Virulence and Characterization of Potato Bacterial Wilt Isolates (*Ralstonia solanacearum)* in Rwanda

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Bacterial wilt caused by *Ralstonia solanacearum* is one of the two major potato diseases in Rwanda. An *in vitro* study was conducted to identify and differentiate the pathogen isolated from three potato cultivars highly susceptible to *R. solanacearum* in Rwanda namely Kinigi, Kirundo and Gikungu. This was performed by streaming of vascular flow assessment as well as cultural and morphological tests on triphenyl tetrazolium chloride (TTC) and casamino peptone glucose (CPG) agar as well as biochemical tests through Gram staining and biovar test. In addition, an *in vivo* trial was also carried through to evaluate the incidence and severity of those target isolates on potatoes. All isolates showed typical morphological traits of virulent *R. solanacearum* on CPG and TTC media. The test isolates were all Gram-negative bacteria. Biovar test confirmed that all the isolates belonged to race 1 biovar 3 of *R. solanacearum.* Moreover, the highest disease severity (DS=100%) and disease incidence (DI=100%) were recorded in Gikungu isolate followed by Kinigi (DS=97.33% and DI=98.25) and Kirundo (DS=94.67% and DI=92.61%). From the findings of this first study it is concluded that the pathogens isolated from Kinigi, Kirundo and Gikungu were typical *R. solanaceraum* belonging to race 1 biovar 3 and were all pathogenic to potato plants. Gikungu and Kinigi isolates were highly virulent and caused severe wilting and frequent incidences than Kirundo isolate. Race 1 of *R. solanacearum* affects a wide range of plant species in the Solanaceae family. Therefore, Gikungu or Kinigi isolates belonging to this race can be used for further studies in plant protection in management of the disease.

Keywords: Bacterial isolates, Pathogenicity test, Potato, *Ralstonia solanacearum,* Rwanda.