

Captive-Bred Marine Inverts

They're not widespread, but some species are being bred.

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The marine side of the aquarium hobby often comes under a lot of flak from environmentalists and conservationists. With the bulk of the ornamental organisms taken from the wild, many people believe that the hobby places unnecessary strain on an already stressed system. Indeed, the marine hobby doesn't have clean hands. In the past, poor and outright destructive methods of collection resulted in serious environmental problems, rightly justifying environmentalists' concerns.

As the marine hobby has grown, however, these problems have decreased, and these concerns are no longer quite as valid. As more aquarists have entered the marine hobby and more individuals have been exposed to marine aquaria, more individuals have become enamored with the ocean. More people have become concerned, increasing pressure to conserve these habitats. Coupled with advances in collecting and shipping technology, often made possible by increases in demand, the marine hobby has come a long way from its early days.

This is one of the points that the "Conservation Corner" has been making all along: With increased exposure to fish and other aquatic life, aquarists (as well as those who just enjoy watching the tank) become increasingly conservation minded. As numbers grow, they become able to actually affect the hobby. The Marine Aquarium Council (MAC) grew out of concerned hobbyists of differing levels. Today, MAC encourages captive breeding, trains fish collectors to collect fish responsibly and in a sustainable manner and certifies wild-caught fish as being properly collected.

What About Inverts?

Last month, we visited the topic of captive-breeding marine fish and how the influx of many captive-bred and captive-reared fish has affected the aquarium hobby. While fish make up the bulk of the marine hobby, there is so much more. An average aquarium store will devote fully a third or more of its marine livestock room to the rest of the marine hobby: the invertebrates.

Purely for the sake of convenience we can divide inverts into two categories: the reef organisms and everything else. The reef organisms are those creatures that require a reef aquarium to thrive, including the true corals and many organisms often called coral, such as mushroom anemones, gorgonians, etc. and other photosynthetic organisms (e.g., giant clams).

Everything else includes the myriad of snails and hermit crabs, other crabs, shrimp, worms, and those anemones that are not typically kept in the reef aquarium (i.e., the "typical" anemones, bubble tips, carpets, condies, etc.). Next month, we'll discuss the reef organisms in detail, and this month we'll address everything else.

The most commonly sold invertebrates are undoubtedly the various snails and hermit crabs used as clean-up crews. These organisms range in price from about a dollar or so to about five bucks, and they are often sold in groups (e.g., by the dozen). Mostly, they are sold for the reef aquarium, although many are sold for aquaria containing invertebrates as well. An average aquarium store may go through as many as 50 of a given type each week. So, tremendous numbers of these organisms are sold into the hobby.

Captive Specimens Needed

In the short run, these organisms are amazingly hardy, able to withstand just about anything the aquarium dealer throws at them. In fact, many varieties of hermit crab are so hardy that they can be placed in fish-only aquaria and withstand doses of copper-based medicines.

In the long run, however, these same creatures often suffer very short lives. The various types of "turbo" snails (*Turbo* spp., *Astrea* spp., etc.) are notoriously short-lived in the aquarium. In some species, our water is not actually suitable to them; it's far too warm. In aquariums featuring other species, the proper food is not present in sufficient quantities — just as freshwater aquarists often starve plecos and other "algae eaters" by assuming they eat everything aquarists call "algae," so too do marine aquarists often starve these organisms.

While they are very adaptable in the short range, mishandling of snails and hermits (e.g., just "plunking" them from tank to tank) stresses them and may result in early deaths. Hermit crabs live in the shells of snails, and there is often a huge difference in size between the largest hermit crab and the smallest available snail shell in the aquarium. Thus, they often are unable to find a suitable new shell and die as a result.

The very high rates of mortality in these organisms increases an already high demand. In the wild, these guys are, for the most part, basically short-lived food items for other organisms anyhow. They have very high reproductive rates, and their removal from the wild has incredibly little effect. However, we can only imagine how tedious it must be to collect some of these organisms. While we were unable to find any evidence of farming or aquaculture of these inexpensive cleaners in any significant number (there appear to be some small operations), such an operation would undoubtedly be quite profitable simply by eliminating the need and cost of collection. If any readers are aware of large-scale operations, then please inform us.

Captive Successes

Among the more decorative invertebrates, three groups are now being bred in captivity: shrimp, anemones and cephalopods. The various shrimp of the genus *Lysmata* are beautiful crustaceans best known for their cleaning abilities. These shrimp will hover near rock, awaiting a fish. They will then dart out, wander over the fish and pick parasites, much in the fashion of the cleaner wrasses (*Labridae*).

Unlike cleaner wrasses, however, these shrimp are not obligate cleaners and will often eat other fare. One does not need sick fish to keep them alive. The amount of cleaning will vary between species, with some (such as the peppermint shrimp) doing virtually none, and others being quite good for this purpose.

Numerous hobbyists have reported spawning these beautiful shrimp in captivity. In fact, it turns out that they may be the easiest marine organism to spawn, provided adequate water chemistry is maintained. They are simultaneous hermaphrodites, which means finding a pair is as easy as buying two.

As with marine fish, however, the trouble arises when it comes to raising the offspring. Like newly hatched marine fish, the shrimp are tiny and feeding them can be somewhat difficult. Moreover, the difference between the hardness of inverts and fish comes into play here. Shrimp are a touch more fragile.

Many shrimp larvae are actually fairly big and can eat larger-sized prey items. Some reports indicate they feed on newly hatched brine shrimp. Many smaller foods are more appropriate and are becoming increasingly easy to find. They may eat CYCLOP-EEZE or similar foods, and will happily devour other fine foods.

Hobbyists have been at the forefront of these spawnings, and often rear 100 or more cleaner shrimp at a time, sometimes in aquaria as small as 10 gallons. Considering that cleaner shrimp sell for as much as \$30 each, this may actually be a viable breeding project for those looking to make a profit on the marine hobby (ignoring, of course, the fact that one must raise 10 zillion shrimp to pay for the tank!). Aquaculture centers have been slow to jump on this bandwagon, however, and very few captive-raised shrimp are available.

A Special Case

Anemones are one of the ugly black eyes of the marine hobby to this day. An anemone is a keystone species, which is one with a key role in the environment. For example, one would label the oak trees in an oak forest as a keystone species: if they vanish, so does the forest.

Anemones are a keystone species because they offer sanctuary to a number of species, not least of all the clownfish. Being incredibly long-lived in the wild, they may form the basis of a small community for countless years. In aquaria, despite our best efforts, the vast majority of anemones die within a few months.

Many authors have argued that anemones should not be kept by hobbyists. However, one type of anemone is occasionally available as a captive bred specimen: the bubble-tipped anemone (*Entacmaea* cf. *quadricolor*). This is one of the few anemones that seems to do well in the aquarium. It actually does so well that it isn't unheard of for individuals to actually divide in the aquarium.

Aquarists are thus able to occasionally provide captive-reared bubble-tips. Unfortunately, it is a rather slow-growing species and reproduces sporadically at best. This makes it, unfortunately, unsuitable for aquaculture. Captive-bred organisms are occasionally available from various online sellers and exchange boards. It is possible that as dedicated hobbyists raise bubble-tips through subsequent generations that we may develop a more plastic strain which divides readily in the aquarium.

Outliers

Last among the occasionally bred marine invertebrates are cephalopods: the octopuses, squids and cuttlefish. These organisms are not generally captive bred for the marine hobby. However, cephalopods are widely used in research,

creating an increased demand. As a result, captive-raised individuals are available to hobbyists.

Despite being captive raised, these animals are still best left to dedicated cephalopod aficionados. Cephalopods have very poor survival rates and are very difficult to keep in aquaria in general. Those interested in cephalopods are encouraged to attempt to find captive-bred individuals. Not only is it easier to ascertain the age of these short-lived species, but captive-bred specimens are far more adaptable to the aquarium than wild-caught specimens.

Several other types of invertebrates are being bred in aquaculture facilities by various companies throughout the world. While aquarists will often have to go through a little extra effort to obtain captive-bred specimens, the benefits are well worth it.

Like marine fish, they are far more adaptable to the aquarium and help relieve pressures on wild populations. Unfortunately, most species are not readily available in aquarium stores, so those looking for captive-bred stocks are best advised to visit message boards and ad services online if animals can't be found at local shops.

Next month, we'll conclude our saltwater arc by looking at the remaining group of marine organisms: the corals and other reef creatures.