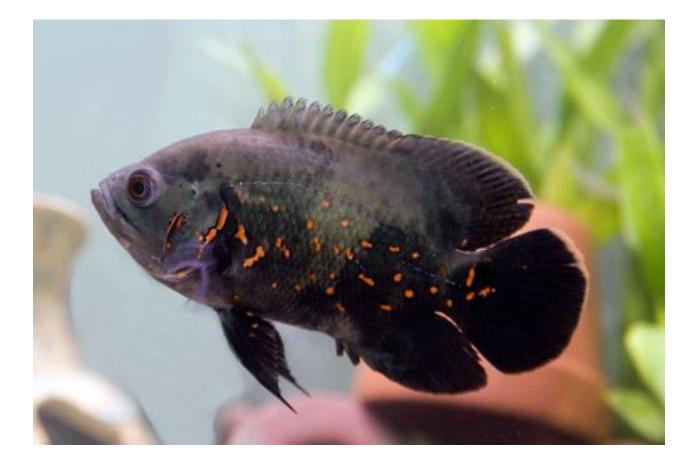
Synthetic hormones for induced breeding of fishes





• Synthetic spawning hormones - increasingly used due to their efficacy and convenience

• Banerjee et al. (1989) succeeded in the purification of pituitary gonadotropic hormone from *Channa punctatus* and *Catla catla*.

• Of all the mammalian hormones tested on fish, chorionic gonadotropin (CG) - successful -because CG behaves as a luteinising hormones (LH)

• Synahorin (a mixture of CG and mammalian pituitary extract) in combination with pituitary gave positive results in rohu

• Bhowmick et al. (1979) found mammalian hormones antuitrin-s, leutocyclin and RH-LH ineffective when injected singly or in combination with carp pituitary extract

• The CIFRI, Barrackpore - detailed studies on the use of LH-RH alone or in combination with progesterone and obtained breeding success which ranged between 25-49% in carps and 100% in catfish

Synthetic spawning agents :

- LH-RH (natural or synthetic) alone not very effective in inducing spawning in fish
- A combination of LH-RH-a (GnRH-a) and a dopamine antagonist for induced ovulation and spawning in cultured fish is a highly effective procedure called the Linpe method
- Reports of successful spawning of catla, rohu and mrigal with LH-RH analogue at 10-20 μg/kg b.w. and obtained 100% ovulation with pimozide at 10mg/kg b.w.
- Parameswaran et al. (1988) achieved successful spawning in mrigal with LH-RH-a, buserelin acetate in combination with progesterone
- Investigations of Jose et al. (1989) with LH-RH-a indicated successful breeding of mrigal and *Labeo fimbriatus*.

The Linpe method and ovaprim:

• Commercialized by Syndel Laboratories, Inc., Vancouver, British Columbia, Canada, under the tradename ovaprim

• The ovaprim spawning kit - use with salmonids, cyprinids and other freshwater cultured fish- wide success

 In India- ovaprim for induced spawning of Indian major carps, fringe lipped carp, silver carp, bighead carp and grass carp (Nandeesha et al. (1990, 1991)) economically, the use of ovaprim is advantageous

• The spawning success, quantity of eggs obtained, the fertilization rate and hatching percentage remained consistently higher with ovaprim as compared to carp pituitary extract (CPE) or human chorionic gonadotropin (HCG)

• 40% more fry can be obtained by using ovaprim in place of commercial CPE

• Ovulation and spawning has been successfully induced in India by the Linpe method in the Asian catfish, *Clarias batrachus* (Manickam and Joy, 1989) and Indian catfish, *Heteropneustes fossilis* (Manickam, 1992)

• Similarly, indigenous preparations, *viz*. Ovatide (M/s. Hemmopharma Ltd., Mumbai) and WOVA-FH (M/s. WOCKHARDT Ltd., Mumbai) are also being used commonly for the commercial spawning of carps and other fishes in India

• A combination of busereline (LHRH-a) and domperidone has been successfully used for the spawning of IMC (Basavaraja et al., 2007).

Dosage of ready-to-inject spawning agents (ovaprim, ovatide, WOVA-FH, etc.)

- Females :
- Catla : 0.4-0.5 ml/kg b.w.
- Rohu : 0.3-0.4 ml/kg b.w.
- Mrigal : 0.25-0.3 ml/kg b.w.
- Fringe-lipped carp : 0.3-0.4 ml/kg b.w.
- Catfishes : 0.6-0.8 ml/kg b.w.
- *Males (all species of carps)* : 0.1-0.3 ml/kg b.w.
- *Males (catfishes)* : 0.15-0.4 ml/kg b.w.
- Silver carp : 0.4-0.7 ml/kg b.w.
- Grass carp : 0.4-0.8 ml/kg b.w.
- Bighead carp : 0.4-0.5 ml/kg b.w.
- Mahseers : 0.6-0.7 ml/kg b.w.

Steroids :

• The effects of steroid hormones on ovulation are seen primarily as germinal vesicle breakdown (GVBD)

 GVBD is normally controlled by one or more steroids produced in the ovaries under gonadotropin stimulation, but the timing of ovulation related to that of GVBD varies

 In vitro ovulation normally follows steroid induced GVBD in catfish (*H. fossilis*) (Goswami and Sundararaj, 1971a,b)

• The action of pituitary gonadotropins on final oocyte maturation is known to be medicated through steroid hormones

• Deoxy corticosterone acetate (DOCA) and cortisone effectively stimulated *in vitro* ovulation in *H. fossils* (Ramaswami, 1962; Goswami and Sundararaj, 1971a,b)

• The thyroid stimulating hormone is also reported to bring about ovulation in Indian catfish (Ramaswami and Lakshmanan, 1958)

• There are circumstantial evidences which suggest that pheromones secreted by IMC help in effecting spawning (Ranganathan et al., 1967)

• Similarly, sympathetic spawning of carps in bundhs appears to be due to the release of pheromones (Moitra and Sarkar, 1975).