Antagonism of *Pseudomonas* sp. EMM-1 and its potential as bio-control agent

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Statement of the problem: In nature, plants are subject to several diseases due to the presence of pathogens. Fungal diseases are commonly controlled through the use of pesticides which have resulted in clinical and environmental damages. The use of beneficial bacteria may promote diverse beneficial function in intensive agriculture such as biological control, where bacteria can exhibit antagonistic interactions to compete for space and nutrients in their habitat. The best known antagonistic bacteria are *Enterococcus, Lactococcus, Streptomyces, Bacillus, Pseudomonas, Klebsiella, Escherichia,* and *Burkholderia* due to their potential to produce inhibitory substances such as broad-spectrum antibiotics, organic acids, siderophores, antifungal and bacteriocins. Our study model, *Pseudomonas* sp. EMM-1, is a Gram-negative bacterium isolated from contaminated soil highly competitive due to the production of one or more inhibitory substances. Its antimicrobial activity was demonstrated against diverse beneficial and pathogenic microorganisms including the genera *Bradyrhizobium, Azotobacter, Staphylococcus, Streptococcus, Klebsiella* and *Burkholderia*; as well as the phytopathogenic fungi *Pantoea* and *Fusarium*.

Methodology & Theoretical Orientation: Bacterial competition is mainly evaluated by double-layer agar and simultaneous inhibition assays. In this work the double-layer agar methodology was performed to evaluate the ability of Pseudomonas sp. EMM-1 to antagonize diverse fungi isolated from soil and plants with fungal diseases such as *Aspergillum* and *Fusarium*.

Conclusion & Significance: The results of inhibition assays suggest that *Pseudomonas* sp. EMM-1 is able to produce metabolites that inhibit the growth of diverse fungi, leading us to assume its potential as biocontrol agent.

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