

Raw Secondary Metabolites of Chitosan-enriched Pseudomonas fluorescens P60 to Control Corn Sheath Blight

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Abstract	<p>Corn is a strategic cereal with economic value and always face the corn sheath blight in the field. An alternative safely and environmentally friendly disease control is the use of biological agent Pseudomonas fluorescens P60 that produced raw secondary metabolites. This study aimed to test the effectiveness of chitosan enriched P. fluorescens P60 raw secondary metabolites against leaf blight and to determine the effect on the growth of maize. The research was conducted at the Laboratory of Plant Protection and Experimental Farm, Faculty of Agriculture, Jenderal Soedirman University. In vitro test used a completely randomized design and in planta test used a randomized block design consisted of four treatments and six replicates. The treatments consisted of control and the secondary metabolites of P. fluorescens P60 enriched with chitosan 1, 2, and 3%. Variables observed were inhibition ability, chitinase and protease analysis qualitatively, incubation period, disease intensity, infection rate, AUDPC, crop height, crop fresh weight, and root fresh weight. The results showed that the secondary metabolites of P. fluorescens P60 enriched with chitosan 3% was effective in inhibiting the growth of Rhizoctonia solani as 63.3%, produced chitinase and protease, and could control the disease by delaying the incubation period as 79.05%, lowering the disease intensity as 68.68%, lowering the infection rate as 100%, and lowering AUDPC as 83.32%. The secondary metabolites of P. fluorescens P60 enriched with chitosan 3% was effective in improving plant growth by increasing plant fresh weight as 33.9% and root fresh weight as 43.09% compared to control. Chitosan could be used for improving effectiveness of antagonistic bacteria raw secondary metabolites. The raw secondary metabolites of bacterial antagonists could be improved their effectiveness against plant diseases by enrichment of chitosan.</p>
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