Friend or Foe?

Introduction to the world of marine nasties

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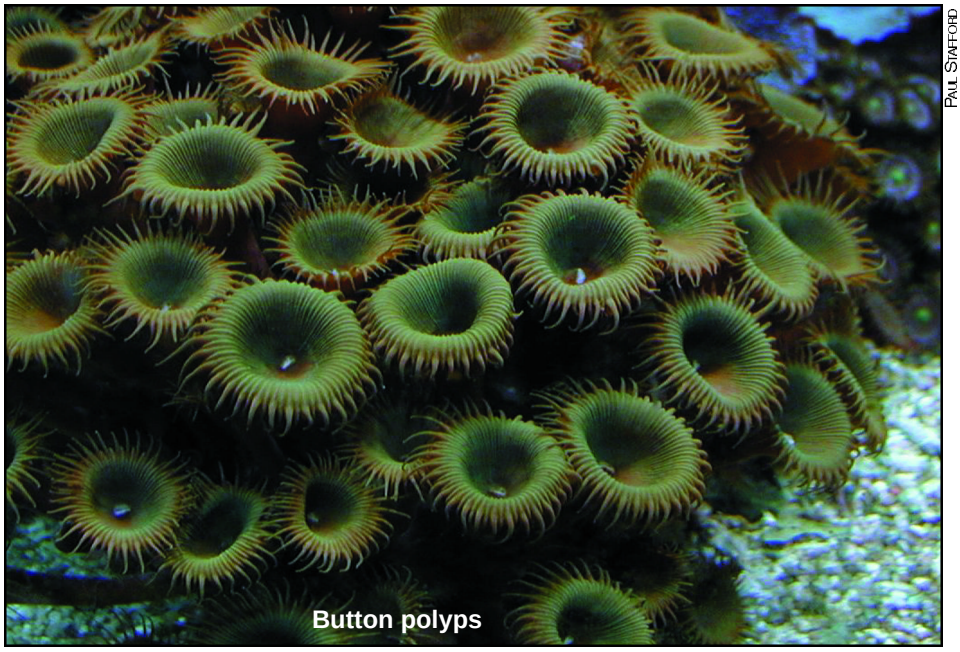
The rise of marine reef-keeping over the last five or so years has seen the hobby move from very 'high-tech'forms of filtration to much more natural systems commonly filtered with live rock. Of course, many successful aquaria are still run with trickle filters, fluidised bed filters and the like but an increasing number are not; relying on good light, good flow, good protein skimming and live rock instead.

One of the reasons for favouring live rock is the very natural look it lends the aquarium as it is often home to diverse forms of colourful algae.

Many people want pieces of rock with obvious invertebrate life on them, for example button polyps (*Parazoanthus sp*.) or mushroom anemones (*Discosoma sp*.). But if these relatively delicate organisms can survive shipping and then the curing process it begs the question "what else can?"



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Button polyps

The fear of stocking nasties is one of the major reasons that people cite for not adding live rock to their systems; are you unwittingly stocking something that is going to consume your expensive corals or will it actually benefit the tank perhaps by consuming uneaten food intended for your fish or be a useful grazer of unwanted algae?

This series of articles will attempt to provide an answer by looking at the major animal groups that have representatives which regularly turn up on and in live rock. Please note that this series is NOT anti-live rock, indeed I couldn't be more for it, but a sensible approach to what it contains can give you some great 'freebies'and tell you when a pest is present.

A word on Taxonomy

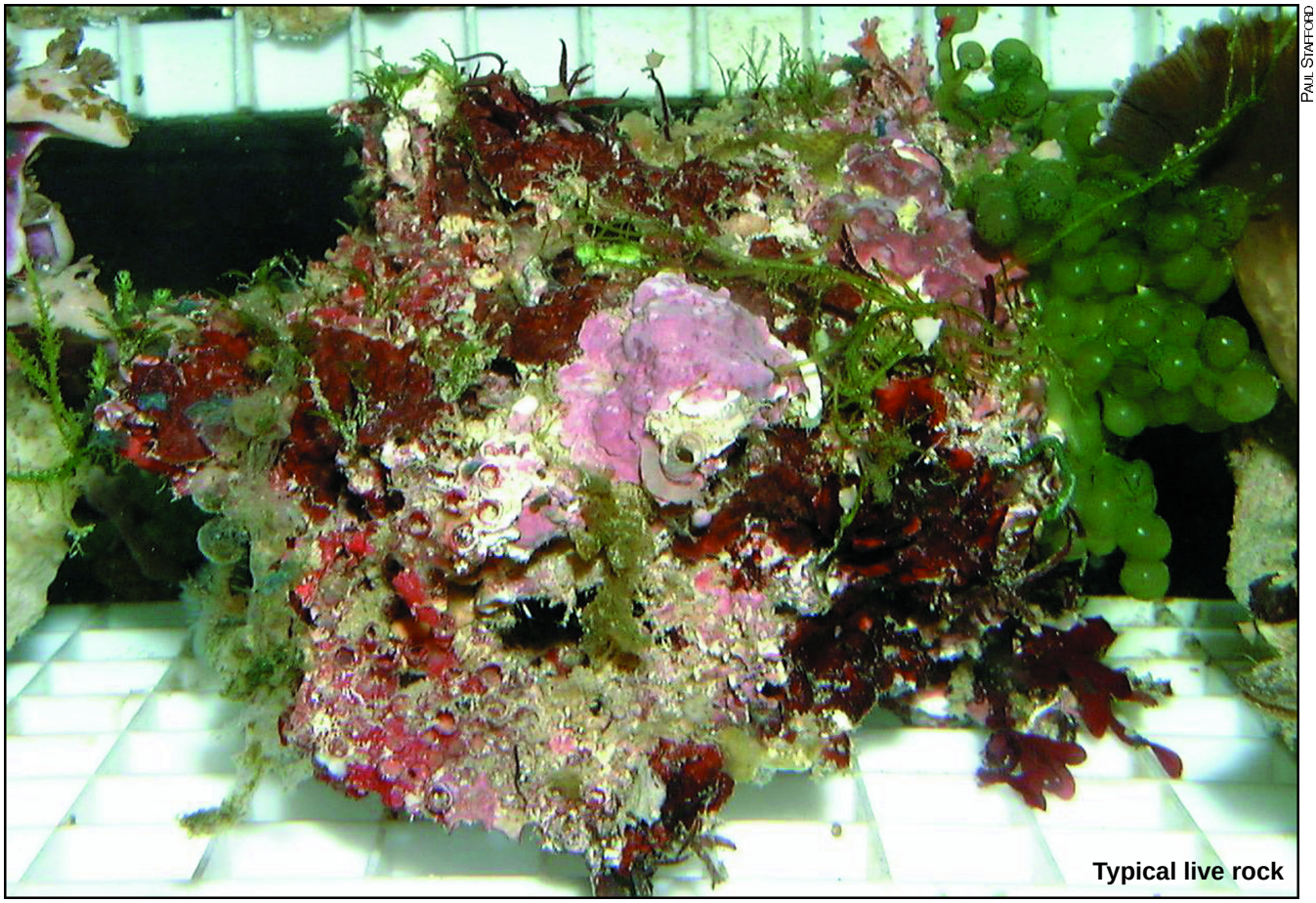
Throughout this series I will try to keep everything as easy to follow as possible by referring to the common name of an animal first, and then putting the latin name afterwards in italics. However, some of the animals we will look at don't have a common name and so Latin names must be used. I will also refer to the group of animals to which they are assigned. The assignment of animals to a group (*Taxon. Plural = Taxa*) is usually based on their physical structure or *morphology* and is referred to as Taxonomy. Other characteristics that can separate 2 species are colour, ability to mate and produce fertile offspring, geographical isolation etc. For most mammals recognising two separate species is quite easy – for example the differences between a gorilla and orang-utan are obvious. For a planktonic shrimp, however, the species may be separated into different species based on the number of hairs on a particular part of their antennae!! Thus I will try to be as simple as possible in my identifications – it may not be possible to correctly identify everything but by establishing the characteristics of members of the same family we can make an educated guess.

What is live rock?

I think it's a good idea at this point to have a quick reminder of what live rock actually is and where it comes from. Live rock originates as coral on the reefs of the tropics. Storm and wave action breaks chunks of the reef off and they are washed up in shallow areas where they accumulate. This is an entirely natural process that ensures progression of species on the reef and eventually results in the formation of coral sand. The vast majority of live rock in the U.K. is imported from Fiji where it is collected under license from these shallow water areas.

Before the rock is collected it is open to colonisation by many animals. Many arrive in larval or egg form carried by ocean currents or move onto the rock from adjacent pieces. Some may have existed there since before the rock was torn from the reef.

Now the sole reason that live rock is of interest to aquarists is not the invertebrate fauna present or indeed the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Typical live rock

algae or interesting shapes, it is simply that when cured live rock is added to the aquarium it provides biological filtration i.e. that all the nooks and crannies of the rock contain bacteria which convert the products of fish and invertebrate waste into nitrite then nitrate.

There are also bacteria present that can, to a small extent, help convert nitrate into nitrogen gas thus reducing pollutants even further. However, given the choice between a bare piece of live rock and one showing evidence of colourful algae and perhaps some small pieces of coral most marine aquarists will choose the latter – and who can blame them? Many interesting invertebrate specimens can be purchased this way. Very often button polyps, mushroom anemones and a large variety of hard corals survive the shipping and curing processes e.g. *Porites*, *Favia*, *Favites*, *Platygyra*. Such pieces are rare but not unobtainable.

Look also at the specimen pieces of, say, mushroom rock that we buy. If you scrutinise every piece closely, very often you will spot unusual corals growing in association with the specimen – many of which are extremely difficult to obtain as true specimen pieces.

Don't blame the live rock!

A quick note here – if a nasty turns up in your aquarium then it doesn't necessarily follow that the live rock is to blame. Having imported and cured live rock for some time now I am aware that many harmful pests do not survive the transportation from source. This is due to the fact that live rock is shipped 'dry'i.e. with no water because of prohibitive freight costs. Although kept moist by the bags inside many animals do not survive.

However, consider a piece of button polyp sent from the Far East in a bag with clean salt water and oxygen – the chances for survival of any unwanted guests living on the rock below must be significantly higher. Most invertebrates are shipped in this way and many rare and unusual coral specimens are obtained by hobbyists through this route.

It is highly likely that many pest organisms are introduced via this route, arguably more than through the introduction of live rock – indeed doesn't it make sense if you are a predator to stay in close proximity to your next meal?

To give you some idea of what can survive the shipping process I once found a living dottyback (*Pseudochromis sp.*) in a bag containing a piece of star polyp (*Pachyclavularia sp.*). If a fish can survive then almost anything else can!

Other organisms I've found in association with corals include mantis shrimp, pistol shrimp, predatory nudibranchs, brittle stars and many varied species of mollusc. Now brittle stars and some mollusc species are the friends of the marine aquarist as they are either good at scavenging uneaten food and detritus or grazing undesirable algae. This is why I have written this series of articles – to help you, the aquarist, to separate the wheat from the chaff. I do not claim that this is the definitive guide to everything you will see but by covering the most commonly found groups you should have enough information to make an educated guess as to the most appropriate action to take.

It would be irresponsible of me to suggest that live rock is blameless with regard to the introduction of pests but I think it gets a bad press nonetheless. Many people are worried about contaminating an existing aquarium with 'nasties'imported with the live rock. My point is that if you can import them with a piece of coral then don't miss out on the huge benefits that live rock can offer.

Another aim of this series is to inform you about animals including fish that can help you control pest species: for example

the use of peppermint shrimp (*Lysmata amboinensis*) to control 'triffid'anemones (*Aiptasia sp*.) The animals which have a role in this biological control include many fish species some of which are already popular with marine aquarists for their spectacular colours.

There is another reason for learning a little more about the invertebrate diversity in the reef aquarium in that it can give vital clues as to the correct position of a coral with regard to light and flow. Positioning a coral in your aquarium is vital to its long-term health and vitality. Associated invertebrate fauna can also suggest whether the coral has been collected from an area with a lot of suspended food i.e. plankton. For example, many books will tell you that certain soft corals, most notably from the genus *Dendronephthyea*, do not like strong light and yet it is not uncommon to find *Porites sp*. growing on the rock the coral has been collected on. *Porites* is a hard coral that likes good lighting and flow. Therefore it is likely that the particular specimen of *Dendronephthyea* has been collected from a strong light area. Similarly, if a piece of coral possessing zooxanthellae is found on a rock with an abundance of filter-feeding organisms such as tubeworms, sea squirts and bivalve molluscs the coral may thrive a little better with the addition of fine particulate food such as Marine Snow.

So what are the major groups of live-rock hitch-hikers we need to recognise? Well there are many but here are the main groups:


Live rock after 9 months

MARINE WORLD PUBLICATIONS

Live-rock hitch-hikers

Protozoans	Mostly foraminiferens
Sponges	Many species – very common
Anemones	Several species
True hard and soft corals	Mostly excellent freebies
Flatworms	A few species differing in their impact
Nemerteans	Ribbon worms – rare
Sipunculates	Peanut worms
Molluscs	Potentially thousands could be imported
Segmented worms	As above!
Crustaceans	As above & not just crabs
Starfish etc	Including sea urchins, brittle stars, sea cucumbers etc
Tunicates	Sea squirts
Bryozoans	Sea mats

All of these groups will be covered in this series with more attention given to the groups containing large numbers of interesting specimens such as the molluscs and crustaceans.

Diversity

One of my customers has the philosophy that if he hasn't bought it, it doesn't belong in his aquarium! Now it's easy to say that we should remove everything that we are suspicious of but with a little observation and hopefully some help from this series of articles there are many beneficial species which can be allowed to stay. Throughout this series you will note that I refer to the *diversity* of the aquarium. By treating the reef aquarium as an ecosystem in its own right the greater the species diversity, the more stable a system will become – provided the species involved aren't harmful. For example several species of grazing animal are better than one as their different grazing techniques and varying body structure will allow some to reach places others can't meaning undesirable algae is more effectively prevented. The same is true of having several scavenging species and so on.

What we have to remember here is the sheer number of different species that are found in the reef environment. You can bet that if you name any coral there are a huge number of invertebrates that feed upon it!

Foraminiferans

The single-celled organisms or *Protozoa* are the most simple forms of animal life on earth if algae and bacteria are excluded. Most single-celled animals of concern to aquarists are the parasitic forms including Costia and Trichodina which parasitise fish. Leishmania and Trypanosoma are human and mammal parasites transported by insects which cause diseases such as Chaga's disease and African sleeping sickness. There are some good guys out there however! Almost all live rock has evidence of foraminiferans. These are small single-celled animals that we can call a specialised type of amoeba. There are over 7000 species living today – mostly marine and most are found living on various substrates although some are planktonic. (There are over 28000 fossil species described!) Even though they are unicellular many species are visible to the naked eye – some reaching a centimetre in diameter.

Foraminiferans have modified appendages branching from the main cell body. These **reticulopodia** form a fine mesh for the entrapment of food particles from the water column. It is almost impossible to remove a foraminiferan from

its protective shell. However, these little chaps are beneficial detritivores in the marine aquarium and can proliferate nicely given the right conditions. The most commonly seen form on live rock is a bright red-pink form called Homotrema. (*Fig. 2*) This is the form responsible for the pink sands of Bermuda – actually made up of the dead skeletons of foraminiferans!

Another form that marine hobbyists may be familiar with is the pink wart-sized species that is frequently found on the underside of Caribbean live rock (*Fig. 3*) You will be aware of the food capturing spicules that this species employs if you have ever tried moving this rock when it has become established in your aquarium as they are very sharp and can be quite painful if they break off in your skin!

Other forms include a common species in marine tanks that looks a bit like a small branching tree approximately 1-2cm tall. They are usually found on the underside of live rock in areas where detritus is likely to collect.

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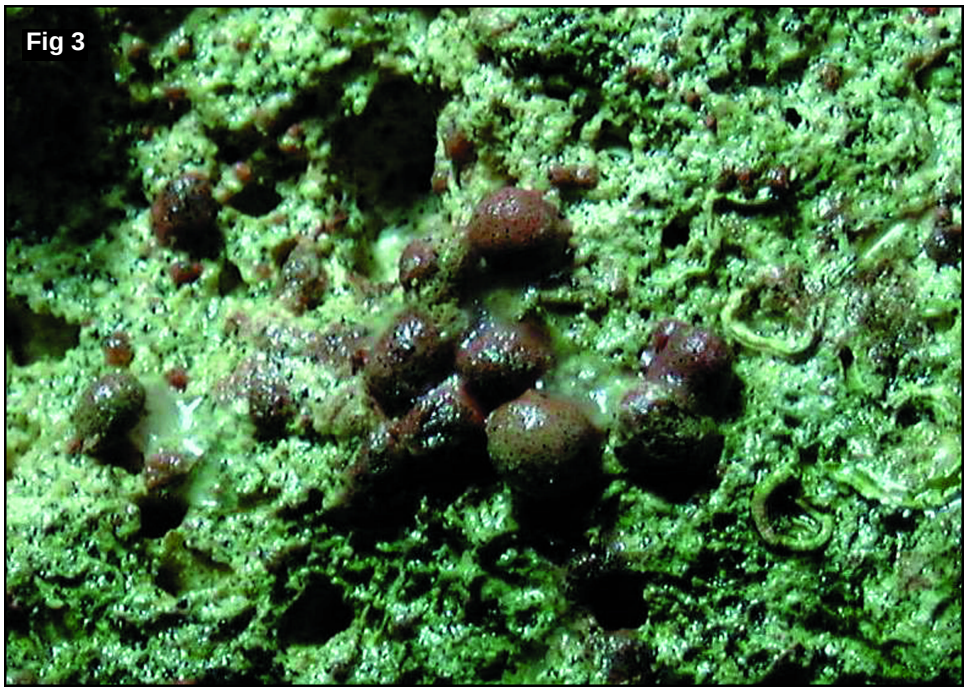
So foraminiferans, though small, are good things to have in the aquarium as they will aid in the removal of fine particulate matter.

In the next instalment the single-cells get organised and form far more complex animals such as sponges and flatworms – both can be abundant in reef aquaria.

Subsequent articles will embrace creatures such as snails and sea slugs, crabs and shrimp, sea squirts and starfish. They will also include lesser-known groups that can turn up periodically in your reef.

I hope that this first feature has whet your appetite for the rest of the series. At the very least I hope that it gives you some insight into the complexity of a reef system – something that no amount of technology can recreate. We should look upon ourselves more as managers of our aquaria – much like how a farmer tends his land by removing pests like greenfly and encourages the former's natural enemies such as ladybirds. This, for me, is the advantage that a 'natural'live-rock based system has over a high-tech one. It's dynamic and fascinating and you never know what's going to turn up next!



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