

CERIODAPHNIA--a Newly Discovered Live Food

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I'm always on the lookout for new live foods to culture, especially anything small enough to feed to new darter fry. Of course, native killie fry and whatever else I may have at the time will benefit also. Live-food cultures, especially small crustaceans, are fun to keep, and I like to take cultures to meetings and auctions to make a few \$\$\$\$. It helps keep the stuff in the hobby. I also trade and give a lot away. Thus I was glad to obtain a culture of Ceriodaphnia dubia, a tiny daphnid new to the hobby, from a friend and fellow darterologist with the Environmental Protection Agency in Chicago.

C. dubia is one of the organisms used by the EPA for water-quality testing. Originally they used the larger Daphnia, but they do not reproduce as rapidly as Ceriodaphnia, which can produce three or four broods per week under optimum conditions. Ceriodaphnia are small indeed--rarely exceeding 1mm. They are round or oval. Ceriodaphnia occur widely and commonly in temperate fresh waters throughout the United States and Canada, as well as Europe, Asia, and South America. Some 20 species, they are found in lakes and ponds, often in foul water, and also in the Great Lakes, from which five species are known.

A filter feeder like Daphnia, Ceriodaphnia feeds on algae, bacteria, diatoms, and organic detritus, and is in turn eaten by many species of fish and by some copepods and shrimp.

Reproduction, also like Daphnia, is parthenogenetic during spring and summer with males and ephippial females appearing in fall. These females carry one egg in the ephippium on their back for some time. Eventually the egg drops off and falls to the bottom, or the female dies. The egg overwinters on the bottom, needing cold temperatures before it can hatch. Males are distinguished from females by the modified first legs and long, stout setae on the antennules. Also, they tend to have denser coloration and swim more erratically. Younger males resemble juvenile females.

The fishroom is where the great qualities of this little crustacean really shine. Not only does it outproduce Daphnia in broods per week, but the neonates of C. dubia are much smaller--in fact, smaller than brine shrimp nauplii from Utah eggs. This makes Ceriodaphnia small enough for most, if not all, small fry--or even small adults of diminutive species like Leptoluca, Elassoma, or Heterandria. An added advantage is that it is a good

weekend or vacation fry food, since it won't die in the water as do brine shrimp, micro worms, etc.

Finally, C. dubia is happier at most fishroom temperatures than Daphnia (ideal temperature 20°C=68°F) or some other small crustaceans such as Bosmina (11°-19°C=52-66°F). which are sometimes used as fish foods. Ceriodaphnia dubia reaches maximum feeding and reproduction at 25°C=77°F, and in a mixed culture with Daphnia at this temperature (25°C), C. dubia will outcompete the Daphnia. If the cultures drop to 20°C or below, the Daphnia will take over.

C. dubia can be mailed or otherwise transported in polyethylene bottles or bags. Several hundred can live as long as a week in a one-litre bottle three-quarters full with culture medium, i.e., water and food. On receiving a culture, allow it to come to room temperature and acclimate to your water gradually over a day or two, as C. dubia is somewhat sensitive to rapid pH and temperature changes. To avoid mass die-off and loss of the culture, I like to spread newly arrived cultures of any live food into three or four small containers to acclimate. This way, the chances of losing everything are minimized.

Once acclimated, cultures can be kept in almost anything from quart jars to gallon jugs or any empty fish tank. I use the quart and gallon jars since my tanks are always full of fish. I harvest the C. dubia once a week from quarts and twice a week from gallons. This also prevents overcrowding in the culture. Aeration is not necessary, but good light is beneficial. Ideal is 16 hours per day, but cultures will do well in any reasonably lit room.

C. dubia is harvested by pouring from the jars through two or three nets from a small mesh to fine mesh (gauze-like) to a brine shrimp net. Those passing through the gauze are fed to the smallest fry. The net with the C. dubia can either be rinsed out into the tank or into a small container of water to be spread around to several tanks. Eyedroppers are handy for feeding small amounts.

Again, the cultures should be used at least weekly. When they start to decline, restart some new cultures using aged or tank water and a small amount of the old culture. Overcrowded and/or underfed cultures may produce males and ephippial females and the cultures decline.

Of the foods I use for C. dubia, green water is the best all-around. It doesn't cause pollution, so again it is a good vacation food. The only fault with green water is that it, too, is a culture, and many people seem to have problems maintaining it. I've had three good cultures going for about five years, and now that I need it most, I'm having

problems. Next best is yeast water, about ¼ tsp. of dry yeast to a pint or so of water well dissolved. It keeps in the refrigerator up to a week. Feed the yeast just until the water becomes slightly cloudy. Feed again when the water clears. Avoid overfeeding, as yeast gets smelly and can clog the filtering apparatus of the C. dubia. Aeration may be necessary to keep the dissolved oxygen above 5 mg/l. For small cultures, another good food is liquid fry food in a tube, e.g., "Small Fry" or "Liquifyry."

I also want to include here the EPA diet for C. dubia. It is balanced to provide sufficient nutrition to support maximum reproduction, and is fed at 3 ml./l. to avoid overfeeding. While this formula may be too tedious for most of us to bother with, it certainly suggests some good ideas and seems highly adaptable to other foods and methods. Some sources are provided should anyone be interested. Also, who knows what other goodies these companies may carry?

The food is made by combining the following three ingredients:

*Digested trout chow, U.S. Fish & Wildlife Service Specification Diet SD9-30, to 1 L of distilled or deionized water. This trout chow may be obtained from Ziegler Bros., Inc., P.O. Box 95, Gardners, PA 17324. Mix well in a blender and aerate continuously (digest) for one week at ambient laboratory temperature prior to use. At the end of digestion period, place the mixture in a refrigerator and allow to settle overnight. Decant 300 mL of the supernatant and combine with equal volumes of supernatant from "CEROPHYL" and yeast preparations (below). Discard the remainder.

*Yeast. Add 5.0 g of dry yeast, such as "Fleischmann's" or "St. Rejis," to 1 L of distilled water. Stir with a magnetic stirrer until well dispersed or use a blender at low speed for five minutes. Refrigerate overnight, mix well, and combine 300 mL with equal volumes of supernatant from the trout chow and CEROPHYL (below). Discard remainder.

*"CEROPHYL" (powdered, dried, cereal leaves), available from Sigma Chemical Co., P.O. Box 14508, St. Louis, MO 63178 (800-325-3010). Place 5.0 g of CEROPHYL powder in a blender. Add 1 L of distilled water. Mix at high speed for five minutes. Place in a refrigerator overnight to settle, decant 300 mL of the supernatant, and

combine with equal volumes of supernatant from trout chow and yeast preparations (above). Discard remainder.

The trout-chow method should be adaptable to other pelleted food (guinea pig/rabbit pellets) with vegetable content. This method also should be good for those with large cultures. I like the frozen-food approach for storage; freezing foods into ice cubes, which can be stored in plastic bags, should be more convenient than bottles. Both small (qundrop-size) and large ice cubes could be used to suit the size of your culture.

As you can see, C. dubia is a good, new live food for your small fry (and maybe fish slightly larger)--small, prolific, and easily raised. I hope you'll want to try some. It's been spreading around to Chicago hobbyists since early 1987.

References

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