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Planted Aquaria 101

There are few sights in the aquatic hobby that rival the beauty of a healthy planted aquarium. This care sheet is a brief guide to starting and maintaining an enchanting ecosystem of your own. If you are new to the hobby, please read my article “Aquarium Keeping 101” which covers basics that are not discussed here. For brevity’s sake, I will try not to repeat what has been discussed in my other articles, and keep this concise. Now, let’s talk planted tanks! We’ll start from the top (lighting) and work our way down (gravel).

Lighting (Watts Rule!)

The life of plants is 100% dependant on light. First and foremost, avoid sunlight! While that may seem counterintuitive, sunlight filtered through a window will encourage algae growth, not plant growth. I always cover or even paint the backs of tanks that are near windows. With sunlight eliminated, it is time to add artificial light. The standard hoods that come with aquariums are designed to allow enough light in the tank to view fish but are too weak to grow most aquatic plants. The rule of thumb (though flawed), is 3 to 5 watts per gallon of aquarium water. A standard 29 gallon tank will usually have a 17 watt fluorescent bulb, giving just over a half watt per gallon. While some low light plants will do well in 2 WPG, going with the standard fixtures will only grow extremely tough plants such as Java moss.

Color Temperature

Color temperature is measured by the Kelvin rating, with 2700 being the low end of most commercial bulbs (reddish yellow), 6500 considered “daylight” (slightly bluish white), and actinic above 10,000 K being a very blue bulb. Actinic bulbs are designed for coral reef tanks and are typically not used in planted aquariums. Most plants will grow well in the low to daylight range provided wattage is high enough.

Types of fixtures

There are several types of fixtures on the market; most will grow plants well, provided they are strong enough. Avoid incandescent hoods; they give off more heat than light and are a waste of energy. Standard fluorescents are better but you will need multiple bulbs for most set-ups to get enough light to your plants. HO and VHO (high output and very high output) are the ideal choice, though the fixtures and bulbs are fairly expensive. You get the output of roughly three standard bulbs from one VHO. These require their own ballast, so they can’t be used in standard fixtures. T5 and PC (power compact) are the two most popular choices. I have had healthy planted tanks using both T5 and PC but T5 is my slight preference. Metal halides are occasionally used; these do provide great lumens output, but the cost and heat produced steer most hobbyists away from these. I expect compact fluorescents and LED lighting to become popular in the near future, but the cost of these fixtures is prohibitive at the time of this writing.

Filtration

There are many types of filtration on the market, but for planted aquaria, the main concern is mechanical -or simply pulling detritus and “gunk” out of the water. With proper plant growth, you will typically not see much nitrogen or phosphate build up. Canister filters that sit below your aquarium are the choice for most. I prefer the Eheim, but Rena, Fluval, and others make very good units. The next choice would be hang on the back

power filters. I have a strong preference for Aqua-Clears, for a number of reasons –not the least of which is that it has no expensive cartridges to replace each month. If running CO2 in your system (which I will touch on later), make sure the tank has a high water level so the splashing doesn't de-gas the CO2 you are trying to inject. For the same reason, I would remove any Bio-wheels if running a Marineland brand. For more information on filters, please see "Aquarium Keeping 101".

CO2

Next to light, the most important nutrient to plants is CO2, or carbon dioxide. Some hobbyists make their own CO2 in 2 liter bottles with yeast mixtures, but I have never found that method to be worthwhile.

Fermentation is a messy and hit-or-miss procedure, in my experience. Most hobbyists use pressurized gas, available at most local welding supply outlets. Please educate yourself on the safety considerations of pressurized CO2 cylinders.

Besides the cylinder, you will need a regulator (to control the amount of gas), check valves (keep things moving in one direction), diffuser/reactor (to mix CO2 in the water), needle valves (to give fine control of the gas), and tubing (be sure to use CO2 resistant tubing). Rexgrigg.com gives a more exhaustive explanation and makes the best regulator on the market. He's a bit crotchety, but sure knows his planted tanks!

Other Equipment

Heater

The fish and plants you buy will probably be tropical species. 78 degrees is a good temperature to aim for. Some advocate substrate heating, but it is not necessary, and usually you will still need a conventional heater.

Test Kits

Test kits are another must-have. You will need test kits for pH, GH, ammonia, nitrite, and nitrate. Avoid the dip strips, they are not very accurate. Instead look for liquid reagents.

Algae Cleaners

There are many pads and magnets on the market. Scotch-Brite's "Dobie pads" are ideal for glass aquaria, as is the edge of a credit card, or a razor blade. If your tank is acrylic, you will need a scraper made for it, since it scratches easily.

Timers

It is a great idea to have your lights on a timer for 10-12 hours a day. I personally put my CO2 system to turn on and off with the tank lights.

Decorations

Most planted tanks have rocks and/or driftwood in addition to plants. Stay away from limestone, tufa rock, or anything that comes from the beach. Driftwood, especially Mopani can leech tannins, which will darken water, but causes no harm and Mopani is a beautiful addition to planted tanks. Pre-soaking wood for several days can reduce leeching in your tank.

Fertilizers

There are many fertilizers on the market, and most serve the same function: to add iron, nitrate, phosphate or trace minerals to your tank's water. The only one I will recommend by name is Flourish Excel. This product is magic in a bottle! It not only gives organic carbon to your plants, it also will eliminate many types of nuisance algae.

Water Conditioners

Most tap water is treated with chlorine, which you will want to remove. All dechlorinators serve the same purpose, and most use sodium thiosulfate as the active ingredient. I personally use Genesis brand.

Substrate

There are a number of gravels, sands, and substrates on the market that are designed to grow aquatic plants. Even regular aquarium gravel will suffice, but choose a fine particle size. In order of personal preference, I would opt for Flourite first, then Shultz aquatic planting soil (available at your local lawn and garden center), then a standard aquarium gravel. Any inert substrate of a small particle size will work, but the clay-fired ones seem to give best results. Depth is largely up to you, but needs to be at least deep enough for a good root system (2 inches or so).

And Finally... Water

If you can safely drink your household tap or well water, you should be able to keep fish and grow plants in it. Test the pH and hardness, and keep species that thrive in that environment. There are plants and fish that will thrive in hard or soft water, and it is easier to keep things that will live in the water you have rather than your needing to play chemist and constantly alter it.

Fish to Avoid

Anything that gets very large (Pacu, Oscars, etc.), digs (many cichlids) or eats plants (namely Silver Dollars and goldfish).

Plants to Avoid

There are many plants that are not aquatic that I have seen for sale in pet shops. Among these are Mondo Grass, Umbrella Pine, Peace Lily (sold as Brazilian Swords), Chinese Evergreen, Aluminum Plant, and Arrowhead. Also be careful about introducing java moss or duckweed: they grow like kudzu and are hard to eradicate. Also check the plants for snails and other pests. For what it is worth, most commonly encountered snails will seldom eat healthy plants, and seem to prefer algae and dead or dying plant tissue. Still the populations can get out of control quickly.

Routine Maintenance

Like with a fish tank, small partial water changes are the key to aquarium success. There is no filter, supplement, or gadget that can make up for exchanging out water on a regular basis. 10% weekly is usually ideal, and is less stressful on the inhabitants than 40% monthly. But I'll break down "chores" by timeline.

Daily:

- Feed fish as much as they can eat in about 30-45 seconds. Don't skimp on quality, there really is a difference!
- Look at your fish. Check for normal coloration and behavior. Check water temperature. Just a quick glance at the thermometer can prevent disaster if a heater either quits or the thermostat gets stuck in the "on" position.
- Look over the plants, trim away any die-off, and replant anything that has floated.
- Check the filter and CO2 system.

The daily chores shouldn't take ten minutes.

Weekly:

- Wipe the glass down with an algae pad, magnet or scraper.
- Do a 10% partial water change. Be sure the water you replace is the same (or very close) temperature. Dechlorinate if necessary.
- Check parameters with a test kit.

- Rinse filter sponges/pads. I suggest unplugging the filter first so that a minimum of “dirty” water dumps into the display tank.
- Fertilize if needed.

Weekly chores for one 100 gallon tank should take about an hour.

Monthly:

- Clean filter cartridges and replace carbon (if using carbon). Carbon is spent in a month’s time underwater.

Annually:

- Many folks recommend changing bulbs on your fixtures six to twelve months. If plant growth seems to have slowed, give this a try. All fluorescent light bulbs lose some brightness as the phosphors in them burn over time. It has been my experience that as long as the bulbs will fire, they will still grow plants, though probably not at the level new bulbs will.

The maintenance of a planted tank isn’t much more than a regular fish aquarium, but the enjoyment is SO much more! The possibilities of aquascaping are as limitless as your imagination! I hope that you will get the utmost satisfaction out of your artistic creation, and have a centerpiece that everyone who enters your home will admire.

- Chip Bridges