Friend or Foe Part 3

Tristan Lougher B.Sc.
Digital images by the author

This instalment in the series will centre on the the Cnidaria, that is the anemones, corals and their allies, the vast majority of which the reefkeeper can view as a bonus when they arrive in association with live rock or specimen pieces of coral. We will also have a quick look at a closely related group that is represented by a common species that has caused great consternation to aquarists due to its bizarre feeding apparatus!

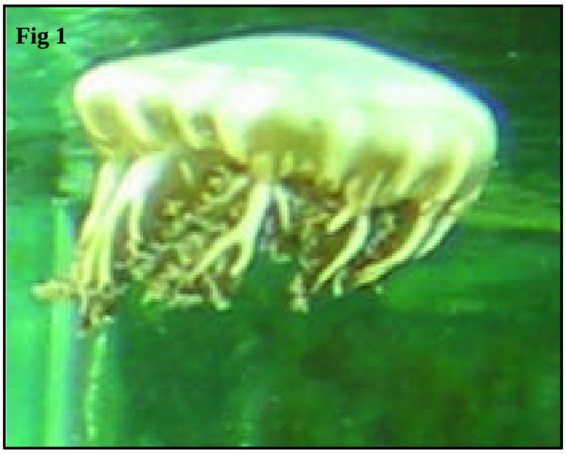


Fig 1

The Phylum Cnidaria contains over 5000 species – the majority of which are marine. Their name is derived from the unique cells that they can possess called cnidocytes. These are home to the stinging organs that are so obvious in anemones and jellyfish but hard and soft corals can possess them too.

We can further divide the Cnidaria into separate Classes of interest to aquarists, namely:

Scyphozoa	Jellyfish
Anthozoa	Anemones
Hydrozoa	Hydroids / Fire corals (*Millepora sp.*)

Hydrozoa

The class which seems to demonstrate characteristics of all of the above named classes is the little recognised Hydrozoa. Hydrozoans show a wide variety of structures and range in size from extremely small – (< 2mm) to extremely large (several metres across). They range in form from simple "button polyp" – like animals to the complex Portuguese Man o' War (*Physalia sp.*).

The life cycle of many hydrozoans incorporates a medusa stage. The medusoid stage can be a means for hydrozoans to facilitate sexual reproduction – there are separate egg and sperm carriers, or dispersal – the medusoid stage is free swimming and enables the animal to distribute its genetic material over a wider range. The medusae are often mistaken for jellyfish and understandably so since they have a bell shaped upper body usually with dangling tentacles. See the Figures of *Cassiopea* (**Figures 1 & 2**), a true jellyfish, for a better idea of the overall shape of a medusa.

Fig 4

Hydrozoans are only infrequently offered for sale in the U.K. Recently some specimens of *Distichophora* (**Figure 3**), a purple branching variety, have been imported from Indonesian waters and sometimes *Millepora* (**Figure 4**) can be found for sale as a specimen piece. But it is the arrival and identification of hydrozoans as hitch-hikers on live rock and associated with hard and soft coral specimen pieces that we are most interested in here.

Fig 2

In my experience, *Millepora* is a very common import, particularly with *Clavularia* and *Anthelia* specimens (so-called star polyps). It can be very desirable as large specimens can resemble branching or leafed true hard corals. **Figures 5** and **6** show some *Millepora* a day after importation when the hair-like polyps have not extended but the colouration and shape of the colony are typical.

Care must be taken with *Millepora* as the common name for the genus suggests. Fire corals can be dangerous for humans producing a nasty rash when coming into contact with soft skin. They can also cause problems to fish if placed in flow that is too strong or direct. Polyps can be ripped free of the coral in this situation and as they float they continue to be capable of stinging anything they come into contact with – including fish!

Despite this, *Millepora* can make an excellent freebie in the reef aquarium and give vital clues as to the correct positioning of the specimen piece on which it arrived. All species of *Millepora* from the Indo-Pacific, where the majority of U.K. imports come from, are found in relatively shallow water (<10m) and in areas of moderate to powerful flow.

Specimens of *Millepora* and *Distichophora* are unlikely to go unnoticed for long in the reef aquarium due to their size and the fact that they have a calcareous skeleton. However the majority of hydrozoans are very small and often overlooked. Investment in some sort of magnifier or hand lens can reveal a beautifully delicate new world.

Like *Distichophora*, the majority of hydrozoans likely to be encountered are filter feeders and therefore common around the bases of soft corals such as *Dendronephthyea*, Gorgonians and sponges but also many corals that photosynthesise – suggesting a need for supplementary feeding of the latter in the aquarium.

Such colonies often resemble long strands of filamentous algae but closer scrutiny reveals very small polyps sometimes less than 1mm tall. Often these hydrozoans are brightly coloured – yellow, red and orange forms are common.

Of little practical use but of general interest is the presence of hydrozoans on animals such as decorator crabs or spider crabs suggesting the type of environment in the area they were collected.

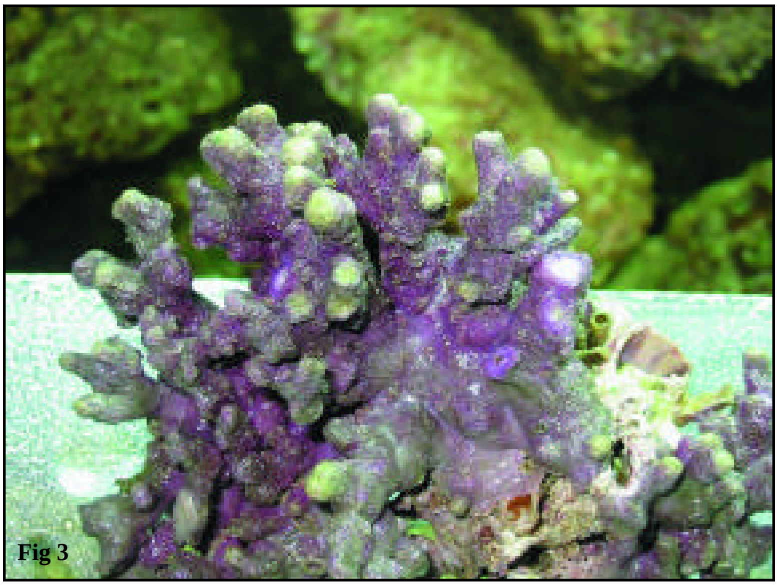


Fig 3

The Hydrozoan Class also contains a free-living form of hydroid which is capable of reaching plague proportions in specialised breeding systems where there is abundant food (**Figures 8a, b and c**). I have experienced them particularly in association with seahorse grow-out aquaria which are kept saturated with food at all times. This species forms an orange furry mat where they are abundant although the colour may be due to their food source which is primarily freshly hatched brine shrimp nauplii and may differ where other foods are presented. They also seem to be copper tolerant and their origin is a mystery. They could come with the brine shrimp eggs or in the artificial salt mix; in either case they have to be capable of surviving complete desiccation!

The only way to eradicate these pests is by thorough cleaning, which is something that most breeding and grow-out systems demand anyway. You just have to accept the fact that you and the hydroids will become reacquainted in a week or so!

Scyphozoa- the jellyfish

I know that many of you reading this will be thinking "I have never seen a jellyfish in my aquarium!" and if every jellyfish resembled *Cassiopea* (**Figures 1& 2**) then you could be right but, like the hydrozoa, some jellyfish have different life-cycle stages that can demonstrate a sessile stage resembling small polyps or tubeworms. The commonest form belongs to the genus *Nausithoe* in which the sessile polyp stage lives in leathery tubes up to 20mm tall on the surface of live rock (**Fig 9**). One reason they thrive in marine reef aquaria is due to the presence of zooxanthellae in their tissues although they will filter feed and can be found in association with photosynthetic corals that require a lot of supplementary feeding.

I believe most sightings of jellyfish in the aquarium are due to sessile hydroids producing medusoid stages, *Nausithoe* being one of the most likely origins. It is possible that if they avoided being sucked into filters that they could grow (they reach a maximum size of 25-30mm) as the medusa has photosynthetic pigments too.

The polyp stage can reproduce asexually which explains the large scale coverage experienced by some aquarists.

The only jellyfish that is regularly kept by aquarists is *Cassiopea* (**Fig. 1**). This fascinating creature is available for sale but is not suited to the typical reef aquarium as there is usually too much flow present. These animals are found in shallow lagoons

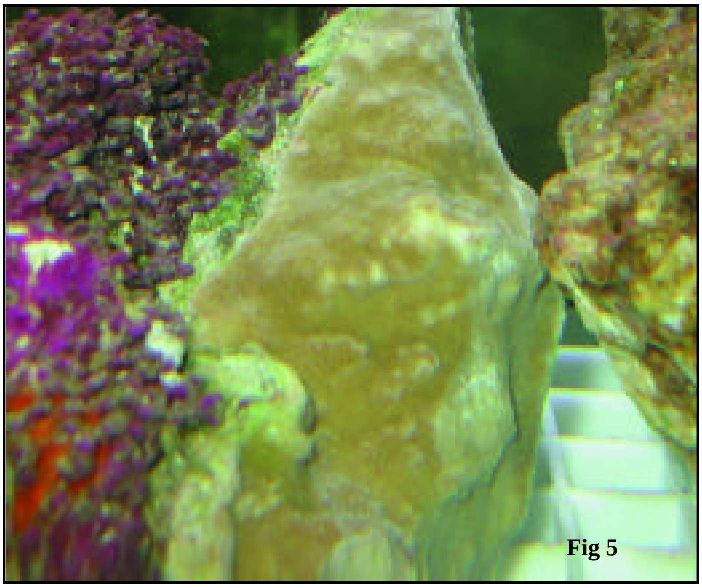


Fig 5

Fig 6

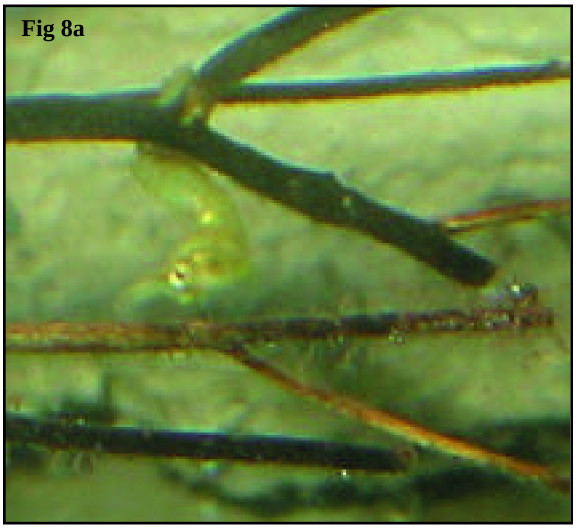


Fig 8a

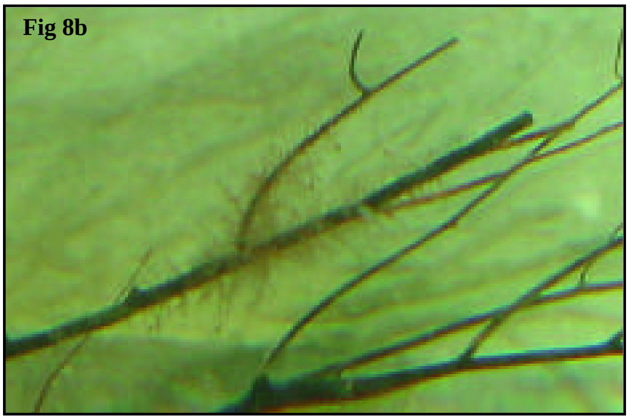


Fig 8b

on sandy or mud substrates and mangrove areas. They have abandoned the stinging cells that jellyfish are renowned for and now their tentacles are full of zooxanthellae. To enhance the performance of these symbiotic algae *Cassiopea* has evolved to rest "upside-down" on the substrate.

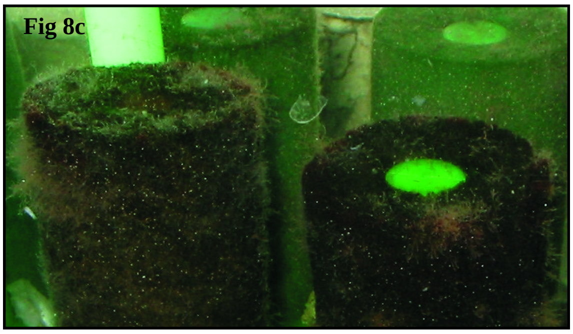


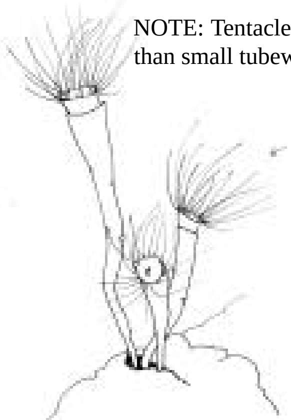
Fig 8c

Anthozoa

This class contains the objects of desire for most reef aquarists – the hard and soft corals and anemones. We can further subdivide this class into the orders and sub-orders which we are most likely to encounter:

Acinaria	Sea anemones
Zoanthinaria	Colonial anemones
Corallimorpharia	Mushroom anemones
Scleractinia	Stony corals
Stolonifera	Star polyps
Alcyoniinae	Soft corals

Fig 9



Nausithoe polyp form

Actinaria – the anemones

There are two main species that compete for attention within this order. The first is the all too common *Aiptasia* sp (**Figures 10a and b**). This has several common names such as triffid anemone, glass anemone, glass rose anemone etc. Fossa and Nilsen 1998 state that *Aiptasia sp*. are the most troublesome pests in reef aquaria! Whether you agree with this statement may depend upon whether your reef is home to these persistent creatures or not!

The main reasons for the proliferation of these anemones in reef aquaria are firstly that they possess zooxanthellae. This means that the conditions in a reef aquarium with high light intensity provide much of the food they need. However, they are also capable of feeding upon almost any kind of food that is offered to your reef inhabitants – thus supplementing the energy provided by light. Finally, they are prolific reproducers. Their reproduction in reef aquaria is almost exclusively asexual by pedal fission or budding – this is the main reason for the futility of cutting or grinding out of the pest anemone. Any damage to *Aiptasia* caused by the aquarist often results in more anemones than were there in the first place.

Removal and control of *Aiptasia*

Not an easy one this. I am bound to experience people who disagree with my opinions here but they are based on good solid experiences – both mine and those of my customers.

Firstly, I would like to state my opposition to the control of *Aiptasia* using fish. Two butterflyfish species have been regularly cited in the literature as capable of controlling glass anemones: The Copperband (*Chelmon rostratus*) and Sunburst (*Chaetodon kleinii*). My experience of these fish is that while giving the appearance of consuming the anemones all they succeed in doing is causing them to remain withdrawn in crevices. The fish can remove tentacles adroitly and repeated attacks on the anemones "train" them to stay hidden. However, remove the fish and almost miraculously within a couple of days your reef will be overrun with anemones again!

Copperband and sunburst butterfly are not really suitable subjects for the reef aquarium either with their tastes stretching to hydrozoans, colonial anemones such as zoanthids and also tubeworms. They will

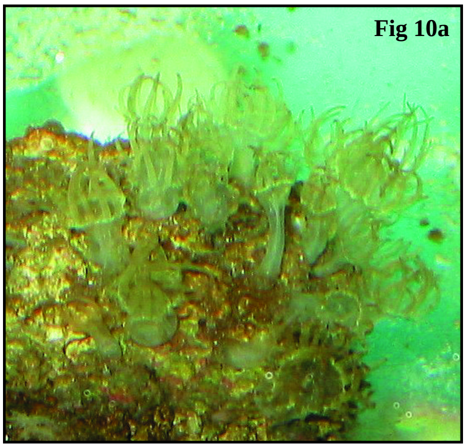


Fig 10a

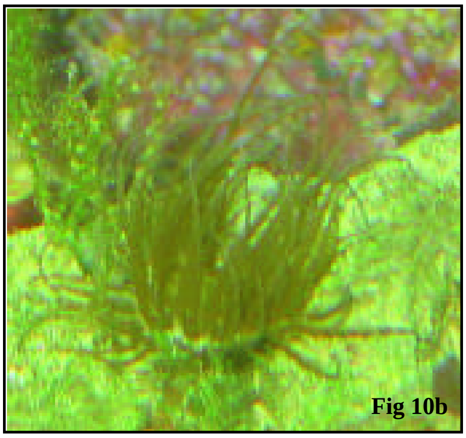


Fig 10b

reduce the overall biodiversity of the system and the additional foodstuffs they require once they have exhausted the aquarium's natural supply can increase pollutants drastically.

There is a species of nudibranch which is regarded as the possible saviour of reef tanks infested with *Aiptasia*. *Berghia verrucornis* is a natural predator of glass anemones that has been successfully reared in captivity. I confess to having no experience with these molluscs as I have never been able to source any and this itself is one reason why they are, for the time being at least, not a practical solution for reef aquaria. I have spoken at length to members of a couple of U.K institutions that have had some experience with *Berghia* and received the same opinions from each. They state that *Berghia* is a superb consumer of *Aiptasia* anemones but the fact that they are so specific in their dietary requirements means they must be continually supplied with *Aiptasia*. This has always been a problem with biological control – the question of balance. The predator eradicates the pest then dies of starvation. But at least you've got rid of the glass anemones, right? Well, yes, as long as you never introduce another piece of coral or live rock that may be home to *Aiptasia*!

In my opinion the peppermint shrimps (*Lysmata wurdemanni*) (**Figure 11**) or

Fig 11

Lysmata rathbunae are the best compromise eradicators of *Aiptasia*.

These two species are likely to be indistinguishable to the casual observer but as far as I know they both have the same performance in terms of their ability to consume *Aiptasia*. For the sake of the article I will concentrate on *L.wurdemanni.*

This shrimp is classed as a cleaner shrimp by many zoologists but it also has the beneficial feature of consuming *Aiptasia*. The feeding behaviour can be difficult to witness in aquaria as these shrimps are quite secretive and many fish, not recognising them as cleaners will actively pursue and consume them if given the opportunity. It's no wonder that the aquarist seldom sees them at all! I have spent some time watching a group of these shrimps feeding on glass anemones. One individual will attack the base of the anemone with short stabbing thrusts from its front legs. This seems to cause the anemone to withdraw its trailing tentacles – perhaps suggesting that the shrimps are susceptible to the stinging cells venom. However, once the majority of the tentacles are withdrawn the attack becomes frenzied with the shrimp literally ripping pieces from the *Aiptasia*. Very often, in a last bid to escape, the anemone will release its foothold but this just enables the shrimp to carry it off and consume every last piece! I have seen small specimens use this technique with quite large specimens up to 10cm tall.

Of course I am aware that people have had differing levels of success with these shrimps and for those of you that have tried and failed to control *Aiptasia* then there could be valid reasons. If the tank is being fed a lot of frozen food daily in order to keep fish satisfied (perhaps the reason for the proliferation of *Aiptasia* in the first place) then the shrimp will tuck-in heartily and ignore the more dangerous food option. Sometimes, simply by withholding such foodstuffs from the aquarium for a couple of days will stimulate the shrimp to start consuming the pests. Given that *Berghia* is ***too*** specific a consumer of glass anemones isn't a shrimp that will eat them but also persist with frozen foods a positive bonus?

Peppermints also seem to be reluctant to move great distances in the aquarium itself – possibly a reason why one particular glass anemone persists when all others have been removed.

Once final warning concerns the potential for peppermints to consume decorative Parazoanthids – such as the common yellow polyp (**Figure 12**). I do not speak from experience here as I have a small colony of these polyps in a display aquarium that is also home to three 5cm peppermints!

Fig 12

For those of you that remain unconvinced and do not wish to add these very useful creatures to your aquarium why not establish a "quarantine" system with 6 or 7 of these chaps in it? They will exist quite nicely in a 45 litre aquarium with a few pieces of live rock present and if you moderate their food prior to an invertebrate purchase they will remove any *Aiptasia* almost immediately! This type of system is also handy for "cleaning" existing rocks – as long as they are not too large!

Anemonia

There are several references in reefkeeping literature concerning an anemone resembling the common bubble anemone

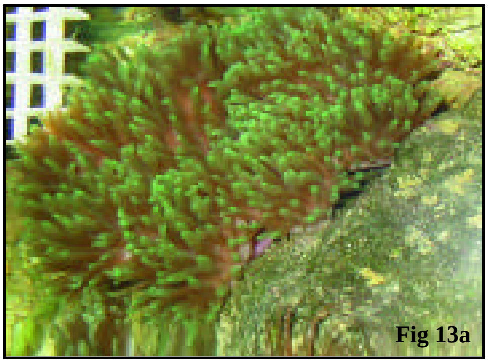
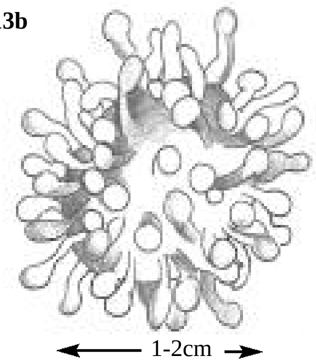


Fig 13a

Fig 13b



Anemonia sp. viewed from above.
Anemonia is brown in colour

(*Entacmea quadricolor*) (**Figure 13a**) in all but size. *Anemonia sp*. (**Figure 13b**) are frequently imported in association with soft corals and polyps and reach about 2-3cm tall. They are highly mobile and thrive in high light and flow conditions. Most of the references state that this anemone is capable of reproducing rapidly and potentially overgrowing the entire aquarium. The potential is there as it shares the same attributes with regard to feeding as *Aiptasia*.

The good news is that this anemone is usually highly visible on specimen invertebrate pieces which can be avoided or the anemone removed prior to introduction to the aquarium. Having stated this, however, I would like to point out that I haven't received any reports of these animals taking over aquaria in our region but it would be unwise to tempt fate!

Scleractinia – The Hard Corals

Having discussed the bad guys that can turn up from time to time it's nice to now turn to the excellent freebies that the sharp-eyed aquarist can find in his or her dealers aquaria. Close scrutiny of pieces of live rock and specimen invertebrates can yield several coral species which are rarely imported or very expensive when bought as a specimen piece. Given time and consideration these corals can thrive in marine aquaria.

One of the good things about hard corals is the majority of them are easy to identify, at least to genus level. The variety of polyp form is incredible though and **Figs 14, 15, 16, 17**, and **18** all show the variety on offer. Other common species include *Pectinia sp*., *Monastrea sp*., *Turbinaria sp*., *Heterocyathus sp*.and *Pavona sp*.

Don't worry too much if you can't correctly identify your hard coral. Most require strong light and flow. A good general rule of thumb is that the smaller the individual polyp the more light and flow required. For example, large *Cynarina sp*. consisting of one large polyp up to several cm across generally tolerate a deeper position in the aquarium compared to *Acrapora sp*. which is made up of a large number of tiny polyps only a few mm in diameter.

Although the healthiest specimens will inevitably be located on the rocks beneath polyps and soft corals that have been imported in oxygenated bags the species found in association with live rock can and do recover from the transportation process and provide some spectacular specimens.

The most common forms on live rock include *Porites and Favites* **(Figs 19 & 20)**. Don't be put off by appearances – if the rock has been freshly imported then the skeleton of the coral will be visible and look pretty dead but given good aquarium conditions will recover in a couple of weeks. It is my belief that these corals are adapted to quite changeable conditions and therefore once settled in the aquarium they are able to grow quickly. **Figure 19** shows *Porites* in its green form but it is perhaps more common in the brown colour morph.

Porites is often imported on the base of blue sponge and *Nephthyea* corals too indicating that the specimens may have been found in areas with intense illumination and flow.

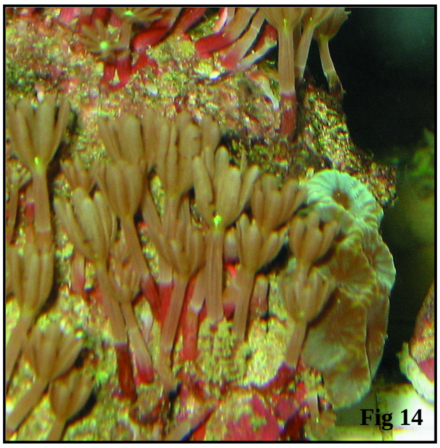


Fig 14

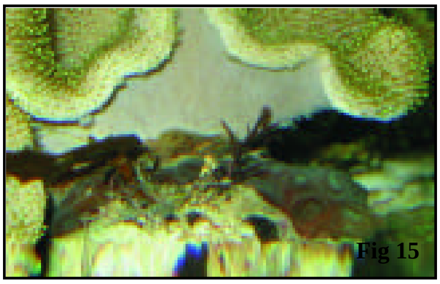


Fig 15

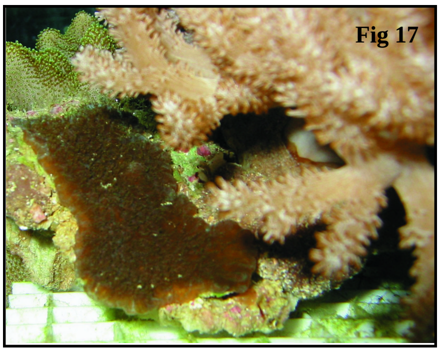


Fig 17

Other polyps

When I select my specimen pieces I always try to find pieces with more than one species of invertebrate present. Such pieces make superb selections for beginners – they enable them to try a couple of sometimes very different species at the same time, thus giving confidence in their system and a more natural look to the aquarium itself. Multi species pieces can also enable experienced reefkeepers to try specimens that they might otherwise be reluctant to introduce. A few weeks ago I located a piece of mushroom polyp that was spectacular by itself but the rock was also home to two small (2cm diameter) pieces of *Goniopora lobata* – a temperamental hard coral that confounds even the best aquarists. Isn't it better to try a small piece like this rather than spend £20-£30 on a larger specimen of this coral? The worst case scenario is that you end up with the mushroom polyp.

Careful selection of your next invertebrate could lead to excellent free pieces. **Fig 21** shows a piece of mushroom coral that was home to two small cream coloured lumps. Closer investigation

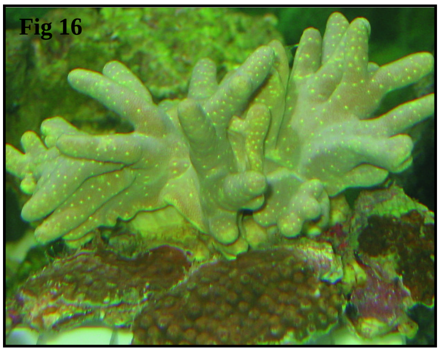


Fig 16

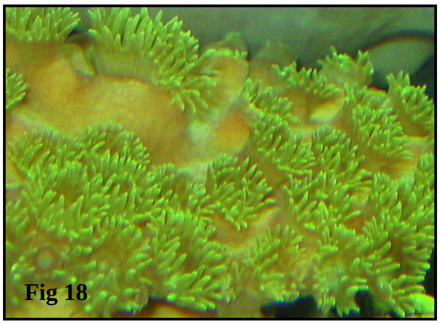


Fig 18


Fig 20

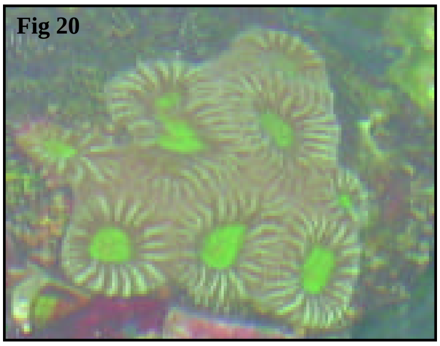


Fig 20

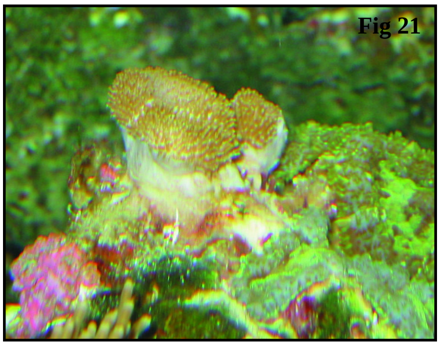


Fig 21

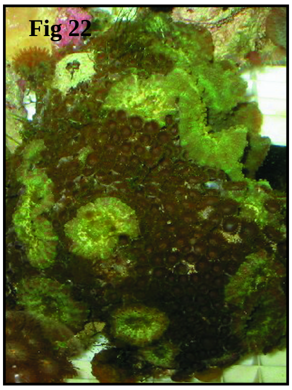


Fig 22


Fig 23

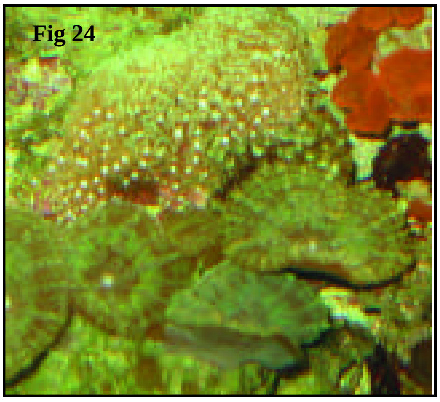


Fig 24

revealed that they were in fact two separate pieces of *Sarcophyton*, or leather coral.

As you can appreciate, the soft corals and other polyps that arrive on live rock are, by nature, mostly unproblematic. The principles one applies to the reef in terms of positioning with regard to correct lighting and potential for battling between species apply to those that are found on the same rock. Transplantation may be necessary at some stage if the reef is to remain in harmony.

The figures below show some of the polyps that can be found together regularly.

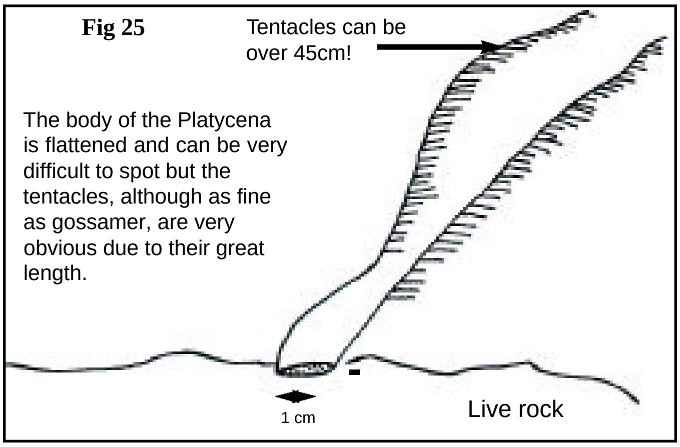
Phylum Ctenophora

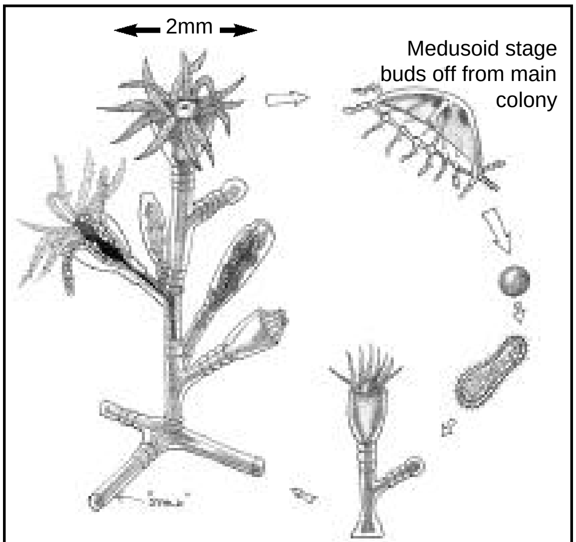
The ctenophores are a group more commonly known as sea gooseberries or comb-jellies and are found in oceans and seas world-wide. I have included them here, even though they are not cnidarians, as they share many similarities to jellyfish. There is one group that are of interest to aquarists – the Platyctena. Unlike the rest of the phyla they are not free-swimming or planktonic-instead they occupy the surfaces of soft corals and polyps in the aquarium. *Sarcophyton* and *Lobophyton* (both "leather" corals) are very commonly home to these unusual animals. The body is very rarely seen by the aquarist due to its often transparent nature and flattening. The feature that draws the most attention is the long feeding tentacles that these animals possess. **Figure 25** shows a drawing of the tentacles which are very fine and almost translucent. I'm certain that some of you will recognise them! Ctenophores are totally harmless and add to the overall interest of the aquarium.

I hope that this latest instalment of the series has been informative and encouraged you to keep your eyes open in both your own aquarium and that of your dealers'.

The next article will feature some really bad bad guys and some rather good good guys as it will centre entirely on molluscs. I haven't written it yet – it could be an epic!

Fig 25





After Barnes 1980
Life cycle stages of a typical hydrozoen, such as the ones found in association with gorgonians. The “stalk” colouration can vary considerably – often being yellow, orange or red

Acknowledgements

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