

Histological Investigation of the Digestive System and SEM Study of Radula in *Fusinus nicobaricus* (Gastropoda: Fascioliidae)

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Received: 26-11-2018

Accepted: 15-10-2019

DOI: 10.18805/ijar.B-3759

ABSTRACT

In the present study, histological studies of the digestive system and SEM study of radula of *Fusinus nicobaricus* was evaluated. The digestive system contains proboscis, oesophagus, stomach, hepatopancreas, intestine, rectum and anus. The digestive tract of *Fusinus nicobaricus* encloses a buccal mass at the anterior region which contains a chitinous radula. The oesophagus leaved the buccal mass dorsally and passed the food into an extensible stomach. A pair of salivary gland lied with mid-oesophagus region. Digestive gland secreted digestive enzymes into the lumen of the stomach into mid region. Intestine was thin walled, usually long and possess loop through the digestive gland tissue and leaves as short rectum. Hepatopancreas was also implicated in storage and excretion of inorganic reserves, lipids and carbohydrate metabolites. Radula, a specific character and part of the appendices of digestive system of majority of molluscs. It was observed that the type of radula in *F.n* is rachiglossate with radular formula of 1+R+1.

Key words: *Fusinus nicobaricus*, Hepatopancreas, Oesophagus, Radula, Rectum.

INTRODUCTION

Marine fauna comprises of several phyla, orders, classes, families, genera and species. Among the various phyla represented in the marine environment, the phylum Mollusca is the second largest phylum in the animal kingdom next to Arthropoda (Abbott, 1954). Gastropods evolved on rocky marine bottoms but have radiated into a wide variety of other habitats. *Fusinus nicobaricus* comes under the family fascioliidae and sub-family fusininae. They are carnivores, feeding on worms and clams.

Virtually every possible feeding mode is found in gastropods and the morphology and physiology of the digestive system vary widely (Hyman, 1967). The gastropoda are remarkable for their feeding mechanisms and for the wide variety of food they subsist. The feeding habits and food preference do not form a distinctive part of a particular group. Thus, the prosobranchia in particular, displays almost every conceivable food preference.

Another peculiar feature of mollusc is the presence of a chitinous radula. Purchon (1977) stated that the adaptive radiation of the gastropoda is principally based on adaptations of the buccal mass and radula to meet the problems faced in feeding in various ways on a wide variety of food substances. In most gastropods the radula is a highly developed feeding organ that acts as a grater, rasp, brush cutter, grasper, harpoon or conveyor. Total number of teeth varies from 16 to thousands and is almost always arranged in a longitudinal ribbon of transverse rows (Ramesh and Ravichandran, 2008).

Scanning electron microscope is the powerful tool in radular study. Research on functional morphology of molluscan radula has focussed attention on the obvious food preparing and food-gathering operation of teeth and their relationship. The scanning electron microscope permits the examination of radula with higher magnification without elaborate preliminary preparation and without squashing or fragmentation. A clear picture of three-dimensional morphology can therefore be obtained, which enlightens more mundane methods of observation. The radula has been frequently investigated because of its importance as a tool in supraspecific systematics to diagnose the species. The shape of the radula teeth is directly related to the kind of food, which the animals eat and the way in which it is manipulated. The length of the radula also appears to be related to the quantum of work, which has to be done in feeding (Reid and Mak, 1999). In the present study an attempt was made to elucidate the histological studies of digestive system and anatomy of the radulae of *Fusinus nicobaricus* from the Gulf of Mannar region.

MATERIALS AND METHODS

Specimens of *Fusinus nicobaricus* used in the present study were collected during low tides from the sea in their natural habitat that is intertidal zone, from reefs by divers and from trawl nets used for crab fishing from Gulf of Mannar coastal region. They were brought to the laboratory and maintained under laboratory conditions for further observations. Preserved specimens were not used for

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