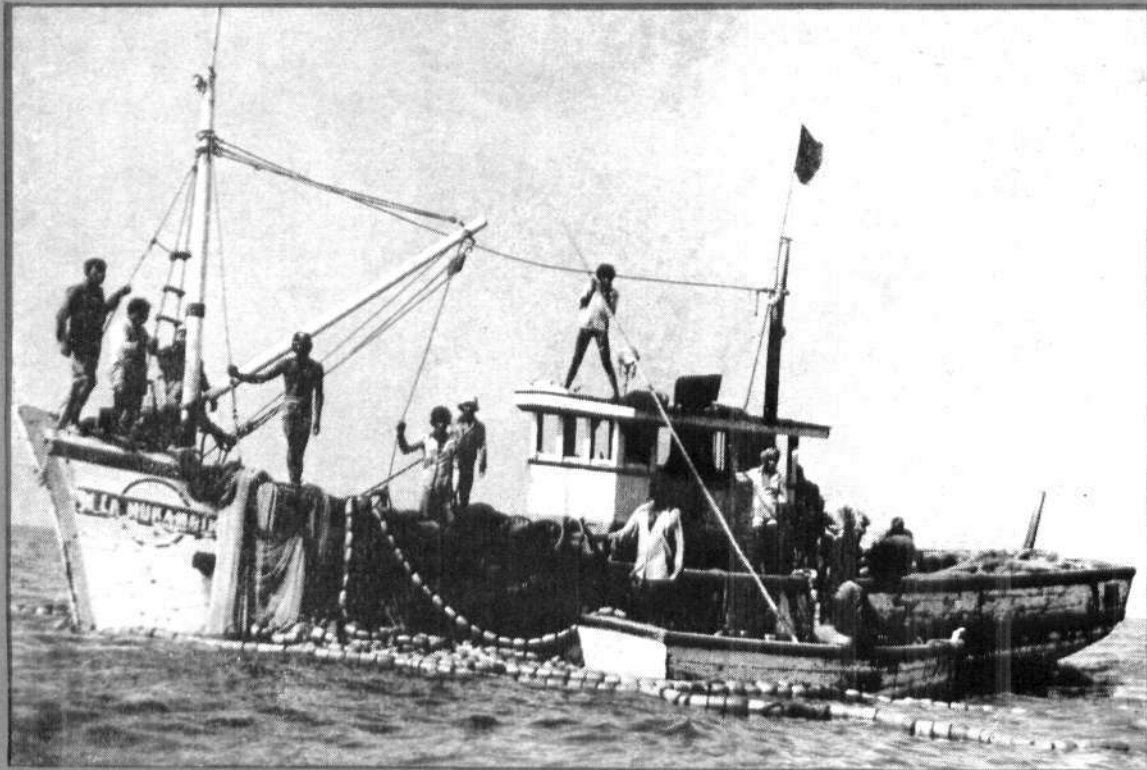




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EXPERIMENTAL MOLLUSCAN SEED TRANSPORT*

Introduction

A priority area of attention under the R & D efforts of the Institute is the mass production of seed of cultivable marine fish and shellfishes and to make available the required quantity to the farmers and for 'ranching'. Investigations carried out during 1980-'86 in the shellfish hatchery at Tuticorin enabled mass production of the spat of pearl oyster (*Pinctada fucata*) and edible oyster (*Crassostrea madrasensis*) and also the standardization of technique for such mass production. Trials were conducted during 1985-'87 to evolve safe methods of seed transport, avoiding mortality in transit. The present communication outlines some of the procedures found effective in handling the seeds before, during and after subjecting them to long distant transport by road, sea or air.

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I. Transportation of seed of pearl oysters

The pearl oyster spat are known to be highly susceptible to oxygen deficiency, and variations in temperature and salinity in the sea water. While planning the experimental transport, the following criteria were adopted.

- a) Selection of the spat of the same batch
- b) Conditioning of spat for 24 hrs in filtered sea water before packing
- c) Ensuring constant sea water drip or bathing to keep the spat free from adverse effects arising out of variation in water temperature
- d) Relieving stress that may result due to oxygen deficiency by adequate oxygenation
- e) Refreshing the spat with fresh sea water in one or two stages during transport and on reaching the destination and
- f) Devising easy methods of packing the spat.

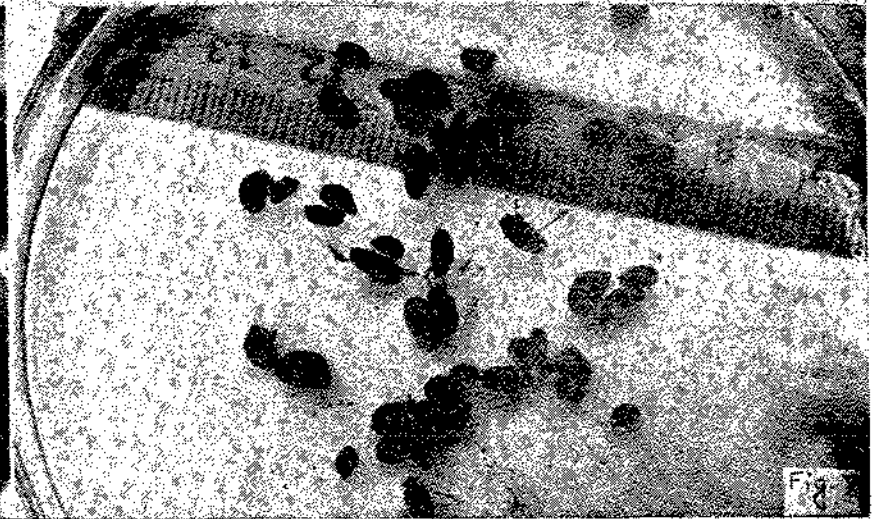
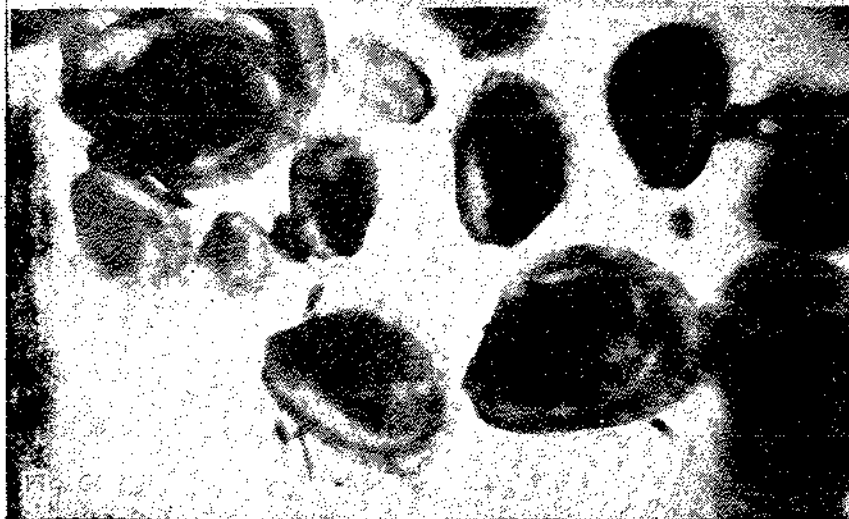
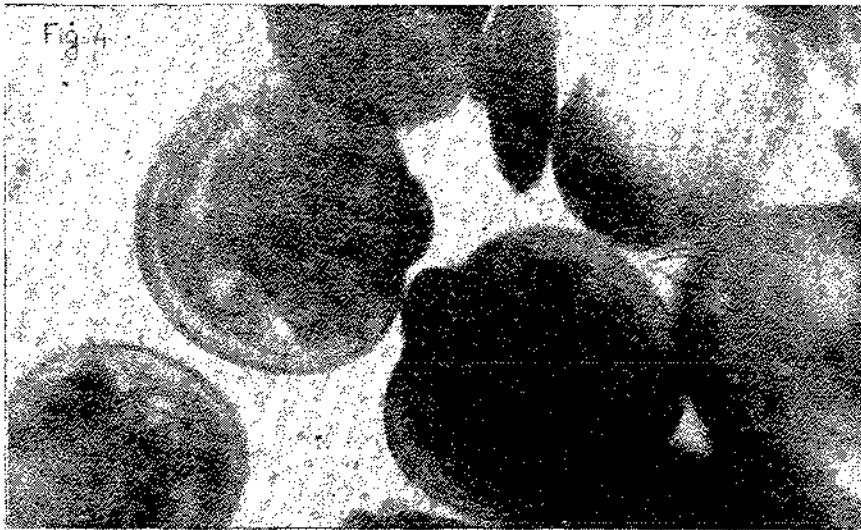


Fig. 4. Umbo stage larva.

Fig. 5. 27 days old spat.

Fig. 6. 33 days old spat.

Fig. 7. 45 days old spat.

Transport by sea

In December, 1985, 50,000 spat of the size 8.3 mm (35,000) and 24 mm (15,000) were taken by sea to the oyster farm at Krusadai, managed by Tamil Nadu Pearls Ltd. The distance covered was 80 nautical miles in 9 hrs.

The spat were uniformly spread in closely knit nylon meshed cages. The cages were arranged under shade on the deck of a mechanised boat. Care was taken to keep the spat always wet by sea water shower during the journey. The entire consignment reached the destination without any mortality. Subsequent monitoring of the survival and growth in the farm at Krusadai showed normal behaviour.

Transport by road and sea

In October 1986, 10,000 spat of size 3.7 mm (2,500) and 13.7 mm (7,500) were sent to Agatti in Lakshadweep. The distance covered was 400 km by road and 250 nautical miles by sea.

The spat were packed in leak-proof polythene bags, each bag containing 750 spat in 3,000 ml of filtered sea water. The bags were filled with oxygen and mouth tightly sealed. The bags were encased in tin containers. After 12 hrs of road journey, the spat were transferred into plastic basins with fresh sea water and aerated adequately. The basins with spat were transported by

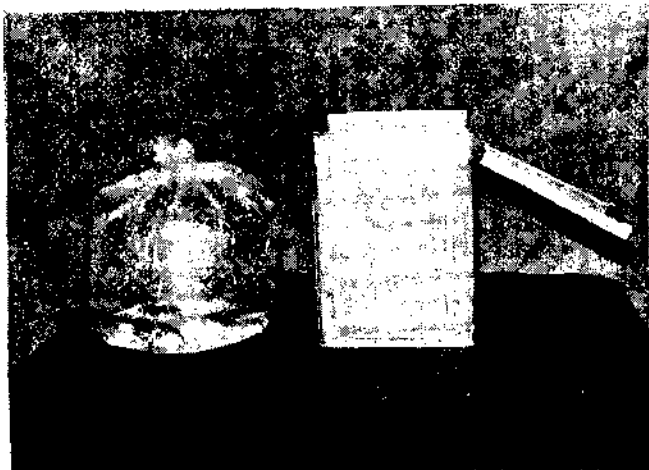


Fig. 1. Pearl oyster seed for road transport - in oxygen-filled polythene bag.

sea from Cochin. The basins were kept in shade maintaining constant change of sea water. There was no report of spat mortality during this attempt.

Transport by road and air

In May, 1987, 5,800 spat of size 10 mm (5,500) and 23 mm (300) were sent to Sikka in Gujarat. The first leg of the transport was by road upto Trivandrum covering a distance of 180 km and from there to Jamnagar *via* Bombay by air involving a distance of about 1,700 km. The total time involved in the transport was 33 hrs.

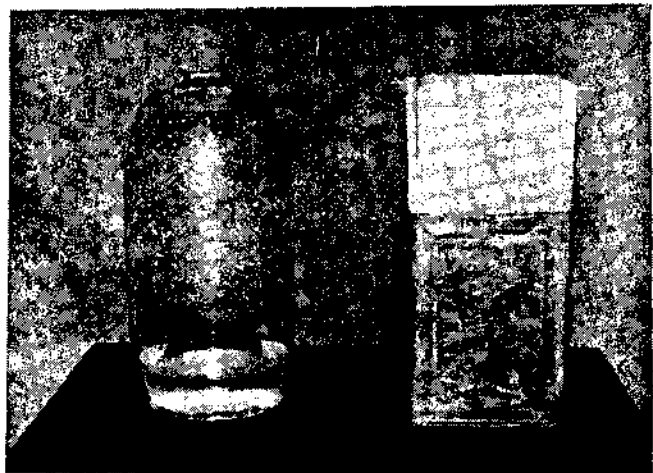


Fig. 2. Pearl oyster seed for air transport - in oxygen-filled heavy-duty fish transport bag.

The spat were transported by road in wet condition. At Trivandrum, they were kept in basins containing fresh sea water and aerated overnight. Heavy-duty polythene fish seed transport bags were used to carry the spat by air. Five hundred spat were put in each bag containing 4,000 ml of filtered sea water. Oxygen was filled to capacity and mouth tightly closed. The bags were wrapped with wet cotton wool and lowered into retrievable polythene bags. These bags were put in tin containers with sides lined with thermocol. Each tin had a lid also. These extra measures were taken because the transport of the spat was done during the peak summer month when atmospheric temperature had exceeded 36°C and water temperature 33°C. A mortality of 14.5% was reported at the end of the transport of spat at Sikka.

II. Transportation of seed of edible oysters

Lot of useful information are available on the transportation of seed of edible oysters from countries

like Japan and United States. These seed are known to be more hardy and if subjected to 'hardening' prior to transport, they are known to survive the transit period very well. Hence, while planning the transport of edible oyster seed from Tuticorin the above fact was given due importance. Where the process of hardening was not adhered to, the percentage of mortality of spat after reaching destination was found to be fairly high. Wet packing of the seed was found to be economical as well as efficient while transporting. Packed in this way the oyster seeds were kept alive even upto 90 hrs. The following experiments were conducted during 1981-'87 to find out the satisfactory transport method.

Transport by road

250 oyster seed of size 30-40 mm were sent to Madras by road. Hardening was done for 10 days prior to transportation. The seeds were wrapped in gunny sheet soaked in sea water and put in a box type cage 40 x 40 x 10 cm size with nylon meshes. After

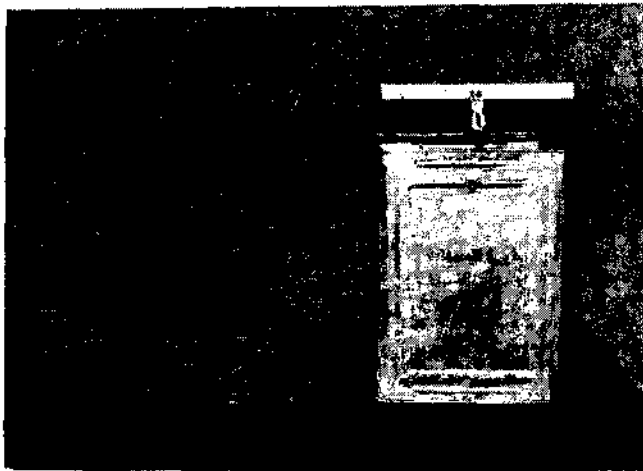


Fig. 3. Hardened edible oyster seed wrapped in wet gunny sheet ready for transportation.

17 hrs of road journey covering a distance of 650 km, the consignment reached Madras, and the percentage of mortality of the seed was 0.4 only.

In another experiment 2,000 spat of size 15-20 mm were transported to Narakkal by road, covering a distance of 470 km in 15 hrs following identical procedure. No mortality was observed during transportation.

Transport by road and air

In 1987, 5,800 spat of size 10-20 mm were sent to Sikka in Gujarat State, involving road transport initially for a period of 6 hrs from Tuticorin to Trivandrum followed by air lift to Jamnagar *via* Bombay, involving a duration of 33 hrs.

The oyster seed wrapped by gunny sheet soaked in sea water were kept in tin containers (9 nos). This was to facilitate easy handling of the consignment at the time of loading in the plane. At the end of the road transport period, the seed were emptied into plastic basins containing fresh sea water prior to repacking them as before. This process was followed so that it would enable the seed to remain fresh during the aerial transport period.. Very little mortality occurred during the transit.

Acknowledgements

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