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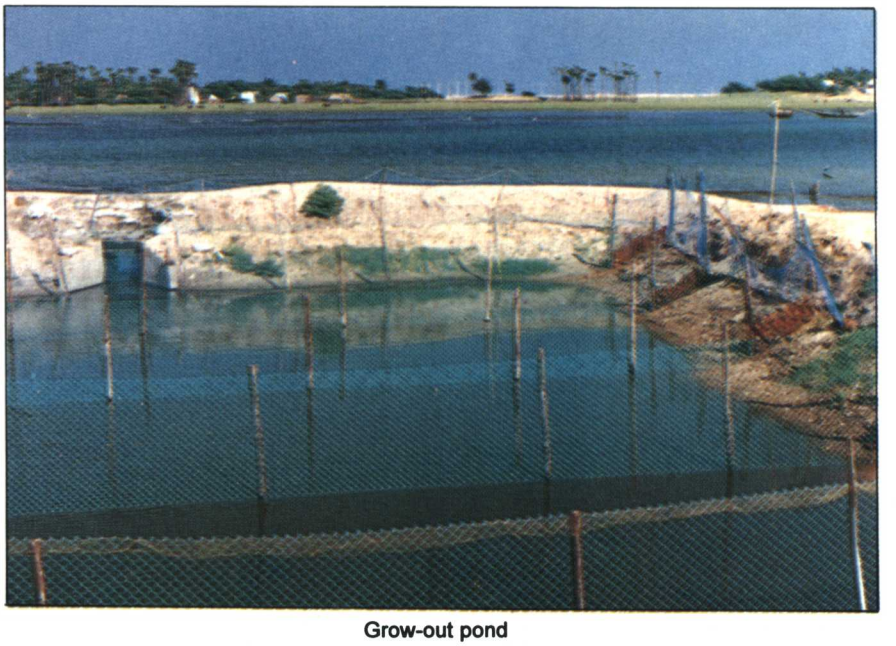
MUD CRAB FARMING -AN ALTERNATIVE SOURCE FOR INCREASING PRODUCTION

Mud crab is always in demand from the point of view of being a delicacy, medicine-added product and export-oriented commodity. Two species of mud crabs, namely, *Scylla tranquebarica* (larger species) and *Scylla serrata* (smaller species) are exploited from the inshore sea and brackishwater bodies of India, mostly by indigenous gears. Mud crab forms a sustenance fishery, especially in the backwaters, estuaries, brackishwater lakes and lagoons.

Till 1987, mud crabs were utilised for both local consumption and export in the form of frozen and canned products. Since there is a great demand for live mud crabs from Europe and South-east Asian countries, the export trade for live mud crabs started with 36 tonnes packed in 1987-88, which increased to 1635 tonnes in 1995-96. Like-wise, the foreign exchange earnings of Rs 0.7 million in 1987-88 increased to Rs 167.1 million in 1995-96.

Since the resource of mud crab available in the wild is limited, the other alternative to increase the production is through farming. Though there is no exclusive traditional farming for mud crab in India, juveniles of mud



Grow-out pond

crab are known to enter the tide-fed perennial and seasonal brackishwater fish/shrimp culture fields of Karnataka, Kerala and West Bengal and small quantities of grown-up crabs are harvested along with fish and shrimp. However, mud crab is cultured either alone or with milkfish, shrimp and seaweeds in countries like China, Indonesia, Malaysia, Singapore, Sri Lanka, Taiwan and the Philippines. In recent times due to wide-spread shrimp disease outbreaks, the shrimp farmers of Kerala, Tamil Nadu, Andhra Pradesh, Orissa and West Bengal have taken up mud crab farming on a small scale, as an alternative to shrimp farming. In this context, information on the culture practices of mud crabs presented here can be useful to traditional fish farmers for adopting culture practices.

Two types of culture can be adopted: 1) Grow-out culture in earthen ponds with proper fencing, where juvenile crabs can be raised to marketable size over a period of 3-4 months and 2) fattening, in which "water crabs" or recently moulted crabs can be reared for a period of 3 to 4 weeks to gain weight.

Cultured mud crabs (*S. tranquebarica*)

For grow-out culture, ponds with an extent of 0.1 to 0.4 ha water spread area should be located in tide-fed areas in estuaries, backwaters and creeks. Suitable fencing should be done with materials like casuarina poles, bamboo split matting, G.I. chicken wire mesh, nylon netting, plastic coated iron mesh and asbestos sheet to a height of 1.0 to 1.5 m, to prevent the escape of stocked crabs. The fencing can be fixed either along the inner periphery of the pond or over the pond dyke. To reduce the mortality among the reared crabs, hide-outs/shelters should be provided by placing earthen/PVC pipes and worn-out tyres.

Juvenile crabs can be collected from fishermen operating drag net, cast net, lift net and bamboo trap in the estuaries, backwaters, brackishwater lakes and creeks and can be packed with wet seaweed / saw dust for transport by road.

For grow-out culture, the stocking rate should be 1 to 5 crabs per square metre with a uniform size of 100 grams depending upon the availability of stocking material. The reared crabs should be fed twice a day, preferably in the morning and late evening with trash fish / bivalve meat @ 10 % of stocked biomass.

The rearing medium should have a salinity of 10 to 35 ppt, dissolved oxygen 5 to 7 ppm and pH 7.5 to 8.5. The depth of water in the pond should be maintained at 0.5-1.0 m. In case, any foul smell emanates from the pond or when the crabs tend to come out of the pond, the water should be changed.

Dr. G. R. M. Rao, Director, CIBA, addressing the Symposium on Aquaculture Activity in Maharashtra, Mumbai

The reared crabs should be examined periodically to record their growth and health condition. They should be handled with care and properly tied before measuring their weight at the time of sampling and harvesting. It is expected that at a stocking density of 1 crab per square metre, crabs belonging to *S. tranquebarica* can grow from an initial weight of 80-100 grams to a final weight of 400-500 grams in 4 months with a survival rate of 70-80 %. At the final harvest, crabs can be collected by hand-picking after draining the pond water.

In the fattening process, "water crabs" are purchased from crab merchants and stocked @ 1 crab per square metre in earthen ponds with proper fencing or nylon net cages and are reared on a diet of trash fish / bivalve meat for a period of 3 to 4 weeks.The "water crabs" of 150-500 grams can gain a final weight of 230-650 grams and those of 800-1000 grams to a final weight of 1000-1200 grams with a survival rate of 70- 90 % during 3-4 weeks of fattening.

This article was prepared by S\Shri M. Kathirvel and S. Srinivasagam, Senior Scientists, CIBA, Chennai.

RESEARCH HIGHLIGHTS

Treatment for epicommensal infection in shrimp larvae

For the removal of epicommensal (*Epistylis* sp.) infection of hatchery-raised larvae of tiger shrimp (*Penaeus monodon*), bath treatment in 20 ppm formalin for an hour was found to be effective.

Captive broodstock of seabass *(Lates calcarifer)*

Among the captive broodstock of seabass *(L. calcarifer)* maintained since December 1995 at the Institute's broodstock holding facility at Muttukadu Experimental Station, females possessing ovaries in Vstage were found. The diameter of ova ranged from 0.437 to 0.457 mm. Further, males were in oozing condition.

Miss Natalee Daalder, Country Manager for ACIAR, Australia (extreme right) with Dr. G. R. M. Rao (second from left), Director, Drs. A. R. Thirunavukkarasu, S. K. Pandian and L. H. Rao, Senior Scientists.

Experimental induction of white spot disease in lobsters

Laboratory trials on induction of white spot disease in shrimp and crab have shown that white spots appeared on the exoskeleton of the animals, prior to their mortality. However, when the extract of white spot disease-infected shrimp tissue was injected into the body of laboratory-held spiny lobsters *(Panulirus homarus, P. ornatus* and *P. polyphagus)* and sand lobster *(Thenus orientalis)*, it was observed that though the lobsters are susceptible to white spot virus infection, characteristic white spots could not detected on their exoskeleton.

VISITORS

The following visited the Muttukadu Experimental Station :

Shri Jaswant Singh, Hon'ble Minister for Fisheries, Civil Aviation and Revenue, Govt. of Haryana, 6 May 1997.

15 B.F.Sc. Students from G.B., Pant University of Agriculture and Technology, Pant Nagar (Uttar Pradesh), 7 May 1997.

Shri M.P. Parmar, Joint Commissioner, Shri K.R. Narayanan and Dr. H. Dave, Assistant Directors, Dept. of Fisheries, Govt. of Gujarat, 17 May 1997.

15 Fisheries Officials from the Staff Training Institute, Dept. of Fisheries, Govt. of Tamil Nadu, 19 May 1997.

10 Officer Trainees from Indian Bank Management Academy for Growth Excellence, Chennai, 28 May 1997.

30 B.Sc. Students from Madras Christian College, Tambaram, Chennai, 30 May 1997.

32 Trainees from CIFE, Lucknow, 17 June 1997.

Miss Natalee Daalder, Country Manager for ACIAR (for South Asia), Australia, 29 June 1997.

ENGAGEMENTS

Dr. G.R.M. Rao, Director, attended the following meetings :

- ICAR Director's Conference at New Delhi, 4-7 May 1997.

- Committee of Officers on Fisheries, Central Board of Fisheries, Dept. of Agriculture and Co-operation, Ministry of Agriculture, New Delhi, 13-14 May 1997.
- Symposium on Coastal Aquaculture, organised by Maharashtra Chamber of Commerce, Mumbai, 20-21 June 1997.
- World Bank Review Mission Meeting, organised by Dept. of Agriculture and Co-operation, Ministry of Agriculture, New Delhi, 22-25 June 1997.

Dr. K. Gopinathan and Dr. C.P. Rangaswamy, Senior Scientists, attended the Second Meeting on Course Writers for B.Sc.(Aquaculture) at CIFA, Bhubaneshwar, 27-28 April 1997.

Dr. Syed Ahamed Ali, Senior Scientist, attended the Fourth Meeting of Social Audit Committee at CICFRI, Barrackpore, 9 May 1997.

Dr. L.H. Rao, Dr. Mathew Abraham and Dr. T.C. Santiago, Senior Scientists, attended the National Agricultural Technology Project's Workshop on Coastal Aquaculture at CIFT, Kochi, 22-28 May 1997.

Dr. A.R. Thirunavukkarasu, Senior Scientist, attended the National Agricultural Technology Project's Workshop on Livestock and Fish Production Systems in the Arid Ecosystem at Jodhpur, 5-8 June 1997.

MEETINGS

The Annual Staff Research Council Meeting of the Institute was held on 23-24 April 1997 at the Muttukadu Experimental Station of CIBA.

STAFF NEWS

Appointment

Dr. G.R.M. Rao, Principal Scientist from CIFA, Bhubaneshwar, was transferred to CIBA, Chennai, to act as Director w.e.f. 1 April 1997. Dr. Rao joined Central Inland Fisheries Research Institute in 1964 and served at Rajamundry (Andhra Pradesh),

Dr. G. R. M. Rao

Chennai (Tamil Nadu) and Bhubaneshwar (Orissa), during 1964-1987 and from 1987 to March 1997 at Central Institute of Freshwater Aquaculture, Bhubaneshwar. His field of specialisation included capture fisheries in freshwater and brackishwater and culture fisheries with special reference to breeding and culture of freshwater carps and air-breathing catfish *(Clarias batrachus)* and brackishwater shrimp. Dr. Rao has served as an ICLARM Consultant to Bangladesh in catfish breeding and culture. Dr. Rao was awarded with INDAQUA Award for catfish culture by MPEDA, Ministry of Commerce. To his credit, 37 scientific and technical papers were published in Indian and International journals.

Retirement

Dr. K. Alagarswami, Director opted for voluntary retirement with effect from 1 April 1997.

Born on 13th August 1937, at Silukkuvarpatti, Nilakottai Taluk, Tamil Nadu, Dr. Alagarswami had obtained B. Sc. (Hons.) and M.A. from University of Madras and Doctor of Agriculture from University of Tokyo, Japan. He joined as a Research Assistant on 31 July 1959, in Central Marine Fisheries Research Institute (CMFRI), at Mandapam Camp and promoted to Senior Research Assistant in 1968, Junior Fishery Scientist in 1971, Scientist-SI in 1975, Scientist-S2 in 1976, Scientist-S3 in 1978 and Scientist-S4 in 1984. Dr. Alagarswami was trained in Japan and United Kingdom in fisheries research. Apart from Mandapam Camp, he served at Tuticorin and Kochi. His field of specialisation in CMFRI was molluscan fishery and biology and marine pearl culture. He had made significant contribution in developing a suitable technology for pearl and pearl oyster spat production, for which he was awarded two times by ICAR (Hari Om Ashram Award and ICAR Team Award). K. N. Bahl Memorial Award of the Society of Biosciences was awarded to him in 1992.

He was selected as the Director of Central Institute of Brackishwater Aquaculture, Chennai, in 1988. After assuming the directorship, he concentrated on the development of infrastructure facilities for this newly formed Institute. Under his leadership, considerable progress has been made in R & D programmes in developing suitable technologies for hatchery seed production of tiger, white and kuruma shrimps, artificial feed for hatchery and

Dr. K. Alagarswami

grow-out operations for tiger and white shrimps and mapping out different diseases of tiger and white shrimps in hatchery and grow-out systems.

To his credit, Dr. Alagarswami published more than 50 papers in national and international journals. He visited China, Denmark, Japan, Thailand, the Philippines, U. S. A. and United Kingdom.