

***In vitro* growth studies of rice, maize and ground nut seeds using culture cotton method**

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ABSTRACT

Methylobacterium, bioinoculant can be used to improve plant growth. *In vitro* Groth studies of various seeds were observed using culture cotton method which is not used previously.

Key words: Culture cotton, *Methylobacterium*, *In vitro*, bioinoculant, plant growth.

INTRODUCTION

Methylotrophs a potent bioinoculant to improve crop production. These organism oxidize environmental methane as a sole source of carbon (Quayle, 1961) for their growth either aerobically (Hallem *etal*, 2004) or anaerobic environment. Green and Bousefield stated that these organisms are predominantly present in paddy field soil and phyllosphere because of high methane emission in paddy field. (New Scientist magazine, 1989). The methane source in the paddy field supports the growth of methylotrophs (Charles *etal*, 2005). Methylotrophs can be easily cultured in laboratory using some specialized media. Methylotrophs are agriculturally important organisms by producing growth hormone vitamins and pigments (Corpe, 1985; Mahadevan, 1985; Holland and Polacco, 1994; Rohmer, 1999; Koeing, 2002). Various *invitro* culturing of plants have been introduced so for to identify Agrobacterial characteristics of plant seeds using bioinoculant (Smith, 1992). New approach in *invitro* growth studies has been introduced as culture cotton method which are not been used previously.

MATERIAL AND METHODS

Healthy Rice, maize and Groundnut seeds were selected and surface sterilized. Sterile Petriplates were taken and substratum for seeds (Cotton) was carefully kept in plates. Pure culture of *Methylobacterium* was added in the medium and the seeds were sown separately in each petriplate. Plates were kept undisturbed for few days to check Agrobacterial characters of the seed.

RESULT AND DISCUSSION

Plants should be subjected to analysis of growth characteristics in *invitro* before going hardening. Various methods can be followed for Agrobacterial character analysis in plants in *invitro*. Current *invitro* methods like *Rhizobium* inoculation in pot culture and foliar spray have certain disadvantages. A novel and simple approach was introduced to analyse thee growth characteristics like seed germination, shoot and root elongation, leaf area meter in *invitro* condition. By getting the rough analysis once can come to a conclusion about

Table 1: Agrobacterial characters of plants using culture cotton inoculation

S. No	Treatments	Shoot length (Cm Plant ⁻¹)	Root length (Cm Plant ⁻¹)	Plant Biomass (G Plant ⁻¹)		Germination Vigor index	
				Fresh weight	Dry weight		
1	Un inoculated control	4.2	6.2	0.5	0.07	60%	252
		5.5	6.4	0.45	0.05	55%	302
		3.5	4.5	0.3	0.45	65%	227
		4.5	4.3	0.5	0.55	75%	337
2	BI-1 Rice Sorghum Ground nut Maize	8.2	8.1	0.7	0.11	85%	697
		7.5	8.2	0.7	0.07	70%	525
		5.5	5.8	0.5	0.06	80%	440
		5.4	5.3	0.7	0.10	75%	405
3	BI-2 Rice Sorghum Ground nut Maize	8.0	8.4	0.8	0.10	95%	760
		6.4	7.2	0.6	0.07	85%	544
		4.0	5.2	0.6	0.06	75%	300
		5.0	5.7	0.9	0.11	90%	450
4	Average	8.1	8.2	0.75	0.10	90%	729
		6.9	7.7	0.65	0.07	77%	531
		4.7	5.5	0.55	0.06	77%	362
		5.2	5.5	0.80	0.10	85%	442

**Plate 1: Growth of seeds using Culture cotton method**

the field growth of the particular plant. Log phase broth culture was taken for as inoculants for its high metabolic activity in that stage. Pure culture of *Methylobacterium* was taken, it was poured in sterile cotton as a substratum for growing seeds. To avoid other group of microorganism contamination, which

imparts in plant growth. Medium was added during the growth period of seed if the medium is exhausted. This is because the depleted medium should not stop the growth of the organism. Growth was monitored for various seeds and it was tabulated (Table 1 and Plate 1).

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