Exogenous Nitric Oxide Donor Sodium Nitroprusside Enhanced Growth Attributes of Polybagged Rubber (*Hevea brasiliensis*) Seedlings

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Abstract

Shoot, dieback condition has been observed in poly bagged young-budded rubber especially under hot and dry weather conditions. This is partly attributed to the failure of the root system. Therefore, it is imperative to find ways to improve the root system while enhancing other growth attributes of poly bagged rubber seedlings. Nitric Oxide (NO) functions as a signaling molecule as well as a phytohormone in numerous physiological processes in plants, from seed germination up to senescence. In the present, study, the effects of Sodium Nitro Prusside (SNP) as a NO donor on the root architecture and growth characteristics of polybagged rubber seedlings were investigated. Seven days old rubber seedlings were soaked in 200 µM and 500 µM solutions of SNP for 6 and 24 hours respectively prior to transplanting in polybags. Mock treated seedlings were soaked in water. Soaking in SNP greatly improved the root architecture of rubber seedlings by increasing the number and the length of lateral roots and the dry weight of roots while enhancing other growth parameters *viz.*, stem diameter, shoot height, shoot dry weight, leaf area and chlorophyll content. Soaking in SNP at 500 µM for 6 hrs was found to be the most effective for overall growth performance in rubber seedlings. The improved growth characteristics of rubber seedlings could be attributed to the beneficial effect of SNP as a NO donor in modifying phytohormone signaling pathways, enhancing antioxidant enzyme activity, increase in nutrient uptake and effective allocation of photo assimilates.

Keywords: Nitric oxide, Phytohormones, Rubber seedlings, Sodium nitroprusside

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