

Mud crab *Scylla tranquebarica* culture in earthen pond at Tuticorin

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Abstract

The mud crab, *Scylla tranquebarica* was cultured in an earthen pond of 0.125 ha in the Karapad hatchery of Tuticorin Centre of CMFRI. They were fed on chicken waste and trash fish and harvested after 273 days of culture. Sampling of crabs was carried out every month by noting their carapace width and weight. The results show an increase in average weight from 133g at stocking to 428.5g after 275 days, with a survival of 23.8%. Low survival was mainly due to poaching as well as cannibalism. The hydrographical parameters during the period was monitored.

Crabs have emerged as an important seafood commodity for export in recent times. Mud crabs (*Scylla spp.*) are much in demand as a quality food, due to their size, meat content and delicate taste (Rattanachote and Dangwatanakul 1992), and hence command high prices in domestic and international markets

Mud crab farming is carried out either in monoculture or polyculture system throughout Asia. In India, the failure in shrimp farming and the high demand in export market for live crabs have prompted many farmers to take up crab farming. Experimental culture (Srinivasagam and Kathirvel, 1992) of mud crabs was taken up at both laboratory and field levels to assess growth, survival and productivity. As technology for commercial crab seed production is yet to be perfected, farmers depend on seed caught from wild. However, excessive dependence on wild juveniles for crab farming is undesirable as it may threaten the natural stock over a period.

Generally, two types of culture are practised: rearing of juvenile crab for a period of 4-5 months in earthen ponds with fencing and fattening of "water crabs" or newly moulted crabs in suitable ponds, pens and cages for 3-4 weeks. Mud crabs, *Scylla tranquebarica* were cultured, on an experimental basis, in an earthen pond, in Karapad hatchery of the Tuticorin Research Centre of Central Marine Fisheries Research Institute.

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Material and methods

Five hundred numbers of *S.tranquebarica*, were stocked in an earthen pond of 0.125 ha, in which considerable tidal effect prevailed. These crabs were collected in

three batches from Taruvaikulam landing centre. At the time of stocking, the carapace width of the males ranged from 75-117mm and females from 75-120mm. The total average weight was 133g. The crabs were stocked at the rate of 8/m², at 54.6 : 45.4 ratio of male to female. Chicken waste was fed for four days a week, trash fish twice a week and both once per day at the rate of 5% of body weight of crabs. The feed was placed on the side of the pond and crabs were found to come out and take away the feed. They were fed during morning hours around a fixed time. Depth of water in the pond was 1m. The pond was fenced with palmyrah rachis on top of the earthen bund, to prevent the escape of crabs. Natural shelters in the form of soil mounds with mangroves were provided which remained submerged during high tide and got exposed during low tide. Few stoneware pipes were also provided inside the pond as shelters for crabs, especially during molting. According to the tidal changes, water was exchanged daily through the sluice gate and the sluice screen was cleaned every alternate day for easy exchange of water. Water quality parameters, mainly temperature (water and atmosphere), salinity, pH, dissolved oxygen and turbidity were recorded, once a week. Sampling was conducted every month, using lift nets provided with baits, mainly fish entrails and chicken waste. Growth was determined by noting the carapace width (CW) and weight (Wt) of crabs.

Results

The crabs were harvested, after a culture period of 273 days. During high tide, the crabs, which gathered near the sluice gate were caught with scoop net and the rest handpicked after draining the pond water at low tide, using a 5Hp pump. At the end of the culture period, the carapace width of males ranged from 110-136mm, overall growth increment being 40mm. In females, the carapace width ranged from 110-145mm with an overall increase of 60mm (Fig.1). Percent survival was 23.8%. The average weight increased from 133g at the time of stocking to 428g at harvest. The overall growth rate in terms of weight was 1.089 g/day. In males at harvest, the carapace width showed a growth rate of 0.146 mm/day and in females, 0.219 mm/day.

Temperature during the period ranged from 27-34°C, salinity from 19-47ppt, pH 7.7-8.5, dissolved oxygen 3.8-10.7 ml/l and turbidity 3-10.7 (Fig.2).

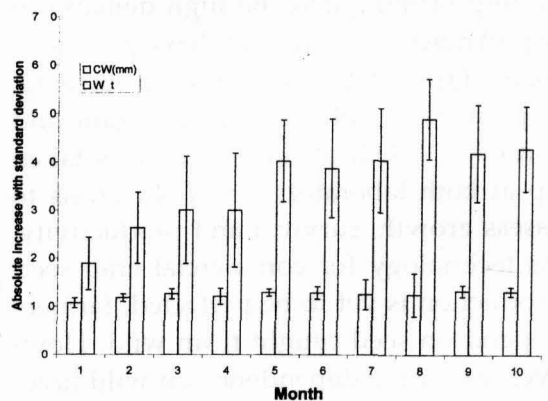


Fig.1. Growth in terms of CW (mm) & Wt (g)

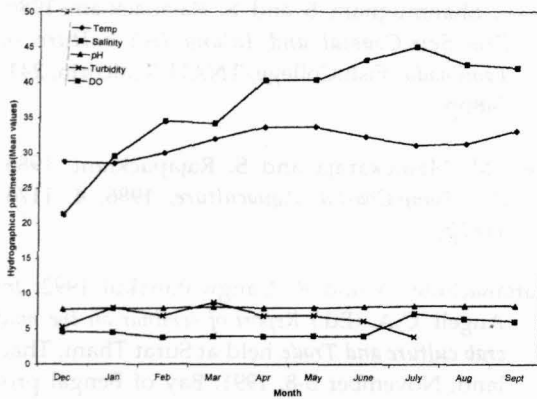


Fig. 2. Hydrographical parameters during the culture period.

Discussion

Several workers have attempted experimental culture of crabs, both in India and abroad. *S. serrata* at an average stocking size of 30g attained 278 g at harvest (Anon, 1980). In the present study, the weight of the crabs increased from 133 g at stocking to 428 g at harvest, when grown for 273 days, in a 0.12 ha pond. After a culture period of 238 days, the crabs weighed on an average 498 g, with an average daily increment of 1.53 g. After this, the average growth rate/day declined to 1.089 g at harvest. Kathirvel (1980), reared *S. serrata* in aquarium tanks (0.6x0.3x0.3m) feeding clam meat for 80days, obtaining an average monthly growth of 3g.

In terms of carapace width the overall growth in the present study was 5.49mm/month, which is comparatively less. Marichamy (1980) reported a growth of 7.13mm/month in 8-10 months. Culture of *S. serrata* in basket type cages, showed a maximum growth of 11.6-13.3mm/month (Marichamy *et al.*, 1980).

In Philippines, mud crabs 5-10g, stocked at 0.5-1.5/m², with seaweed *Gracillaria* sp as shelter attained 330-440g in four months. Experiment carried out in a private farm, in Sri Lanka for 115 days fed on trash fish and shrimp head meal, showed an average weight gain of 200-300g (Samarasinghe and Fernando, 1991).

In the present study, during April-May, drastic increase in salinity was noticed. This may be a reason for the decrease in growth rate during this period. But according to Marichamy *et al* (1986), high salinity has never been a hindrance for the survival and growth of mud crabs in the coastal ponds developed at Tuticorin. Another possible reason for the decrease of growth rate after 238 days of culture may be attributed to poaching, which was observed on few occasions. This might have led to the removal of larger sized crabs, resulting in reduced weight at harvest.

The production rates in culture systems should be optimized by further culture trials, at different stocking rates. Genodepa (1999) stocked *S. serrata* in two stocking densities, 2.5 and 5 crabs/m² and on two feeding rates, 0 (no feeding) and 3% body weight. The best result was obtained at a stocking rate of 5/m². The average body weight at the end of 147 days was 275-300g. Romeo (1999) designed four treatments, 1) 5/m² with no shelter, 2) 5/m² with shelter, 3) 1/m² no shelter, 4) 1/m² with shelter. The average weight of the mud crab in treatments 1,2,3, & 4 were 144.5, 110.3, 122.9 and 105.5g respectively.

The crab seed for farming are obtained

from the wild, but their availability is limited. It is, therefore, necessary to develop and refine breeding, hatchery and grow-out technologies for *Scylla* spp. in order to exploit the potential and as well to develop export oriented industry without any adverse environmental impact. The improvement of culture techniques would boost production, as mud crab culture in many countries has not yet really been developed. Mud crab farming can also be developed as an alternative employment option for fishing communities.

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