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CONTENTS

Captive broodstock development and induced breeding of grey mullet, *Mugil cephalus*

Research Highlights

Shrimp Nutrition

Visitors

Engagements

Meetings

Human Resource Development

National Aquaculture Week

Exhibition

Staff News

Appointment

Promotion

Transfer

Relief

Publications

CAPTIVE BROODSTOCK DEVELOPMENT AND INDUCED BREEDING OF GREY MULLET *MUGIL CEPHALUS*



Embryo development inside the eggs of grey mullet *Mugil cephalus*

Development of a captive broodstock, induced breeding and seed production of the grey mullet *Mugil cephalus* was taken up at Muttukadu Experimental Station of the Institute. 60 sub-adult and adult *M. cephalus* were maintained in two 100 t capacity RCC tanks with flow-through system, for over one year from January 1996 and reared on a formulated pelleted maturation diet. The proximate composition of the feed was crude lipid 5.97 %, crude protein 35.27 %, crude fibre 3.37 %, ash 8.79 %, moisture 5.47 % and NFE 41.13 %. Among the reared broodstock, 20 % of them attained full maturity without any hormonal treatment. In mature females, the diameter of ova ranged from 0.525

to 0.615 mm, while the milt was oozing in mature males.

In order to advance the breeding, 5 females measuring 380-420 mm / 675-1000 g were subjected to induced breeding during January-March 1997. One of the females (380 mm / 675 g) having ova diameter of 0.525-0.550 mm was administered with HCG @ 10,000 IU/kg as a priming dose, while Ovaprim @ 5 ml/kg was given as a resolving dose after an interval of 24 hours, which has resulted in complete ovulation. 22 hours after the administration of resolving dose, the ovulated eggs were stripped into a container devoid of water and the milt from two oozing males was stripped

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22-hour old hatchling of *Mugil cephalus*

over the eggs. A total of 1.4 million eggs were obtained and the rate of fertilisation was 90 %. The hatching started 30 hours after fertilisation and was completed in 2 hours. Water temperature of the medium ranged from 26.0 to 28.0 °C. The number of hatchlings was estimated at 5.2 lakhs, which worked out to 41.6 % of the fertilised eggs. The hatchlings were equally distributed and reared in five 2-ton tanks with flow-through facility. The mouth formation in the hatchlings was noticed on 4th day. It was possible to rear the hatchlings up to 8 days from the time of spawning. Due to infection with ciliates, large-scale mortality of the hatchlings was noticed.

This is the first time in India that successful maintenance of captive broodstock and subsequent breeding of *M. cephalus* was achieved by Central Institute of Brackishwater Aquaculture. This significant work was carried out by Dr. Mathew Abraham, Senior Scientist in association with Scientists, Dr. P. Kishore Chandra, Dr. Shiranee Pereira and Shri M. Kailasam.

RESEARCH HIGHLIGHTS

Shrimp Nutrition

Plant-based protein sources viz., soyabean meal, *Spirulina* etc. have been effectively used for replacement of animal protein in shrimp feeds by

suitably manipulating the essential amino acid index in the feed. Feeding trials with *P. monodon* (size ~12g) gave good growth and survival when fish meal content was reduced to 5% level and plant protein content increased to 30% along with 7% *Spirulina*.

Feed materials viz. prawn head, squid liver meal, polychaete worms, fish solubles, neem cake, etc., were tested for their attractant and growth promoting properties by incorporating them in standard purified diets in feeding trials with *P. monodon*. Results indicated that polychaete

worms possess greater attractant property followed by prawn head.

VISITORS

The following visited Muttukadu Experimental Station.

14 B.F.Sc. students from College of Fisheries, Orissa University of Agriculture and Technology, Berhampur, Orissa, 3 January 1997.

27 students of Coastal Aquaculture and Marine Biotechnology, College of Science and Technology, Andhra University, 4 January 1997.

35 participants of the National Aquaculture Week, conducted by Aquaculture Foundation of India, 2 February 1997.

A batch of B.Sc. (Industrial Fish & Fisheries) students from Christian College, Tambaram, Chennai, 6 February 1997.

9 trainees from Staff training Institute of Directorate of Fisheries, Govt. of Tamil Nadu, 15 February 1997.

ENGAGEMENTS

Dr. K. Alagarwami, Director, attended the following meetings.



Dr. Prabin Chandra Sarma, Member of Parliament and Chairman, Social Audit Committee is being received by Dr. K. Alagarwami, Director

- Meeting on Technical Consultancy on World Bank - assisted Shrimp and Fish Culture Project at Dept. of Agriculture and Cooperation, Ministry of Agriculture, Govt. of India, New Delhi, 12 February 1997.
- Second Meeting of the Social Audit Committee at CICFRI Centre, Guwahati, 13-14 February 1997.
- Executive Committee Meeting of Rajiv Gandhi Centre for Aquaculture at MPEDA, Kochi, 20 March 1997

Dr. R.D. Prasadam, Principal Scientist, attended the Meeting of the Sub-group on Coastal Aquaculture for drafting IX Five Year Plan of Tamil Nadu Govt., Chennai, 24 February 1997.

Dr. A.R. Thirunavukkarasu, Senior Scientist, attended the Workshop on Coastal Regulation Zone of Tamil Nadu Coast, organised by the Dept. of Town and Country Planning, Govt. of Tamil Nadu at Anna University, Chennai, 29 January 1997.

Dr. L.H. Rao, Senior Scientist, participated in the ICAR-ODA Meeting at NBPGR, ICAR, New Delhi, 5-6 February 1997.

Dr. C. Gopal, Scientist (SS) and Dr. S.S. Mishra, Scientist, attended a Farmer's Awareness Programme, organised by BFDA at Machilipatnam, 5 February 1997.

Dr. S.S. Mishra, Scientist, attended a National Seminar on Recent Trends in Aquaculture at Nagarjuna University, Nagarjuna Nagar, Andhra Pradesh and presented a paper, 6-8 February 1997.

Shri M. Kathirvel, Senior Scientist at Headquarters, visited KRC of CIBA, Kakdwip, 24-28 February 1997, in connection with crab culture programme.

MEETINGS

The third meeting of the Research Advisory Committee was held on 11-12 March 1997, at Muttukadu Experimental Station of CIBA.



Participants of the Social Audit Committee (Left to right : Dr. K. Alagarswami, Director, Dr. V. Rajagopalan Ex-Vice Chancellor, TNAU, Dr. M.S. Prabhavati, Deputy Director of Fisheries, Govt. of Tamil Nadu, Dr. Mathew Abraham, Dr. K. Gopinathan, (Senior Scientists of CIBA) and Dr. M. Sinha, Director, CICFRI.

The third meeting of the Social Audit Committee was held on 26-27 March 1997, at the Muttukadu Experimental Station of CIBA. Dr. Prabin Chandra Sarma, M.P. (LS), Assam, Chairman, Social Audit Committee, presided over the meeting.

HUMAN RESOURCE DEVELOPMENT

Smt. M. Jayanthi, Scientist, under-went training in Agricultural Electronics at CIFT, Kochi, 12-20 February 1997.

Dr. P. Kishore Chandra, Scientist, attended the National Training Programme in DNA Finger Printing in Farm Animals at National Dairy Research Institute, Karnal, 25 February to 14 March 1997.

Shri. M. Shashi Shekhar, Scientist, attended a training course in Application of Biotechnology in Animal Health Management at Centre of Advanced Studies in Animal Biotechnology, Indian Veterinary Research Institute, Izatnagar, 20 February to 12 March 1997.

NATIONAL AQUACULTURE WEEK

The Institute participated in the National Aquaculture Week, organised by Aquaculture Foundation of India, Chennai and co-sponsored by Fisheries Division, ICAR, Dept. of Agriculture and Co-operation (Ministry of Agriculture), Dept. of Ocean Development and Dept. of Biotechnology, Govt. of India, at Vijayawada, during 24-26 January 1997 and at Chennai during 31 January - 1 February 1997. The following scientists took part in the deliberations of the technical sessions: Dr. R. D. Prasadam, Dr. K. Gopinathan, Dr. L. H. Rao, Dr. P. Ravichandran, Shri M. Kathirvel, Dr. S. Kulasekarapandian, Shri D. Narayanaswamy, Dr. S. A. Ali, Dr. A. R. Thirunavukkarasu, Dr. C. Gopal, Dr. K. V. Rajendran and Dr. S.S. Mishra.

EXHIBITION

The Institute participated in "Aqua Fair", organised by Inland Capture Fisheries Society of India at Central Inland Capture Fisheries Research Institute, Barrackpore, in connection with the Golden Jubilee Celebration of CICFRI during 16-17

March 1997. The Institute's activities and achievements were exhibited in the form of charts and photographs. The Scientists, namely, S/ Shri Hardial Singh, S.R. Das, R.K. Chakraborti, Dr. P.K. Ghosh and Shri B.K. Banerjee from Kakdwip Research Centre and Shri Marella Ravi, Photographer, from the Headquarters participated in the exhibition.

STAFF NEWS

Appointment

Shri S. Stanline as T-II-3 at Chennai, 17 February 1997.

Promotion

Smt. S. Bhagirathi, Assistant as Superintendent at Chennai, 27 February 1997.

Transfer

Dr. P.S.P. Gupta, Scientist, from CIBA, Chennai to National Institute of Animal Nutrition and Physiology, Bangalore, on Inter-Institutional transfer. Relieved on 4 January 1997.

Shri R. Rangeshwaran, Scientist, from CIBA, Chennai to Project Directorate of Biological Control, Bangalore, on Inter-Institutional transfer. Relieved on 4 March 1997.

Dr. J.V. Ramana, Scientist, from CIBA, Chennai to National Institute of



Dr. M. Sakthivel, President, Aquaculture Foundation of India, Chennai, interacting with the scientists of CIBA during the celebrations of National Aquaculture Week at Muttukadu Experimental Station

Animal Nutrition and Physiology, Bangalore, on Inter-Institutional transfer. Relieved on 31 March 1997.

Relief

Shri N. Kalaimani, Senior Scientist, relieved on 2-year study leave, 27 January 1997.

PUBLICATIONS

The Institute has published the following Technical Bulletin and Extension series.

- CIBA Bulletin No. 10, Mud crab culture, March 1997.
- CIBA Extension series, No. 8, Site selection and farm design, January 1997.
- CIBA Extension series, No. 9, Finfish Farming, January 1997.
- CIBA Extension series, No. 10, Small-scale shrimp hatchery technology. January 1997.
- CIBA Extension series, No. 11, Disease diagnosis and health management in shrimp farms, January 1997.
- CIBA Extension series, No. 12, Shrimp nutrition and feed technology, January 1997.
- CIBA Extension series, No. 13, The brine shrimp *Artemia*: Biomass and cyst production, March 1997.



The Institute's stall at "Aqua Fair", organised by the Inland Fisheries Society of India at C.I.C.F.R.I, Barrackpore, West Bengal

