Cleaning Fish Aquariums

When cleaning your fish aquarium, don't destroy the good bacteria.

By Mike Wickham

We've been taught that germs are bad, that they cause disease and are something to fear. But that's not entirely true. While some microorganisms are pathogenic, most are harmless. Many are helpful, and some are even necessary for the health of humans and other life forms. For example, our intestinal tracts contain bacteria that help us digest food and absorb nutrients.

In the aquarium, the best examples of helpful, necessary microorganisms are the nitrifying bacteria. These are the bacteria that break down the ammonia our tropical fish excrete as waste. This process is known as biofiltration or the nitrogen cycle. Without these helpful bacteria, ammonia in the aquarium would quickly accumulate to lethal levels, and our tropical fish would move on to the great aquarium in the sky. So, protecting these helpful bacteria is essential.

Another thing we were taught as children is that keeping our room clean is a good thing. Keeping an aquarium clean and free of waste is also important, but we do not want to create a sterile environment, which would destroy those essential nitrifying bacteria. So, we want our aquariums to be clean but not too clean. Let's talk about ways to maintain the cleanliness of your aquarium without taking it too far.

Start at the Bottom

Probably the biggest repository of helpful bacteria in your aquarium occurs on the surface of each piece of gravel. Each grain, though appearing smooth to the eye, is rough at a microscopic level, and thus provides a huge surface area for the growth of helpful bacteria. So, it follows that if you sterilize your gravel, you will destroy most of the biofiltration in your aquarium. Not knowing this, hobbyists sometimes remove the gravel for cleaning and have been known to boil it, scald it or (worst of all) use bleach or soap to sterilize the gravel. This is a huge mistake! It kills off the nitrifying bacteria and will allow ammonia levels to increase rapidly in the water. Gravel should never be cleaned with anything but plain, aquarium-temperature water.

Besides using inappropriate cleaning methods, these aquarists are also making too much work for themselves. The best way to clean gravel is with a gravel vacuum. This is a modified siphon hose with a large tube at one end. While siphoning out old water for partial water changes, the large tube is pushed into the gravel briefly, then lifted. The flow through the hose is strong enough to move and tumble the gravel, releasing all sorts of particulates. The heavier gravel falls back to the aquarium bottom, while the mulm-laden water flows out the tube into a bucket for disposal. It's quick and easy, and the helpful bacteria will remain intact on the gravel. You have to change water to dilute dissolved waste, anyway, so it's a way to dispose of solid and dissolved waste in one quick process.

Remember to make the new water safe for both tropical fish and helpful bacteria. Chlorine and chloramines are chemicals added by water treatment plants to kill germs. If your tap water contains chlorine or chloramines — which is very likely (and your local fish retailer will know) — you must treat the new water with a tap water conditioner to neutralize these, so they do not destroy nitrifying bacteria or damage the mucous membranes of the tropical fish. (Note: If you draw water from your own well, you won't have chlorine or chloramines, but you might have other compounds, such as nitrate.)

Safely Maintaining Filters

The most significant part of your aquarium maintenance is likely to involve the cleaning of one or more filters. Filters don't remove waste — they just collect it. Nitrifying bacteria grow on every solid surface in the aquarium, including gravel, glass, aquatic plants, decorations and filter media. Indeed, most filters contain some type of biomedia designed to provide plenty of surface area for the growth of helpful bacteria. So, it's best to take steps to preserve the bacteria on this media when possible.

Disposable Filter Media

Many filters use disposable media as a convenient way to clean the filter. When the media is dirty, you throw it away and replace it. Slide-in filter cartridges for power filters are the most common example. But every time you replace disposable filter media, you throw out the good bacteria living on it. This may or may not be a problem. It depends on how much biofiltration there is elsewhere in the aquarium. For example, in a heavily planted aquarium with a gravel bed, it is unlikely to be a problem; there will be plenty of nitrifying bacteria colonizing those other sites. It would be different in a bare aquarium set up for breeding, however. The filter media would be the main source of biofiltration in such a setup.

There are steps to play it safe. If your filter uses more than one filter cartridge, change them at alternate cleanings. This allows a seasoned filter cartridge to remain, while the new one colonizes with helpful bacteria. Another option is to change the polyester filter media one time and the activated carbon the next. Again, this will allow some seasoned media to remain in the aquarium while bacteria colonize the new media. Also, don't replace media too often. The activated carbon inside a filter cartridge is good for about a month. So, if the polyester clogs in two weeks, it's all right to rinse the mulm off the filter cartridge and continue to use it for a couple more weeks.

Permanent Filter Media
The best filter designs incorporate some permanent media. that you rinse and reuse instead of replacing it. So, you maintain the helpful bacteria living on the media. Examples include various sponges, ceramic noodles and the rotating biowheels found in some filters. Rinse these items to remove accumulated detritus, and they are ready to keep working.

When rinsing, take care not to harm helpful bacteria. Don't sterilize the media or let it dry out, and do not use soap or hot water. Some hobbyists prefer old aquarium water for rinsing rather than risking having the chlorine in their tap water do damage. Personally, I don't think this is a problem as long as the rinse is quick. I would not leave media to soak in chlorinated tap water, however — long exposure would destroy the helpful bacteria.

One final tip for maintaining helpful bacteria is to not turn the filter off, except for maintenance, especially with a canister filter. Helpful bacteria require oxygen. If a dirty canister is turned off, the helpful bacteria will use up the oxygen and die. Because the filter is closed off from air, nitrifying bacteria will be replaced by anaerobic denitrifying bacteria, which do not need oxygen to break down waste.

These produce hydrogen sulfide and other toxic substances as a by-product. If you turn this dirty filter back on after having it off for a few hours, a day or a week, it may force poison into your aquarium. If you have a power outage, it's a good idea to clean your canister filter before restarting it. Happy fishkeeping!