

Abstract

The suitability of cage erection and hide-outs on the growth, survival and production of *Penaeus indicus* were studied for 100 days in Vellar estuary. Among four uniform rectangular cages (10×4×1 m) erected, two cages were placed on the bottom soil substrate and other two cages were placed 30 cm above the bottom soil substrate. Of the two cages erected on the soil substrate, only one cage was provided with hide-outs. Similarly, among the two cages erected 30 cm above the bottom soil substrate, only one cage was provided with hide-outs. At the end of the study, the higher growth of 14.7 g, survival rate of 75% and total production rate of 200 g/m² were observed in the cage erected on the bottom soil substrate with hideouts. In other two cages, the growth, survival rate and total production rate were 10.5 g, 60% and 120 g/m² respectively. From the present investigation it is concluded that the cage erected on the bottom soil substrate with hideouts is suitable for the successful culture of *P.indicus*.

Keywords: *Penaeus indicus*; Vellar estuary; High-density polyethylene; Styroform boxes; Hideouts

Introduction

Erection of cage for culturing of shrimps plays a key role in higher production. It may vary depending upon species, water current, water depth and natural calamities. Sampath and Menon [1] Krishnan et al. [2] and Shanmugam et al. [3-5] erected the cages above 30 cm from the bottom sediments for the culture of shrimps. However Beveridge [6] reported that the cage erected on the soil substrate in the shallow regions enhance the shrimp production. Similarly, providing of hide-outs inside the cages also plays a vital role for the shrimp culture in cages. Rajyalakshmi et al. [7] Bensam [8], Srikrishnadhas and Sundararaj [9] and Shanmugam et al. [5] suggested providing hideouts inside the cages for the higher production of shrimps. On contrary, Krishnan et al., [2], Uma Maheswari [10] and Venkatasamy [11] did not use hide-outs. Hence in the present study, it is attempted to find out the suitable type of cage erection and hide-outs to maximize the yield of the shrimp, *P. indicus*.

Material and Methods

The present study was carried out in the Vellar estuary just opposite to the Marine Biological station at Parangipettai, the width of the estuary is 100 m close to the mouth and the maximum is about 200 m opposite to the centre. The average depth is 2 m whereas the maximum depth is 5 m at the time of high tide.

The benthic life in Vellar estuary is very rich, because of the varied substrate available here. Apart from these the Vellar estuary is rich in seaweeds also and thus acts as a very good nursery ground for many shell and fishes. Hence this estuary forms an ideal environment for practicing cages culture.

Cage erection

The following materials were used for the cage erection:

1. Four rectangular (10×4×1 m) high-density polyethylene (HDPE) knotless webbed cages of 16 p mesh type.
2. Casuarinas poles of 3.5 m long and 10 cm diameter were used for supporting the cage and hold it in its position.
3. Foot and head rope of 5-7 mm thickness high-density polyethylene to the cage with the casuarinas poles.

placed with the HDPE ropes of 1 mm thickness leaving small portions in the corners to keep the feeding plates inside the cage.

Seed transportation

The seed purchased from hatchery was transported to culture site in Vellar estuary by oxygenated polythene bag and were kept in styroform boxes. Before transportation, the qualities of seeds were examined by taking the seeds in a plastic container to ensure uniform size and good

health. Postlarvae of penaeid shrimps are small, fragile and are sensitive
***Corresponding author:** Sivanandavel P, Department of biotechnology, Jeppiaar Engineering College, Old Mammallapuram Road, Chennai-600 119, E-mail: sounsuma@yahoo.com

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The survival rate of cage erected on bottom without and cage erected above bottom with hideouts were 72% and 56% respectively. It is obvious that, cage erected on bottom showed good survival rate than the cage erected above bottom. Of the cages erected on bottom, the cage with hideout showed high survival rate (78.5%) over the cage without hideouts (72%). Similarly, in the cages erected above bottom also, the cage with hideouts showed high survival rate (56%) than the cage without hideouts (41.5%) (Table 1).

Environmental Parameters

Discussion

Beveridge [6] pointed out that, shrimps are a group of animals, which are difficult to culture at high densities since they fight and exhibit cannibalistic behaviour. However, if the bottom of the cage is buried in mud, then shrimps can be successfully reared even in small units. The poor growth rate of the shrimps reared in cages above the soil substrate may attribute to the cannibalistic behaviour of the shrimps as stated above.

Abdul Aziz and Emmanuel [12] found that *P. monodon* reared with sand substrate grew 75.75% faster than those reared without sand substrate. Similarly Liao and Chao [13] also confirmed that the substrate is an essential component in the culture system of *P. monodon*. *M. affinis* also grew 11-22% faster in aquaria with sediment than in
