Influence of Infestation by Labratrema Minimus (Bucephalidae: Digenea) on Oxygen Consumption of Edible Cockle Cerastoderma Edule (Mollusca: Bivalvia) in Laboratory Conditions

Abstract:
Short-term oxygen consumption and filtration rate experiments were conducted to evaluate the response of edible cockle Cerastoderma edule when infested by the Digenean trematod Labratrema minimus. In this experiment the metabolic activities of bivalves were measured to determine this particular aspect of the host-parasite interaction. We have used the Bucephalidae digenea Labratrema minimus infestation as a factor which can alter the metabolic rates of its host: the edible cockle Cerastoderma edule from Arcachon bay (France). The results show that specific oxygen consumption of infested cockles decreases in comparison with that of healthy ones. This decrease in specific pumping rate is partly due to increase in the total cockle biomass measured, which is due to the presence of the parasite and can represent 20% of a healthy cockle’s O₂ consumption (it can constitute up to 92% of live mass in high infestation intensities [personal observations; 1996]) but consume little oxygen. In addition, the disease provoked by infestation can reduce the true metabolic activities. The results show that pumping rate is related to the intensity of the infestation with greater infestation associated with lower oxygen consumption. We also demonstrate that L. minimus is capable of oxygen consumption regulation. The consumption rate is maintained below 0.3 μmol O₂ min⁻¹ g⁻¹ FDW (Fresh Dry Weight) in all external oxygen concentrations experimented.

Keyword(s): Filtration Rate, Cerastoderma Edule, Digenea, Host-Parasite Interactions