

ANTIOXIDANT RESPONSE OF BACTERIA TO HERBICIDE S-METOLACHLOR

Martins, P.F.¹; Carvalho, G.¹; Pileggi, M.²; Azevedo, R.A.¹

¹ Departamento de Genética, ESALQ, Universidade de São Paulo, Brazil

² Departamento de Biologia Estrutural, Molecular e Genética, Universidade Estadual de Ponta Grossa, Brazil

The increase of reactive oxygen species (ROS) production is observed in response to a variety of stressful agents, including herbicides. Some studies relate cell protection and resistance to agrochemicals with antioxidant system. S-metolachlor is a chloroacetanilide herbicide of high toxicity and it is one of the most frequently detected agrochemical in water samples. We tested the effect of this herbicide in two bacteria: *Klebsiella oxycota* and *Enterobacter cloacae*. The strains grown in the presence and absence of herbicide were analyzed. Protein profile by SDS-PAGE and the activity of the antioxidant enzymes catalase (CAT) and superoxide dismutase (SOD) by non-denaturing PAGE were determined. No apparent differences were observed for *Klebsiella oxycota* and *E. cloacae* in soluble protein concentration and distribution, but the intensity of some protein bands were altered for strains in the presence of the herbicide. *E. cloacae* exhibited a CAT isoenzyme and an increase in total CAT activity in response to the herbicide. Both strains showed three SOD isoenzymes, but no differences were observed to the herbicide. The results suggest a different response of the bacteria to s-metolachlor and that the herbicide is inducing the production of ROS, particularly hydrogen peroxide.

Supported by: FAPESP

Key-words: herbicide, oxidative stress, bacteria