INGA News
Newsletter of the International Network on Genetics in Aquaculture

Progress of the Carp Genetics Project

A training workshop on Analysis of Socioeconomic and Genetic Data of the Project on the Genetic Improvement of Carp Species in Asia was held at the ICLARM Headquarters, Penang, Malaysia from 21 March to 7 April 2000. The objectives of the workshop were to help national scientists analyze the data from the surveys and experiments so far completed, and to strengthen their capabilities for data handling. Twenty-two scientists from Bangladesh, China, India, Indonesia, Thailand, and Vietnam participated in the workshop. Socioeconomic analysis of data on consumers and producers in all countries is in the final stage. Final estimates of yield losses due to various factors, expected returns from various types of carp aquatic research, technical efficiency of carp production, price and income elasticities of demand for different carp species, and other econometric analysis of this data will be ready by September 2000. For the genetics component, most research focuses on strain evaluation and selective breeding. There is also some research on triploidy and monosex female culture in common carp. The Central Institute for Freshwater Aquaculture (CIFA), India, is developing molecular genetics techniques to be used in conjunction with the selective breeding program. Single-trait (size at harvest) selection is being used by most programs and mass selection is the method used in most collaborating institutions. Most of the species studied have wild or mixed wild/farmed base stocks, except for the common carp (all farmed). Initial size differences between groups are a common problem constraining the accuracy of evaluations of different strains and families in common stocking. Tests were, therefore, conducted to evaluate the significance of the effects of the initial weight on the final weight at harvest. Estimation of genetic parameters is in progress. A summary of the breeding programs in progress or planned in each country is given below.

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The summary of breeding programs.

Country	Species	Traits	Selection method
Bangladesh	Silver barb *(Barbodes gonionotus)*	Size at harvest	Mass
	Catla *(Catla catla)*	Size at harvest	To be decided
China	Common carp *(Cyprinus carpio)*	Size at harvest	Mass
	Blunt snout bream *(Megalobrama amblycephala)*	Size 1 (3 cm)	Mass
		Size 2 (10-15 cm)	Two separate lines
		Size at harvest (>300 g)	
India	Rohu *(Labeo rohita)*	Size at harvest (Disease resistance later)	Combined Mass (family later)
	Common carp (*C. carpio*)	Size at harvest (Late maturity)	To be decided
Indonesia	Common carp (*C. carpio*)	Size at harvest	To be decided
Thailand	Silver barb (*B. gonionotus*)	Size at harvest	Mass
	Common carp (*C. carpio*)		Mass
Vietnam	Common carp (*C. carpio*)	(Early survival) Size at harvest	Family
	Silver barb *(B. gonionotus)*	Size at harvest	Mass

Transfer of Selective Breeding Technology to Sub-Saharan Africa and Egypt

Although Africa is rich in fish genetic resources, especially the tilapia species, poor people in Africa do not get adequate dietary protein. The potential of aquaculture has not been fully tapped and the strains of fish used in aquaculture need to be improved to raise productivity.

ICLARM and its partners from the Philippines and Norway have successfully developed methods for selective breeding of tropical finfish through the Genetic Improvement of Farmed Tilapia (GIFT) project. Various African countries, including Côte d'Ivoire, Egypt, Ghana, and Malawi requested the transfer of GIFT technology and training in selective breeding to them. In response to this and to address the requirements of African aquaculture, ICLARM and its partners will implement a project entitled *Transfer of Selective Breeding Technology for Aquaculture Improvement from Asia to Sub-Saharan Africa and Egypt.* With funds from the Japanese Human Resources Development Fund of the United Nations Development Programme, the project will accomplish the following:

(i) establishment of a regional tilapia genetic enhancement center in Egypt; and

(ii) training of Egyptian and sub-Saharan African scientists by Philippine scientists.

The expected beneficiaries of this project are the national fisheries and aquaculture services and ultimately the client farmers in Africa and Egypt who are currently using poor performing breeds of tilapia.

Senior Scientists From India Visit Thailand and Philippines

The genetic improvement programs aimed at producing improved fish breeds for use in aquaculture operations are well underway in a majority of INGA member countries. In India, the Central Institute of Freshwater Aquaculture (CIFA) has improved the growth performance of rohu (*Labeo rohita*) through selective breeding. The second generation improved strain is ready for dissemination to farmers. CIFA is keen to formulate strategies and plans for the dissemination of the improved strain to farmers throughout India. This will entail the distribution of germplasm to hatcheries and training the hatcheries to maintain the quality of germplasm without inbreeding through appropriate broodstock management practices. In this connection, INGA assisted the visit of the two Principal Scientists of CIFA, Dr. P.V.G.K. Reddy and Dr. R.K. Jana to the GIFT Foundation International Inc. (GFII) in the Philippines and the National Aquaculture Genetics Research Institute (NAGRI), Department of Fisheries, in Thailand to study the dissemination strategies being followed by these institutions for dissemination of improved germplasms in the two countries.

Dr. R.K. Jana visited the Philippines and Thailand from February 28 to March 4, 2000. Dr. P.V.G.K. Reddy visited these countries from April 15 to 23, 2000. In the Philippines, they visited the GFII, the Freshwater Aquaculture Center of the Central Luzon State University, the National Freshwater Fisheries Technology Research Center of the Bureau of Fisheries and Aquatic Resources, and the nearby tilapia farms accredited by GFII. In Thailand, they visited the National Aquaculture Genetics Research Institute in Pathumthani, the National Inland Fisheries Institute in Ayudhaya, and some private hatcheries and farms in Cha-chaengsao and Prachinburi.

Request for Tilapia Germplasm

The Governments of Fiji, India, Malaysia and Thailand have asked for sixth generation GIFT germplasm for use in selective breeding experiments. The GIFT Foundation International Inc., in coordination with ICLARM, is now breeding the fish for shipment to these countries. The GIFT Project/ICLARM handed over the improved tilapia germplasm to the Foundation when the project ended in 1997, so that the foundation could continue the selective breeding research and disseminate it to the farmers.

Transgenic Salmon for Commercial Aquaculture Production

Despite the many concerns associated with the use of transgenic fish in aquaculture, some fish biologists are now using transgenesis to produce fish with improved growth rates and other economically desirable traits. The A/F Protein Company, a development stage biotechnology company based in USA and Canada, uses 'all fish' gene constructs based on antifreeze protein gene promoter to produce transgenic Atlantic and Pacific salmon that are fast growing. Some individual fish grow 10 to 30 times during the early phase of growth. Transgenic salmon brood stocks are now being developed at Prince Edward Island, Canada by A/F Protein Canada. It is anticipated that the transgenic fish will represent a new generation of brood stock, which will enhance the capacity and intensity of aquaculture outputs. Source: Hew, Choy L. and G. Fletcher. Transgenic fish for aquaculture (on line) Available: http://cii.mond.org/9708/970812.html (April 19, 2000)

Meeting on Biosafety

The Convention on Biological Diversity announces the schedule of the *6th International Symposium on the Biosafety of Genetically Modified Organisms*. The meeting will be held on 8-13 July 2001 at Saskatchewan, Canada and is directed to scientists actively involved in biological risk assessment and/or biotechnology regulations.

For complete information, contact Saskatchewan, Canada Biosafety Symposium Conference and Catering Office, Saskatoon, Canada; Tel: 1 306 966 86000; Fax: 1 306 966 8599; E-mail: conference – catering@usask.ca; Web: http:/www.usask.ca/agriculture/biosafety (on line). Available: http://www.biodiv.org/conv/Bio-Calendar2000.html

New Website on Aquaculture Genetics

The website of *Genetic Computation Limited* (http://www.genecomp.com/) brings to the attention of geneticists some important papers that have been published in journals.

For more information, consult the website http://www.genecomp.com/