

TITLE: ANTAGONISTIC POTENTIAL OF MICROORGANISMS ISOLATED FROM CORN AGAINST *Fusarium verticillioides*

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ABSTRACT:

Fusarium verticillioides is the fungal species most commonly associated with important diseases in corn crop. The chemical control has been the most frequently used method against this pathogen. However, the use of this control method may rising production costs and cause environmental problems and food contamination. Thus, alternative techniques, such as biological control, need to be used. The focus of this study is to select fungi and bacteria isolated from corn silk with *in vitro* antagonist potential against *F. verticillioides*. The microorganisms were isolated from corn silk from Sete Lagoas/MG, Sidrolândia/MS, Goiânia/GO and Sertaneja/PR regions of Brazil. *F. verticillioides* was obtained from the plant pathology laboratory at the National Maize and Sorghum Research Center (Embrapa Milho e Sorgo). Antagonistic activity of 174 fungal or bacterial isolates was evaluated by paired cultures method on potato dextrose agar (PDA) medium, in petri dishes. PDA plates were inoculated with a 5 mm disc of *F. verticillioides* cultures in the center of the plate and 30 µL of suspension for each bacterial isolates or a 5 mm disc for each fungal isolate was added at four equidistant points of the plate. Plates containing only *F. verticillioides* were evaluated as control. The antagonistic efficiency of each isolate was calculated by the zone of inhibition (ZI), using the formula: $ZI\% = (N1 - N2) / N1 \times 100$, where N1 is the radial growth of the mycelium found in the absence of the antagonist and N2 in the presence of the antagonist, after 7 days incubation at 25 °C. The experiment was performed in triplicate, percent ZI data were submitted to analysis of variance with means separation based on the Tukey test at 5% probability. The results of the antagonistic activities showed that there was a significant difference between the isolates in relation to the radial growth inhibitory capacity of *F. verticillioides* in solid medium. Among the isolates tested, 77 showed a percentage of inhibition between 0% and 20%, 28 isolates inhibited between 20% and 40%, and 57 isolates reduced the radial growth of the pathogen between 40% and 60%. Twelve isolates stood out for antagonistic activity, showing radial growth inhibitory of the pathogen above 60%. With these results, we can conclude that these isolates have potential for the control of *F. verticillioides* in corn. However, to validate these results, experiments on corn plants should be carried out under greenhouse and field conditions.

Keywords: biocontrol, mycotoxins, antifungal activity, *Zea mays*

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