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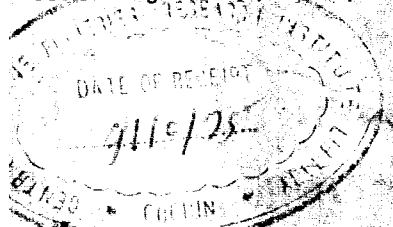
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## OUR COVER



An assortment of fish obtained from  
composite culture

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# EDITORIAL



## Aquaculture

# INDIAN FARMING

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**F**ISH is one of the fine items of food for man. Protein-rich and easily digestible, the role of fish in improving Indian diet and all in all augmenting the food resources of the country cannot be exaggerated. Its export potential also is enormous.

This issue is devoted to culture—the scope and possibilities in fresh, brackish and salt waters. It is estimated that nearly 70 million hectares of these waters are available, of which only 0.6 million hectares are under cultivation. From this, the possibilities of this great sector can be understood.

Faced with the challenges of dwindling food and energy sources, and the ever-worsening problem of pollution, the scientists and planners the world over are looking at earth's resources as an integrated whole where utilization and conservation go hand in hand. An over-intensified exploitation of land for food crops alone will cause suffering to, and progressive depletion of animal and fish resources. Thoughtless and ill-planned development of industries will bring within its wake pollution, particularly of the rivers and oceans. The fish will just vanish. Events in the nature of grave warning have already occurred. This means a totally integrated agriculture, animal husbandry and aquaculture, the whole operation being viewed as one ecological chain, meant for the healthy survival of men, animals and fishes.

In a humble way, this is also the philosophical and programmatic content of ICAR's own operational research projects.

There is also another noteworthy aspect about aquaculture in general. It is a labour-intensive programme. There is tremendous need for production and employment to go hand in hand. Production, without employment and the purchasing power that it creates, can cause its own problems. A close look at the rural areas will easily confirm this simple economic truism.

All in all, the subject deserves close study. The material that we present will help in this direction.

AS on land, cultivation in the sea also requires scientific husbandry practices. The major task of the scientists in this field is to develop the techniques which could be easily practised by the lay man and which would yield the maximum returns on the investments. Moreover, these techniques should be capable of being adopted by the small entrepreneurs as well as by the large-scale operators. Taking into consideration these principles, the Central Marine Fisheries Research Institute has been carrying on investigations at Vizhinjam, near Trivandrum from 1971 on the culture of the mussel, a bivalve mollusc rich in proteins glycogen and fats, and the highlights of the work are presented here.

#### Production Potential

In natural condition, mussels grow well, attached on rocks and other hard substrata along the coastal areas to a depth of about 15 metres. Since these animals

# MUSSEL CULTURE ON ROPES

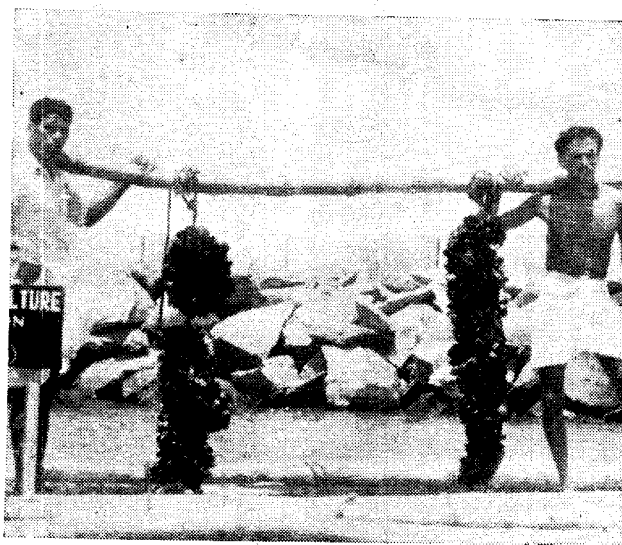
G. P. KUMARASWAMY ACHARI

Central Marine Fisheries Research Institute, Sub-Station,  
Vizhinjam

are hardy they can be easily handled and once the young mussels settle on any surface they do not generally move about. They feed on minute plants and animals abundant in sea water and do not need additional feed while being cultured. Mussels shed their sexual products into the sea when they are about 7 to 8 months old and the offspring reach the harvestable and marketable size within one year. At Vizhinjam the annual production of mussels from the natural bed is estimated to be four tonnes per hectare but by culture it is estimated to reach about 150 tonnes per hectare. In Spain which is the most advanced country in mussel culture it is reported that the annual production per hectare reaches about 600 tonnes which is much higher than that raised from any other crop by man either from the land or from the sea. The main factor involved in this enormously high production is that these animals feed mainly on diatoms, the primary producers in the sea and much energy is not wasted because of their sedentary nature.

Protected bays with an average depth of 15 to 20 metres are very ideal for mussel culture. In shallow areas, culturing of mussels on poles also can be practised, as has been done in France. At Vizhinjam mussel is cultured on ropes suspended from floating rafts in the bay.

Spanish type of floating rafts of small dimension (5m×5m) are constructed with bamboo and are floated on diesel barrels coated with paint and are anchored with stone anchors at four corners. Fifty nylon ropes of 12 mm thickness and 10 metre length can be suspended before the breeding time of mussels (July-August) from these rafts for the culture of mussels. In Spain rafts of 18m×18m are constructed and about 600 to 1,000 such ropes are suspended. Young mussels settle on these ropes during the breeding season. If by the end of August or by the beginning of September the settlement of young ones is not sufficient on these ropes, seed mussels



One-year-old rope-cultured mussels

below the size of 20 mm can be transplanted on these ropes by using strips of old cotton nets of 10 mm mesh size. The nets get disintegrated in sea water within a week's time and the mussels get firm attachment on the ropes. It is found that mussels transplanted at Vizhinjam by September attain a size of above 60 mm by May and the dominant group reaches 80 mm in August and 85 mm in September. To avoid overcrowding on ropes, 'thinning' can be attempted and the mussel can be retransplanted until they are about 40 to 50 mm to have the best results. The harvest of the cultured mussel's can be started by May and the crop can be disposed of economically adjusting to the local needs. The preliminary experiment showed a production of 6 kg of mussel per metre of rope suspended and the subsequent experiments have proved that it can be enhanced up to 15 kg per metre of rope. It is estimated that it is possible

to produce above 150 tonnes of mussels per hectare by attempting mussel culture on a large scale. A pilot project on mussel culture is proposed to be implemented soon with the collaboration of the National Research Development Corporation and the State Fisheries Department at Vizhinjam for this purpose.

#### **Utilisation**

At Vizhinjam mussels fetch a market price of Rs 4 to Rs 5 per hundred when they are above the size of 70 mm and are popularly known as 'muthuva chippi'. One hundred mussel of this size with shell weigh about 2 kg. The commercial exploitation starts by October and lasts till April or May. Monsoon months are avoided because of the roughness of the sea.

At present mussel is marketed locally within a radius of 8 km to 10 km of fishing centres especially in the Calicut-Cannanore zone and Kovalam-Cape Comorin zone of the southwest coast of India. If it can be disposed of within 6 to 8 hours after harvesting the mussel can be transported to other places also. Dehydrated mussels can be stored for short duration but for longer periods mussels can be preserved using spices. These can also be canned in oil or pickled for export.

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