

The Effects of Acid Rain, Smog Cars on Antioxidant Systems, Associated Enzyme and H⁺-ATPase Activity in Rice Cultivars (*Oriza sativa* L.)

Authors : Heidarali Malmir

Abstract : The effects of acid rain (AR), smog's cars (SC), and combined AR+SC on the antioxidants enzymes, lipid-soluble antioxidants, and water-soluble antioxidants were studied in the two cultivars of rice. The results showed that simulated AR significantly increased the total glutathione (TGSH), thiobarbituric acid (TBA), and α -tocopherol, accompanied by decreases in dry weight and leaves area in the two cultivars, and this change was more obvious in Shirudi cultivar than in Aus cultivar ($p \leq 0.05$). Under SC stress cultivar shirudi had higher H⁺-ATPase, glutathione peroxidase (GSH-px), and catalase (CAT) activities than cultivar Aus. The results of superoxide dismutase (SOD) activity, TGSH, and α -tocopherol levels affected by AR treatments were very different to those of SOD activity, TGSH, and α -tocopherol levels, as shown in SC treatment. It seems that SOD activity coupled with the water-soluble antioxidants and α -tocopherol levels correlated with the lipid-soluble antioxidants. It is suggested that α -tocopherol increases H⁺-ATPase activity.

Keywords : H⁺-ATPase, membrane permeability, lipid soluble antioxidants, water soluble antioxidants, associated enzyme

Conference Title : ICPPP 2023 : International Conference on Phytogeography and Plant Physiology

Conference Location : London, United Kingdom

Conference Dates : July 24-25, 2023