

CHANGES IN THE ACTIVITY OF GST ENZYME ON MUSSEL (*MYTILUS GALLOPROVINCIALIS*) FROM IZMIR BAY

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Abstract

Izmir Bay as a study area has been polluted by various kind of domestic and industrial wastes without any wastewater treatment process until 2000's when central WWTP is introduced. Glutathione-s-transferase (GST, EC:2.5.1.18) is one of important enzyme in detoxification process and used by many researchers for assessing the effects of pollutants on the organisms. In this study it was aimed to find out the changes in GST enzyme activity of mussels (*Mytilus galloprovincialis*) which were collected from different stations of Izmir Bay. According to obtained results GST activity were decreased in all stations compared with control group (taken from mussel farm) and as a conclusion GST activity is essential but not enough for assessing pollution effects.

Keywords: Bivalves, Ecotoxicology, Izmir Bay

Aquatic environments are under great pressure due to anthropogenic factors such as chemical pollution and population growth. Izmir bay as a study area has been polluted by various kind of domestic and industrial wastes without any wastewater treatment process until 2000's when central WWTP is introduced (1). Although discharging pollutant agents are stopped Izmir bay is not still ameliorated fully so monitoring of biomarkers in sentinel organisms is very essential for assessing the healing process of ecosystem. Analytical studies are very important for the determination of pollutants quantitatively but insufficient for assessing effects on organisms. Antioxidant defence system is essential for organisms to cope with many stressors like biological, physical or chemical pollutants and changes in enzyme activity is a good biomarker for assessing the pollutant effects on organisms (2). Glutathione-s-transferase (GST, EC:2.5.1.18) is one of important enzyme in detoxification process and used by many researchers for assessing the effects of pollutants on the organisms (3,4). Changes in activity of GST can be early warning system for detecting the ecosystem problems if the toxicant levels are below lethal concentrations. In this study it was aimed to find out the changes in GST enzyme activity of mussels (*Mytilus galloprovincialis*) which were collected from different ports (Uckuyular, Goztepe, Konak, Pasoport, Alsancak, Karsiyaka and Bostanlı) and near of Bayrakli and Alaybey than brought to laboratory in icebox.

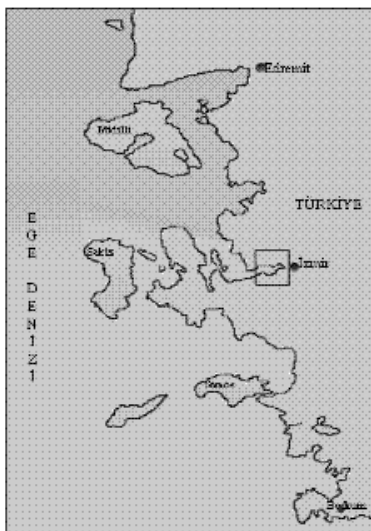


Fig. 1. Inner part of Izmir Bay

According to obtained results GST activity were decreased in all stations compared with control group (taken from mussel farm). Among the stations the lowest GST activity was measured in Uckuyular and Pasoport stations (0.11) and although the highest was at the Konak harbour (Fig. 2) still it was under control values (0.15).

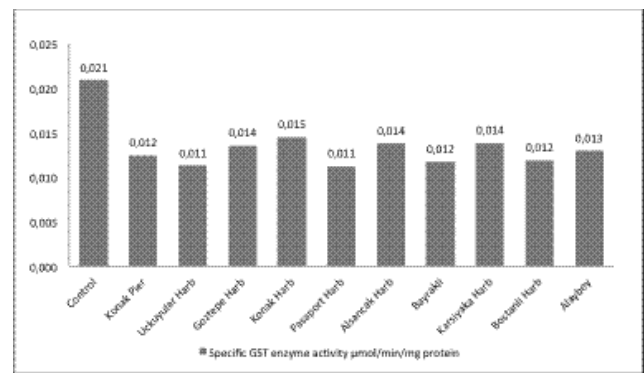


Fig. 2. The specific GST enzyme activity (µmol/min/mg protein)

In study with mussels exposed to Bisphenol-A GST enzyme activity was low in higher concentration as it cause high toxicity parallel to current study (5). GST enzyme activity is probably the first defence for pollutant and as increasing levels of toxicants the activity decreases in a critical level where the organism can not cope with pollutant by antioxidant defence system. This study will be expanded for other biomarkers not only biochemical ones but also genotoxicity to find out health of organisms in Izmir bay.

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