

Raw Secondary Metabolites of Trichoderma harzianum T10 in Tapioca Flour Towards Cucumber Damping-off

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Abstract	<p>Trichoderma harzianum is effective for controlling soil-borne pathogenic fungi and producing secondary metabolites. When applied in the field, the raw secondary metabolites are quickly decreased directly by sunlight. One strategy to avoid degradation is the use of tapioca flour liquid formula for biological control agents. This research aimed to obtain the most effective concentration of tapioca flour in development of raw secondary metabolites of Trichoderma harzianum T10, its effect on damping-off and growth of cucumber. This research was carried out at the screen house and the Plant Protection Laboratory, Faculty of Agriculture, Jenderal Soedirman University from September 2017 up to January 2018. The study was conducted in two stages, i.e., in vitro and in planta. The in vitro stage used completely randomized design with five repetitions and five treatments consisted of T. harzianum T10 in Potato Dextrose Broth, and in 0.5; 1; 1.5; and 2% of tapioca flour media. In in planta, randomized block design was used with five repetitions and six treatments consisted of control, T. harzianum T10 in PDB, and in 0.5; 1; 1.5, and 2% of tapioca flour media. Variables observed were density of conidia, disease incubation period, disease incidence, AUDPC, maximum growth potential, germination ability, plant height, canopy fresh weight, root length, and fresh root weight. Result of the research showed that the highest conidial density (1.23×10^7 conidia mL⁻¹) of T. harzianum T10 was found in 2% tapioca flour with an increase of 63.28% compared to the PDB. The tapioca flour of 1 and 2%, and PDB could suppress the disease incidence by 81.82%. The lowest AUDPC was at 2% tapioca flour. The raw secondary metabolites could not delay the incubation period significantly and increase cucumber plant growth. The novelty is the use of antagonistic fungi in terms of raw secondary metabolites and the discovery of tapioca flour with the right concentration to produce high conidia density and high raw secondary metabolites. The benefits are to find other cheaper ingredients in promoting antagonistic fungal growth and the use of antagonistic fungal bioactive compounds to control plant pathogen</p>
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