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Physiological and Biochemical Characterization of the Paddy Field Cyanobacterium *Anabaena doliolum* under Exposure to Elevated Temperatures

Yattapu Prasad Reddy[1], Ravindra Kumar Yadav[2], Keshawanad Tripathi[2] and G. Abraham[1*]

Centre for Conservation and Utilization of BGA, ICAR-Indian Agricultural Research Institute, New Delhi-110012

Abstract—*To understand the physiological and biochemical response of the mesophilic diazotrophic cyanobacterium Anabaena doliolum to temperature, the organism was grown under three temperature regimes 30, 35 and 40 ^{0}C for 16 days. Exposure of the cyanobacterium to 40 ^{0}C temperature resulted in severe reduction in growth and cellular constituents as compared to the cells exposed to 35 ^{0}C. The cyanobacterial cells also showed enhanced production of H_2O_2 and lipid peroxidation products in response to exposure to high temperature. Increase in the activity of superoxide dismutase, catalase and peroxidase was observed in A. doliolum exposed to elevated temperature. Increase in the temperature resulted in enhanced level of antioxidants such as carotenoid, proline and ascorbate. Although, the number of heterocysts increased in response to temperature, the nitrogenase activity decreased significantly. The results show the sensitivity of the cyanobacterium A. doliolum to elevated temperature.*

Keywords*: Anabaena doliolum, antioxidants, mesophilic, high temperature.*

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