

Algae Scrubber

Written by Cain W. Cook

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Most people in the aquarium hobby use hang-on-back, sumps, wet/dry, and canisters to filter their aquariums. They also have to use carbon, cartridges, and bio-media to help keep their water crystal clear. But most people have never heard of an algae scrubber. An algae scrubber is a filter that is used to harvest a special type of algae to filter their aquariums. You can also find this algae on ocean piers at low tides and even in older setups on décor & rock work.

All though hardly anyone uses this type of filter these days, but the technology for them has been around for well over 30 years. They were primarily used in cleaning lakes and streams of contamination or high levels of harsh chemicals. The main reason they were not widely used back then was the cost. Most started around \$3000 and were hard to build. Now due to the recent advancements in plastics, water pumps and lights people can have these wonderful setups in their homes.

Why should I have this type of filter you say? The main reason is this filter is a skimmer, carbon filter, and phosphate & nitrate remover all in one plus much more. The key to this filter is the algae called "Turf". Turf is slow growing algae found in the ocean that removes excess foods and inorganics while raising organics to natural levels found in nature. Another great attribute with Turf algae is that it works on both freshwater AND saltwater setups and can be the ONLY filter on the tank. Don't get turf algae confused with green or brown algae. Since green and brown algae will mostly eat leftover food and nutrients and won't help as much in removing of metals, ammonia, nitrate & nitrites, inorganics etc. Turf algae is better and more efficient at this job.

The algae scrubber can remove metals, ammonia, nitrites, dissolved wastes, and inorganics (Inorganic Nitrate and Inorganic Phosphate are what cause nuisance algae to grow on your rocks and glass, and are what you measure with your test kits.). So extra care should be taken if treating the tank as the turf algae may absorb some medicines. Another great quality of the turf algae is that every week during maintenance (explained below) when you scrape one side of the filter algae off it removes all the harmful chemicals, inorganics, and dissolved wastes from the water for good.

Setup of the algae scrubber is now quite inexpensive and generally only requires an investment of around \$50 depending on what you do and don't have. A few things you will need to start your algae scrubber.

Water pump (see below to choose which one you will need)

Lights (see below for the correct lights needed)

A plastic canvas, roughed up. It's best to rough up 3 screens and glue them together

A container for the filter to be housed

Misc plumbing supplies

PVC pipe for spray bar

Vinyl tubing, or tubing without mold inhibitors

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You need around 1 square inch of screen per gallon of water. So a 36 gallon tank would need a mesh screen of 6"x6" to filter the tank. It's not a good idea to have two screens as one screen may die while the other one eats all the food, so try at your own risk. You also need to choose the correct gph for your pump so you can get enough water to spray across the mesh screen. Here is a simple chart to help you with that. 35gph per inch of screen is a general rule when making this filter. Account for drop off in water pressure do to pipe, bends, fittings and distance having to push the water through as this will reduce flow rating so adding 40% onto your initial rating will help counter that. You can measure the water flow coming out of the setup by placing the screen over a bucket, dived the bucket size and number of seconds it takes to fill, then multiply by 3600, works on both gallons and liters.

Width-----	GPH (Gallons Per Hour)
2"	70
3"	105
4"	140
5"	175
6"	210
7"	245
8"	280
9"	315
10"	350

Lighting for your screen is the most important thing. Without it you have no algae growth and no filtering. It's even more important to have the correct lights so you will be able to grow sufficient amount of turf algae for your filter. You also want to get a container big enough as to be able to get the light close enough to the mesh screen. The redder the color of light the better it is, algae likes a redder light. A plant light or "grow light" will do or any yellow/greenish light will do as well. Any light within 2000k or 3000k, even a 6500k will work for the light. Remember we are growing algae, not plants. You won't see it so lighting should not appeal to you anyways.

The best bang-for-your-buck light will be a CFL floodlight or bog light. A 23 watt light is a bare minimum and 33 to 40watt being ideal and a "plant growth" color of 2700k is recommended as it the ideal temp for growing algae. A 50-60watt is too much and should not be used, but you can double up on lights using two 23 watts on both sides for added growth. Bulbs should be placed on both sides so as to promote growth on either side. It's best to buy "floodlights" if you don't then its good practice to get a "CFL reflector" to direct the light back on your screen. If your light does not have a white coating on the sides you may also want to get one (i.e. a coil bulb)

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A good thing you can do for this filter is to put it outside in direct sunlight. If you do this then you don't need light bulbs. You can run a hose outside to your screen then back in. If this is the case then you will have to check how much loss you will have in GPH with the tubing and consider that in the pump requirements.

It's best to leave your lights 18h on/6h off. If you are using a timer, make sure when the power goes out to check and see if the timer saves the setting. Some timers lose the settings and will keep the lights on all day, killing your algae. If not given rest periods then the algae will die. Another good idea is when the tanks lights are off for the algae lights to be on. So you will filter through out the night.

Ok, on to maintenance. The first weeks are the most important in growing the correct algae. Every week take the screen out and remove the algae with your fingers not nails. Leave a thin layer of algae behind for growth and remove only one side a week. If you have a salt setup, run under fresh tap water to kill any amphipods that are on the screen. They will look like circles on the screen if you do. Over time it will get harder and harder to remove algae on one side so an ice scraper lightly used will help, remember to leave algae behind. If the algae starts getting more than 0.5" thick then bump up the time between maintenance. If you want to cut the time down before actual filtering tanks place, since it will take months to grow the turf algae, try to get a hold of someone that already grows turf algae and ask them for a starter culture.

It's like scraping lint off dryer vents

[IMG]http://i246.photobucket.com/albums/gg113/fish_master2000/ScreenBuildDay9scrubbing.jpg
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Photo by "Santa Monica" on MFK

First thing you want to do is find a container that you're going to use. A sump or trashcan can be used (a 5g bucket will be used in this demonstration). Drill a hole in the bottom of the bucket so the water can drain back into the take or sump. Or attach a hose fitting so you can place it somewhere else that's higher than the level of the tank, instead of directly on top. You want to then measure the screen out that you will be using and rough up the surface so the algae can attach its self to the screen. Let the screen stick up a little so you can put about ½ to 1" of it onto the spray bar. A good choice for a screen is using plastic canvas roughed up with a hole saw drill bit.

Second, fashion a spray bar across the top of the bucket. Then measure the screens width that you will be using and mark it on your PVC, then measure how thick the screen is and double that number and mark it on the tube. When using a dremel on PVC make your first cut in the middle first then go back and trim the sides off. PVC as a tendency to curl on you while cutting.

[IMG]http://i246.photobucket.com/albums/gg113/fish_master2000/PipeDremel.jpg[/IMG]

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Now attach your screen to the spray bar and use zip ties to hold them together. It would be a good idea to make grooves for the spray bar to sit in while on top of the bucket so it won't move. Or add paper clips, the black ones that function like a clamp is great. Make sure the screen doesn't touch the sides of the cut in the spray bar. This will cut down the water flow on that side. If water movement is too fast and spray out like a hose or blows algae off, make the cut larger or add slits going across your main cut to allow more water flow.

[IMG]http://i246.photobucket.com/albums/gg113/fish_master2000/PipeInstall.jpg[/IMG]

Photo by "Santa Monica" on MFK

Finally, attach your pump to the spray bar and set the bucket higher than your tank's water level. Then add a hose going from the bucket to the tank, this will act like a drain. Or you can set atop the tank and have the drain focused in a hole in the lid so water can fall in.

[IMG]http://i246.photobucket.com/albums/gg113/fish_master2000/BucketInOperation.jpg[/IMG]

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Now enjoy your brand new algae scrubber. Watch for all your algae in your tank start to disappear and water clarity improve. Not to mention you will never have to make another water change, EVER!