Part 14
Friend or Foe
The Un-segmented worms - Part 2

PHOTOS BYTHE AUTHOR UNLESS OTHERWISE STATED

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To continue our look at the miscellaneous groups of animals listed here under the title un-segmented worms we will be taking a brief look at a number of different phyla. All have the same general characteristics, i.e. they are worm-like in shape, but this does imply a close relationship between all of the groups listed here. Indeed, as we will see, many have developed characteristics based on their environment which is a common theme that many worm-like animals share.

Phylum Nemertea
Ribbon Worms

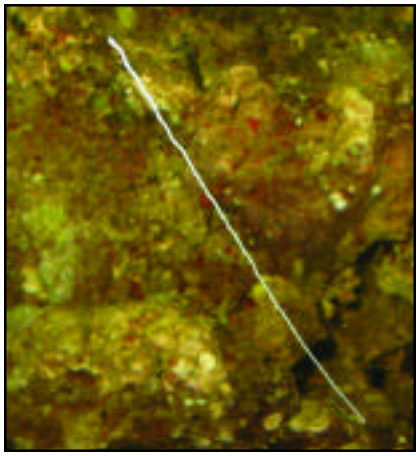

Figure 1. Ribbon worms tend to be elongate, flattened animals which can reach enormous lengths. Many marine species are quite delicate and few survive shipping.

Ribbon worms or bootlace worms as some temperate species are called are relatively abundant animals associated with marine environments. Numbering about 1150 species the ribbon worms are, as their common name suggests, elongate and flattened (these characteristics can be used to separate the nemerteans from other Phyla listed here. A little known fact is that one species of ribbon worm is actually the longest animal in the world with recorded lengths at between 10 and 55 metres! (*Lineus longissimus*)

I have unearthed very few of these fascinating creatures in tropical marine aquaria over the years but they do occur. It is likely that live rock is the source of most individuals experienced by aquarists: I have found many dead specimens in association with newly imported Fijian live rock, but as yet, have not yet found a living specimen of this species which is relatively large and black in colour.

Ribbon worms are predatory creatures of primarily marine existence (there are some freshwater and terrestrial species) and in this environment they may be found burrowing in sand or rubble or associated with crevices and void spaces in and around rocks. All nemerteans are predatory and possess a specialised proboscis which they use to capture their prey. Although they do not present a major threat to reef inhabitants they are known to predate small crustaceans like amphipods which regular readers of Marine World will recall are actually beneficial detritivores. Some species are known to be egg predators. In this situation they use their proboscis to pierce the egg before sucking out the contents.

If you suspect that you have one of these creatures in your aquarium and you want to remove it then the best way is probably to remove the rock that it calls home. Ribbon worms have incredible powers of regeneration and can regenerate any missing parts if they are damaged in the removal. Indeed, some species reproduce asexually and facilitate this by breaking at intervals along the body. Each piece of worm then grows the body parts it is missing, such as the head or tail or even both.

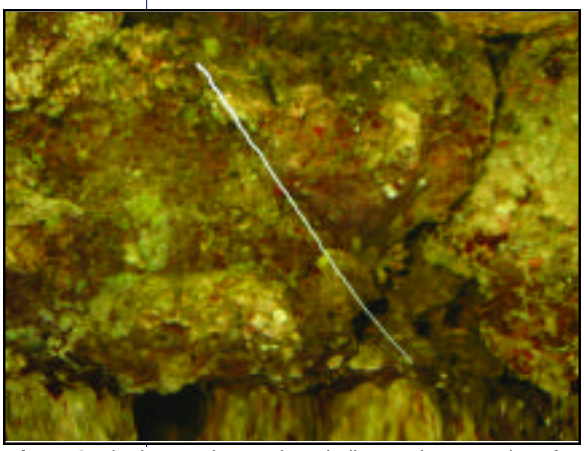

Figure 2. The image shows what I believe to be a species of ribbon worm that arrived with some African live rock. I took the photograph as soon as I spotted the 15cm long specimen but was then called away so I did not have time to remove it and examine it closely.

Phylum Nematoda
The nematode worms (Roundworms)

We may not be directly familiar with the phylum Nematoda, or we at least may not want to admit to knowing too much about

them but we will have heard of them at least. This is because the nematode worms include several species that are parasitic. For example, *Toxocara canis* is the roundworm we treat our dogs with "wormer" for (*Toxocara canis* is the species affecting cats). The human pinworm, *Enterobius vermicularis*, affects mainly children and is relatively benign when compared to larger species such as *Ascaris lumbricoides* (as big as a pencil), *Wucheria bancrofti* (causes elephantiasis) or *Loa loa* (The African eyeworm). The lectures in parasitology I took as a student were always very well attended as the lecturer always had a remarkable set of slides with which to amaze and repulse us with. There is some sort of morbid fascination with animals that invade the bodies of others. Look at the *Alien* series of films- we love it! Anyway, before I digress too far the point I am trying to make here is that it is quite possible that we think of nematode worms only as animal parasites. Well, they are also the parasites of plants too! Seriously though, although they may be encountered in a parasitic role by marine aquarists (given that the majority of the fish species we keep are still wild caught many will harbour internal parasites) free-living forms which are definitely non-parasitic are extremely likely to be present in our aquaria.

Nematodes are interesting creatures with a variety of deviations from the basic worm body plan but nonetheless always retaining an elongate tubular form. There is some debate over the number of species currently described (around 80,000) and those which may exist (it has been suggested that every species of animal on earth may have a parasitic nematode worm that is unique to each. This would mean well over a million species of nematode and make them the largest animal phylum). Most species are small and many measure less than 1mm. Larger species do exist including the aforementioned *Ascaris* spp. at several centimetres in length. Nematodes are extremely abundant in every ecosystem. Densities of a particular species of nematode in one square metre of benthic mud of the North Sea reached an incredible 4 million plus individuals. Barnes (1991) quotes a source from the last century:

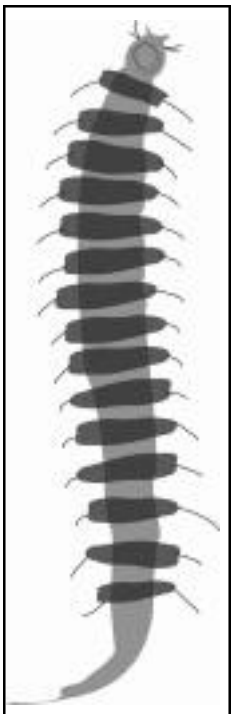

Figure 3. The nematode *Desmoscolex* showing an atypical body form for the phylum

"If all the matter in the universe except the nematodes were swept away, our world would still be recognisable….

…we should find its mountains, hills, vales, rivers, lakes and oceans represented by a thin film of nematodes"

Even if we take this with a pinch of salt it should be almost inconceivable that free-living nematodes are not present in our aquaria.

Marine nematodes are held to be the most primitive of the group and they show a range of forms which we might not necessarily connect with the typical roundworm structure. Figure 3 shows an illustration of a marine form called *Desmoscolex* which forms part of the much larger assemblage of animals grouped under the title Marine Interstitial Fauna. What this term refers to is the forms of various groups of animal which live in the water that surrounds individual grains of sand. Marine interstitial animals are generally of a similar size (100-200 micrometres in diameter) and elongate. Phyla which include such animals include flatworms, polychaete worms, molluscs, arthropods and, of course nematodes. Many of these animals are to be encouraged in the substrates of our aquaria even though they will almost certainly never be seen. Many species are detritivores and a healthy number of these will ensure the well being of substrates including plenums, deep sand beds and our base sand.

Apart from the substrate roundworms can be found by the determined aquarist living on live rock and in association with algae. Many species are more typical in form than *Desmoscolex* often appearing transparent to the naked eye but otherwise looking very much like an un-segmented earthworm.

Phylum Gastrotricha

A small phylum of mainly interstitial specialists inhabiting freshwater and marine habitats and even managing to eke out an existence on the water film surrounding soil particles the gastrotrichs peak in size at only 4mm and most are considerably smaller than this. I have seen many

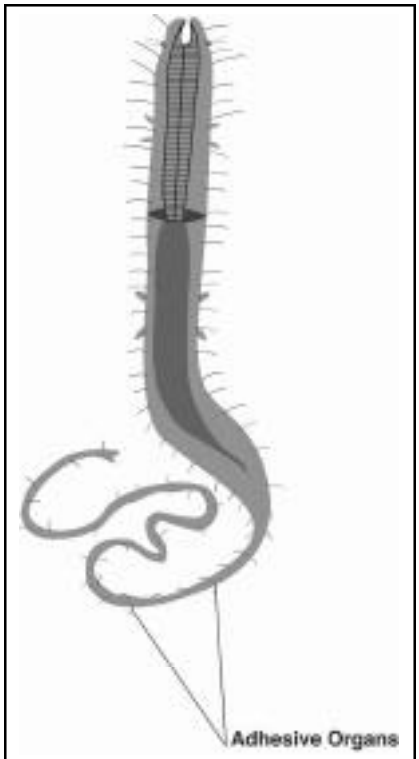

Figure 4. The gastrotrich *Urodasys viviparous*

sketches of gastrotrichs but have never found any in my reef aquaria. However, Fossa and Nilsen , have found them in such a system and perhaps their lack of mention in most publications rests more with the fact that they have not been looked for than their actual absence, and I am perhaps as guilty of this is anyone. Densities have been reported at over 1000 individuals in 20 ml of sand in intertidal areas where as many as 40 species may be present in any one area. Figure 4 shows the gastrotrich *Urodasys viviparous*: note how similar it is in general body shape to the nematode *Desmoscolex*. However, unlike the nematodes, gastrotrich move around the interstitial spaces not by swimming but by creeping around using hair-like cilia. In order to anchor themselves in shifting substrates they often have at least two adhesive organs around their "tail" region. This prevents them from becoming detached from substrate particles when the sand or mud is moved by, for example, shifting tides.

The diet of gastrotrichs consists of small particulate matter including single-celled protozoans and algae whether they are alive or dead and so they may have a role to play in the general ecology of marine aquaria. As with almost all of the animals listed in this section of the friend or foe series their occurrence in our aquaria may not be immediately apparent, but if in residence they may be amongst the most abundant animals present.

Phylum Phoronida
Horseshoe worms

The final worm-like animals we will look at in this edition of *Marine World* are the horseshoe worms, or phoronids. This is a tiny group of animals numbering only about 20 or so species and superficially they resemble polychaete tubeworms like feather dusters. What makes them different? Well, phoronids possess a food capturing ring of tentacles that is similar in appearance to the feeding apparatus of tubeworms. However, this apparatus, termed the lophophore, is derived from a different region of the body than that of the polychaete worms. Another characteristic of horseshoe worms, and indeed all so-called lophophores, is the presence of a U-shaped gut. This basically means that the gut is around twice the length of the body and the mouth and anus of the creature are quite close together although the latter is outside of the lophophore.

Given the lack of species in this phylum are we likely to encounter it in our aquaria? Well, it is certainly possible. Phoronids have been found in association with tube anemones (Cerianthids) and can be seen surrounding the larger animal. They appear to attach themselves to the flesh of the anemone without apparently causing any harm. I have seen many tube anemones over the years but have never seen one of them playing host to phoronid worms. However, I have not given up hope and will continue to scrutinise every specimen that T.M.C. import until I find one!

I hope that you have enjoyed this brief look at some of the more unusual animals we might be playing host to with our aquaria. In the next issue we have more, sometimes equally strange, animals to look at.

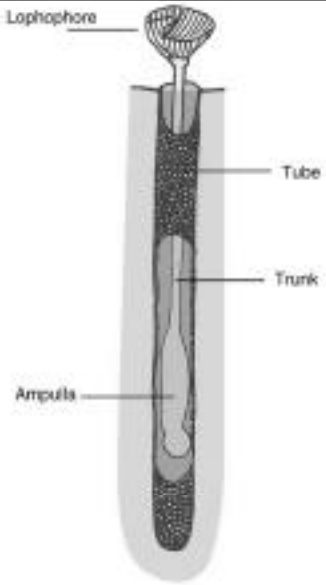

Figure 5. The body plan of a horseshoe worm. Note the similarity to polychaete "feather dusters"

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