



BOOK OF ABSTRACTS



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Tolerance and stress response of the saprobe macrofungi *Macrolepiota procera* to nickel

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Nickel (Ni) is an essential element for many organisms however it is very toxic at high concentrations and also depending on the species. In macrofungi the mechanisms underlying their Ni-tolerance are poorly documented. We examined, for the first time, the participation of the antioxidative system in the *Macrolepiota procera* exposed to different Ni²⁺ concentrations and their relation with Ni-tolerance. The effect of the pH on Ni-tolerance was also evaluated. The fungus was cultivated on solid medium with different Ni concentrations (0.05, 0.2, 0.8 mM) at pH 4, 6 and 8, and fungi growth and Ni uptake was determined. The antioxidative enzymes, catalase (CAT) and superoxide dismutase (SOD) and the production of hydrogen peroxide (H₂O₂) were evaluated on fungal submerged cultures within first hours of Ni exposure. Results showed that *M. procera* growth decreased when Ni concentrations increased, reaching a maximum growth inhibition (higher than 80%) up to 0.2 mM of Ni. The Ni uptake increased proportionally to Ni increase in the medium. Both Ni-tolerance and Ni-accumulation were affected by media pH. Microscope observations showed differences on the size of spores produced by fungi at different Ni concentration. Ni exposure induced oxidative stress, as indicated by the production of H₂O₂, which levels seem to be regulated by the antioxidant enzymes SOD and CAT. The time variation pattern of SOD and CAT activities indicated that the first has a greater role on the alleviating stress. The results obtained suggested that the *M. procera* tolerance to Ni is associated with the ability of this macrofungi to initiate an efficient antioxidant defence system.

Keywords *Macrolepiota procera*; Nickel; stress; Ni-tolerance; Ni-accumulation; hydrogen peroxide; antioxidant enzymes