Breeding "Freshwater" Eels

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By Al Castro

Q. For some time now, I have raised various kinds of freshwater eels, including the typical spiny eels (Macrognathus aculeatus) and tire-track eels (Mastacembelus argus, I believe). To date, however, none have bred. Most publications I have read indicate that these eels are not known to have bred in captivity. Is this true, and, if not, what are the ideal aquarium conditions for the breeding these eels? In addition, I would appreciate the titles of any books on freshwater eels.

A. I try to avoid making my answers to questions too technical, but in order to answer your question I will have to discuss some aspects of systematics. There is very little aquarium information on "freshwater eels" because virtually all the aquarium animals referred to as eels are not actually eels.

True eels belong to the order Anguilliformes and the family Anguillidae. The two species that are sometimes found in aquariums are the American eel and the European eel. Both species are biologically noteworthy because of the tremendous migrations they make from their home inland waters to the distant Sargassum Sea off of the Bahamas. Both species spawn freely and produce pelagic (floating) eggs that, upon hatching, produce larva that swim all the way back to their parents' original home waters to mature, before returning to the Bahamas to spawn for themselves.

Closely related to the true eel, or anguillid, are the marine moray eels (family Muraenidae) that are frequently maintained by aquarists, and the marine conger eels (family Congeridae), which are occasionally maintained in aquariums. There are a few other families of fishes related to the true eel, but they are almost never seen in aquariums.

Among the many letters I have received from readers have been several with questions about "freshwater moray eels." These are not morays but instead should be referred to as swamp eels. They are not even distantly related to the true eels. The swamp eels belong to the order Symbranchiformes and are in the family Symbranchidae.

Your "spiny eels" are even further away, evolutionarily, belonging to the order Mastacembeliformes and the family Mastacembelidae. Not all spiny eels are long, slinky and snake-like. Some species actually look short and stubby. There are no books (at least that I have encountered) on spiny eels, but in many aquarium books with descriptions of fishes there are generally at least brief compilations of notes about them. And they have been spawned on several different occasions. I will take this opportunity to share some of my notes with you.

The Mastacembelidae, or spiny eels, are found throughout most of Africa, south of the strict desert regions, and throughout southern and southeastern Asia. They vary in size from the 6-inch-long Mastacembelus circumcinctus to the 3-foot-plus Mastacembelus erythrotaenia, the fire eel. Many species are found in brackish water, and most appreciate a teaspoon of salt per gallon of water. The normal habitat is weedy, bushy areas over muddy or sandy bottoms, where the spiny eels hide during the day. They come out to seek food in the late evening or after dark. Their primary food, in nature, is small invertebrates, such as shrimp and worms, although the larger species will eat small fish if they can catch them.

These preferences must be taken into account for successful maintenance and any hope of breeding. They do quite well in planted community tanks as long as you remember their willingness to eat small fish. They should be provided with many hiding places — rock piles, driftwood and flowerpots are all quite suitable. The larger the tank, the better. Many species can be kept together, and many species can be kept in groups, but the giant fire eel is a loner, becoming very aggressive when encountering other fire eels.

The "standard" spiny eel, Macrognathus aculeatus, is commonly referred to as the porthole eel or the peacock eel. It is also one species that has been spawned relatively frequently. The porthole eel grows to about 13 inches, but will spawn after it has reached about 7 inches in length. Females are slightly larger than males of the same age and are noticeably more plump than the males. Females become even more plump when conditioned on Tubifex and white worms for spawning. Water conditions do not appear to be too important, but slightly alkaline water with salt in it seems best. I keep temperatures relatively cool, about 72 degrees Fahrenheit, which does not seem to inhibit them.

A male will chase the female and nudge her near the vent to stimulate the spawning instinct. Spawning takes place in a twisting, turning "worm-ball," and the eggs are scattered over or in bushy plant masses. Clumps of Myriophyllum or water hyacinth roots make good naturalistic spawning sites, but large, fluffy nylon spawning mops make great substitutes.

Spawns are large, with more than 800 eggs for young females and over a thousand for more mature fish. The green eggs hatch in about 72 hours, and the fry are free-swimming about three days later. I have never successfully raised the fry because the food I provided was too large (I used newly hatched brine shrimp nauplii), but I have read accounts that say the best food is cyclops nauplii and radiolarians.

I have no experience in spawning tire-track eels because this species grows much larger than the fish I prefer to keep, reaching about 28 inches in length. I assume, but do not know, that the procedure should be much the same as for the preceding species. One of the notes that I did encounter on this species states that the tire-track spawns during the cooler period of Sri Lanka's winter, while the other species seem to spawn during the warmer periods, just prior to the onset of the monsoon season.