



Hypophysation-A Induced Breeding technique in “Labeo rohita”

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Abstract

Producing fish to spawn by artificial methods is called induced breeding. *Labeo rohita* are induced to spawn by the injection of pituitary extract, a process called Hypophysation. Hypophysation is a technique of induced breeding in *Labeo rohita* by injecting pituitary gland extract. In hypophysation, the pituitary gland extract is injected into intramuscular/pectoral fin region of fish. The gland induces the fish to breed. When the pituitary gland of the same species is used, the hypophysation is called homoplastic. Induced breeding is practised in a wide variety of species, with Hypophysation we can get pure seeds in large number in all seasons. With this technique we can produce hybrid varieties of species. This technique shows high fertilization rate(70-80%) and Hatching rate (75-85%) this study explores about procedure and result of hypophysation technique.

Keywords: Pituitary gland, *Labeo rohita*, Fertilization, Hybrid varieties, Homoplastic.

INTRODUCTION

Fish culture in freshwater ponds was practiced in India as early as 350 B.C., though on a limited scale. Carp culture is common in India. Aquaculture in the State of Punjab is a fast-developing income generating activity, providing a quality and low-cost protein diet to the people (Agarwal, 1999). At present, nearly 9890 ha is under fish farming as compared to 343 ha in 1980–81 and fish production increased in subsequent years from 2800 to 86000 tonnes, including both capture fisheries and aquaculture, For the last ten years, the States aquaculture production has contributed an annual average growth of 6000 tonnes per annum. The carp culture improves the socio- economic

status of fish farmers by adopting new scientific technology for breeding (Nandeesh and Rao, 1989). Rohu or *Labeo rohita* is a freshwater fish mostly found in rivers and ponds. They are geographically distributed along temperate and tropical regions like Vietnam, Pakistan, Nepal, India, Myanmar and Bangladesh. *Labeo* breeds mostly in bund types of tanks and rivers but not in confined waters. The adult *Labeo* fish is about 0.5 to 2 metres in length and weigh around 4 kg (maximum up to 45 kg). Their body is brownish or bluish on the dorsal surface and silvery-white below. Also, the body surface is covered with large and overlapping cycloid scales that are of taxonomic importance. These cycloid scales are round, bony and flat. The scales overlying the lateral line are perforated by the tubes of the lateral line system. They have a compressed and fusiform body that can be distinguished into the head, trunk and tail. They have a depressed head which forms an obtuse, short, and blunt snout. It also has paired eyes and paired nostrils. The head bears a fringe-lipped mouth in the subterminal region. The mouth is bounded by fleshy lower and upper lips. Two slender and filamentous barbels arise from the upper lip. Rohu contains homocercal caudal, dorsal, anal, ventral fins and paired pectoral fins. Their fin rays are typically soft. Furthermore, their caudal fins fork into two equal lobes. They have five pairs of gill slits that are covered by the operculum. The large operculum encloses gills as well as the branchial chamber. Weberian apparatus is present between the inner ear and swim bladder. They have mesonephric kidneys.

MATERIALS & METHODS

Materials required

Kingdom	Animalia
phylum	Chordata
class	Actinopterygii
Order	Cypriniformes
Genus	Labeo
Species	Rohita

Healthy Rohu fish, Acetone, Sterile blade, syringe, Distilled water, Cotton, Centrifuge, alcohol.



Method

This research study done at Government Degree and PG College (A), Siddipet (Department of M.Sc Fisheries) of Telangana state.

Hypophysation involves the following steps:

1. Collection of pituitary glands
2. Preparation of pituitary extract
3. Selection of breeders
4. Injection of pituitary extract
5. Breeding
6. Hatching

Steps involved in Hypophysation



1. Collection of Pituitary Gland

In the first step in hypophysation is the collection of pituitary glands. The gland is collected from *Labeo rohita* (Rohu) fishes. The pituitary gland is located on the ventral side of the brain. Then the head is dissected out to expose the brain. The pituitary gland is isolated from the ventral side of the brain. The pituitary glands are stored in alcohol for better use.

2. Preparation of Pituitary Extract

The glands are macerated in a tissue homogenizer with a little distilled water. The homogenate is diluted with distilled water. The preparation is centrifuged at about 1000rpm for 5 minutes. The

supernatant is the pituitary extract. It is preserved in glycol.

3. Selection of Breeders

Mature males and females are selected and stocked for hypophysation. Two males and one female form one unit for hypophysation.

Ratio of Male and Female is 2:1

4. Injection of Pituitary Extract

The selected males and females are kept on a table, the extract is injected intramuscularly at the base of the pectoral fin or pelvic fin or caudal fin. About 0.5 to 2ml of extract is given for breeder's weighing up to 10 kg. The female is given two doses, namely the first dose is preparatory dose and second one resolving dose. about 4 hours interval is given between the two doses. The male is given only one dose.

5. Breeding

After injection of the pituitary extract the breeders are introduced into a breeding hapa. The breeding hapa is a rectangular mosquito net cloth enclosure. The breeding hapa is built at our college premises. It is suspended in a pond water with the help of four poles. To provide the running water similar to river conditions is maintained in the hapa with the help of electric motors. the breeder's mate in the hapa. They breed in 14-17 hours.

6. Hatching

In 18-25 hours, the eggs are fertilized. The fertilized eggs are transferred to a hatching hapa which is at our PG Department. The hatching hapa is made up of two rectangular mosquito nets. It is suspended in water. The hatching hapa consists of an inner hapa and an outer hapa The eggs are hatched in the inner hapa. The hatchlings wriggle out through meshes of the inner hapa and reach the outer hapa.

Fertilization rate=Number of fertilized eggs/Number of estimated eggs x 100

The shells and dead eggs present in the inner hapa are removed. The hatchlings are kept in the outer hapa for three days Then they are transferred to nursery ponds at behind our college premises in cement tanks. And reared the seeds till they attained fingerling stage .

Result & Discussion

Induced breeding with Hypophysation we can get pure seeds in large number in all seasons. With

this technique we can produce hybrid varieties of species. This technique shows high fertilization rate(70-80%) and Hatching rate (75-85%) this study explores about procedure and result of hypophysation technique. Here we can get best quality of fish seeds

Conclusion

The breeding technique is most effective where we can get desired quality of seeds, provide specific benefits for aqua-culturists: Increased Control: Induced breeding allows for precise control over the timing of reproduction, facilitating synchronized spawning and better management of fish populations. Enhanced Productivity: By inducing breeding, farmers can achieve higher reproductive rates, leading to increased production of *Labeo rohita* fish, thereby improving overall farm yield. Genetic Selection: This technique enables selective breeding, allowing farmers to choose desirable traits such as faster growth, disease resistance, or better meat quality, leading to improved stock characteristics. Optimized Resources: Induced breeding helps utilize resources more efficiently by aligning the reproduction cycle with favorable environmental conditions, resulting in better survival rates for the offspring. Reduced Dependency on Natural Cycles: Farmers are less reliant on unpredictable natural breeding seasons, making it possible to breed *Labeo rohita* throughout the year, contributing to a steady and reliable supply.

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