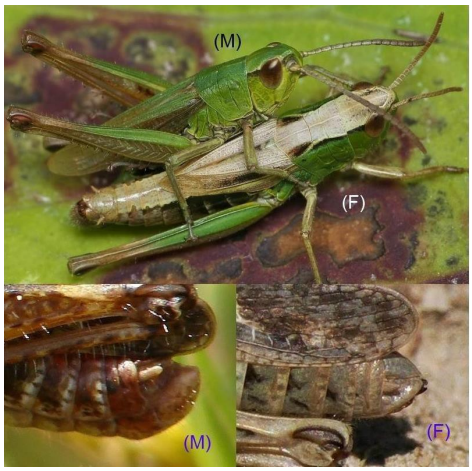
A Guide to the Shropshire Orthoptera and Dermaptera

by David W. Williams

Excluding escapes and naturalised aliens (eg Egyptian grasshopper, house cricket) thirteen species of Orthoptera (grasshoppers, crickets etc) and three species of Dermaptera (earwigs) have been recorded in Shropshire. Two further species currently occur in adjacent counties. Cockroaches & mantids (Dictyoptera) are also included within the 'orthopteroid' insects (as are phasmids). Britain has three native species of cockroach, but it is unlikely that any of them will turn up in Shropshire (though there are old records of Oriental cockroach, an established alien inhabitant of artificially heated places). This guide is intended to cover all the species likely to be encountered in the field in Shropshire.

Orthoptera; Caelifera: grasshoppers (5 spp.), groundhoppers (2 spp.)

Grasshoppers are insects of high Summer. They overwinter as eggs, hatch in Spring and mature during June and July, persisting into Autumn.
Groundhopper life-cycles are more variable. They overwinter as either nymphs or adults and can be found as adults in any month of the year, though there is a peak of activity in Spring.



Sexing Grasshoppers

Identification of grasshoppers can sometimes be helped if the gender of the insect is established. Several features separate the sexes. The main picture, left, shows a pair of meadow grasshoppers. Notice that the male is smaller than the female, but has obviously longer antennae. This is true of all British grasshoppers. He also has relatively larger eyes and longer wings, though these differences can be very subtle in some species (in meadow grasshoppers, females have particularly short wings).

The lower pair of photographs show the difference in the abdominal tips of the two sexes (in this case both are mottled grasshoppers). Males' abdomens tend to be snub & upturned, whereas females' taper more evenly from both above and below.

Singing grasshoppers can be assumed to be male. In fact both sexes can sing. However female song is very quiet & rarely heard, being used only in courtship, as a signal to the male that she is ready to mate.

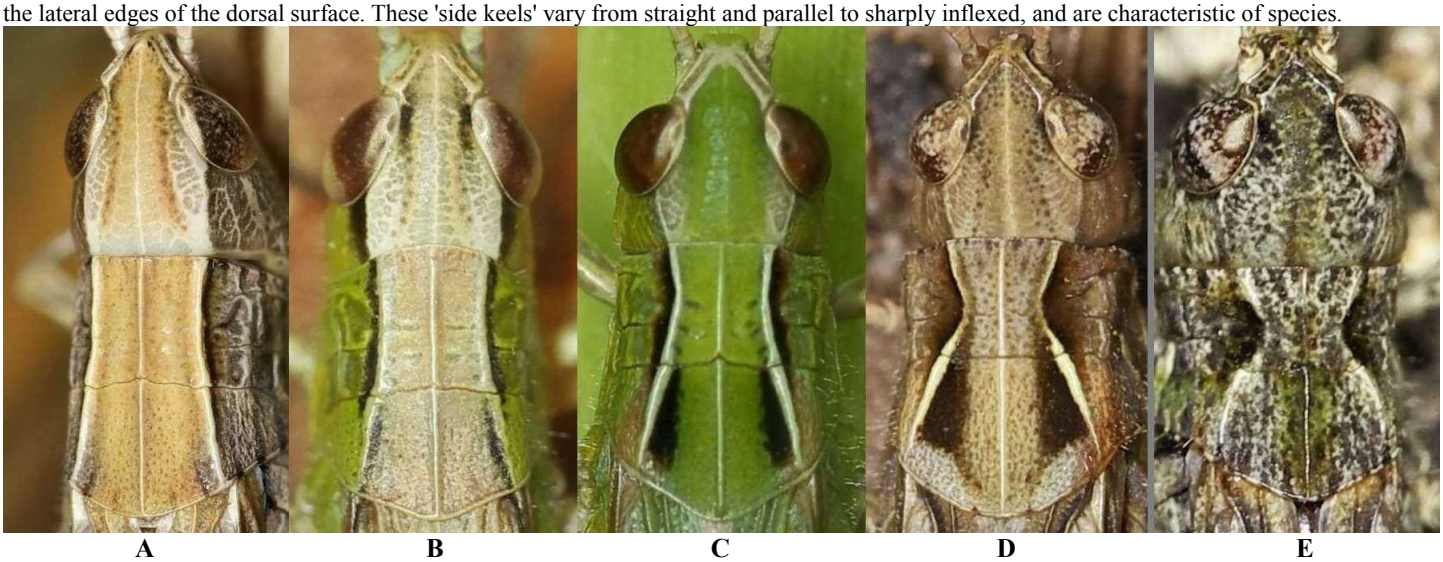
Grasshopper Wings

Late instar nymphs can look quite similar to adults. They are best told by their wings, which in nymphs are present only as 'wing buds'.
Adult female meadow grasshoppers typically have very short wings, which can lead to confusion with nymphs.
Top left: adult female meadow grasshopper. Note that the wings have 'adult' venation ie a network of veins enclosing many small cells.
Top right: late instar nymph (field grasshopper). Note the wing buds, which lack a defined network of veins and cells. All four wings are at least partly visible, whereas the hind wings are always hidden by the fore wings in adult meadow grasshoppers. The wings are reversed, with the hind wings lying on top of the fore wings and the costa (stiffened 'leading edge') uppermost.

Meadow grasshoppers are typically flightless. However, a fully winged form can occur. It is uncommon, but worth being aware of where high population densities occur. Both males and females produce forms with longer wings than normal and which are capable of flight.
Bottom left: long-winged male meadow grasshopper (with missing leg).
Bottom right: typical male meadow grasshopper, with wings distinctly shorter than abdomen.

Grasshopper Pronota

In most cases, grasshoppers are most easily identified by their songs. But perhaps the single most important visual identification feature is the pattern on the dorsal surface of the pronotum (saddle-shaped plate behind the head). Three ridges run along it; one on the dorsal midline, the other pair on the lateral edges of the dorsal surface. These 'side keels' vary from straight and parallel to sharply inflexed, and are characteristic of species.



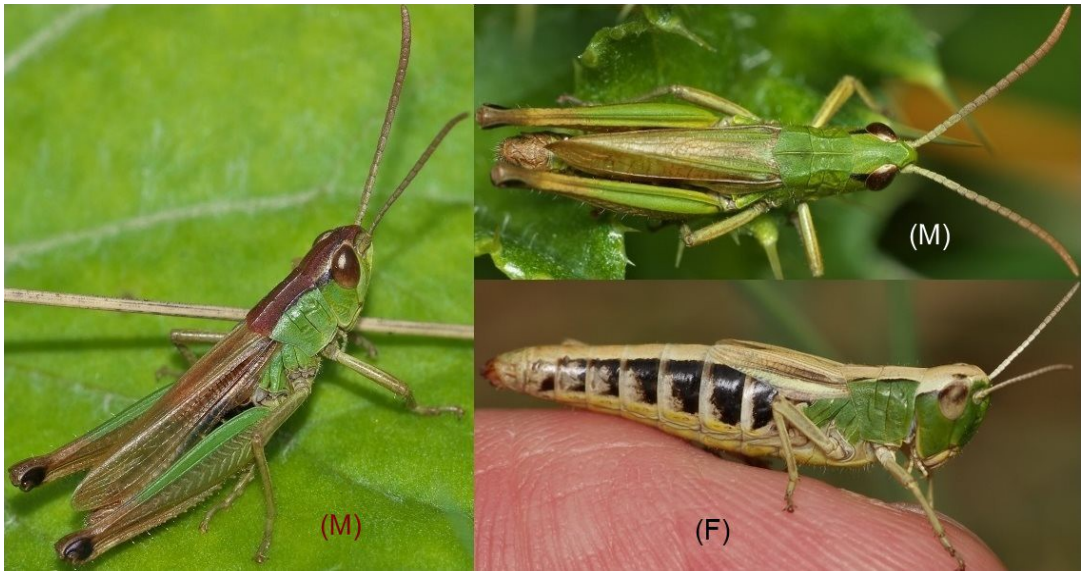
A **B** **C** **D** **E**

A: lesser marsh grasshopper (straight & parallel or slightly incurved). **B**: meadow grasshopper (slightly incurved; on average slightly more curved than lesser marsh). **C**: common green grasshopper (strongly incurved). **D**: field grasshopper (strongly inflexed. Note also that black 'wedges' stop well short of rear edge of pronotum). **E**: mottled grasshopper (strongly inflexed, on average slightly more so than field grasshopper).

Having reached an initial identification based on the pronotum, next consult the following species accounts for further confirmation.

COMMON GREEN GRASSHOPPER
Omocestus viridulus

- Male 17mm +/- 2mm. Female 20mm +/- 3mm.
- Typically green, but can be combinations of green / brown / purple. Female is always green dorsally at least, but may be otherwise coloured on sides.
- **No red** on abdomen.
- Wide range of lush, grassy habitats. Avoids dry / parched areas.
- Probably commonest Shrops sp. (with *C. brunneus*).
- Earliest grasshopper sp to mature, usually during June (about 2 wks earlier than *C. brunneus*).
- Song: long (10-30s) bursts of ticking, like a free-wheeling bicycle. Recordings here: http://www.orthoptera.org.uk/account.aspx?ID=41



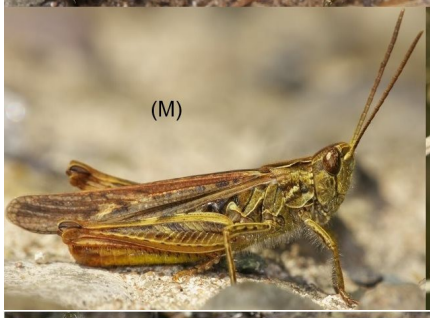
MEADOW GRASSHOPPER
Chorthippus parallelus

- Male 13mm +/- 3mm. Female 20mm +/- 3mm.
- Britain's only **flightless** grasshopper, but can produce winged individuals at high population densities.
- Commonly at least partially green, but can be brown / purple; immensely variable.
- Male: relatively small. Usually **black / very dark hind 'knees'** (but variable). Wings usually shorter than abdomen.
- Female: typically **brachypterous**, with wings less than ½ length of abdomen. Fully winged forms do occasionally occur. See 'Grasshopper Wings' section. Note female in photo is missing a hind leg!
- Wide range of damp & dry grassy habitats.
- Song: 1 – 3 sec burst of dry, rattlesnake-like rattling. Recordings: http://www.orthoptera.org.uk/account.aspx?ID=44

LESSER MARSH G/HOPPER
Chorthippus albomarginatus

- Male 15mm +/- 2mm.
- Female 19mm +/-2mm.
- Generally subdued colours; dull browns & greens, but brighter individuals & purple forms do occur.
- Male: wings usually a little shorter than abdomen (variable). Knees not as strongly darkened as *C. parallelus*.
- Female: fully winged, but wings usually distinctly shorter than abdomen. Typically with a **white stripe** along leading edge of forewing (but variable & also sometimes present on other spp, esp *C. brunneus*).
- Formerly strongly associated with damp habitats, but has expanded its range into dry grassland.
- Song: soft, short burrs (c. ½ sec), repeated 3 or 4 times at 1 to 2 sec intervals. The male then moves position before repeating. Rather similar to *C. brunneus*, but chirps slightly longer & softer. Recordings: http://www.orthoptera.org.uk/account.aspx?ID=45

NOTE: this species was only discovered in Shropshire in 2013. See 'Recording' section re: acceptance of records.



FIELD GRASSHOPPER, *Chorthippus brunneus*

- Male 17mm +/- 2mm. Female 22mm +/- 3mm. Largest Shrops. sp.
- Typically sandy brown; usually **not** green. However, green & purple forms do occur and it is, inevitably, very variable.
- Both sexes are quite densely **hairy** on the underside of the thorax, though this is not easy to see in all lights.
- Almost always with **red/orange colouration on abdomen** (usually stronger in males).
- Dry / parched grassy places usually with a short, sparse sward eg road verges. Avoids lush, damp vegetation.
- Song: short burrs (c. ½ sec), a little like the sound of riffling a pack of cards, repeated at 1-2 sec intervals. Similar to the song of *Chorthippus albomarginatus*, but the burrs are slightly shorter & harder. Recordings: http://www.orthoptera.org.uk/account.aspx?ID=42

MOTTLED GRASSHOPPER, *Myrmeleotettix maculatus*

- Male 13mm +/- 1mm. Female 16mm +/- 3mm.
- Cryptic mixtures of browns, greens, greys & black (& sometimes purples). Generally 'busy', with spots & stripes.
- A **small** species, with a relatively large head.
- Male: **clubbed antennae**. Red colouration on abdomen.
- Female: antennae slightly thickened towards tip (can be hard to discern).
- Dry, parched, hot habitats with bare ground, eg south-facing slopes. Intolerant of shade or damp. A habitat specialist; *C. brunneus* is the only other grasshopper likely to be found in association with this species.
- Song: bursts of sound lasting 10-20 sec, starting very quietly & steadily increasing in volume before stopping abruptly. The sound has a swishing / wiping quality, a little like the sound of sandpapering. Recordings: http://www.orthoptera.org.uk/account.aspx?ID=48

GROUNDHOPPERS

Superficially similar to small grasshoppers, groundhoppers differ from them in several ways. Most obviously, the pronotum extends backwards over the entire abdomen, or beyond it. Both sexes have a leaf-shaped structure at the abdominal tip. In males this is is smooth edged, but in females it is serrated. They do not sing. Perhaps surprisingly, they are strong & willing swimmers. Groundhoppers are insects of bare ground with a covering of mosses or algae, upon which they feed. They are small, inconspicuous and cryptically coloured. Like grasshoppers, they are extremely variable in colour & pattern. The best way to find them is to walk slowly through suitable habitat, watching for small insects jumping around your feet.

COMMON GROUNDHOPPER, *Tetrix undulata*

- Male 8 to 9mm. Female 9 to 11mm.
- Pronotum extends to tip of abdomen.
- Bulky appearance, with very pronounced central keel on pronotum.
- Flightless.
- Habitat: **dry or damp** ground as above.

SLENDER GROUNDHOPPER, *Tetrix subulata*

- Male 9 to 12mm. Female 11 to 14mm.
- Pronotum & wings extend 3 to 5mm beyond tip of abdomen.
- Slightly smaller & slimmer than *T. undulata*, but extended pronotum gives greater overall length.
- Fully winged & capable of flight.
- Restricted to bare ground in **damp** habitats, eg pond margins, damp woodland rides. However, flies readily & may turn up in seemingly unsuitable habitat.

Upper picture: © Sarah Barnes.
Lower pictures: *T. subulata* swimming in a ditch.

Orthoptera; Ensifera: bush crickets (6+2 spp.)

Like grasshoppers, bush crickets overwinter as eggs. However, they hatch later in Spring and do not mature until late July or August, persisting into late Autumn (frosts permitting). They are characterised by their long hind legs and, especially, very long antennae. They are much less variable than the Caelifera; some bush crickets hardly exhibit any variation in colour or pattern, whilst others may have two distinct colour forms. Females are readily identified by their prominent ovipositors. Some flightless species produce fully-winged, dispersive forms at high population densities. Their songs are higher pitched than grasshoppers' and become inaudible to ageing human ears; a bat-detector can be used to detect their calls. Note that in the following accounts, lengths quoted are overall frons to tip of abdomen, *excluding* ovipositor, cerci & (where longer than abdomen) wings.

DARK BUSH CRICKET *Pholidoptera griseoaptera*

Male 16mm +/- 4mm. Female 17mm +/- 4mm.
Always brachypterous & flightless. Female almost wingless.
Shade of brown can vary from greyish to chestnut. Females tend to be paler & less contrastingly marked.
Habitat: tall herbage, scrub. Typically found on bramble; in Shropshire freq. found in stands of Indian balsam on banks of Severn.
Song: short, harsh chirps, repeated every 3-4 sec, 22 kHz. At age 42 I had no problem hearing this sp.
Recordings: http://www.orthoptera.org.uk/account.aspx?ID=13

L: male; R: female; INSERT: young nymph

ROESEL'S BUSH CRICKET, *Metrioptera roeselii*

Male 17mm +/- 4mm. Female 18mm +/- 4mm.
Usually brachypterous, but can produce a fully-winged, flying form.
Two colour forms: 'brown' & 'green'.
Side-flaps of pronotum with **yellow edge all around.** Sides of thorax with **yellow spots**. Dark **herringbone pattern** on hind femora.
Habitat: rank grassland. Males sing from a concealed position in tall herbage (eg half way up a thistle).
Song: long, continuous, even 'reeling' churr, like the sound of a wind-up toy, or crackling power lines. 20 kHz. At age 42 I had no problem hearing this sp.
Recordings: http://www.orthoptera.org.uk/account.aspx?ID=16

L: male, brown form; R: male, green form;
INSERT: young nymph © Joe Botting.

BOG BUSH CRICKET, *Metrioptera brachyptera*

Male 15mm +/- 3mm. Female 17mm +/- 4mm
Usually brachypterous; rarely produces a fully-winged, flying form.
Two colour forms: 'green' (more common) & 'brown'.
Side-flaps of pronotum with **pale/buff rear edge only. Black stripe** on hind femora.
Habitat: restricted to wet heathland, with cross-leaved heath & purple moor-grass, & below 250m altitude. In Shrops, found on northern mosses & Catherton Common in the south, though absent from much of the latter due to altitude. Also an old record from Hodnet Heath.
Song: short chirps repeated at a rapid, even tempo (2 – 6 per sec). 25 kHz. Somewhere between the ages of 39 & 42 I lost the ability to hear this species. Recordings: http://www.orthoptera.org.uk/account.aspx?ID=15

L: female, brown form © Maria Justamond. R: female, green form. INSERT: young nymph © Tim Melling.

SPECKLED BUSH CRICKET, *Leptophyes punctatissima*

Male 13mm +/- 4mm. Female 15mm +/-3mm.
Always brachypterous & flightless.
Unvarying in appearance. Always covered in fine black spots. Small nymphs resemble aphids or capsid bugs, but with black spots & very long antennae.
Habitat: scrub, overgrown hedgerows etc. Often in asscociation with *P. griseoaptera*. Strong association with brambles. Adults will ascend high into the tree canopy where the opportunity arises.
Song: Virtually inaudible, even to people with perfect hearing. Very short, soft chirps, 40kHz. With a bat detector these chirps are audible at c. 30m range & sound a little like the alarm call of a stonechat. Recordings: http://www.orthoptera.org.uk/account.aspx?ID=21

L: male; R: female; INSERT: young nymph © Maria Justamond.

OAK BUSH CRICKET, *Meconema thalassinum*

Male 15mm +/- 2mm. Female 15mm +/- 3mm.
Fully winged & flies readily. Appearance unvarying.
Nocturnal & **arboreal.** Attracted to light; may enter houses, moth-traps (or rest in uplit foliage above them) etc.
Habitat: Wide range of broad-leaved trees, esp oak & lime. Nymphs seem to be beaten out more often than adults, presumably because they are more numerous. Females descend from the canopy after dark to oviposit in bark on the tree trunk, where they may be discovered by torchlight. If held in the torch beam they may drop to the floor.
Song: Does not stridulate. Male drums on leaf with foot (= inaudible!).

L top & btm: male; Mid: female; R: final instar nymph

SOUTHERN OAK BUSH CRICKET, *Meconema meridionale*

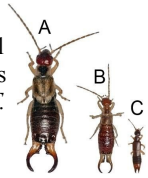
Male 13mm +/- 2mm. Female 14mm +/- 2mm.
Very similar to *M. thalassinum* in appearance & habits, except that it is **flightless** and almost completely **wingless.**
Adults should be easily separable from *M. thalassinum* due do vestigial wings. Nymphs of *M. thalassinum* may cause confusion, but note that a) pairs of red & black markings on the pronotum are only present in adults of the two spp, and b) nymphal wing buds are quite structurally distinct, lacking a defined network of veins & cells, with all four wings visible & wings reversed. See also 'Grasshopper Wings' section, where comments apply equally to crickets.
Discovered in UK in 2001, this species is spreading rapidly & has been recorded in Wales & the English Midlands. There are no Shrops records (as at end 2013). Being flightless, its spread is presumably human-assisted; as such it may turn up anywhere.
See 'Recording' section re: acceptance of records.
L top: female; L btm: male; R: male. All *M. meridionale* images © Sarah Barnes

LONG WINGED CONEHEAD, *Conocephalus fuscus (= C. discolor)* (Note: *C. fuscus* is the currently preferred name, but almost all literature still uses *C. discolor.*)
Male & female 19mm +/-3mm.
Fully winged & capable of flight. Typically with wings reaching to tip of abdomen, but extra-macropterous forms are common, with wings much longer than abdomen. Adults in photographs are extra-macropters. Typically green with brown dorsal stripe; a pale brown form occurs rarely.
Male: in side view, cerci almost **straight** & uniformly tapered**.**
Female: long, **straight ovipositor.**
Habitat: Rough, dry or damp grassland / reeds etc. May be found in association with *M. roeselii* or *C. dorsalis.*
Song: 30kHz: at the limit of human hearing, but easily heard at 25m range with bat-detector. Continuous, fast-paced hissing tick. Recordings: http://www.orthoptera.org.uk/account.aspx?ID=17
This species was first discovered in Shropshire in 2013 (at one site). See 'Recording' section re: acceptance of records.
Pictures: L top & btm: extra-macropterous male; Mid: extra-macropterous female; R: final instar male nymph.

SHORT WINGED CONEHEAD,
Conocephalus dorsalis

Male 14mm +/- 3mm. Female 15mm +/- 3mm.
Usually brachypterous & flightless, with wings varying between ½ & ¾ length of abdomen. However, a long-winged, flying form occurs which can be easily confused with *C. fuscus.* Typically green with brown dorsal stripe; a pale brown form occurs rarely.
Nymphs of the two conehead spp. are very similar. *C. fuscus* nymphs might be mistaken for adult *C. dorsalis*, but the nymphal wing buds are quite distinct on close inspection. See 'Grasshopper wings' section, where comments apply equally to crickets. Also, the dorsal stripe on nymphs is almost black.
Male: in side view, cerci reduce abruptly in diameter towards tip, which is **upturned.** Female: **curved ovipositor.**
Habitat: reedbeds & other **damp** habitats eg rush-meadows, pond margins etc.
Song: Similar to *C. fuscus* but even higher-pitched (40kHz) & with an intermittent secondary sound, which is slower-paced. The overall effect is of someone periodically offering a knife to a grinding wheel and then withdrawing it. Bat detector essential.
Recordings: http://www.orthoptera.org.uk/account.aspx?ID=18
There are no Shropshire records for this species (as at end 2013). It is present in Worcestershire. See 'Recording' section re: acceptance of records.
Pictures: L: male; Mid: female; R top: *C. fuscus* male cerci; R btm: *C. dorsalis* male cerci. All *C. dorsalis* images © Sarah Barnes.

Order Dermaptera: earwigs: (3 spp.)



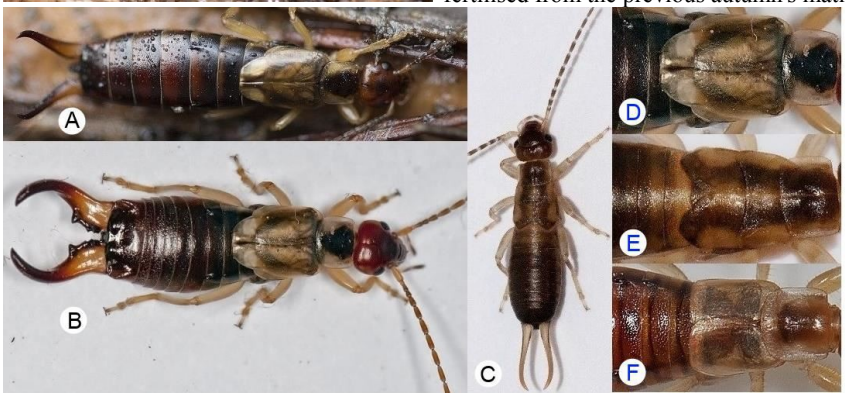
The common earwig, *Forficula auricularia* is one of the most ubiquitous insect species in Britain. Most aspects of its lifestyle are well understood. The lesser earwig, *Labia minor,* is probably also common and widespread, though much more specialist in its requirements. In contrast, less is known about Lesne's earwig, *Forficula lesnei.* Its life-cycle is assumed to be similar to that of *F. auricularia* though little is certain. All earwigs are very under-recorded.

Right: life-sized (printed at A4) images: **A** = *F. auricularia* ♂; **B** = *F. lesnei* ♂; **C** = *L. minor* ♀

COMMON EARWIG, *Forficula auricularia*

Earwigs are notable for the level of maternal care given to eggs and young nymphs. This is known to occur in *F. auricularia* & *L. minor* and assumed to occur in other earwig species. In *F. auricularia*, mating occurs in the autumn. Females then retreat to a nest chamber, where they lay a batch of eggs. This chamber will be formed somewhere moist & dark, eg under a rock. Females tends their eggs ceaselessly, licking them to keep them free of mould. This behaviour continues throughout the winter, nymphs hatching in spring. Young nymphs continue to be guarded by their mother until their second or third instar. The superb photograph (© Keith Lugg) shows a female *F. auricularia* with eggs & hatchlings. Keith discovered her tending the eggs in early December 2011; the photograph was taken at the end of the following March, by which time the eggs were beginning to hatch. She had therefore been tending them for nearly four months at least.

The fate of males is uncertain. They are not seen in spring, so it seems that they do not survive the winter. However, males have hibernated successfully in artificial conditions, & been discovered in the wild in January. Also, females sometimes lay a second brood of eggs in spring. These are presumably fertilised from the previous autumn's mating, but the possibility of spring males cannot be ruled out.



Size: Head/body 10-15mm. Forceps: ♂ 2.5-8mm; ♀ 2.5mm. 'Macrolabic' males (with extra-long forceps up to 8mm long) occasionally occur.

Fully winged, but only flies rarely.

Nymph: only late instar nymphs develop wing buds, but at all stages are identified by their **long, slender forceps**.

A: adult ♀. **B**: adult ♂ **C**: final instar nymph.

D: *F. auricularia* adult thorax, showing hind wing tips projecting beyond elytra. **E**: *F. auricularia* final instar nymph thorax, showing wing buds, which form a characteristically 'w' shaped rear edge. **F**: *F. lesnei* adult thorax, showing absence of visible hind wings.

A © Megan Asche. **B, C, D, E** & **F** © Keith Lugg.

LESNE'S EARWIG, *Forficula lesnei*

Size: Head/body 6-10mm. Forceps: ♂ 2.5-3mm; ♀ 2mm.

Significantly smaller than *F. auricularia.* Overall bright **chestnut colour.** Flightless, with hind wings either absent or concealed beneath elytra. Confusable with similarly sized *F. auricularia* nymphs – see above for distinguishing features.

Adults are generally found from July to November. Nocturnal. More warmth-requiring than *F. auricularia* & at northern edge of its range in Shrops. Even in Surrey it is best searched for on south-facing slopes & sheltered spots (Baldock, 1999). Hedges, scrub & rank vegetation in such places should be beaten or swept for it. In Worcs, Gary Farmer notes an association with traveller's joy, *Clematis vitalba,* & this is also mentioned by Baldock. Has been found hibernating in hollow plant stems eg hogweed, *Haracleum sphondylium.*

See 'Recording' section re: acceptance of records.

Pictures: top: ♀; btm: ♂. Both pictures © Keith Lugg.

LESSER EARWIG, *Labia minor*

Size: Head/body 4-7mm. Forceps: ♂ 0.75-1.25mm; ♀ 0.5-1.0mm

Very small. Male forceps straighter than *Forficula* spp. males', enclosing an oval rather than a circle. Somewhat similar in appearance to a small rove beetle. Fully winged & flies readily by day & night. Attracted to light; may enter houses, moth traps etc.

Lives within moist heaps of organic matter which generate heat eg manure & compost heaps (esp. horse manure). Continuously brooded & may be found in any life stage at any time of year. Due to habitat, very under-recorded! I therefore reproduce the following from *Grasshoppers and Crickets of Surrey*: "Dig about 6" into the heap, where it is moist & warm. The earwig... will probably dive into the manure as soon as it is exposed... as soon as you see it dive, grab the manure & put it onto a (white sheet) & then wait for it to crawl out. John Widgery told me of this method & I found my first specimen in the heap... in my own garden within 5 minutes, in spite of my previously searching (it) intermittently for about 20 years" (Baldock, 1999). Picture: adult ♀ © Joe Botting.

RECORDING

Please email records to me (Shrops County Recorder) at dw1971@btinternet.com Ideally records should include date, OS grid reference or clear locality, name of recorder, brief habitat details & anything else of interest. NOTE that records for lesser marsh grasshopper, southern oak bush cricket, the two coneheads and Lesne's earwig may not be accepted without good photographs or other physical evidence. Roesel's bush cricket records may be queried if recorded in bog bush cricket habitat.

ACKNOWLEDGEMENTS & FURTHER READING Though I have rarely referenced the below sources, I have borrowed heavily from them all.

A Photographic Guide to the Grasshoppers & Crickets of Britain & Ireland, Martin Evans & Roger Edmondson (WGUK, 2007). A superb book; magnificent photographs, and contains everything you need to know about the British Orthoptera. Relatively portable & inexpensive. Excludes the related orders.

Grasshoppers and Crickets of Surrey, David W. Baldock (Surrey Wildlife Trust, 1999). Will nearly suffice as an ID guide in its own right. Also covers earwigs & cockroaches & contains a wealth of useful information on fieldcraft, bat detectors etc. A must (doesn't include southern oak bush cricket, as not discovered until 2001).

Grasshoppers and Allied Insects of Great Britain and Ireland, Judith A. Marshall & E.C.M. Haes (Harley Books, 1988). Has an accompanying audio tape of calls (sold separately). Remains the standard work; very comprehensive though some nomenclature & maps are out of date. Excludes southern oak bush cricket.

New Naturalist: Grasshoppers and Crickets, Ted Benton (Collins, 2012). Thorough treatment of the Orthoptera, with a very useful accompanying DVD.

Gary Farmer's website for Worcestershire Orthopteroids is a useful resource: http://worcestershireorthoptera.weebly.com/

The website of the national Orthoptera Recording Scheme is at http://www.orthoptera.org.uk/