

Aquaculture Biotechnology

Induced Breeding

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- Induced breeding is a technique by which ripe or mature fish breeds in confined water when stimulated by pituitary hormone or by other synthetic hormone
- The stimulation promotes timely release of sperms and eggs from ripe gonads
- In simple words, spawning in fishes induced by artificial breeding stimuli is called “induced breeding.

HISTORY OF INDUCED BREEDING

- The technique of induced breeding was first evolved in Argentina after producing pituitary extract by B. A. Hussay in 1930.
- Brazilian was the first country to develop a technique for hypophysation in 1934.

NEED OF INDUCED BREEDING

- i. Because of environmental condition like photoperiod, rain, Temperature, currents of water.
- ii. Insufficient release of hormones in captive conditions.
- iii. Insufficient of natural foods. Insufficient of natural foods.

TECHNIQUES OF INDUCED BREEDING

(a). Location of pituitary gland –

- Pituitary gland is also known as hypophysis.

This gland in fishes is located at Sella turcica of sphenoid bone.

- It is situated on the ventral side of the brain just behind the optic chiasma and below the hypothalamus

COLLECTION OF PITUITARY GLAND

- Collection of pituitary gland made only from ripe gravid fish. Suitable periods for collection of gland of major carps is May to July
- Gland of homoplastic species is more effective than heteroplastic species.
- Gland obtained from immature and spent fishes do not give satisfactory result.

PRESERVATION AND STORAGE OF PITUITARY GLAND

- ❑ Glands are stored in 100% alcohol at ordinary temperature.
- ❑ After each 24 hours 100% alcohol is changed for further dehydration and fattening.
- ❑ The gland is stored in a refrigerator.
- ❑ Extract may also preserved in glycerine (3ml Extract +1ml water+2ml glycerine).

SELECTION OF BROODERS FOR INDUCED BREEDING

- ❑ The brooders should be healthy, fully ripe and medium sized
- ❑ The age group of 2-4 years and have the weight about 1-5 kg. suitable for induced breeding.
- ❑ Large sized breeders are avoided for difficulty in handling.

INJECTION TO THE BREEDERS

- For intra-muscular injection the fish is laid on its side and needle is inserted either in caudal peduncle or into shoulder.
- For intra-peritoneal the injection are given to the bases of paired pectoral fins.
- Clinical needle no. 19, 22, 24 are used for breeders over 3 kg, 1-3 kg and 1 kg.

INJECTION TO THE BROOD FISH



<https://image.slidesharecdn.com/inducedbreeding-171023173450/95/induced-breeding-in-fishes-19-638.jpg?cb=1510070455>

DOSES OF PITUITARY GLAND EXTRACT

- Female is given a preliminary dose of 2-3 mg/kg body weight.
- After an interval of 6-8 hours a second dose of 5-8 mg/kg body weight given to female if first dose has not worked.
- Male – 2-3 mg/kg body weight

SYNTHETIC HORMONE OF FISH SPAWNING (OVAPRIM AND OVATIDE)

OVAPRIM AND OVATIDE :-



SPAWNING

- After injection to the brooders a set of brooders are released into the breeding hapa.
- The size of the hapa ranges to 3x5 meters.
- The height of hapa should remain about 20 cm. above the level of water
- The spawning takes place within 3-6 hrs after final injection.
- The fertilized eggs are transparent, pearl like whereas unfertilized eggs are opaque or whitish.

FACTORS INFLUENCING INDUCED BREEDING

- Climate – Temperature should be 24-32 C with cloudy days and rainy periods.
- Water condition - Flowing water.
- Turbidity- 100-1000 mg/litre or ppm.
- Light-- For early maturation and spawning.
- Dissolved oxygen-Not should be less than 5ppm/litres