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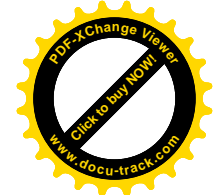
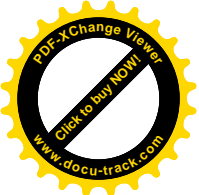
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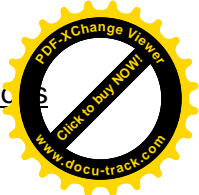
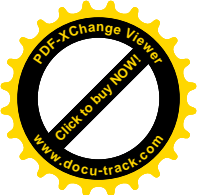


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S7/P52: RETARDATION IN SEED GERMINATION AND INDUCTION OF OXIDATIVE STRESS IN LETTUCE PLANTS UPON SPENT COFFEE GROUNDS EXPOSURE

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Over the past years, several strategies have been tentatively applied to reuse spent coffee grounds (SCG). This residue, obtained after the brewing process, has a global production around 6 million tons per year. The use of SCG in domestic agriculture is an increasing popular practice. However, scientific evidences about their effect on plants remain unknown. Caffeine present in SCG (about 0.2%) together with tannins and chlorogenic acids could have a toxic effect on soil microorganisms and plants. In this study, we intended to verify the relation between seed germination and the antioxidative system in *Lactuca sativa* L. cv. "Wonder of four seasons" plants upon exposure to several fresh SCG amounts. The percentage of seed germination was evaluated in Petri dishes containing SCG at different concentrations [0%, 5%, 10%, 15%, 20% and 30% (v/v)]. The response of antioxidant system to SCG was evaluated on roots and leaves of lettuce plants after being exposed for 24h to different SCG concentrations [0%, 5%, 10% and 15% (v/v)] in aqueous solution. The levels of hydrogen peroxide (H₂O₂), superoxide anion (O₂⁻) and malondialdehyde (MDA), as well as the activities of superoxide dismutase (SOD) and catalase (CAT) were determined and their relation with seed germination was assessed. Results showed significant decreases in germination percentage with increasing SCG concentration, attaining a maximum inhibition (98% when compared to the control) under SCG concentrations of 30%. This effect was coincident with a significant increase of H₂O₂, O₂⁻ and MDA levels during the first 12 h of elicitation as well as of SOD activity, but not of CAT, showing clear signs of increased oxidative stress. SCG-induced oxidative stress was concentration-dependent and was mainly observed within the lettuces roots. Taken together, the results suggest that the effect of the SCG on seed germination was probably caused by the toxicity of compounds present in the SCG (e.g. caffeine) and also to induced oxidative stress by resulting in an imbalance between pro-oxidant and antioxidant defense mechanisms in plant cells.

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