TITLE: INHIBITORY ACTION OF CAVE BACTERIA AGAINST PHYTOPATHOGENIC FUNGI

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ABSTRACT:

Cave microorganisms survive in nutrient shortage condition, and it is believed that for this reason they can produce secondary metabolites of broad interest. Thus, the objective of this work was to characterize the enzymatic activity and inhibitory action of cave isolates (IS) against phytopathogenic fungi *Sclerotinia sclerotiorum*, *Macrophomina phaseolina* and *Fusarium solani*. We tested 49 cave bacteria isolated from Altamira-PA caves, for enzymatic activity in the production of pectinase, endoglucanase, amylase, protease, cellulase, and free N-fixation capacity. The evaluation of antagonistic activity of bacterial isolates against these fungi was tested by dual culture on Tryptone Soy Agar, and zones of inhibition were measured daily for 7 days. Inhibition (%) was compared by ANOVA and treatment means were grouped by Scott-Knott test ($p < 0.05$). Inhibition higher than 20% was considered as antifungal activity. As results of 49 IS, 44 synthesized the enzymes amylase, protease, pectinase and endoglucanase, 45 IS of the cellulase enzyme, and other 45 IS are able to fix free nitrogen. In relation to fungi, *M. phaseolina* was sensitive to 45 isolates (92%), exhibiting inhibitory activity from 33% (IS4) to 57% (IS22), remarking that 49% of bacteria reduced mycelial growth at the fourth day of incubation. *S. sclerotiorum* was sensitive to 25 isolates (51%), presenting mycelial growth inhibition from 22.55% (IS34) to 56% (IS43), of which, 57% stopped mycelial growth at the sixth day of incubation. *F. solani* was sensitive to 43 isolates (87.8%), varying the inhibitory activity from 23% (IS8) to 45% (IS26). Most of the IS that synthesized the enzymes tested corresponded to IS that showed an inhibitory action on these microorganisms in study. It is concluded that through the characterization of these microorganisms, there are relevant discoveries to obtain promising biomolecules for use in several areas, because these exhibit, for example, potential inhibitory action against phytopathogenic microorganisms.

Keywords: bacterial isolates, enzymatic activity, biomolecules.

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