Anemone Deaths

My saltwater aquarium carpet anenome and long tentacle anemone died.

By J. Charles Delbeek

Q. I had a carpet anenome and a long tentacle anemone in a 55-gallon tank with a protein skimmer, a canister filter, a heater, and two powerheads connected to an undergravel filter for current. I keep the light on for 14 hours per day using two 20-watt 50/50 bulbs. The gravel is crushed coral.

My anemones died, but I have no idea why. What do I need to know to keep these animals alive and well?

A. Unfortunately, your message is typical of the problems that many aquarists encounter when keeping tropical sea anemones, which die more often than not. This has prompted many to question keeping anemones in captivity, and to go so far as to suggest banning their import. This is unfortunate, because it's not impossible to keep anemones — it's just that the information required to do so has not been made readily available.

Having said this, I must add that sea anemones are not for the beginner. One should have a basic understanding of reef aquariums and have had success in keeping corals, zoanthids and mushroom anemones before attempting to keep sea anemones. Familiarize yourself with the species you wish to keep. Where it is found in nature gives excellent clues as to what kind of conditions it will require in an aquarium. The Field Guide to Anemonefishes and Their Host Sea Anemones by Daphne G. Fautin and Gerald R. Allen (published by Tetra Press) is an invaluable guide to the sea anemones commonly available in the trade that are hosts for clownfish. It's excellent for properly identifying each species, as well as for providing natural history and habitat information.

This writer's message also points out some of the common errors made when keeping anemones in aquariums. The filtration, lighting and heating systems must be designed with anemones in mind. Just about any filtration system can be used to keep anemones as long as you maintain low levels of dissolved inorganic nitrogen compounds (e.g., ammonia, nitrite and nitrate) in the water. Also keep levels of organic compounds low through the use of activated carbon and/or adequate protein skimming. Adequate oxygen levels and good water movement are also very important.

In general, the adage "the simpler the system the better" applies when it comes to keeping anemones. Your filtration system should have been adequate, but there is no mention of the type or size of skimmer used. Also using powerheads on the undergravel filter, depending on how they are situated, does very little for the oxygen content of the water. They should be positioned so that they cause a great deal of turbulence on the surface of the water, which greatly improves gas exchange. Some units have an optional air line that can be attached to create thousands of air bubbles, but while these do boost oxygen levels, they tend to create a salty encrustation that can quickly corrode fixtures in and around the aquarium. Also, if these encrustations fall into the tank and settle on an anemone, they can cause serious harm to the animal.

Water movement is also critical for anemones — most species come from areas with significant turbulence and flow, even if only during tidal changes. The canister filter is probably of little use other than to hold activated carbon and offer additional water flow, provided it is cleaned on a regular basis (every week or two, at least).

Using a heater in an aquarium is fine, but in a tank with anemones it can spell disaster — many species tend to wander, and there is a good probability that they will eventually settle onto the heater. When the heater turns on, the anemone cannot move off quickly and its foot can be burned, which can lead to tissue damage and often to infection. Thus, it's best to position the heater in a separate sump or chamber, behind a partition in the tank, or, failing this, provide a shield around the heater that allows for good water flow, but prevents anemones from attaching directly to the heater. Placing the heater within a length of perforated PVC pipe is one way to accomplish this.

The biggest problem with the tank mentioned in this question is the lighting system. Like other reef inhabitants, many of the sea anemones sold to hobbyists contain symbiotic algae called zooxanthellae. This means these animals require light, and lots of it. The two 20-watt fluorescent tubes on this tank are far from adequate, and this is most likely the reason for the deaths of the anemones, which require bright light to survive. At least two very high output tubes should have been used on this system. Provided one can adequately cool the aquarium, placing it close to a window where it can receive several hours a day of sunlight is also very beneficial to sea anemones.

In addition to the items noted above, there are a number of things that should also be done in order to increase your success rate. Be sure to use screens on all intakes of water pumps and/or powerheads. Anemones seem to be attracted to areas of high water flow, and often end up being attached to powerhead intakes; a position that often results in sea anemone puree!

Although I noted that anemones have zooxanthellae, they will also feed when offered food. But be careful not to overfeed them. A small piece of shrimp, scallop, squid or marine fish offered once a week or so is all that is required.

Sea anemones also seem to do best when trace element solutions are added, especially those that contain iron and zinc. There are a number of commercial supplements now available, such as MarinVit (from Sera) and Combisan (from Two Little Fishies). Use these additions with caution, and never overdose!

Finally, providing the correct substrate can be critical. For example, the long tentacle anemone mentioned in this letter (most likley Macrodactyla doreensis) lives in sandy areas and needs a sandy or fine gravel bottom to do well. It will reach down below the substrate and attach to the bottom of the tank. In contrast, the bubble-tip anemone (Entacmaea quadricolor) lives in rocky areas and will require rocks with crevices and large holes in which to wedge itself. In the second volume of our book series, The Reef Aquarium, which is due out this fall, Julian Sprung and I will provide more specific details on anemone care and offer species guidelines.

Anemones can be long-lived in captivity provided the above criteria are followed and a healthy specimen is obtained. At the Waikiki Aquarium we have a carpet anemone (Stichodactyla mertensii) that is over 10 years old, and several colonies of bubble-tip anemones that are over 17 years old and spawn each April! In fact, as I write this column (April 21st) I am expecting them to spawn sometime next week.

In summary, marine aquarists need to determine the requirements of the tropical sea anemones they're interested in before purchasing them. Anemones are delicate animals, and require expertise and care to thrive in captivity.