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Post Natal (Maternal) Care in a Live Bearing Fish (Red Swordtail, *Xiphophorus helleri*; Cyprinodontiformes: Poeciliidae) --- A New Finding for an Ornamental Fish in Aquarium

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Abstract:

We report a peculiar and very uncommon behavior during fry delivery by female 'Red Swordtail' fish, *Xiphophorus helleri*, as observed in aquarium. It is a completely new finding; and we may suggest this behavior as 'post-natal (maternal type) parental care'.

Keywords: Red swordtail fish, Parental care, Post-natal care, Maternal care, *Xiphophorus helleri*

1. Introduction

Being one of the most popular and attractive ornamental poeciliid live-bearing species for aquarium keeping, *Xiphophorus hellerii* (Heckel, 1848), a native to Central America, has been bio-invaded to so many countries of the world (GISD). The red swordtail is an aquarium-bred variety from its original wild green color form (Green swordtail) which is a benthopelagic (Fishbase), euryhaline species. In India, it is very commonly and successfully bred and reared by the aquarists and farmers both in glass aquaria and in cement cisterns or in earthen container, because of their easy and prolific breeding habit. It is a common practice by the farmers to keep single gravid (or 'pregnant') female red swordtail fish in a separate aquarium where it delivers the young. Red swordtail shows 'aplacental viviparity' or 'ovoviviparity' where the hatchlings get nourishment from their own yolk-sac- 'lecithotrophy' (Wourms, 1981), after being hatched within mother's abdomen, where ultimate pre-natal maternal care of the fry is assured (Ghosh, 2009) till the moment of their birth. The live young, almost immediately after delivery, are free-swimming and capable to derive their nutrition exogenously (Ghosh, 2006). The present paper reveals a peculiar and new behavior of the mother fish during fry delivery in aquarium which is very uncommon in other poeciliid fishes.

2. Materials and Methods

Gravid red swordtail fishes of 2.5 inches to 3 inches (6.35 cm to 7.62 cm; total length) were selected (identified by bulging abdomen and dark colored gravid-spot at the vent) from the breeding cisterns and kept separately in all glass aquaria (24" X 12" X 12") for fry delivery. Females were fed well with *Tubifex* worms, mosquito larvae, *Daphnia* and good quality artificial dry food commercially available for aquarium purpose, before they were placed in 'fry-delivery tank'. Ambient water temperature was maintained around 30° C with the help of a thermostat. Alkaline water (pH 7.60) was used in all the aquaria. The fry delivery was carefully observed.

3. Observations in Aquarium

It has been observed time and again that the larger gravid females (about 3 inches/7.62 cm and above) show a peculiar behavior while releasing small fry from female genital tract. In the earlier phase of fry releasing, (up to 60-70 numbers, where 130-150 numbers or more of total fry were released at each term of pregnancy from a single female brood) the fry, immediately after coming out from mother's abdomen, appeared to show quite natural piscine feature being straightened, free-swimming and suitable for exogenous nutrition. But, in later phase of fry releasing, sometimes, the fry come out of their mother's abdomen appeared to be as if 'folded and intertwined instead' and not been even able to swim freely but are to be settled on to the bottom of the aquarium. At this time, it was observed that the 'mother fish' went to her 'new-born babies' and 'nib' at them with her lips, and the coiled fry became straight and

free swimming after mother's taking care of in this way. The numbers of newly emerged coiled fry varied between two to fifteen, as observed in different cases for several occasions.

4. Conclusion

The poeciliid live bearing fishes are in habit to exhibit good degree of pre-natal care (carrying the internal brood till the fry become free swimming, after delivery), meaning thereby taking care for their babies, and there is no report of post-natal care whatsoever at least in case of live bearing poeciliid ornamental fishes as yet. Rather, the females of guppies and mollies (other members of family Poeciliidae) are well known to be cannibal to their own siblings after releasing hatchlings, if they get opportunities. But in red swordtail, we observed no such instances of eating its own fry; rather mother invest her time and energy to their "handicapped (weak-offspring)" fry, even while at the time of releasing of the fry, which increase their chances of survival and also ensures reproductive fitness. Hence this maternal instinctive behaviour may be suggested as an example of 'post-natal parental care (female care)' exhibited by the red swordtail fish—the rare and exception amongst the live bearing poeciliid ornamental fishes, as observed in aquarium. It may, therefore, be envisaged that the parental cares in earlier vertebrates might have evolved as polyphyletic, but in instinctive manner under the genetic regulatory process, supported by some epigenetic factors definitely under a particular 'Selection pressure'. In course of latter evolutionary ladder, however, several altered selection forces developed and that in conjunction with interactive changed genetic and epigenetic factors might indulge various types of parental care to be evolved in 'Fishes' that went on to be fixed and refixed up to the 'Birds' and 'Mammals' through 'Amphibians' and 'Reptilians' stocks.

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