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Detection of Pathogenic and Non-Pathogenic *Ralstonia solanacearum* in Bell Pepper and Lettuce Cultivation Lands in Sri Lanka

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Abstract

Ralstonia solanacearum is a soil-borne, gram-negative, phytopathogenic bacterium that critically threatens global agriculture. *R. solanacearum* comprises two distinct strains: one pathogenic and the other non-pathogenic. This bacterium exhibits extensive genetic diversity, infecting over 200 crop species, including bell pepper and lettuce. This study aimed to identify pathogenic and non-pathogenic strains of *R. solanacearum* in bell pepper and lettuce cultivation lands in Sri Lanka, including Divulpitiya, Mirahawatta, Keppetipola, and Nuwara Eliya, along with control sites such as Jaffna, Colombo, and Kegalle. Soil, water, and infected plants were collected, kept in sealed bags, and transported to the laboratory under cool conditions. The samples were processed for *R. solanacearum* isolation using (TTC) agar medium. Based on the recorded results in Divulpitiya sampling site, 87.5% and 100% of soil samples were contaminated with virulent and non-virulent *R. solanacearum* respectively. Further, 70% and 100% of collected water and plant samples were respectively contaminated with virulent *R. solanacearum* species in Divulpitiya sampling site. Further, at the Mirahawatta sampling site, 0% contamination was recorded for virulent strains of *R. solanacearum* whereas 78% contamination was recorded for non-virulent *R. solanacearum*. Similarly, none of the samples from Keppetipola and Nuwaraeliya sites, were positive for virulent *R. solanacearum* whereas 100% samples of those sites were positive for non-virulent. Importantly, none of the samples from Jaffna control site were positive for virulent *R. solanacearum* whereas 100% of samples were positive for non-virulent strain. Moreover, 50% and 60% of samples from Kegalle and Colombo control sites were respectively contaminated with virulent strains whereas 100% of samples of those sites were contaminated with non-virulent strain. The finding of the present study reveals that the prevalence level of *R. solanacearum* in selected agricultural lands giving an alarming condition for Sri Lankan agriculture.

Keywords: *R. solanacearum*, Bell pepper, Lettuce, Agricultural contamination