THE BEAUTY OF FILTER FEEDERS

When I see films of reefs on television, I notice that there is an all together different look, than I have ever seen in a closed system. In tanks there are the soft and stony corals, anemones and the like, that you can buy at your local marine shop, but there is a lot missing. The reef tanks that I have seen were well stocked with healthy plants and animals but the tanks looked **sterile**. I see dendronephthya (carnations or cauliflowers), sponges and gorgonians for sale but very few seemed to thrive in well established tanks. Even in magazines, tanks look like beautiful gardens, but they don't look like the living inshore reef.

In the reef there is competition for space on the rock, not just competition for space under the light. There are often a myriad of species in any given square foot. In many reefs, the rock is barley visible. This is due to the crowding of diverse organisms, as they grow over and through each other. The variety of color is breathtaking. Vibrant color is one of the thing for which reefs are most famous.

The reef tanks that I have seen have more tans, browns and fluorescent greens than I see in the wild. Most marine tank invertebrates seem to require strong, high quality lighting. The zooxanthellae algae in the flesh of these invertebrates tend to make them different shades of brown and green. Clams can be expensive exceptions and are often a "must have" item, to add a little color to the tank. Most thriving marine tank inhabitants can flourish with little or no feeding at all.

Many filter feeders come in brilliant reds, yellows, oranges, purples, blues ***and*** greens. They are often fairly fast growing too. They can pop up in crevices and start to grow over rocks and other filter feeders, packing the rock with life. We probably all like to see the enthusiasm of a guest in your home that has a fixated stare at an Elegant Coral or a Rose Tipped Montipora but a greater variety of species can maintain a higher level of interest, for the owner of the tank, well after the blush of the newest addition to the tank wears off.

Sponges, for example, come in so many different colors, textures, shapes and sizes that they alone could make a tank look beautiful. At a conference that I went to recently, the show tanks were decorated with large sponges that were brilliant in color. None of them were encrusting however and although they would grow relatively quickly at first, sadly, I knew that a large portion of those specimens would be dead within a year.

Improper collection is not always their greatest peril, rather it is starvation. Many of us have tried to supply filter feeders with ground up shrimp, fish and other foods. We then find that excessive feeding causes other problems in a closed system. Hair algae and slime can quickly become a problem that a few crabs and snails can't handle. After all, how much ground shrimp is there in the open reef.

I searched for ways to have my systems handle more feeding. I tried many products but they were all designed for very limited use. Then I got interested in living plankton, thinking that live food would not foul the water. In the night films of reefs there were always clouds of plankton and other debris. I read a lot of material and then started a brine shrimp tank. I also bought the set up for growing green water and rotifers.

One problem with the plankton that I can raise is that it is primarily on the large end of the spectrum or it is phytoplankton. In addition, zooplankton that is not killed by standard pumps is

eaten by the fish in no time when the lights are on and in any case these animals are to large for most of my filter feeders.

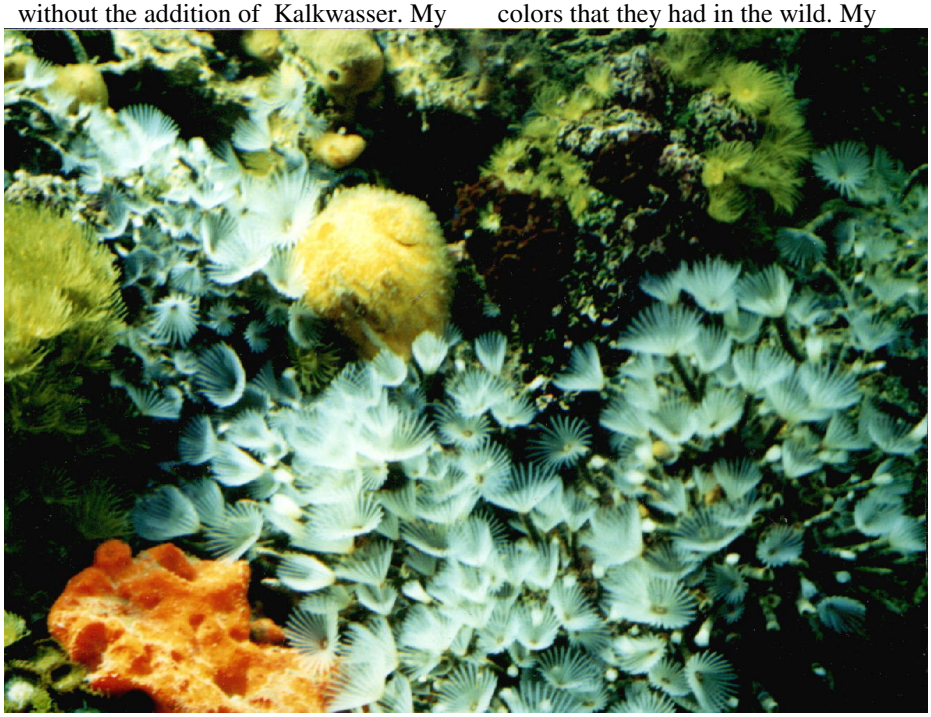
About that time I bought and read a copy of Dr. Adey's book DYNAMIC AQUARIA. I was quite impressed by it so I built a few algae scrubbers and dump buckets. This type of system can keeps liquefied and powdered foods suspended longer because only decayed food is treated as fertilizer and removed by the algae as it passes through the scrubber. My current version is four feet long with a low profile so it can fit under the tank's hood. This dump bucket produces surge and turbulence although it was not as strong as I expected .

There also is a great need for high water displacement in the tank. In addition to delivering oxygen to, and carrying away waste products from tank inhabitants, strong displacement reduces settling of food on the bottom of the tank.. The non-traumatic pumps that are advocated in DYNAMIC AQUARIA are not available to the public yet. However I am testing one medium volume pump now that works well.

I found that Richard Greenfield at CaribSea and I had a common interest in growing filter feeders like sponges. I told him that I was a "Beta Tester" for several products including pumps. He suggested that I test the CORAL LUNG pump that he was developing. After exchanging the appropriate paper work I received the first of two pumps from him. Although I got a preliminary design it was simple and worked quite well. It creates high volumes of turbulent in the water rather than just a steady stream.

I also read about the Jaubert live sand system. The addition of a plenum under the sand bed seemed to be a good idea so I used it when I started my new 130 gallon tank about one and a half years ago. Adey and Jaubert seem to agree on having an aragonite sand bed. It lowers nitrates and helps to regulate pH, calcium levels and other parameters of a healthy system. I also talked to Richard Greenfield of CaribSea about the specifications for his aragonite sand. He is a marine geologist and very knowledgeable. I eventually purchased my sand and crushed coral from him.

I found, like many others, that the tank will run OK with just the sand bed alone and I did get good skeletal growth without the addition of Kalkwasser. My



clam grew from five to nine inches in eighteen months. However, I chronically over feed so I need more horse power to make the tank run cleaner and thus I use the static sand bed as a strong supplemental system for my tank.

After the first three months of operation using the sand bed alone, I started my scrubber and began to harvest the algae. I also put a small bag of carbon in the scrubber to remove dissolved organic compounds but I don't force water through the bag. This would act as a mechanical filter or food trap. The inhabitants in my tank perked up and the live rock stayed cleaner. The hair algae dyed off or was eaten by my three snails and didn't grow back. The tank got so stable that it seemed almost bullet proof.

Sponges and feather dusters seem to need better water flow and turbulence than I thought. They seem to do best where they, at first, look like they are getting a beating. They quickly, recover and then thrive. Often long tentacled corals are incompatible with this turbulence but placing them farther away from the source will allow them to adjust after a few days.

Small polyp stony corals have long been reported to do well in strong current. Some people report that rather intense turbulence allows these corals to diffuse carbon dioxide and other metabolic wastes from their tissues. This seems to return much of the lighter colors that they had in the wild. My starter corals seem to like the strong turbulence that the pumps provide. I put them almost right under the splash of the dump bucket.

Mr. Greenfield also told me to call Marc Weiss at Word Wide Fish Farms because he had great success in growing sponges, and I might qualify as a Beta Tester for him too. I did so and Marc gave me two products to try but would not tell me what they would do for my tank.

One product was a liquid and was later released as Coral Vital. After using it, I noticed that the tank looked cleaner and I could feed the tank more. In addition, the growth of coraline algae accelerated. As a side note I should report that my Pacific Blue Tang developed ick two days after I bought it. After I added Coral Vital the ick seems to have gone into remission. After eight months it is still healthy.

The Coral Vital reportedly is a catalyst for the growth of useful bacteria and at high dosages small white strands of this bacteria can be seen growing near all of my pumps. Since I had heard that bacteria and other very small particles were being used as a food sources for sponges in commercial environments this seemed like a viable way of boosting my bacteria populations.

I tried using brewers yeast as a food source but it produced green and red slime within a week so I stopped using it completely. Ground shrimp and fish

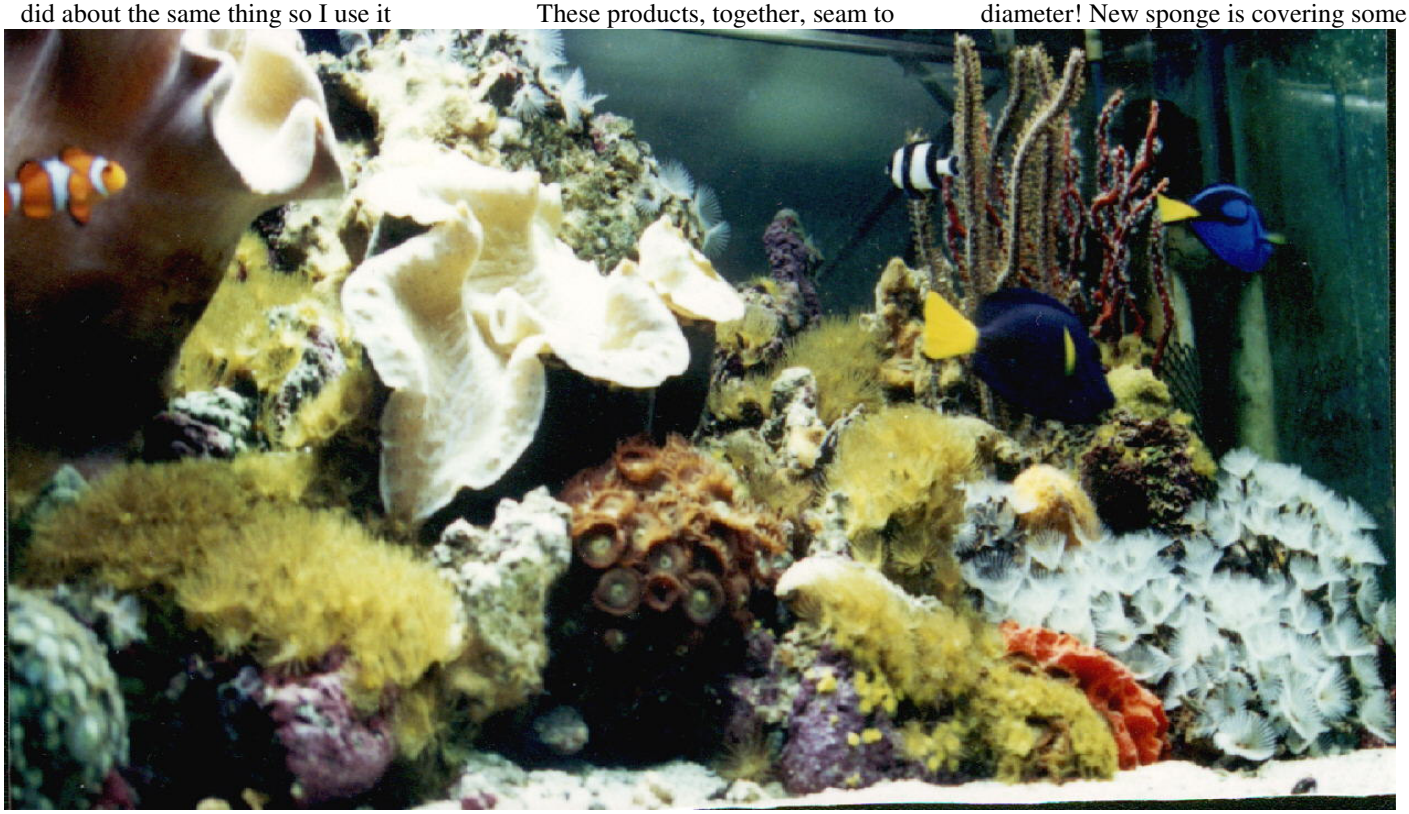
did about the same thing so I use it sparingly.

I also tried acidophilus as a live bacteria source. I buy it from the local drug store in pill form so I have not found out how high dosages will effect my tank. I use it periodically. Spirulena is another food source that I use. I use about a half of capsule per day. These methods had some success but not on the order that I was looking for.

The other product that Marc Weiss later sent me, called SMV Plus for now, is a reddish brown powder that stays suspended in the water column for a long time because it is so fine in texture. I only use about a heaping tea spoon full per day because it is not ready for mass production yet. This is enough to completely cloud the tank for hours so I feed at night so that it will clear up by the time I turn on the lights the next day.

I don't have scavengers except for worms so it appears that virtually none of this product ends up on, in or under the sand bed. I also have a 55 gallon brine shrimp tank. There is no current because I just have a static sand bed and an air stone in it. If I badly over feed this tank the powder settles out in a few days but does not foul. The brine shrimp feed right off the bottom.

SMV+ is perported to be an amalguim of symbiotic fuwna and microbial accelerators.



These products, together, seam to provide a wider spectrum of choices to the differing species that require specific size ranges of foods.

After using the SMV+ products for a month or so I started to see quite a few small white or purple feather dusters growing near the two CORAL LUNG pumps. I had seen them around my tanks for years but they were few in number and small in size.

I also saw, what I thought was, a yellow slime growing on two of my rocks. I never saw yellow slime in my tank before and it was localized so I waited to see what would develop. It turned out to be the beginnings of yellow sponges. It was not like my "liver sponges" that start out orange-yellow in the shade but turns gray in the bright light. This was a bright yellow, frilly, encrusting sponge that I had not seen before. it completely covered two fist sized rocks. I also got one of my clathrina clathrus sponges, that normally grows to only a quarter inch in diameter in my tank, to grow to two inches in size in four months. This sponge is also showing up in white in addition to the typical yellow.

After six mounts of the new turbulence and feeding regime, the feather dusters completely covered several rocks. I estimate over 1000 individuals. Some feather dusters have grown to about an inch and a half in diameter! New sponge is covering some of the feather worm casings while leaving the feather heads exposed. I am also beginning to see small red and orange boring sponges on a few rocks as well is and small ball or moon sponge. There is a species of purple sponge that is growing as well.

I discontinued the use of the powder to see if the growth was a coincidence. The bigger feather dusters stayed retracted most of the time and my encrusting sponges all but died out. I then restarted the use of the reddish powder. The feather dusters responded right away and the sponges are slowly beginning to grow back.

All of these are preliminary observations on a small scale. Of course I may just be a person this is easily entertained but I am quite excited! I am seeing the beginnings of spontaneous growth on rocks, that were seeded in the ocean, but long starved of food in my tanks.

I am still looking for ways to safely broaden the feeding spectrum. If more spontaneous growth can be stimulated a much more interesting and natural look of a reef will be possible in the home aquarium.