



*Euchorthippus declivus* × 1.5

***Euchorthippus declivus*.** Forewings short in both sexes, usually with a clear white stripe. Flightless. Side keels of pronotum almost straight. Song a prolonged succession of short croaks, each consisting of a few distinct pulses. Abundant in both dry and damp grassland, including woodland clearings and montane pastures. 6-10. S & C.

***Gomphocerus sibiricus*.** Male immediately identified by swollen front tibia. Female has no swelling and less strongly clubbed antennae. Pronotum usually clearly humped in front half and often with a clear X-shaped mark on top. Song begins with well-separated chirps, getting quicker, rather like the rapid winding of a watch, and then becomes a constant loud call reminiscent of a small cicada: this lasts for up to a minute and then dies away with a few more short chirps. 7-9. Montane pastures, mainly in Alps and Pyrenees.

***Chorthippus scalaris*.** Usually dark brown: sometimes green. Male has greatly enlarged front region of forewing. Median area of forewing enlarged in both sexes, with prominent parallel cross-veins in male and irregular cross-veins in female. Hindwings dark. Song starts with slow build-up of short croaks, getting quicker and louder until it becomes a constant rattle like a free-wheeling bicycle. This lasts about 10 secs and is punctuated by short, higher-pitched notes. Both sexes rustle loudly in flight. 7-9. Montane pastures from southern Sweden southwards.

***Dociostaurus maroccanus*.** Pale to dark brown. Side keels of pronotum form a cross with pale outer edges. Central keel clearly cut by transverse sulcus. Female up to 37mm long. Song a soft staccato croak, not unlike a clock ticking. 4-10 in a wide range of habitats. Becomes gregarious and develops into a serious pest in some years, especially in Corsica and Italy and other parts of the far south. The gregarious form has less strongly marked forewings and a less clear white cross on the thorax. S & C.

**Small Gold Grasshopper *Chrysochraon brachypterus*.** Flightless, with short pink or golden green forewings in both sexes – mere lateral flaps in the female. Body with a bright, silky lustre. Song of repeated short buzzing sounds, rather like striking matches. 6-9. Short turf and stony places, wet or dry, in the mountains. S & C.

**Large Gold Grasshopper *C. dispar*.** Sharply angled forehead. Male forewing distinctly oval. Flightless, with greatly reduced hindwings. Female is often pale brown. Song a very harsh, ratchet-like chirp, lasting about 1 sec and repeated at short intervals. Heathland, woodland clearings, hedgerows, and damp grassland. 6-9.

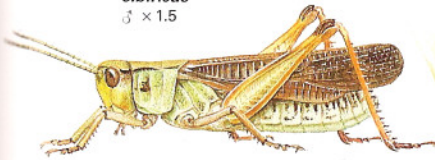
**Stripe-winged Grasshopper *Stenobothrus lineatus*.** Mainly green, sometimes with brown forewings and legs. Median area of forewing enlarged, with prominent parallel cross-veins. Female usually with white stripe near front edge of forewing. End of abdomen orange-red when mature. Song a rather high-pitched whine, lasting 10-20 secs and with a marked rhythmic rise and fall in volume. The male's hind legs move remarkably slowly during stridulation, but he has up to 450 pegs on each femur and the pitch thus remains high. Warm, dry grassland, especially on limestone. 6-10. S & C.

***Paracinema tricolor*.** Stridulatory pegs on forewing. Pronotum with a straight, dark stripe on each 'shoulder'. Forewings become clear towards the tip. Hind tibiae red with black-tipped white spines. Female 30-40mm, male only 25mm. Rustles in flight. Moist grassland. Quite rare in most places, but not uncommon in the rice fields of the Camargue, where it causes some damage. 7-10. S.

## GRASSHOPPERS



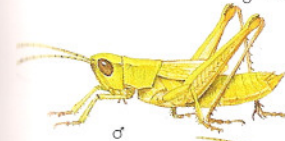
*Gomphocerus sibiricus*  
♂ × 1.5



*Chorthippus scalaris*  
♂ × 1.5



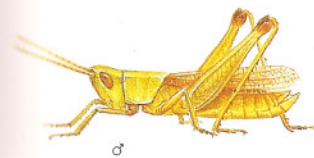
*Dociostaurus maroccanus*  
♂ × 1.5



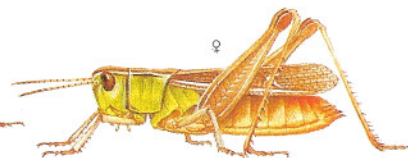
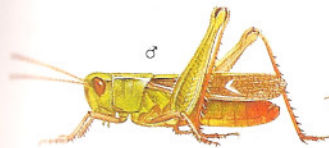
Small Gold Grasshopper × 1.5



Large Gold Grasshopper × 1.5



Stripe-winged Grasshopper × 1.5



*Paracinema tricolor*







**FLASH COLOURS.** Several grasshoppers have brightly coloured hindwings. When disturbed, they fly on an erratic course and flash their colours. A bird chasing one of these insects latches on to the colourful 'hunting image', but then the grasshopper drops to the ground, covers its hindwings, and 'disappears', leaving the bird searching in vain for a colourful object. Human observers are often deceived by this flash coloration and even mistake the grasshoppers for butterflies. Most of the

colourful species, including all those on this page, have stridulatory pegs on the forewings, but stridulation is at best very weak.

***Psophus stridulus.*** Central keel of pronotum quite pronounced and not crossed by the sulcus. Hind femur smoothly curved on upper edge. Greyish brown to black. Female forewings only just reach tip of abdomen. Both sexes produce a grating sound. They also produce a rustling noise in flight, especially loud in the male, and the species has been called the rattle grasshopper. Rough grassy places, mainly in upland areas. 7-10. Southern Scandinavia southwards.

***Acrotylus insubricus.*** Hairy. Large head stands above pronotum, especially in male. Pronotum knobby in front half; hind margin  $\pm$  rounded, not sharply pointed. Brown to black. Dry places, especially on sandy soils; common on sand dunes. All year in warm-est regions; hibernates elsewhere and active mainly 3-11. S.

***Oedipoda germanica.*** Superficially like *Psophus*, but central keel clearly interrupted by sulcus. Upper edge of hind femur has a distinct notch just beyond the middle. Light or dark brown. Rough ground in dry, sunny places, including roadsides and cultivated land. 7-11. Locally common in S & C.

***O. caerulescens*** is similar but has blue hindwings. Forewings and body grey or brown. Commoner and more widely distributed than *germanica* in warm, dry places; often on sand dunes. 7-11. S & C.

***Oedaleus decorus.*** Head large and rounded. Strong central keel on pronotum, hardly or not at all interrupted by sulcus. Usually a distinct white cross on top of pronotum. Body and forewings green or brown. Hot, dry places. 6-10. S & C.

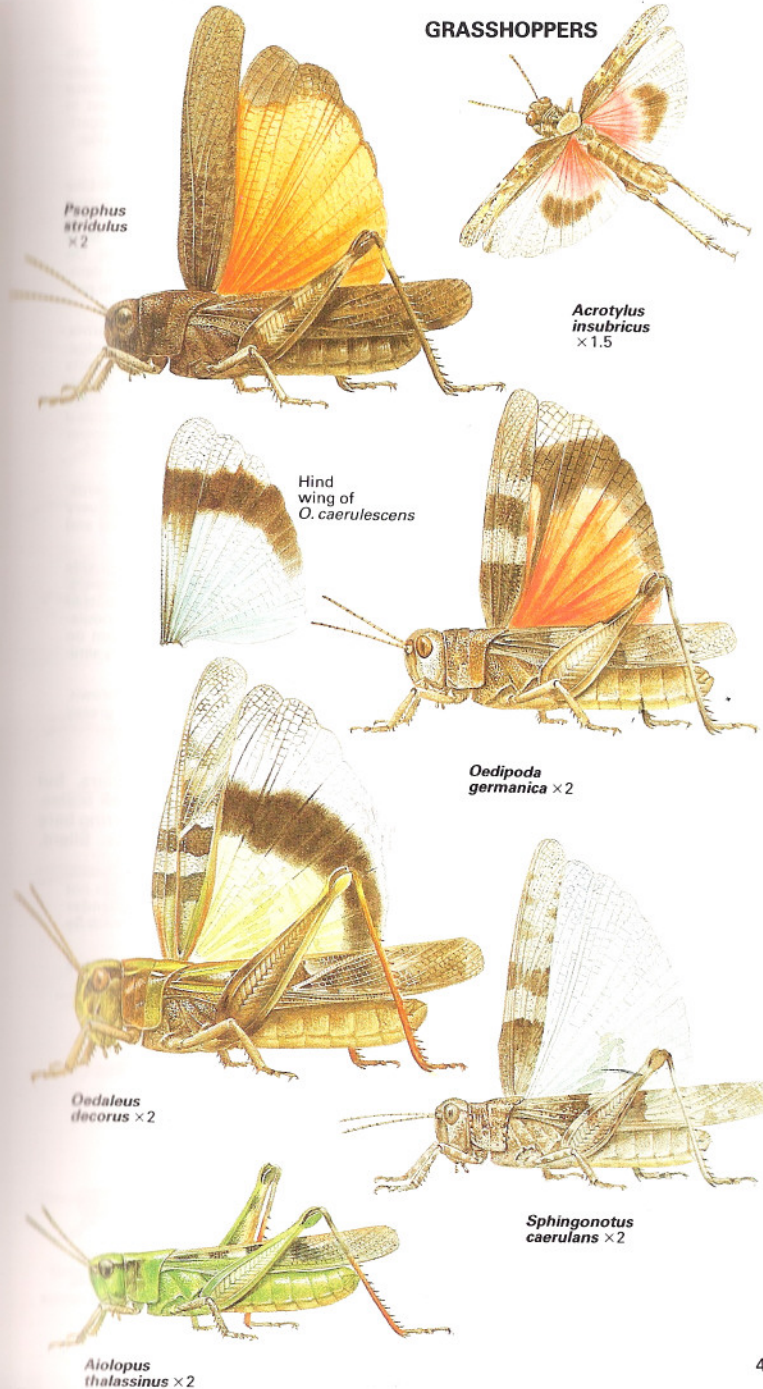
***Sphingonotus caerulans.*** Central keel of pronotum very weak and present only in hind region. Forewings clear and distinctly membranous towards tip. Hindwing with no trace of black band. Hind femur with just one complete pale band on inner surface. Warm, sandy places. 6-10. S & C.

***Aiolopus thalassinus.*** Pronotum with weak central keel and no side keels. Proportion of green and brown very variable. Hindwings colourless. Stridulatory pegs on forewing. Grassland and woodland clearings, especially where damp; also on cultivated land. 3-10, but may be all year in far south. S & C.



***Bryodema tuberculata.*** Side keels virtually absent; central keel prominent only at front. Disc very flat; hind end  $\pm$  right-angled or obtuse. Surface markedly rough. Rustles in flight. Mainly sandy places. 7-10. N & C.

## GRASSHOPPERS



*Psophus stridulus*  
 $\times 2$

*Acrotylus insubricus*  
 $\times 1.5$

Hind wing of  
*O. caerulescens*

*Oedipoda germanica*  
 $\times 2$

*Oedaleus decorus*  
 $\times 2$

*Sphingonotus caerulans*  
 $\times 2$

*Aiolopus thalassinus*  
 $\times 2$



△ **Migratory Locust** *Locusta migratoria*. Solitary phase has swollen pronotum with arched central keel. Male, often brown, averages only 35mm long. Female usually green. Flies rapidly. Stridulatory pegs on forewing. Male screeches loudly in presence of female. Dense vegetation, including cultivated land, but not a serious pest in Europe. 7-11: sometimes through winter in far south. S & C: rare visitor to B. Gregarious phase, more rarely seen in Europe, is greyish brown or yellowish: sexes ± alike.

nymph of Egyptian grasshopper



showing reversal of wing buds



Underside of *Podisma* thorax showing peg

△ **Egyptian Grasshopper** *Anacridium aegyptium*. Like gregarious phase of *Locusta*, but clearly distinguished by indented pronotal keel, striped eyes, and a blunt peg under the thorax between the front legs. Male about 35mm long; female 50-65mm. Flies well. On trees and shrubs in warm, dry areas. Causes little damage. Silent. All year. S: sometimes carried north in produce. Nymphs are bright green or orange-brown.

**Brown Mountain Grasshopper** *Podisma pedestris*. Pronotum with straight or smoothly curved rear edge. A peg between front legs. No stridulation, but insects make crackly sounds by rubbing jaws together. Flightless. Male is quite sprightly, but heavier female drags herself over the ground. Stony, sparsely vegetated places in mountains, usually above 1000m, but lower in north: often near snow line. 7-10.

**Pezotettix giornai**. Hairy. Peg between front legs is tongue-like and bent backwards. Central keel runs length of pronotum: side keels only in front half. Forewings very short in both sexes. Grey to reddish brown or almost black. Dry, scrubby places and cultivated land. Silent. All year in S: 6-10 in southern C.

**Calliptamus italicus**. Peg between front legs. Very blunt forehead. Central and side keels well developed: pale stripes on side keels and forewings not always present. Hind femur reddish pink internally, with three dark spots: middle and posterior spots of equal size. Male 14-25mm long, with long curved cerci: female 22-40mm. No stridulation, but male 'sings' by rubbing jaws together. Common and often abundant on grassland and cultivated areas: sometimes a pest. 7-11. S & C. *C. barbarus* is very similar, but middle spot on hind femur is much larger than others.

**Acrida ungarica**. Unmistakable shape, with blade-like antennae. Green or brown. Female 50-70mm long, much stouter than male and often mottled. Damp, grassy places, including coastal marshes. Silent. 7-10. S.

**GROUNDHOPPERS Family Tetrigidae** Superficially like grasshoppers, but pronotum extends back to tip of abdomen. Forewings reduced to small scales, but hindwings usually well developed. Active all year in sunshine, preferring bare and sparsely-vegetated ground. Eat mosses and other small plants. Silent. Several species in Europe: 3 in Britain.

▲ **Common Groundhopper** *Tetrix undulata* is pale brown to black. Hindwings do not reach tip of pronotum. Heaths, open woods, and other dry places. ▲ **Slender Groundhopper** *T. subulata* has a relatively longer pronotum and hindwings reach its tip. Pale brown to black. Flies and also swims well. Damp places.

*T. depressa* has central keel only in front half of pronotum, and two dark depressions near centre. Damp places, including seashores. S & C.

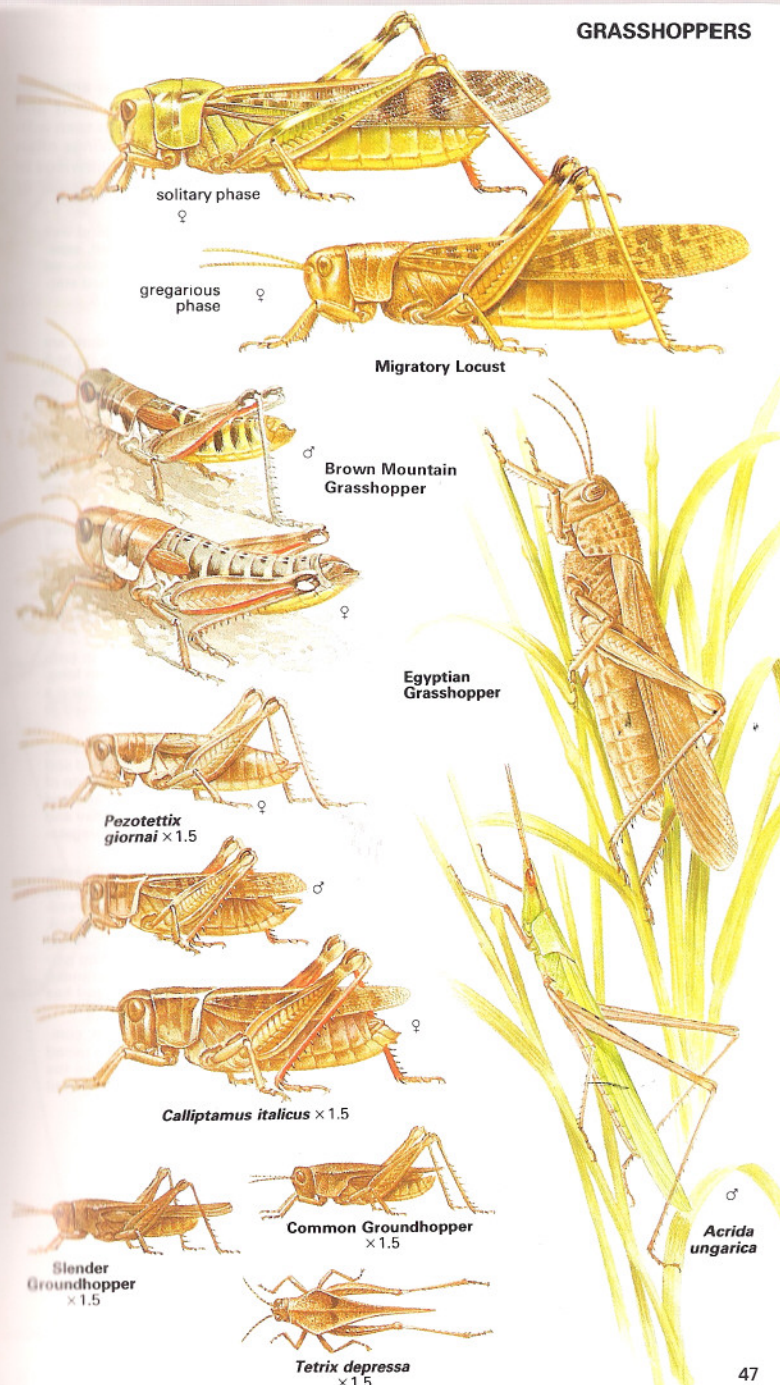


*Calliptamus italicus*



hind end of male, showing large cercus

## GRASSHOPPERS



solitary phase ♀

gregarious phase ♀

Migratory Locust

♂ Brown Mountain Grasshopper

Egyptian Grasshopper

♀ Pezotettix giornai × 1.5

♀ Calliptamus italicus × 1.5

♂ Common Groundhopper × 1.5

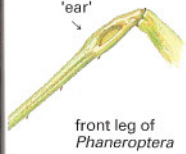
♂ Slender Groundhopper × 1.5

♀ Tetrix depressa × 1.5

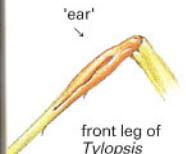
♂ Acrida ungarica



**BUSH-CRICKETS** Family *Tettigoniidae* Orthoptera with long, slender antennae and 4-segmented tarsi. Female has a blade-like ovipositor, either short and strongly-curved like a sickle or long and sabre-like. Mated female often seen with a gelatinous spermatophore attached to base of ovipositor (p. 39). Wings often short and sometimes absent, but male usually retains enough of his forewings to produce his song. An ear on each face of the front tibia. Many are crepuscular or nocturnal insects.



front leg of *Phaneroptera*



front leg of *Tylopsis*



ovipositor of *I. pyrenea*

***Phaneroptera nana***. Ear on front tibia is oval. Hindwings extend well beyond forewings at rest. Side lobe of pronotum well-rounded, especially on hind margin. Insect covered with tiny dark, often rust-coloured dots. Ovipositor short and strongly curved. Song a high-pitched staccato ticking, mostly at night. On a wide range of bushes. 8-10. S.

***P. falcata*** of C. Europe is almost identical.

***Tylopsis liliifolia***. Like *Phaneroptera* but side lobes of pronotum are rectangular and 'ears' are slit-like. Green or brown. Antennae up to 5 times body length. Ovipositor short and curved. Song of 2-4 weak chirps, like striking a match, repeated irregularly; mainly at night. Scrubby places (brown form) and grassy areas (green form). 7-10. S & C.

***Isophya pyrenea***. Stout, with many tiny red dots on back. Forewings very small in both sexes, those of female half covered by pronotum. Song is a very weak squeak, like turning a cork in a bottle. Grassy places in mountains: mainly ground-living. 5-8. S & C. Many similar species in SE.

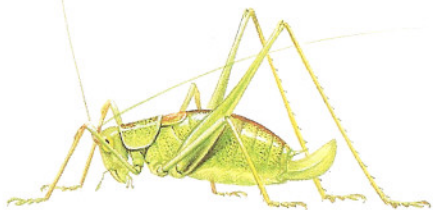
***Barbitistes fischeri***. Bright green when young, becoming heavily speckled and then almost black as it matures: always shiny. Forewings very short in both sexes, those of male inflated as in *Leptophyes*. Song a series of 20-40 feeble grinding sounds, produced over a period of 10-20 secs and repeated at irregular intervals; mainly at night, although insect often active by day and enjoys sunbathing. On trees and shrubs: often abundant and sometimes damaging vines. 5-8. SW.

***Polysarcus denticauda***. Heavy-bodied. Forewings very short in both sexes and almost entirely hidden in female. Ovipositor 15-25mm long, curved towards apex and toothed at tip. Male cerci very large. Song a prolonged series of soft but monotonous metallic chirps, produced in sunshine. Montane pastures. 6-9. S & C.

▲ **Speckled Bush-cricket** *Leptophyes punctatissima*. Densely speckled, with very short forewings in both sexes, those of the male inflated and perched saddle-like on the back. A narrow brown line along the top of the abdomen. Song a very short and feeble scratching sound repeated every few seconds: interval gets shorter as temperature rises: day and night. Superbly camouflaged on nettles, brambles, and other vegetation, including many garden plants. 7-11. S & C.

▲ **Oak Bush-cricket** *Meconema thalassinum*. Fully winged in both sexes, often flying to lights at night, although flight is rather weak. Male has long curved claspers. Ovipositor about 9mm long and gently curved. No stridulation, but male drums gently on leaf surface with hind foot. Forewings are raised while doing this and sound can be heard several metres away. Inhabits a wide range of deciduous trees, including garden apples. Rarely seen by day. 7-11. ***M. meridionale***, a Mediterranean species recently established in southern Britain, is flightless and has wings less than half the body length.

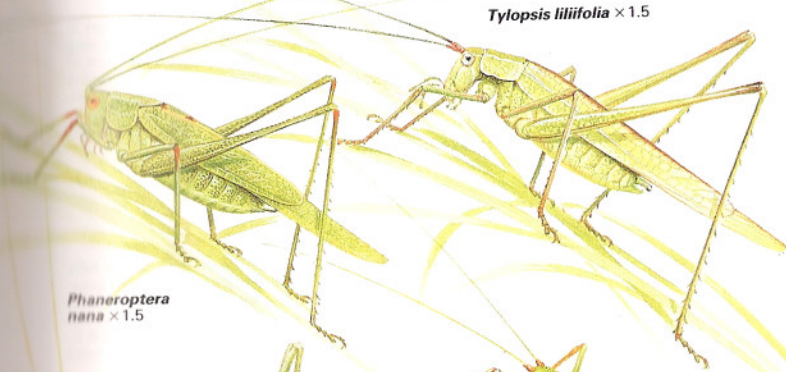
***Cyrtaspis scutata***. Readily identified by the enlarged pronotum, completely covering forewings in both sexes. Hind end of pronotum raised in male. Pale green to pinkish grey. Song very feeble, rather like the ticking of a watch. On trees and shrubs. 8-12: sometimes surviving until spring in mild years. S: mainly western.



Speckled Bush-cricket ♀ × 1.5

**BUSH-CRICKETS**

*Tylopsis liliifolia* × 1.5

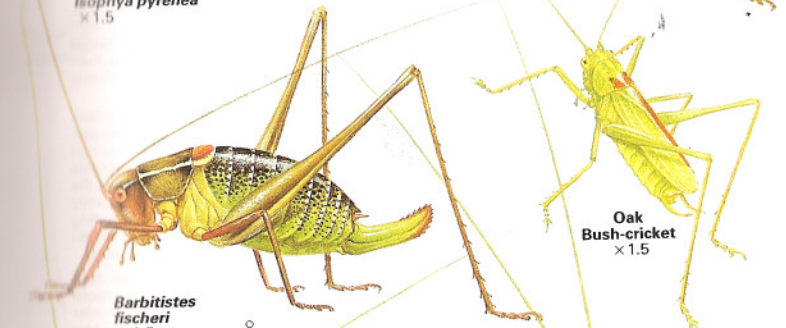


*Phaneroptera nana* × 1.5



*Isophya pyrenea* × 1.5

Speckled Bush-cricket × 1.5



*Barbitistes fischeri* × 1.5

Oak Bush-cricket × 1.5



*Polysarcus denticaudata*

*Cyrtaspis scutata* × 2





Short-winged Conehead



Long-winged Conehead

△s **Short-winged Conehead** *Conocephalus dorsalis*. Forewings short in both sexes; hindwings vestigial. Ovipositor 8-11mm long. Song long bursts of faint high-pitched sound consisting of alternating periods of hissing and ticking – like a knife-grinding machine when the blade is alternately pressed firmly and lightly against the wheel. Marshes, river-banks, and other moist grassland. More active by day than by night, but hard to see when stretched along reed stems and leaves. 7-10. Mainly coastal in Britain.

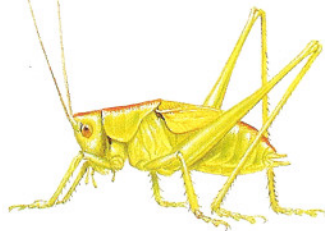
△s **Long-winged Conehead** *C. discolor*. Resembles *dorsalis* but is fully winged and ovipositor is longer and nearly straight. Both species occasionally all brown. Song long bursts of high-pitched, quiet sound of constant tone – like a distant knife-grinder. Mainly diurnal in areas of tall grass and other rough vegetation, both dry and moist. 7-10. S & C. Restricted to a few southern, mainly coastal localities in Britain until recently but now extending its range inland.

**Ruspolia nitidula**. Green or brown. Fully winged. Head acutely pointed. Ovipositor longer than abdomen and almost straight. Song a prolonged and strident sound: very loud, like a knife grinder or even an alarm clock ringing at a low pitch: strictly nocturnal. Mainly in damp places, such as river-banks, with tall grass or other dense vegetation. Sits more or less vertically on leaves and stems. 7-10. S & C.

▲ **Great Green Bush-cricket** *Tettigonia viridissima*. The largest British bush-cricket. Fully winged, but not a great flier. Stridulatory area of male forewings always brown and about 1/6th of total wing length. Ovipositor about 20mm long and slightly down-curved: just reaching tip of forewings. Song loud and harsh, like a sewing machine, continuing for long periods with short breaks every few seconds. Becomes active in afternoon and carries on for much of the night, with peak of activity in the evening. In trees, shrubs, and rough vegetation in general. Can bite hard if handled, in common with most large species. 7-10. **T. cantans** is similar, but forewings shorter and more rounded, with stridulatory area covering about 1/4 of total length. Ovipositor straight and reaching well beyond tip of forewings. Song more rasping than *viridissima*, starting slowly and then increasing in speed and volume: continuous for long periods. 7-10, mainly in upland areas.

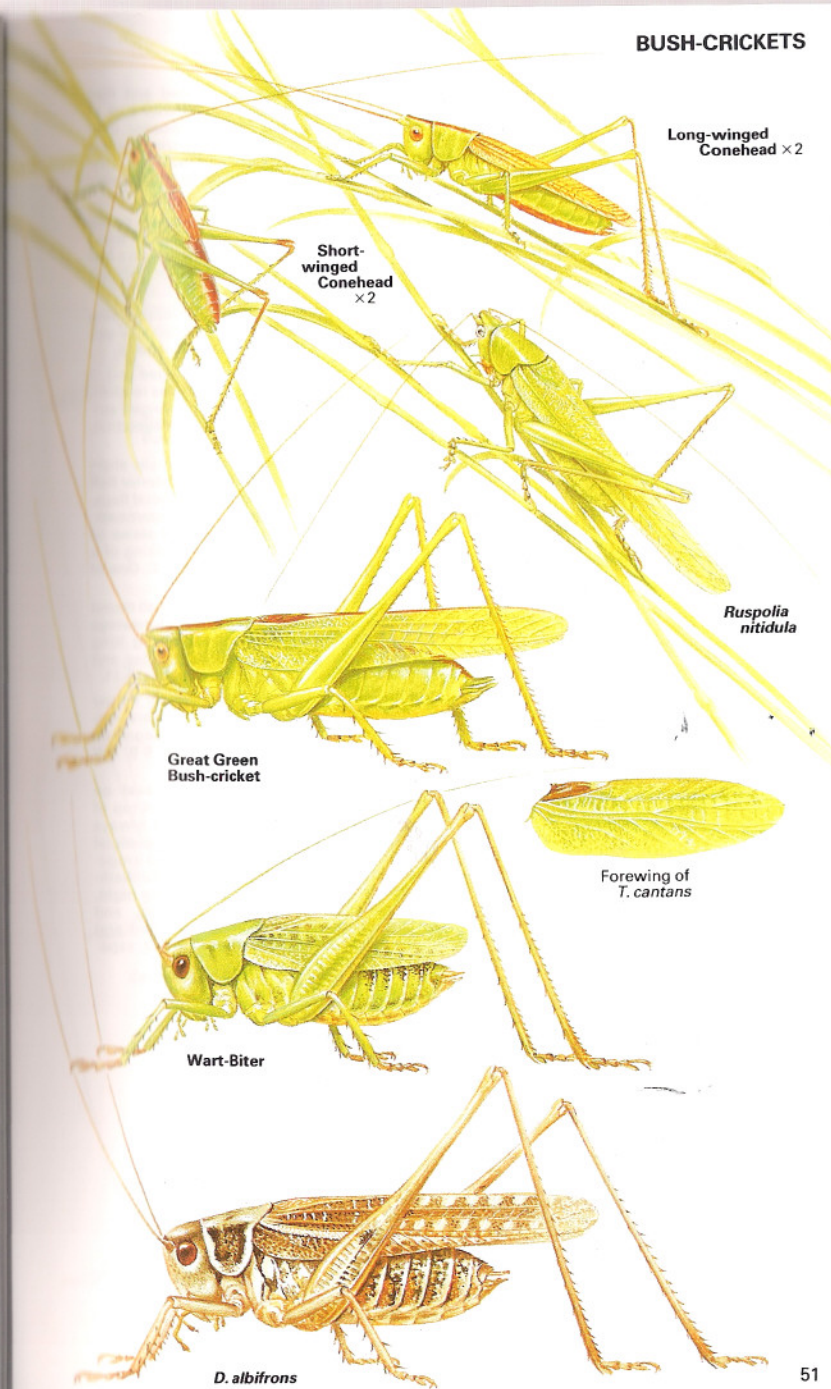
△s **Wart-Biter** *Decticus verrucivorus*. Green or brown, often heavily mottled. Pronotum flat, with central keel running its whole length. Fully winged. Ovipositor about 20mm long, with very gentle upward curve. Named because once used in Sweden to bite warts from the skin. Song long bursts of clicking sounds, starting slowly and then speeding up to resemble the sound of a free-wheeling bicycle: continues for several minutes. Mainly diurnal, usually singing only in sunshine. Open grassy places, including marshy habitats, heaths, and montane pastures. 7-10. Very rare in Britain and confined to just a few localities in southern England (green form only).

**D. albifrons**. Similar to *verrucivorus*, but larger and never green: face very pale. Song very high-pitched, beginning with isolated chirps more like a bird than an insect but then speeding up and becoming louder and finishing with a strident ratchet-like sound. Diurnal in dry, scrubby habitats: sometimes a pest of cereals and fruit crops. 7-11. S.



This Great Green Bush-cricket nymph shows the characteristic bright green colour and brown dorsal stripe. The reversed wing-buds, typical of the later nymphal stages of orthopterans, are clearly visible.

## BUSH-CRICKETS



Long-winged Conehead ×2

Short-winged Conehead ×2

*Ruspolia nitidula*

Great Green Bush-cricket

Forewing of *T. cantans*

Wart-Biter

*D. albifrons*