

Biocontrol Ability of Tomato Indigenous Microflora against Multiple Tomato Postharvest Pathogens

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Postharvest diseases play a major role in food losses worldwide. Therefore, strategies for postharvest disease management are essential for sustainable food production. The use of biocontrol agents is one of the strategies presently used. This study focused on the isolation and characterization of (tomato) *Solanum lycopersicum* indigenous microflora from tomato fruit exocarp and screening their biocontrol ability against common postharvest pathogens isolated from tomatoes. Tomatoes were obtained from the Kandy market and the preferred variety was Roma variety. Potential biocontrol agents were isolated from healthy tomatoes using standard microbiological procedures. Pathogens were isolated using standard triple sterilization procedure and their pathogenicity on tomato epidermis was confirmed through Koch's postulate. Dual culture assay, and *in vitro* assay (spore germination assay) were performed to screen the degree of pathogenicity and biocontrol ability. Equal volumes of spores of each biocontrol agent and pathogen spore suspension (equivalent to 1×10^5) were inoculated onto the middle side of the tomato exocarp with each pathogen and biocontrol agent spore suspension individually inoculated as control. Healthy tomatoes yielded four fungal species, *Yeast* sp., *Trichoderma* spp., and two unidentified isolates as indigenous microflora, while *Rhizopus* sp., *Botrytis* sp., and *Geotrichum* sp. (*Rhizopus* rot, Gray mold disease, and sour rot disease respectively) were isolated as pathogens. Inhibition percentages by *Trichoderma* spp. against pathogens *in vitro* study were 39.06%, 27.84%, and 74.97% against *Rhizopus* sp., *Botrytis* sp., and *Geotrichum* sp. respectively. *Trichoderma* spp. and pathogen interaction revealed coil formation by *Trichoderma* spp. suggesting mycoparasitism as its mechanism of action. *Trichoderma* sp. caused a 90%, 100%, and 100% reduction in disease incidence compared to the control for each of the three pathogens tested in the tomato epidermis. This study revealed the potential of using indigenous microflora of tomato epidermis to control postharvest diseases.

Keywords: Antagonistic, Indigenous Microflora, Postharvest, Tomato, *Trichoderma* sp.