

Beneficial Microbes: Food, Pharma, Aqua & Beverages Industry

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The role of *wcbE* gene in the synthesis of antimicrobial compounds of *Burkholderia seminalis* TC3.4.2R3

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Several compounds with antimicrobial activity are produced by *Burkholderia* spp. nevertheless little is known about the recently described specie *Burkholderia seminalis*. Gene clusters of *B. seminalis* strain TC3.4.2R3 associated to the synthesis of antimicrobial compounds have been identified by analyzing a Tn5 mutant library. Among these genes we identified a gene encoding a glycosyltransferase (*wcbE*) in the *wcb* cluster, which is associated with capsule synthesis. Comparison of the *wcb* cluster region with other species of *Burkholderia* showed that some genes are not shared with other *Burkholderia* species, such as a gene encoding a hypothetical protein and epimerase gene. Another gene, named *wcbR* is conserved in this genus and has a PKS domain, suggesting that this cluster may be associated not only with the synthesis of capsule, but also with the synthesis of secondary metabolites. Phenotypic tests revealed that mutants of the *wcbE* glycosyltransferase lose the ability to inhibit pathogens, such as *F. oxysporum*, *C. fimbriata*, *C. paradoxa* and *Colletotrichum*, compared to wild-type *B. seminalis*. The antagonism test with organic extracts from *B. seminalis* both wild-type and some mutants showed inhibition of fungal growth, suggesting that molecules with antimicrobial activity are extracted in the process. Comparisons between mutant and wild-type revealed that *wcbE* gene is crucial for biofilm formation in a process temperature-dependent, however the gene does not seem to influence the oxidative stress or resistance to antibiotics. Despite *wcbE* being located in capsule cluster, it is also involved in microbial interactions and antimicrobial production in *B. seminalis* TC3.4.2R3.

Biography

Priscila Jane Romano de Oliveira Gonçalves has completed her MSc in Microbiology in 2012 and currently is a PhD student at São Paulo University (USP). However, she is doing her Split-Site PhD at London School of Hygiene and Tropical Medicine, London, UK, at the moment.

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