

A COMPARISON BETWEEN THE MACROSCOPIC AND MICROSCOPIC STAGING OF OVARIES IN *ARISTAEOMORPHA FOLIACEA* (RISSO, 1826)

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Abstract

Specimens of *Aristaeomorpha foliacea* caught in the Southern Tyrrhenian Sea were examined in order to validate the macroscopic scale used in MEDITS project to determine the ovarian maturity of this commercial shrimp. The scale was tested against a microscopic examination of ovarian samples.

Keywords: Crustacea, Decapoda, Reproduction, Tyrrhenian Se

INTRODUCTION The red shrimp *Aristaeomorpha foliacea* (Risso, 1826) is an economically important resource of the Mediterranean Sea, mainly found between 300 and 700 m depth. Studies on reproductive biology of this shrimp are usually based upon macroscopic observation of gonads [1,2,3]. The present work attempts to validate the macroscopic scale for maturity staging of *A. foliacea* currently used in MEDITS project [4] by histological examination of ovarian tissue.

MATERIAL AND METHODS Shrimps were caught by commercial trawlers in the Southern Tyrrhenian Sea, at a depth of 600 metres, between January and July 2009. Ovaries (n = 50) from formalin fixed specimens were dissected in the laboratory, and macroscopically staged for maturity, according to MEDITS scale, as follows: 1, immature; 2a, virgin developing; 2b, recovering; 2c, maturing; 2d, mature; 2e, resting adult. Ovarian samples were processed for histology and observed under the light microscope.

RESULTS AND DISCUSSION Histological analysis allowed to distinguish 5 types of cells: oogonia, OO (<10±0.11 µm), early primary oocytes, EPO (15–25 µm), late primary oocytes, LPO (25–85 µm), early vitellogenic oocytes, EVO (90–300 µm), and late vitellogenic oocytes, LVO (>300 µm). Stage 1 ovaries contained mainly oogonia and early primary oocytes, together with some late primary oocytes. Both 2a and 2b ovaries (Fig.1) contained oogonia and early primary oocytes in a germinative zone, as well as late primary oocytes, arranged in tubules, in a maturative zone. Stage 2c ovaries (Fig. 2A) contained both early and late vitellogenic oocytes, besides EPO and LPO. Stage 2d ovaries were microscopically similar to 2c, except for one specimen, in which oocytes were found at a very advanced vitellogenic stage, with no nuclei, and a typical convoluted perivitelline space along the cell membrane (Fig. 2B), resembling the “cortical rods” described by Nazari *et al.* (2007) [5] in *Farfantepenaeus paulensis*, suggesting imminent spawning. No stage 2e individuals were found during the sampling period. Histological analysis confirmed the immaturity of stage 1 ovaries, and revealed no difference in the most advanced oocyte stage between 2a and 2b ovaries, which represent the same functional stage at different ages. Maturing (2c) and mature (2d) ovaries, which are clearly distinguishable macroscopically by colour, appeared histologically very similar, suggesting a fast achievement of yolk deposition in this species.

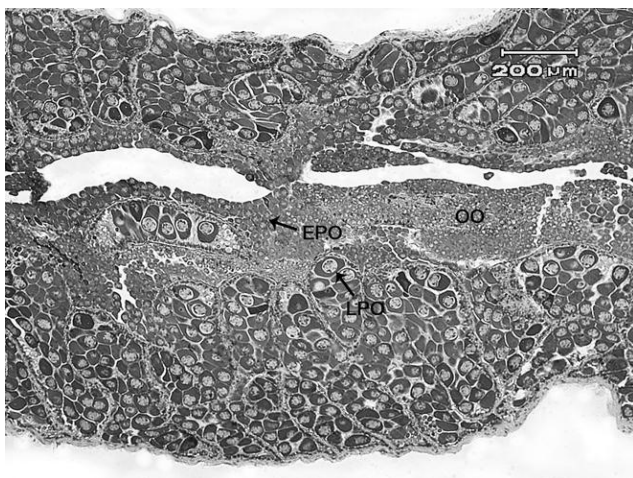


Fig. 1. Stage 2b ovaries of *A. foliacea*, with a germinative zone containing oogonia (OO) and early primary oocytes (EPO), and a maturative zone containing late primary oocytes (LPO)

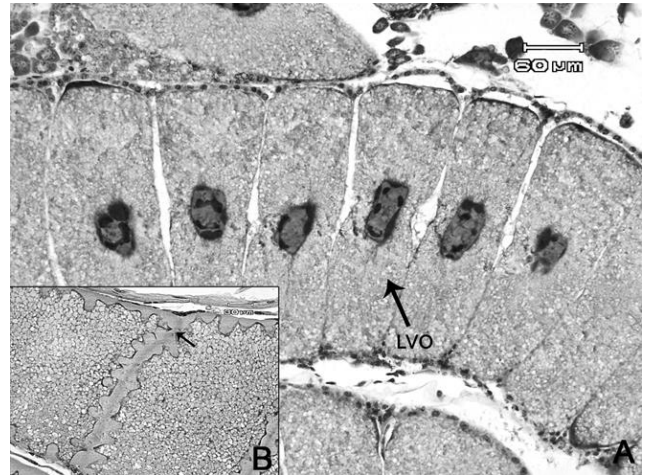


Fig. 2. Stage 2c ovaries of *A. foliacea* with late vitellogenic oocytes (LVO) piled up as coins in a single row (A); stage 2d ovary with advanced late vitellogenic oocytes characterized by a convoluted perivitelline space along the cell membrane (B)

References

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