

**TITLE:** IDENTIFICATION OF THE MAJOR SECONDARY METABOLITE SECRETED BY *BACILLUS AMYLOLIQUEFACIENS* THAT CAUSES GROWTH INHIBITION IN FILAMENTOUS FUNGI.

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**ABSTRACT:**

The development of food production in Brazil indicates a possible increase for the next years, and would significantly influence national economy. Traditional crop management through the use of agrochemicals generates a decrease in the crop pests but impair the quality of food. Aiming at this problem, research have been carried out in search of biomolecules that can replace agrochemicals. Several studies show that compounds secreted by bacteria have such potential for inhibition against phytopathogenic fungi. The objective of this study was to isolate and identify the major secondary metabolite, secreted by the bacterium *Bacillus amyloliquefaciens*, that causes inhibition in the growth of the filamentous fungus. This work also evaluated the behavior of the bacterium *Bacillus amyloliquefaciens* against the fungi *Trichoderma reesei* QM9414, *Candida spp.* and selected phytopathogenic fungi such as *Fusarium graminearum*, *F. oxysporum*, *F. verticillioides*, *Bothrytis* and *Aspergillus flavus*. The supernatant of *B. amyloliquefaciens* growth medium was spread on PDA culture media (2, 4, 6, 8 and 10  $\mu$ L) and showed the antifungal action against *Trichoderma reesei* QM9414 in all volumes tested. Analysis of the simultaneous growth of *B. amyloliquefaciens* against phytopathogenic fungi in media BDA showed that the secreted compound causes inhibition in the fungi forming a halo around the bacterium. In order to obtain the active principle of the bacterium, cells were grown in BDA culture medium for 96 h. The medium was then centrifuged, filtered and then partitioned in chloroform to extract secondary fungicidal metabolites. Through the preparative thin layer chromatography technique, it was possible to obtain a mixture of the bioactive principles of *B. amyloliquefaciens*. Preliminary analyzes by ESI-MS<sup>n</sup> of the mixture of the bioactive compounds showed at least five peaks whose three of them can be a homologous series of heptapeptides.

**Keywords:** *Bacillus amyloliquefaciens*, identification, secondary metabolite, growth inhibition, filamentous fungi

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