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STUDIES ON CELLS OF PROXIMAL PARSDISTALIS OF PITUITARY GLAND IN RELATION TO GONADAL CYCLE IN FRESHWATER *ANABAS TESTUDINEUS*

AMITA GUPTA
DEPTT. OF ZOOLOGY, COLLEGE OF BASIC SCIENCE & HUMANITIES,
O.U.A.T., BHUBANESHWAR-751 003, INDIA.

Detailed studies were carried out on the cells of proximal parsdistalis of the pituitary gland of *Anabas testudineus* through out the year. Different cell types in the proximal parsdistalis were studied. Quantitative changes were observed in the cells as they are associated to the maturation of gonads of fish. It is concluded that the percentage to basophils is maximum with maximum secretory activity during the spawning period. It confirms the secretion of basophils is directly related with gonadal maturation.

Key words : Proximal parsdistalis, pituitary gland, gonadal cycle, *Anabas testudineus*.

INTRODUCTION

Numerous publications and reviews have come up dealing with morphology, cellular composition of fish hypophysis. The inter-relationship between pituitary and gonads have been established by a number of workers like Khanna & Pant (1969), Moitra & Sarkar (1976), Toyoji *et al.* (1986) and Shimizu *et al.* (2003). Moitra & Sarkar (1976) noted that cyanophil-I undergo quantitative variations along with reproductive cycle. Aim of this study was to investigate quantitative variations in cell composition of proximal parsdistalis region of the pituitary gland of *Anabas testudineus* in relation to gonadal cycle as pituitary gland is the most vital gland, has a great role in gonadal activity.

MATERIALS AND METHODS

Live and mature specimens of fish were collected from local water reservoirs and kept in aquarium for a few days to acclimatize them to the laboratory conditions. Fishes 7-12 cm in length were selected to study. By exposing skull pituitary gland were carefully removed and fixed in Bouin and Hellys solution. Paraffin sections 6-8 μ thick were cut and stained with Haematoxylin-eosin, Mellory's triple, Periodic acid and Schiff's reagent (PAS). Cell numbers in proximal parsdistalis region were counted in ten fishes every month throughout the year.

RESULTS AND DISCUSSION

Unpaired small pituitary gland in *A. testudineus* is situated on ventral side of the brain behind the chiasma and above saccus vasculosus.

Pituitary gland of a number of specimens were studied throughout the year. The pituitary gland increased in size during spawning period of the fish and proximal parsdistalis region enlarge during this period. Mid longitudinal sections of pituitary glands were studied. Percentage composition of different cells of proximal parsdistalis part of pituitary glands were calculated and presented in Table I. Basophils number increased

Table I : Percentage composition of different cell types in the proximal parsdistalis of *Anabas testudineus* during calender year.

Months	Average values		
	Acidophils	Basophils	Chromophobs
January	70.3	24.9	4.8
February	63.4	32.3	4.3
March	47.7	48.2	4.1
April	41.9	54.2	3.9
May	35.6	60.8	3.6
June	34.7	62.2	3.1
July	26.8	69.8	3.4
August	25.5	68.9	5.6
September	33.7	61.2	5.1
October	40.8	54.3	4.9
November	54.6	41.2	4.2
December	56.1	39.8	4.1

February onwards, during July to August basophils increased enormously in number as well as in size. However, percentage of acidophils decreased during this period. During September to October basophils show shrinking and their number was also decreased while percentage of acidophils is increased. Chromophobes do not show any significant fluctuation in numerical abundance in relation to gonadal cycle.

It is evident from present study that percentage of basophils increased during July and August which is spawning period of fish. So increased percentage of basophils is associated with gonadal maturation. During Jaanuary to April basophil cells are small in size and few in number. During October to December their number starts decreasing. The similar behaviour of basophil cells in different fishes have also been observed by several workers like Khanna & Pant (1969) in *Glyptothorax pectinopterus*, Moitra & Sarkar (1976) in *Cirrihinus mrigala*, and Toyoji *et al.* (1986) also observed marked morphological changes in gonadotrophs during annual reproductive cycle and predominant gonadotrophs in spawning phase. Kathuria (1972) observed alternating cycle of increased and decreased of gonadotrophs in *Anguilla anguilla*, *Pleuronects platessa* and *Limanda limanda* but he did not observed much change in chromophobes number during annual cycle. These observations tallies with authors findings. Thus present observation clearly prove high degree of activity of basophils with gonadal activity of the fish and after discharging their content in blood stream these cells become vacuolated. Moitra & Sarkar (1976) observed more potent pituitary extract during spawning period. This too support present findings that basophils are abundantly available with the approach of spawning period with high degree of secretary activity to regulate gonadal function.

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