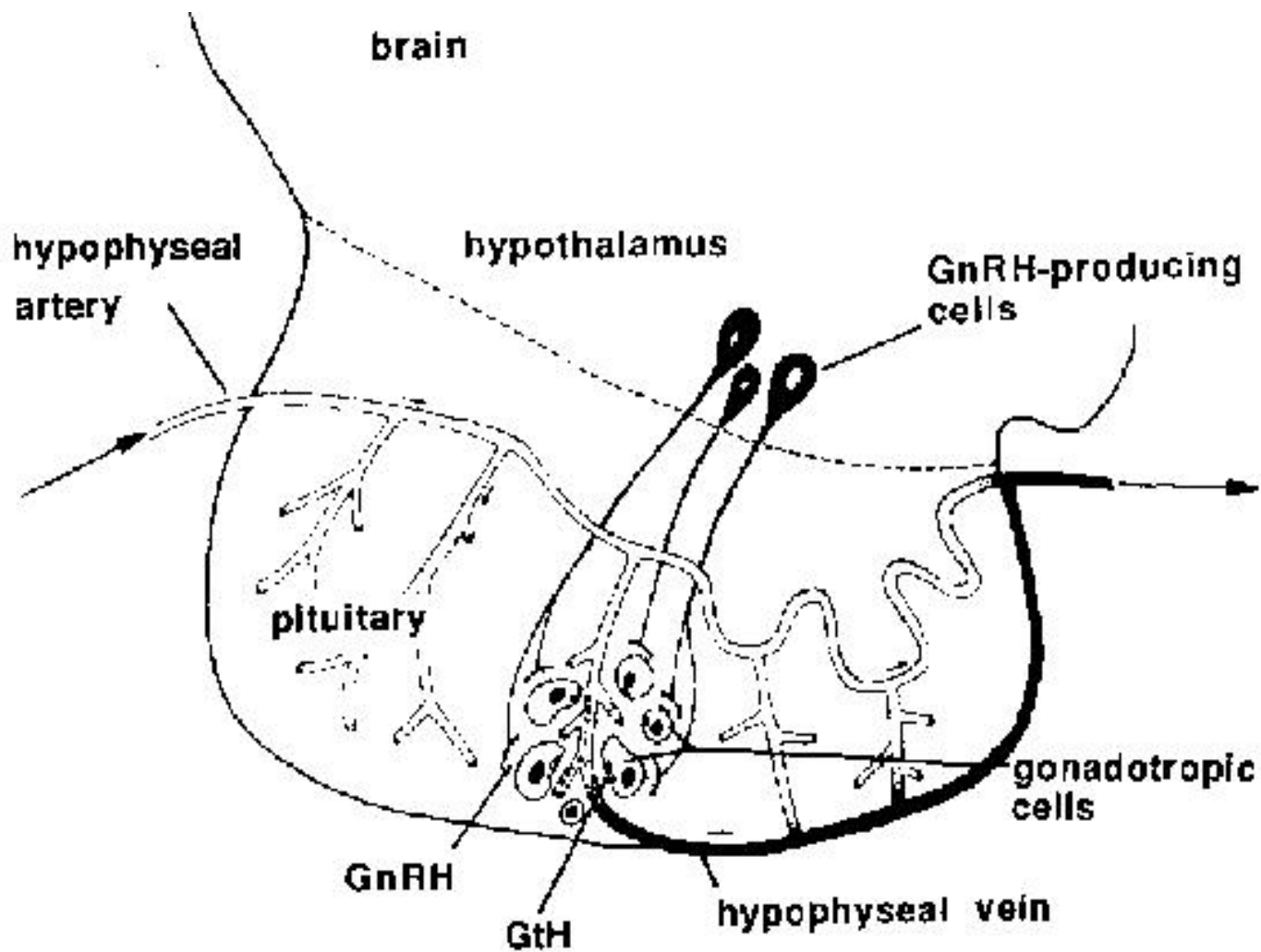


Fish Pituitary gland



Structure:

- Pituitary gland is an endocrine gland situated on the ventral side of the brain
- It is a small, soft, whitish body whose size and shape vary with species
- It is more or less round in carps; oval in catla and rohu and pear-shaped in mrigal
- The pituitary is located in a concave cavity known as *Sella turcica* and enclosed by a thin membrane known as durameter
- It may be attached to the brain by a short stalk called the Infundibular stalk.



Types of pituitary glands

- Based on the presence or absence of the stalk, the pituitary is classified into Leptobasic (with stalk) and Platybasic (without stalk) pituitary
- Leptobasic pituitary – eg. Carps and catfishes
- Platybasic pituitary – eg. Glassfish (*Ambasis* spp.)
- The teleost pituitary comprises of two parts – the glandular part (the adenohypophysis) and the nervous part (the neurohypophysis)

Collection of pituitary gland:

- Fish pituitary gland can be collected by dissecting and removing a portion of the scalp or through the Foramen magnum

(1) Dissecting and removing a portion of the scalp :

- In this method, the brain case (cranium) is obliquely cut using a butcher's knife/hand saw/bone cutter and the scalp removed
- The brain is then exposed by removing grey matter and fatty substance with forceps and cotton



Figure: Making an oblique cut in the cranium



Figure: Fatty tissue and grey matter exposed

- The anterior end (optic and olfactory nerves) of the brain is cut and the entire brain is lifted up and laid back, thus exposing the pituitary under a membrane
- After removing the membrane and the fluid, the pituitary is lifted up by inserting the blunt end of the forceps and carefully transferred to a vial containing a preservative



Figure: The brain being exposed



Figure: The pituitary seen as a small whitish body



Figure: The pituitary mounted on to a hand

(2) Through the Foramen magnum:

- Foramen magnum is a large posterior aperture of the skull through which the spinal cord passes
- The grey matter and fatty substance are first removed with the help of forceps and cotton (they are pulled out posteriorly)
- The brain is then exposed
- The anterior end (optic and olfactory nerves) of the brain is cut and the entire brain is lifted up and laid back, thus exposing the pituitary

- After removing the fluid the membrane, the pituitary is lifted up by inserting the blunt end of the forceps and carefully transferred to a vial containing a preservative
- The first method is commonly practiced even though the second method is less time consuming and a large number of glands can be collected within a short time, with a good resale value of the fish
- Even an untrained person can practise the first method

Preservation of pituitary gland:

1. Preservation in absolute alcohol :

2. The gland , after collection, is immediately transferred to a vial/phial containing fresh absolute alcohol (ethanol)
- After 24 hours, the alcohol is removed and fresh alcohol is added and stored at room temperature or in a refrigerator

2. Preservation in acetone:

- Immediately after collection, the pituitary gland is kept in ice-chilled acetone and stored in a refrigerator for 2-3 days
- After this period, the acetone is changed and the gland stored in a refrigerator
- Both absolute alcohol and acetone have defattening and dehydrating effect

3. Immediate freezing

- The collected glands are frozen immediately and stored in a freezer

Preparation of fish pituitary extract for injection

- The extract preparation should be carried out just before injection
- The required quantity of glands is taken out of vial and they are dried on a filter paper by allowing the alcohol to evaporate
- The glands are then homogenized with distilled water or saline in a tissue homogenizer
- If acetone-dried glands are used, they can directly be taken for maceration
- One-third of the media is used for homogenization, while the remaining two-third is used for rinsing the homogenizer and the glass rod
- Recommended dilution rate is 20-30 mg in 1 ml of the media
- The extract is centrifuged at 5,000 rpm for 5 minutes
- The clear supernatant solution containing gonadotropins is taken in syringe for injection

Dosage of pituitary extract

- Assessment of proper dosage is most important for successful spawning
- Female – 2 injections, male- 1 injection, i.e. at the time of second injection to the female
- I Dose or Provocative or preliminary dosage and
- II Dose or effective or resolving dosage
- The interval between the two doses is 6 hours.

Carp glands to major carps:

	Female	Male
I Dose	2-3 mg/kg b.w.	nil
II Dose	5-8 mg/kg b.w.	2-3 mg/kg b.w.

Carp glands to exotic carps:

	Female	Male
I Dose	4-6 mg/kg b.w.	nil
II Dose	10-16 mg/kg b.w.	4-6 mg/kg b.w.

Catfish glands to major carps:

	Female	Male
I Dose	10 mg/kg b.w.	nil
II Dose	20 mg/kg b.w.	10 mg/kg b.w.

Catfish glands to exotic carps:

	Female	Male
I Dose	20 mg/kg b.w.	nil
II Dose	40 mg/kg b.w.	20 mg/kg b.w.

Types of injection:

- *Homoplastic injection* : Injecting pituitary from one fish to another fish closely related to the donor fish. E.g. carp pituitary gland extract to carps
- *Heteroplastic injection* : Injecting pituitary from one fish to another fish distantly related to the donor fish. E.g. carp pituitary gland extract to catfish and *vice versa*