

FECUNDITY STRATEGY OF THE HIGHLY EXPLOITED LIMPET, *PATELLA ORDINARIA*, FROM AN OCEANIC ARCHIPELAGO

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Abstract:

Limpet harvesting dates back to the 15th century in Madeira archipelago (NE Atlantic Ocean), when the archipelago was colonized by the Portuguese. This activity is size-selective, removing older and larger individuals with greater commercial value. It can lead to a lower reproductive output as individual fecundity is size-dependent. The sharp decrease of intertidal limpet populations has led to the implementation of various management measures including the establishment of a closed season from November to March to avoid disturbance during the reproductive season. So far, sizes and the reproductive parameters size and age at first maturity have been previously used to determine the exploitation status of the limpet *Patella ordinaria* in Madeira Island, with no study performed on the reproductive strategy of these limpets. This is pivotal to comprehend the population dynamics of any species, being fecundity one of the reproduction parameters that should be analysed. Improved understanding of these features will provide new info of the population sustainability to harvesting. This work aims to provide new information on the fecundity of *P. ordinaria*, an issue included in a broader study that explores complex life cycles in metacommunities in order to predict future scenarios in human-exploited and fragmented ecosystems. An average of 17 females per month were randomly collected over the spawning season of 2021-2022 from the subtidal zones of the rocky shores of the Madeira archipelago, by snorkeling. Histological analysis and visual image analysis system were used to study the four main criteria applied for fecundity type

determination: (i) presence of a hiatus between pre-vitellogenic and vitellogenic oocytes; (ii) number of standing stock of advanced vitellogenic oocytes over the spawning season; (iii) mean size of standing stock of advanced vitellogenic oocytes over the spawning season; and (iv) the incidence of atresia over the spawning season.

Key words: *Patella ordinaria*, fecundity type, Madeira Island, Northeastern Atlantic Ocean.

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