Dendronephthya and Tubastrea Corals

Do Dendronephthya and Tubastrea corals need light to survive?

By Scott W. Michael

Q. There is an error regarding a family of soft corals, which continues to be repeated by numerous authors and publications. One author states that "filter feeding invertebrates, such as Dendronephthya and Tubastrea, should be placed at the bottom of the tank in shaded areas." This same premise is stated by other coral experts.

While the information regarding Tubastrea (which is found under overhangs and in caves) is accurate, apparently these authors have assumed that because these corals are not photosynthetic, they do not like light. As a former staff writer/underwater photographer and editorial contributor to more than 30 other magazines, who has logged 5000-plus dives in every tropical ocean on the planet, I can assure you this statement is incorrect.

Long before I became a reef aquarist I developed a fascination with Dendronephthya. In the Maldives and Red Sea, where this coral grows in profusion, you will find red, pink, yellow, purple and white Dendronephthya species living adjacent to Acropora corals! In bright, and often very shallow, waters, they spread their delicate branches as much as several feet to produce a spectacular underwater vision that any diver would be privileged to see.

I have photographed these corals in waters as shallow as 15 feet living quite gloriously in direct sunlight with a stiff current flying past. On the west side of the sunken islands of the straits of Tiran in the Egyptian Red Sea, these corals are absolutely dense in shallow waters. And the currents where they proliferate can be wicked.

Although I have occasionally seen them in the shade, they are normally out directly in the brightest light down to depths approaching 50 feet. As most divers know, the coral zones above 60 feet, and especially above 30 feet, are the brightest areas in tropical oceans.

If the environment is any indicator of the conditions these corals prefer, I would place my bet on bright light and good water motion! I have kept six of these corals, with excellent success, in my 180-gallon aquarium. I have found that they extend their branches better at higher (1.023 to 1.025) salt concentrations. And, they will not tolerate rapid downward changes in salinity.

I discovered this fact when I tried to reduce the salinity of the tank over a few hours from 1.023 to 1.018 in an attempt to cure a sudden outbreak of ich. Even though no other corals in the tank appeared affected, all of my Dendronephthya corals laid down and disintegrated into a pile of spicules overnight.

Prior to this catastrophe, and with specimens I have acquired since, these corals grow and new corals often spring up around the base of larger specimens. To keep them healthy and growing they must be fed rotifers or other suitable microscopic zooplankton. As suggested by my own observations of their natural environment, my Dendronephthya are kept high in the aquarium near the metal halides and right next to my Acropora. I'm hopeful you will help stop the perpetuation of this incorrect information about the habitat of Dendronephthya in future articles.

A. Thank you for the very informative letter and your concern about the dissemination of misinformation. Your letter was forwarded to me so that I might share your observations, and my thoughts.

As far as your comments on the habitat preferences of Dendronephthya are concerned, my field observations both agree and disagree with yours. I too have encountered Dendronephthya (which belongs to the family Neptheidae, a family that includes a number of other soft coral genera) in relatively shallow waters, often in full sunlight. For example, in the Maldive Islands I observed an awesome Dendronephthya garden, exposed to the sun, in 40 feet of water.

But I have consistently found the greatest proliferation of these corals on the sides of large coral heads (where they get direct sunlight for only part of the day), under overhangs, in archways and in caves. For example, if you dive the huge coral heads that are part of the barrier reef of Beqa Lagoon, Fiji, you will find some of the most colorful swim-throughs and caves in the world. The ceilings and walls of these underwater cathedrals are adorned with red, orange, pink and yellow soft corals of the genus Scleronephthya and Dendronephthya. I have included a photo of the alcyonarian fauna under one such overhang.

You will find Dendronephthya on the top of these coral heads as well, but it is not nearly as abundant in this habitat. Even in the Egyptian Red Sea you can find incredible concentrations of Dendronephthya under large plate corals, under overhangs and in huge shaded cracks that cut into the reef.

Also, members of this genus are commonly found at depths greater than 50 feet. There is the Great White Wall off Taveuni, Fiji, for example. Here one finds huge assemblages of Dendronephthya on a fore reef wall, in waters 140 to 160 feet deep. In the Coral Sea, some of the biggest (5 feet and larger) soft coral trees are found at depths greater than 150 feet, and in the Maldives you will see spectacular stands of Dendronephthya in waters deeper than 100 feet.

I agree with you that these animals are found in shallow, sunlit waters, but they certainly are not restricted to, or for that matter most abundant in, these conditions. This is not because they cannot tolerate bright conditions — obviously at least some species can — but it is more likely the result of greater competition for growing space in these areas.

Shallow, sunny habitats are more often dominated by hard coral, fire coral and those alcyonarians (e.g., soft corals) that need light to survive. Many of these corals have stinging nematocysts or exude chemicals to inhibit the growth of, or kill, neighboring corals that compete with them for space.

The Dendronephthya spp., on the other hand, have poorly developed stinging cells and no chemical arsenal, and thus are not as successful in these turf battles. But, because Dendronephthya and Scleronephthya do not have zooxanthellae, which of course require light, they can grow in areas where those cnidarians that depend on these symbiotic algae cannot. Although placing them under metal halides may not hurt them, it certainly is not a care requirement.

I should point out that Delbeek and Sprung (1994) do report that these corals don't tolerate exposure to ultraviolet (UV) light. Our observations, however, would suggest this is not the case for all members of the genus Dendronephthya, but it may be for some.

Your information on captive soft corals is interesting and may prove helpful to those advanced reef aquarists who want to try and keep these species. Water movement and live food are no doubt two key ingredients. However, studies on Dendronephthya hemprichi and D. sinaiensis in the Red Sea have demonstrated that these corals feed primarily on phytoplankton, not zooplankton (Fabricius et al. 1995)! Although they do ingest a small number of zooplanktors (mainly planktonic mollusks and crustaceans), they depend on microscopic algae for the vast majority of their carbon requirements. This is probably why we have such difficulty keeping these animals for extended periods of time, because we do not meet their nutritional needs! This same study determined that one member of each of the genera Scleronephthya and Acacaria also feeds mainly on phytoplankton, and suggests that many other coral species may rely on planktonic algae as a nutrient source.

Your observation on its sensitivity to sudden changes is also an important contribution to our knowledge of these corals. I have had fellow aquarists tell me they lost their Dendronephthya when there was a sudden increase in water temperature. This coral is most often found on the fore reef, a habitat exposed to the least amount of environmental change. Maybe this accounts for Dendronephthya sensitivity to dramatic alterations in water parameters.

References

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Fabricius, K. E., Y. Benayahu and A. Genin. 1995. Herbivory in asymbiotic soft corals. Science 268:90-92.