

Aquarium Lights for Beginners

Bonus content from the June 2009 AFI magazine column "The Aquabotanist."

By Scott Hieber

Q. I am a newbie with planted aquariums. What are the best kinds of lights to use?
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A. There are basically three kinds of lighting for planted aquariums: incandescent, fluorescent and metal halide; but of these, only the latter two are worth considering. Incandescent was once the prevalent method of aquarium lighting back in the days when aquariums were mainly fish-only setups. Incandescent bulbs and fixtures were relatively cheap and provided enough light for viewing without encouraging the kind of algae growth that occurs so easily in tanks with no plants.

Unfortunately, incandescent bulbs waste about 95 percent of their input energy as heat. So, having enough incandescent lighting to successfully grow plants in an aquarium means a lot of unnecessary expense and a lot of heat, and in many cases, it would be difficult to fit enough bulbs over an aquarium, anyway. Although incandescent bulbs have useful purposes, lighting planted aquariums is not one of them.

Fluorescent lamps utilize about 35 percent of their input energy as visible light, so they are more economical in the long run. And because they run so much cooler than incandescents watt for watt, you don't have the heat issues.

Fluorescent tubes designed for planted aquariums are any that have several phosphors, so the light output includes the parts of the spectrum that plants can use for photosynthesis. Fluorescents are typically either long tubes or more compact curved tubes.

Metal halide bulbs are much smaller than compact fluorescent lamps, so light comes from a single point rather than the entire length and surface of a tube. This has two important consequences: one aesthetic and one practical. The aesthetic benefit is that because the light is emitted as a point source, stark shadows are cast, and in an aquarium, there is the effect of glittery, rippled lines. Fluorescents have much more diffused lighting, with very soft shadows and no glitter-line effect in the water.

The second difference is that because metal halides are more compact, even though they have about the same energy efficiency as fluorescents, the heat is emitted from a smaller area. The heat from a 100-watt metal halide bulb is the same as from a 100-watt fluorescent, but it is concentrated in a smaller area, so you usually need some method of preventing excessive heat build-up. This is usually accomplished with a fan, whereas fluorescent fixtures can usually be cooled without fans.

Another consequence of metal halide compactness is that it can take several to cover the length of an aquarium. Fluorescents that are long tubes emit light more evenly for the length of the typical aquarium, so the number required depends on the wattage needed for the tank.

Also, metal halide bulbs tend to shift their spectral output as they age, turning greener and less pleasant over time. Either fluorescents or metal halides can be used with equal success on a planted aquarium, though fluorescents are popular because of their lower cost.

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