

Comparative Analysis of Photosynthetic and Antioxidative Responses of Two Species of *Anabaena* under Ni and As(III) Stress

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Abstract : Cyanobacteria, the photosynthetic prokaryotes are indispensable components of paddy soil contribute substantially to the nitrogen economy however often appended with metal load. They are well known to play crucial roles in maintenance of soil fertility and rice productivity. Nickel is one such metal that plays a vital role in the cellular physiology, however at higher concentrations it exerts adverse effects. Arsenic is another toxic metalloid that negatively affects the cyanobacterial proliferation. However species-specific comparative responses under As and Ni is largely unknown. The present study focuses on the comparative effects of nickel (Ni²⁺) and arsenite (As(III)) on two diazotrophic cyanobacterial species (*Anabaena doliolum* and *Anabaena* sp. PCC7120) in terms of antioxidative aspects. Oxidative damage measured in terms of lipid peroxidation and peroxide content was significantly higher after As(III) than Ni treatment as compared to control. Similarly, all the studied enzymatic and non-enzymatic parameters of antioxidative defense system except glutathione reductase (GR) showed greater induction against As(III) than Ni. Moreover, integrating comparative analysis of all studied parameters also demonstrated interspecies variation in terms of stress adaptive strategies reflected through higher sensitivity of *Anabaena doliolum* over *Anabaena* PCC7120.

Keywords : antioxidative system, arsenic, cyanobacteria, nickel

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