Detailed Methods for Breeding Over Marbles

(Source: S. Russell from Zebrafish Book 5th Edition)

Fish and marbles

At the onset of the light cycle, zebrafish will generally initiate breeding behavior that results in the laying and fertilization of eggs. In a tank that has been marbled, the eggs collect between the marbles and escape predation. However, when no marbles are in the tank, the fish will rapidly consume the eggs. By eating the eggs, the fish are cycling the protein within the tank, reducing the energy loss experienced in egg production and breeding behavior. By marbling a tank, the egg protein source is denied and energy loss to a tank is extensive, which is why fish should be put over marbles no more frequently than once per week. On days when the fish are not over marbles, they should be fed several times per day with protein rich foods to compensate for their energy loss.

Marbles are used to cover the bottom of the tank the night before the user expects to get eggs from the tank. By covering the bottom of the tank with a layer of marbles, breeding fish are unable to eat the freshly laid eggs because the eggs sink down between the marbles to safety.

Marbling a tank

The fish should be fed approximately 30 minutes before adding marbles to give the fish sufficient time to consume the food. When the fish have stopped feeding, it is important to siphon excess food and debris from the bottom of the tank.

Add marbles to a freshly siphoned tank by slowly dropping them through the water to the bottom of the tank. The tank bottom must be completely covered with marbles. Approximately one liter of marbles is enough to cover the bottom of a ten-gallon tank properly. Marbles should be added to the tank slowly enough so that the fish can avoid being hit by them.

Removing eggs from a tank

Remove eggs from the tank using a siphon (see Embryo Collection). To siphon eggs, prepare a container to receive the eggs and water. Place the container near the tank, and below the water line of the tank. To operate the siphon, place the glass tube into the tank. Draw water by mouth into the siphon, and quickly place the flexible tubing into the container. Water should flow into the container. Siphon the bottom of the tank in a methodical manner to collect the eggs.

Siphons are to be used only once. When finished with the siphon, sterilize it by bleaching and rinsing. Never use a siphon in more than one tank.

Removing marbles from a tank

Marbles should be removed from tanks promptly. After siphoning, use a net to remove the marbles. Clean them with bleach and extensive rinsing.

Cleaning marble eggs

Clean eggs obtained from marble tanks either by rinsing with clean system water to wash away debris or by removing the debris with a pipette. To rinse, pour off dirty fish water with as much of the loose debris from the eggs as possible. Add clean system water and repeat the process. With each addition of clean water to the eggs, the debris is diluted and suspended in the water so that it can be subsequently poured off. Repeat this process three to six times. Finally, use a pipette to remove any remaining debris. This method is quick, but often does not completely free the eggs from debris. In addition, eggs can sometimes be lost while pouring off the water.

An alternative is to use a pipette to remove debris. Place the eggs in a small Petri dish or a finger bowl. Using a squeeze bottle, deliver a stream of system water into the Petri dish so that the eggs and debris swirl around the dish. Note that the eggs will gather in the center of the dish rather quickly, while most of the debris will swirl around the dish for a longer time. Before the debris swirls in to meet the eggs, use a pipette to remove it. System water can be squirted directly on the eggs to dislodge stubborn debris. Repeat the process until the eggs are clean. Finally, remove any heavy debris that survived the swirling with the pipette.

Once the eggs are cleaned, transfer them into clean beakers full of system water. Then place the beakers in a water bath or incubator. Records are kept for each tank of marble fish. The number and quality of eggs collected are noted, as well as the number of eggs that are used.

Fish used in producing marble eggs

Fish used for embryo production over marbles are for the most part reliable at egg production until they are about 2 years old. Generally, marble fish consist of 8 females and 4 males in a 10 gallon tank.

Feeding marble fish

Because fish producing eggs over marbles expend more energy than regular stock fish, it is important to provide them with a diet that compensates for the energy lost in egg laying and breeding and that is ample enough to allow the fish to develop the reserves from which new eggs will be produced and nourished.

In general, it is better to feed the fish several times (four to six) lightly than to feed them once or twice heavily. Multiple light feedings allow the fish better opportunity to utilize the food sources and preserves tank water quality by minimizing the amount of food left rotting on the bottom of the tank. As a "rule of thumb", fish should not be given more food than they can consume in 5 minutes. If fish are still eating after 5 minutes, they are probably being overfed, so reduce the amount next time. If, after 5 minutes, there is uneaten food in the tank, and the fish are no longer feeding, the excess food should be removed either with a siphon or a fine net.

Because marbles protect eggs from predation but also collect and concentrate feces and uneaten food, it is wise to fast the fish while they are over marbles. This reduces production of feces and provides a healthier environment for eggs; therefore, the feeding information refers to times when the marbles are not in the tank.

Example of Feeding Schedule
<table>
<thead>
<tr>
<th>Time of Day</th>
<th>Food Choice</th>
</tr>
</thead>
<tbody>
<tr>
<td>A.M. or early in the light cycle</td>
<td>Baby brine shrimp or OSU brood pellet food or Tetra Minutes staple food</td>
</tr>
<tr>
<td>Late A.M.</td>
<td>Repeat of above choices.</td>
</tr>
<tr>
<td>Early P.M.</td>
<td>Repeat of above choices.</td>
</tr>
<tr>
<td>Late P.M.</td>
<td>Repeat of above choices or OSU yellow food or adult brine shrimp.</td>
</tr>
</tbody>
</table>