Temporal Changes in the Growth and Antioxidant Defense in the *in vitro* Raised Plantlets of *Arachis hypogaea* L. Genotypes Subjected to Nitric Oxide Elicitation

Aman Verma[1,*], C.P. Malik[1] and V.K. Gupta[2]

[1,*]*School of Life Sciences, Jaipur National University, Jaipur-302 025, India*

[2]*Department of Biochemistry, Kurukshetra University, Kurukshetra-136 119, India*

ABSTRACT

As a bioactive signal, nitric oxide (NO) is involved in multiple plant physiological responses. It regulates diverse biochemical processes in plants in a concentration-dependent manner. Different NO generators viz. sodium nitroprusside (SNP), S-nitroso-N-acetyl penicillinamine (SNAP) and S-nitroso-L-glutathione (GSNO) have been reported but SNP is the most widely used and effective NO donor. Here, we investigated the *in vitro* effects of NO donor, SNP, on biochemical and physiological characteristics such as, multiple shoots, chlorophyll content, activities of catalase (CAT), peroxidase (POX), polyphenol oxidase (PPX), and ascorbate peroxidase (APX), total soluble carbohydrates and proteins in *Arachis hypogaea* L. genotypes (M-13 and PBS24030). *In vitro* impact of SNP on shoot multiplication potential was found to be increasing from 5 to 100 µM SNP alone in M-13 and PBS24030. Rhizogenesis was noticed in the presence of SNP alone. Total chlorophyll content was highest at 100 µM SNP alone in both the cultivars. Treatment with both SNP and 6-Benzyl adenine (BA) was more effective in enhancing the antioxidant enzyme activities, total soluble carbohydrates and proteins as compared to SNP alone in both the cultivars. The results obtained in the study clearly indicated not only the *in vitro* establishment of groundnut cultivars in the presence of SNP alone and in combination with BA but also its effect on various growth promotory physiological parameters.

Key words: Antioxidant enzymes, *Arachis hypogaea* L., *in vitro*, PGR's, Plant growth regulators, nitric oxide

Author for correspondence: Aman Verma, e-mail: verma.aman1980@gmail.com