

Ralstonia solanacearum inovírus Brazil 1 shows potential to use as a control agent against to bacterial wilt

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The *Ralstonia solanacearum* Species Complex (RSSC - *R. solanacearum*, *R. pseudosolanacearum* and *R. syzygii*) are Gram-negative bacteria that have been widely studied for being the etiological agent of the bacterial wilt disease that affects various plants, which have a significant impact on agriculture. These phytopathogens invade the root and then migrate to the xylem vessels, where their colonization causes clogging of the xylem vessels. As a result, this interrupts the flow of water and nutrients from occurring efficiently in the plant, thus causing the denominated bacterial wilt (BW). The use of bacteriophages is an alternative for controlling bacterial wilt. In previous work, it was observed that some eggplant plants infected with *R. solanacearum* had leaves with milder wilting symptoms. Subsequently, it was shown that these plants were infected with the isolate of *Ralstonia solanacearum* UB2014, which is infected with a tubulaviruses called *Ralstonia solanacearum* inovírus Brazil 1 (RSIB1). Tubulaviruses are chronic phages, meaning they do not destroy their hosts during infection. In other words, the hosts constantly produce and release viral particles during their lifetime. It has been shown that RSSC isolates become mutualistic bacteria after infection with RSIB1, i.e., they can colonize plants without developing bacterial wilt. We hypothesized that plants inoculated with *Ralstonia* infected with RSIB1 if infected by aggressive *Ralstonia* isolates, would not generate the disease because these bacteria would become infected by the tubulaviruses. Therefore, this study aimed to assess whether tomato plants previously inoculated with *Ralstonia* strains infected with RSIB1 can generate protection against *Ralstonia*, referred to here as the protective effect. In addition, it was also tested whether plants previously inoculated with aggressive *Ralstonia* isolates not infected with RSIB1 and subsequently inoculated with *Ralstonia* infected with RSIB1 developed bacterial wilt, referred to here as the curative effect. At the end of this study, we observed that *R. solanacearum* infected with RSIB1 can protect tomato plants against the aggressive *Ralstonia* isolate. However, we also saw that it is impossible to prevent the wilt's progression after the plant is colonized with the aggressive isolate. We can, therefore, conclude that RSIB1 has the potential to be used as a biological control agent for bacterial wilt, protecting plants from developing MB.

Key words: Biological control and Tubulaviruses

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O Complexo de Espécies de *Ralstonia solanacearum* (CERS) são agentes causadores da murcha bacteriana (MB), sendo extremamente danosas à agricultura. O *Ralstonia solanacearum* Inovírus Brasil 1 (RSIB1) é um fago com habilidade de reduzir agressividade do CERS. Nós hipotetizamos que plantas inoculadas com *Ralstonia* infectadas com RSIBR1 se infectadas por isolados de *Ralstonia* agressivos não geram a doença pois essas bactérias passam a ser infectadas pelo tubulavírus. Os resultados obtidos neste trabalho indicam que o RSIB1 apresenta potencial para uso como agente de controle biológico da murcha bacteriana protegendo plantas de desenvolverem a MB.

Palavras-chave: Controle biológico e Tubulavírus