SEA URCHIN (*Paracentrotus lividus*) GONADAL HISTOLOGY

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INTRODUCTION

Sea urchins are invertebrate animals of the phylum Echinodermata with a circular, flattened hard shell that is covered with plenty of sharply pointed spines and tube feet and generally inhabiting rocky bottoms. One of the most common sea urchin species in the Mediterranean Sea is *Paracentrotus lividus* which is among the most popular seafood. The gonads are the edible part of the sea urchin with a high level of essential amino acids and poly unsaturated fatty acids content. Sea urchins are gonochoristic organisms and during the spawning season, the eggs and sperms produced in the gonads are released to the water column for fertilization. Both for the male and female sea urchins, 6 phases were determined in the reproductive cycle. In the last decades, increasing demand and economic value of this species caused a hunting pressure and their stocks were effected negatively. Hence world-wide fisheries management regulations on this species were brought and also various studies on the sea urchin culture methods were performed.

OBJECTIVE

This study was carried out for the determination of sex and sexual development stage of sea urchin (*Paracentrotus lividus*) samples collected from Northern Aegean region of Turkey in October 2015 by using histological methods.

METHODS

A total of 6 sea urchin samples collected from the Aegean Sea coasts of Gelibolu (Çanakkale, Turkey) from a depth of 0-1.5 meters (Fig. 1) were brought to Experimental Fish Diseases Laboratory of Istanbul University Faculty of Fisheries alive and reared in a 150 liter glass aquarium prepared with the proper water parameters (temperature: 22 ºC; salinity: 38 ‰) and supplied with an appropriate substrate, aeration and external filters (Fig 2). During the study sea urchin samples were fed daily with pellet feed and/or moist feed (Fig 3). Their wet weight was determined in a digital scale and diameter and oral-aboral distance was determined with a vernier caliper.

Sea urchin samples with a mean weight of 54.8 g, mean oral-aboral distance of 2.8 cm and a mean diameter of 4.9 cm were selected for histological examination. Sea urchin tissues were fixed in phosphate buffered formalin and Bouin's fixative comparatively. Later, tissue samples were embedded in paraffin blocks, sections of 5 µm were prepared (Fig 4) and stained with hematoxylin & eosin (Fig 5) and analyzed under light microscope.

RESULTS AND DISCUSSION

With this study, it was observed that sea urchin can be reared successfully in the aquarium when provided proper water conditions, substrate and feed. It was also observed that using Bouin's fixative provides better results in histological examination. In this study, by using histological methods, it was determined that these sea urchin samples were all female. The presence of undeposited eggs in ovaries, nutritive phagocytes in the lumen and few primer oocytes around the ascinal wall (Fig 6) revealed that these sample were in the recovery phase in the development cycle. Present study provides important preliminary data for the further studies targeting the economical evaluation of sea urchin as seafood and further studies on the aquaculture of this species in Turkey.

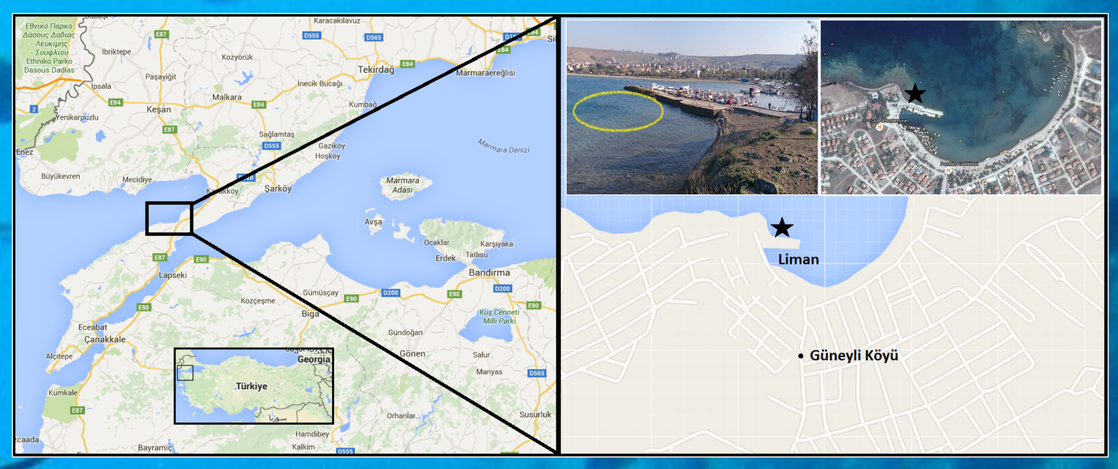

Figure 1. Sampling Area

Figure 2. Sea urchins attached on the rocky substrates placed in the aquarium

Figure 3. Feeding sea urchins with pellet feed in the aquarium

Figure 4. Preparing histological sections from parrafin blocked sea urchin tissues

Figure 5. Mounting the Hematoxylin & Eosin stained histological sections with a proper solution.

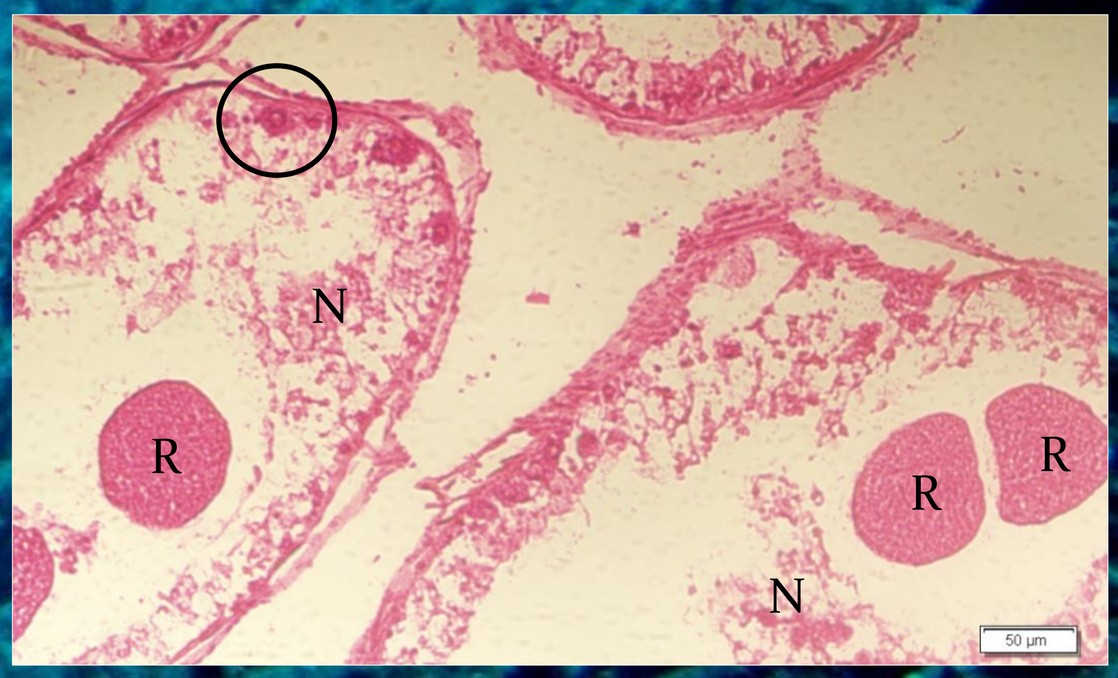

Figure 6. General view of female ovaries of the sea urchin samples. Nutritive phagocytes (N) and undeposited eggs (R) in the lumen of ovaries and primer oocytes (circled) attached on the ascinal wall