Dissolved Organic Compounds Explained

Contributed by Cecil Griffith

If you're like most planted aquarium owners, you want a healthy algae free aquarium. You dose fertilizers regularly and make sure you don't over do the lighting, but you still manage to have some problems when it comes to fish and plant health. Understanding dissolved organic compounds and how they effect your planted aquarium will help you sustain a enriching environment for your aquatic plants and fish.

What is a dissolved organic compound?

An organic compound is any compound that contains one or more atoms of carbon. Natural waters, freshwater aquariums and saltwater aquariums contain a great variety of soluble organic compounds. These include such compounds as sugars, fatty acids, humic acids, tannins, vitamins, amino acids, proteins and urea. Suspended organic matter in water includes remains of organisms in various stages of decay and living phytoplankton, zooplankton, fungi and bacteria. Sometimes each of the concentrations of individual organic compounds is not measured. Instead it is more common to measure total particulate organic matter, biochemical oxygen demand, or chemical oxygen demand. These variables are indicative of the total quantity of organic matter in water.

So where do they come from?

The major source of dissolved organics in aquaria is the natural biological processes that accompany having a tank full of fish that are fed often. Fish feed, fish wastes and other particulate organic material are colonized by bacteria which break the material down into dissolved substances. The basic step is for particulate carbon to become dissolved carbon. More fish and more fish feed means a higher concentration of organic substances.

How to control excess dissolved organic compounds?

There are many ways to control the amount of organic carbon in your system. Remember, there are two general types of organic material: particulate and dissolved. There are ways to remove both from your aquarium.

First, limit the amount of particulate carbon in your aquarium. This does not mean reducing the number of fish in the tank or reducing the feeding amount (but these would surely help). It means cleaning the mechanical filter component of your filtration systems often.

The filter pad is where a majority of the particulate material will get trapped. If your system is heavily stocked you might have to clean this every couple of days but the reward will be worth it. Organic material trapped on the filter pad is of no benefit to the aquarium environment - remove it often. Some people use charcoal in their filters to help remove some of this material.

Next, if your aquarium has a substrate; clean it regularly with a siphon action gravel washer. The gravel at the bottom of an aquarium is a good place for particulate organic material to collect - so getting rid of this material will help.

Getting rid of the organic material on a regular basis will go a long way towards keeping an aquarium healthy and keeping disease away. So how often is a regular basis?

That has to be decided on an aquarium by aquarium basis. If you have a lot of fish and feed a lot you'll have to clean the mechanical filter and substrate more often than a person with a few fish who feed sparingly. The major way to get rid of dissolved organic carbon is water changes. This is a simple method but most people are a little lazy about this.

The people with saltwater tanks are very concerned about dissolved organics. They use protein skimmers, meters and control devices for ORP, ozone, and other things specifically made to control the compounds.

People with freshwater planted aquariums have the added benefit that plants are able to help with this by using some of these organics. By doing 50% water changes, cleaning filters regularly, correct fertilization, not overfeeding, and doing all the necessary maintenance involved helps to promote a healthy aquarium.

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