CHAPTER X

S U M M A R Y

CHAPTER I:

The work done by several authors on the migration of H.ilisha is referred. The migration of H. ilisha in river Narbada and fisheries of H. ilisha are discussed in brief. The relation of H. ilisha fishery with lunar periodicity is noted. The area of collection of samples are briefly mentioned.

The fishery of marine Hilsa toli is narrated in brief. It is also noticed that H. toli drifts into the estuary of river Narbada on the highest high tide day of the year.

CHAPTER II:

The histological studies on the Hypothalamo-neurohypophyseal neurosecretory system (HN system) of migratory (anadromous) H. ilisha were carried out and were compared with those carried out on the HN System of nonmigratory, marine H. toli and drifted H. toli. The comparison suggested a role of neuro-secretory material in osmoregulation and in sexual maturity. The secretory cycle of Nucleus Lateralis Tuberis was correlated with sexual maturity in both

H. ilisha and H. toli. The role of cerebrospinal fluid in the 3rd ventricle was suggested as a vehicle of hormones secreted by NLT on basis of histological studies.

CHAPTER III:

The histochemical demonstration of two enzymes, Acetylcholinesterase(AChE) and Butyrylcholinesterase (BChE) in the Nucleus Preopticus and in the Nucleus Lateralis Tuberis of migratory (anadromous) H. ilisha, in marine H. toli and in drifted H. toli revealed that these enzymes may have direct or indirect role in synthesis and discharge of hormones produced by the two group of the neurosecretory cells.

CHAPTER IV:

The histological studies on the pituitary gland of migratory H. ilisha and of non-migratory, marine H. toli were carried out. The basophils of mesoadenohypophysis exhibited a secretory cycle which could be correlated with the sexual maturity in both the species. The secretory cycle of the acidophils of mesoadenohypophysis was in correlation with the growth of H. toli and H. ilisha. The follicles of the proadenohypophysis, Erythrosinophils showed secretory cycle which was correlated

with sexual maturity and migration in H. ilisha and with sexual maturity in H. toli. The pronounced degeneration and destruction in this region was observed in drifted H. toli. Cytolysis, Pycnosis etc. degenerative changes were noticed in almost all the regions of drifted H. toli. This was attributed to the change in medium.

The presence of Neurosecretory material in the follicles of Proadenohypophysis of the pituitary gland of mature and spent, H. ilisha and H. toli was suggested as a mediator for the stimulation to the follicular cells. The probable third group of neurosecretory cell was located in the fingerling of H. ilisha. It's probable significance is discussed.

CHAPTER V:

The role of thyroid follicles of fingerlings of H. ilisha is discussed in relation with presence of few A.F. positive cells in pituitary gland and as stimulator to central nervous system to induce NSM from NPO for migration to sea.

The maximum activity of thyroid in H. ilisha captured from the sea prior to migration into the river Narbada is correlated with the discharge of NSM from NPO

in hypothalamo neurohypophyseal tract and in neuro-intermediate lobe of pituitary in mature H. ilisha captured from the mouth of river Narbada during migration.

The braking of follicles and decrease in activity of follicles during migration and in spent H. ilisha is discussed.

The discharge of thyroid hormone after spawning and active follicles before spawning in H. toli, are correlated with the reproductive cycle.

The goitrous condition of the thyroid follicles observed in H. toli, drifted into the estuary on the highest high tide day of the year, due to strong current of sea, is atributed to iodine poor environment-esturine water.

CHAPTER VI:

The activity of the chromaffin tissues of migratory Hilsa ilisha and nonmigratory Hilsa toli is studied during different phases of life cycle.

The hyperplasia of the chromaffin tissue in migratory Hilsa ilisha may be due to change in salinity,

stress caused by maturity, starvation and due to increase in demand of catecholamines for mobilisation of fat from liver, adipose tissues for the supply of more energy for migration during spawning and starvation.

The destruction and degenerative changes observed in chromaffin tissues of nonmigratory Hilsa toli,drifted in the estuary on the highest high tide day of the year, may be due to sudden change into hypotonic medium-estuarine water.

The little hyperplasia of the chromaffin tissues of mature Hilsa toli and spent Hilsa toli (Cuv. & Val.) may be due to stress of gonadal development, stress occassioned by starvation. It may also be due to increase in demand of catecholamines for the mobilisation of fat for the supply of energy during starvation during the period of spawning.

CHAPTER VII:

The hyperplasia of the adrenocortical tissue during spawning suggested that corticosteroids secretion has increased, the corticoids appeared to decrease during spawning in both spent migratory and nonmigratory fish.

The hyperplasia may be due to 'stress' caused by change in salinity and due to starvation during spawning.

The degenerative and destructive changes observed in adrenocortical tissue of nonmigratory, drifted H. toli may be due to drifting into the estuary and due to sudden downfall in ion concentrations of water.

The changes in the cells of adrenocortical tissue may give an idea of different zones of adrenal cortex of mammal and a probable homology is suggested.

CHPATER VIII:

The histological studies on the Caudal Neurosecretory System (CNS) of H. ilisha and H. toli were carried out. The role of the CNS of both, H. ilisha and H. toli, in maturity was suggested. The studies of the CNS of drifted H. toli supported the ionoregulatory or osmoregulatory role for the CNS.

The probable discharge of NSM (acid violet positive) into the lumen of central canal of the spinal cord and in the lumen of blood vessels was discussed on basis of histological studies.

The discharge of Acid violet positive neurosecretory material in the central canal through the ependymal cells was discussed on basis of the histological studies.

CHAPTER IX:

Cholinesterases are present in the perikarya of neurosecretory cells, axon fibres of the neurosecretory cells and in the walls of blood vessels of the caudal neurosecretory system (CNS) of migratory Hilsa ilisha and non-migratory Hilsa toli.

Both the enzymes, acetylcholinesterase and butyryl-cholinesterase may directly or indirectly involved in synthesis and release of neurosecretory material in the caudal neurosecretory system of both the species.

The activities of cholinesterases were studied in relation with the neurosecretory activities of NS cells of CNS in connection with the changes in ion contents (na, K, Ca and chlorides) of river waters and sea water.

CHAPTER X:

Summary of all the chapters.