

**Subject : Aquaculture**

**Unit : III**

**Topic : Induced Breeding**

**Class : II M.Sc Zoology.**



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# *INDUCED BREEDING*

## INTRODUCTION:

- ❖ The breeding of fishes in confined waters by pituitary hormone injection is called induced breeding.
- ❖ Induced breeding is practised in a wide variety of species such as Carps, Cat fishes, Clarius, Mulletts, etc.
- ❖ Induced breeding is needed because of,
  - environmental condition like photoperiod, rain, temperature, currents of water.
  - Insufficient release of hormones, insufficient of natural food.
  - Mixture of undesirable species and genetically more impure.
  - To have a pure quality, induced breeding technique is followed.

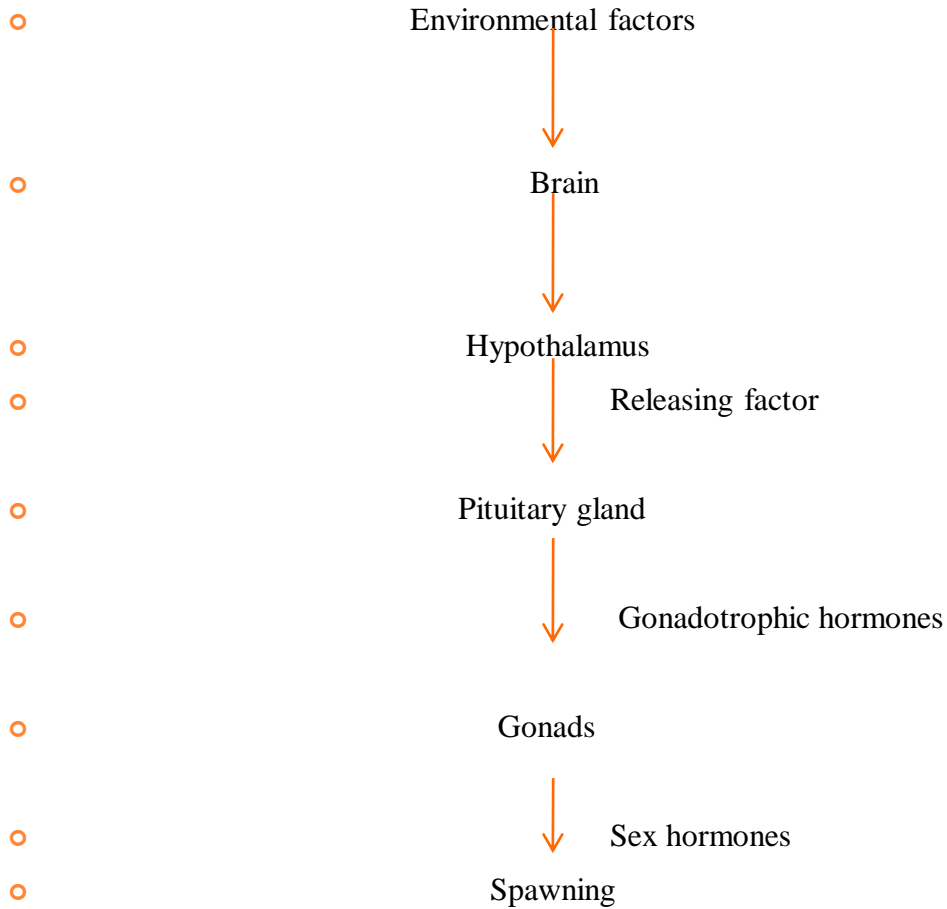


# DEVELOPMENT:

- ❖ Induced breeding technique was first developed in Brazil, in 1934.
- ❖ In India, it was developed by Hamid Khan in Mrigal in 1937.
- ❖ In 1957, Chaudhuri and Alikunhi successfully done in Indian major carps.



# PRINCIPLE OF HYPOPHYSATION



## PROCEDURE FOR HYPOPHYSATION

❖ Hypophysation involves the following steps:

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



## COLLECTION OF PITUITARY GLAND

- ❖ The gland is collected from mature fishes or any other vertebrates.
- ❖ It is located on the ventral side of the brain.
- ❖ It is isolated from the ventral side of the brain
- ❖ Pituitary glands are stored in alcohol.



# PREPARATION OF PITUITARY EXTRACT

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



# SELECTION OF BREEDERS

- ❖ Mature males and females of healthy carp breeders are selected.
- ❖ It should be in the age group of 2-4 years.
- ❖ Weight should be 1-5 kg.





# INJECTION OF PITUITARY EXTRACT

- ❖ The selected males and females are kept on a table on a cotton cushion.
- ❖ The pituitary extract is injected intramuscularly at the base of pectoral or pelvic fin or caudal fin.
- ❖ About 0.5 to 2 ml of extract is given for weighing upto 10 kg.
- ❖ The female is given two doses, namely a preparatory dose and a resolving dose.
- ❖ About 4 hours interval is given between the two doses.
- ❖ The male is given only one dose at the time of second injection to the females.



# INJECTION OF PITUITARY EXTRACT



# 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.
- ❖ It is suspended in a pond water with a help of four casuarina poles.
- ❖ The breeders mate in the hapa.
- ❖ They breed in 6 hours.



# BREEDING HAPA



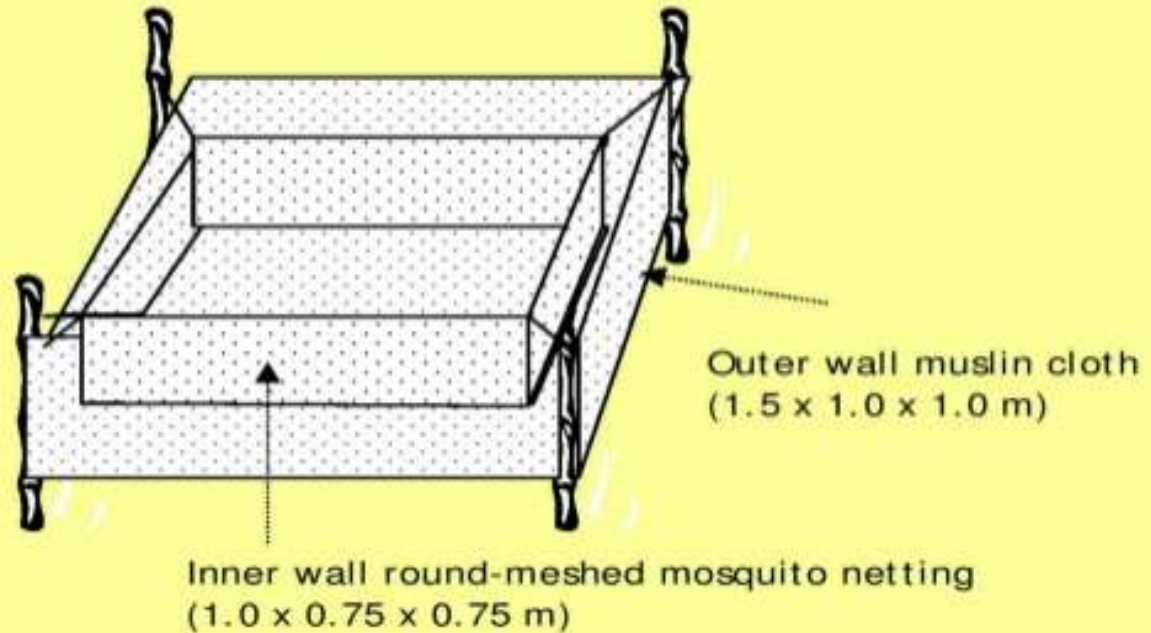
# HATCHING

- ❖ In 10 hours, the eggs are fertilized.
- ❖ Fertilized eggs are transferred to a hatching hapa.
- ❖ It is made up of two rectangular mosquito nets. It is suspended in water.
- ❖ The hatching hapa consists of an inner hapa and 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.
- ❖ 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.



# HATCHING HAPA.

*Hatching hapa*



## SUBSTITUTES OF PITUITARY EXTRACT

❖ In addition to pituitary extract, a number of agents is used for induced breeding.

They include

1. Human chorionic gonadotropin (HCG)
2. Luteinizing hormone (LH)
3. Progesterone
4. Antioestrogens
5. Ovaprim



# OVAPRIM

- ❖ Ovaprim is a drug used as a substitute for pituitary extract in induced breeding.
- ❖ Ovaprim is used for a variety of fishes such as Indian major carps , Salmon, Cat fish, Loach, etc.
- ❖ This drug is practised in countries like China, India, Pakistan, Taiwan, Singapore, Nigeria, Vietnam, Indonesia, Malasia, etc.
- ❖ Now a days 73% of the farmers use ovaprim instead of pituitary extract.

## Advantages:

It is readily available in the market

The technique is simple, just injection only.

Higher spawning rates.

It has long shelf-life.





# CONCLUSION

- Pure seeds can be obtained.
- Seeds are available in large numbers.
- Seeds can be obtained in all seasons.
- Hybrid varieties can be produced.



Thank  
you

