OXIDATIVE STRESS AND ANTIOXIDANT RESPONSES GENERATED BY DIESEL ON THE DIGESTIVE GLAND OF THE ANTARCTIC LIMPET NACELLA CONCINNA

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The limpet Nacella concina is a gastropod mollusk widespread along Antarctic coasts. Due to its intertidal-sub tidal habitat, this species is particularly accessible to floating organic pollutants. Hydrocarbons can penetrate into the organism by diffusion across the body surface and through the digestive system, since limpets feed on algae that are easily reached by floating pollutants. We investigated the possible effects of a fuel commonly used in Antarctica (diesel) on the activity of antioxidant enzymes and oxidative damage on the digestive gland of the limpet Nacella concina, as possible biomarkers for hydrocarbon pollution in Antarctic coasts. Four groups of 24 animals each were kept in seawater containing 0, 0.5, 2.5 or 5% diesel. Superoxide dismutase (SOD), catalase (CAT), glutathione S-transferase (GST) and glutathione peroxidase (GPx) activities as well as lipid peroxidation (LPO), protein oxidation (PO) and reduced glutathione (GSH) levels were studied in 6 animals of each group after 1 to 4 days (acute treatment) and 1, 2, 3 and 4 weeks (chronic treatment) of exposure. There was a general trend to increased enzyme activity with increasing doses of diesel. Moreover, protein oxidation and lipid peroxidation were significantly increased in the chronic assay.