

In Vitro* Antibacterial Activity of Theaflavin against *Ralstonia solanacearum

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Ralstonia solanacearum, a soil-borne bacterium, is responsible for bacterial wilt in a variety of solanaceous crops, leading to significant yield losses. Using antibacterial agents to control bacterial wilt is expensive and may produce antimicrobial resistance. Theaflavin, a polyphenolic compound obtained from tea (*Camellia sinensis*), has shown antimicrobial effects previously. Hence, this study was carried out to evaluate the activity of theaflavin against *R. solanacearum*. A 100mg/mL stock solution was prepared using theaflavin powder and sterile distilled water as the solvent. A series of dilutions was prepared using the above to obtain the concentrations: 50mg/mL, 25mg/mL, 12.5mg/mL, and 6.25mg/mL. Tetracycline was used as the positive control, and sterile distilled water as the negative control. *R. solanacearum* was cultured on Muller-Hinton agar overnight, and a fresh bacterial suspension (McFarland 0.2) was prepared in Phosphate Buffer Solution. A well diffusion assay was performed on Muller-Hinton agar for the aforementioned concentrations against *R. solanacearum*. Antibacterial effect of theaflavin was measured by deducting the Diameter of the Inhibition zone by sterile distilled water and from the diameter of the inhibition zone due to theaflavin/ tetracyclin. All theaflavin concentrations tested inhibited *R. solanacearum*. Along with the reducing concentration gradient, the size of the inhibition zone decreased. The ZOI were 11.50±0.7mm for 100mg/ml, 9.13±0.6mm for 50mg/mL, 7.50 ±0.6mm for 25mg/mL, 5.38 ±0.3mm for 12.5mg/mL and 3.75±0.5mm for 6.25mg/mL. ZOI for tetracycline was 16.75±0.5. These findings indicate that theaflavin has a concentration-dependent antibacterial effect against *R. solanacearum*, suggesting that theaflavin may be an alternative to control bacterial wilt.

Keywords: Antibacterial agents, Bacterial wilt, *Ralstonia solanacearum*, Theaflavin