

PRELIMINARY EVIDENCE OF AN OXIDATIVE STRESS SYSTEM IN FRESHWATER CRAYFISH AUSTROPOTAMOBIOUS PALLIPES ITALICUS



Oxidative damage reflects an imbalance between the production of oxidants and removal or scavenging of those oxidants. The antioxidants neutralize via enzymatic and non-enzymatic mechanisms the toxic effects of the free radicals, acting at different levels both within the cell and in the extra cellular fluids. A study on the oxidative defenses under conditions of stress temperature was carried out in the freshwater crayfish *Austropotamobius pallipes italicus*, an endangered species now distributed in scattered areas in Italy and a few Europeans countries. Glutathione peroxidase (GPX) and Glutathione reductase (GR) activity have been measured in the hemolymph, hepatopancreas and muscle tissue by an enzymatic assay in male individuals exposed, for seven days, to three different temperature: 4 °C, 15 °C and 25 °C. Antioxidative enzyme activity was found in the hemolymph, but not in the hepatopancreas and in the muscle tissue. The enzyme activity varied in the hemolymph according to the temperature the animals were exposed to. As far as the GPX is concerned we found the activity only in the hemolymph of animals exposed to the temperature of 15 °C.

On the contrary, GR activity was detected in the hemolymph at the three considered temperatures. Although the highest level of GR activity was found at 25 °C, followed by 4 °C and 15 °C, it was nonetheless very low and much lower than the level of GPX activity. Very little is known on oxidative stress in crustaceans and virtually nothing in the freshwater crayfish *A. pallipes italicus*. Our data, although preliminary, indicate that the antioxidant defenses provide a useful criterion for the thermal tolerance in studies on natural distribution and suitability of aquacultural environments.

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