GENERAL INTRODUCTION
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The presence of a functional hypothalamo-hypophysial neurosecretory system in vertebrates has led to revise earlier views regarding the hypothalamus-pituitary relationship. The hypothalamo-neurohypophysial system (which consists of hypothalamic nuclei, their axonal fibres forming tractus preoptico-hypophyseus and the neurohypophysis) works as a morphological as well as a physiological connection between the hypothalamus and the pituitary gland. In fishes, fibres from the neurosecretory hypothalamic nuclei terminate in the neurohypophysis which remains inter-digitated with the adenohypophysis and provides a very close association between the neurosecretory fibres and pars intermedia of the pituitary gland forming a neuro-intermediate lobe.

Earlier to the application of improved staining techniques and the introduction of the concept of neurosecretion by specific methods, Herrick (1901), Sheldon (1912), Scharrer (1928, 1930 and 1932 a,b) and Palay (1945) described the process of neurosecretion in fishes by using conventional stains. The outstanding publications of Scharrer (1928, 1930 and 1932 a,b) on hypothalamo-hypophysial system gave an impetus to other subsequent workers for further investigations. The Gomori's Chrome-alum Haematoxylin Phloxine (CAHP) method Bargmann, 1949) and Gomori's Aldehyde
Pushsin (AF) method (Gabe, 1953 and Dawson, 1963) and their modifications have been proved to be ideal for studying the neurosecretory system. Since then the hypothalamic-hypophysial neurosecretory system has been studied in a number of teleosts but still much is needed before a generalisation of this system in such a vast group of vertebrates may be made.

In the hypothalamus of teleost fishes three nuclei i.e., the nucleus preopticus (NPO), the nucleus lateralis tuberis (NLT) and the complex of nucleus recessus lateralis (NRL) and nucleus recessus posterioris (NRP) comprising the paraventricular organ (PVO) of teleosts have received special attention because they have been suggested to influence the pituitary gland by nerve fibres innervating it (Baumgarten and Braak, 1967; Holmes and Hall, 1974; Simon and Heinboth, 1974; Ekengren, 1973, 1975a; Fremberg and Meurling, 1975, and Ekengren and Terlou, 1973). There is a definite tractus preoptico-hypophysisus in teleosts through which the neurosecretory material is transported from nucleus preopticus to the pituitary gland but how the secretion of nucleus lateralis tuberis is conveyed to the pituitary gland is still debatable.

The developing events such as growth, differentiation, sexual maturation and other functional activities are influenced by the endocrine secretion and as such the study of developing endocrine glands carries a special significance in view of their participation in metabolic regulation during the course of development. Though great advances have been made in the study
of various aspects of hypothalamo-hypophysial neurosecretory system, a study of its histogenesis has received little attention and is limited to only few species of teleosts.

It is now an established fact that the secretory activity of the teleostean pituitary gland is under the control of active principles or regulatory factors elaborated in the hypothalamic nuclear centres in the form of chemical substances but the regulatory mechanism is not properly understood. One of the controlling mechanism is by direct infiltration of neurosecretory neurons among the glandular cells (Bretschneider and Duyvene de Wit, 1947; Da Lage, 1955, 1958; Legait and Legait, 1957, 1959; Bargmann and Knoop, 1960; Dodd and Kerr, 1963; Knowles et al., 1967 and Zambrano, 1972) which is generally referred as neuro-glandular link. The other controlling mechanism is through an indirect neuro-vascular-glandular link (Green, 1961; Kerr, 1968; Bhargava, 1966, 1965/68 and Ball and Baker, 1969) where the neurohumoral transmission takes place in between the neurohypophysis and the glandular part of the pituitary gland through the vascular network. Yet another view put forward by Sathyanesan and co-workers (Sathyanesan and Haider, 1971 a; Sathyanesan, 1972; Sathyanesan and Jose, 1975, 1977; Sathyanesan and Das, 1975, 1978; Joy and Sathyanesan, 1979 and Singh and Haider, 1979) is that the hypothalamic factors are transmitted to the pituitary gland through a portal system.

The physiology of reproduction in teleosts has been a subject which received wide attention. It has been reviewed by
Bretschneider and Duyvven de Wit (1974), Hoar (1955, 1957 and 1960), Ball (1960) and Donaldson (1973). However, the seasonal changes in the neurosecretory hypothalamic nuclei in teleosts in relation to their gonadal cycle have not been much studied.

In fishes, the effects of pollutants on the endocrine physiology are in their early phase of exploration. The pollution of rivers by lead, zinc, copper and other heavy metals has attracted attention for a considerable time and their toxic effects have been observed by a few workers on fish reproduction (Spehar, 1976 and Speranza et al., 1977). Though considerable work has been done on the effects of insecticides, very little work has been done on the effects of heavy metal salts on the hypothalamo-hypophysial complex.

Keeping in view of the above mentioned observations, an attempt has been made in the present work to study the histology and cytology of the hypothalmo-neurohypophysial system in Mandua nudus (Ham.). The development and vascular relationship of the hypothalmo-hypophysial complex have been described. Seasonal changes in the hypothalmo-neurohypophysial system have been studied in correlation with the reproductive cycle. An attempt has also been made to see the effects of salts of some heavy metals on the hypothalmo-hypophysial system and gonads.