

## Reef Tanks: Almost a Science

**Keeping reef tanks is based on science, but there are many ways to succeed.**

*By J. Charles Delbeek*

I would like to begin this column by discussing some of the feedback I received on my March 1997 column. One e-mail concerned my comments regarding retailers.

First, I would like to say that there are quite a few excellent retailers in the country! How many of their customers do you think are writing to me with problems such as algae blooms, shrinking and dying corals, or corals that just don't seem to grow in their aquariums? Not too many.

I rarely get letters from people telling me how great their tanks are doing. They only seem to write when they are having problems. The common thread through many of these letters and e-mails is poor advice from local "experts," and inadequate or inappropriate setups.

I should point out that aquarium keeping is far from being an exact science. We are not yet to the point where one can simply follow instructions and have a successful setup from day one. There are so many factors that can interact with each other within these enclosed ecosystems that we may never reach that point. Therefore, it is not unusual to find that there are many different ways to success. Some may make absolutely no sense, and others are next to impossible to duplicate, but both give excellent results.

The outline I provided in the March column is but one way of doing things. However, it is a methodology that I know works, for I have seen it done hundreds of times on several continents. Ultimately, it is the skill and knowledge of the aquarist that is the deciding factor in any system. Just keep an open mind to new ideas.

A prime example of this is the algae scrubber filtration system. The original proponents were so rigid and inflexible in their thinking that they either refused to, or could not, see a number of problems inherent in the original methodology. In the last few years several institutions, individuals and manufacturers have shown that, if one is prepared to be less dogmatic, these systems can be made to work, and work reasonably well.

### Trickling Nitrates

Q. My name is Zach and I am 12 years old. I am currently running a 20-gallon reef aquarium, and have been doing a lot of research on this topic. Very soon I will be switching to a 46-gallon tank, and I have run into a big problem. I have been to many different fish stores in my area, and have seen their beautiful reef aquariums. I ask the same question at each store and never get the same answer. Should I use bio-balls in my wet/dry filter? Some people say yes and some people say no. Some say things like, "Bio-balls will cause a buildup of nitrates and eventually kill all of your corals, so don't use them." Others say, "I've been using bio-balls forever and I've never had a problem."

I will be running my new tank off a fair-sized protein skimmer and my wet/dry filter. I really don't know what to do. Please help me.

A. Well, Zach, both comments are correct —to some extent. Trickle filters with biomedica will produce nitrates. They're supposed to. However, if there are not a lot of nitrogen-containing compounds to convert into nitrate, not much will be produced.

So, if you have a large, healthy population of live rock, a very efficient protein skimmer, a low bioload and don't add much in the way of nutrients — or any combination of these, then a wet/dry filter may not produce much nitrate at all. This is exactly how I ran my first reef aquarium. It's quite possible to run a reef tank with bio-balls in the wet/dry filter and not have any "problems" with nitrate.

However, you can be just as successful, and probably more so, without them. Then you can spend the money saved on other components, like a good protein skimmer or a pH meter.

Yes, biomedica will produce nitrates, but in a reef tank they don't generally build up and then kill your corals. First of all, nitrates tend to level off well below 100 parts per million (ppm) in reef tanks with live rock in which a trickle filter is used. Secondly, there is no scientific evidence that nitrates kill corals. There are lots of opinions on the matter, but no hard

evidence. There are tanks with nitrate levels of 40 ppm or more that have excellent growth of stony corals. However, such concentrations are some 1000 times greater than normal seawater levels, and it's always best to maintain your water as close to natural seawater conditions as possible.

#### A Full Plate

Q. I have a 38-gallon reef tank that contains some mushroom corals (*Corallimorpharia*) and a long-tentacled plate coral (*Heliofungia actiniformis*). The mushrooms have grown considerably in the past year. About six months ago I purchased the plate coral. It has been doing well until about a week ago. On one side in particular, the tissue has started dying. Also, the tentacles aren't getting very big during the day. The only thing that I can think of that may have caused it to start dying is a large anemone that came on the live rock that may have touched it. I have moved my plate coral away from the anemone. Is there anything I can do to help the tissue grow back?

I use a 75-watt very high output (VHO) actinic lamp and a 95-watt VHO actinic/daylight combo lamp. My filtration consists of a BioWheel 60 and a Supreme Skilter 400. Well, thanks for any advice, and I must say that I truly love your magazine.

A. In his letter, this writer included photos of his tank and the offending anemone, as well as some water quality information. Unfortunately, he did not include any information on calcium and alkalinity levels, or supplements he has been using.

*Heliofungia* are stony corals that are notoriously difficult to keep. The typical pattern is for them to do well for six to 10 months, then slowly begin to shrivel as the tentacles become shorter and the tissue begins to peel away from the skeleton. Sometimes the coral will do well for several years and then a seemingly insignificant injury will cause the coral to retract and die.

At the Waikiki Aquarium we have kept several specimens in our systems for more than eight years now. These are open systems in that there is a constant slow drip of seawater from our seawater well system. This water is unlike natural seawater in many ways — namely, it has very low levels of organic nutrients and high levels of inorganic nutrients, such as iron, nitrogen, phosphorous, silicate and so on. However, I have had problems with minor coral injuries becoming sites of tissue loss, and some specimens have been lost as a result, even after having been placed in our outdoor tanks with natural light.

It is not unusual to find small pieces of gravel wedged in between the ridges of the upper skeleton. These usually get there due to fish picking up and dropping gravel, but can also be caused by the aquarist. These pieces should be removed as quickly as possible or else they can work their way into the tissue and cause it to rupture.

*Heliofungia* should be kept on the bottom of the aquarium, not perched on rock. The tissue extends all the way around the coral, and if placed on the rough surface of a rock, the tissue can be punctured or abraded. So you should remove your coral from the live rock and place it on the bottom. *Heliofungia* also appreciate moderate to occasionally strong water motion.

The anemone in your tank belongs to the genus *Bartholomea*, which is in the same family as *Aiptasia*. Therefore, it is likely that this anemone did sting your coral enough to cause the effects you are seeing.

I would recommend, after moving the coral off the live rock, that you feed your coral occasionally to help with the healing process. Small pieces of fresh shrimp (frozen and thawed is also fine) or squid should be tried at least twice a week to begin with. This may help in the healing process by providing extra nutrition for the tissue to heal. Others have tried using omega fatty acid-containing products, such as Selcon(TM) (manufactured by American Marine), to help with tissue regrowth in damaged corals. The food is first soaked in the Selcon or the coral is removed from the aquarium and soaked in a solution of Selcon and tankwater, and then returned to the tank. Though some have reported excellent success with this technique, I have no experience with it.

Test your tank water for calcium and alkalinity levels. They should be 380 to 480 milligrams per liter and 2.3 to 3.0 milliequivalents per liter respectively. Finally, you should consider replacing the skimmer/filter combo unit you are using with a larger, dedicated skimmer design, which will be more efficient and thus more effective.