens ×5

Leucospis puparum ×5

ICHNEUMONS Ichneumonidae. An immense group of parasitic insects whose larvae live in or on the young stages of other insects. Adults are rather slender, with long antennae of at least 16 segments. The front edge of the forewing appears rather thick, owing to obliteration of the costal cell, and there is a prominent stigma. A few species are wingless. Ichneumons are abundant in hedgerows and other dense vegetation, scuttling around and vibrating their antennae as they search for the scents of their hosts. Butterfly and moth caterpillars are the main hosts and generally just one egg is laid in or on each one. Endoparasitic species generally emerge after pupation of the host, much to the dismay of many people who collect caterpillars to breed out the adult butterflies or moths. Many other insects are used as hosts, and some ichneumons even use spiders. Female ichneumons often have a very long ovipositor to reach hosts deep inside plants or other animals. The family Braconidae is very similar in habits but readily distinguished by its venation: there is a long open cell towards the rear of the forewing (see below). Braconids tend to be smaller than ichneumons and often lay many eggs in each host.

- ▲ **Agriotypus armatus.** Thorax has long, curved spine. Wings distinctly clouded. An ectoparasite of various case-bearing caddis flies. Female crawls into water and lays an egg in a case containing a fully grown larva or pupa. The grub consumes the pupa and then pupates in the case: adult remains in the case for the winter and emerges in spring or early summer. Cases containing pupae or resting adult *Agriotypus* can be recognised by a silken ribbon attached to one end and used in respiration.
- ▲ **Rhyssa persuasoria.** One of the largest ichneumons. Ectoparasitic on horn-tail larvae (p. 222): slender ovipositor drills deep into pine trunks to reach host. Not uncommon in pinewoods in summer. The brown and yellow *Megarhyssa superba* is even larger.
- ▲ **Pimpla hypochondriaca.** A very common endoparasite of various moth larvae and pupae, notably those of the Snout Moth (p. 168). All summer. There are several similar species, mostly a little smaller: one is an endoparasite of the pupa of the Large White Butterfly.
- ▲ **Lissonota setosa.** Resembles *Pimpla*, but larger and female has a very long ovipositor. Endoparasitic in larvae of the Goat Moth, the ovipositor being used to drill into tree trunks. The smaller, but otherwise similar ▲ **L. fundator** attacks clearwing larvae in stems. There are many similar species.
- ▲ **Diplazon laetatorius.** An abundant endoparasite of various hover-fly larvae. The egg may be laid in the host egg, and adult emerges from host pupa. There are several similar species.
- ▲ **Netelia testacea.** A very common ectoparasite of moth larvae. Abdomen flattened from side to side and arched upwards. Short ovipositor capable of piercing human skin if molested. Flies all summer: markedly nocturnal and abundant in light traps. There are several similar species but only *testacea* has dark tip to abdomen.
- ▲ **Ophion luteus.** Very like *Netelia*, but venation differs. Scutellum distinctly triangular. Late summer and autumn: very common. Endoparasite of various caterpillars. One of many similar species, with or without dark hind ends.
- ▲ **Protichneumon pisorius.** An endoparasite of hawkmoth larvae. Adult 5-9: not uncommon on umbels and other flowers.
- ▲ **Amblyteles armatorius.** Scutellum cream or yellow. Hind trochanter yellow. Very common on umbels in summer: hibernates as adult, often in caves. An endoparasite of many caterpillars, especially noctuids. One of several similar species.
- ▲ **Ichneumon suspiciosus.** One of many very similar species, difficult to separate with certainty. Very common on umbels in summer: hibernates as adult. An endoparasite of swift moth larvae and various noctuid caterpillars.



Cotesia glomerata × 5



Cotesia cocoons surrounding dead host larva

ICHNEUMONS

