PUTRA SCIENCE PARK

INNOVATION OPEN DAY

PROSPERING THROUGH INNOVATION

UPM Tricho Beads

Introduction

Current agriculture practices emphasize on environmental sustainability by limiting the use of chemical fertilizers and pesticides. This method are not sustainable in thelong run because they pollute the atmosphere, damage the environment, leave harmful residues and can lead to the development of resistant strains among the target organism with repeated use. Technical, economical and environmental factors are forcing to adopt new sustainable methods, such as the use of microorganisms bio-control agents (BCA), to control plant pathogen. For BCA, the major difficulty to reach the market and to be competitive with the chemical fungicides is represented by a consistent and reliable effectiveness and by the length of shelf life. Both problems can be faced with a scientific development of formulation of BCA. Encapsulation is a process by which active ingredients are packaged within a matrix for the purpose of shielding the active ingredients from the surrounding environment. Microorganisms are encapsulated to create a micro-environment in which the cells will have an increased survival rate in storage, will be released at the appropriate sites and easy to deliver.

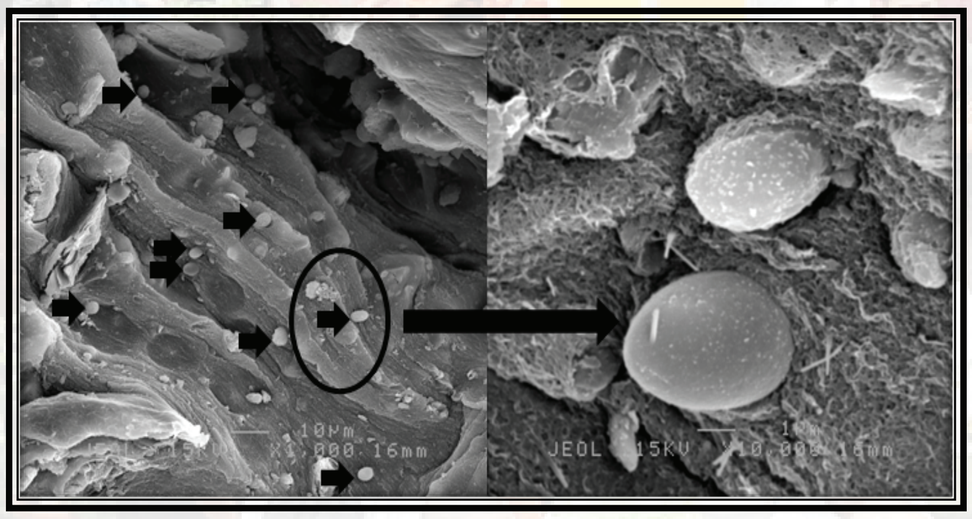


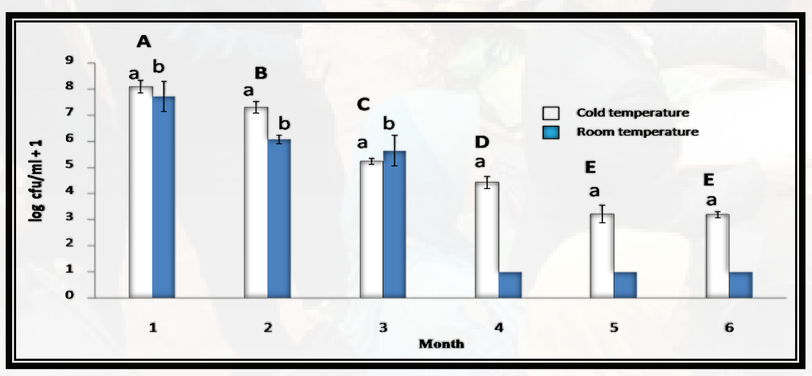
Fig 1. SEM of cross section of alginate-MMT showed the distribution of T. harzianum UPM40 conidia within the matrix.

	Alginate Bead	Alginate/MMT bead
Weight (mg)	2.13 ± 0.05	4.94 ± 0.04
Diameter (mm)	1.32 ± 0.03	1.91 ± 0.02
Shape factor	0.12	0.06
Swelling ability	17.84%	29.90%

Table 1. The improvement of physical properties of alginate/MMT compare to alginate beads.

Benefits

1. Better storage, shelf life and slow release



Storage analysis of the encapsulated *T. harzianum* UPM40 showed that the low storage temperature of 5°C resulted in significantly (P<0.05) better storage compared with room temperature (30°C).

2. Soil/seed application improved plant growth

3. BCA for controlled soil borne pathogen

Fig 4. Antagonistic activity of *T. harzianum* UPM 40 against *S. rolfsii* in dual culture (A). Abnormality of parasitized mycelia (B).

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