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Note

Successful transportation of wild stock of endangered "Thooli" *(Labeo dussumieri)* spawners without anaesthetics

A. GOPALAKRISHNAN*, A.G. PONNIAH, VS. BASHEER, KG. PADMAKUMAR, ANURADHA KRISHNAN** AND KULDEEP K. LAL**

National Bureau of Fish Genetic Resources, Canal Ring Road, Dilkusha P. O., Lucknow-226 002, India

ABSTRACT

Several problems are encountered during transportation of fishes from wild to captivity. The note describes successful transportation of wild caught endangered *Labeo dussumieri* spawners over distances below 100 km without anesthesia or sophisticated transporting devices which is of immense help in the gene banking programme of endangered species.

One of the proven techniques of saving endangered species from extinction is to increase its population size with the help of sound breeding techniques under controlled conditions (Minckley and Deacon, 1991). The basic necessity of any captive propagation programme is a fish hatchery and brood stock of the target species which usually have to be transported from the wild. Construction of fish hatcheries only for endangered species will not be feasible and the cost effective alternative is to make use of the breeding facilities created for commercial purposes. Mostly, commercial hatcheries will be situated far away from the areas of occurrence of endangered species. Thus, transportation of endangered species usually caught from remote localities to distantly located hatcheries becomes inevitable in captive breeding programmes. The present report covers the successful transportation of wild stock of endangered "thooli" *(Labeo dussumieri)* without the use of sophisticated transporting devices and anesthetics for purpose of breeding and gene banking.

Labeo dussumieri, locally called as "thooli" is a cultivable, but endangered peninsular carp now found in only few rivers of Kerala. Earlier, the fish had a wide distribution and was also abundant in almost every river in Kerala, but became rare or totally disappeared over the years due to over-exploitation and indiscriminate killing of brood fish (Kurup, 1994). A recent survey

Present Address: * NBFGR Cochin Unit, C/o CMFRI, Ernakulam, Cochin-682 014, Kerala, India.
** Regional Agricultural Research Station, Kumarakom-682 566, Kottayam, Kerala, India.

conducted by the National Bureau of Fish Genetic Resources (NBFGR) in selected stretches of four rivers in Kerala revealed more than 80% decline of the stock in Manimala and Meenachil rivers and its total disappearance from Chalakkudy and Karuvannur rivers. In 1998, the NBFGR initiated a milt cryopreservation programme for this endangered species in collaboration with the Regional Agricultural Research Station (RARS) of the Kerala Agricultural University (KAU) at Kumarakom. The RARS is located in the vicinity of Vembanad lake and along the lower stretches of Meenachil (Kavanaar) river. The site was fixed based on pilot survey conducted. The laboratory and farm facilities of RARS were utilised to carryout the fertilization experiments to test the efficacy of cryopreserved milt.

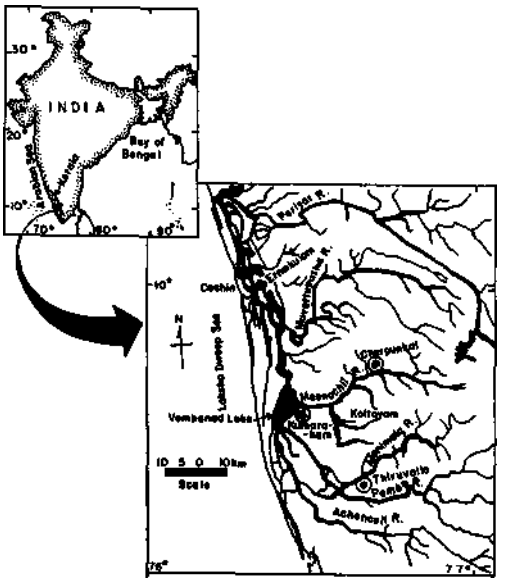

Fig. 1. Map showing Rivers of present occurrence of *Labeo dussumieri* in Kerala.

Sampling location ® Working place ®

Labeo dussumieri is an annual breeder with the peak breeding period during the southwest monsoon (June-July) season in Kerala (Kurup, 1994). He reported the upstream spawning migration of "thooli" from the lower stretches of Meenachil, Manimala and Pampa Rivers, and Vembanad Lake to the upstream of rivers (even upto 60-70 km and above), 2-3 days after the onset of monsoon showers. Two collection sites for spawners were fixed in the up stream (a) one at Cherpunkal along Meenachil river and (b) another at Kallungal along Manimala river. The collection sites were fixed based on the experience of local fishermen in encountering spawners. Both places are located more than 50 km away from RARS in two different directions (see Fig. 1 summarised from the Water Atlas of Kerala, 1995). Bamboo traps and or gill nets were arranged to catch spawners.

Transportation of specimens from Meenachil river

Ascending migration of "thooli" started after torrential rains in Meenachil. A total of 30 spawners were collected on 21 June 1998 using both bamboo traps and gill nets by evening and they were stocked temporarily in cement cisterns (10 tonne) filled with river water adjacent to the collection site. In the morning of 22nd June, 1998, 21 spawners were selected out of 30 for transporting to Kumarakom. Of the 21 specimens, 8 were males (each approximately 450 g) and the rest were females (each weighing approx. 900 g). The males were kept individually in oxygen filled polythene bags and females were carefully transferred to a 100 1 plastic bin, filled with river water (~ 75 litres) and its top portion covered with nylon mesh. Continuous oxygen supply was also provided to the fish. The specimens

(total weight 15.5 kg) were soon transported from the site to Kumarakom in a jeep with an average speed of 25 km/ hour to avoid too much splashing of water. The vehicle was halted twice on its way along the banks of flooded Meenachil to replenish water in the bin. The mean water temperature during transportation was 28.0±1.5°C. The specimens reached Kumarakom after 3 hours of road journey. They were given a brief dip in $KMn0_4$ and soon both the sexes were stocked in separate hapas in a concrete pond (capacity 12 tonnes) kept ready for receiving the spawners. The fish were left undisturbed for 2 days prior to milt collection and fertilization experiments. One fourth of the water was replaced daily from the ponds and there was no mortality or injury infection to any of the spawners. All the specimens responded well to 'ovaprim' injection and the quality of egg and sperm were found to be good as evinced from the high hatching percentages. The gametes were successfully used for testing for development of sperm cryopreservation protocols.

Transportation of specimens from Manimala *river*

Specimens migrating upstream of Manimala river were caught using bamboo traps at Kallungal (Tiruvalla), adjacent to the Sugarcane Breeding Station of Kerala Agricultural University on 27 June, 1998. The spawners (7 males each weighing approx. 500 g and 7 females each weighing 1 kg, total weight approx. 11kg) were collected and stocked for 5 hours in a concrete tank (1 tonne capacity) near the collection site. Later all the fishes were transferred into a plastic bin (100 1 capacity), filled with river water (~ 75 1) and transported with oxygen supply as in the previous case (Mean water temperature 27°C). On reaching EARS, males and females were stocked in separate hapas in a concrete tank (10 tonnes capacity) after a brief dip in $KMn0_4$. As in the previous case, no mortality or infection was noticed this time also and they released superior quality eggs during experiments.

Transportation of brood fish has always been a bottleneck, usually ending up with infections and mass mortalities (Peer Mohammed and Devaraj, 1997). The major causative factors behind this are (1) high concentration of carbon dioxide and ammonia (2) change in pH and alkalinity of water as a result of accumulation of wastes (3) deficiency of oxygen in the transporting medium and (4) hyperactivity, strain, exhaustion and physical injuries during transport (Ferreira *et al.*, 1984; Berka, 1986; Peer Mohammed and Devaraj, 1997). Anaesthetic drugs such as benzocaine hydrochloride, phenoxyethanol, sodium amytal, MS-222 and neutralised MS-222 have been shown to be effective in promoting the survival of fish during transport (Smith and Hattingh, 1979, Ferreira et. al., 1984; Cloud *et al.*, 1990; McCarter, 1992). The anaesthetic drugs were not used in the present case to avoid residual effect if any on the gamete quality (Allison, 1961; Billard, 1981) since the milt was to be utilised in cryopreservation programmes. Also to keep the costs down, special transport devices were not fabricated.

The success in the live transport of "thooli" brood fish can be attributed to (1) capture of specimens using bamboo traps with absolutely nil or minimum injury, (2) provision of constant supply of oxygen during the journey, (3) partial replenishment of river water atleast twice

while transporting fish, (4) comparatively constant water temperature (27-28°C) and (5) optimum or low stocking density of fish (almost 12 kg) in 75 1 water for a distance of 55 km (3 hours).

In another attempt in 1994, NBFGR was able to transport successfully approx. 130 kg (45 specimens) of brood stock of *Cyprinus carpio* (mirror carp and scale carp) for a distance of 80 km along the rough hilly terrains from Rewalsar lake to Deoli fish farm, Bilaspur in Himachal Pradesh using 2 tanks of 4,000 1 total capacity without oxygenation (Lai, personal communication). Out of this, 30 specimens survived and were used repeatedly in successful breeding programmes (Ponniah, *et al.,* 1996). These results indicate that the spawners can be transported successfully without anaesthetics for shorter distances (below 100 km) which will be of immense help in conservation programmes of endangered fish species.

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