

WATER SNAILS
are they friends or foes?

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To some people an aquarium is not complete unless it has at least one or two snails roaming the sand and glass. If other fish-keepers see even one tiny snail in their aquarium they see red and begin immediately to sort their way through the sand and plants seeking out any other that may be hidden. Any which are found are gleefully squashed on the aquarium side.

In fact, it's quite hard to get two aquarium hobbyists who completely agree about snails.

Those who support the right of snails to live at peace in aquariums usually expect too much in return from the shell-backed guests. They are often expected to clean the glass sides, the plants and the sand, and to maintain the water in a crystal clear state.

These people misguidedly believe that snails in the aquarium will tip the biological scales in favor of the aquarist and solve all his problems, real or imagined.

Sorry - it doesn't work that way.

In the other extreme, some aquarists blame snails for all the problems found in an aquarium, the dirt and even green water! And once again, this doesn't happen.

Water snails are very interesting creatures in themselves, despite what many people attribute to them, and, in fact, they can be quite helpful to aquarists if properly chosen and kept to reasonable populations. However they do have their limitations.

First of all, there is no species of snail known that will eat excrement of any kind, despite the blind faith of countless beginner aquarium hobbyists who buy a couple of snails to eat the fish wastes which accumulate in their tanks.

Snails eat pretty much the same foods that fishes do, and this fact in itself is helpful to aquarium keepers. The slow-moving water snails find and eat foods which the fish have neglected, usually through overfeeding. They usually will not eat anything that is alive, although some marine snails are known to catch and eat live fish.

Snails also eat algae, the dying leaves of plants and the bodies of dead fish. In this way they help keep things tidy in the aquarium. Just the same, one cannot expect an isolated snail to eat all leftover fish food, all the algae growing in a well lighted tank, plus any plant or fish that happen to die. Then, again, if there are very many snails and too little food, don't blame any hungry snails for eating healthy plants - too much of anything tends to be evil.

Some fish breeders have round snails to be beneficial in some cases and not in others. In an aquarium where egg layers are being spawned all snails should be excluded. Snails won't eat the parent fish, but they are avid egg-eaters. Once the eggs have been hatched, snails are recommended, though, by many breeders.

There is no such problem in a tank of livebearers.

When feeding baby fish, especially there is a great danger of uneaten food fouling the water. Hungry snails will help keep these tanks clean, will not harm the living baby fish but will clean up any which die, and often they provide infusoria for the fry through the medium of their excrement.

"HOLY TERRORS"

Often the vary fish we keep in an aquarium will determine if we can keep snails as scavengers or not. Guppies are holy terrors in the realm of snails tormentors. They pick away at snails until they are dead.

Swordtails are pretty bad, too. Other fish which often destroy snails are Bettas, large Cichlids, Paradise Fish, Gouramis, Puffers and some Characins. Snails are usually safe with Killifish, small goldfish, Danios, White Clouds, Rasboras, Loaches and most Catfish.

Besides being scavengers, snails make quite good live fish food, especially the youngsters. They can also be used as an early warning system for distress in the aquarium. The common small snails are air breathers and will absorb dissolved gasses through their skin.

When a tank begins to become foul, even though it looks quite clear, the snails head for the water surface. When you find every snail nugging the surface of the water you can be sure there's trouble in the aquarium. Usually this will occur before it's too late and you will be able to do something before you lose any fish - unless, of course, too many

dead fish caused the condition in the first place.

There are quite a few species of snail to choose from, and like fish, each species has slightly different requirements and behaves in a different way to its relations.

One remarkable fact about all freshwater snails is that if you really want to keep them, they seem to be killed off, either by conditions in the aquarium or by the fish, yet if the snails are not wanted they usually thrive, multiply rapidly and soon become a pest.

Because of the composition of their shells, mostly calcium, alkaline water is better, if not absolutely necessary, for snails to do well. Acid water "attacks" the calcium, eating it away and causes the snail's shell to become pitted with shallow holes. If the water is quite soft and contains little or no calcium the shell will be very thin, brittle and might fall to pieces. Just the same, snails will - and do - live in quite soft, acid water. These are the conditions that most growers of aquatic plants favour, and as most of these people will tell you, snails can soon multiply and destroy much of their work if they aren't kept in careful check.

Without doubt, the most popular water snail with tropical fishkeepers is the Mystery Snail - Ampullaria cuprina. A giant in the water snail world, this snail, called the Apple Snail by European fish keepers, reaches the size of a golf ball.

There are four distinct species of Ampullaria snails, although as far as I know only A. cuprina is available in Australia. This is quite fortunate for fishkeepers who like to also grow aquatic plants, for the other three species - A. canaliculator, A. gigas and A. paludosa - are ravenous plant feeders and would soon destroy all growth in a planted tank.

Most snails are hermaphrodites - meaning they have the sexual organs of both males and females. Such snails must mate - but every snail they meet is a member of the opposite sex! Mystery snails, though, are either male or female, so to breed them it is necessary to have both sexes. Fortunately for those who wish to keep snails, it is quite easy to tell the sex of a Mystery Snail.

The snails' operculum - the trapdoor with which they close their shells - gives the answer. In the female this plate is slightly concave, while with the male it is slightly convex. This difference can be noted best when the operculum is closed.

Ampullarias have four "horns" and also an extendable breathing tube which they lift above the water surface then pump air into their body system. This air is sufficient to last them for quite some time while submerged.

Ampullaria received the name "mystery" because for many years their method of reproduction was unknown.

Aquarists who have kept them now know the male, which is usually the smaller of a pair, climbs onto the female's shell and inserts a

long, thin muscular organ into a vent under her shell. This whitish organ locks the pair firmly together, even if they are lifted from the water, and to force the snails apart at this stage risks injuring one or both of them.

OUT OF THE WATER.

To lay the eggs the female climbs out of the water and hangs motionless. In nature she climbs onto plants protruding from the water, but in an aquarium she will hang from the tank frame or reinforcing strips.

The eggs, pinkish or white in color, come from under the shell and travel along a groove in the female's body. They then adhere to the aquarium glass or plant. Dozens of eggs are laid during one spawning, each of them passing out of the female's body, and these build into a large mass, resembling a lump of honeycomb.

The eggs hatch in about three or four weeks if conditions are right. They must not dry out or fall into the water, or the embryo will die.

In normal hobby conditions, with sufficient mature parent snails, little care need be taken of the eggs, provided the aquarium has a cover glass to keep the above-water area where they are in a humid state. But if large numbers of snails are required for some purpose it is probably best to carefully remove the egg cluster, using a razor blade, and place them in special rearing conditions.

These conditions are best provided by using a small aquarium containing several inches of water. A stand is placed above water level, supporting the stand with a jar or flowerpot, and the eggs placed on this. A cover glass should be placed on the aquarium to encourage humid conditions, and if the room temperature is low a heater should be placed in the aquarium.

When the young snails hatch they make their own way down into the water and immediately begin searching for food.

Young snails, and even adults in a community aquarium, should be fed regularly with vegetable matter, such as pieces of lettuce leaf, boiled silver beet or cabbage. If these are not available and aquatic plants are, these will be soon eaten.

Mystery snails cannot tolerate foul water conditions. If these occur the snails will congregate around the water surface and will soon die if conditions are not improved. Acidic water will also cause their shell to become badly pitted and unattractive in appearance.

Care must be taken to keep an aquarium containing Mystery Snails well covered, or you might find them drying out on the floor one morning. The eggs are usually laid at night and snails often topple over the aquariums' edge while they are seeking out a suitable spot for their eggs.

Sometimes known to fish breeders as "infusoria snails", Mystery Snails are kept by some breeders to produce infusoria as the first food for newly-hatched fry.

Snails kept for the purpose are placed into an unplanted aquarium and fed on lettuce leaves. Their droppings provide an ideal medium for the growth of infusoria, and water from the aquarium is siphoned or poured into a rearing tank containing the newly-hatched fry.

The best water temperature for keeping, breeding and rearing Mystery Snails seems to be about 76 to 78 degrees Fahrenheit.

One of the least common, yet most useful water snails for aquarists is undoubtedly the Malayan Burrowing Snail - Melania tuberculata.

These snails are small, only around 2.5cm in length, and have long cone-shaped shells. They take their name from their habit of burrowing deep in the aquarium gravel as they scavenge for food, so they are of double value to aquarium keepers in that they keep the gravel loose and clean plus they also reach uneaten food not reached by other species of snail.

When an aquarium is well lighted the Malayan Burrowing Snails stay hidden beneath the gravel, and many aquarists have had quite large populations in their tanks without knowing it. At night the snails swarm over the gravel and sides of the aquarium.

Malayan Burrowing Snails are live-bearers and reproduce quite quickly in tropical aquariums. This, and their burrowing habit, make them difficult to eliminate, but they seem to do very little damage to plants and are therefore unlikely to cause too many problems. In fact I know of plant growers who encourage them in their growing tanks.

A recommended method of controlling over-populations of this snail is to remove all the aquarium's gravel, pour boiling water over it to kill the snails, then sift it to remove the larger shells. This, of course, involves totally dismantling and re-establishing the aquarium.

Common Pond Snails - Peplimnea lessoni - are the source of the greatest snail problems in Australian aquariums. Like their American cousins - Physa fontinalis - the Australian pond snails breed very quickly, laying their eggs on the undersides of plants and on the inside surface of the aquarium glass, and it allowed to reproduce and grow unchecked will soon become a pest.

Australian pond snails in eastern states grow to almost an inch in length and have swollen shells, brownish-yellow in color. Their bodies are quite large and the shells have a small spire. Often the shells are rather fragile and easily squashed, and sometimes they are quite translucent, enabling the snail's body to be seen inside the shell.

Another form of pond snail found most commonly in New South Wales is Sublimnea brazieri, smaller than the earlier snail, more slender, and with a sharply pointed spire. This snail is a host of the sheep liver fluke.

Other species of Sublimnea are found in the southern states of Australia.

Once in an aquarium these snails are extremely difficult to eradicate, and their excessive black dropping cover the gravel. They are not to be recommended for the

aquarium, but unfortunately often come into our tanks on plants. Some dealers also sell them to people who simply ask for "some snails". The reason why so many dealers have these snails for sale is probably because they first obtain them free of charge on plants, then the snails multiply unaided in their tanks, giving them a great profit margin.

If you plan to use bunches of plants in a breeding tank for egg-layers make sure the plants don't contain pond snails or their eggs - otherwise most of the eggs your fishes lay will fall victim to their great appetites. The plants themselves will also become ragged and eaten as the snails' rasp-like teeth strip them of layers of vegetation.

Very few fish seem to be interested in eating Australian Pond snails whole, with the exception of a few Cichlids and Puffers, although most fish find the snails' squashed bodies quite tasty morsels.

If for some reason you wish to keep pond snails - and the only possible use they seem to serve in an aquarium is their eating of Hydra, which in turn will capture and eat young fry - you will find they live equally well in cold or tropical water, although it is best not to move them straight from coldwater to tropical in the middle of a cold winter.

RAMSHORNS.

Ramshorn Snails - Planorbis corneus - are more commonly kept by people with goldfish ponds than by tropical aquarium keepers, but they do equally well in ponds or tropical and coldwater aquariums. The shells of these

snails are like flat spirals and can grow to the size of a twenty cent piece.

Most Ramshorn Snails are black in color, although they are available in an attractive red color. The red variety adds color to a community aquarium and this is really the only value Ramshorns have in an aquarium - there is really no other advantage in keeping them.

They are a nuisance in breeding tanks because they eat fish eggs and much of the food left for fish. They also breed profusely throughout the year, laying eggs enclosed in small globules of yellowish jelly.

Almost all the Ramshorn Snails offered for sale in Australia come from the European species imported many years ago, but we do have a native Ramshorn - although it is much smaller than its Continental relations, rarely reaching one-quarter of an inch in diameter.

Our native Ramshorns are found on aquatic plants in ponds, creeks and rivers, but because of their size and inconspicuous coloring they are overlooked quite easily. Like the "imports" our native species is also found occasionally to have a pinkish tinge.

Like the old saying 'A prophet isn't recognised in his own land,' one of Australia's most attractive snails is better known overseas than it is here. European and American literature abound with references to the Australian Red Snail, and those who have seen this information usually believe that it is the Red Ramshorn Snail which is being referred to. This is not so.

The Australian Red Snail - Bullinus australianus - has a strong smooth shell, with the spire much larger than the body whorl. This color is an attractive yellowish-red, although a similar snail, B. lessoni, is of a greyish brown color.

Both these snails are quite prolific and, although they do better in cooler water, will live quite happily in tropical aquariums.

There is a simple method of identifying Bullinus snails. If you hold a snail shell up with the spire towards the top and the opening towards you, almost all snails will have their openings on your right-hand side. With Bullinus, the opening is in the left.

American Pond Snails - Physa fontinalis - are found in aquariums. They grow about about half an inch in length, are nearly black in color and have hard, rough shells which discourage fish from eating them.

I have been told that Japanese Live-Bearing snails - Viviparus malleatus - are available in Australia, but I have not been able to identify one for sure. These snails give birth to live young, which are about the size of small peas, but an adult snail is extremely large and can be confused with a Mystery Snail.

Japanese Live-Bearers' spirals, though, are much more raised than those of Mysteries and the shell is wider than it is high. These snails do not eat plants, but seem happier in coldwater aquariums than in tropical tanks.

Local Livebearers

Australia has its own members of the family Viviparus, found in the tropical and sub-tropical regions. Members of the family are quite common in rivers around Brisbane and in northern New South Wales.

One Viviparidae, of the genus Notopala, has a strong, large shell and an almost round opening. The general color is a greenish yellow, while narrow darker bands run around and across the spire, giving it a checkered appearance.

Of little interest to aquarium keepers is another family of Australian freshwater snails, the Little River Snails - or the family Paludestrinidae. These are common in Tasmania and the south eastern section of the mainland, but there are few species found as far north as Sydney.

There are many species of this family and all are rather small - from one-eighth to a quarter of an inch in length - with long spires and a strengthened opening. All have dull colored shells and little to recommend them for the aquarium. In any case they only do really well in coldwater.

Much more interesting are the Marsh Snails, similar in habit and appearance to the Malayan Burrowing Snails. These snails belong to the family Thiaridae and have the genus name of Thaia - the name by which Malayan Burrowing Snails are referred to in some literature.

Marsh Snails

Marsh Snails are easily distinguished from pond snails by their long, slender spire and the fairly strong, opaque shell. The edges of

the shell's whorls, or curves, also appear to have been sculptured and the opening is quite narrow.

These snails are generally round in tropical and sub-tropical areas and only a few species are found south of Brisbane.

One of the more southern species is the Belonne Marsh Snail - Thiara balonnensis - found in southern Queensland and northern New South Wales. Its shell is a light yellowish-brown color, with spots of light and dark capping the whorls and a few lighter colored streaks around the spire.

Although Australian Marsh Snails can be kept indoors in coldwater aquariums, they are unlikely to survive outdoors long during a severe southern winter.

The aquarium keeper who is interested in breeding fish or growing lush plants will find that snails are quite a nuisance, despite their somewhat doubtful reputation as scavengers.

But besides snails there are quite a few invertebrates which can serve as aquarium scavengers.

These include freshwater shrimp, of which Australia has a good variety to choose from, mussels and such creatures as daphnia. Although most fish will eat daphnia, mussels are usually fairly safe from attacks by all fish barring large Cichlids, as are some of the larger shrimps.

A factor in favor of invertebrate scavengers is their low use of dissolved

oxygen. Vertebrate scavengers such as catfish must be counted as part of the aquarium's fish population when considering the aquarium's population capacity, population in the limited space available.

Scavengers

The best non-vertebrate "scavenger," though, not only removes unwanted food, but also the fish wastes and accumulated dirt. If used properly it prevents condition which lead to "green water" and most other varieties of troublesome algae or bacteria blooms. It doesn't consume high amounts of oxygen, either, but rather dissolves more oxygen in the water and removes harmful gases.

Interested in this "scavenger?"
Additional notes by Geoff Allen

In reference to sexing the Mystery Snail - Ampullaria cuprina, the snails' operculum, the trapdoor with which they close their shells, supposedly with the male the operculum is slightly convex and the female slightly concave, with the 55 snails I have and checked for this, there is no great difference to the naked eye and the same with Arthur Hutchcraft's 50 or so snails. We didn't check with a microscope or with a magnifying glass, so when they say "slightly" they mean "very slightly".

In reference to the snail toppling over the aquarium's edge while seeking out a suitable spot for their eggs, everytime I find a snail on the floor I just pop it back into the tank near the front or an area where it can be seen quite easily, and keep an eye on it for about 24 hours and if it hasn't moved in that time it can be considered dead and thrown out, so it will not pollute your tank. All the ones I have put back in, are all fine and well.