Isolation, characterization and selection of Pseudomonas spp. as biological control agents from a suppressive soil

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Bacterial profile from a suppressive soil against Rosellinia necatrix, fungal pathogen of avocado roots, were obtained by 16S rRNA gene sequencing. The results revealed a significant increase in the bacterial class of Gammaproteobacteria, especially in some antagonistic representatives of Pseudomonas spp. For this reason, a collection of 246 bacterial isolates was obtained from this suppressive soil in order to identify new strains with antifungal activity against this fungal phytopathogen. First, we performed an isolation on a selective medium for Pseudomonas-like microorganisms. Then, we used different characterization tests in order to analyse the bacterial collection, including the identification of the general metabolic profile of glucose, the profiling of antifungals produced, both the putative production of antifungal compounds and lytic exoenzymes, as well as the evaluation of traits related with beneficial effects on plants. A final selection of representative strains resulted in antifungal isolates belonging to the genus Pseudomonas and related groups. These selected strains were tested for plant protection by an in vivo experiment using avocado and wheat plants challenged by the pathogen R. necatrix, showing all of them an antifungal ability and plant disease protection.

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