



Journal

J. Biol. Chem.
Environ. Sci., 2018,
Vol. 13(2): 343-358
<http://biochemv.blogspot.com.eg/>

MITIGATION OF DROUGHT STRESS ON FENUGREEK SEEDLINGS BY APPLICATION OF ASCORBIC ACID

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ABSTRACT

Drought stress is one of the most crucial abiotic factors that limit the seeds germination, seeding growth, plant growth and yield. The aim of this study was conducted to investigate the effects of application of ascorbic acid (200 mg/l) on drought stress which induced by concentrations of polyethylene glycol (0, -2 and -4 bars) in fenugreek seedlings. Drought stress caused significant decrease in germination percentage, growth parameters (shoot length, fresh and dry weight of seedling and seedling vigor index) and total chlorophyll content whereas total phenolics and activity of enzymes [Ascorbate oxidase (AO), catalase (CAT), peroxidase (POX) and polyphenol oxidase (PPO)] increased at the maximum concentration of polyethylene glycol compared to control. On the other hand, pretreatment of seeds treated with ascorbic acid (200 mg/l) enhanced all parameters studied under drought stress. Moreover, Electrophoretic studies of esterase, peroxidase and catalase isozymes showed wide variations in the number of bands by using ascorbic acid under drought stress as compared to untreated. Finally, using the ascorbic acid was able to enhance the tolerance of fenugreek seedling to drought stress.

Key words: Ascorbic acid, chlorophyll, drought stress, enzymes activity, isozymes, phenolics.