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Project Profile for Pearl Culture

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Brief Outline of Pearl Culture Industry

Pearl culture has been developed in Japan as a major industry giving large revenue to the country during the past 80 years right from the time of Mikimoto, by artificially stimulating pearl oysters through introducing a foreign body as nucleus into the gonad of the oysters. Since then much improvements have been made in the farming of pearl oysters and pearl culture in Japan, and subsequently Malaysia, Thailand, Philippines, Hongkong, Australia, Burma and Korea have ventured into this field for large scale pearl production. A detailed review of the position in India has been presented by Alagarwami & Qasim (1973). Subsequently much improvements are made in pearl culture and it is a fact that pearl culture can be taken up on a large scale in the coastal regions of Panama, Venezuela, Ethiopia, Saudi Arabia, Libya, Tanzania, Maldives, Andaman & Nicobar Islands, Burma, South-East Asian countries, the West Indies and many of the Pacific Islands in the tropical belt since these areas are already having pearl oyster resources.

PRINCIPLES OF PEARL CULTURE

Pearl oysters are a group of two-shelled animals having a bright and shiny inside layer of shell which is

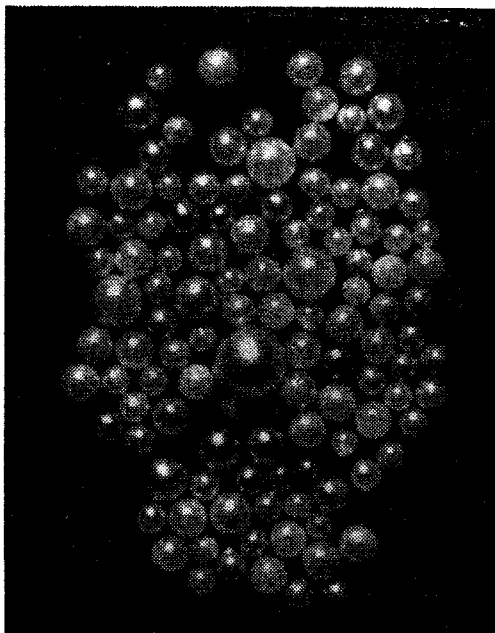
closely associated with the fleshy part called mantle and this shiny layer is called 'mother of pearl'. These animals live in marine conditions and they feed on tiny microscopic particles by filtering them from the surrounding sea water and are known to occur in the tropical and subtropical belt in submerged reefs shallow seas and in some cases on intertidal flats.

Methods have been developed for concentrating these animals in localised areas leading to the establishment of a culture farm by providing suitable collectors to attract the settlement of spat by applying principles of the behaviour of benthic animal community (Achary 1969 & 1960 b) and also by using breeding hapas (Achary 1960 a). These structures are suspended from floating rafts anchored in the sea and the oysters collected are protected in economically designed cages suspended from these rafts. It has been observed that the pearl oyster has three peak breeding seasons in a year at Vizhinjam and this condition might exist around the tropical belt depending upon the monsoon conditions and water move-

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ments. The tiny oysters or the young spat take on an average, nine months to grow to a size suitable for operation.

The grown up oysters are brought to the laboratory and after giving proper anaesthesia they are clamped on specially designed stand. Using specially designed instruments a foreign spherical body which is called 'nucleus' and a graft tissue are implanted inside the gonad of the oyster. Depending upon the size and quality of the oyster as



Pearl Developed at Vizhinjam

many number of nucleus as possible can be implanted into one oyster. In tropical conditions it takes 25 to 30 days to develop a pearl sac around the nucleus and pearls can be extracted after six months to nine months duration of farming them in the sea, depending on the size of the nucleus introduced. Once in a month these oysters are to be cleaned by bringing them to the laboratory for removing silt and other fouling organisms. If a nine

month old oyster is used for the first implantation and extraction of pearls it is possible to extract pearls even three times from a single oyster during its life span. The work for collection, culturing, breeding and multiplication and marketing should be streamlined on the lines of an industrial flow-system. Based on the technology developed at Vizhinjam, the author was deputed to the Government of Kerala from CMFRI during 1976-79 for organising a pilot project for pearl culture at Vizhinjam, Trivandrum and the author is thankful to the Govt. of Kerala for the encouragements.

INFRASTRUCTURE FACILITIES REQUIRED

This could be divided into two parts; one for farming and developing oyster stock as well as farming of nucleated oysters in the sea and the other for laboratory facilities for rearing and nucleus implantation of oysters as well as the management/administration of the establishment. It is to be noted that in any area where a new pearl farm is to be developed, if the available natural stock of oysters are in a sizable quantity of about one lakh numbers, it is possible that even during the first year itself pearls could be developed and marketed simultaneously, provided the laboratory facilities and the farm conditions are established within two or three months from the date of starting the programme, and sufficient number of trained personnel are available from the beginning itself. Subsequent development of stock also could be made by proper monitoring of the farm conditions. A shallow protected bay of full marine conditions without silting and pollution and having an

average depth of 10 to 15 metres will be quite ideal for pearl farming even though areas with lesser depth also could be used. There are chances of lowering the salinity conditions inside bays during monsoon times if any rivers are discharging into such bays and it is desirable that the salinity is above 25 p.p.m.

a. Farm equipments required:

Floating rafts, HDP ropes of various thickness, cages, spat-collectors, breeding hapas, anchors, anchor chains, motor boat etc.

b. Laboratory and establishment facilities:

Laboratory with running sea water facilities, fibre glass tanks for conditioning and stocking of oysters, surgical instruments, nucleus of diameters 2 mm to 6 mm size, necessary chemicals and other minimum laboratory requirements.

If sufficient stock of pearl oysters can be made available from the natural sea beds, the project can start functioning from the production phase during the first year of the project itself. The profile presented here can be applied for pearl culture projects on pilot scale as well as on commercial scale, by changing the magnitude of inputs.

REFERENCES

- Achari G. P. K. 1969.
Sabbellariids as associates of other invertebrates and their role in the formation of benthic animals communities, *J. Nmar. biol. ass. India* 11 (1 & 2), 198-202
- 1980 a. New designs of spat collectors breeding hapas, cages and improved technology for pearl farming. *Symp. coastal Aquaculture. Abst. No. 182.*
- Mar. biol. Ass. India* 12-18 Jan 1980.
- 1980 b. Artificial biocoenosis for ecological reconstruction to facilitate Aquaculture. *Ibid: Abstract No. 29. Mar. biol. Ass. India* 12-18 Jan. 1980.
- Alagarwami, K. S.Z. Qasim 1973
Pearl Culture - its potential and implications in India. *Indian J. Fish.* 20 (2): 533 - 550. □