CHAPTER 1

Morphology of hypophysis and testis of G. giuris
I. MORPHOLOGY OF HYPOPHYSIS AND TESTIS OF G. giuris

(i) Morphology of hypophysis

The hypophysis of adult G. giuris is of the leptobase type and is composed of neurohypophysis and adenohypophysis. The adenohypophysis is divided into three regions, viz., rostral pars distalis, proximal pars distalis and pars intermedia (Fig. 1).

Adenohypophysis

Eight types of endocrine secreting cells are found in adenohypophysis of the pituitary gland of G. giuris. In the present investigation, an attempt has been made to study the role of prolactin secreting cells and gonadotrophs in detail in reproduction under normal condition and after exposing the fishes to various percentages of salinity, thiourea and methallibure during non-breeding and breeding phases of the male gobiid fish.

Prolactin secreting cells (PRL)

The prolactin secreting cells (PRL) are the major constituents of the rostral pars distalis (RPD) of anterior adenohypophysis. They are compact in nature and occupy almost the entire part of RPD. These cells are usually spherical/oval, with centrally situated nuclei containing one or two nucleoli. The cytoplasm is homogeneous and stain deeply with erythrocin and phloxine stain (Fig. 2).
Fig. 1: Median sagittal section of the hypophysis of *G. giuris*.

CAHP x 100

ANH - Anterior Neurohypophysis
MNH - Middle Neurohypophysis
PI - Pars Intermedia
PNH - Posterior Neurohypophysis
PPD - Proximal Pars Distalis
RPD - Rostral Pars Distalis
Fig. 2: Median sagittal section of the pituitary indicating the distribution of prolactin secreting cells (PRL) and gonadotropin secreting cells (GTH).

CAHP x 125.
Gonadotrophin secreting cells (GTH)

The gonadotrophic cells (GTH) are present in the proximal pars distalis (PPD) of the adenohypophysis. The above cells are large in size with distinct nuclei and nucleoli, and staining deeply with aldehyde fuchsin, CAHP and Cleveland Wolfe Trichrome (Fig. 2).

(ii) Morphology of testis

The testis of sexually mature male fish, G. giuris are paired structures, situated dorsally in the body cavity and extending the entire length of peritoneal cavity. Depending on the stage of maturity, they vary in colour and length (Fig. 3).

Histology of testis

The T.S. of testis of G. giuris shows a number of seminiferous lobules surrounded by thin connective tissue-stroma along with few blood vessels in the intertubular spaces. The thickness of the connective tissue matrix varies according to the stage of sexual maturity of the testis (Fig. 4). The seminiferous lobules vary in their shape and size and are highly convoluted.
Fig. 3: Photomicrograph of morphology of testis of G. giuris during (a) Non-breeding phase, (b) Breeding phase.
Fig. 4: Transverse section of the mature testis of *G. giuris* showing the distinct interstitial gland (IG) and seminiferous lobules (SL).

Ehrlich's Haematoxylene and Eosin x 200.
Each testis has a central mass of glandular tissue, 'the interstitial gland' or testicular gland. This gland is 'U' shaped which lies on the mesorchial side occupying 1/3rd of the testis mass running almost entire length of the testis. The interstitial gland shows positive reaction for Sudan-Black 'B' stain. The testis exhibits seven different stages of germ cells during maturation cycle. They are (1) Resting germ cells, (2) Primary spermatogonia, (3) Secondary spermatogonia, (4) Primary spermatocyte, (5) Secondary spermatocyte, (6) Spermatids and (7) Spermatozoa.