BIOCHEMICAL RESPONSES AND BIOACCUMULATION IN CAGED OYSTERS (CRASSOSTREA BRASILIANA) EXPOSED TO EFFLUENTS FROM ANTHROPOGENIC SOURCES IN THE LAGUNA ESTUARINE SYSTEM, SOUTHERN BRAZIL

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Aquatic ecosystems are of major importance for the human society and strong contributors to biodiversity. Nevertheless, they constitute the final destination of a variety of anthropogenic contaminants. Biochemical biomarkers have been widely used as indicators of exposure to aquatic pollutants, since they have the potential to establish a mechanistic link between chemical exposure and consequences at population and community levels. Thus, the possible ecotoxicological effects of effluents from anthropogenic sources were investigated by measuring selected organic contaminants and biochemical responses in caged oysters (Crassostrea brasiliana) in Southern Brazil. Oysters from a control farm area (T0 – Sambaqui, Florianópolis, SC) were transplanted to four sites in the Laguna Estuarine System, Laguna, SC: P1 – affected by discharges of untreated sanitary sewage; P2 – impacted by sewage, agricultural and industrial activities; P3 and P4 – influenced by dredging and agricultural operations. After 36 h and 7 days of exposure, enzymatic responses were measured in the gill and digestive gland tissues including biomarkers from antioxidant and related enzymes catalase (CAT), glutathione peroxidase (GPx), glutathione reductase (GR) and glucose-6-phosphate dehydrogenase (G6PDH), and phase II enzyme glutathione S-transferase (GST). After 7 days, CAT activity of gills was significantly increased at P2, P3 and P4 compared to T0 and P1. Contrariwise, the digestive gland showed an opposite response, with P3 and P4 presenting lower activities. GST activity was significantly decreased in P4 when compared to P2. These data are corroborated by the increased levels of polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs) and linear alkylbenzenes (LABs) in the tissues of oysters at P4 site. A time dependent pattern was also observed for both biomarkers and bioaccumulation. Our survey demonstrated the effectiveness of cage-exposure studies and biomarker methods in ecotoxicological characterization using C. brasiliana as bioindicator species. Furthermore, it shed a light on a pollutant burden in the Laguna Estuarine System.

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