



Assessment of Arsenic Induced Oxidative Damage and Modulation of Antioxidant Defence System in Tomato

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Abstract: Arsenic (As) is proved to be phytotoxic for growth and development of plants. After uptake by plants causes cell membrane damage, inhibition cellular functions, oxidative damage, and even cell death. As exposure results in the generation of ROS (reactive oxygen species) such as superoxide radical, hydroxyl radical and hydrogen peroxide which can directly damage proteins, amino acids and nucleic acids. It can also cause peroxidation of membrane lipids. Being a strong oxidizing agent, ROS induces oxidative stress which results degradation of biomolecules and finally cell death. To cope with oxidative stress plants induce their antioxidant defence system which leads to the synthesis of enzymatic and non-enzymatic antioxidants such as superoxide dismutase (SOD), catalase (CAT) and glutathione-S-transferase (GST), ascorbate (AsA) and glutathione (GSH). In addition, phytohormones also play important role to inhibit oxidative stress-induced cell death. Increased concentrations of phytohormones were observed in response to treatment. It has been concluded that the induction of oxidative stress is the main process underlying As phytotoxicity. The present investigation portrays a general idea about phytotoxic effect of As in terms of oxidative damage and its regulation in tomato plants.

Keywords: Antioxidants, Arsenic, Oxidative stress, Phytohormones, Phytotoxicity
