

Identifying liver fluke snails

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In NSW, about 20 million sheep and 2 million cattle graze pastures where liver fluke (*Fasciola hepatica*) commonly occurs. Liver fluke is widespread across eastern NSW, where average rainfall is about 600 mm or more a year; specifically, it occurs on the tablelands and nearby slopes, and the north and south coasts. It is also found in irrigation areas further west, where the annual rainfall is only 400 mm, but is supplemented by regular irrigation.

During its life cycle, liver fluke must develop in a particular type of small freshwater snail. In Australia, the most important of these host snails is an indigenous freshwater snail, *Lymnaea tomentosa*. The introduced snails, *Lymnaea columella* (from North America), and *Lymnaea viridis* (from the Pacific area), can also act as intermediate hosts. These snails are found in coastal NSW.

Liver fluke infection only occurs where these snails are found.

Finding liver fluke snails

Liver fluke snails live in the mud or on plants in shallow water at the edge of springs, small creeks, dam inflows and outflows, irrigation channels, poorly drained drainage channels or in water troughs. They are small and sometimes difficult to find.

The kind of habitat in which the snail is found often gives clues to which type it is. For example, *Lymnaea tomentosa* prefers trickling creeks flowing from hillside springs and soaks (black

bogs), and is only rarely found in dams, water troughs or large creeks. It can, however, be found in dam overflows after heavy rain, or within spring-fed dam inflows and outflows.

Lymnaea columella is found in deeper creeks and dams, and can also survive in stagnant bodies of water.

Lymnaea viridis is a versatile snail, and is found in slightly deeper creeks and channels, as well as in areas preferred by *Lymnaea tomentosa*.

Another lymnaeid snail, *Lymnaea lessoni*, is often found on plants and floating on the surface of deeper water, such as stagnant pools and irrigation ditches. This snail does not transmit liver fluke.

To examine snails, pick them up with your fingers or scoop them up in a kitchen strainer. Most of the snails look alike to an untrained observer. Use the following guide to identify which type it is.

Identifying freshwater snails

The characteristics used to identify snails are as follows:

Adult size

The shell of mature freshwater snails varies from about 5 mm long for the small types to about 25 mm for the largest.

Direction of the spiral

Most freshwater snails have a cone-shaped spiral shell, and the direction of the spiral is a useful identification feature. To determine the direction of the spiral (or twist) of the shell, place the snail on the palm of your hand with its opening downwards and the point of the shell towards you. Looking at the pointed end, the direction of the spiral is determined by going around the shell from the point (or apex) to the large end. The shells of snails transmitting liver fluke twist in a clockwise direction, while the most common freshwater snails (buliniform type – *Physa*,



Physastra, *Isidorella*, and *Glyptophysa*) have anti-clockwise spiralled shells.

Opening of the snail

Lay the snail down with the opening facing you and the apex away from you. The opening of fluke snails is on the right-hand side, while the opening of buliniform type snails is on the left.

Tentacles

All snails have tentacles on the front of the head-foot. The head-foot is that part of the snail exposed out of the shell. When the snail is moving, you can see the tentacles on the front of the head-foot. In most freshwater snails, these are long and similar to those of the common garden snail. However, the two tentacles of fluke snails are flat, triangular, ear-like structures. You can see the tentacles most easily in sunlight when the snail is underwater on the mud, or placed in water on a white tray.

Operculum

In some snails (so-called operculate snails) a bony, trapdoor-like structure covers the opening of the shell when the head-foot is withdrawn inside. Liver fluke snails do not have an operculum.

Colour

Although the colour of the snail and its shell is a useful feature, it can vary for the same type of snail from different localities. Liver fluke snail bodies are light grey or black, whereas the buliniform types are usually reddish or grey.

About different snail types

Lymnaea tomentosa (the liver fluke snail)

This is the common intermediate host snail for the liver fluke in Australia and New Zealand. The shell has three or four whorls. In NSW, it is found in springs and small creeks on the tablelands, western slopes and coast, as well as in irrigation areas. It has limited distribution in other eastern states of Australia.

Lymnaea viridis

This snail is similar to *Lymnaea tomentosa*, but the shell is longer and has four to five whorls. An introduced species from the Pacific Islands, it is the intermediate host of liver fluke in Papua New Guinea, and now also in Australia.

Lymnaea columella

This snail is also similar to *Lymnaea tomentosa*, but has a longer shell with grid-like striations. It is a North American snail that has been introduced into Australia and New Zealand through the trade in aquarium plants. It is found in coastal NSW and some tablelands areas. It can also transmit liver fluke, and could alter the pattern of liver fluke disease if it spreads to grazing areas.

Lymnaea lessoni

Lymnaea lessoni is similar to the fluke snails, but has a large, round shell up to 25 mm long. It is often found on plants and floating on the surface of deeper water, such as stagnant pools and irrigation ditches. These snails do not transmit liver fluke.

Succinea

This is a land snail normally found in moist areas, but sometimes present in freshwater habitats. Its shell is superficially similar to those of the fluke snails, but the body differs in that it has thin tentacles like a garden snail. These snails do not transmit liver fluke.

Gabbia

Gabbia is a common freshwater snail with an operculum. It has long, thin tentacles and is found in the outer Sydney area and some tablelands areas. These snails do not transmit liver fluke.

Physa, *Physastra*

Also known as buliniform type snails, *Physa* and *Physastra* are most often found in large numbers in small creeks, dams, water troughs, etc, in all areas. These species do not transmit liver fluke.

Planorbinae (Planorbinae)

Planorbins are small, flat, coiled snails, commonly attached to waterweeds in dams, lagoons, small creeks, and in temporary habitats in small depressions (melon holes). They transmit stomach fluke, a small, conical fluke found in sheep and cattle. Stomach fluke is less important than liver fluke, and rarely causes serious disease in NSW, except in the irrigation districts and on the north and south coasts.

If I identify liver fluke snails, what can I do about them?

The first thing to do is to make sure that liver fluke is present by using WormTest (faecal worm egg count test; ask for the fluke egg count option) or the liver fluke ELISA (blood test for liver fluke antibodies).

Once you do this you can treat the disease. Dosing sheep and cattle with suitable anthelmintics is the main method of treating liver fluke disease; however, this treatment should be combined with improved drainage, to limit the number of fluke snails and reduce grazing of 'flukey' areas. A strategic drenching program is essential for effective control (see Primefact 446 *Liver fluke disease in sheep and cattle*).

Controlling fluke snails is usually difficult, because of their high reproductive rate and ability to burrow into the mud and survive dry weather. However, with planned property management, reducing the size of the wet areas suitable for snail growth and limiting the grazing of snail infected areas can be profitable. Ways to do this include draining swampy areas and building dams in or below springs, to reduce the area of shallow water favoured by the fluke snail.

On many properties, only small parts of paddocks have habitats suitable for snails, and sheep and cattle tend to graze these swampy areas during droughts. For good control in these situations, fence off the swampy area and pipe water to water troughs. Most flukes are picked up on the pasture eaten by sheep and cattle in autumn and early winter (about February to June), so limit grazing 'flukey' areas at this time of the year if you can.

Freshwater aquariums

Many of the snails described in this Primefact are commonly found in freshwater aquariums, such as those used for tropical fish, goldfish and aquatic plants. It is likely that exotic snails (such as *Lymnaea columella* and *Lymnaea viridis*) have entered Australia as contaminants of aquatic plants or fish, and may be spread within the country by this means. Therefore, please **DO NOT** empty the family fish tank in the local creek – rather, discard the contents on dry land.

Submitting snails for identification

You can send snails to the Regional Veterinary Laboratories for positive identification. To do this, collect up to 20 snails and put them in a small plastic or glass container filled with water and aquatic plants from the collection site. If the laboratory will not receive them within two days, preserve with a little formalin or alcohol. Locations and addresses of laboratories are:

Regional Veterinary Laboratory
Elizabeth Macarthur Agricultural Institute
Woodbridge Rd, MENANGLE NSW 2568
(Private Mailbag 8, CAMDEN NSW 2570)

Regional Veterinary Laboratory
Bruxner Hwy, WOLLONGBAR NSW 2477

Regional Veterinary Laboratory
Forest Rd, ORANGE NSW 2800

Further information

For more information on liver fluke snails or liver fluke disease, contact your Rural Lands Protection Board veterinarian, private veterinarian, or local NSW Department of Primary Industries office. Further information may also be obtained from the Primefacts listed below.

Acknowledgement

This Primefact is largely based on the article by Dr Noel Campbell published in the *Agricultural Gazette of NSW*, Vol. 88, No. 4, August, 1977.

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Related Primefacts

Primefact 446 *Liver fluke disease in sheep and cattle*

Primefact 452 *Stomach fluke (paramphistomes) in ruminants*

Note: Fluke control should be integrated with the control of other internal parasites. See Primefact 446 and various Primefacts on internal parasite control.

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Check for updates of this Primefact at:

www.dpi.nsw.gov.au/primefactsT

Disclaimer: The information contained in this publication is based on knowledge and understanding at the time of writing (June 2007). However, because of advances in knowledge, users are reminded of the need to ensure that information upon which they rely is up to date and to check currency of the information with the appropriate officer of New South Wales Department of Primary Industries or the user's independent adviser.

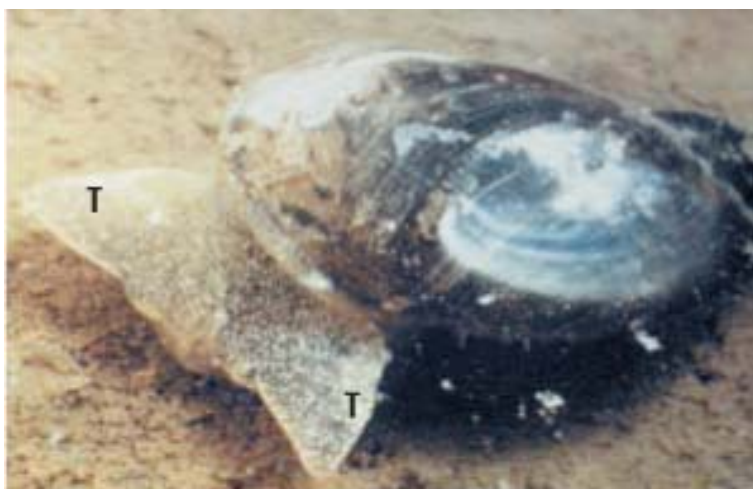
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Key to common freshwater snails in Australia

Snail type	Direction of spiral of shell	Operculum	Tentacles	Length of shell of adult snail (mm)	Comments
<i>Lymnaea tomentosa</i> *	Clockwise	Absent	Flat, triangular	4–12	Foot grey to yellowish and well extended out of shell, shell with 3–4 Whorls
<i>Lymnaea viridis</i> *	Clockwise	Absent	Flat, triangular	4–12	Shell with 4–5 whorls
<i>Lymnaea columella</i> *	Clockwise	Absent	Flat, triangular	8–20	Foot black, shell elongated, with grid-like striations
<i>Lymnaea lessoni</i>	Clockwise	Absent	Flat, triangular	10–25	Round, fragile shell (papershell snail)
<i>Succinea</i>	Clockwise	Absent	Thin, blunt-like	5–10	Land snail sometimes garden snail found in or near freshwater habitats
<i>Gabbia</i>	Clockwise	Present	Long, thin	4	
Buliniform snails	Anticlockwise	Absent	Long, thin	5–10	<i>Glyptophysa</i> , <i>Physastra</i> , <i>Isidorella</i> or the introduced <i>Physa</i> .
Planorbin snails#	Flat, Anticlockwise	Absent	Long, thin	2–4	<i>Gyraulus</i> in temporary pools, <i>Helicorbis</i> in spiral dams, at the edges

* Transmits liver fluke.

Transmits stomach fluke.



Lymnaea tomentosa – note the ear-like tentacles (T).



Lymnaea tomentosa (shell 4–12 mm long) – note the size in relation to the match head.



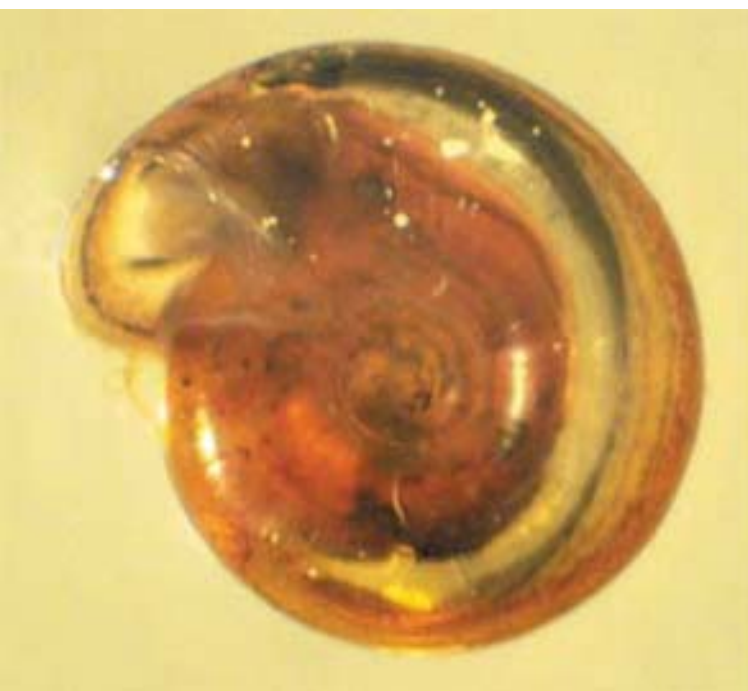
Lymnaea viridis – introduced from the Pacific Islands (shell 4–12 mm long). This snail can also transmit liver fluke.



Lymnaea columella – introduced from North America, this snail can also transmit liver fluke, and is found in coastal NSW and some Tablelands areas (shell 8–20 mm long).



Lymnaea lessoni – notice the rounder, thin, large shell (shell 10–25 mm long).



Helicorbis australiensis – This is a planorbis snail, and an intermediate host for stomach fluke (shell is 4 mm long).