

Plant Based Products as Bacteriological Media: A Double Green Approach

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ABSTRACT

The production of Microbial biomass in liquid culture media often represents an indispensable in research and development of industrial processes. The cultivation of microorganisms in the laboratory and on commercial scale, however, requires a complex set of nutrients that usually incurs huge costs and hence limit the feasibility of microbial processes. On the other hand, plant materials in different forms can provide carbon and nitrogen sources for microbial growth and hence can alternatively be used as substrate. Biofertilizer Technology is now successfully being applied to many countries in the world and seems quite promising in replacing the chemical fertilizers. Now a days there are many small industries that are producing Biofertilizer commercially. This envisaged in the present study to screen 35 different plant based product-extracts were tested. The PGP strain of *Bacillus subtilis* which is specific for potato crop was obtained from NIBGE culture bank. Different extraction methods such as decoction, grinding, soaking were also investigated. Various concentrations of extracts were applied initially to optimize the amount of the plant materials needed. The growth of PGP strain was also monitored in presence of various combinations of extracts. To upgrade this process a 1 liter fermenter was used to prepare inoculum for pot experiments. Pot experiment were initially carried out in sand and then soil. Soil were analyzed for its chemical composition. Strain was labeled with antibiotic resistance to carry out further studies. Growth of plant on the basis of root length, shoot length, number of compound leaves, dry weight was carried out and compared with nutrient broth/LB broth. Number of viable cell were calculated in different intervals of time by cfu/ml of rhizosphere. Root association of bacteria were studied by using scanning electron microscopy. The ability of the stain to promote plant growth was also assessed after cultivation on the selected extracts and results showed that the organism retained its PGP ability and hence it can be concluded that these extracts can be used for culturing industrially and agriculturally important bacteria.

Keywords: Growth media, Plant growth promotion, Inoculum preparation.

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