THE EFFECT OF ROUNDUP HERBICIDE ON ANTIOXIDANT ENZYME ACTIVITY IN THE YEAST SACCHAROMYCES CEREVISIAE

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The expression of a series of genes takes place under the influence of heat shock in the cells of the yeast Saccharomyces cerevisiae. One of them is the CTT1 gene which codes catalase T. A similar increase in the expression of the catalase T gene was observed under the influence of other stress factors, such as ethanol or hydrogen peroxide. In this study, we examined the stress effects in yeast under the influence of Roundup, a herbicide in which the biologically-active substance is glyphosate. The toxicity of Roundup mainly consists of blocking the synthesis of aromatic amino-acids. After one hour of incubation with Roundup, a considerable reduction in yeast cell survival was observed. It was noticed that the stress caused by this herbicide increases the activity of catalase (CAT) and superoxide dismutase (SOD). In addition, it was also observed that yeast cells adapt to these stress conditions by increasing their resistance to the toxic influence of this herbicide and to the influence of other harmful compounds, such as ethanol, hydrogen peroxide and menadione. The increase in activity of catalase and dismutase may be an adaptive response of the cells to the growing number of free radicals. It suggests the participation of reactive oxygen species (ROS) in the response mechanism to this type of stress.