

## Oxidative Stress Induction by Metals Bioaccumulation in *Allium cepa* L.

Geremias, R.<sup>1</sup>, Bortolotto, T.<sup>2</sup>, Pedrosa, R.C.<sup>3</sup>, Regoli, F.<sup>4</sup>, Fattorini, D.<sup>4</sup>, Fávere, V.T.<sup>1</sup>

<sup>1</sup>Depto de Química, UFSC, SC, Brazil,

<sup>2</sup>Depto de Ciências Biológicas, UNESC, SC, Brazil

<sup>3</sup>Depto de Bioquímica, UFSC, SC, Brazil

<sup>4</sup>Università Politecnica Delle Marche, Ancona, Italy

Metals are able to accumulate in the tissues and may be cause of oxidative stress in the plants. The aim of this work was to evaluate the association between metals bioaccumulation and induction of oxidative stress in *Allium cepa* L. The concentration of the metals was determined by a flame atomic absorption spectrometric method and the oxidative damage was evaluated using biomarkers like lipid peroxidation (LP), DNA damage index (DI) and carbonyl proteins levels (CP). The *A. cepa* roots and bulbs exposed to metals (1mg L<sup>-1</sup>; n= 5; 7 days; 25°C) showed significant bioaccumulation. The roots presented Cu = 34019 ± 9709, Fe = 121 ± 23 and Mn = 1498 ± 603 µg/g and the bulbs Mn = 197 ± 44 µg/g while the baseline levels were Cu = 12 ± 1, Fe = 42 ± 8 and Mn = 35 ± 7 µg/g for roots and Mn = 14 ± 3 µg/g for bulbs of the negative control. The oxidative damage was increased significantly (P<0.05) in *A. cepa* exposed to effluent contaminated with metals (LP = 128.0 ± 7.2 ηmol.g<sup>-1</sup>; DI=122.2 ± 25.9; CP= 186.3 ± 16.9 µmol.mg<sup>-1</sup>) when compared to the negative control (LP = 94.4 ± 5.4 ηmol.g<sup>-1</sup>; DI = 9.5 ± 2.3; CP = 64.2 ± 15.1 µmol.mg<sup>-1</sup>). In conclusion, these results suggest that the transition metals may accumulate in the tissues and generate reactive oxygen species probably by the Fenton reaction, with consequent induction of oxidative stress.

Keywords: metals bioaccumulation; oxidative stress; *Allium cepa* L.

Acknowledgements: CNPq