

Structure of Germ Cells and Reproductive cycle of Pearl Oyster, *Pinctada fucata martensii* and Pacific Oyster, *Crassostrea gigas*

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Introduction

Pearl oyster, *Pinctada fucata martensii* and Pacific oyster, *Crassostrea gigas* are the important commercial bivalves in Korea. Pearl oyster is distributed over the southern coast of Japan. In Korea, aquaculture of pearl oyster had started after successful transplantation of spat from Japan in 1964. Study on reproductive cycle and germ cells of pearl oyster and Pacific oyster is needed in Korea because the referred information mainly recited from Japan or old literature cite. Purpose of the present study was to investigate a fine structure of germ cell and a reproductive cycle of pearl oyster and Pacific oyster through histological method and electron microscopic observation.

Materials and Methods

Fine structures of the germ cells of pearl oyster and Pacific oyster were investigated using individuals monthly collected from Tong-Young and Nam-Hae along the south coast of Korea from October 2000 to September 2001. For electron-microscopic observations, excised pieces of gonads were cut into small pieces and prefixed immediately in 2.5% glutaraldehyde solution. After doing several series of process of post fixation, embedding, section and stain, fine structure examined with transmission electron microscope (JEM 1200 E-X II, 60~80 Kv, JEOL, Japan).

Results and Discussion

1. Structure of germ cell

In ovary it was classified into oogonium stage, previtellogenic stage, vitellogenic stage and mature stage. Variety of egg yolk granules, lipid granules, mitochondria and endoplasmic reticula were observed in cytoplasm from the fine structure of ripe oocytes. Outside of cytoplasm, vitelline was observed to envelope the microvilli.

In testis it was classified into spermatogonium stage, spermatocyte stage, spermatid stage and spermatozoon stage. The spermatozoon consisted of head, middle piece and tail. The spermatozoon of pearl oyster had a cowl-shaped acrosome, spherical nucleus and five mitochondria, two centrioles and flagellum, and that of Pacific oyster, a cap-shaped acrosome with a domed structure at the anterior part, elliptical shaped nucleus, four spherical mitochondria, two centrioles and flagellum.

2. Reproductive cycle

The gonadal developmental phases of both species were classified with following five successive stages.

Pearl oyster: multiplicative stage (November to February), growing stage (January to March), mature stage (March and April), spawning stage (May to August), degenerative and resting stage (September to November).

Pacific oyster: multiplicative stage (December to March), growing stage (March and April), mature stage (April to June), spawning stage (June to August), degenerative and resting stage

(August to January).

The spawning peaks of pearl oyster and Pacific oyster were revealed in June and July, and July, respectively.