Improvement of *Bacillus velezensis* UMAF6639 as a biocontrol agent

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The need to implement sustainable agricultural models has led to the search for alternatives to deal with different plant diseases, with the use of biocontrol agents being one of the most versatile options. A clear example of these agents are the strains belonging to the *Bacillus velezensis* group, Gram-positive bacteria capable of colonizing the different structures of plants and synthesizing a variety of compounds with various activities, ranging from growth promotion to antagonism against to different phytopathogens due to the synthesis of molecules such as lipopeptides (surfactins, fengycins and iturins) among others.
Previous studies carried out in our research group have shown how the *B. velezensis* UMAF6639 strain has a great biocontrol capacity in plants belonging to the *Cucurbitaceae* family, derived mainly from the production of lipopeptides.
The objective of this work focuses on the genetic improvement by random mutagenesis of said strain to obtain mutants with greater antimicrobial activity. Once the derivatives with the greatest antimicrobial activity have been identified, their characterization is being carried out to determine the genetic changes that justify the increase in their biocontrol capacity, as well as the changes in the production profile of secondary metabolites, implementing genomic and metabolomic tools to decipher the different mechanisms responsible for the antagonistic activity of these strains.

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