



## Influence of *Azotobacter chroococcum* on seedling parameters of rice (*Oryza sativa* L.)

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**Abstract :** The effect of plant growth promoting Rhizobacteria, *Azotobacter chroococcum* on rice seedling was investigated in this endeavour. Influence of *Azotobacter chroococcum* was significant creating variation for almost all seedling characters. The genotype Kumargore (M) performed better for almost all the seedling characters, but it failed to exhibit higher incremental change (%) for the same after inoculation. The higher incremental change was exhibited by genotypes Nigersail, Daharnagra and Kumargore.

**Key Words :** Rice, seedling vigour, *Azotobacter chroococcum*, Tropical environment

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### INTRODUCTION

Bio-fertilizer can be defined as microbial inoculants which contain live or latent cells of selected strains of microorganisms. They are used as a supply of nitrogen and phosphorus to agricultural crops (Shehata and El-Khawas, 2003, Yadav *et al.* 2011). Bio-fertilizer also reduces the use of inorganic fertilizer and prevents pollution (Narula *et al.*, 1991; Lakshminarayana, 1993). Dinitrogen (N<sub>2</sub>)-fixation in the rhizosphere of rice has attracted a wide interest in biological and agricultural research, because rice is the staple or major food crop of different countries of the world (App *et al.*, 1980; Watanable and Roger, 1984). Several N<sub>2</sub>-fixing in rice-bacteria association under flooded condition. Each bacterium may be considered for sustaining and promoting N<sub>2</sub>-fixing in association with rice plant (Yoo *et al.*, 1986; Nagananda *et al.*, 2010, Woyessa, and Assefa, 2011). Among dizotrophs, *A. chroococcum* is a soil inhabiting N<sub>2</sub>-fixing bacterium, which is also known to secrete growth promoting factors as well as antifungal antibiotics. For this attributes, pretreatment of seeds with a suspension of *A. chroococcum* has generally shown improvement is seed germination and seedling vigour. Seedling

growth is closely related with the root system, root length, its branching pattern, root geometry etc. (Bhaduri and Bairagi, 1968). Besides agricultural use of bio-fertilizers, Ali *et al.* (2011) demonstrated the beneficial effects of bio-fertilizers in aquacultures. In the present endeavour the effect bio-inoculum, *Azotobacter chroococcum* on seeding vigour in rice was studied.

### MATERIALS AND METHODS

The experiment was conducted at District Seed Farm, Kalyani, Bidhan Chandra Krishi Viswavidyalaya during *Kharif* (wet) season of two consecutive years in a Randomized Block Design design with three replications. To study the seedling growth pattern of 16 indigenous and folk cultivars of rice as influenced by the bioinoculums *A. chroococcum* were selected. In addition to those indigenous folk varieties, four stable mutants and three high yielding recommended varieties suitable for varying agro-climate conditions were included for having a comparative idea with regard to its responsiveness toward the inoculums for seeding production.

Seeds of all 23 rice genotypes were thoroughly mixed

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