

Research Paper :

## A cheap nutritional liquid medium for enhancement of *Trichoderma harzianum* and *Pseudomonas fluorescens* population

SALLY K. MATHEW, ANU ANIE MATHEWS AND K.SURENDRA GOPAL

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See end of the article for authors' affiliations

Correspondence to :  
**SALLY K. MATHEW**  
Department of Plant  
Pathology, College of  
Horticulture, Kerala  
Agricultural University,  
Vellanikkara,  
THRISSUR  
(KERALA) INDIA

### SUMMARY

*Trichoderma harzianum* and *Pseudomonas fluorescens* are widely used for the management of soil borne diseases. The chemically defined media used for the development of formulations are expensive. Cheap, abundant and readily available raw materials are required to produce low cost bioformulations. Hence, a study was conducted to find out a cheap liquid medium for the mass multiplication of bioagents for which different concentrations of coconut water along with nutritional supplements were used. The present study clearly indicated that 50 per cent coconut water or 25 per cent coconut water supplemented with sugar @ 15g / l, as cheap nutritional liquid medium for mass multiplication of *Trichoderma harzianum* and *Pseudomonas fluorescens*.

### Key words :

*Trichoderma harzianum*,  
*Pseudomonas fluorescens*,  
Coconut water,  
Nutritional supplements

Biocontrol of plant disease is an important component of integrated disease management. In view of hazardous impact of agrochemicals, biological control of plant diseases are gaining much importance in recent years. Biocontrol agents are widely utilized for the management of plant diseases in different crops. Among the various bioagents, *Trichoderma* spp. and *Pseudomonas fluorescens* are the widely used ones for the management of plant diseases. One of the important criteria for the bioformulation is that, the medium used for the mass multiplication should support fast multiplication of bioagents and must be cheap and easily available.

Earlier workers have tried various liquid media like molasses yeast medium, Czapek-Dox broth, V-8 broth, Potato dextrose broth for the mass multiplication of *Trichoderma* (Papavizas *et al.*, 1984; Harman *et al.*, 1991.) and King's B broth for the mass production of *P.fluorescens* (Vidhyasekaran and Muthamilan, 1995). Coconut water is an important by-product and a thrown away waste of the coconut processing industry. Matured coconut water consists of 5.4% total solids, 3% soluble sugars, 0.5 % minerals, 0.1 % protein, 0.1 % fat, 60 mg % acidity and pH 5.2 (Sathyavathy,1995).As the matured coconut water contains considerable amount of nutrients especially, sugars and minerals, it is

an ideal medium for the growth of microorganisms. The ability of undiluted coconut water for the growth of *Trichoderma* has been reported by Anandraj and Sharma (1997). The present study was carried out to reduce the concentration of coconut water without affecting the viable cell count of *T. harzianum* and *P. fluorescens*, for which, different dilutions of coconut water with nutritional supplements were used.

### MATERIALS AND METHODS

The studies on cheap nutritional liquid medium for enhancement of *Trichoderma harzianum* and *Pseudomonas fluorescens* population were carried out at the Department of Plant Pathology, College of Horticulture, Trichur during 2008-09.

Different concentrations of matured coconut water viz; 100, 50, 25 per cent and 25 % supplemented with magnesium sulphate (2g/ l), dextrose (15g/l) and sugar (15g/l) were prepared and sterilized at 1.1 kg cm<sup>2</sup> for 15 min. In addition, Tapioca powder @ 5g / l was also used in the case of *T. harzianum*.

These sterilized liquid media were inoculated with 7-d-old culture of *Trichoderma harzianum* and 48 h old *P. fluorescens* separately. Cell count and viability were estimated by serial dilution agar plating technique using selective media of the

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