The Aquarium of Richard Heite - Louisville, Kentucky

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The main show tank is a 125-gallon glass tank that has been set up since February 1995. It is the largest of five reef tanks. The other four are used primarily to grow out cuttings taken from coral colonies in the 125-gallon tank. The 125 gallon has a single overflow and shares a common 30-gallon sump (acrylic) that is 18 x 24 x 17 inches.

When the tank was initially set up the goal was to establish a diverse reef tank, heavily loaded, using the modified Berlin method. The rockwork was organized to provide sufficient variation in structure to allow room for the fish to swim in and sufficient hiding places, without having a “fruit stand” look when the corals were placed in the tank. The narrower front-to-back design of a 125-gallon tank does not give sufficient room to accomplish this and the hope is to upgrade the tank in the next couple of years to a 180-gallon tank with dual overflows.

Two smaller tanks for growing out cuttings from coral colonies in the main 125-gallon tank have been added and share the sump with the 125. The first auxiliary tank added was a 29-gallon, originally intended to be a refugium for the system, and later a 30-gallon display tank was added to provide additional room for growing out cuttings.

Live rock/substrate
Initially, 75 pounds of Indonesian live rock was added to the tank, followed by another 50 pounds of live rock from various locations six months later. The substrate at this time is a 4- to 6-inch deep bed of sugar fine aragonite sand. The sand bed was originally built with a plenum. This was removed in November 1997 because the coarse aragonite sand had hardened into a rock-like solid sheet due to poor management of calcium/alkalinity.

Filtration
In addition to the live rock, a 5foot tall, 4-inch diameter, airstone-driven counter-current skimmer is used to remove organic compounds. The overflow from the main tank drains into a 6- x 4- x 6-inch box that sits in the inlet end of the sump. A RIO 2100 pumps water from the box up to the skimmer. The remaining water overflows into the common 30-gallon sump. This arrangement ensures the skimmer is getting overflow water from the main tank, and not re-circulating water within the sump. A Dynamaster Two air pump drives four 3 3/4-inch wooden airstones located near the bottom and approximately one third the way up from the bottom of the skimmer.

Activated carbon is also used, with tank water circulated directly through the carbon by a Magnum 350 canister filter. Periodically, when testing indicates a trace of phosphate, a phosphate remover is substituted for the carbon in the canister filter.

Circulation
The main circulation between the tank and the sump is provided by two Little Giant 3-MDQX-SC pumps that circulate approximately 1500 gallons per hour (gph). Large bore flexible tubing (1 inch ID) connects the pumps to two independent distribution headers in the tank. The first has two outlets, located about 1 inch deep and approximately 6 inches from the front of the tank. The outlets have 45-degree outlets that direct the water flow forward and downward.

The second header runs along the back wall of the tank and has three equally spaced drops down behind the rock. There are “tee” fittings on the ends to distribute the flow evenly.

Four Maxijet 750s are used to provide point flow circulation within the tank. Two Maxijet 1000s are connected to a homemade wavemaker, which alternates the two powerheads on a 10 second cycle. The Maxijet 1000s are mounted at the ends of the tank facing each other.

Circulation to the two grow-out tanks is provided by two Mag Drive 700s that sit in the common section of the sump. The

returns from the two tanks empty into the main part of the sump.

Water management
Frequent water changes are a key part of the system maintenance. Approximately 5-percent water changes are done weekly. Instant Ocean salt mix mixed in reverse osmosis/deionized water is used for water changes.

Water parameters are as follows:
Specific gravity = 1.024 to 1.026
Alkalinity = 2.5 to 3.5 milliequivalents per liter
Calcium = 435 to 480 parts per million (ppm)
Nitrates = undetectable
Phosphates = undetectable
Iodide = 0.04 to 0.08 part per million.

Makeup water is saturated kalkwasser, with occasional supplements of B-Ionic to maintain alkalinity. A much more stable maintenance of alkalinity has been achieved using vinegar in both the kalkwasser mix bucket, as well as the clear kalkwasser solution. By adjusting the amount of vinegar used, I can push the kalkwasser during periods of lower evaporation (high humidity) and have thus almost eliminated the necessity of adding B-Ionic.

Lighting/photoperiod
The main tank, as well as the two grow-out tanks, uses very high output (VHO)fluorescent lighting (tubes from Ultraviolet Resources, Inc.; URI) driven by IceCap ballasts. On the 125-gallon tank there are a total of six 72-inch VHO tubes divided between three ballasts. Two of the six tubes are actinic 03 and are on between 9 a.m. and 11 p.m.. The second pair of 50/50 daylight tubes is on between 10 a.m. and 9 p.m. The third pair of 50/50 daylight tubes is on between 11 a.m. and 10 p.m., equalizing the life of the 50/50 tubes between the two ballasts.

The actinic 03 tubes are changed on an eight to 10 month cycle, while the daylight 50/50s are changed on a 14 to 16 month schedule. One advantage to the VHO tubes is the “softness” of the light, even from new tubes. As many as four tubes have been changed at a time with no apparent adverse side effects on the animals.

The 29-gallon grow-out tank has four 24-inch VHO URI tubes (two actinic 03s and two Daylight 50/50s) on a single IceCap ballast, while the 30-gallon tank has three 24-inch VHO tubes (one actinic and two daylight 50/50s) driven by a single ballast. Fewer lights are used on the 30-gallon tank because it is much shallower than the 29 gallon. Both tanks are on a 13-hour light cycle.

Feeding and additives
The fish are fed at least once a day on various combinations of flake foods. Frozen food is fed periodically to provide variety, along with sheet algae (Seaweed Selects). ESV’s powdered freeze-dried plankton and frozen baby brine shrimp are added periodically.

The only additives used are ESV’s potassium iodide and, occasionally, B-Ionic, kalkwasser and strontium.

Inhabitants

Fish
This tank contains a Red Sea sailfin tang (Zebrasoma desjardinei) that has established itself as the “boss” of the tank, a yellow tang (Zebrasoma flavescens), an Achilles tang (Acanthurus achilles), a foxface rabbitfish (Siganus vulpinus), a swallowtail angelfish (Genicanthus melanospilos), a yellow goby (Cryptocentrus cinctus) and a banded goby (Amblygobius

phalaena.

Invertebrates
There are also three tiger tail cucumbers, and many blue-legged hermit crabs and Astraea snails. There are two keyhole limpets that arrived as hitchhikers and have been residents since the tank was first established. A group of peppermint shrimp helps keep the Aiptasia anemones under control. There are many varieties of brittle stars, including some babies that have now reached about 1/4 inch in diameter (central body diameter).

Corals
There are several colonies of green finger leather corals (Lobophytum sp.), a large bubble coral (Plerogyra sinuosa), torch coral (Euphyllia glabrescens), two colonies of pearl bubble coral (Plerogyra flexuosa), Porites sp. coral, hammer coral (Euphyllia ancora), slipper coral (Polyphyllia talpina), Anthelia, numerous colonies of button polyps, several different varieties of star polyps, pom-pom Xenia (pulsating), toad stool (Sarcophyton sp.), neon green finger leather corals (Sinularia sp.), green Bali staghorn coral(Acropora sp.), jewel tip coral (Porites antennata), brain (Blastomussa sp.), club foot coral (Stylophora pistillata), Pocillopora damicornis, Montipora damicornis, open brain (Trachyphyllia sp.), clove (Clavularia sp.), Acropora cytherea, Acropora cerealis, galaxy coral (Galaxea fascicularis), blue tip Acropora (species unknown), Seriatopora hystrix (blue), Seriatopora hystrix (brown), Montipora digitata, cauliflower coral (Pocillopora verrucosa), green Acropora (species unknown), cream colored Acropora (species unknown), table Acropora (species unknown), Acropora humilis (green), Acropora tennuis (blue), Hydnophora exesa, Hydnophora grandis, purple Acropora (species unknown), Acropora aculeus, a colony of red carnation coral (Dendronephthya sp.), a colony of orange carnation coral (Dendronephthya sp.) and a Pacific coral (Wellsophyllia sp) that recently lost most of its tissue for some unknown reason. The carnation corals have been in the tank for three months and have up and down days, but generally seem to be surviving but not thriving.

There are four clams — three Tridacna maxima and one T. crocea. There have been several propagation events. The blue T. maxima clam on the left end of the tank went through a spawning cycle back in October. It is sti