COMPATIBILITY AND MEDIA TESTING OF VARIOUS INDIGENOUS BIOLOGICAL CONTROL AGENTS OF PEPPER PLANTS (Piper nigrum L.)

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ABSTRACT

Biological control for plant protection presented a promising and exciting alternative to chemical methods for safeguarding plants against the increasing threats posed by plants diseases. This approach revolved around the utilization of biological control agens (BCAs) to suppres the activity of significant plant pathogens. This study aimed to determine the compatibility and inhibition between biological control agents and to obtain best media formulation for the growh and development of Trichoderma hamatum, Trichoderma harzianum, Trichoderma sp., Pseudomonas fluorescens, and Paenibacillus polymyxa. An experimental approach was employed, consisting of two stages, namely compatibility testing of BCAs and media testing using synthetic and natural materials containing nitrogen, phosphate, and potassium. The media tested included: (1) synthetic NPK, banana peels liquid, molasses, (2) rice straw liquid, banana peels liquid, molasses, and (3) moringa leaves liquid, banana peels liquid, molasses. Observed parameters included colony radius, inhibition of percentage, spore density, spore viability, and number of colony formed. The results showed that the tested BCAs included synergistic or compatible, with inhibition levels categorized as low to medium (<70%), allowing their combination into a media formulation. Medium 2 was the most effective for the growth of T. hamatum UPN34, T. harzianum UPN16, and Trichoderma sp. LPT28. P. fluorescens performed best on medium 3, while P. *polymyxa* performed best on medium 1. These findings suggest that biological control agents can be effectively combined using suitable growth media to enhance plant protection strategies.

Keyword: *Piper nigrum* L., compatibility, inhibition, combination, media formulation.