Algae: Controlling Growth in Freshwater and Saltwater Aquariums

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Actually, the title of this article is a bit misleading. We can never "control" algae; we can only try to keep it "under control." To accomplish this, we must understand what conditions encourage the growth of algae and how they can be limited. The two factors that we must consider are light and nutrients.

Light

Light is one of the more perplexing components to algae control, as algae will thrive under low OR high intensities. Without aquatic plants, low light conditions will favor the growth of algae, since there is no competition for the light or other nutrients.

In freshwater planted aquariums, the use of full spectrum lighting will promote the growth of plants, which will restrict the growth of algae. If these bulbs are over 1 year old, loss of intensity might promote algae. If you notice this, replace the bulbs.

In most saltwater applications, the lighting intensity will be greater and if there are no competing organisms (corals, anemones), algae has all the light it needs. Many actinic and metal halide lights will require replacement after 6 months.

Nutrients

Almost all slime algae growth is caused by excessive nutrients, and true algae will also be more difficult to restrict if nutrient levels are too high. The two principal nutrients we need to control are nitrate and phosphate. Both of these are end-products of the fish and bacterial digestion of foods. Obviously, the less food we feed, the fewer nitrates and phosphate will accumulate in the aquarium. Since fish do need to eat, we need to take other approaches of control.

In freshwater aquariums, the presence of true aquatic plants will make better use of the nutrients, "starving" the algae. This is particularly true when we can keep the pH level between 6.5 and 7.0, where the plants will utilize the ammonium as a nitrogen source, but the excess ammonium will NOT be toxic to the fish.

In saltwater reef aquariums, the corals, anemones, and coralline algae will also out-compete the algae, as long as we keep the nutrient levels as low as possible. In the mini-reef, this means nitrate levels below 10 PPM and phosphate levels below 0.10PPM. (Even these levels are hundreds of times higher than the natural conditions. Paradoxically, the coral reef is actually a nutritional wasteland with an abundance of thriving organisms, thanks to the power of the sun.)

We can use phosphate removing pads or resins to help control the phosphate. The pads are used for a 72-hour period to reduce built-up levels, while the resins can be placed in the filter system for long-term control. To control nitrate, we must control the digestion of extra proteins in the water. In saltwater aquariums, we can utilize a protein skimmer to remove the proteins BEFORE they are digested. For most freshwater applications, this is not a practical solution. Another option is the use of protein-adsorbing resins which effectively prevent digestion of the proteins. As the resins become saturated, they will need to be replaced or recharged. Specialized De-Nitrators can also be used to "eat" the nitrate.

Other control measures

Algaecides

In freshwater systems (without plants) we can apply algaecides to help keep the algae production under control. This option also exists in **Fish Only** saltwater tanks, by using a low level of copper (0.010 PPM). But for saltwater aquariums with fish and invertebrates or corals, copper is NOT an option and can be toxic to the invertebrates and coral. It is also toxic to some fish.

Controlled cultivation

If there are plenty of corals and the like to compete, it is possible to cultivate green algae in areas of the aquarium where it does not annoy us. This will limit the growth of algae in areas where we do not want it.

More on slime algae

Nuisance slime algae is a problem in saltwater aquariums, particularly with new tanks where conditions will vary more than in a mature system. Usually the brown style is the first algae to appear, followed by a green slime. These are a *Cyanobacter* species of bacteria, not true algae, so lighting is of little importance. Sudden appearances in a well-established aquarium could be related to a decrease in metabolism in the competing organism caused by a decrease in intensity of older lights. Once again, replace the bulbs.

Even with our best efforts, sometimes the slime *Cyanobacter* will appear to take over. In that event, it is best to turn off your pumps, gently wipe the slime off the glass, gravel and rocks, and let it settle and siphon it out of the aquarium. There are "slime" treatments that will "kill" the *Cyanobacter* (active ingredient is erythromycin), and in some cases they will eliminate the slime. Remove the excess slime before treatment, and make sure the nitrate and phosphate levels are as low as possible.

Hair algae

Perhaps one of the other great scourges is hair algae. While nutrient control is still essential, in the saltwater aquarium we can utilize Scarlet Leg and Blue Leg Hermit Crabs to eat the offending algae. Also, if the calcium levels are maintained above 350

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PPM, the coralline algae will compete for attachment sites. In freshwater aquariums, some success has been reported using Glass (Ghost) Shrimp to control hair algae. If you develop "brush" or "beard" algae on the leaves in your freshwater aquarium, the best method of control is to prune the affected leaves before it spreads. It has been reported that higher levels of CO_2 will help control these algae, perhaps by making the true plants healthier and less likely to allow attachment of the algae to their leaves. When all is said and done, prevention is the best method of control.

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