

BREEDING THE TESSELATED DARTER
by Joe Hanyok, Dunkirk, Maryland

Since I'd been trying to breed the Tesselated Darter (*Etheostoma olmstedii*) for three years, I read Pete McKendrick's article in the Fall 1993 issue with great interest. Until this spring, my success was pretty much hit and miss; I didn't know what I was doing right if I succeeded or wrong if I failed. Last year I had a partial success and released about 70 3/4" fry back into the stream where I had captured their parents. Unfortunately, I also had three failures--three batches of a hundred eggs each that produced baby fish that died within a few hours of birth.

This year, thanks to advice from a number of people, including Bruce Gebhardt and Robert Goldstein, and my own persistence, I think I finally have it all together. This spring I've successfully bred four batches of eggs, a total of well over 400 fry. These were produced by stream-bred parent darters that wintered in my tank. Next year I hope to reach my goal and successfully breed some of my home-grown darters. Since I now feel confident that I know what I'm doing, I thought I'd pass on a few tips to other members who might be interested in this enjoyable challenge.

I keep my breeding adults in a 30-gallon tank filled with water from their home stream. The local streams have soft water with a pH that stays in the 6.4-6.8 range throughout the year. I have well water in my home that's more alkaline than I can measure, above 7.6. I found early on that it was easier and cheaper to haul the stream water the mile or so to my home than to chemically bring the well water down to the stream's acid level.

The tank is filled with the usual gravel, rocks, and plants and has an external filter. I control the tank light with a timer and vary the darters' day from 11 hours in the winter to 16 in the summer. For hatching and raising fry, I have a 10-gallon tank set up like the 30-gallon. During the non-breeding times of the year, I keep several darters and a catfish in the smaller tank, then move them to the larger one when the eggs start arriving. Every month I remove 20 percent of the water in each tank and replace it with fresh stream water. I keep the pH in both tanks at 6.4.

Six or seven darters is the maximum I keep in my 30-gallon; any more, and they seem to become very nervous. I also have a catfish, a couple of Black Mollies, and a few dace in with the darters to eat any leftover food. Darters will eat blackworms, tubifex worms, and cut-up earthworms. Actually, they'll try anything that moves. Since worms are messy (just ask my wife or daughter) and sometimes hard to find, I also feed the fish shrimp from the supermarket. I

dice the shrimp into baby-aspirin size, and smaller, pieces and drop them into one spot in the tank. At first, it took the darters a few days to find the shrimp. The other fish helped out by stirring up the shrimp pieces to give the necessary movement. Because of the convenience, I soon found myself feeding only shrimp to the darters, removing the uneaten pieces with a dip tube. They loved it and seemed to thrive on this diet. Unfortunately, this was the biggest mistake of my breeding project. All the fry from females fed a shrimp-only diet died within several hours of hatching, while those produced by females fed both shrimp and worms survived. I found out the hard way that a varied diet is needed for successful breeding.

In January, I start preparing the 10-gallon hatching tank. I take out the resident fish, change half the water, and dose the tank with acriflavine and methylene blue for several weeks. Right before I move the eggs into the tank, I give it another partial water change.

I have no difficulty inducing my darters to lay eggs. Tesselated Darters are cave spawners. To simulate their natural egg-laying environment, I built a breeding cave in the large tank. I placed four stones on the bottom gravel with a flat piece of slate about 3" square on top, forming a small table about an inch-and-a-half tall. About mid-December, the dominant male takes over the cave and cleans the underside of the table top. In early to mid-March, the egg laying begins. I believe that this is about six weeks earlier than the darters in the streams in my area. Each mature female will usually lay eggs three or four times at about one-week intervals. She attaches her eggs, about a hundred, to the underside of the flat table top over a period of several hours, with the male following her, fertilizing the eggs.

I usually leave the eggs in the large tank for several days after laying. The male guards the eggs and removes any that are fungus and unfertilized.

Moving time is stressful for the male darter. I reach into the tank and remove the table top with the eggs. The male immediately freaks out and darts around the tank. I put the egg rock--egg side up--into the 10-gallon tank, placing it on small stones to elevate it above the gravel. I then replace the male's table top with a second, blank piece of slate. After a short while, the male calms down and starts to clean the underside of the new cave roof, preparing it for the next egg-laying session.

I don't give the eggs any special aeration--just that provided by the external filter. In fact, I turn the pump speed to slow to keep the turbulence to a minimum for the fry. During my initial attempts at breeding several years

ago, I had followed the sterile-tank method--five-gallon tank with an airstone under the egg rock, box filter, and nothing else. All the fry died. I think I probably poisoned the tank. I've had much better success using a seasoned tank.

The eggs take about a week or so to hatch. I remove the fungused eggs as they appear, with a special dip tube I made that has a tip on one end to pry the bad eggs loose. Pre-treating the tank and leaving the eggs in the male's care for a few days seems to keep the number of fungused eggs to a minimum, about 5 or 10 percent. After four or five days, you can see the little darters inside the eggs, occasionally moving. This is also about the time that the parents lay their next batch of eggs. Once hatching starts, it takes about a day. The fry don't break out of the egg shells; the shells just sort of deteriorate around them. After several minutes the fry will dart off and start moving around the tank. Last year, many were sucked into the filter siphon, even at slow pump speed. This year I covered the siphon with a fine mesh, a piece of panty hose. Success--this year no fry were sucked into the pump.

When the darter-hatching begins, I start a batch of brine shrimp eggs. The baby darters will use up their egg yolks in about two days and start taking the brine shrimp. It's really quite satisfying to see their clear stomachs turn orange as they fill up with brine shrimp. I stagger two cultures of brine shrimp and feed the baby darters twice a day. To keep the tank clean, I step up the water changes right after hatching, changing a gallon or two every three days. I also throw in a few small snails to eat the dead brine shrimp. After about three months, when they've grown to a half-inch or so, I switch them to cut-up blackworms.

As I mentioned earlier, I think I finally know what I'm doing. Last year I managed to raise about 75 fry. I kept five and released the rest. My home-bred darters didn't breed this year, though my reference book says that they can. It may be that the larger adults that I captured last year intimidated them. In any case, I'll soon release the "wild" fish and keep a half-dozen of my "tame" darters. Next year I should reach my goal.

I understand that Maryland has other species of darters. I've read that the Rainbow Darter, a gravel spawner, is found in central Maryland. If anyone has any experience with Rainbows or any other darters in the Maryland area, please give me a call or send me a letter about your experiences.

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