FACTORS AFFECTING AUXIN BIOSYNTHESIS BY WHEAT AND RICE RHIZOBACTERIA

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ABSTRACT

Microbially released auxins have great influence on plant growth and development. Thirty-one cultures of bacteria were isolated from the rhizosphere of different varieties of wheat grown at different sites and twenty-eight from the rhizosphere of rice. Relative efficacy of these isolates was determined for in-vitro auxin production. Among different rhizobacterial isolates, W_9 showed significantly higher auxin production compared with all other tested isolates both in the presence and absence of its precursor, L-tryptophan. Various environmental factors such as substrate concentrations (L-TRP @ 0 to 6 g L^{-1} growth medium), glucose concentrations (0 to 8 g L^{-1} growth medium), pH (6.5 to 8.5), temperature (25 to 45 °C), incubation period (24 to 96 hrs.) aeration (shaking vs. static) and antibiotics (erythromycin and streptomycin from 0 to 0.733 g L^{-1} growth medium) were tested for optimal auxin production in the liquid medium inoculated with the culture W_9 isolated from wheat using colorimetry assay. The auxin biosynthesis was significantly influenced by the environmental factors and maximum productions were found to be at 5 g of L-TRP, 3 g of glucose, 7 pH, 30 °C temperature, 48 hours incubation and shaking at 100 rpm. Application of antibiotics had inhibitory effect on auxin biosynthesis.