IDENTIFYING LAND SNAILS

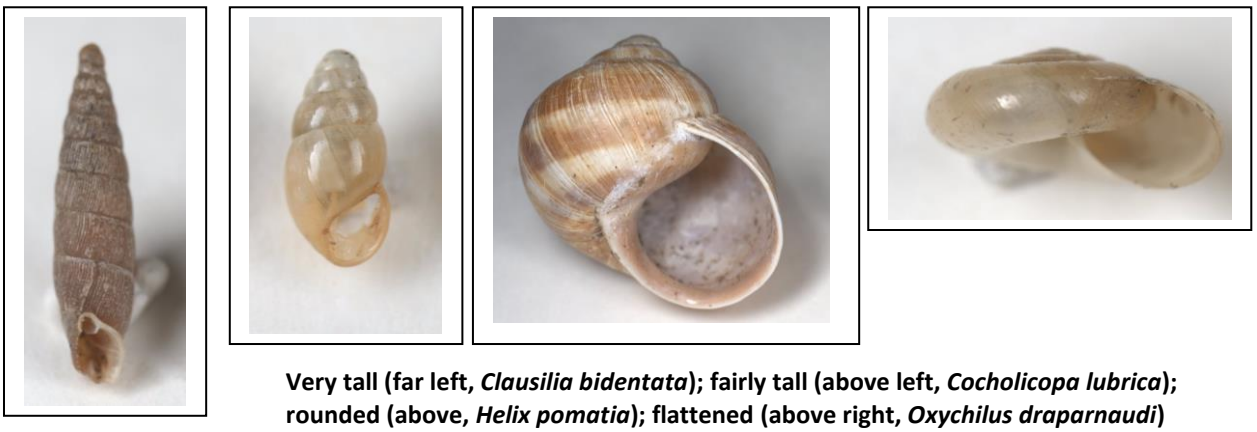
Brian Eversham **Version 2.1** **February 2016**

This key is an updated, expanded and illustrated version of one I first produced in July 1999 and have amended several previous training workshops. The previous, unillustrated, versions were partly based on the Conchological Society's *Paper for Students No. 3, Key to Land Snails,* written by the late A E Ellis in 1964 and revised in 1974. I had added quite a few species not included in Ellis's key, changed the structure of the key, described many features in less technical language, and added additional features, especially for many of the tricky species-pairs.

Useful identification features

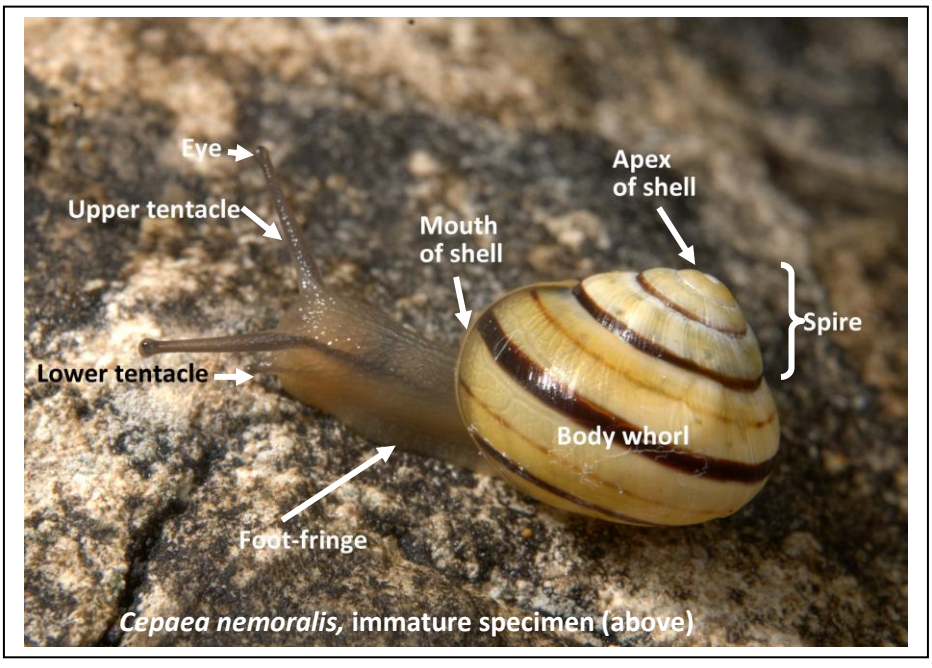
The following photographs shows the main features used in the keys.

Overall shape, which may be expressed as the ratio of height to breadth: it may be tall and thin (height much greater than breadth), approximately round (height and breadth about equal), or flattened (much broader than tall):



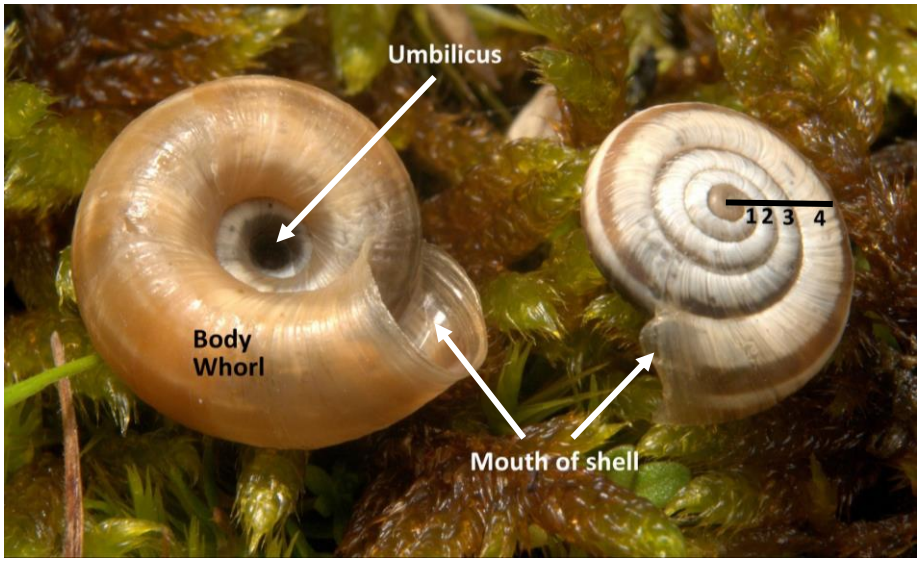
Very tall (far left, *Clausilia bidentata*); fairly tall (above left, *Cocholicopa lubrica*); rounded (above, *Helix pomatia*); flattened (above right, *Oxychilus draparnaudi*)

There are a few **technical terms** in naming the parts of a snail:

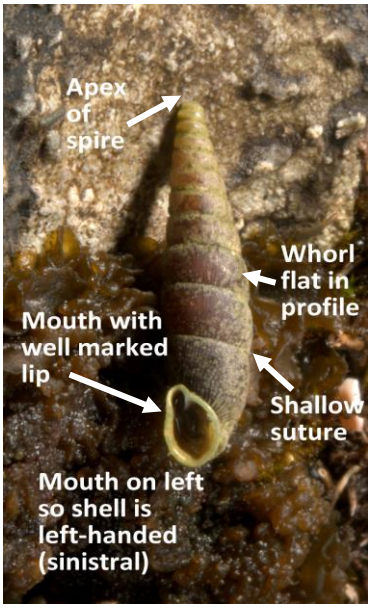


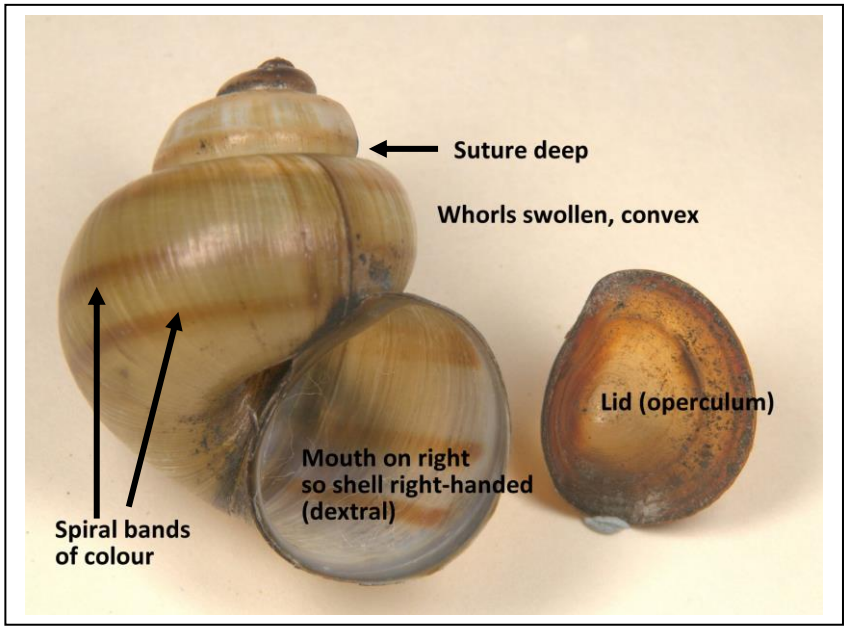
***Cepaea nemoralis,* immature specimen (above)**

***Helicella itala,* two immature specimens (below). The last, widest, twist of the shell is the body whorl. The hole in the middle of the spiral is the umbilicus (Latin for 'navel'). The right-hand specimen shows how to count whorls: start at the middle, ignore the half-coil of protoconch (original shell laid down before hatching), which is usually a different texture and/or colour from the rest of the shell. Then imagine a line from there to the outer edge, count the turns from there. In this case, there are four full whorls, and about a quarter whorl beyond the line.**



The **direction in which the shell is coiled** is important too. In 'left-handed' (sinistral) shells, if the top of the spire points upward, and the opening of the mouth faces you, the mouth is on the left side; if 'right-handed' (dextral), spire upwards, mouth facing you, mouth on the right. In some species, each whorl lines up neatly with the previous one, to give a smooth outline and flattened whorls. In others, each whorl bulges or juts out step-like giving a broken outline and deep sutures (the line where successive whorls meet).





***Clausilia dubia* (above, left) and *Viviparus contectus* (above, right - a freshwater species which illustrates the features clearly)**

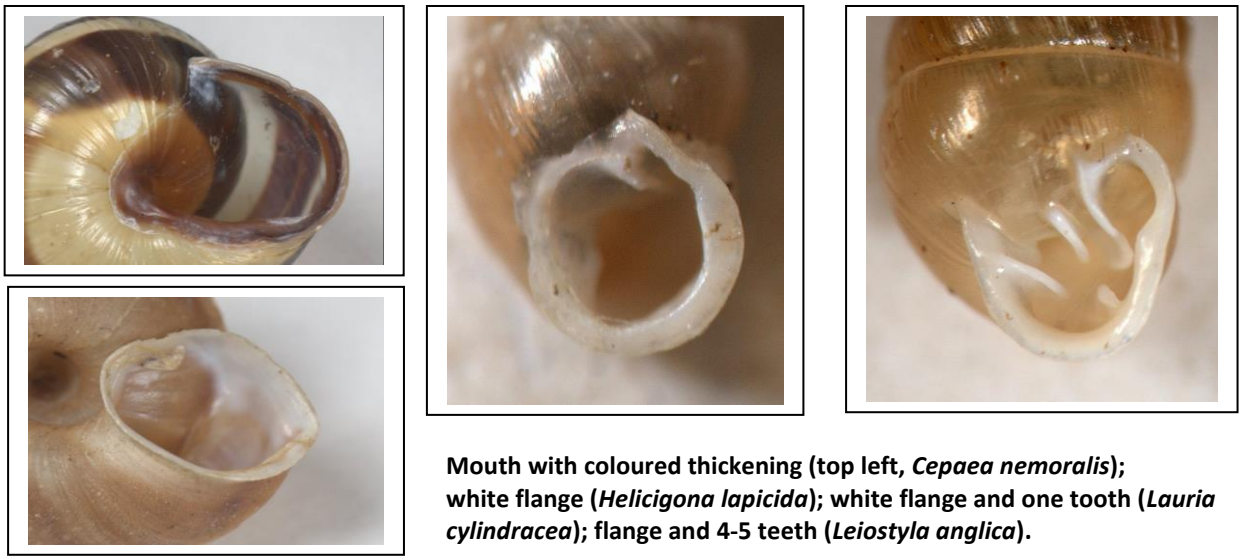
The **colour of a shell, and any colour pattern**, can be very helpful in identification, but beware that empty shells often look a very different colour from a shell with the snail inside. Translucent shells (see below) may be very pale when empty but nearly black with the animal showing through the shell. A few species, most commonly *Monacha cantiana,* have a pale-and-dark marbled or mottled body which shows through the shell and makes the live animal look very different from the translucent pale empty shell. Some shells have spiral colour stripes, e.g. *Cepaea, Cernuella*, and a few have the shell mottled, e.g. *Cornu, Arianta.*

Shell thickness and translucence is important. Most shells allow a little light through, especially if you have a strong light source behind the shell as you look at it. These can look opaque if there's a strong light from in front. A few species have shells which are almost glassy-transparent, often with a yellow, amber, brown or pale green tinge. Some, especially helicids like *Cernuella* and *Candidula,* have thicker, chalky shells which are almost opaque white.

Surface sheen, texture and sculpting are important but need practice to recognise the differences. The **sheen** varies from very smooth glassy gloss, e.g. *Oxychilus, Cochlicopa,* to a waxy or silk finish, e.g. *Succinea, Aegopinella,* to a matt finish, e.g. *Candidula.* The **texture** may be smooth (e.g. *Oxychilus*), slightly rough (e.g. *Cornu*), bumpy (e.g. Helicigona) or even hairy, e.g. *Trochulus.* The **sculpting** may be absent (totally smooth, e.g. *Oxychilus*), or consist of fine growth lines (which are transverse, also called radial, e.g. *Hygromia*), coarse growth lines, e.g. *Trochulus striolatus,* or strong ridges or ribs, e.g. *Candidula, Clausilia.* In one species, *Acanthinula aculeata,* the ribs are extended as spines or prickles. In a few species there is also **spiral sculpting**, very strong and striking in *Pomatias,* and which can intersect the transverse sculpture to create a criss-cross pattern, clearly seen at high magnification in *Aegopinella.*

The difficult bit - adult or not?

This key, like most published keys and field guides to land snails, works mainly on the features of the shells of **adult** snails. I'm not aware of a working key that covers all the immatures too. One of the main difficulties for a beginner is that there is no simple, fool-proof way of recognising that a snail is immature. Many species have a thickened edge to the mouth of the shell when they are adults, and in some, this develops into a flange, or has one or more 'teeth' protruding into the mouth:



Mouth with coloured thickening (top left, *Cepaea nemoralis*); white flange (*Helicigona lapicida*); white flange and one tooth (*Lauria cylindracea*); flange and 4-5 teeth (*Leiostyla anglica*).

If a shell has any sort of thickening or teeth on the mouth, it's adult. Unfortunately, there are quite a few species which do not have thickenings of any sort, whose shell just stops at the mouth, or gradually thins out (as juvenile shells of other species do).

As with learning any group of species, it's **very helpful to have a range of specimens in front of you before you start keying**. When you do that, quite a few smaller specimens will be seen to resemble very closely the top portion of larger ones in shape, colour and texture, e.g.

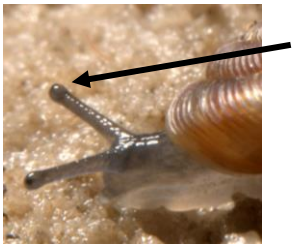
Adult (left) and juvenile (right) shells of *Cochlodina laminata* (left) and *Helicigona lapicida* (above).

Otherwise, if a specimen does not have any thickening or teeth in the mouth, and does not resemble the top (oldest) part of other specimens, try to key it out tentatively, but beware that it might not work out. In particular (as shown above), some juveniles are less tall, and appear proportionally wider, than the corresponding adults.

A warning: land snail or pond snail?

Land snails often fall or are washed into the water, and are frequently found in rivers and ponds, especially in flood debris. Pond snail shells are sometimes found on dry land if a pond or ditch has been dredged, and often get washed up in flood debris or scattered across low-lying meadows. A handful of 'aquatic' species are amphibious enough to crawl out of water and into damp grassland.

If the snail is still alive, look at the tentacles: all but two uncommon species of British land snails have two pairs of tentacles, with eyes at the tip of the longer, upper pair; pondsnails have only one pair of tentacles, and their eyes are either at the base of the tentacle, or on a small swelling a short distance from the base of the tentacle. These features are obviously not available on empty shells, and these keys make no allowance for land snails; but if your snail looks nothing like the species here, it may well be a stranded pond snail (for which a separate key is available).



Land snail (*Discus)* eye

Pond snail (*Bithynia)* eye

Changing names

I have updated the names in the key, in line with Anderson's checklist (2005) and Naggs *et al.* (2014). Where the name used in Britain has changed in the last 35 years (generally, since publication of Kerney & Cameron's field guide, published in 1979), I have included the previously used name in brackets. This does *not* mean that the new and old names are synonyms - in some cases, the old name is now applied to a separate species which is not thought to occur in Britain. Almost all these changes are explained in Anderson's checklist (2005), which is available as a free download from the Conchological Society's website.

Where the genus name has changed, I have given the old genus, but to save space I've not written out the species name twice. If the new genus is of a different Latin gender, the ending of the species name may have changed (e.g. *Trichia striolata* is now *Trochulus striolatus,* and I show this as *Trochulus (=Trichia) striolatus*).

A key to land snails

In most cases, this key takes you to species. In some, a few closely related species key out together, and you should refer to a more specialist guide to tell the difference. Some recent additions to the British list which are still very rare are mentioned as a note next to the species as which they would probably key out. A few very rare species, mostly not found in Beds, Cambs or Northants, or which are confined to heated greenhouses, are omitted.

1 Mouth of shell closed with a lid (operculum), illustrated below. Eyes at base of tentacles, front of head drawn out into a 'snout' 2
Mouth without lid. Head without an obvious 'snout', and eyes at tips of upper tentacles 3

2 Less than 3mm tall and less than 1mm wide. Slender, cylindrical, glossy. Scarce, found in ancient woodland or fens only ..... *Acicula fusca*
Up to 15mm. Conical, whitish, thick chalky shell with strong spiral ridges. On chalk ..... *Pomatias elegans*

***Pomatias elegans* showing operculum (left) and 'snout', with eyes at base of tentacles.**

3 Sinistral (left-handed spiral: when held with spire pointing upward, mouth is on left) 4
Dextral (right-handed spiral) 11

Sinistral (on left) and dextral shells

4 Less than 2mm tall when mature 5
More than 8mm when mature 6

5 5 teeth inside mouth of shell. Fine, regular growth-lines. In marshes, rare. ..... *Vertigo angustior*
6 teeth inside mouth. Growth-lines irregular, faint. ..... *Vertigo pusilla*

6 Mouth round and simple, usually without teeth or with a single small tooth. Shell conical (widest at base), surface often rather silky, with close-set fine irregular growth lines. 8-9mm. On walls, rocks and trees.....
..... *Balea perversa* or *Balea sarsii (=heydeni)*

Note: these two recently separated species are difficult to identify. *B. perversa* lives on walls and rocks and is taller and slenderer (8-10mm adult) than *B. sarsii* (6-8mm adult), which lives on mossy trees.

Mouth ear-shaped, with internal folds, teeth and ridges when mature (see below). Shell spindle-shaped (tapering at base as well as apex), often with strong transverse ridges. 12-18mm. N.B. immatures are smaller, round-mouthed and conical 7



***Balea perversa* (left); mouth of shell with teeth (*Cochlodina laminata,* mid, and *Clausilia dubia,* right)**

7 Smooth, glossy, pale brown or yellowish, growth-lines faint. 15-17mm tall, 4mm wide. Illustration below. Mainly woodland. ..... *Cochlodina laminata*

Note: the introduced *Papillifera papillaris (=bidens),* known from single sites in Bucks and Dorset, is pale, glossy, 12-15mm tall, and has conspicuous rows of round whitish granules in the sutures.

Strongly ridged, less glossy, darker (but with white streaks or all whitish when worn). Usually <15mm. 8

8 Umbilicus open and wide. Mouth broad and slightly pointed at bottom. Up to 17mm tall, 3.8-4mm wide. V. rare, waste ground near R Thames ..... *Balea (=Laciniaria) biplicata*

Umbilicus almost closed. Mouth narrower and more rounded. Rarely >15mm. 9

9 Shell very swollen and thickset, dark red-brown, 11-14 x 3.4-3.6mm. Uncommon, in woodland and hedges in S. England ..... *Macrogastra rolphii*
More cylindrical and slender, dark brown or blackish, with pale streaks on worn ridge (entirely grey or white when very worn). Often smaller 10

10 Narrow, usually streaked with white, 9-12 x 2.3-2.7mm, very variable. Illustrations below. Very common in many habitats throughout Britain ..... *Clausilia bidentata*
More swollen, smoother, larger, 11-14 x 2.7-3.2mm. Illustration below. Rocks and walls in northern England
..... *Clausilia dubia*



Cochlodina laminata **(left),** ***Clausilia bidentata*** **(middle),** ***Clausilia dubia*** **(right)**

11 Teeth present inside mouth of shell 12
No teeth inside mouth 18

12 (**7 options, based on numbers of teeth inside mouth of shell - look carefully!)**

Single tooth present 13

2 blunt, wavy teeth, shell often hairy, shaped like a flattened cheese, spire sunken below body-whorl, lip thick and white. 12mm diam. Illustrations below. Ancient woods and hedges in S England . *Helicodonta obvoluta*


Helicodonta obvoluta, **old shell (left), and young hairy specimen (right)**

3 teeth 14

4 teeth 16

5 teeth 17

6-8 teeth (2 uncommon spp., 2-3mm)..... *Vertigo substriata, V. antivertigo*

8-9 teeth. 7mm tall, 8 whorls, strongly ribbed. Uncommon, on dry grass on chalk in S England and in Cumbria. ..... *Abida secale.*

13 Mouth narrow, usually with 1 weak tooth, set back from the mouth, occasionally 0, 2 or 3 obscure teeth. Whitish external rib *behind* the rim. 3-3.5mm, cylindrical. Shell dull brown. Usually in dry, calcareous sites ..... *Pupilla muscorum*


Pupilla muscorum **(left), showing pale, whitish rib or bulge on back of shell.** ***Abida secale*** **(right) showing multiple teeth in mouth of shell**

Note: *Pupilla pratensis* has recently been found in Scotland. It occurs in wet meadows, is slightly larger and proportionately wider (average 3.7 x 1.9mm compared with 3.2 x 1.6mm in *muscorum*), more whorls (average 5.25 vs 4.75) and is a darker chestnut-brown colour.)

Lip broad, turned outward or reflexed. One prominent sharp tooth at the top of the mouth, jined to the lip. No external rib. Shell glossy, less cylindrical. 4mm tall. Common in dry and moist habitats.
.....*Lauria cylindracea*

Lauria cylindracea: **two adults, one juvenile, (left), teeth in adult mouth (right)**

Note: the very rare *L. sempronii* (currently known from two sites in Glos.) is smaller (up to 3.2mm), more cylindrical, and the mouth either has no teeth, or a very small, delicate one which is not connected to the lip

14 Up to 7mm tall, smoothly tapered toward both ends, extremely glossy bright orange-brown, resembling *Cochlicopa* but with teeth in mouth. .....*Azeca goodallii*

Azeca goodallii **showing shape and teeth in mouth**

2mm tall 15

15 Shell plain white, 5-5.5 whorls, shaped like a whelk. Very common in grassland, wetlands and woodland throughout. ..... *Carychium minimum, C. tridentatum*

Note: in general, *C.minimum* has a broader, more rounded shell, usually of 4 whorls visible from front, and is found in wetlands and damp woodlands; *C. tridentatum* is more parallel-sided, usually with 5 whorls visible from the front, and occurs in drier sites, especially on calcareous soils. They are most reliably identified from small features inside the shell (but you have to break the shell to see the features).

***Carychium minimum* (left) and *C. tridentatum* (right)**

Shell light brown, cylindrical, 6 whorls. Not all teeth visible form in front. Rare, dry grassy places on South coast ..... *Truncatellina callicratis*

16 2-2.5mm, rare upland species ..... *Vertigo alpestris, V. lilljeborgi, V. geyeri*
3-4mm, scarce ancient woodland and fen species. ..... *Leiostyla anglica*

17 1.7-2.2mm, with rather even whorls and a strong, pale rib a little way behind outer lip of mouth, separated from it by a slight depression, dull. Mainly dry calcareous grassland. Fairly common (commonest *Vertigo*). ..... *V. pygmaea*
2.2-2.7mm, last whorl very large (60% of height), glossy. The largest *Vertigo*. In calcareous fens and marshes, rare. ..... *V. moulinsiana*

18 Shell hairy or spiny (check especially in and around umbilicus) 19
Not hairy or spiny 23

19 Single row of spines round pouter edge of each whorl, 2mm, conical. Woodland ..... *Acanthinula aculeata*

***Acanthinula aculeate* showing spines on the outer edge of each whorl**

Hairy all over (but easily abraded) 20

20 Flat coiled shell (Swiss-cheese-shaped), with sunken spire and 2 blunt teeth in mouth. Illustrated at couplet 12. Ancient woodland and hedgerows in Hants and Sussex. ..... *Helicodonta obvoluta*
No teeth in mouth. Spire not sunken. 21

21 Umbilicus wide, shell about 8mm diam., hairs curved. Very common, illustrated at Couplet 67 ..... *Trochulus (=Trichia) hispidus*
(Juvenile *Trochulus striolatus*, with no lip inside mouth, and shell usually flatter and angled at edge, may key here)
Umbilicus very narrow, partly closed by reflexed lip. 22

22 (**4 options**)

Shell greenish, very translucent. Hairs short and soft, often rubbed off. No rib inside mouth. 6mm. On coast of south-west England and Wales. ..... *Ponentina subvirescens*

Shell yellowish-white to pale brown, fragile, 7.5mm, hairs straight, persistent. Frequent in damp woodland and fens throughout. ..... *Ashfordia granulata*

Shell reddish-brown, 7mm. ..... *Trochulus (=Trichia) sericeus (= plebeius)* (fairly common, many habitats) **or** ..... *Perforatella rubiginosa* (very local, in wet woodland beside R Thames)

Shell translucent greyish (black-and-cream marbled digestive gland often visible through shell - see illustration). No rib inside mouth. Whorls widening rapidly. .....juvenile *Monacha cantiana*

***Monacha cantiana,* showing marbled body visible through translucent shell**

23 Shell more or less keeled or angled at outer edge of shell 24
Shell evenly rounded at outer edge 28

24 Outer edge of shell sharply keeled 25
Outer edge of shell bluntly angled or keeled 26

25 17mm, very flattened, lens-shaped, with wide, deep umbilicus, red-brown mottled. Distinctive texture of raised granules. Conspicuous white lip. See below. Woods, rocks, walls on calc. soils, local..... *Helicigona lapicida*

***Helicigona lapicida,* empty adult shell, empty juvenile shell, live adult: the land snail with the sharpest keep on the outer edge**

Shell 7.5mm, perfectly conical with flat base (top-shaped), chalky grey or white, often banded. Umbilicus very small. Rare introduction, grassy places, waste ground etc. . .....*Trochoidea elegans*

26 Up to 7.5mm, very flat, strongly striate, grey mottled with reddish, with strong, regular striae. Umbilicus deep and extremely wide. Illustrated below. Very common, most habitats. ..... *Discus rotundatus*

Usually over 8mm. Not mottled reddish. Opaque whitish band running round outer edge (accentuating keel). Not striate. 27

27 10-12mm. Shell globose, *Helix*-like, rather thin and delicate, strongly angled and usually with a fine white line round the keel. Umbilicus almost closed. Growth-ridges fine and rather regular. Common in gardens . ... *Hygromia cinctella.*
11-14mm. Shell rather flattened, but variable. Umbilicus medium (12-20% shell diam.). Growth ridges coarse, irregular, often wavy, shell usually rather thick. Very common, most habitats including gardens *Trochulus (=Trichia) strio*

***Hygromia cinctella* (left), *Trochulus striolatus* (right)**

28 Shell very thin, semitransparent 29
Shell opaque..... 44

29 Shell elongated, obviously taller than broad 30
Shell flattened or globose, equal or broader than tall 32

30 **(3 options)**
Shell colourless or whitish. **Very** slender and narrow, 5.5 x 1.3mm, fragile. Almost cylindrical, mouth c. 35% shell height. Subterranean in loamy and chalky soils. ..... *Cecilioides acicula*
Shell very glossy and slippery, translucent yellow-brown but quite strong, elongate-oval (about 4-7mm x 2.-3mm). Mouth about 30% of shell height ..... 53 (*Cochlicopa*)
Shell translucent amber or brown, larger and broader, at least 6 x 3mm when mature. Whorls increasing rapidly, body whorl huge and mouth 50-75% shell height, spire very short. Wetlands. ..... 31 (Succineidae)

31 Shell <10mm. Sutures deep and whorls convex. Mouth <55% of shell height. Both species are scarce or rare, *C. arenaria* in dunes slacks*, S.oblonga* in fens. ..... *Quickella (=Catinella) arenaria* **or** *Succinea oblonga*
Shell 10-24mm. Sutures shallow, whorls flattened and rapidly expanding. Mouth at least 60% of shell height. Two common and 1 rare species..... *Succinea putris* (verycommon) **or** *Oxyloma elegans (=pfeifferi)* (very common) **or** *O. sarsi* (scarce – confusingly called *elegans* in historical records)

Note: Although best confirmed by dissection, it is often possible to distinguish these in the field. The very rare *O. sarsi* has a very elongate shell over 20mm long when adult; *S. putris* is fairly large (10-17mm) and thebody is pale grey; *O. elegans* is small, less than 12mm, and dark-bodied.

***Succinea putris* (left) and *Oxyloma elegans* (right)**

32 Shell flattened or depressed (coiled like a ram's-horn) ..... 33 (Zonitidae)
Shell globose ..... 43 (*Zenobiella,* Vitrinidae)

33 Umbilicus closed or very narrow, shell greenish white or white, tightly coiled, <4mm ..... 34 (*Vitrea*)
Umbilicus wider, usually larger, whorls expanding rapidly 36

34 Umbilicus minute or completely closed. Limestone in N England. ..... *Vitrea subrimata*
Umbilicus open. Common throughout ..... 35 (*V. crystallina/contracta*)

35 Whorls expanding more rapidly Mouth often with an internal thickening a little way back from the opening. Last whorl more flared. Shell usually glassy and transparent or green-tinged. To 4mm (usually. 3-3.5mm). *V. crystallina*
Whorls more tightly coiled. Mouth without rib. Last whorl distinctly narrower and flatter. Shell glassy and transparent, but often clouded whitish. 2.5-2.8mm. ..... *V. contracta*

36 Umbilicus very wide ..... 37 (*Zonitoides*)
Umbilicus moderately wide, deep 38

37 6-7mm, pale brown or green-white (animal dark grey with paler spots). Umbilicus very open, most whorls visible within (*Discus* shape). Woods, hedges, on non-calcareous soils. Local. ..... *Zonitoides excavatus*
5-6mm, shell pale brown (but animal blue-black so appearing dark; dull orange spot on mantle on upper side of last whorl just above the mouth edge) (see photos). Umbilicus narrower. Common, wetlands. *Zonitoides nitidus*

***Zonitoides nitidus,* empty shells (left) and live animal showing orange spot on mantle (right)**

38 (**3 options**)
Shell not glossy, a waxy or silk-finish lustre (see illustrations) ..... 39 (*Aegopinella*)
Shell glossy and smooth ..... 40 (*Oxychilus*)

***Aegopinella nitidula* and *Oxychilus draparnaudi* (left) and *Nesovitrea hammonis* (right)**

39 Shell white or very pale brown, smooth, 3.5 whorls. Showing spiral as well as radial grooves or ridges under magnification. 4mm. Common, esp. in damp woods. ..... *Aegopinella pura*
Dull, waxy brown, whitish below, 4.5 whorls. Spiral striae inconspicuous. Usually larger (10-15mm). Common in many habitats, often disturbed places including gardens. ..... *Aegopinella nitidula*

40 Less than 10mm, 4-5 whorls, spire slightly raised, often smelling of garlic. 41
Up to 16mm, 5.5-6 whorls, spire entirely flattened, rarely if ever smell of garlic. 42

41 <7mm, smelling strongly of garlic when alive. Body entirely blue-black. Shell yellow-brown, often more opaque white beneath, 4-4.5 whorls, outer edge smoothly rounded.. Wide range of habitats, including gardens. Very common..... *Oxychilus alliarius*
8-10mm, usually less strong garlic smell. Body paler grey, jet-black mantle edge showing as band inside mouth of shell. Shell rich brown, very glossy, 5 whorls, outer edge slightly angled. Mainly woodlands, local. .... *O.navarricus subspecies helveticus*

42 Shell 11-16mm, yellow-brown and slightly opaque, last whorl expanding rapidly, so mouth appears large and flared. Growth lines conspicuous, often appearing wrinkled. Common, esp. in disturbed sites, e.g. gardens.*O. draparnaudi*
9-12mm, very pale, whorls evenly expanding, rather tightly coiled. Growth lines very faint. Common in many habitats ..... *O. cellarius*

In order, left-right: *Oxychilus draparnaudi, O. cellarius, O. navarricus, O. alliarius;* and live *O. navarricus*

43 Spire slightly elevated, up to 9mm diameter Shell fairly thin and very flexible, similar in shape to *Trochulus striolatus.* Very local, in ancient woodland. ..... *Zenobiella (=Perforatella) subrufescens*
Spire completely flat. Shell glass-like, greenish, appearing very fragile. Whorls enlarging rapidly, last very large. Animal unable to withdraw completely into shell..... ..... *Vitrina pellucida* (adult in winter, common) **or** *Phenacolimax major* (adult spring, rare, ancient woodland), **or** *Semilimax pyrenaicus* (Ireland only)

Note: need careful examination to identify. Are included in new slug guide. *V. pellucida* has a pale mantle (front body) with few dark markings, and only a small flap of tissue extending along the shell; *P. major* has a dark or dark--mottled mantle and a long flap of tissue almost reaching the top of the spire:

***Vitrina pellucida* (above left) and *Phenacolimax major* (above right)**

***Daudebardia rufa* (left) is a semislug found in Britain for the first time in 2015, in woodland in south Wales. Blue-grey, with a body much larger than its rather flat shell, and up to 20mm long.**

44 (**4 options based on shell shape**)
Shell conical or top-shaped 45
Very elongate (height much greater than breadth) 47
Flattened (breadth much greater than height)..... 56
Globose (± 'typical snail shape' like a garden snail) 61

45 (**3 options**)
Umbilicus deep, wide, shell dark brown, turning whitish. Growth lines well defined, irregular. 4.5 whorls, last faintly keeled. 3mm. Illustration below. Dry limestone rocks, walls. Local. ..... *Pyramidula pusilla (=rupestris)*
Umbilicus distinct but very narrow, shell pale golden-brown, strongly and very regularly ribbed, iridescent to naked eye. 5.5-6 whorls. 2mm. Old woodland, mainly N ..... *Spermodea lamellata*
Umbilicus imperceptible, almost closed by lip. Very glossy and thin-shelled, base convex. 5.5 whorls, up to 3.5mm. Illustration below. Common, wetlands, damp grassland, woodland ..... 46 (*Euconulus*)

46 Pale yellowish-brown, translucent. with a slight silky gloss. 2.8-3.5mm. Spiral striae faint or absent even at high magnification. Common, many habitats..... *Euconulus fulvus*
Darker brown, spiral striae on base of shell more distinct. Glossy rather than silky. Smaller, 2.3-2.8mm. Mainly marshes.....*Euconulus alderi*
Note: there is disagreement over the distinctiveness of the two *Euconulus* species, and even a suggestion that a third species, *E. praticola,* may occur in Britain.

***Pyramidula pusilla,* left, and *Euconulus fulvus,* right**

47 Small (<5mm tall), if extremely glossy, then very slender, less than 1.2mm in breadth..... 48
Larger (5-15mm), or if about 5mm, then very glossy and 2-2.5mm in breadth 52

48 Shell colourless, glassy, becoming opaque whitish when worn. Very slender, 5.5 x 1.3mm. tapering slightly at either end, mouth fragile, elongate, unlipped, c. 35% of shell height. Subterranean in loamy and chalky soils. ..... *Cecilioides acicula*
Shell golden or dark brown, opaque, cylindrical, not or scarcely tapering, 1.8-3 x 0.9-1.5mm. Mouth round, with thickened lip and/or teeth, forming <25% of shell height. 49

49 Under 2mm, almost cylindrical, strongly and regularly striate. ..... 50 (*Truncatellina*)
2-3mm, rather smooth, gently tapering to a bluntly domed apex. .....51 (*Columella*)

50 Mouth without teeth. Ribbing very well-marked and regular. Whorls moderately rounded. Very rare, scattered. ..... *Truncatellina cylindrica*
Mouth with three teeth (set far inside mouth, not easily visible), ribs slightly weaker, sometimes irregular, whorls more rounded and suture deeper. Very local in dry calc. grassland on south coast. ..... *Truncatellina callicratis*

51 Taller, more cylindrical, 2.5-3 x 1.3-1.5mm, 5.5-6.5 gently convex whorls with moderately deep sutures. Shell thin and pale yellowish-brown, rather shiny. Damp calc. places. ..... *Columella edentula*
Shorter, broader, more tapering, 2-2.5 x 1.3-1.4mm, with 4.5-6 strongly convex whorls with deep sutures. More opaque and darker, appearing matt due to regular, close-set growth lines. Drier, more acidic habitats. ..... *Columella aspera*

52 (**3 options)**
Shell very glossy and slippery, translucent yellow-brown. No umbilicus. Lip bluntly rounded but inconspicuous. 4.5-7.5mm..... 53 (*Cochlicopa*)
Shell dull, dark brown, often mud-covered. Umbilicus narrow but visible, lip white, broadly reflexed. 8.5-17mm. .....54 (*Ena*)
Shell chalky whitish or sandy, spiral striped or blotched with dark brown, 8-20mm. Coastal dunes & grassland. .....55 (*Cochlicella*)

53 Shell 5-7.5 x 2.4-2.9mm, rather broad elongate-oval tapering toward apex, pale to dark brown, translucent. Illustrated below. In all damp habitats..... *Cochlicopa lubrica*
Smaller, slenderer and more cylindrical, 4.5-6.8 x 2.1-2.5mm, usually paler but less translucent. Illustrated below. In drier calc. habitats..... *Cochlicopa lubricella*
(Note: there is some doubt as to whether there are two species of *Cochlicopa* in Britain, and if so, whether they can be separated on shell characters. But populations in dry habitats tend to look like *lubricella,* so until genetic or dissection features are available, this separation appears to be useful.)

Left: *Azeca goodallii* (confusable with *Cochlicopa,* but browner shell, smooth outline, teeth in mouth), *Cocholicopa lubrica,* and *C. lubricella*.

Above left: *Cochlicopa lubrica.* Above right: *Cochlicopa lubricella*

54 14-17 x 6-7mm, 7-8 whorls. Lip pinkish-white. Rare, old woodland, S England..... *Ena montana*
Smaller, 8.5-8 x 3.7mm, 6.5-7 whorls. Lip pure white. Shell often encrusted with mud. See below couplet 55. Common, woods, hedgerows, walls and rocks. .....*Merdigera (=Ena) obscura*

55 Very elongate conical, height twice breadth, 10-20 x 4-7mm, 8-10 slightly convex whorls, growth-ridges irregular and rather weak. Common on dunes and coastal grassland.. See illustration below..... *Cochlicella acuta*
Smaller more broadly conical, 8-12 x 5-8mm, 7-8 rather flatter whorls, growth-ridges more pronounced, esp. on last whorl. Rare introduction, SW England. ..... *Cochlicella barbara*

Cochlicella acuta* (left) and *Merdigera (=Ena) obscura

56 Lip strongly thickened and trumpet-like, mouth relatively very large and circular, umbilicus wide, shell opaque and whitish, up to 2.5mm. .....57 (*Vallonia*)
Lip not thickened 60

57 Shell strongly and regularly ribbed, nautilus-like. Lip very strong, thickened and flange-like. 2.2-2.7mm. Illustration below. Dry calc. turf, rocks, walls, dunes. ..... *Vallonia costata*
Shell smooth, without ribs. Mouth-flange rather weaker. 58

58 Shell 2-2.5mm, 3.25 evenly-expanding whorls, circular in outline, whorls rounded in side-view (not shouldered). Lip of mouth reflexed through 90° to form flange. Illustration below . Moist meadows, marshes, dunes. ..... *Vallonia pulchella*
2-2.2mm, about 3 whorls, last quarter-whorl expanding more rapidly, to the flared mouth, outline elliptical. Mouth-edge less reflexed, so last whorl runs smoothly to lip. Dry calc. sites ..... *Vallonia excentrica*

***Vallonia costata* (left), *V. pulchella* (mid and right)**

60 Tiny, 1.2-1.5mm, golden-brown, of 3.5 whorls, with extremely fine, close-set growth-lines giving a characteristic sheen. Common and widespread, smallest native snail. ..... *Punctum pygmaeum*
Note: two other tiny species key out here. *Paralaoma servilis (=P. caputspinulae = Toltecia pusilla)* has strong, regular growth lines; *Lucilia (=Helicodiscus) singleyana* is up to 2.5mm wide, and very flattened.
Large, 9-25mm, opaque chalky white, banded and blotched with brown, of 5.5-6.5 whorls. Dry grassy places, local. ..... *Helicella itala*

***Helicella itala* (left) showing very flat shell and deep, wide umbilicus**

61 Umbilicus open, often deep 62
Umbilicus mostly or entirely obscured or sealed by the lip 68

62 Shell opaque chalky, white or grey, seldom glossy, often with spiral dark bands or streaked, flecked or mottled with brown. Never hairy..... 63
Shell slightly translucent, glossy, creamy, greenish or brownish, no darker markings. May be hairy, esp. in umbilicus and when young..... 65

63 Globular, height 70% breadth or more, 6-19 x 8-25mm. Mouth flushed with brown or pink inside. Growth lines very fine, sometimes faintly glossy. Illustrated below. ..... *Cernuella virgata or C. aginnica*

Note: *C. aginnica* is a recent addition to the British list, currently known from a few sites in Kent. It is slightly flatter than the common *C. virgata,* and has a wider umbilicus.

More flattened, height usually 50-70% breadth, 4-8 x 6-16mm. Mouth not coloured inside. Growth lines coarse. Shell opaque. 64

64 More flattened, spire shallow, whorls expanding rapidly, umbilicus wide and eccentric. Growth-ridges rather fine, close-set and regular. Scarce, downland. ..... *Candidula gigaxii*
More globular, spire more raised. Whorls expanding evenly, umbilicus narrower and central. Growth-ridges coarse, rather irregular, wavy near sutures. Illustrated below. Common in dry grassy places.. ..... *Candidula intersecta*

In each photograph, left is *Cernuella virgata* and right is *Candidula intersecta*

65 Globular, height >75% breadth, 4-6.5 x 5-8mm (never larger). 4-4.5 rapidly expanding whorls, mouth large, rounded, with very weak or no internal rib. Dull greenish yellow, with short, soft hairs (often lost). Umbilicus small, partly covered by lip. Grassland . SW England and Pembroke only. ..... *Ponentina subvirescens*
May be larger, often flatter, brown, creamy or yellowish, not greenish. Umbilicus usually wider. Mouth often with white thickened rib inside. 66

66 Larger, 11-14 x 16-20mm, 5.5-6 whorls. Umbilicus small, slightly obscured by reflexed lip. Shell creamy-white, usually flushed reddish near mouth (body, dark grey with creamy mottling, may show through translucent shell). Common on waste ground, roadsides etc in S England; rarely in woodland..... *Monacha cantiana*
Less than 14mm, brown or yellow-brown. Umbilicus usually wider and deeper. Some hairs often persist..... 67

***Monacha cantiana* - hairy young on left, half-grown in middle showing marbled body, adult on right**

67 Larger, 6-9 x 11-14mm, rather flattened (50-65% as high as broad), angled on outer edge (sometimes almost keeled) which is often marked with an opaque white band. Almost never hairy when adult. Very common in most habitats. ..... *Trochulus (=Trichia) striolatus*
Smaller (4.5-6 x 6-12mm), more globular, completely rounded on outer edge, no spiral white band. At least a few hairs often persisting in umbilicus. *Trochulus (=Trichia) hispidus* (v common) **or** *T. sericeus (=plebeius)* (local) **or** *Perforatella rubiginosa* (rare) **or** *Ashfordia granulata* (common, see 22 or 75)

***Trochulus* species: left two specimens are *T. hispidus* (small, rounded-flattened shell, open umbilicus)**
Middle two are *T. sericeus* (small rounded shell, higher spire than most *hispidus,* half-closed umbilicus)
Right two are *T. striolatus* (larger, slightly angled outer edge with pale 'equatorial' spiral line)

NB: Most of the following large snails are distinctive but variable; comparison with colour illustrations at the end or in Kerney & Cameron 1978 is much easier than using a key

68 Umbilicus entirely and smoothly seeled by lip 69
Umbilicus slightly open 72

69 Up to 25mm. Ground colour a uniform bright yellow, pink or brown, often with 1-5 clearly defined dark brown bands. Usually no irregular blotches. Growth lines weak and irregular. 70
Up to 35-50mm. Fawn or uneven brown, often blotched, mottled or irregularly banded with dark brown or black. Growth lines either coarse and irregular, or shell surface appearing wrinkled. 71

70 Lip almost always dark brown. Spire more raised. Often larger. Colour yellow, brown, pink or orange, commonly with 1-2 dark brown bands, occasionally unbanded. ..... *Cepaea nemoralis*
Lip almost always white. Ground colour usually yellow, often unbanded or with 1-5 dark brown bands. Usually smaller and more globular, with less raised spire. ..... *Cepaea hortensis*

Cepaea:* in each of the three groups above, the left specimen(s) are *C. hortensis* and the right are *nemoralis

71 Larger, up to 50mm. Pale fawn or whitish, with slightly darker brown banding. Coarse growth lines, and fine spiral striae. Body pale, often yellowish. Scarce. ..... *Helix pomatia* (Roman snail)

Note: *Helix lucorum* is occasionally introduced from Europe. It is almost as large as *pomatia,* but is usually a deeper chestnut-brown with a conspicuous narrow pale spiral band. It lacks the mottling of *Cornu aspersum.*

Rarely >35mm. Fawn or rich brown with blackish or dark brown bands or mottling. Wrinkled growth lines. Very common..... *Cornu aspersum (=Helix aspersa)* (Garden snail)

In both above photos, left snail is *Helix pomatia,* right is *Cornu aspersum*

72 Lip white or pinkish, strongly thickened and reflexed 73
Mouth of shell with little or no thickening..... 75

73 One dark brown spiral band, otherwise dark brown with pale creamy flecks. Body blackish. Lip white and reflexed. Umbilicus a small crescentic slit. 10-22 x 14-28mm. Illustration below. Common..... *Arianta arbustorum*

No dark spiral line. No pale flecks. Body usually pale grey or yellowish. Often smaller. 7

74 11-14 x 16-20mm. Creamy-white, usually with white lip but flushed reddish near mouth. Often a faint white band running round periphery, never any dark banding on shell. (NB body dark grey with creamy mottling, may show through translucent shell). Common on waste ground, roadsides etc in S England .... *Monacha cantiana*



Monacha cantiana **- hairy young on left, half-grown in middle showing marbled body, adult on right**

Variable but often larger, 9-20 x 12-25mm. Colour variable, white, fawn or ginger (rarely pinkish), often with varied dark spiral bands, translucent or interrupted. Growth ridges crossed by fine spiral striae. Lip usually tinged pinkish. Rare alien on dry coastal sites in S England. ..... *Theba pisana*

75 12-17mm. Globose, *Helix*-like. Mouth with strong lip. Usually with pale band round outer edge. Growth-ridges fine and rather regular. S. Devon only. ..... *Hygromia limbata*
7.5mm. Yellowish-white to pale brown, no colour patterning, fragile, covered in persistent hairs; if all have abraded, pits or scars on the surface still visible. Mouth barely thickened, lip reflexed basally only. Frequent, fens and carr ..... *Ashfordia granulata*

Literature on land and freshwater molluscs

Anderson, R. 2005. An annotated list of the non-marine Mollusca of Britain and Ireland. *Journal of Conchology,* **38**(6)

The most up-to-date checklist, explaining many recent changes in naming, and updating the British list. Available to download free from the Conchological Society website (see below).

Boycott, A.E. 1934. The habitats of land Mollusca in Britain. *Journal of Ecology,* **22**, 1-38.

Boycott, A.E. 1936. The habitats of freshwater Mollusca in Britain. *Journal of Animal Ecology,* **5**, 116-186.

Two thorough accounts which have never been superseded; still useful.

Cameron, R.A.D., Eversham, B.C., & Jackson, N. 1984. *A field guide to the slugs of the British Isles.* AIDGAP publ. no. 156, 23pp.

A fairly simple, straightforward key. Now out of date and thoroughly superseded by Rowson *et al.*(below)

Cameron, R.A.D. & Redfern, M. 1976. *British land snails*. Linnean Society Synopses of the British Fauna, (New Series) **6**. London: Academic Press. (Revised version, joint with AIDGAP, in press.) **I**

Key to adult snails only (but hard to tell whether a shell is immature). Illustrations useful, descriptions mostly good. Largely superseded by Cameron (2003).

Cameron, R. 2003. *Land Snails in the British Isles.* AIDGAP key, Occasional Publication **79.** Preston Montford: Field Studies Council.

By far the best available key to land snails. The descriptions in Kerney & Cameron (1976) are still a very useful supplement.

Ellis, A.E. 1978. *British freshwater bivalve Mollusca.* Linnean Society Synopses of the British Fauna, (New Series) **11.** London: Academic Press. **I (E)**

Good keys, excellent descriptions, b&w photos of all species. Not an easy group to learn, but a good guide. In some ways superseded by Killeen *et al.* (2004).

Eversham, B.C. 1986. Slugs around Huntingdon. *Report of the Huntingdonshire Fauna & Flora Society*, **38th**, 1985, 22-26.

Eversham, B.C. & Jolliffe, A.S. 1992. Freshwater molluscs: their habitats and distribution. *Report of the Huntingdonshire Fauna & Flora Society*, 1991, **44th**, 30-42. **E**

Gloer, P. & Meier-Brool, C. 1994. *Süsswassermollusken: ein Bestimmungsschlüssel für die Bundesrepublik Deutschland.* Hamburg: Deutscher Jugendbund für Naturbeobachtung.

Excellent illustrated keys to freshwater molluscs; text in German.

Janus, H. 1968, reprinted 1979 and later. *The young specialist looks at Molluscs.* London: Burke.

Despite title, a thorough and well illustrated guide to land and freshwater snails and bivalves, with effective keys, descriptions and line drawings. Account of slugs out of date and some of the slug illustrations are unintelligible.

Kerney, M.P. 1999. *Atlas of the Land & Freshwater Molluscs of Britain and Ireland*. Colchester: Harley Books

An excellent recent Atlas, with plenty of ecological and historical information.

Kerney, M.P. and Cameron, R.A.D. 1979. *A field guide to the land snails of Britain and north-west Europe.* London: Collins.

Excellent illustrations, descriptions and habitat info, but hard to use initially because of lack of keys or overview. Use alongside Cameron & Redfern or other simple keys.

Kerney, M.P. & Stubbs, A.E. 1980. *The conservation of snails, slugs and freshwater mussels.* 23pp. London: NCC.

A short account of the need for, and methods of, mollusc conservation.

Killeen, I., Aldridge, D. & Oliver, G. 2004. *Freshwater bivalves of Britain and Ireland.* (Field Studies Council Occasional Publication No. 82)

Extremely well illustrated and clearly presented, making the difficult Pisidium species at least more approachable.

Killeen, I.J., Seddon, M.B. & Holmes, A.M. 1998. *Molluscan conservation: a strategy for the 21st century.* (Journal of Conchology: Special Publication No. 2). 320pp. **C**

Macan, T.T. 1977. *A key to the fresh- and brackish-water Gastropods.* (FBA Sci. Publ. 13, 4th edition).

Straightforward and well illustrated, and generally reliable, though a few species are omitted and some errors remain.

Naggs, F., Preece, R.C., Anderson, R., Peiris, A., Taylor, H. and White, T.S. 2014. *An illustrated guide to the land snails of the British Isles.* London: Natural History Museum, Conchological Society, Malacological Society.

A very good-value laminated fold-out colour photographic chart showing several shells of every British species, from a range of angles. For many species it includes a photo of the live snail too. It even includes some recent introductions and greenhouse aliens which are omitted from most guides. Probably rather daunting for a complete beginner, and with little text to guide the identification process or to show which differences between photos are significant. But a superb supplement to other keys and guides, and almost as good as having access to a reference collection.

Rowson, B., Turner, J., Anderson, R., and Symondson B. 2014. *Slugs of Britain and Ireland: identification, understanding and control.* Telford: AIDGAP, Field Studies Council, National Museum of Wales.

A superb modern monograph on British and Irish slugs, thoroughly illustrated with colour photos throughout, drawing on DNA analysis to resolve uncertainties, providing dissection features for the most difficult groups, but allowing almost all species to be identified alive, using external features.

Wardhaugh, A.A. 1989. *Land snails of the British Isles.* 24pp. Aylesbury: Shire Publications.

A short, simple and well illustrated guide to many of the commoner species.

Willing, M.J. 1997. Fresh- and brackish-water molluscs: some current conservation issues. *British Wildlife*, **8,** 151-159.

Useful websites

Using a search engine with the genus or species names of freshwater snails will usually produce a large number of illustrations to compare with a specimen you are trying to identify. Most such photographs and drawings are correctly named: with pondsnails, I would estimate about 90-95% of photographs are accurately labelled (with some groups, like slugs, this falls to 50-60%).

There are a few sites especially relevant to this course. The illustrations used in this key, and many more pondsnail photos, will be available online at
http://www.flickr.com/photos/cladoniophile/sets/72157633163393637/

There is an interactive key to British species, using the excellent black-and-white photographs in Gloer & Meier-Brook (1994), at:
http://www.conchsoc.org/aids_to_id/fwidbase.php
It operates by clicking on the photograph most like your specimen at each couplet.

Very good photographs and helpful descriptions of the species which occur in Ireland are available at:
http://www.habitas.org.uk/molluscireland/splist.asp

The most recent checklist of the British non-marine molluscs, with explanations of all the recent additions to the fauna, and the technical reasons for name changes, may be downloaded from:
http://www.conchsoc.org/resources/Anderson.pdf

A spreadsheet of the names of British molluscs (and indeed, the rest of our fauna) is available at:
http://www.nhm.ac.uk/research-curation/scientific-resources/biodiversity/uk-biodiversity/uk-species/checklists/NHMSYS0001700910/index.html

If you do not have access to the Atlas of British molluscs (Kerney, 1999), you can retrieve up-to-date maps of any species from the National Biodiversity Network at:
http://data.nbn.org.uk/

Type in the name of any species into the box at the top right, wait till it lists a range of types of maps, and click on Grid Map if you want simply a set of dots on an outline map, or Interactive Map (slower to load) if you want to see records overlaid on a zoomable map of Britain. Beware, the NBN Gateway includes some records which have not been thoroughly verified, and sometimes 19th century records appear as 'modern' dots.