▲ ***Orthocephalus saltator***. Rather hairy. Head not noticeably wider than front of pronotum. Antennae black. Tibiae red or brick-coloured (black in *O. coriaceus*). Hind femora enlarged for jumping, especially in female. Male always fully winged: female usually brachypterous as illustrated. 6-9 in rough grassland, mainly on composites.

▲ ***Orthotylus virescens***. 6-9 on broom. Partly predatory. One of many rather similar green bugs in this genus, although rather darker than most. Specific identification is difficult in this genus, although host plant is a good guide. The genus may be confused with some species of *Lygus* and *Lygocoris*, but these genera are generally more robust and they have a distinct collar at the front of the pronotum.

▲ **Black-kneed Capsid** *Blepharidopterus angulatus*. Named for the black patches at the tips of the tibiae – especially prominent in the nymphs. Antennae much shorter in some males. 6-10 on a wide range of trees, especially apple and lime. Partly predatory, destroying large numbers of red spider mites in orchards.

▲ ***Pilophorus perplexus***. Pale bands are due to silvery hairs. 6-10 on oaks and other deciduous trees, feeding mainly on aphids and sometimes on leaves and young fruits. Rather active and sometimes mistaken for ants. ▲ ***P. cinnamopterus*** is similar but lives on pines.

▲ ***Campyloneura virgula***. Bright yellow cuneus with red apex distinguishes this from several otherwise similar bugs. 6-10 on a wide range of trees, feeding on aphids and other small insects and on red spider mites. Nymphs are bright yellow and orange.

▲ ***Mecomma ambulans***. Sexes markedly different, but fully-winged females occasionally occur in north and on mountains. 6-9 among rushes and other vegetation, especially in and around damp woods. Partly predatory.

▲ ***Halticus apterus***. Head noticeably wider than front of pronotum. Wings occasionally fully developed and covering abdomen. Femora black: tibiae and antennae yellowish brown. Leaps with aid of enlarged hind femora. 6-9 on legumes and bedstraws in grassy places: sometimes a pest of clovers and related crops. Related species have pale head and sometimes pale thorax as well.

▲ ***Myrmecoris gracilis***. Almost always micropterous and extremely ant-like, running rapidly on ground. 6-9 on heathland and other dry habitats. Largely predatory: sometimes in ant nests, feeding on brood but not on adults. N & C.

▲ ***Pithanus maerkeli***. Usually micropterous and ant-like, the pale wing pads giving the illusion of a narrow waist. Female occasionally fully-winged. 5-9 in grassy places, especially where damp. Partly predatory.

▲ ***Lygus pratensis***. In northern half of Europe and on mountains both sexes are light brown, usually with no marks on pronotum. Elsewhere males are darker red with a yellowish scutellum and females are greenish brown, both usually with dark marks on the pronotum. Both forms occur in B. Feeds on a wide range of plants and hibernates as adult.

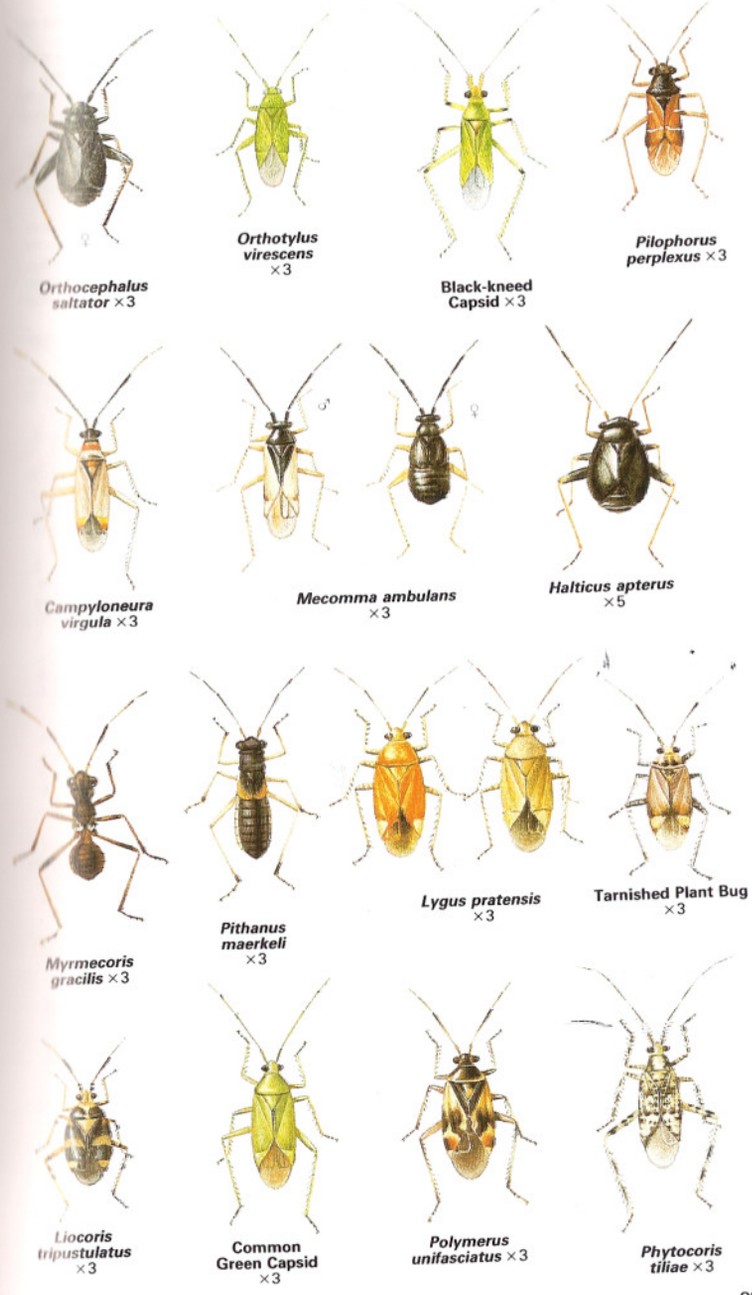
▲ **Tarnished Plant Bug** *L. rugulipennis* varies from yellow to brick red or brown. Dense coat of short, fine hair distinguishes it from *pratensis*. Abundant on a wide range of plants, including stinging nettle, causing white spotting on leaves. Also attacks flowers and frequently causes malformation of peas and beans. Although sometimes a serious agricultural pest on the continent, it is more of a garden pest in B. Hibernates as adult.

▲ ***Liocoris tripustulatus***. Young adults (late summer) are light brown with yellow spots. After hibernation they are deep reddish brown with bright orange scutellum and cuneus. Mainly on nettles. ▲ ***Capsodes gothicus*** is superficially similar but is parallel-sided and has a dark head.

▲ **Common Green Capsid** *Lygocoris pabulinus*. Abundant 5-10 on a very wide range of woody and herbaceous plants: woody plants, on which over-wintering eggs are laid, are infested mainly in spring. Often a pest of soft fruit, potatoes, and several other crops. Pale brown tibial spines distinguish this from several closely related species: narrow pronotal collar distinguishes it from *Orthotylus* spp.

▲ ***Polymerus unifasciatus***. Fine golden pubescence on forewing (strong lens!). Tibiae with strong black spines. 5-9 in rough, grassy places, feeding on various bedstraws.

▲ ***Phytocoris tiliae***. White or pale green with black markings. 6-10 on a wide range of deciduous trees. Largely predatory, taking small caterpillars, aphids, red spider mites, etc. There are several similar species but they lack the pale patch at junction of corium and cuneus.



△ ***Miris striatus***. A very striking bug, found mainly on oak and hawthorn in B but on alder, birch, sallow, and many other trees on the continent. 5-8. Partly predatory.
▲ ***Calocoris quadripunctatus*** has similar colours but is smaller and much more oval in outline and the orange cuneus has a black tip.

▲ ***Calocoris stysi***. Light areas are yellow or pale green: cuneus always orange. 5-8, mainly in wooded areas. Feeds on the flowers and young fruits of stinging nettle, and also on aphids. Adults visit umbellifer flowers.

▲ **Lucerne Bug** *Adelphocoris lineolatus*. Tibial spines at least as long as tibial width distinguish this genus from *Calocoris*, which has very short spines. 6-10 in damp grassland, almost always on legumes although adults may attack composite flowers. A pest of lucerne in parts of C and in the USA.

△ ***Stenotus binotatus***. Both sexes yellow and black at first: with age male becomes orange and black and female becomes greyish and black. 2 black pronotal spots always present. 5-10 in rough grassland, feeding largely on flowerheads of grasses.

▲ ***Capsus ater***. Head and pronotum often black. 2nd antennal segment greatly swollen, as in all members of the genus. 6-9 in long grass everywhere, including gardens and woodland clearings. Feeds mainly on lower parts of stems.

▲ ***Heterotoma merioptera***. Inhabits dense vegetation, especially nettles and other hedgerow plants, and various trees and shrubs. Partly predatory. 6-10.

▲ ***Pantilius tunicatus***. Dull yellowish green at first, becoming reddish later. Mature insects have red patch at tip of abdomen. Clothed with short black hairs. Last 2 antennal segments very short. 9-10 on hazel, alder, and birch.

△ ***Miridius quadrivirgatus***. Cuneus not always red. Waste places and rough grassland, on wall barley and other grasses, especially where fairly damp. S & C: coastal in B.

▲ ***Stenodema laevigatum***. 1st antennal segment stout and hairy. Pronotum strongly punctate. Young adults (7-8) are pale yellow with reddish brown stripes, but stripes soon fade and bugs become browner. Hibernate as adults and become green in spring to match fresh grass, although male darker than female. Abundant in long grass of all kinds.

△ ***Notostira elongata***. Tibiae and 1st antennal segment very hairy. Pronotum smooth. 2 broods per year. Males of both broods largely black, margined with greyish or yellowish green. Summer females mainly green: autumn females pinkish brown, developing a green abdomen after hibernation. Males do not survive winter. Abundant in rough grassland.

▲ ***Teratocoris antennatus***. Varies from pale green (mainly females) to deep orange, with varying amounts of black: males generally blacker than females. Wing length variable, usually leaving part of abdomen exposed. 1st antennal segment always reddish brown. 6-10 in marshes and damp grassland. N & C.

▲ ***Leptopterna dolabrata***. Black and yellow or black and orange. Legs and antennae very hairy. Males generally fully-winged: females mostly brachypterous. Emits a very pungent odour. Abundant 5-9 in grassy places, as long as not too dry. Feeds on cocksfoot and other tall grasses: sometimes a cereal pest in north. The very similar ▲ ***L. ferrugata*** inhabits the drier grasslands.

▲ **Common Shore Bug** *Saldula saltatoria* Saldidae. Rather flat, with prominent ocelli and eyes. Rostrum 3-segmented. Predatory and, like most members of the family, living on mud at edges of ponds and ditches: very active in sunshine. Rather variable and not easily separated from its numerous relatives.

△ **Marine Bug** *Aepophilus bonnairei*. No ocelli. Always short-winged. Lives in rock crevices and among seaweeds on lower part of the shore, usually in family groups. Predatory. Atlantic, Irish Sea, and Channel coasts.

Leptopus marmoratus Leptopodidae. Resembles shore bugs but has ocelli on stalked platform. Under stones at edges of ponds and streams. S & C.

Isometopus mirificus Isometopidae. On old, lichen-covered trees, feeding on aphids and psocids. Sometimes placed in Miridae, but differs from mirids in having ocelli. S & C (southern).

Ochterus marginatus Ochteridae. A semi-aquatic bug living at the edges of rivers. Differs from true water bugs (p. 86) in having ocelli and visible antennae. Flies rapidly. Predatory, feeding mainly on fly larvae. S & C (southern).

Ochterus marginatus ×3

MIRID BUGS

Miris striatus ×2

Calocoris stysi ×2

Lucerne Bug ×2

Stenotus binotatus ×2

Capsus ater ×3

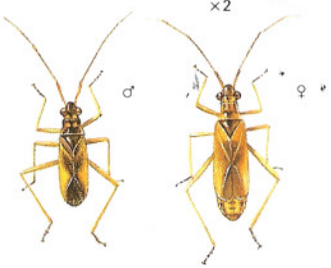
Heterotoma merioptera ×3

Pantilius tunicatus ×2

Miridius quadrivirgatus ×2

Stenodema laevigatum ×2

Notostira elongata ×2



♂

♀

Teratocoris antennatus ×3

♀

Leptopterna dolabrata ×2

Common Shore Bug ×4

Leptopus marmoratus ×3

Marine Bug ×4

Isometopus mirificus ×5

SURFACE DWELLERS Antennae clearly visible. All are predatory and are clothed, at least on the lower surface, with water-repellent hairs that prevent them from becoming wet. Most hibernate as adults.

▲ **Water Measurer** *Hydrometra stagnorum* Hydrometridae. Head very long and thin. Virtually wingless as a rule but sometimes with partly or fully developed wings. Walks slowly over surface, usually among vegetation, at margins of ponds and streams. Spears small prey with beak. △ ***H. gracilenta*** is slightly smaller and much rarer.

▲ **Common Pond Skater** *Gerris lacustris* Gerridae. Wings range from minute to fully developed. Skates rapidly over surface of still and slow-moving water, using front legs to grab other insects that fall on to the surface. Winged individuals often fly far from water to hibernate. There are several similar species.

▲ ***Aquarius najas***. Like a large *Gerris* but prefers flowing water. Usually wingless. Sides of 7th abdominal segment produced into long points, but these do not reach tip of abdomen. ▲ ***A. paludum*** is similar but usually fully-winged.

▲ **Water Cricket** *Velia caprai* Veliidae. Winged or wingless. Underside orange. On still and slow-moving waters with little vegetation, especially in wooded areas and uplands. It feeds like *Gerris*.

▲ ***Mesovelia furcata*** Mesoveliidae. Usually wingless. Runs rapidly on floating leaves of pondweeds and other aquatic plants, on which it is well-camouflaged. 7-9, feeding on small insects on or just below the surface. S & C.

SUBMERGED BUGS Antennae concealed in pits or grooves on head. Mainly carnivorous. Most hibernate as adults, or at least become quiescent for the winter, usually in mud.

▲ **Water Scorpion** *Nepa cinerea* Nepidae. Very flat. Creeps slowly over mud and vegetation in shallow water, drawing air from surface through hollow 'tail'. Catches prey, including small fishes, with raptorial front legs. Fully-winged, but few individuals ever fly. Active all year.

△s **Water Stick Insect** *Ranatra linearis*. In deep ponds with plenty of vegetation, on which it lies in wait for small prey to pass. Breathes like *Nepa*. Flies by day in warm weather. S & C.

▲ **Saucer Bug** *Ilyocoris cimicoides* Naucoridae. Fully-winged, but flightless. In weedy and muddy ponds, carrying a large air-bubble under forewings and on underside of body. Fiercely carnivorous and may pierce skin if handled.

▲ ***Aphelocheirus aestivalis*** Aphelocheiridae. Varies from micropterous to fully-winged, but usually micropterous in B. Mainly in swift streams with gravelly beds and scattered vegetation. Feeds on various young insects and may stab fingers if handled. Breathes with a plastron (p. 255) and never needs to surface.

▲ **Common Backswimmer** *Notonecta glauca* Notonectidae. Swims on its back with a large air-bubble attached to ventral surface. Dorsal surface strongly keeled. Active all year in still waters, flying readily in warm weather. Fiercely carnivorous, commonly attacking tadpoles and small fishes – and fingers! Also called water boatman. ▲ ***N. maculata*** has mottled brick-coloured forewings.

▲ ***Plea atomaria*** Pleidae. A small, back-swimming predator living in still and slow-moving water with plenty of weed. Often present in vast numbers.

▲ ***Corixa punctata*** Corixidae. One of several similar species, often known as lesser water boatmen. Swims right-way-up: dorsal surface not keeled. Middle and hind legs more or less same length. Feeds largely on unicellular algae and plant debris in weedy ponds and slow-moving water. Active all year and flies well. Males stridulate loudly during courtship, as do most species in the family.

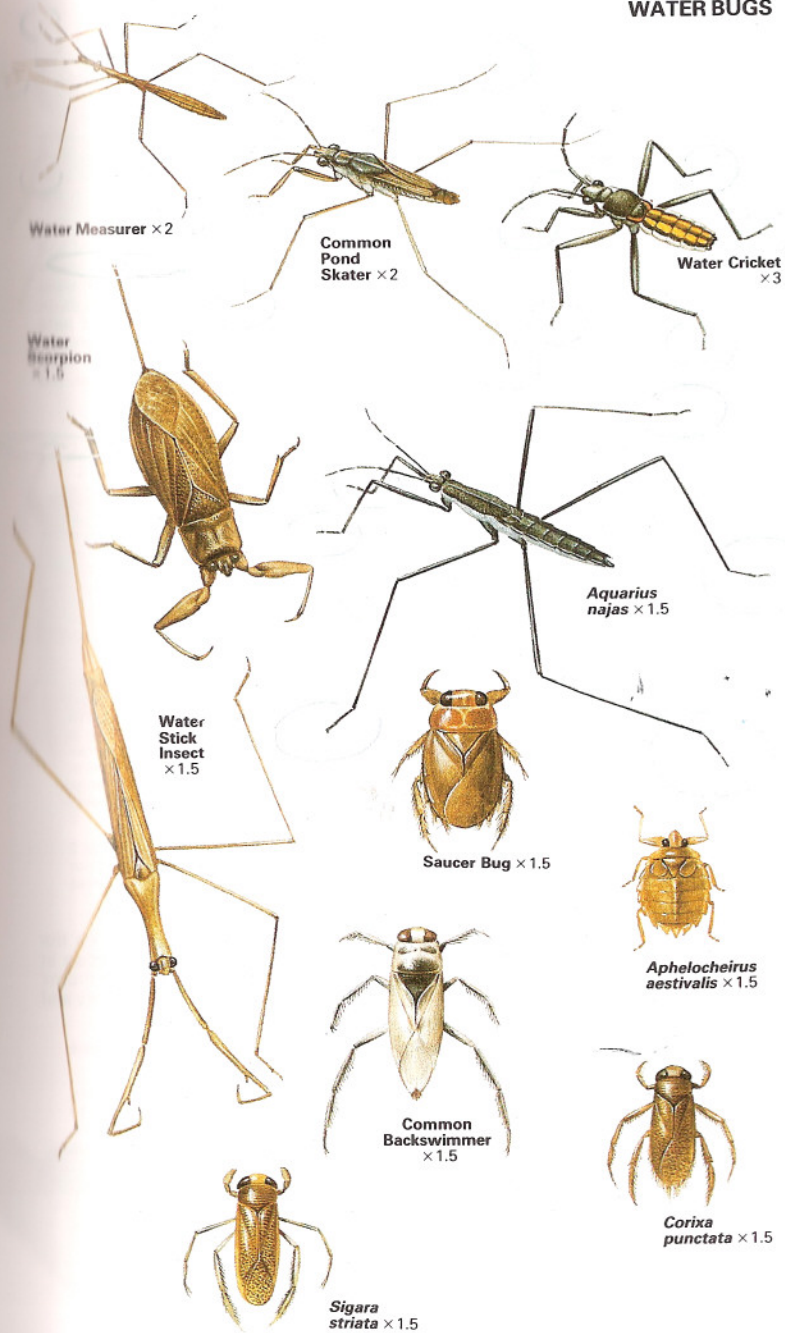
△s ***Sigara striata***. In still water. Males stridulate very loudly and can be heard yards away if placed in a shallow dish of water. There are many similar species, some very common in B. They are usually more slender than *Corixa* spp.

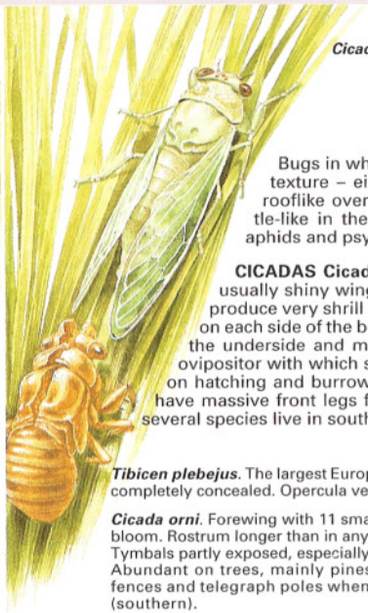
▲ ***Cymatia coleoptrata***. Distinguished from *Corixa* and *Sigara* by smaller size, unbanded pronotum, and long front tarsi. Usually micropterous. In weedy ponds and ditches, darting out to catch small prey.

Mesovelia furcata ×5

Plea atomaria ×5

Cymatia coleoptrata ×5





Cicada orni freshly emerged from nymphal skin

HOMOPTERAN BUGS

Sub-order Homoptera

Bugs in which the forewings, when present, are of uniform texture – either horny or membranous – and usually held rooflike over the body at rest. Antennae are short and bristle-like in the cicadas and hoppers but much longer in the aphids and psyllids (pp. 94-96).

CICADAS Cicadidae. Large homopterans with transparent and usually shiny wings. They live mainly on trees and shrubs. Males produce very shrill sounds by vibrating small membranes (tymbals) on each side of the body. Flaps called opercula protect the tymbals on the underside and may act as sounding boards. Female has a long ovipositor with which she lays eggs in bark, but nymphs fall to ground on hatching and burrow down to feed on roots for several years. They have massive front legs for tunnelling. The group is largely tropical, but several species live in southern Europe and one reaches B.

Tibicen plebejus. The largest European cicada, with an extremely loud song. Tymbals completely concealed. Opercula very large and overlapping. 6-9, mainly on pines. S.

Cicada orni. Forewing with 11 small dark spots. Body often covered with dense grey bloom. Rostrum longer than in any other species, reaching back to base of abdomen. Tymbals partly exposed, especially at the sides. Opercula oval and well-separated. Abundant on trees, mainly pines, 6-9. Can sometimes be seen in hundreds on fences and telegraph poles when freshly emerged and drying their wings. S & C (southern).

Tibicina haematodes. Tymbals completely exposed from above. Opercula very small and widely separated. 2 spines on front femur. Extensive reddish colour on pronotum. Costa and basal parts of other veins very red. 6-9 on various trees. S & C (southern).

△s ***Cicadetta montana***. Tymbals completely exposed from above. Opercula rather small. Pronotal colour and pattern vary, but usually dark. Front femur with 3 spines, the posterior one sloping sharply forward. 5-8 in woodland clearings and scrubby places, on a wide range of shrubs and herbaceous plants, but possibly now extinct in B. Song is soft and warbling and easily missed. ***C. argentata*** is very similar but has larger opercula and much more red on the pronotum. Wing veins are distinctly paler than in *montana*. Scrubby areas 6-9. S. ***C. pygmea***, the smallest species, lives on a wide range of trees and shrubs, especially oaks, pines, and junipers. 6-9. SW. ***C. tibialis*** is similar to *pygmea* but with very bright red bands on the abdomen. SE.

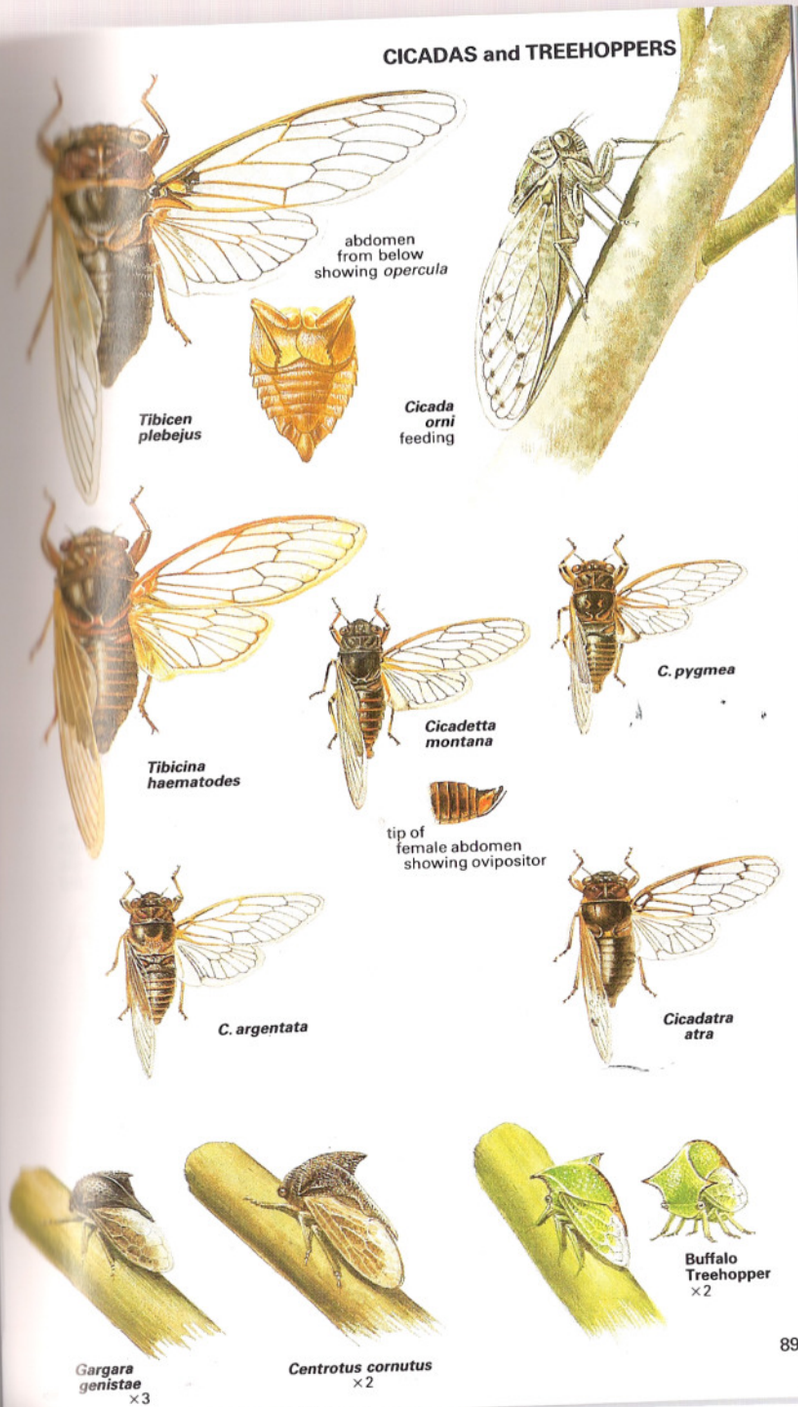
Cicadatra atra. Tymbals partly exposed from above and from the sides, as in *C. orni*. 2 dark spots near tip of forewing. Pronotum with extensive yellow mottling. Front femur with three or four spines, the basal one being the longest. 6-9 on a wide range of trees and shrubs. S.

TREEHOPPERS Membracidae. A large family of jumping bugs in which the pronotum extends back over the body. Mainly tropical, with only 4 species in western Europe. Pronotum often ornate, frequently resembling prickles or thorns in tropical species and thereby affording protection. Nymphs are rather spiky and pointed at the rear.

△s ***Gargara genistae***. Rear extension of pronotum straight, reaching about half way back along the abdomen. 6-10 on broom and other leguminous plants.

▲ ***Centrotus cornutus***. Pronotum horned on each side, horns being larger in south than in north. Rear extension of pronotum sinuate on lower edge and reaching back to about tip of abdomen. 4-8, on a variety of herbs and shrubs in wooded habitats. ***Acanthophyes chloroticus*** resembles *Centrotus* but is much shorter and pronotum is usually brown or yellowish. 5-8 on various herbs and shrubs. S.

Buffalo Treehopper *Stictocephalus bisonia*. Green fades to dirty yellow after death. Rear extension of pronotum wider than in the other species and completely covering scutellum. 7-9 on a wide range of woody and herbaceous plants: often causes damage to apples and other fruit trees by laying eggs in bark of twigs. An American species now widely distributed in S & C (western).



FROGHOPPERS Cercopidae. Jumping homopterans, mostly brown, in which the hind tibiae are rounded and bear just a few spines. This distinguishes them from the cicadellids (p. 92), which have many spines. Antennae arise from between the eyes. Forewings horny and pitted. Hindwings have a peripheral vein, at least in hind region. Nymphs of most species live in masses of froth, giving rise to their other common names of spittle bugs and cuckoo-spit insects.

▲ ***Neophilaenus lineatus***. Forewings light or dark brown, generally with a pale stripe along the costa. Basal half of costa more or less straight. 6-9 on grasses: dark form generally in cooler and damper areas. There are several similar species.
Lepyromia coleoptrata. Yellow to dark brown. Costal margin of forewing very convex. 5-9 on grasses in marshes and damp grassland. N & C.

▲ ***Aphrophora alni***. Pronotum has central keel. Forewing may lack one or both pale patches on costal margin: whole wing may be darker. 5-10 on many kinds of trees and shrubs. There are several similar species.

▲ **Common Froghopper** *Philaenus spumarius*. Ground colour basically buff, with a very variable dark pattern: occasionally dark all over. Abundant 6-9 on a wide range of woody and herbaceous plants.

▲ ***Cercopis vulnerata***. Anterior margin of pronotum straight, not arching forward between eyes as in other cercopids. Nymphs live communally on roots, surrounded by solidified froth. 4-8 on various plants, mainly in wooded areas. S & C. There are several similar species on the continent.

▲ ***Cixius nervosus*** Cixiidae. Forewings membranous with well-defined veins. Hindwings without peripheral vein. Pronotum yellowish brown with prominent lateral keels. Scutellum dark brown or black with 3 keels. 5-10 on various trees. There are several similar species.

▲ ***Issus coleoptratus*** Issidae. Forewings rather horny with a network of cross-veins. Hindwings smoky brown with no peripheral vein. Pronotum bulges strongly forward between eyes: hind margin almost straight. 5-10 on various trees and in moss. Several similar species live on the continent, mainly in S.

△s ***Tettigometra impressopunctata*** Tettigometridae. Forewings horny and distinctly pitted: veins weak. Hindwings with no peripheral vein. Hind tibia with an apical circlet of spines. On dry grassland, hibernating as adult. S & C: mainly on sand dunes and chalk in B. Many similar species live on the continent, mainly in S.

Dictyophara europaea Dictyopharidae. Becomes yellowish after death, but easily identified by conical head and network of veins towards tip of forewing. 6-10 on a wide range of herbaceous plants, especially umbellifers. Leaps strongly. S & C.

Bursinia genei. 6-9 on a wide range of shrubby and herbaceous plants. S.

Family Delphacidae. A family of small hoppers, distinguished from similar groups by a large movable spur at apex of hind tibia. Forewings rather tough: hindwings with no peripheral vein. Antenna springs from a notch in lower margin of eye. Sexes are often very different. Most species have brachypterous and fully-winged individuals.

△ ***Delphax pulchellus***. Female usually brachypterous, with few dark marks on forewing. Latter reaches about half way along abdomen. 6-9 on reeds in marshy places and on river banks.

▲ ***Megamelus notula***. Forewings may be almost entirely brown: sometimes fully-winged. 4-10 in marshy habitats. Absent from most of S.

▲ ***Delphacodes pellucida***. Forewings always reach at least to tip of abdomen in male: long or short in female. Pronotum and scutellum may be black. 5-9 in grassland nearly everywhere. There are many similar species.

△ ***Asiraca clavicornis***. Front and middle legs broad and flat. 1st antennal segment long and broad. Scutellum with 4 keels. 4-10 in damp, grassy places. S & C.

△ ***Stenocranus minutus***. Always fully-winged. Forewings transparent and iridescent, with prominent veins. Dark patch often indistinct, but may cover inner half of wing. On grasses in many habitats.

△ ***Delphacinus mesomelas***. Lateral keels of pronotum arched round eyes. Long-winged form equally common. 6-8 in wooded and scrubby areas, especially on broom.
Tropidocephala elegans 1st two antennal segments very short. Head, pronotum, and scutellum green or yellow. Scutellum with 3 keels. 5-10 in well-vegetated habitats. S.

FROGHOPPERS and PLANT HOPPERS