ABSTRACT

Withania coagulans (L.) Dunal is one of the most important medicinal plant. The existing study about this was planned to inquire the effects of callus extracts on selective bacterial growth. Optimization of seed germination at different soaking time periods and temperatures was applied. A very good result of 100% seed germination was obtained at 15 hrs soaking time incubated at 25±2. *In vitro* method for callus induction was successfully established using cotyledon and stem explants. MS medium supplemented with different plant growth regulators auxins and cytokinins with varied concentrations were applied such as 2,4D with kinetin, IBA with BAP and BAP with NAA. Best results I found, from BAP with IBA. Antibacterial activity of n-Hexane, petroleum ether, methanol and aqueous extracts obtained from the cotyledon and stem calluses were tested against *Escherichia coli* and *Pseudomonas aeruginosa,* gram negative bacterial strains and fungal strains of *Aspergillus niger* and *Aspergillus oryzae* using agar well diffusion method. The tested bacteria and fungi showed transiently varied response with the type of extracts. The cotyledon and stem showed antibacterial activity in all solvents used. The antibacterial and antifungal activity more shown in methanolic and aqueous extracts. Petroleum ether extracts were found to be least effective, whereas n-Hexane extracts corroborate moderate activity on model organisms.To evaluate antioxidant activity of callus culture extracts, DPPH, TAA and Metal chelating methods were approached. The extracts of BAP 4 mg/L in combination with IBA 2 mg/L showed highest number of antioxidants followed by the extracts from NAA 2 mg/L and IBA 2 mg/L macerate. The following study revealed that plants are naturally blessed by biologically active compounds and free radicals which can be further investigate and study for their efficacy to enhance, pharmacologically and ethno-botanically.