

AN AQUARIUM SPAWNING OF RAINBOW DARTERS

By Robert Thomas, Brinnon, Washington

In November of 1984, I swapped some fish with another native-fish fancier, Peter Mang of New York, and received three pairs of Rainbow Darters (*Etheostoma caeruleum*) and a pair of Banded Darters (*E. zonata*) in the deal.

All the darters were housed in a 20-gallon-low tank on the bottom shelf of a shelf unit in my fish room. No other fish were in the tank, and it was furnished with a couple of ceramic shelf units and a half flower pot for cover. Over the winter, I collected a branch of a local form of willow moss and added it to the tank for additional cover.

The tank received light from a small, 18" fluorescent unit placed atop the tank. A bubble-actuated floss-box filter was used for aeration and filtration. Dacron floss was used in the filter.

Over a period of time, the tank settled down to being acid and a little hard, according to commonly sold pH and DH test kits. Water was siphoned off and replaced approximately every two weeks in about 25 percent of the volume. Replacement water was from my well, which is slightly alkaline and medium in hardness. Water freshly from the well is supersaturated with oxygen, which settles out in bubbles over a day or two—similar to the way in which chlorine gas settles out of city water.

Low temperatures in the fish room over the winter of '84-'85 reached a low of about 60°F. Tanks on bottom shelves possibly reached 58°F.

The darters were fed mostly frozen brine shrimp and frozen blood worms with an occasional feeding of live tubifex worms over the winter. In spring, this diet occasionally also included live glass worms.

On May 4, 1985, I decided to replace the willow moss, which had by then become sparse and stringy due to the weak illumination it had received. As I was carrying the plant outside to dispose of it, I noticed what proved to be three eggs in the butt end of the plant where the stiff plant shafts resembled horsehair. I removed the three eggs and placed them in a petri dish in water from the aquarium. The water was not treated in any way.

The water temperature was 64°F when I took it on May 4. I replaced the willow moss with a sunken mop of dark brown dacron rug yarn placed in the same attitude and location in the tank. The mop was coarse, and the strands were a foot long or longer. I had used it as a killie-spawning medium previously. I removed a cork and put a piece of pencil lead where the mop was tied together in order to hold it in place.

On May 5, I found 13 more eggs in the mop placed in the tank the previous day. A couple more eggs broke as I tried removing them from the mop with my fingers. Apparently the eggs harden slightly a while after they are laid. The additional undamaged eggs were added to the others in the petri dish. The eggs are fair-sized—a little over 1.5-2 mm—and are clear with a large yolk spot.

On May 6, I found only one egg in the mop. This one was added to the others and a couple of fungused eggs were removed. Nearly all the eggs were found in the tight, tied end of the mop.

I tested the darter-tank water on May 5 and found it to be rather acid (6.2 pH) and  $4\frac{1}{2}$  DH (77 parts per million hardness). I added crushed coral to the tank filter in place of the dacron floss to neutralize the pH on May 8.

On May 13, the first egg hatched in the petri dish, followed by 10 more on May 15, and the last egg hatched on May 16. Storage temperatures ranged from 68°-75°F. The newly hatched darters were placed in a shoe box on May 16. The fish had a yolk sac and didn't move around much the first day or so. They were transparent when first hatched, with large black eyes. Their heads are large and distinct, with a definite break in contour where the head is.

On May 17, the young darters took micro worms, and on May 18 they were taking newly hatched brine shrimp nauplii. The 12 young are over a month old now and are about  $5/8$ " long. They're starting to show a little pattern on their sides,

On May 19, I found four more eggs in the spawning mop following a water change. The eggs were apparently not fertile, however, and fungused the following day.

At one month, the darter fry eagerly await feeding time, scooting and hopping after shrimp and micro worms. They will be moved into a shallow 10-gallon tank this week for growing on. They will be switched over to a frozen diet as soon as possible.

Raising the darters has been very satisfying, and I was quite pleased with their acceptance of the spawning mop. Most references mention their spawning over gravel, so it was quite a surprise to have them spawn in a bare-bottomed tank.

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