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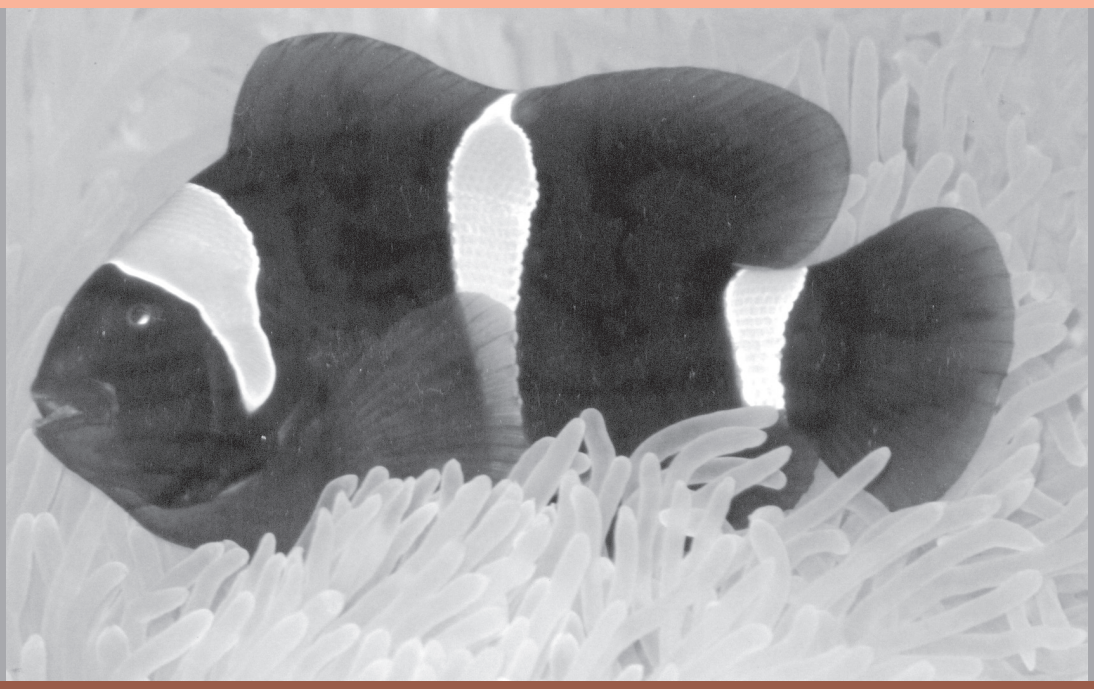

TECHNICAL AND EXTENSION SERIES

CENTRAL MARINE FISHERIES RESEARCH INSTITUTE

COCHIN, INDIA

(INDIAN COUNCIL OF AGRICULTURAL RESEARCH)

1200 Surival of remote set seed of the clam *Paphia malabarica* : Effect of continued submergence and short term exposures to salinity variations

Clams belonging to family Veneridae are commercially harvested from several estuaries and coastal areas. *Paphia malabarica* commonly known as the yellow foot clam or textile clam is an important resource and supports a commercial fishery in their places of occurrence. The natural habitat of this clam is the marine zone of estuaries where the subtrate is clayey-sandy. These semi-hard textures of the subtrates facilitate easy burrowing compared to very hard rock substrates. Usually these clams

burrow with their strong foot and the two shiphons will be at the surface. Because of this particular habit they are found in high densities. Another adaptive feature of these clams is their movement. Though sedentary they can move by pressing the foot and turning the shell.

Clams are exposed to wide varations in salinity in their natural habitat in a tropical estuary especially during short spells of intense rain. Sometimes the almost freshwater condition in the estuary may last for 10 to 15 days, followed by a long period of high saline condition. One of the major issue therefore is the tolerance of the seed clams to such salinity fluctuations.

Globally clam mariculture is a very popular aquaculture activity. The seed for farming to a great extent comes from the natural bed but in many countries the hatchery produced clam seed is farmed. Most farmers also have adopted the convenient technique of remote setting the seed. Remote setting is the technique of setting the pediveliger larvae produced in hatcheries at sites away from the hatchery usually near the farm site. The method of transporting the larvae is unique - they are sieved and packed in moist cloth and placed in containers which can retain the larvae in cool condition. After reaching the farm site the larvae are released into tanks and provided with mixed algal diet and reared. After a short nursery phase, the seed clams are reared in trays or planted in the ground to be harvested later.

In the present experiment pediveliger larvae of *P. malabarica* produced in the hatchery of CMFRI at Tuticorin were remote set at the Calicut Marine hatchery complex after a transit period of 26 hrs. They were reared in the hatchery and before transferring these clams to the field two sets of experiments mainly to i) evaluate the effect of continued exposure to different salinities ranging from 0 to 35 ppt and ii) evaluate 10,15,20, and 25 ppt and subsequent revival in ambient salinity of 35 ppt were conducted to understand their tolerance to variations in salinity.

Seed clams which were set in the hatchery with a dorso-ventral measurement (DVM) ranging from 6.5 to 10 mm and total weight of 0.78 mg were exposed to salinities of 0,5,10,15,20,25, 30,35 ppt. Their behaviour and mortality was studied in each of these exposures. The experiment was conducted for a period of 28 days. The stocking density was @ 10 clams L^{-1}. All the clams were exposed to uniform variation in temperature which ranged between 22 and 28^0C. The baby clams were fed with *Isochrysis* @

5.0 x10^5 cells day^{-1} and the feed was provided in two instalments. Water was exchanged on alternate days. Replicates of all the treatments were maintained as per the experimental procedure.

Seed clams in 0,5, and 10 ppt had 100% mortality in 8 days. In 15ppt, 100% mortality occured in 10 days. In 20 and 25 ppt the seed clams suffered 33 and 16% mortality respectively in 10 days (Fig.1). In higher salinities there was no mortality in 30 and 35

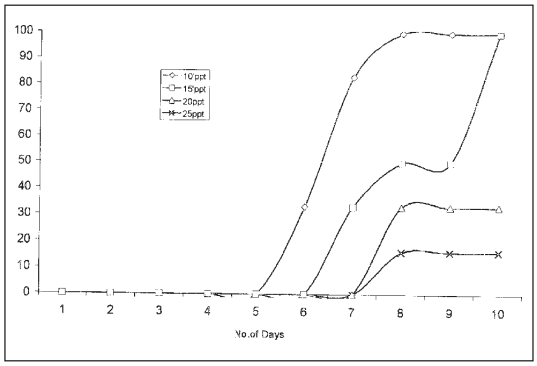

Fig. 1. Mortality percentage of seed clams when reared in varied salinities continously for 10 days

ppt salinity for a month. Throughout of the experimental period when the clams were alive in 0,5,10 and 15ppt the clams were inactive and did not expose the siphon and accept the feed. In all other salinities (20-35 ppt) the clams were active and showed good filtration. Tolerance was low in smaller clams of 6-7 mm than bigger clams of 9-10 mm.

Effect of short term immersion ranging upto 3 days to low salinity conditions such as 10,15,20 and 25 ppt and subsequent revival in ambient salinity of 35ppt.

Seed clams of DVM 7.49 to 8.43 and weight 0.016 to 0.103 g were exposed to 10,15,20 and 25ppt for 3 days and then replaced to ambient salinity of 35 ppt. The stocking density and the feeding schedule were the same as that of first experiment. The behaviour of the clams and mortality were recorded daily.

It was observed that within 2 days there was no mortality, but by 3 days, 2.5% mortality was observed in 10 ppt. Mortality increased to 10% in 4 days and 12.5% in 5 days and without further mortality. In 15 ppt, in 4 days 2.5% mortality was recorded and there was no further mortality. The clams exposed to 20 and 25 ppt did not show any mortality throughout the experimental period (Fig. 2).

The first experiment showed that clam farming / ranching using seed of *Paphia malabarica* of 6-10 mm can be done only at sites where the salinity>25ppt. If low saline condition prevails, the seed must be removed within 10 days. The seed clams can tolerate exposure to low saline conditions upto 48 hrs at different percent survivals. Such exposure will result in 12.5% mortality in 10 ppt and 2.5%

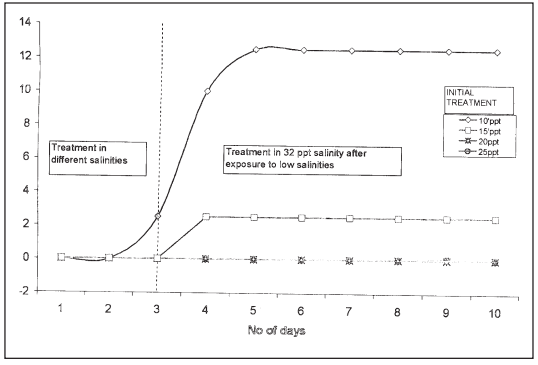

Fig. 2. Percentage mortality of seed clams during exposure to different salinities for 3 days and during subsequent revival in 32 ppt

mortality in 15 ppt 48 hrs exposures to 20 and 25 ppt will not effect the survival of the clams. Remote set clam seed were healthy during the post set phase.

Remarks

The study indicated that remote set seed clams can be transplanted for farming during a period when the salinity variations are not high. Evenwhen low saline conditions like 10 to 20 ppt persist in the field for three days there will not be substantial loss, but continued submergence in low saline conditions for more than 3 days is detrimental to the clams. Hence clam husbandry should be planned to avoid such crop losses.

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