

**Research article**

First record on multiple spawning of pearl spot (*Etroplus suratensis*) reared in small FRP tanks

Selvaraj, S., Felix, S.* and Samuel Moses, T.L.S.

Fisheries College and Research Institute, Tamil Nadu Fisheries University, Ponneri – 601 204, Tamil Nadu, India

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ABSTRACT**ARTICLE INFO**

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Pearl spot, an Asian cichlid fish, endemic to Srilanka and India, are widely preferred as food and ornamental fish. However, commercial aquaculture of this native species is hampered due to sustainable seed production. In light of the above, the present study made an attempt to evaluate the possibility of recording multiple spawning in small FRP tank. Surprisingly, the tanks maintained in group exhibited multiple spawning. However, paired fish maintained separately did not spawn after first spawning. The results recorded in the present study indicate use of FRP tanks for multiple spawning in pearl spot.

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*** CORRESPONDENCE**

felix@tnfu.ac.in

INTRODUCTION

The pearl spot (*Etroplus suratensis*), belonging to the family cichlidae and an endemic cichlid species to Asia, are widely distributed in the India and Sri Lanka (Hora and Pillay, 1962; Ward and Wymann, 1977). Importantly, this fish forms commercial fishery in the brackishwater lakes of India (Bindu and Padmakumar, 2014; Prasad, 1971). This species also exhibit wide salinity tolerance and cultured in freshwater and brackishwater (Chandrasekar *et al.*, 2014). However, limited success has been achieved in the captive breeding for aquaculture, due to its complex reproductive behavior (Mathew Abraham, 2012; Padmakumar *et al.*, 2012).

Pearl spot exhibit different reproductive behaviour such as courtship, pairing and nesting, pit nursing and parental care (Padmakumar *et al.*, 2009). Our previous study demonstrated the use of small FRP tanks for stimulating natural spawning in pearl spot. To check the possibility of multiple spawning of pearl spot in small FRP, the present study was performed.

MATERIALS AND METHODS

Adult pearl spot collected from the boat station and nursery ground regions, surrounding the Pulicat lake area (latitude 13°24' and 13°43'N and longitude 80°03' and 80°18'E) were transferred and acclimatized in small FRP tanks (300 l). The altitude ranges from 100' mean sea level (MSL) to 1200' MSL. After acclimatization in the freshwater, 6 individuals were screened and maintained separately in individual tanks. These fishes were fed ad libitum with Marigold Cruble Feed (No.1) twice daily (crude protein, 36%). Water exchange (20-30%) was performed daily.

Our previous report indicated that mud pot acts as suitable substratum for egg attachment of pearl spot eggs, when installed in the small FRP tanks, with PVC pipe hide outs (30 cm length; 2 nos). Spawning was monitored externally.

RESULTS AND DISCUSSION

Experiment was performed in duplicate. In each tank, six individuals were stocked. To confirm whether same pair exhibit multiple spawning during the same spawning period, paired fish

were gently removed, and maintained in separate tank. The individual that were maintained separately did not exhibit subsequent spawning. Interestingly, tanks maintained with six individual exhibited repeated spawning during the spawning, with minor differences in the spawning interval. In one tank, spawning interval between first and second spawning was sixteen days and second and third, was 12 days. The other tank, first and second spawning was 27 days and second and third spawning was 8 days. Spawned eggs varied between 200 and 500. Water temperature, pH and dissolved oxygen during the experimental period varied between 28-32°C, 7.8-8.6 and 4-8.8 ml/l. The experimental fish that were used for the experiment are presented in Table 1. In the tank maintained with more number of individuals, chances of same male participating in mating process with different females cannot be ruled out. Further investigations required to confirm the physiological significance of this finding.

Several studies reported that a single female of pearl spot exhibit annual spawning (Ward and Samarakoon, 1981; Samarakoon, 1983; De Silva *et al.*, 1984; Bindu and Padmakumar, 2014). An attempt to induce gonadal development using synthetic hormones in pearl spot, resulted in acceleration of vitellogenesis, in comparison to control (Albin Dhas *et al.*, 2010). Further, trials using different synthetic hormones including recently found kisspeptin, neurokinin B, including the GnRH and LH based analogues will help to standardize the techniques for mass seed production of pearl spot under captive conditions.

Previous studies have reported natural spawning in traditional earthen ponds and raceway system, and cement tanks, with limited success in hormonal induction (Padmakumar *et al.*, 2009; Biswas *et al.*, 2014). However, the results of the present study in small FRP tanks is unique for undertaking scientific research to estimate the spawning frequency, spawning interval, age and growth of captive maintained pearl spot. The present study is the first to record multiple spawning of group of pearl spot, maintained in freshwater.

Table 1: Total length and body weight of experimental fish used in the study

Single spawning*		Multiple spawning	
Total length (cm)	Body weight (g)	Total length (cm)	Body weight (g)
<i>Replicate 1</i>		<i>Replicate 1</i>	
17.2	120.8	19.2	158.7
14.8	72.1	17.8	129.2
<i>Replicate 2</i>		<i>Replicate 2</i>	
16.2	116.1	15.6	93.4
14.7	72.1	15.6	93.1
		15.2	94.5
		14.7	72.8
		<i>Replicate 2</i>	
		18.2	129.8
		16.4	118.6
		15.8	105.2
		15.5	82.5
		15.3	82.0
		14.7	81.7

*Single spawning refers to the paired fish that exhibited single spawning, when maintained in group of fishes (3 pairs) and were maintained separately, for monitoring of subsequent spawning.

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