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Breeding of Molly Fish and Sexual Dimorphism of Young Ones in Early Stage of their Life Cycle

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ABSTRACT: The present work was done in the laboratory of the Forestry and Fisheries department to study the breeding of molly fish and distinguished sexes of young ones in the early stage of their life cycle. The study was started from the period of September 2021 to December 2021. The first mortality of 20 fry was recorded during this investigation in the tank since spawning occurs during the night hours and these fish consume their young once immediately after birth. Another experiment involved keeping two common (brooder) female molly fish in a bowl at room temperature. Both were pregnant at the same time, and one female died the day after they were separated. A total of 71 underdeveloped fry were found after dissection. The successful breeding of 2nd female brooder was observed and the total no of fry was 36. The male and female fish (young ones) was clearly observed on the 8th day after spawning. Later they were kept together with the other fry in a separate tank.

Keywords: Molly fish, Breeding, Dissection, Fry, Sexual Dimorphism etc.

INTRODUCTION

Ornamental fishes are tranquil, colorful fish kept as pets in confined setting such as an aquarium or a garden pool for the aim of admiring their beauty for fun and interest. Ornamental fishes are also called “live jewels” for their beautiful colors and playful behavior (Swati *et al.*, 2017). The ornamental fishes are classified into vast categories based on their spawning habit which includes oviparous fishes that lay eggs and a few are livebearers (Devraj, 1989).

Mollies are one of the important commercial freshwater ornamental fish. Mollies are viviparous. Some of the famous varieties of molly fishes are usually located in aquariums worldwide. The male can attain up to the size of 7-8cm and the female up to 9 cm. It favors water with an impartial pH toward barely alkaline (pH 7.5-8.2), and temperature in the range of 18-28°C (Riehl and Baensch, 1996). Although a number of the species of Black mollies have splashes of yellow and orange on the fins and belly region. Overall all the black mollies are all covered in black shadeation only. Black Molly (*Poecilia sphenops*) belongs to the family of Poeciliidae and is one of the pinnacle commercially vital freshwater ornamental fish species that can resist mass-cultured in captivity (Francis, 1992; George & Pandian 1995; Beck *et al.*, 2003). Black molly is an euryhaline fish (Beck *et al,* 2003) that stay certainly in a brackish water ecosystem (Johnson, 1981) and is native from Mexico to Central America. This precise fish is created through humans thru the cross-breeding, or hybridization, of the Common Molly and the Sail fin Molly. Male black molly has a tendency to be mildly competitive than the other mollies, Black Molly has a tendency to be a little sensitive in relation to changes in water. The black molly is a really tolerant species, which seems to be extremely prolific and adaptable. It can live in fresh as well as saltwater and is tolerant of salinities as high as 87 ppt (Sublette *et al.* 1990).

MATERIALS AND METHOD

Study the breeding technique of a molly fish: Mollies become reproductive at a very young age and do not require special breeding conditions instead a clean tank with warm water is the best habitat to them to reproduced (Divya, 2018). Molly is a live bearer species, which means they can directly give birth to young-ones. To breed any species of molly, the sex ratio should be of one pair or a ratio of 1 male and 3 female or 1 male and 1 female. Since they are live bearer species, they do not lay eggs instead give birth to

young free swimming fry (Siddiky and Mondal 2016). 8 pairs of molly fish were brought from the commercial fish shop (ornamental fish) and released in aquarium in September 2021. During the stocking time fishes were well acclimatized and all the water parameters such as pH, temperature, nitrate, phosphate, ammonia and alkalinity were within ideal range.

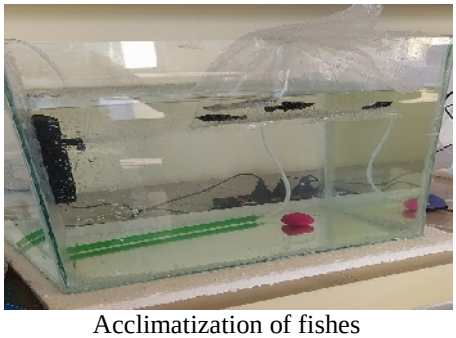
Once the male of both the species starts to mature their anal fins starts to develop a structure for reproduction called as Gonadopodium. The Gonadopodium can be moved in almost any direction and stores the sperm in packs called sperm metamorphosis. Once the sperm is inserted into the female fish and fertilizes its eggs and the rest is stored in the oviduct walls for later use (Siddiky and Mondal 2016).

In light colored species of molly, pregnancy can be recognized by growing dark colored body marking in front of their anal fin or also can identified from their enlarged abdomen. Their movement tends to become slow and they start hiding under the plants of an aquarium. The breeding cycle in mollies usually remains for approximately 3 to 6 weeks (20 to 40 days).

Young Live-bearers are fairly large at birth and their development is very advanced. Once the young live bearers are out from the female body, they tend to swim right away or else they can get eaten live by the parent female fish or the other fishes present in the tank. Hence the fry fishes are kept in a separated tank after birth. The fry can grow very rapidly and accept fine flake food. The number of fry a female fish can give birth to numbers of fry depending up the sizes of the fishes. A large pregnant fish can give birth up to 100 fry, whereas a small pregnant fish can give birth up 65-80 fry (Divya, 2018). Warm water will speed the metabolism of baby mollies, encouraging them to eat more, which in turn will speed up their growth. Livebearers fishes should be provided with plenty of floating flakes and some live food as well to supplement their diet and to give them larger and healthier fry. As always remove any uneaten food after 5 minutes (Siddiky and Mondal 2016).

Ideal Conditions: Dattasubhendu (2017). Aquarium water quality management.

Parameters	Freshwater
Ammonia	0.0
Nitrite	0.0
Nitrate	0.0
pH	6.5-8.5
Temperature	72-82^0 F
Phosphate	<0.5
Carbon dioxide	30(mg/l)



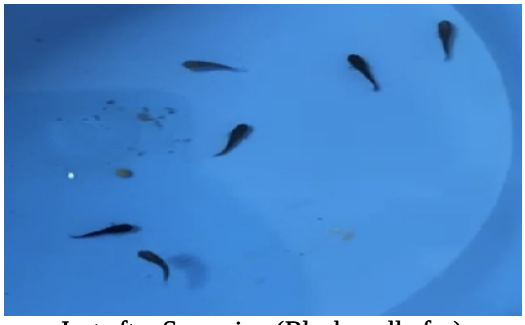
Acclimatization of fishes

Female molly with swollen abdomen

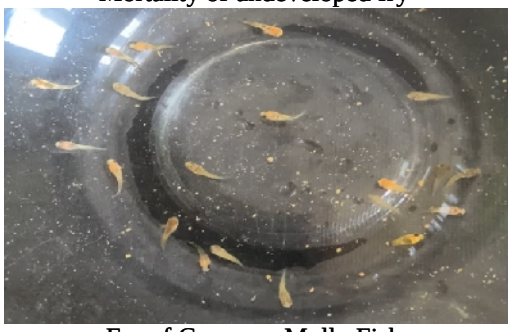
Spawning of Molly Fish

Mortality of Black and Common Molly Fish

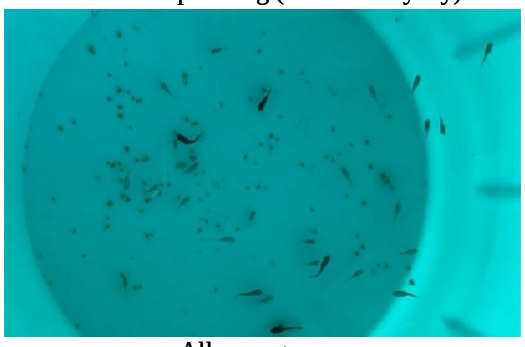
Mortality of undeveloped fry



Just after Spawning (Black molly fry)



Fry of Common Molly Fish



All young ones

Young ones with fully develop fins

RESULT AND DISCUSSION

An experiment on breeding of molly fish were conducted in a glass aquarium, where the ratio of the female and male taken was 2:1 (black molly fish) and 1:1 (common molly). A similar study was done by Siddiky and Mondal (2016) for 3 to 4 weeks in a glass aquarium and tanks to study on Breeding technique of goldfish (*Carassius auratus*), molly (*Poecilia sphenops*), guppy (*Poecilia reticulata*), (Sudha, 2012). Similar studies were done by Naik (2020) on three different species of molly, Black, White and Sailfin *Poecilia* species originating from Central and North-Eastern South America, required for the experiments were obtained from ornamental fish traders of Ratnagiri and Mumbai during the months from April 2016 to March 2017. Another experiment was conducted for 3 to 4 weeks in glass aquarium tanks to study the Breeding technique of molly (*Poecilia sphenops*) by Divya (2018). Molly starts breeding at the age of 4 months. The sex ratio was taken slightly differently in jars of three sets that are 1 female 2 male, 1 female, and 2 males and 2 females with one male.

Number of young ones. During the entire study period, a total of 36 fry were observed after the successful spawning. The size of the fry ranged between 7.0 mm to 1 cm in length. A similar observation also found by Moshayedi *et al.* (2015) in newly hatched fries was 9.83 ± 0.83 and 15.74 ± 0.34 mm in TL on 1 and 30 DAB, respectively. Black molly were spawn in night hrs so that the number of fry in black molly were less than the common molly fry because of predation. After the fry was found they were put in a separate tank with only a bubble diffuser, to allow them to breathe easily. Fry was provided with crushed feeds, so it is easy for them to intake in their mouth. Within 8-10 days, the identification of male and female fry was observed.

Development of fins. The molly fish larvae all developed fins are simply found during the study period. A similar study on guppy larvae was also seen with all observable fins such as other poeciliids (Wourms, 1981). The young fry swims freely just after

spawning and similar observation were found in other livebearers that at the moment of birth, each fry was fully capable of swimming, eating, and avoiding danger (Shikano & Fujio 1997; Shahjahan *et al.*, 2013).

It has been found that the anal fin in each of the sexes of molly becomes modified eight days from the spawning. The anal fin modifications in each sex of *P. reticulata* had been found on day-23, even as Shahjahan *et al.* (2013) stated those modifications on day-21. The anal fin inside the case of a female is small and rounded, even as inside the case of a male it is long and pointed. Day after birth, the pelvic fin is smaller than the pectoral fin, and the caudal fin has a rounded edge. The caudal fin has extra development and truly seems like a tail on the third day after spawning, even as Shahjahan *et al.* (2013) found it on day-7. Pelvic and anal fins have extra developments, which might be comparable with Shahjahan *et al.* (2013) observation, which showed that the anal fin in each sex continues to be comparable till day-15. The anal fin modifications in each sex of *P. reticulata* had been found on day- 23, even as Shahjahan *et al.* (2013) stated those modifications on day-21. One month after birth, the base of the caudal fin is darkish and the abdomen turns swollen in females, even as those traits had been reported on day-28 by Shahjahan *et al.* (2013).

CONCLUSION

Livebearer breeding is simple because they release fry immediately, but the fry may need to be raised in a separate environment to avoid cannibalism from their parents. Molly fish are juvenile fish that are born with a fully complete body, including mouth, jaw, eyes, fins, lateral line, and scales. They also swim freely and are capable of eating immediately after birth, according to the current study. Eight days after spawning, the male and female saxes are also clearly visible. Apart from the cultural aspect, the current study on molly fish breeding and sexual dimorphism in young ones is highly essential, and it will benefit the poorer sections of society as it will provide a future source of revenue.

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