Friend or Foe

Part 4

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DIGITAL IMAGES BY THE AUTHOR

This edition of our series on the marine nasties centres on the phylum Mollusca – an extremely diverse group of organisms comprising some 50,000 extant species and over 35,000 fossil species. It is important to appreciate the incredible array of body forms in molluscs. Consider that an octopus, garden snail and clam are all molluscs and you have some idea of the diversity in this group.

Generalisations include the possession of a "foot" and gills (Ctenidia), the latter being enclosed in a chamber called the mantle cavity. Water flow is facilitated through the mantle cavity by microscopic hairs termed cilia.

Of course, the above characteristics have been refined in almost all molluscs to a lesser or greater extent. For example, the land snails or Pulmonates as their name suggests have developed a lung-like organ within the mantle cavity and lost their gill structures altogether.

Almost every taxonomic class of mollusc is of interest to marine aquarists although not all will be encountered as hitch-hikers on live rock or specimen pieces of coral.

The classes of molluscs are as follows:

Class Aplacophora	No shell with worm-like body
Class Polyplacophora	Primitive molluscs also called chitons
Class Monoplacophora	Deepwater marine shelled molluscs unlikely to be encountered by the aquarist
Class Gastropoda	The largest group of concern to aquarists
Class Bivalvia	Clams, mussels etc. Many species arrived with coral and live rock
Class Scaphopoda	Shell resembles an elephants tusk. Shells are sometimes found but I have no record of living specimens being encountered
Class Cephalopoda	The octopi, squid and cuttlefish. Not encountered in this context

Due to the large amount of mollusc species found in reef aquaria it is impossible to go into great detail about each but I will try to be clear as to their identifying features and whether they are friend or foe.

Class Aplacophora

The Class Aplacophora is a relatively small group of molluscs comprising less than 300 known species, most of which are found in deep water – up to 3000 metres. They are worth mentioning here however, as one family, the *Neomeniomorpha* (**Fig 1**), are found crawling on the surface of soft corals and hydroids upon which they feed. They are less than 5mm total body length and resemble small worms, a shell being totally absent. The impact of these animals on the coral is probably only slight due to their size. They can be removed with a fine paintbrush.

Fig 1

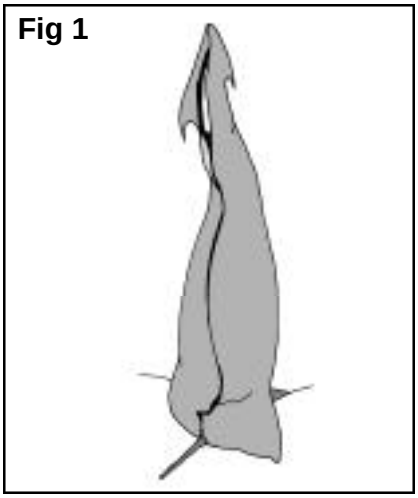
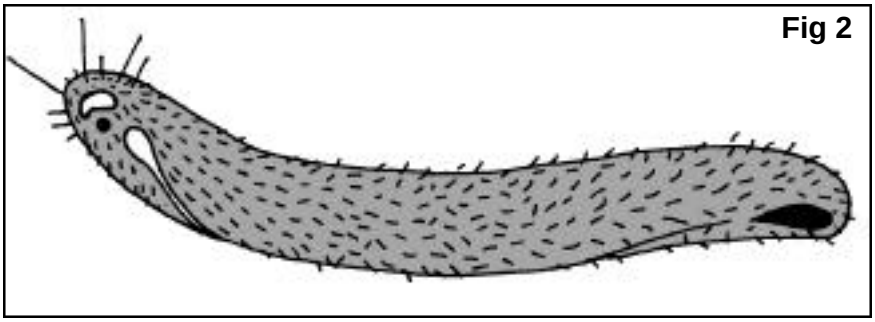


Fig 2

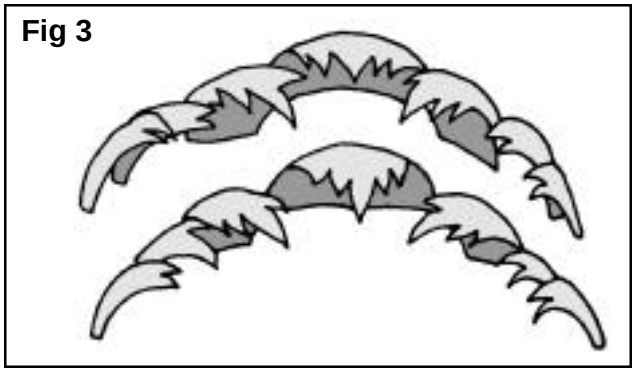


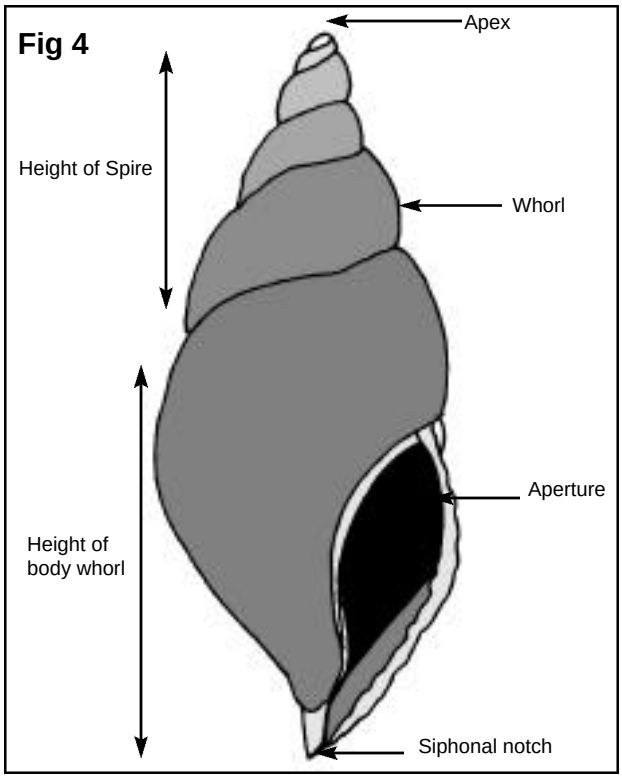
Class Polyplacophora

The Polyplacophora or chitons (**Fig 2**), as they are more widely known, are infrequent imports with live rock and invertebrates. Resembling small legless woodlice they can be perceived to be a primitive limpet whose shell is obviously segmented. Counting the segments will reveal that there are eight separate overlapping plates. Sometimes these plates are obscured to a greater or lesser extent by the mantle. There are around 800 known species of chiton ranging in size from less than 5mm to 40cm in length but the majority encountered in reef aquaria are around 10mm.

The Radula

Despite being primitive molluscs the chitons possess a feeding organ that has been retained and specialised in much more highly evolved members of the Phylum. The radula (**Fig 3**) in chitons is like a toothed tongue which rasps microalgae and





small encrusting animals from the surface of rocks. The structure of the radula is used in classification of certain molluscs as can be seen later in this article but this basic form has been kept by several members of the phylum. The radula is not visible to the casual observer being located internally.

Chitons can be regarded as interesting freebies in the reef aquarium. They may feed on encrusting sponges or bryozoans but are unlikely to harm specimen invertebrate species. They are of benefit in their consumption of microalgae in much the same way as turbo snails.

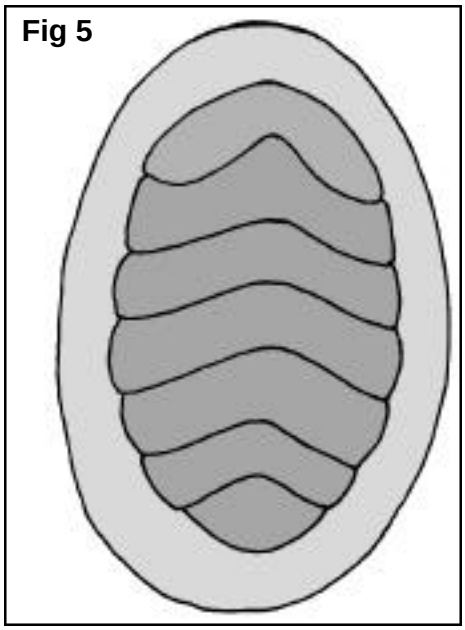
Class Gastropoda

This is a massive group of molluscs consisting of over 30,000 species and probably the most successful having colonised marine, freshwater and land habitats. In the gastropods the plated shell has been developed from the ancient chiton shield into a more sophisticated retreat into which the animal can withdraw. Sometimes, even the entrance to this retreat (the aperture) can be blocked with a hard covering called the operculum making entry to most predators impossible. The gastropods are what we refer to as snails and slugs. This group includes the humble garden snail and magnificent nudibranchs as well as many beneficial and harmful marine species.

One good thing about the shelled gastropods is that they are easy to remove in most cases. A pair of fine tweezers is useful for the removal of some of the smaller species.

The gastropods also represent the most commonly found hitch – hiking animals in reef aquaria so it can be necessary to separate the good from the bad.

Some of the descriptions in this section will refer to the shell shape of the animal. **Fig 4** shows a generalised gastropod shell with annotations indicating the correct terminology for each part.



Order : **Archaeogastropoda**
Superfamily : **Patellacea**
Common name : **Limpets**

Limpets are very common inhabitants of reef aquaria, often forming large colonies of over 100 individuals in even modestly sized aquaria. There appears to be a few species that regularly occur although in my experience the commonest seems to be a small, white variety that remains in the darker areas of the tank, seldomly growing much over 5mm in diameter (**Fig 5**). They appear to be algal grazers and not to bother any other reef inhabitants. Most people will be familiar with the shell shape of limpets - the conical shell gives them away although limpets are not always what they appear to be.

There is one species of limpet that has caused aquarists some cause for concern but this is due to its resemblance to a nudibranch rather than any harm it may cause. *Jordanella floridae* is a true limpet but the mantle is black and extends over the shell. As the Latin name suggests this was an infrequent import with Florida and Caribbean live rock but as the import of this was restricted some years ago the occurrence of *J. floridae* has not been reported for some time although similar Indo-Pacific species may occur.

Larger species of limpet with the same shell shape as their smaller cousins do occasionally occur and some of these are believed to be harmful to soft corals, particularly when supplies of microalgae are exhausted. I have no experience of this but recognise the need for careful observation of any suspicious specimens.

Order : **Archaeogastropod**
Superfamily : **Fissurellacea**
Common name : **Keyhole limpet**

Keyhole limpets resemble a slightly flattened common limpet but the main identifying feature is the hole in the shell at its apex where the animal's siphon tube is accommodated. They are infrequent additions with live rock. As with the true limpets there are reports of hard and soft corals being attacked but they are usually herbivorous, feeding on microalgae.

Order : **Archaegastropoda**
Superfamily : **Trochacea**
Common name : **Turbo snails and their allies**

Most reef aquarists will be familiar with members of this superfamily as it includes

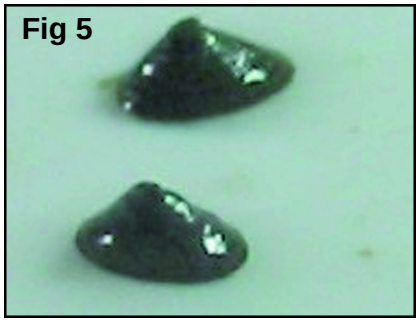


Fig 5


Fig 6


Fig 7

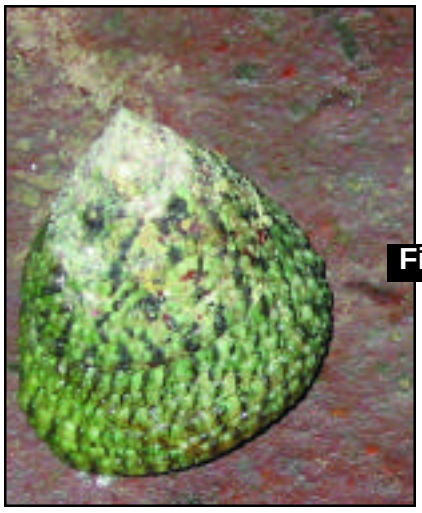


Fig 8

the Astrea snails that are commonly sold as Turbo snails in retail outlets (**Fig 6**). The true Turbo snail, that is, the one with the Latin prefix *Turbo* is more commonly known as the super or spiral turbo (**Fig 7**). These are very common imports with Fijian live rock and specimen pieces from the Indo-Pacific region. They often appear under about 5mm long and rapidly grow to the maximum size of 4-5cm.

Other members of this Superfamily occur too. These include members of the genus *Trochus* (**Fig 8**)

Some Astrea snails have quite spectacular shell shapes (**Fig 9**) and all members of the Trochacea are superb grazers of algae. All regularly found "turbo" snails are beneficial in reef aquaria. Their grazing ability is unsurpassed in other invertebrates given that they promote the growth of coralline algae and reduce undesirable forms. Larger species may knock corals over but they are such good grazers that I am prepared to forgive them for this.

There is another species very closely related to the turbo snails called *Stomatella varia* (**Figs 10 & 11**). This is the commonest gastropod imported with live rock and will thrive as long as it remains unmolested. Due to the mantle of the snail completely covering the shell in most instances this snail is often mistaken for a nudibranch (sea slug). Hopefully you will be able to positively identify this snail from the photographs because handling it will reveal its adaptation to deter predators – it loses its tail! Much like several species of lizard that shed their tails this little creature has evolved the ability to break-off the hind part of its body which occupies a would-be assailant by twitching attractively whilst the animal itself makes a hasty getaway.

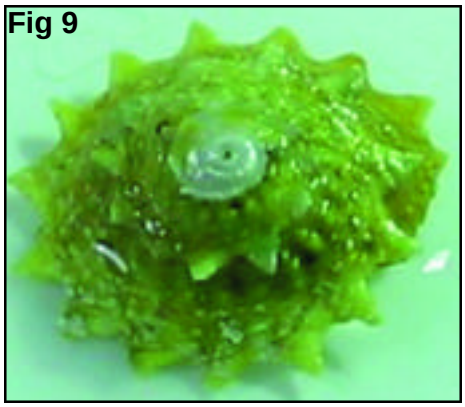


Fig 9

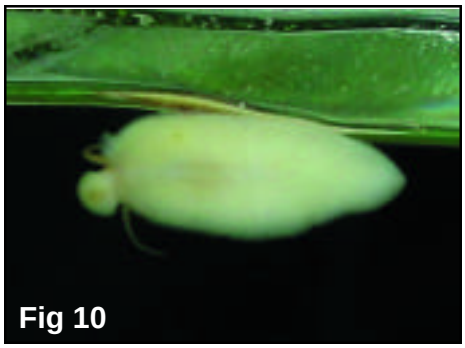
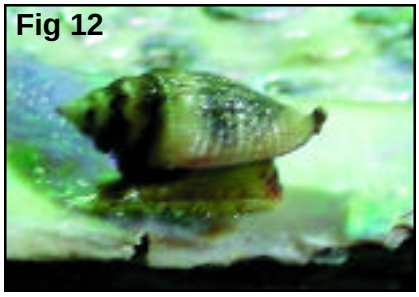


Fig 10


Fig 11

Order : **Mesogastropoda**
Superfamily : **Columbellidea**
Common name : **Dove snails**

Typified by the genus *Euplica* (**Fig 12**), dove snails are very common imports from the Indo-Pacific region. They appear to be totally harmless and many established aquaria have several specimens spending a large amount of time on the aquarium glass apparently feeding on algae. The shell resembles that of *Strombus* – the conch and relatives, but the animal can be distinguished from these distant cousins by the fact it prefers rocks and glass rather than sand, and less prominent eye stalks. Most aquarium specimens attain a length of about 1cm and have a slender foot region



and prominent proboscis.

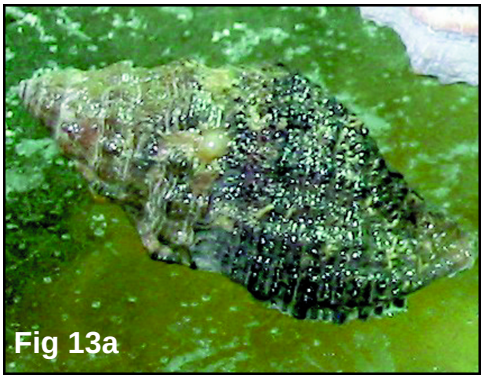
Gastropods such as these should be left in the aquarium. They appear to be very hardy and long-lived. Their inclusion in the ecology of the aquarium is difficult to quantify but half a dozen of these in a forty gallon aquarium will consume a lot of algae in a year and their shells, being more slender than those of the turbo snail family, enable them to get into more nooks and crannies.

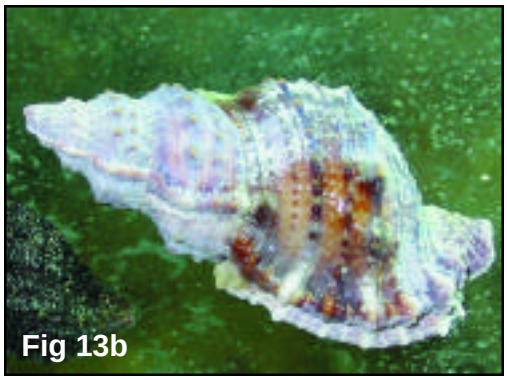
Order: **Mesogastropoda**
Family :
Common name : **Scavenging snails**

There are two species that I would like to focus on under the heading "scavenging" snails. These are common imports and must be left in the aquarium only with great caution.

Species 1
This species (**Fig 13a**) is a relatively common import along with live rock and to date I have been unable to identify it but presume it is a mesogastropod. It shows a distinct liking for meaty food such as mysis, mussel and brine shrimp but this carnivorous diet seems to be limited to dead material rather than the snail being an active predator. However, look at **Fig 13a** again and compare it with **Fig 13b** which is a carnivorous snail responsible for the deaths of four fish in a hobbyist's aquarium. Although differences can be seen it is obvious that confusion can arise. If you are unsure about the intentions of such a snail then remove it. The harmless species is a great addition to sump tanks where it will seek out uneaten food intended for fish.

Species 2
This species (**Fig 14**) has a very distinctive spotted shell that has a similar shell shape to Species 1, although the latter's shell is much rougher in texture. Although I may be completely wrong I am going to recommend that this snail is removed when first sighted. I base this on my experience that this snail only arrives on specimen pieces of invertebrate rather than



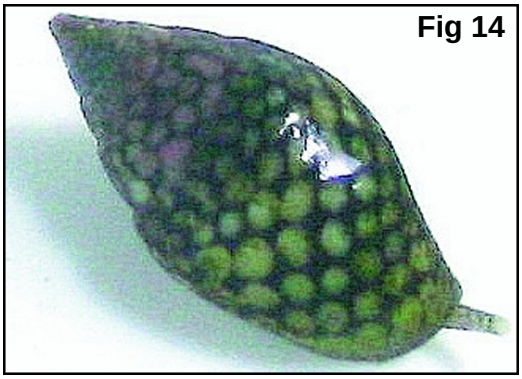


live rock. This could be due to the fact that they are feeding on the specimen and so it is better to err on the side of caution and remove it.

Order : **Mesogastropoda**
Superfamily : **Cerithiacea**
Common name : **Ceriths**

There are a small number of infrequently occurring gastropods that for convenience I will group under the title "Ceriths". Cerith snails generally have elongated shells – characteristic that has given them the alternative name of tower snails (**Fig 15**).

Although there are possible exceptions, ceriths are herbivorous and generally feed upon microalgae. Their tall, slender shell enables them to get into more nooks and crannies than the rounder turbo snails and



their presence in a reef aquarium can be a positive advantage. Most of the specimens I have found in association with reef aquaria are less than 1cm long and spend more time on rocks than the aquarium glass. My own experience of this species centres around the acquisition of dwarf blue-legged hermit crabs. Many small specimens of this helpful little crustacean are to be found residing in the empty shell of a small cerith. However, when the crabs are collected in the wild occupied cerith snails are collected too and it is likely that this is the most common source of the live snail in captivity.

Order : **Mesogastropoda**
Superfamily : **Cerithiacea**
Families : **Vermetidae and Turritellidae**
Common name : Worm snails

Worm snails are a fascinating group of snails that many people mistake for worms due to their occupancy of tube-like shells. When the snails are young they have a typical gastropod shell but as they grow this elongates and the whorls separate resembling the tube of a filter-feeding worm. The shell is attached to rocks, other shells or any suitably hard surface where it remains. The shell can then be overgrown by calcareous algae and any other organism that likes the conditions, almost totally obscuring the shell. The

animal itself can further protect itself with an operculum. The flesh of these snails can be brown, orange, red or green – the brighter individuals generally being the most obvious.

Perhaps the most interesting feature of these snails is their method of feeding. Obviously if you cannot move towards your food you must rely on it to come to you. This is a tactic used by filter feeders and ambush predators but the vermetid snail has no specialised body parts to act as a filter and certainly isn't an ambush predator. Instead it uses the stuff that molluscs have in profusion – mucus. The snail secretes a "net" of mucus threads around the entrance

to its shell. These catch phytoplankton, zooplankton and detritus. After a while "fishing" in this manner the snail then eats the net and whatever it has caught! Figure 16 shows a vermetid snail that has been overgrown by Porites hard coral much like the tubeworms normally found in plume rock (**Fig 15**) . The snail is located in the hole at the bottom of the picture, the red area emanating from the hole appears to be as a result of the feeding behaviour of this cryptic animal.

These snails are harmless and actually do the beneficial job of cleaning up uneaten food and detritus.

Order : Archaegastropoda
Superfamily : Cypraeacea
Common name : Cowries

Many marine aquarists will be familiar with the large tiger cowrie (*Cypraea tigris*) with its beautiful shell and somewhat clumsy habits – the latter being the reason that they are rarely included in reef aquaria. The key to identifying cowries is the distinctive

shell opening which runs its entire length of its underside and is a simple groove sometimes lined with tooth-like projections. (**Fig 17**) There are no obvious whorls or apex.

There are smaller species than the tiger cowrie, many of which are purely algal grazers that may appear for sale or arrive with live rock and specimen pieces. However some species are predatory on soft corals and polyps. One innocuous import is *Eriosaria annulus* which grows to around 2.5cm. It can be readily identified by the rusty brown ring around the middle of the grey shell. It feeds primarily on microalgae and can be left in the aquarium to carry on this helpful job.

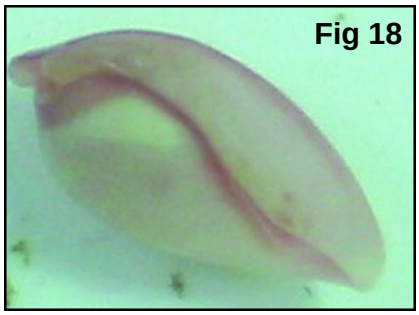
Ovulid snails
Common name: Egg cowries

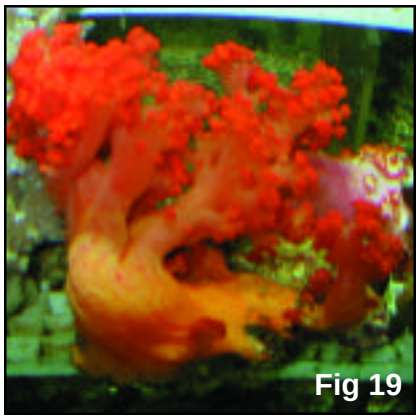
Ovulid or egg cowries have a shell shape that is superficially similar to ordinary cowries but are generally far more harmful than their cousins. Closer scrutiny of the opening of the shell reveals obvious whorls leading to a definite apex at the posterior end and a more curved opening to the shell (**Fig 18**).

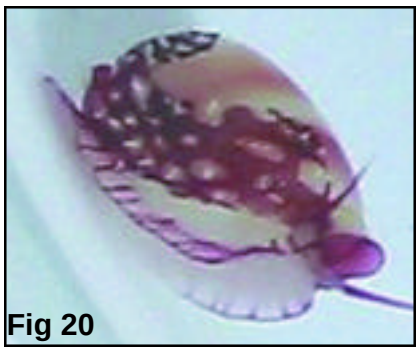
One particular problem with these animals is their incredible camouflage, particularly that demonstrated by the species found on *Dendonephthyea* soft corals (**Fig 19**). *Primovula sp*. (**Fig 20**) is an excellent example of this. It can remain undiscovered in the aquaria of even the most eagle-eyed aquarist, that is, unless you know what you are looking for! The mantle in these snails has evolved to resemble the shape and colouration of a cluster of polyps confounding predators and aquarists alike! Fortunately pieces of *Dendronephthyea* are only host to one or two of these snails at a time and once you have spotted one you should have no trouble in finding others.

Other species of coral and gorgonian are attacked by ovulid snails and it is only the vigilance of the aquarist that can prevent them from doing severe damage to their host. Some species that predate gorgonians are very elongated and taper to a point at either end – an obvious adaptation to remaining concealed on the branching "arms" of gorgonians.

As you can already recognise, even in the more primitive gastropod groupings there are already several species of interest to aquarists whether they are predatory or beneficial in reef aquaria. Most of the species I have concentrated on so far are beneficial in reef aquaria. Unfortunately, in the second part of this focus on the molluscs, all of the gastropods listed are harmful if left unchecked. After highlighting these species I will then go on to look at the other molluscan hitch-hikers we regularly encounter – the Bivalvia, the clams, scallops and cockles.







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