



CIBA NEWS

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RESEARCH HIGHLIGHTS

SUCCESSFUL GROW-OUT CULTURE OF CIBA HATCHERY-PRODUCED FRY OF SEABASS, *LATES CALCARIFER* IN A FARMER'S PONDS AT NAGAPATINAM

The breakthrough achieved in the seed production of seabass, *Lates calcarifer*, by CIBA in July 1997 for the first time in India, has opened up new vistas for species diversification in coastal aquaculture. Though seabass is cultured along with other species of shrimp and fish under traditional culture systems in some parts of India, information on growth rate, production potential etc. are lacking. In order to evaluate the techno-economic feasibility of seabass culture using scientific management techniques, CIBA hatchery-produced seed of seabass were reared in a progressive fish farmer's ponds at Papakoil near Nagapatinam in Tamil Nadu under the technical guidance of the Institute.

About 93% survival of fry (25 days old) was achieved during transportation in

two spells (2000 and 10,000 nos.) from CIBA, Muttukadu to Nagapatinam (350 kms) by road in 12 hours, under oxygen packing @ 50-250 nos./litre of water.

Nursery rearing was carried out in hapas (4 m x 2 m) @ 250 nos./cubic metre for 28 days. Fry were fed on a diet consisting of nauplii of the brine shrimp (*Artemia*), egg custard, boiled and minced fish meat (*ad libitum*) for the first 10 days and exclusively with fish meat afterwards. Grading (removal of shooters) of fry was done once in 3 days. The survival rate was 92 % after 28 days of rearing and the fry attained an average weight of 1.25 g.

Grow-out rearing of seabass was done in two ponds, pond 1 (0.4 ha) and pond 2 (1.1 ha), number of fishes stocked in each pond being 1920 and 8611 respectively. In



Harvest of seabass (*Lates calcarifer*) from the farmer's pond.

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Dr. (Smt.) MUNAWAR SULTANA,
Senior Scientists

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Mrs. & Mr. R. Raja Devasenapathy, the progressive fish farmers holding the harvested seabass.

the pond 1, the fishes were fed with fresh trash fish for the first four months while during the fifth and sixth months it was given in combination with compounded feed (a mixture of ground nut oil cake, rice bran and starch). During seventh to eleventh months, dry fish was also added with the feed. A total of 9692 kg of feed was given, comprising of fresh trash fish 5189 kg, ground nut oil cake 397 kg, starch 236 kg and rice bran 39 kg. In the pond 2, the fishes were allowed to feed on forage fish like *Tilapia* introduced into the pond prior to stocking of seabass. Supplementary feed as mentioned above was given in pond

2 to a lesser extent, total quantity given being 1272 kg.

During the culture period, the salinity in the ponds ranged from 1 to 26 ppt. pH ranged from 7.4 to 8.0 and dissolved oxygen levels recorded were above 4 ppm.

The fishes in the pond 1 were harvested after 11 months of culture. The average weight of fish was 946.5 g with a range of 517 to 1200 g. A total of 1744 kg of fish were harvested from pond 1. The number of fishes recovered were 1843.

The average size of fish in pond 2 at harvest was 740 g with a weight range of 300 to 1500 g. A total of 4,030 kg of fish

were harvested after 11 months rearing. The number of fishes recovered were 5446.

To develop a broodstock of F-1 generation, a few of the grow-out reared fishes (twenty nos.) were transported to Muttukadu and maintained in the Institute's fish hatchery.

Economic evaluation of seabass culture in a farmer's ponds

	Pond 1 (0.4 ha)	Pond 2 (1.1 ha)
	Rs.	Rs.
A. Operational Expenditure		
Pond preparation	2,000	4,000
Seed	8,000	2,250
Transport of seed	1,200	1,200
Nursery rearing	970	3,000
Feed	90,750	11,836
Labour	10,000	10,000
Electricity & fuel	8,000	25,000
Removal of algae	2,600	--
Harvest	2,400	5,000
Total	1,25,920	62,286
B. Income		
Sale of harvested fish	1,44,634	2,37,000
C. Profit		
B-A		
Actual	18,714	1,74,714
Per ha	46,785	1,58,831

This is the first successful rearing of CIBA hatchery- raised seed of seabass in a brackishwater grow-out system. The results of the present study are a base-line guidance for future seabass culture.

The present report was based on the monitoring of seabass culture in a farmer's ponds by Dr. A.R. Thirunavukkarasu, Senior Scientist and Dr. M. Kailasam, Scientist (Senior Scale).

BREEDING OF MUD CRAB

Experimental studies on the development of captive broodstock and induction of maturation in the smaller species of mud crab, *Scylla serrata* have shown that unilaterally eye-stalk ablated females of average size 320 g matured and became berried. In 10 instances of berry formation, a total of 18 million larvae were obtained.

IMMUNOSTIMULATION OF TIGER SHRIMP

Studies on the immunostimulation of tiger shrimp *Penaeus monodon* postlarvae using heat-killed bacteria as immunostimulant indicated that immunostimulation failed to sustain / enhance the protective response. However, it significantly enhanced the growth of shrimp.



Transport of live F-1 generation of seabass by water tanker lorry : Dr. A.R. Thirunavukkarasu, Senior Scientist (extreme left), Shri R. Raja Devasenapathy, the progressive fish farmer (third from left) and Shri Vasantha Kumar Charles, Technical Assistant (extreme right).



Live F-1 generation of seabass

DIETARY PHOSPHORUS REQUIREMENT OF WHITE SHRIMP

The quantitative dietary requirements of phosphorus were determined for white shrimp *P. indicus*. Results of feeding trials using semi-purified diets containing phosphorus levels ranging from 0 to 2.5% indicated that diets incorporating phosphorus at 1% level showed good growth and feed conversion (FCR 1.1:1) in shrimp.

ARTIFICIAL FEEDS FOR SEABASS FRY

The Institute succeeded in weaning seabass *Lates calcarifer* fry, produced in the Institute's hatchery at Muttukadu, to artificial feeds. Two feeds formulated with protein levels at 35 and 40% and prepared as floating pellets, using fermentation technique, were accepted by the fry. Short-term feeding trials indicated that the growth and survival percentage of 45 and 84 respectively were comparable to that obtained with a commercial imported feed.

VIRULENCE STATUS OF INDIAN WHITE SPOT VIRUS

A series of laboratory experiments were taken up to study the virulence status of the Indian White Spot Virus. Preliminary experiments with shrimp *Penaeus monodon* and *P. indicus* indicated a change in the virulence, with both species of shrimp showing higher tolerance levels.

MONITORING OF TRADITIONAL SHRIMP FARMING IN POKKALI FIELDS

Monitoring of traditional shrimp culture farms (Pokkali fields) was taken up by the Institute in Ernakulam, Alappuzha and Thrissur districts of Kerala. Demonstration

of improved techniques of shrimp culture showed a substantial increase in productivity and income. Two adjacent Pokkali fields (total area 2 ha) at Varapuzha, selected for the study, showed an average yield of 1,120 kg/ha, against earlier yields ranging from 300-500 kg/ha obtained using age-old traditional culture practices. In a period of 115 days, the farmer was able to generate a profit of Rs 4,65,670/-.

VISITORS

- Mr. Bruno Chaverial, Aquaculture Engineer, COFREPECHE, Centre De Brest, Ploozane, France, visited Muttukadu Experimental Station on 3 November 1998, for discussions on the Seabass Pilot Project on breeding and

culture (Indo-French collaboration project).

- An appraisal team comprised of Mr. Collect, Mr. Brubhet, Mr. Haemeau and Mr. Roland Lomme from the French Economic Commission, visited CIBA Headquarters, Chennai and Muttukadu Experimental Station, on 12 November 1998, in connection with the pilot project on seabass.

ENGAGEMENTS

Dr. G. R. M. Rao, Director, attended the following Meetings/Workshops/Seminars:

- Launch Workshop of the National Agricultural Technology Project (NATP), held at ICAR, New Delhi, 6 October 1998.
- ICAR Directors' Conference at ICAR, New Delhi, 7-8 October 1998.
- Meeting for the finalisation of the IX Plan document of the Institute, held at ICAR, New Delhi, 17-18 November 1998
- Workshop on Sustainable Livelihoods and Environment Management in the Coastal Ecosystems, held at M. S. Swaminathan Research Foundation, Chennai, 10-11 December 1998 and presented a paper entitled "Sustainability of shrimp culture - India's experience and strategies for future"
- Scientific Advisory Panel Meeting of the National Agricultural Technology Project (NATP), held at Sugarcane Breeding Institute, Coimbatore, 22 December 1998.

The scientists attended the following Meetings/ Workshops/ Seminars:

- Dr. K. Gopinathan, Senior Scientist, attended the Annual Budget Meeting of



Dr. G. R. M. Rao, Director, explaining to the visiting French team.

the Dept. of Fisheries, Govt. of Tamil Nadu, at Chennai, 12 October 1998.

- Dr. M. Krishnan, Senior Scientist, served as Rapporteur in the Twelveth National Conference on Agricultural Marketing, held at Jaipur, 8-10 October 1998 and presented a paper.
- Dr. L. H. Rao, Senior Scientist, participated in the meeting for the finalisation of the IX Plan document of the Institute, held at ICAR, New Delhi, 17-18 November 1998.
- Dr. T. C. Santiago, Senior Scientist, participated in a 2-week intensive workshop on "Chromosome and Gene Manipulation Techniques" under the ICAR National Professorship Project at the School of Biological Sciences, Madurai Kamaraj University, 2-14 November 1998.
- Dr. B. P. Gupta, Senior Scientist, attended the Hindi Workshop held at National Academy of Agricultural Research Management (NAARM), Hyderabad, 28-29 December 1998.

MEETING

- The Fourth Meeting of the Research Advisory Committee of the Institute was held on 18 December 1998 at Muttukadu Experimental Station. Dr.P.S.B.R.James, Rtd. Director, CMFRI, Chairman, RAC, presided over the meeting. Dr. M. Sakthivel, President, Aquaculture Foundation of India (Member, RAC), Dr.S.C.Pathak, Chief General Manager, NABARD, Guwahati, (Member, RAC) and Shri Arjun Prasad Shastri, Social Worker (Non-official member, RAC) attended the meeting

HUMAN RESOURCE DEVELOPMENT

- Dr. G. Gopikrishna, Scientist (SS), participated in the Training Course on Genetics and Biotechnological Tools in Aquaculture and Fisheries, at CIFE, Mumbai, during 2-31 December 1998.

AWARD

- Dr. S. S. Mishra, Scientist, received the Dr. R. Easwaran Memorial Medal (gold medal and citation) from the Indian Veterinary Association, New Delhi, for his article entitled "Restriction fragment profile of a fowlpox virus isolate using restriction endonucleases" which was selected as the "Best Article in Biotechnology" published in the Veterinary Journal Vol.72 (1995). The award was received at the 27th All India Veterinary Conference held at Tamil Nadu University of Veterinary and Animal Sciences on 11 September 1998.

TRAINING

- A training programme on "Brackishwater Finfish Breeding and Culture" was conducted by CIBA from 16-30 November 1998. Three candidates (2 from MPEDA, Kochi and 1 from CMFRI, Visakhapatnam) participated in the programme.
- A training programme on Environment Impact Assessment of Brackishwater Shrimp Farming was conducted by CIBA during 14-23 December 1998. Seven trainees from MPEDA participated in the training programme.

Lectures and demonstrations were arranged for the following at the Muttukadu Experimental Station:

- 22 students (2nd year M.Sc. Environmental Biology) from the Bharathi Arts College for Women, Chennai, 17 November 1998.
- 20 students (1st and 2nd year Environmental Biotechnology) from Institute for Coastal Area Studies, Manonmanian Sundaranar University, Nagercoil, 19 November 1998.
- 20 students from the Dept. of Zoology, Meenakshi College, Chennai, 21 November 1998.
- An interaction programme was organised for 32 fisherfolk from Koodamkulam Village, Tirunelveli district, Tamil Nadu, sponsored by the Nuclear Power Corporation (NPC), Govt. of India, Chennai, on 23 November 1998, at the Muttukadu Experimental Station. Follow-up discussions were held at NPC headquarters at Chennai, on the same day

and were attended by Shri M.Kathirvel, Dr. K.Gopinathan and Dr. A. R. Thirunavukkarasu, Senior Scientists. Shri C. R. Prabhakaran, Chief Engineer, NPC, coordinated the above programme.

- 26 students (M.Sc. Aquaculture) from Nandanam Arts College, Chennai, 12-18 December 1998.
- 12 Sub-Inspectors (Fisheries) from Tamil Nadu Fisheries Staff Training Institute, Chennai, 17 December 1998.
- 64 students from Dept. of Zoology, Quaid-e-Milleth Govt. College for Women, Chennai, 19 December 1998.
- 25 students from the Dept. of Industrial Fish and Fisheries, BJB College, Bhubaneswar, 22 December 1998.

ARS EXAMINATION

- The Agricultural Research Service (ARS) Examination 1998 was conducted by the Institute at Chennai, during 27-29 December 1998.

STAFF NEWS

Promotion

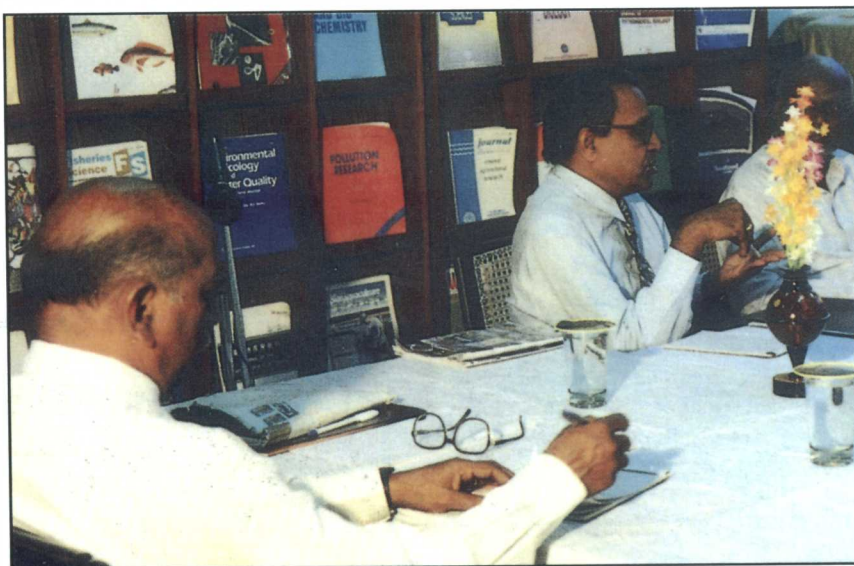
- Shri R. Kandamani, Senior Clerk to Assistant, 16 September 1998.
- Shri S. K. Bindu, Jr.Clerk to Sr. Clerk, 7 November 1998.
- Smt. K. Nandhini, Jr.Clerk to Sr.Clerk, 7 November 1998.

Relief

- Shri N. Raghavan, Sr.Stenographer, on an inter-institutional transfer from CIBA, Chennai to NIANP, Bangalore, relieved on 10 November 1998.

Obituary

- Shri Sitaram Das, S.S.Grade IV, KRC of CIBA, Kakdwip, 24 December 1998.



Dr. P. S. B. R. James, Former Director, CMFRI and Chairman, RAC (extreme left) and Dr. S. C. Pathak, Regional Manager, NABARD, Guwahati and Member, RAC (second from left) during the discussions at the RAC meeting held on 18 December 1998.

