

## **Influence of rhizobacterial and agrobacterial inoculation on selected physiological and biochemical changes of banana cultivar, berangan (AAA) plantlets.**

### **ABSTRACT**

A series of experiments were carried out to observe the effects of rhizobacterial and agrobacterial inoculation, singly or combined on the total content, concentration and distribution of the biochemical components (total soluble protein, soluble nitrogen, proline, peroxidase activity, total soluble phenolic, nitrate reductase activity, nitrate, chlorophyll), physiological characteristics (percentages of growth, number of roots, fresh and dry weight of roots, maximum and total length of roots) and mineral contents (N, P, K, Ca and Mg) of in vitro banana plantlets, Berangan cultivar (AAA) using MS basal medium. The aims of this study are to determine the influence of various rhizobacteria sp. and Agrobacteria sp. inoculation, singly and combined on biochemical and physiological changes of the important banana plantlets in Malaysia, Berangan cultivar (AAA). Results from the inoculation study using MS basal medium were indicated that inoculation with rhizobacteria (*Azospirillum brasilense* Sp7, *Bacillus sphaericus* UPMB10 and *Microbacterium oxydens* UPMB11) or agrobacteria (*Agrobacterium rhizogenes* strains, AR9402 and A4) showed positive response on growth of in vitro banana plantlets compared to uninoculation after one month of experiment. The inoculation treatments also increased the number of root, fresh and dry weight of roots and total length of root. In addition with inoculation, the total content or concentration of the respective biochemical activity as total soluble protein, peroxidase, nitrate reductase, proline, nitrate, soluble nitrogen, phenolic and chlorophyll of the host plants increased and varied according to the type of bacteria used. Inoculation with these bacterial also enhanced the accumulation of N and P in the banana plantlets. Co-inoculation with rhizobacteria (*Azospirillum brasilense* Sp7, *Bacillus sphaericus* UPMB10 and *Microbacterium oxydens* UPMB11) and agrobacteria (*Agrobacterium rhizogenes* strains AR9402 and A4) also showed similar response as in single inoculation; UPMB10+AR9402 treatment was the most effective treatment. The above finding provided evidence that *Azospirillum brasilense* Sp7, *Bacillus sphaericus* UPMB10, *Microbacterium oxydens* UPMB11, *Agrobacterium rhizogenes* strains AR9402 and A4, singly or combined are potentially effective in promoting growth of in vitro banana plantlets. Inoculation of rhizobacteria was showed beneficial to the banana plantlet in saline conditions through increment of growth and improvement in rooting system. Thus, these bacterial strains could be used as a bioenhancer for growth of in vitro banana plantlets

**Keyword:** Rhizobacterial; Agrobacterial; Banana; Physiology; Biochemical