

IDENTIFYING FRESHWATER MOLLUSCS

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The main types of molluscs in fresh water

Three main types of freshwater molluscs can be easily distinguished: snails, limpets and bivalves. The two following keys should enable you to identify nearly all snails and limpets to species level. For a few species, you may need also to consult published keys.

- A Shell in one part, coiled **Snails: Key A**
- B Shell in one part, conical and not coiled, always less than 10mm, and usually less than 6mm long **Limpets: Key B**
- C Shell in 2 parts, hinged at the lower edge, usually held tightly together when handled **Bivalves (Cockles and mussels)**
See note at end



A warning: land snail or pond snail?

Land snails often fall or are washed into the water, and are frequently found in rivers, especially in flood debris. 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 drowned land snail.



Land snail (*Discus*)
eye



Pond snail (*Lymnaea*)
eye

KEY A: quick key to the commoner species of pond snails

- 1 Shell flat-coiled, like a Catherine-wheel or a slice of Swiss roll **2**
- Shell with a turret or spire, either tall or globular **13**
- 2 Shell tiny, with a chalky or horny lid (poke mouth of shell gently with a bristle or grass stalk - feels hard). **Flat valve-snail *Valvata cristata***
- Often larger, no lid (feels squishy when gently prodded) **Ram's-horn snails (family Planorbidae) 3**



Lid in mouth
of shell
(*Bithynia
tentaculata*)



Ram's-horn
snails

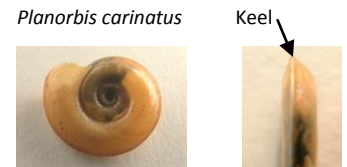
Note: empty shells often lose their lids. A few are keyed out when empty, but others will be difficult to key, but easy to recognise when familiar with them. Shells which have lids usually have a straighter-edged and better-finished mouth, often with a ridge against which the lid fits snugly.

- 3 Large: adults over 20mm diameter and 10mm thick, juveniles at least 4mm thick, with a flared mouth and spiral ridges, sometimes with a row of hairs or bristles on each ridge. **Great Ram's-horn *Planorbarius corneus***



Smaller; rarely over 17mm diameter, and never more than 4mm thick even when adult. If with strong spiral ridges, no more than 7m x 1.8mm. Never with rows of hairs or bristles. **4**

- 4 Adults over 10mm diameter; a keel or ridge, in the form of a raised line, runs round edge of shell; rather large, deep species (adults up to 17mm diameter, and 2.5-3.5mm thick) **Planorbis species 5**



Smaller when adult; edge of shell either smoothly and evenly rounded, or angled. The most angled edge can produce a keel, but never in the form of a raised line; shell smaller, often thinner and more delicate **6**



- 5 Keel offset to one side of edge, so visible only from one side as the curve of the shell wall hides it from the other side; shell rather more tightly coiled. Up to 17mm x 3.5mm. **Common Ram's-horn *Planorbis planorbis***



Keel almost in middle of rim, so visible from above and below; shell spirals widen rather more rapidly. Up to 17mm x 3.5mm.

Keeled Ram's-horn *Planorbis carinatus*

Planorbis planorbis (upper)
P. carinatus (lower)

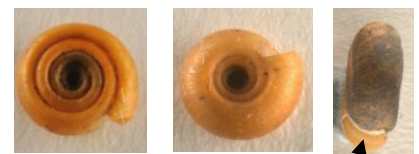
- 6 Shell very tightly coiled, at least 6 whorls in an adult diameter of 10mm or less, mouth no/ barely wider than previous whorl. **7**



Anisus vortex (tightly coiled, left),
Gyraulus albus, less tightly coiled, right.

Shell less tightly coiled and more flared toward mouth **9**

- 7 Shell small and thick, very tightly coiled, with a deep, conspicuous umbilicus (pit) at one side, inside which the inner spirals are visible. Often blackish and opaque. Mouth of shell taller than wide, curved as it wraps around the previous whorl. Edge of shell evenly rounded with no hint of a keel. Adults 6mm x 2mm, with 7-8 whorls.



Bathyomphalus contortus Mouth

Twisted Ram's-horn *Bathyomphalus contortus*

Shell thinner and flatter, often rather translucent brown. Slightly concave on one side, but no obvious umbilicus. Mouth round or obliquely oval. Often with a strong angled keel round the edge. If shell has 5 or more whorls, it is less than 1.5mm thick. **8**

8 Three choices

Shell very thin and flat, often translucent brown. Edge of shell with a strong angled keel round the edge; mouth therefore wider than tall and drawn out into a blunt point. Tightly coiled. Adults 10mm x 1.5mm, with 6-7 whorls.

Whirlpool Ram's-horn *Anisus vortex*



Shell fairly thin and flat, often dark and less translucent. Edge of shell smoothly rounded, mouth almost circular, often with a white band inside. Tightly coiled. Adults 8mm x 1.5mm, with 6-7 whorls.

White-lipped Ram's-horn *Anisus leucostoma*



Anisus vortex (left), *A. leucostoma* (right)

Shell fairly thin and flat, often dark and less translucent. Edge of shell smoothly rounded, mouth almost circular, often with a white band inside. Less tightly coiled. Adults 5.5mm x 1.5mm, with 4-5 whorls.

Anisus spirorbis

Note: there is a debate about whether *A. spirorbis* is a good species, separate from *A. leucostoma*, and whether it occurs in Britain. Although regarded as distinct species in mainland Europe, there is a suggestion that populations change shape between years, depending perhaps on temperature and growth rate. More research is needed.



Anisus leucostoma (left), *A. spirorbis* (right)

- 9 Mouth offset from last whorl, so it lies below the rest of the coil. Very small, shell thin and fragile. 0.5-2mm x 2-4mm. **10**



Mouth of shell almost in line with previous whorl, lying in the same plane as the rest of the shell. Often larger and more solidly built. **11**



- 10 Shell often (not always!) with strong ridges running across the whorls. Mouth rather narrowly elliptical, its long axis along the flat of the shell. Surface of shell dull. An extremely delicate, fragile shell. Up to 1mm x 3mm, with 3-4 whorls.

Nautilus Ram's-horn Gyraulus crista

Shell smooth, never with strong ridges. Mouth almost perfectly circular, in life with a round lid (operculum). Surface of shell glossy. Up to 1.25 x 4mm with 5 whorls.

Flat Valve Snail Valvata cristata



Gyraulus crista

- 11 Looks like a typical ram's-horn snail: shell flat-sided with rounded edges. Each whorl overlapping previous one only slightly, so most of each whorl can be seen from either side, and the two sides look similar. Adults up to 7mm x 2mm with up to 4.5 whorls. **12**

Shell convex on both sides, lens-shaped. Each whorl broadly overlapping the previous one, so very little of the inner whorls is visible from one side, and the two sides are different. Last whorl and mouth very large, making up almost half the diameter of shell. Shell yellowish or grey-white, glossy. Adults only 1.2mm x 4mm, with up to 4 whorls. **Flat Ram's-horn Hippeutis complanata**

(If the shell is the shape of *Hippeutis*, but translucent yellow-brown, up to 7mm diameter, and 3-4 spoke-like ridges are visible inside the shell, it may be the very rare **Shining Ram's-horn, Segmentina nitida**, which is thought to be extinct in BCN.)

- 12 Shell with strong spiral grooves running round it (**check with hand lens or microscope!**) as well as the usual radial growth ridges; lip of mouth of shell meets previous whorl at an obtuse wide angle; a strong, thick rather chalky shell. Up to 7mm. x 1.8mm with up to 8 whorls.

White Ram's-horn Gyraulus albus

Shell with no spiral grooves; mouth of shell meets previous whorl almost at a right-angle; shell a rather translucent, glossy amber colour; up to 6mm x 2mm, with up to 6 whorls.

Smooth Ram's-horn Gyraulus laevis



Gyraulus albus

- 13 Shell right-handed (dextral): if spire points upward and mouth faces you, mouth is on right. **14**

Shell left-handed **25**



Lymnaea balthica (on left: right-handed shell)
Physella acuta (on right: left-handed shell)

- 14 Shell with a horny or chalky lid (operculum) - poke mouth of shell gently with a bristle or grass stalk - feels hard). **15**
No lid - feels squishy when prodded. **21**



Viviparus contectus with lid (operculum) and brown spiral lines

- 15 Shell large when adult (up to 40mm tall), greenish with brown spiral lines **16**
Shell never more than 15mm high, pale brown to blackish, not greenish and never with coloured spiral lines **17**



- 16 Shell rather thin, top of spire quite sharply pointed. With more swollen, bulging whorls, deeper sutures, and usually glossy. Adults up to 35mm x 30mm. **Lister's River Snail *Viviparus contectus***
Shell wall thicker, with blunt point, whorls less swollen, sutures shallower, shell rarely glossy. Adults up to 40mm x 30mm.

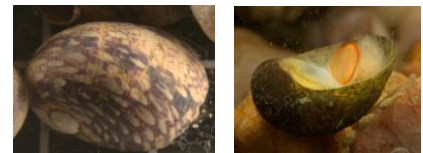
Common River Snail *Viviparus viviparus*



Viviparus contectus (left) and *V. viviparus* (right)

- 17 Shell flat and very thick and heavy, last whorl making up over half the shell. Marbled whitish or yellow on a dark green, brown or purplish background. Mouth and lid a narrow oval or semicircle, lid often yellow or orange. Adults up to 6mm x 11mm with 2.5 whorls. Confined to fast flowing water.

Freshwater Nerite, *Theodoxus fluviatilis*



Theodoxus fluviatilis

Shell taller, thinner and with more even and more numerous whorls. Never marbled pale and dark (though marbling on the body of the snail may show through the shell). Lid broader and rarely yellow or orange. May be larger, and always with 3 or more whorls when adult. **18**

18 Three choices

Shell narrow, sharply pointed, and shell more than twice as tall as it is wide. Mouth about a third the total height or less. Mouth and lid oval or pointed-oval. Adults small, up to 5.5mm tall and 3mm wide.

Jenkins's Spire Snail *Potamopyrgus antipodarum*

(Several saltmarsh *Hydrobia* snails would key out here, too.)

Shell broader, less pointed, roughly twice as tall as wide. Mouth about half the total height. Mouth and lid oval or pointed-oval. Adults often larger (up to 15mm x 9mm)

***Bithynia* species 19**

Shell small and squat, about as tall as wide, or wider than tall Can be ram's-horn shaped). Mouth and lid very rounded, almost circular. Adults up to 6mm x 6mm.

***Valvata* species 20**



P. antipodarum (above), *B. tentaculata* (above right) and *V. piscinalis* (right): not to scale



- 19 Mouth rounded, with no obvious corner at the top; whorls swollen and suture deep; apex rounded; small (up to 6.5mm x 4.5mm) with up to 5 whorls.

Leach's Bithynia *Bithynia leachii*

Mouth with an angle or corner at top; whorls flatter, sutures shallower; apex more sharply pointed; often larger, up to 15mm x 9mm with up to 6 whorls.

Common Bithynia *Bithynia tentaculata*



Bithynia leachii (left) and *B. tentaculata* (right)

(The very rare riverine **Taylor's Spire Snail**, *Marstoniopsis subrica*, might key out here. It is tiny (3mm x 2mm), slenderer than *Bithynia leachii* and plumper than *Potamopyrgus antipodarum*, but with a much blunter spire than either.)

20 Three choices

Shell about as tall as it is wide, up to 5mm x 5mm. Spire about as tall as the diameter of the mouth. Umbilicus (the channel which runs up inside the spiral from next to the mouth) narrow but deep. (See picture at couplet 18).

Common Valve Snail *Valvata piscinalis*

Shell smaller, up to 4mm x 2mm, wider than tall, with a flatter spire and proportionately larger mouth. Umbilicus deep and wide. Rare, and usually in rich fen habitats. Can be very similar to young *V. piscinalis*.

Large-mouthed Valve Snail *Valvata macrostoma*

Shell small, up to 4mm x 1.25mm, very flat, ram's-horn-like, with a very low spire, and mouth offset below the plane of the coils. Umbilicus very wide.

Flat Valve Snail *Valvata cristata*

21 Mouth very large and flared, at least two-thirds the height of shell; spire small or very small **22**

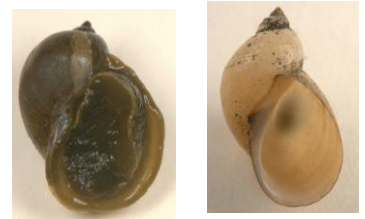
Mouth rarely more than half shell height, with a prominent conical spire above it **23**

22 Shell thin, usually translucent; mouth large but not enormously flared, lip meeting shell at less than a right-angle; spire rather blunt to the touch. Adults up to 20mm x 13mm with up to 5 whorls. **Wandering Pondsnaill *Lymnaea balthica***

Shell usually thicker and more opaque; mouth huge, lip joining shell at right-angle or more; spire small but sharply pointed. Adults up to 35mm x 30mm, with up to 5 whorls. **Ear Pondsnaill *Lymnaea auricularia***

Note: these two species are very variable in shell shape, especially the height of the spire.

(If the shell is a warm amber colour, with a very regular rounded mouth, check that it is not an Amber Snail (Succineidae), common wetland land snails, which are sometimes found in the water. As with all land snails, they have two pairs of tentacles, with eyes at the tips of the upper pair.)



Lymnaea auricularia (left) and *L. balthica* (right)

Succinea putris, an Amber Snail



Succinea putris, an Amber Snail

23 Shell often very large (up to 50mm tall); spire long and slender, body whorl broader, so it juts out, giving a concave shape to shell outline. Up to 50mm x 25mm, with up to 7.5 whorls. **Great Pondsnaill *Lymnaea stagnalis***

Smaller (up to 24mm), with spire more straight-sided, and body whorl and mouth less broadened **24**



Lymnaea stagnalis

24 Umbilicus open; whorls swollen, sutures deep; shell surface smooth; Adults up to 12mm x 6mm, with up to 6 whorls.

Dwarf Pondsnaill *Lymnaea truncatula*

Umbilicus closed by lip of mouth; whorls flatter; shell often with radial and spiral ridges, giving a hammered texture; often larger, up to 24mm x 11mm and with up to 7 whorls.

Marsh Snail *Lymnaea fusca*



Lymnaea truncatula (left) and *L. fusca/palustris* (right), not to scale

Note: the very closely related *L. palustris* is separable only by dissection of the reproductive organs. Although *L. fusca* is much the commoner than *L. palustris* over most of Britain, both have been recorded from eastern England.

- 25** Shell, tall, slender and elegant. Body whorl not especially large, and mouth about half total shell height. Body of snail black or blue-black, and does not overlap outside of shell. Shell very glossy. Up to 13mm x 5mm, with up to 7 whorls. Often in ponds and ditches which dry out regularly.

Moss Bladder Snail *Aplexa hypnorum*

Shell shorter and more rounded. Body whorl swollen, and mouth well over half shell height. Body of snail pale brown or greenish, and surrounding shell with finger-like growths when alive. Shell dull. Up to 18mm x 11mm, with up to 4 whorls.

26

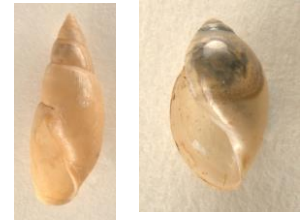
- 26** Shell thin, rather delicate and translucent. Apex of shell rounded. Mouth not flared, and not jutting out, usually joining body whorl at a very obtuse angle. Never more than 12mm x 8mm, and usually less than 10mm, with 4 whorls.

Common Bladder Snail *Physa fontinalis*

Shell often thicker, stronger and more opaque. Apex pointed. Mouth more flared, lip of mouth juts out, and usually joins body whorl at closer to a right angle. Often larger, up to 18mm x 11mm and up to 6 whorls.

American Bladder Snail *Physella acuta*

(It is possible that other introduced *Physella* species occur in Britain.)



Aplexa hypnorum (above), *Physa fontinalis* (above right) and *Physella acuta* (right): not to scale



KEY B: Identifying the three species of freshwater limpets

Recognising left, right, front and back: all three limpet species have the apex of the shell pointing backwards, and the two flatter species have the shell wider at the front and tapering toward the rear.

- 1** Taller (about twice as long as tall) and more conical. Seen from above, broadly oval to circular, length less than twice the breadth, symmetrical. Confined to fast-flowing water; often larger (up to 9mm long, 5mm tall)

River Limpet *Ancylus fluviatilis*

Flatter (usually 3-4 times as long as tall). From above, a long oval or rather rectangular, and wider at the front than the rear, so not symmetrical. **2**

- 2** Apex of the shell leans to the left. From above, the shell is rather straight-sided in the rear 2/3. In side view, the rear slope below the apex is almost straight and the apex just out like a little shelf. Up to 7mm long.

Lake Limpet *Acroloxus lacustris*

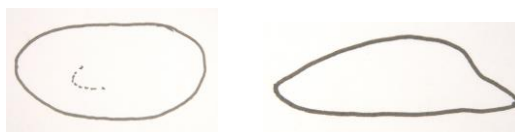
Apex leans slightly to right. From above, the sides are convex. In side view, the rear slope below the apex is rather concave, as the blunt apex curves backwards. Up to 6mm long. **Wautier's Limpet *Ferrissia wautieri***



Ancylus fluviatilis, from above (left) and from side (right)



Acroloxus lacustris (above)



Ferrissia wautieri
From above (left) and from side (right)

A note on freshwater bivalve molluscs

The keys above **do not** include the bivalves, cockles and mussels. There are seven species of larger bivalves, the mussels, *Anodonta*, *Dreissena*, *Margaritifera*, *Pseudanodonta* and *Unio*. These have elongate shells, from 25-200mm long when adult. They are fairly easy to learn to identify. Initially, empty shells are easier to name than live animals, as some of the best features are on the inside of the shell.

There are 27 or so species of smaller bivalves, the cockles, *Sphaerium*, *Musculium*, *Corbicula* and *Pisidium*. These have rounder shells, and are much smaller. Apart from an introduced species reaching 30mm long, the others are from 1.5-22mm long when adult and are very difficult to identify: if you want to try, it's best to collect a range of samples and compare lots of shells together, rather than trying to key out one or two individuals.

There is a well illustrated guide to bivalves (Killeen, Aldridge and Oliver, 2004) which makes identifying mussels fairly straightforward. Nothing except years of practice will make identifying *Pisidium* easy.

Literature on freshwater molluscs

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.

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. Although superseded by Killeen *et al.* (2004), still useful.

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-Brook, 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.

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

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.

Macan, T.T. 1977. *A key to the fresh- and brackish-water Gastropods*. (FBA Sci. Publ. 13, 4th edition). **E,I** Straightforward and well illustrated, and generally reliable, though a few species are omitted and some errors remain.

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.