CIFRI NEWSLETTER

Volume 5 September-December 1982 Number 5 & 6

SEED PRODUCTION—NEED OF THE HOUR

SIXTH WORKSHOP ON AIR-BREATHING FISH CULTURE

Dr. A. V. Natarajan, Director welcomes the participants

The Sixth Workshop on All India Coordinated Research Project on Air-breathing Fish Culture was held at Barrackpore during 27-28 December 1982. The deliberations centred mainly around the need to augment seed production.

Also Inside

VI WORKSHOP

The Sixth Workshop on All India Coordinated Research Project on Air Breathing Fish Culture was held at Barrackpore during 27-28 December 1982. The Workshop evaluated the work done under the Project from 1980 to 1982. The deliberations centred mainly around the need to augment the seed production. The biological constraints coming in the way of largescale seed production of air-breathing fishes were discussed.

The Workshop was inaugurated by Shri G. N. Mitra, the distinguished fisheries scientist. Dr. P.S.B.R. James, ADG (F), Indian Council of Agricultural Research, Prof. B. I. Sunderaj, Delhi University, Prof. S. K. Moitra, Burdwan University, Prof. N. C. Dutta, Calcutta University, Dr. V. D. Singh, Dy. Commissioner of Fisheries, Shri S R. Banerjee, SFDC, Bihar and Shri Gour Narayan, State Fisheries Department, Bihar were among the distinguished persons who participated in the deliberations.

Attention was drawn to the achievements at various centres in breeding the magur, singhi & murrels. Dr. A. V. Natarajan, Director, Central Inland Fisheries Research Institute explained to the participants that low fecundity, cannibalism among young ones, lack of understanding of the nutritional requirements of young ones and the practice of stocking at high density together posed a challenge in meeting the seed requirements of live fishes. However, several headways had been made under the Project. The success at Assam and West Bengal centres in mass breeding of magur was specially appreciated in the Workshop.

The Workshop keenly felt the need for standardisation of the breeding techniques evolved so far. A probe into the utility of synthetic hormone in artificial breeding and an objective assessment on the possible sympathetic breeding of air-breathing fishes was also called for. Apart from this, the importance of survey on natural seed resources was also stressed in the Workshop by Dr. B. I. Sunderaj, Professor of Zoology, Delhi University. Dr. Natarajan suggested the preparation of updated seed calender indicating location-wise availability of live-fish seed in qualitative terms. Further, he opined that ecological conditions which favour and the natural breeding of air-breathing fishes also might be looked into.

Nutritional requirements : High rate of production (1618 to 2240 kg/ha) obtained at Barrackpore centre with low cost feed of vegetable origin was commended in the Workshop. The experiment with feed containing composted water hyacinth was particularly interesting, Dr. V. R. P. Sinha, Head, FARTC opined. Appreciating the efforts done so far in formation of supplementary feed, Shri G. N. Mitra, Fisheries Consultant, Orissa said this field deserved further attention with regard to identification and standardisation of cheap, efficient feed in seed rearing and culture of various species of air-breathing fishes. Dr. Natarajan called for trials on acceptability and digestibility of formulated feeds. Dr. Sinha offered help from FARTC in feed formulation and nutrition experiments.

Culture practices : Discussion was also held on the adopted culture practices. Highly encouraging yield of 375 kg/ha in 30 days under paddy-cum-air-breathing fish culture were reported in the Workshop by Shri P. K. Pandit, S-1. Participants were curious to know the effects of stocking density on yield. Based on the results obtained, Shri P. Das, Project Coordinator felt that the stocking density could be brought down without hampering the production. The Workshop suggested, taking in to consideration the management practices adopted, the stocking density in culture experiments might vary between 20,000 and 30,000 fingerlings/ha for magur, 15,000 and 20,000 for murrels and 40,000 and 50,000 for singhi and koi. Dr. P.S.B.R. James, ADG (Fisheries), ICAR felt the need for further

The workshop was attended by a number of scientists and administrators from various states.

emphasis on cage culture of air-breathing fishes. He also favoured more experiments in derelict waters and swamps.

Basic investigations : Studies on biomonics, karyomorphology, hybridization and photoperiodicity on maturation of air-breathing fishes were well appreciated by the Workshop. Investigations on effects of different dietary proteins on growth and metabolism on magur and effect of pesticides on air-breathing fishes also yielded valuable results.

Future work programme

The Project Coordinator expressed all out appreciation for the extremely cordial Institute-States relationship in implementing the project programme. He assured the workshop that the scientists would definitely improve their performances when the required facilities are provided to them. He said the future work programme would give emphasis on :

—further stress on induced breeding with diverse inducing agents

—standardisation of stocking density for various species and under various ecological conditions ;

—formulation of comparatively cheap feed of animal and vegetable origin from locally available sources

—cage culture

—utilization of swampy and derelict areas

—pathological invesigations

—seed prospecting etc.

The Workshop also looked into the detailed technical programme for each centre. □

RESEARCH HIGHLIGHTS

Artificial breeding of seabream

The seabream *Sparus datnia*, locally known as *Kal kuranti* was subjected to induced breeding by scientists of Puri Research Centre. Report of successful breeding of this commercially important Chilka fish came in during December 1982. Mature female fishes in the size range of 700-1500 g and males in the range of 700-1200 g were bred through hypophysation and stripping. Oozing parents were collected from Chilka lake near the lake mouth. Incubation period was 23 hrs at a temperature of 23-24°C and the yolk sac was completely absorbed within 2 days after hatching. Percentages of fertilization and hatching were 65 and 60 respectively. They were reared in sea water (in plastic pools) and fed 2-3 times a day with 'green water'. Three day old larvae were transported to hatchery at Puri for further rearing. □

A novel method to collect prawn larvae

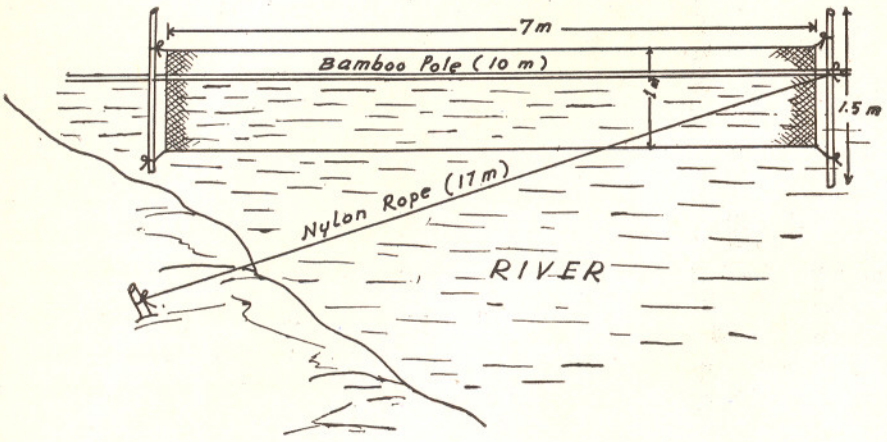


Fig.1.

A diagrammatic sketch of the operation o f the net

A new net has been designed to collect the post larvae of tiger prawn, *Penaeus monodon* from Sunderbans, West Bengal. Conventional type of spawn collecting gears like Midnapore type shooting nets have limited utility in Sunderbans. Fishermen can not wade into these waters to fix the conventional nets. The gradient is often too steep to facilitate easy fixing of shooting nets. The fishermen also are afraid of the shark and ray attacks that frequently occur in the area. The new net makes it possible to collect post larvae of tiger prawn without venturing into water.

The contraption is a net, 7 m long and 1 m wide, suspended across the water surface at right angles to the shore with the help of a long bamboo pole. The net is kept in position (perpendicular to the shore) with the help of a rope (see picture). About two third of the width of the net is immersed in water so that a water column of about 67 cm (from the surface) all along the 7 m net is continuously filtered. The prawn larvae thus filtered find their way towards the shore by wave and wind action and they get accumulated at the shoreward end of the net. They can be scooped up periodically. The net can easily withstand moderate water currents.

The net is a simple and cheap at the same time highly efficient in the prevailing conditions □

Tea seed cake—an effective fish toxicant

Preliminary experiments conducted at CIFRI suggest that tea seed cake is a good fish toxicant. It is a pond manure too. Under laboratory conditions, it could effectively kill tilapia, koi, magur and murrel. Use of chemical toxicants for fish kill is widely denounced for its deleterious effects on the environment. Search for suitable fish toxicants of biological origin is on for quite some time at CIFRI. It is in this context that CIFRI has tried tea seed cake, a rather unconventional toxicant.

A jar experiment showed that tea seed cake @ 50 to 100 ppm could effect a total kill of tilapia (103-135 mm) within 1-1½ hrs. A dose of 100 ppm was needed to kill *Channa punctatus* (135-224mm) in 4 hours 45 minutes. *Anabas testudineus* (132-145mm) and *Heteropneustes fossilis* (102-145 mm) required a dose of 50 ppm and 100 ppm respectively. While *Anabas* took 4 hours 15 minutes, *Heteropneustes* required 3 hrs 40 minutes to get killed.

Tea seed cake was found to be effective for eradicating aquatic snails too. Snails were totally killed at 100-150 ppm in about 24-30 hrs. The experiments were conducted in 10 litre glass jars in the laboratory at a temperature of 29°C to 31.5°C.

Tea seed cake is a good manure to fertilize the nursery ponds. In China, seed cake of the tea *(Camellia sinensis)* containing 7-8% saponin is used as fish poison.

Experiments were continued in plastic pools containing 200 l water. A 2.5 cm layer of pond soil was provided at the bottom and the water temperature was maintained between 22°C to 24°C. Tilapia (120 mm), murrel (100mm), singhi (100 mm) and koi (90 mm) were used as test fishes. At 100 ppm, carps took 2 hrs, tilapia, koi and singhi took 4½ hrs and murrels took 5½ hrs to perish. When a dose of 150 ppm was tried all fishes except murrel and koi died within 3 hours. Murrels and koi required 4 hours exposure. Residual toxicity in the treated water was about 10 to 12 days at water temperature ranging from 22°C to 24°C.

EXTENSION SCENE

Training :

TRAINING IN SURVEY OF POND & TANKS

Bangalore Research Centre of CIFRI has arranged a training for taluk level officials of Karnataka State Fisheries Department in survey of ponds and tanks in Bangalore, Kolar, Tumkur, Mandya and Mysore. Fifty officers were trained in a month-long training programme. The training included lectures, discussions and demonstrations of survey techniques. On the successful completion of the training programme Shri D.B. Pawar, Hon'ble Minister of State for Fisheries & Ports, Government of Karnataka distributed the certificates to the officials at a function held at Bangalore on 14.10.82. (see picture).

TRAINING IN BEEL FISHERIES MANAGEMENT

The newly recruited beel managers of the Assam Fisheries Development Corporation were imparted training in beel fisheries management. In the training programme organised at the Gauhati centre of CIFRI on 26.8.82, participants were apprised of the vast fishery potential the beels offer and the various aspects involved in its management. □

A four day training programme was conducted for the benefit of 41 fish farmers at Kamarpukur from 17-20 November, 1982. The fish farmers belonged to 13 villages under Goghat Block of Hooghly Dist. Methods of pond fertilisation, supplementary feeding and methods of fish sampling were demonstrated to them at a pond in the village, Indira. □

Ten fish farmers completed their 6 days training (II phase) in 'Plant protection in paddy' at Krishi Vigyan Kendra, Kakdwip on 11.11.82. □

Shri Durlov Gogoi, from Assam Agricultural University underwent training in different aquacultural practices including RFS integrated farming system. He was at CIFRI from 15.12.82 to 30.12.82. □

Students briefed :

Ten students from Bethune College, Calcutta, 12 M.Sc. (Zoology) students from the University of Gauhati, seventeen trainees from Vivekananda Institute of Community Development, Mandra and 15 students (Aquaculture) from S.S.L. Jain College, Vidisha, Madhya Pradesh visited the Institute.

Field visit :

Shri U. Bhowmick, Scientist-1 visited the pond of Bangodaya Cotton Mills, Sodepur on 5.11 82 and offered suggestions for control of fish mortality.

Talk :

Shri P. Das, Scientist S-3, delivered a talk on communication media in relation to adoption of scientific fish culture to the Comprehensive Area Development Centre officials at Calcutta on 19.11.82. □

Shri U. Bhowmick participated in a group discussion with a batch of bank officials on modern aquaculture practices at Kalyani on 18.12.82 □

Shri R. N. Pal S-2 delivered a lecture on 'Fish mortality-diseases and their control' at Jokka the benefit of trainee fish farmers sponsored by the Government of West Bengal. □

VISITORS

Dr. Arditti at CIFRI

Dr. Jean-Claude Arditti, Deputy Counsellor for Scientific and Technical Affairs, Embassy of France, New Delhi, visited CIFRI on 13 September 1982. Dr. Arditti desired to know the various technologies developed by the Institute on fresh and brackishwater fish culture. Dr. A. V. Natarajan, Director CIFRI, briefed the visitor on various achievements of the Institute in fresh, brackish and coldwater fish culture as well as on development of management principles for improved fish yield from natural fishery resources. Dr. Arditti showed keen interest in shrimp culture technology of the Institute as well as frog culture. He recounted various achievements of France in mariculture. Dr. Arditti also evinced interest in sewage-fed fish culture technology of the Institute.

Dr. Arditti was taken round to recirculatory-cum-filtering aquaculture system. He was deeply impressed by the technology. He looks forward to revisit the Institute to acquaint himself better with the various programmes being pursued in out-stations.

STAFF NEWS

Apurba Ghosh as new Project Coordinator

Shri Apurba Ghosh is appointed Project Coordinator, All India Coordinated Project on Brackishwater Fish Farming. He joined duty at Barrackpore on 22.10.82.

Shri Ghosh joined CIFRI in 1957. He had made original contributions in brackishwater aquaculture during his stay at Kakdwip Research Centre of CIFRI from 1964 to 1969. His pioneering work in sewage fed fish culture and Paddy-cum-Fish Culture at Rahara since 1969 has earned him and the Institute wide acclaim.

Other visitors

☐ Dr. M. M. Anwar Faculty Member National Academy for Agricultural Research Management on 12.10.82.

☐ Dr. Christopher Price, Fishery Expert, Nimgachi Fish Culture Project, Pabna, Bangladesh on 29.10.82.

PH. D. DEGREES AWARDED

T. Ramaprabhu

Shri T. Ramaprabhu, Scientist was awarded the degree of Ph.D. by Calcutta University for his thesis "Studies on some common aquatic weeds of cultivable freshwaters". The study covered the seasonal abundance, phenology, reproductive capacity, germination and propagation of the weeds *Ottelia alismoides*, *Ceratophyllum demersum and Nechamandra alternifolia* in relation to the ecological conditions of pond habitat.

Trained in USA

Dr. Ramaprabhu had been to USA from 1980-81 under an IDRC research/study programme on aquatic weeds The programme was organised at the Centre of Aquatic weeds University of Florida, Gainesville, Florida, USA. He also visited Aquatic Weed Research Laboratory, California, Aquatic Biology Section, Illinois, International Centre for Aquaculture, Auburn University, and Aquatic Plant Management Inc.. Phoenix, Arizona.

P. K. Mukhopadhyay

The Calcutta University has awarded Ph.D. degree to Shri P. K. Mukhopadhyaya, Scientist. The degree is conferred on him on the basis of his brilliant study on "Biochemical and pathological studies on the toxicity of malathion in the air-breathing fish *Clarias batrachus*". The study brought to relief certain aspects of the functional mechanism of blood and tissues at cellular and sub-cellular levels after the fish was exposed to sublethal levels of the pesticide. This contribution makes it possible to ascertain the mode of toxic actions of malathion in the fish. It also helps in understanding the biochemical significance of the pathological lesions produced in the fish due to sublethal toxicity of the pesticide before any frank sign of toxicity is apparent.

Ph. D.....

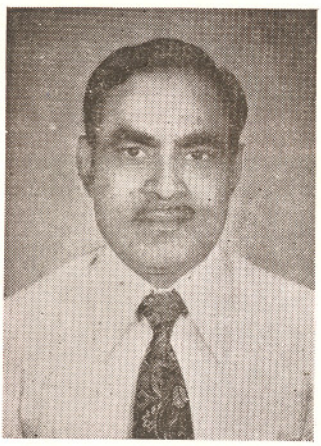
K. M. Das

Shri K. M. Das, Scientist-1 gets Ph.D. degree from the University of Burdwan for his thesis entitled 'Studies on the digestive enzymes in some common freshwater fishes of West Bengal'. He studied the physiology of digestion in Indian major carps to identify the role of digestive enzymes in relation to food and feeding of *L. rohita*, *C. catla* and *C. mrigala*. Qualitative and quantitative estimations of digestive enzymes in relation to food and feeding habits are made. Effect of PH and temperature, diet diversity, starvation and circadian rhythm on digestive enzymes in *L. rohita* were studied.

V. R. Desai

Agra University has conferred the degree of Ph. D. on Shri V. R. Desai, Scientists-2 at Rihand Centre. His thesis entitled "Studies on fishery and biological aspects of Tor mahseer, *Tor tor* (Hamilton) from River Narmada" is based on the investigations on biology and fisheries of the fish from a 48 km stretch of River Narmada around Hoshangabad. The biological aspects covered include food and feeding habits, maturity and breeding, age and growth etc.

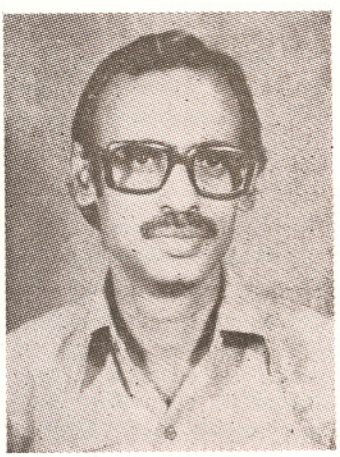
The study is very much relevent inview of the development of



mahseer fishing in Narmada basin and in reservoir proposed to be constructed under the master plan for Narmada by Govt. of M P.

SEMINAR/SYPMOSUIM

Dr. G. N. Chattopadhyaya—S-1 attended the 47th annual convention of Indian Society of Soil Science at Nagpur during 2-4 October, 1982. He presented a paper entitled 'Possibilities of brackishwater paddy-cum-fish farming in coastal saline soils of West Bengal' by G. N. Chattopadhyay, Apurba Ghosh & P. K. Chakraborty. The paper highlighted the bright prospects of paddy-cum-fish culture in the coastal saline soils of West Bengal.



Symposium on Ichthyology :

Dr. A. G. Jhingran, Shri Y. S. Yadava and Shri M. P. Singh Kohli represented CIFRI in the third All India Symposium on Icthyology held at Gauhati University from July 25-29, 1982. Dr Jhingran delivered a special lecture on "Small reservoir fisheries in India". Sri Y. S. Yadava presented a paper on the 'Macrobenthic fauna of Dighali Beel'. Shri Kohli presented a paper entitled "Spawning behaviour in *Heteropneustes fossilis*". During the discussions on development of inland aquaculture stress was given to the beel fisheries of Assam. The delegates were also taken to a few beels around Gauhati.

CIFRI Scientists at CAB

The college of Agricultural Banking (CAB), Reserve Bank of India, Pune organised the 'Third Programme on Financing of Fishery' during 22-27 the November 1982. Sarvashri K. K. Ghosh and S. Paul were deputed to deliver lectures to the bank executives. Shri K. K. Ghosh delivered two lectures viz. (1) Inland fishery resources - Culture and capture fishery water resources and their utilization- Requirements of fish seed and (2) Techno-economic appraisal of coastal aquaculture. Shri Paul talked on (1) Techno-economic appraisal of culture fishery (carps, catfishes and murrels) and (2) Techno-economic appraisal of paddy-cum-fish culture.

Transfers

Name	*Designation*	*From*	*To*
Shri C. Selvaraj	Scientist-2	Dhauli	Pollachi
,, S. K. Wishard	S-1	Allahabad	Kalyani
,, N. C. Basu	T-6	Kakdwip	Barrackpore
,, B. C. Halder	Fisherman	Digha	Barrackpore
,, N. K. Das	Watchman	Barrackpore	Dhiga

Retirement

Shri P. K. Sthanapathi Assistant Administrative Officer, retired from service with effect from the afternoon of 30-11-1982 on attaining the age of superannuation.

Appointments

The following appointments were made during the period under report.

Name	*Designation*	*Posted at*
Shri Apurba Ghosh	Project Coordinator, AICRP on Brackishwater aquaculture	Barrackpore
,, N. Sarangi	T-4	Dhauli
,, Sukumar Saha	T-4	Kakdwip
Kumari Jayashri Das	Jr. Clerk	Barrackpore

Promotions

The following members of the staff were promoted during the period under report :

Name	*From*	*To*	*Name*	*From*	*To*
Shri S. L. Kar	Scientist-S	Scientist-1	Shri S. Krishnan	T-2	T-I-3
,, Ashish Chowdhury	T-4	T-5	,, R. K. Langer	,,	,,
,, A. C. Banerjee	T-4	T-5	,, M. P. Singh	,,	,,

STAFF NEWS

Name	From	To	Name	From	To
Shri A. R. Majumdar	T-4	T-5	Shri A. N. Mohanty	,,	,,
,, K. S. Rao	T-4	T-5	,, N. Sarengi	,,	,,
,, S. L. Raghavan	T-4	T-5	,, Camil Lakra	,,	,,
,, D. R. Rao	T-4	T-5	,, R. N. Singh	,	,,
,, T. S. Ramaraju	T-4	T-5	,, D. Tarai	,,	,,
,, R. C. Singh	T-4	T-5	,, R. S. Negi	,,	,,
,, P. B. Das	T-4	T-5	,, Kishan Deo	,,	,,
,, B. K. Saha	T-4	T-5	,, J. C. Saha	,,	,,
,, R. N. Dey	T-4	T-5	,, S. C. Das	,,	,,
,, Ramji Tiwari	T-2	T-I-3	,, Basmadhyay	,,	,,
,, Donald Singh	,,	,,	,, R. M. Roy	,,	,,

Training

Shri K. N. Krishnamoorti, Shri Kuldip Kumar and Dr. S. M. Pillai have undergone training on fish nutrition under Dr. K. Chou, FAO Consultant on fish nutrition and feed technology at FARTC, Dhauli during 27 August—21 October, 1982.

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Edited by :
B. N. Saigal, V. V. Sugunan, V. K. Unnithan, (Mrs.) G. K. Vinci and S. Paul.
Published by :
The Director, Central Inland Fisheries Research Institute, Barrackpore.
Printed by :
ROMAN PRINTERS (S. S. I. Regd. Unit) 37 Andul Road Howrah 711 109 West Bengal.