

POTENTIAL OF MANAGING *Sclerotium rolfii* BY USING FRAGMENTED DNA TECHNOLOGY FOR INDUCTION OF HOST PLANT RESISTANCE IN SELECTED HORTICULTURAL CROPS

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Sclerotium rolfii is a soil-borne fungus that causes Southern Blight (SB). Host plant immunity induction can be done by applying pathogen-associated molecular patterns exogenously. Certain plant species trigger defence mechanism against pathogens when conspecific or self-DNA fragments are applied as elicitors exogenously. The aim of the present research is to determine whether *S. rolfii* fragmented DNA has the ability to control SB and synthesize host defence enzymes in order to induce plant immunity. A pot experiment was conducted according to a complete randomized design using chili (MI-2) and tomato (Rajitha) crops. Four weeks old seedlings were treated with fragmented DNA in three concentrations (50, 100, and 150 ng mL⁻¹ per plant) as foliar and soil applications. On the 3rd day after treatments, plants were collected to quantify the activity of defence enzymes namely peroxidase and Phenylalanine Ammonia Lyase (PAL). *S. rolfii* mycelium disks (1 cm diameter) were inoculated at the base of plants at the 5th day from elicitor treatments. Disease incidence percentages and disease severity index (DSI) were calculated at 3rd and 6th days after inoculation of the pathogen. Data analysis was done using logistic regression by using SAS studio. Elicitor treatments and the crop species have a significant effect ($p < 0.05$) on disease incidence and DSI in both crops. All the elicitor treatments significantly reduced the disease incidence and DSI compared to the positive control, with no significant difference ($p > 0.05$) among each other. Peroxidase and PAL activity differed significantly between chili and tomato. Application of fragmented DNA at the tested concentrations as a foliar spray or soil drench has not significantly induced PAL or peroxidase activity in both crops. However, present study revealed the potential of applying fragmented DNA as a foliar spray or soil drench in reducing the southern blight disease in chili and tomato effectively.

Keywords: PAL, Pathogen-associated molecular patterns, Peroxidase, Plant immunity, Southern blight