

# The Zero Maintenance Salt Water Reef Tank

By Rich Green

## **Introduction**

In 1991 a friend and I were lamenting the cost and complexity of the new reef tanks currently being offered for sale. My friend was the owner of a small pet store in the northeast Houston area and I had been keeping salt-water tanks for over ten years. One evening after the store was closed and we were on our second cold beverage, the discussion again turned to the cost and complexity of the reef aquarium. The obvious question came up as to why all this was necessary and finally out came the pencil and paper and we started making a list of what we could do and what we couldn't if we really wanted to cut down both on the cost as well as the complexity of the maintenance. That meant minimum filters (simple bioball chamber), good lighting and a 100-gallon tank. Minimum maintenance, say yearly water change. Tank had to produce its own food. Some of the things on the list are pretty obvious and some are not. This isn't rocket science but just the results of two experienced aquarists trying to solve a problem. Over the next few sessions we came up with a list.

## **The LIST!**

**CAN'T** Have hard corals. They require too high a standard for water quality and remember part of the equation is low maintenance.

**CAN'T** Have a heavy fish load. Small fish and only a few of them. Try a ratio one inch of fish per 5 gallons of water.

**CAN'T** Have any meat eaters. Herbivores and omnivores only. Two reasons. First, since we hoped to have the tank produce its own food source for the inhabitants, meat eaters would quickly eliminate theirs. Second, waste from meat eaters has a higher amount of phenols and would require more water changes and better filter equipment.

**CAN'T** Have any fish that have big appetites. While the tank should be able to produce a reasonable amount of food, real active herbivores would eat up the "garden". No tangs.

Ok now that we had agreed on what we COULDN'T have what was left?

CAN Have anything that will subsist on a diet of macroalgae and any spontaneous tidbits that might appear on the live rock. Dwarf angels (Flame and Coral Beauty) , pygmy angels (Cherubs), bicolor blenny, damsels, clarki clownfish, and tomato clownfish ended up being the final fish population.

CAN Have ANY type of soft coral.

CAN Have a couple of scavengers. A Coral Banded shrimp ended up living in the tank for 8 years.

CAN Have some snails to clean the glass and any thing else that could grow any microalgae.

### **Setting Up the Tank**

We chose a 100 gallon acrylic tank, built a spray bar using PVC and added enough base rock to set up the reef. We used three 4-foot single bulb light strips, two with white actinic bulbs and the middle one with a blue actinic.

The biggest problem was going to be the food source. No way around it we were going to have to grow the "garden" before we invited the guests to dinner. We had some good pieces of calurpa that we thought could become our food source if we could grow enough of it. We came up with using black mollies to cycle the tank and hoped that they would leave the calurpa alone. Ten big fat pregnant black mollies were put into the tank and 3 weeks later we added the calurpa and a dozen snails. By the 16<sup>th</sup> week we had a nice growth of calurpa, 150 black mollies of various ages and sizes and were ready to start adding some corals. First, however we needed to get rid of the mollies. A six-inch leopard grouper had been used as a fish for cycling tanks was available. We let him clean out the mollies and three days later no mollies. The grouper was so full he was real easy to net. We put in a nice selection of soft corals and crossed our fingers.

The calurpa was really taking off and we felt that we had to take a chance on the fish. Since the macroalgae was getting 100% of its food from the water, we had to keep up the fish population to support the algae.

We added the dwarf angles, the damsels, and the Clarkis. A couple of weeks later we added the Cherubs and a bicolor blenny as well as a nice sized coral banded shrimp.

For the first couple of days the fish seemed to not really want to eat the calurpa but after the third day I noticed them starting to pick at it. Soon it became a daylong feeding. What was interesting was they only would pick at the very newest growth and although the feeding was constant, the calurpa seemed none the worse for wear. After six months, the calurpa had grown to the point of needing a serious pruning and would eventually be a source of store credit sufficient to pay for the salt and trace elements used during the year. Two years into the life of the tank the center of the reef was completely covered from the base to the top. This was an area about 15 inches wide. When pruning it I would fill a small plastic grocery bag with trimmings.

The soft corals were doing well and small mushroom coral polyps began to appear next to the older ones. Water quality was never an issue. After the initial rise in nitrates following the mollies, the macroalgae seemed to do a fantastic job of removing it and the numbers stayed in the 5 to 15 PPM range. Water was replaced to offset evaporation and some trace elements added every couple of months. Some mulm buildup occurred and with no substrate it would have been fairly easy to remove but we just left it for the annual cleaning.

At the end of 12 months it was time for the first cleaning. We partially filled two large garbage cans and two ice chests with water from the tank. We then took a piece of coral with the live coral attached and rinsed it rather vigorously in the first or “dirty” can then again in the “clean” can. The two rinsings removed almost all fine mulm and loose particles from the rock the coral was attached to. The piece was then placed in the ice chests filled with clean water. Once all the pieces of coral with living organism attached were cleaned the base rock was removed and placed on a plastic sheet out side and thoroughly rinsed with a hose. The tank was completely emptied of water with the exception of the water still in the filter compartment, the inside cleaned and then salt and water added to the tank. We used a type of

salt that dissolved very quickly mixing the water right in the tank and immediately started the process of rebuilding the reef. The first time it took the two of us almost 7 hours. By the third year we had it down to 5 hours.

In 1999 I had to move to Arizona and gave the tank to a friend who had no experience at all in the hobby. I made arrangements for a person from a local pet store near his house to come by at the end of a years time and do the annual clean. During that time he did only what I had done, add fresh water to top off the tank and add the trace elements. Prune the calurpa every three to four months. The lights were on a timer. At the end of one year all the fish were alive, as were all the corals.

### **Summary**

This is one account of one experience. Yes, there is no question that we could have done some vacuuming to reduce the mulm buildup and could have done water changes more frequently. However, the final results were a healthy group of fish living in a tank where the corals were surviving and actually multiplying. That is what we set out to do. Yes, some fish died but none within the first year they were put in the tank. Cause of the deaths was unknown and the dead became food for the living as well as fertilizer for the calurpa. The toughest part of this method is by far the patience it took to set up the tank and grow the “garden” before introducing what would be the final fish population. The second toughest thing was not putting certain types of fish in the tank. We had the advantage of seeing the behavior of the fish in display tanks and could be pretty sure that the fish would do ok under these conditions before putting it in the tank.

While I am sure there are other fish that would work, the ones listed earlier DID WORK. I also don't want to give the impression that the decisions of how to go about doing this were reached in a couple of hours. We spent at least 4 months researching and testing ideas before ever starting this.