

Histological observation in the tissues of *Sepia aculeate* of Pazhayar Kollidam Taluk, Nagapattinam District

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Abstract

Sepia aculeate is an important species in Tamil Nadu region having good nutritional values. In the present study, the histological investigation of the different tissues (Gills, liver, muscles, gonad and ovary) of *Sepia aculeate* collected from Pazhayar, Kollidam Taluk, Nagapattinam District, Tamil Nadu, India. The present work on histological observation was carried out in gills, liver, muscles, gonad and ovary that had resulted from marine *Sepia aculeate*.

Key words : Histology, *Sepia aculeata*, Gills, Liver, Muscles, Gonad and Ovary.

Introduction

The cephalopod capture is an artisanal fishery along the coast that does not have a precise regulation of their populations and catches (Boyle and Rodhouse, 2005). Numbers of residual egg in a cuttlefish gonad have been reported by Boletzky (1987) as a single observation, and there is no study of the corresponding histology of the ovaries. The aim of this study was to investigate a maximum available number of deceased *S. officinalis* including histological studies, thus obtaining more detailed information on the reproductive biology and spawning efficiency in this species. Water pollution is usually caused by various human sources, typically (point and non-point) industrial facilities and agrochemicals especially in aquatic ecosystem, has grown up to be a serious environmental problem nowadays. Adversely human activities are directly or indirectly affect the environment (Jayakumar *et al.*, 2018). In European countries it is consumed fresh or frozen (Jereb and Roper, 2005). Additionally, absorption of toxic chemicals through gills is rapid and therefore toxic response in gills is also rapid (Tamizhazhagan *et al.*, 2016). Unlike common cuttlefish *Sepia officinalis*, data on the reproductive biology of *S. orbignyana* are scarce (Hastie *et al.*, 2009). Histology is the microscopic study of plant and animal tissues. Although all organisms are comprised of at least one cell, we will be focusing on observing cells and tissues of the human body. All organisms are composed of cells. Humanoid body cells are grouped by their similarities in structure and function into tissues (Tamizhazhagan and Pugazhendy, 2017). In relation to the research of the histology of these organisms, few species have been studied and this information is necessary for the fishery resources

management and the aquaculture development. The aim of this study is to describe the histology of gill, liver, kidney, muscles, gonad and ovary of species *Sepia aculeata*, which knowledge is necessary for research and biological aspects.

MATERIALS AND METHODS

The *Sepia aculeata* was collected from Pazhayar area, Nagapattinam District, south east coast Tamil Nadu and were brought to the laboratory in large plastic troughs and acclimatized for one week. Healthy, *Sepia aculeata* were sacrificed and liver, gill, muscles, gonad and ovary tissues were dissected, removed and fixed in 10% formalin on the spot. After 24 hours the fixed tissues were taken for histological technique followed by Gurr (1959). For histological analysis section were cut at 5-6 μ m thickness and stained with Haematoxylin and Eosin. After stained the slides were examined under light microscope and photographed (Labomed).

RESULTS

In the present investigation, the gill tissue of *Sepia aculeata* primary gill lamella, secondary gill lamella, gill filament and epithelial cells were noted (Fig. 1). The normal microscopic structure of liver tissue included numerous hepatic cells, hepatocytes liver capillaries are irregularly distributed between the polygonal hepatocytes structure were observed (Fig.2). The normal structure was observed in the *Octopus aegina* of muscle tissue. The microscopic examination of the muscles showed normal appearance of the tissue where, smooth cell appear, endomysium and cell nuclei were noted (Fig.3).

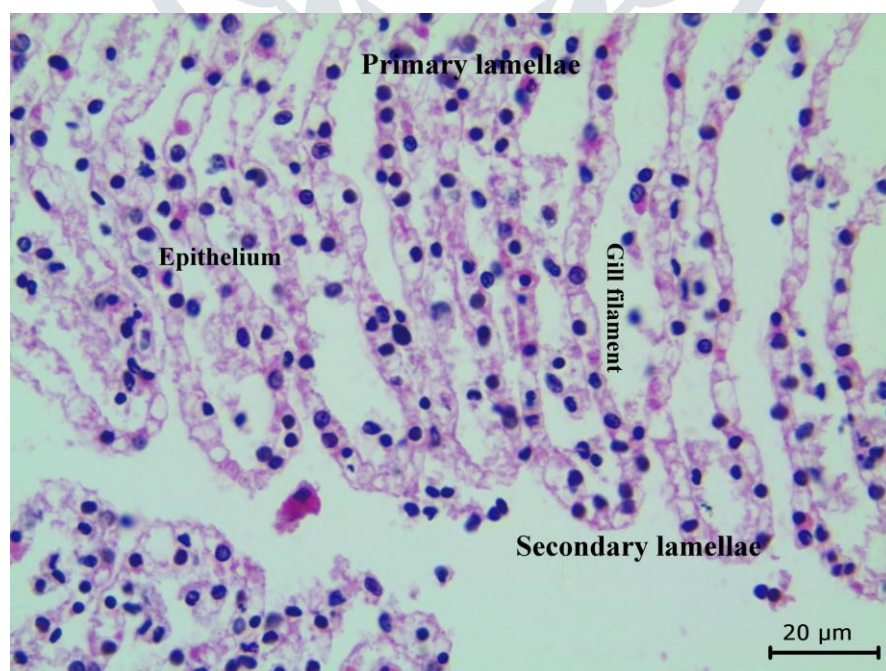


Fig. 1. Structure of gill in the marine *Sepia aculeata* (40x).

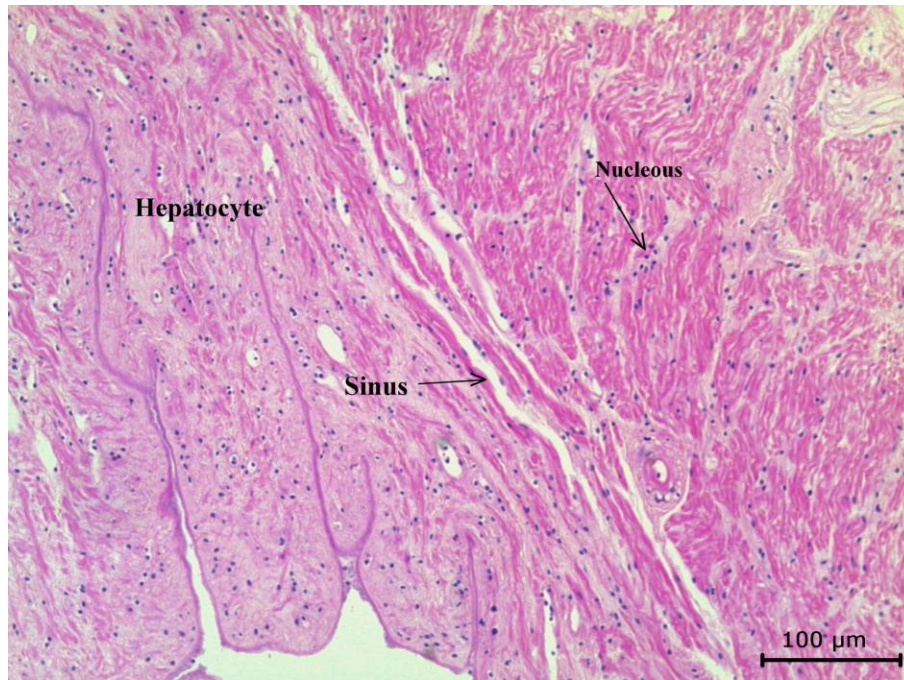


Fig. 2. Structure of liver tissue in the marine *Sepia aculeate* (10x).

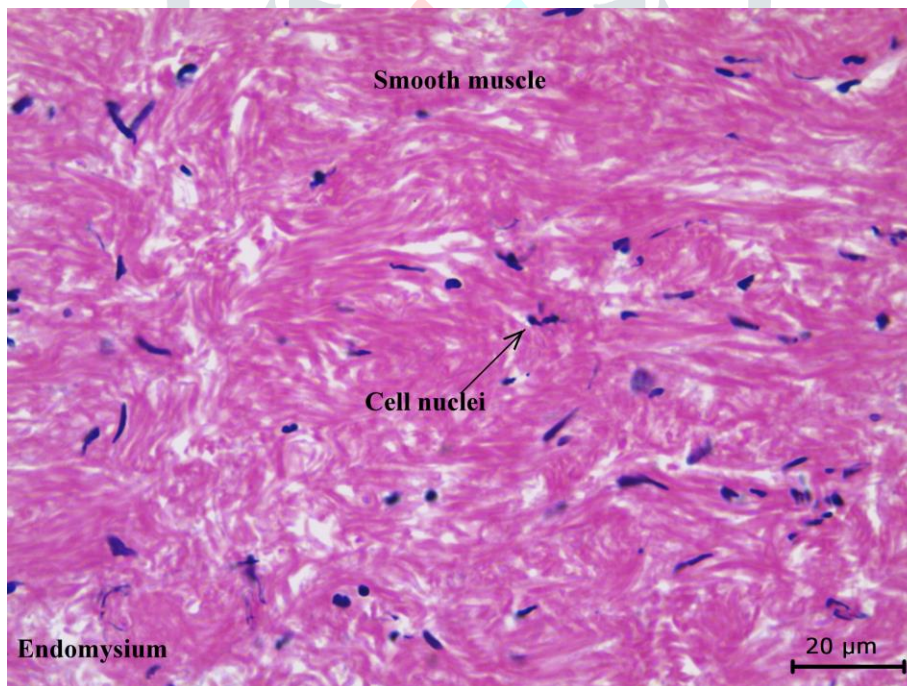


Fig. 3. Structure of muscles tissue in the marine *Sepia aculeate* (40x).

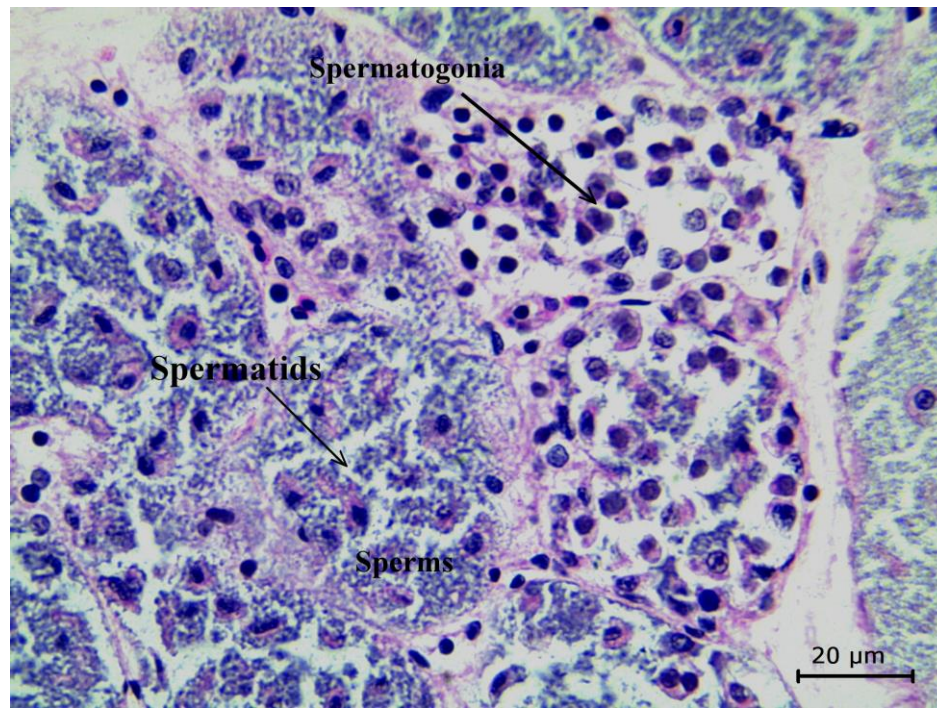


Fig. 4. Structure of gonad tissue in the marine *Sepia aculeate* (40x).

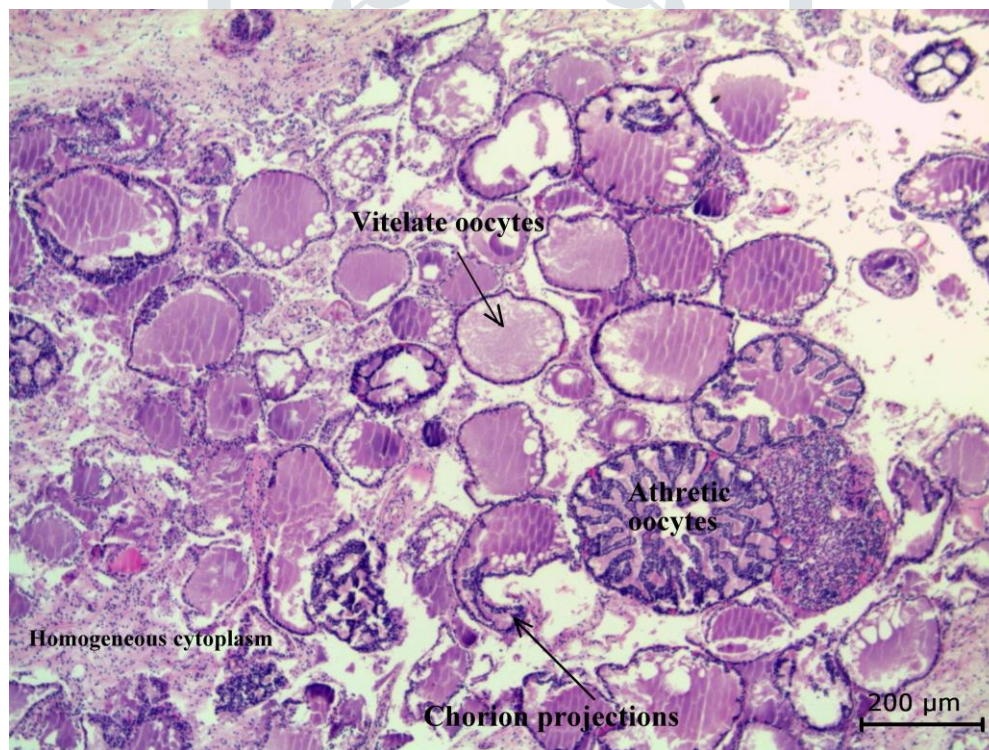


Fig. 5. Structure of ovary tissue in the marine *Sepia aculeate* (40x).

The distal and proximal oviducts have smooth muscle fibers, vitelate oocytes, atretic oocytes, homogeneous cytoplasm and chorion projections (Fig.5).

Discussion

The histological analysis of molluscs epithelium consists of cuboidal cells with large nuclei. Ciliated cells are also present (Heike Wagele *et al.*, 1999). Histological analysis of cuttlefish ovaries revealed that oogenesis is asynchronous (Rocha *et al.*, 2001) and spawning likely is intermittent, as reported by Laptikhovsky *et al.* (2003) for *S. officinalis*. Histological study of mature gonads with ripe eggs was impossible because of the very large size of the oocytes (Derya Dursun *et al.*, 2013). Asynchronous oocyte development was obvious after maturity stage I. The connective tissue in the center of the gonad holds the oocytes together and provides nourishment via the net of blood vessels. Growing oocytes lie more sparsely in the ovary (Derya Dursun *et al.*, 2013). Molluscs have both cellular and humoral mechanisms of defense (Ford, 1992). The most widely reported defense mechanism in cephalopods is the cellular one (Malham, 1996; Malham and Runham, 1998). The vas deferens shows a thick tubular prostate gland. The glandular cells lining the duct are elongate, filled with light blue staining grana and basal nuclei. The proximal and distal sections of the vas deferens are lined by an epithelium with cuboidal, ciliated cells only (Heike Wagele *et al.*, 1999). This paper provides a detailed description of the microscopic structure of the gill, liver, muscles, gonad and ovary in the marine *Octopus aegina*. In addition we propose a simple microscopic scale that can be used to determine the maturity degree of the organisms, which can be used in subsequent investigations.

Conclusion

The present work on histological observation was carried out in gills, liver, muscles, gonad and ovary that had resulted from marine *Sepia aculeate*.

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