

Histological Studies on Tissues of *Loligo duvauceli* (Orbigny, 1848) in Pazhayar coastal water, Nagapattinam District Tamilnadu

¹R. Kavitha & ²Dr. A.Christy Ponni

¹Research Scholar, PG and Research Department of Zoology, TBML College, Porayar-609 305, Tamilnadu (India)

²Head of the Department, PG and Research Department of Zoology, TBML College, Porayar-609 305, Tamilnadu (India)

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Corresponding Author

Dr. A.Christy Ponni

ABSTRACT

Histology is that the microscopic study of animal and plant cell and tissues through staining and sectioning and examining them below a magnifier (electron or lightweight microscope). There square measure numerous ways wont to study tissue characteristics and microscopic structures of the cells. microscopic anatomy studies square measure utilized in rhetorical investigations, autopsy, designation and in education. additionally, microscopic anatomy is employed extensively in medication particularly within the study of pathological tissues to help treatment. The aim of this work was to observe the structural and functional integration of the different organs like muscle, gill, liver and gonad. The cellular organization of body parts of *Loligo*, proves the same type of functional significance as encountered in other cephalopods.

1. Introduction

Cephalopod molluscs are rich and varied marine organisms that live the benthic and pelagic atmospheres from seaside areas to the deepsea [1]. In the present study histological organization of the selected tissues of *Loligo* were made for a better understanding of different organs like muscle, gill, liver and gonad. Earlier studies on cephalopods [2] on octopus [3], on cephalopods [4], on Squid *Moroteuthis ingens* [5].

Histology is that branch of anatomy that studies tissues of animals and plants. In its broader facet, the word microscopic anatomy is employed as if it were a equivalent word for anatomy, as a result of its subject material encompasses not solely the microscopic structure of tissues however conjointly that of the cell, organs, and organ systems (6). The body is composed of cells, intercellular matrix, and a fluid substance, extracellular fluid (tissue fluid), which bathes these components (7). Extracellular fluid, which is derived from plasma of blood, carries nutrients, oxygen, and signaling molecules to cells of the body. Conversely, signaling molecules, waste products, and carbon dioxide released by cells of the body reach blood and lymph vessels by way of the extracellular fluid. Extracellular fluid and much of the intercellular matrix are not visible in routine histological preparations, yet their invisible presence must be appreciated by the student of histology (8).

2. Materials & Methods

For histological studies 20 specimens were used. The specimen of *Loligo* collected from the study area and washed well with fresh water and were kept in ice box were brought to the laboratory. The animals were dissected and their tissues were pooled out for histological studies. The tissues were fixed in 5% formalin for 72hrs. The fixed tissues were washed in running tap water over night and then dehydrated in ascending grades of alcoholic series. For block making, paraffin wax of melting point 58-60 C was used. Sections cut at 5 micrometer in thickness, were deparaffinized and stained in Delafield's

haematoxylin with eosin as counter stain. The photomicrographies of various sections of the tissues were taken for microscopic observations.

3. Result and Discussion

Histology is that branch of anatomy that studies tissues of animals and plants. This textbook, however, discusses only animal, and more specifically human, tissues. In its broader aspect, the word histology is used as if it were a synonym for microscopic anatomy, because its subject matter encompasses not only the microscopic structure of tissues but also that of the cell, organs, and organ systems (6). The body is composed of cells, intercellular matrix, and a fluid substance, extracellular fluid (tissue fluid), which bathes these components (7). Extracellular fluid, which is derived from plasma of blood, carries nutrients, oxygen, and signaling molecules to cells of the body. Conversely, signaling molecules, waste products, and carbon dioxide released by cells of the body reach blood and lymph vessels by way of the extracellular fluid. Extracellular fluid and much of the intercellular matrix are not visible in routine histological preparations, yet their invisible presence must be appreciated by the student of histology (8).

One of the highest benefits of using histopathological biomarkers in ecological monitoring is that they permit examining exact target organs with gills, liver and kidney that are responsible for energetic functions, such as respiration, excretion, accumulations and biotransformation of xenobiotic in the fish (9). Furthermore, the fluctuations found in these organs are normally easier to recognize than following the functional factors (Fanta et al., 2003) and helps as warming signs of harm to animal health (Hinton and Lauren, 1990). Numerous xenobiotics stimulate the action of definite enzymes that modify metabolism, further leading to apoptosis initially demonstrating as necrosis with inflammatory protective reactions (10-12). Histological examination of the gill, muscle, liver and kidney in vertebrates is done to evaluate the effect of toxic constituents found in the location on the respective animal species (13).

The effects are much noticeable in chronic exposures for periods up to 90 days or more (14-17).

Muscle: The histological section of muscle consists of connective tissues containing muscle fibres arranged in 3 mutually perpendicular directions (transverse muscle fibre, longitudinal muscle fibre and helical muscle fibre) [6].

Gill: The histological sections of gill consist of the primary and secondary gill lamella, gill filament and epithelial cells were noted. Secondary lamellar epithelial fission on the inner side.

Liver: Histological studies of liver contain hepatocytic cells, lipid droplets and glycogen granules. They consist of liver capillaries and secondary lysosomes are observed.

Testis: The histological section of testis consists of spermatogonia, spermatocyte, matured spermatid and sperm cells were observed.

Ovary: The histology of the ovary shows that it is yolkless and vitellogenic oocytes and arteric oocyte within the gonad. Matured eggs are also observed.

The cellular organization of body parts of *Loligo*, proves the same type of functional significance as encountered in other cephalopods.

Histological studies of molluscs (cephalopods) epithelium consists of cuboidal cells with large nuclei. Ciliated cells are also present [18]. Histological study of mature gonads with ripe eggs was impossible because of the very large size of the oocytes [19]. Schipp *et al.* [20] studied the structure and function of the cephalopod gills by electron microscopical and histochemical methods. Laptikhousky and Arkhipkin [21] studied Oogenesis and gonad development in the cold water *Loliginid Squid Loligo Gahi*. This paper provides a detailed description of the microscopic structure of the muscle, gill, liver, testis and ovary in the marine *Loligo*. The histological studies of various organs in general indicate similar details as those reported in *Octopus aegina* [22] and *Sepia aculeata* and other cephalopods of the Pazhayar coastal waters [23].

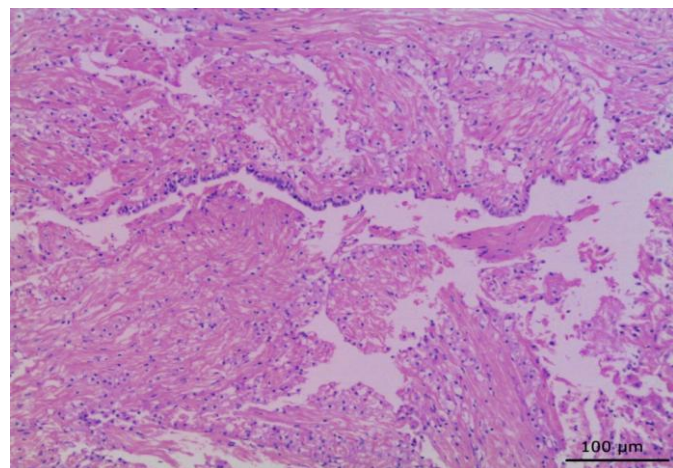


Figure-1 Structure of muscle in the marine *Loligo duvauceli*.

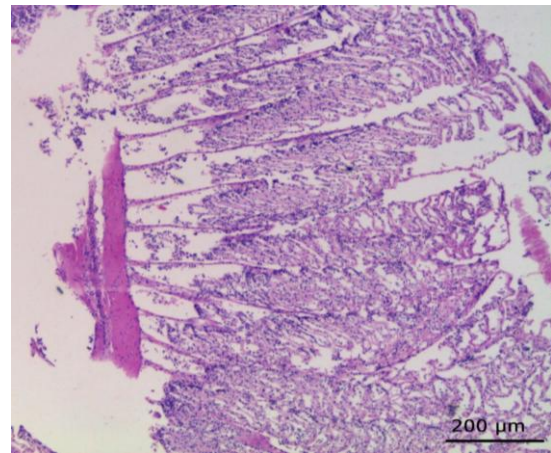


Figure-2 Structure of gill tissue in the marine *Loligo duvauceli*.

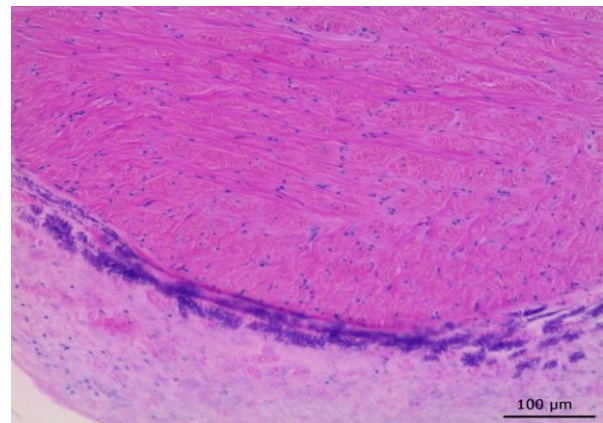


Figure-3 Structure of liver tissue in the marine *Loligo duvauceli*.

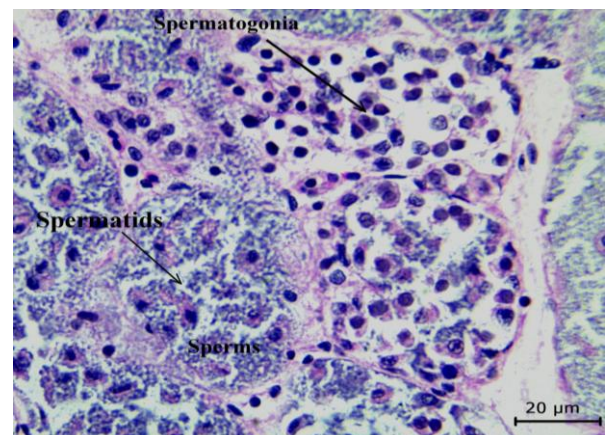


Figure-4 Structure of testis tissue in the marine *Loligo duvauceli*.

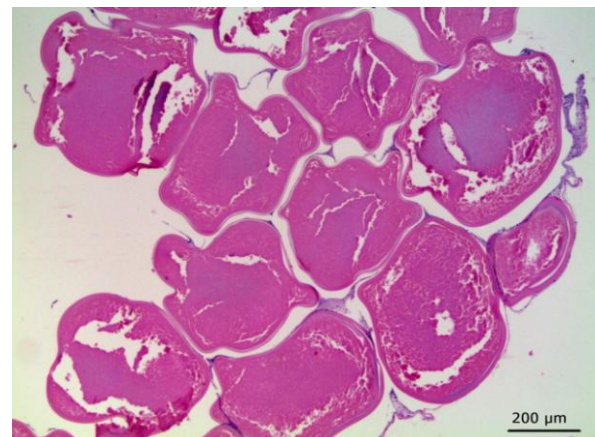


Figure-5 Structure of ovary tissue in the marine *Loligo duvauceli*.

4. Conclusion

Histology is a fundamental subject to understand the functioning of the different organs and systems. It is, therefore, the essential basis for the study of physiology. Histological analysis of the gill, liver, muscle and testis shows the cellular organization of body parts of *Loligo*, proves the same type of functional significance as encountered in other cephalopods.

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Conflict of Interest

The authors declare that there are no conflicts of interest.