Phytology

Biochemical parameters affected by sorbitol induced osmotic stress in *Zea mays* Ganga Safed-2 leaves

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Abstract

In the present investigation, effect of osmotic stress imposed by the supply of sorbitol was analyzed on biochemical parameters, such as, protein, RNA, DNA and proline content in leaves of *Zea mays*, Ganga Safed-2 genotype. For the study, maize leaf segments obtained from light grown seedlings were treated with varying concentrations of sorbitol (0.0-1.0 M) under illumination. Total protein, total RNA and DNA were found to decrease markedly and significantly by the supplementation of 0.2 to 1.0 M sorbitol in excised leaf segments. The relative water content decreased marginally with the sorbitol treatment, but a several-fold increase in proline content was noted. SDS- PAGE analysis of sorbitol treated maize leaf tissue revealed the appearance of a protein (approx. 70 kDa) in 0.6M sorbitol treatment. Further, extensive homology (Protein score: 270) was found for that protein with chloroplast heat shock protein 70 from *Cenchrus americanus*. Concentration-dependent decrease in total chlorophylls and carotenoids was observed with an increasing supply of the osmotic inducer. It is suggested that sorbitol interferes with the growth and metabolic parameters of the *Zea mays* Ganga Safed-2 leaf tissue and stimulates the synthesis of stress induced proteins.

Keywords: osmotic stress, maize leaf, protein, sorbitol

1. Introduction

overcome stress factors. These proteins are known to play a