



Genomic and Evolutionary Features of the SPI-1 Type III Secretion System That Is Present in *Xanthomonas albilineans* but Is Not Essential for Xylem Colonization and Symptom Development of Sugarcane Leaf Scald

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Xanthomonas albilineans is the causal agent of sugarcane leaf scald. Interestingly, this bacterium, which is not known to be insect or animal associated, possesses a type III secretion system (T3SS) belonging to the injectisome family Salmonella pathogenicity island 1 (SPI-1). The T3SS SPI-1 of *X. albilineans* shares only low similarity with other available T3SS SPI-1 sequences. Screening of a collection of 128 plant-pathogenic bacteria revealed that this T3SS SPI-1 is present in only two species of *Xanthomonas*: *X. albilineans* and *X. axonopodis* pv. *phaseoli*. Inoculation of sugarcane with knockout mutants showed that this system is not required by *X. albilineans* to spread within xylem vessels and to cause disease symptoms. This result was confirmed by the absence of this T3SS SPI-1 in an *X. albilineans* strain isolated from diseased sugarcane. To investigate the importance of the T3SS SPI-1 during the life cycle of *X. albilineans*, we analyzed T3SS SPI-1 sequences from 11 strains spanning the genetic diversity of this species. No nonsense mutations or frameshifting indels were observed in any of these strains, suggesting that the T3SS SPI-1 system is maintained within the species *X. albilineans*. Evolutionary features of T3SS SPI-1 based on phylogenetic, recombination, and selection analyses are discussed in the context of the possible functional importance of T3SS SPI-1 in the ecology of *X. albilineans*.

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