TITLE: IDENTIFICATION AND *IN VITRO* ANTAGONISTIC ACTIVITY OF ACTINOBACTERIA AGAINST *Pantoea ananatis*, THE CAUSAL AGENT OF MAIZE WHITE SPOT DISEASE

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ABSTRACT:
The maize white spot (MWS) disease, caused by the bacterium *Pantoea ananatis*, is an economically important disease in all corn producing areas of Brazil. In the last decades, the severity of maize foliar diseases has intensified, and the application of agrochemicals in crop fields is the main measure of control. However, these products have a number of social, environmental and economic negative impacts. Thus, the biological control represents a cost effective alternative towards a socially and environmentally friendly agriculture. Many secondary metabolites produced by members of the phylum *Actinobacteria* exhibit antibiotic activity against broad spectrum of microorganisms. The objective of this work was to identify and select actinobacteria with potential for biocontrol of *P. ananatis*. Sixty-nine actinobacteria isolated from tropical soils were characterized morphologically based on the color of the aerial and vegetative mycelium as well as by spore chain morphology. In addition, the partial sequencing of the 16S rRNA gene performed the molecular identification. The results showed a high morphological and molecular variability among the isolates, which were grouped in three genera: *Streptomyces* (82.6%), *Amycolatopsis* (10.1%) and *Kitasatospora* (7.3%). The antagonist activity was performed against fifty *P. ananatis* strains using the overlay technique and evaluated by the formation of inhibition halos. The isolates ACT 1 (*S. pseudovenezuelae*), ACT 2 (*S. novaecaesareae*), and ACT 3 (*S. laculatispora*) were the most efficient in inhibiting the growth of *P. ananatis*. The antibiotic profile of the selected isolates using high-performance liquid chromatography coupled to a mass spectrophotometer showed the presence of the antibiotic neomycin in the culture extract of the ACT 1 isolate. The inhibition of the growth of *P. ananatis* using the disk diffusion test with neomycin, strongly suggested that the antagonistic activity of the ACT 1 isolate was due, at least in part, to the neomycin production. The present results showed a high morphological and genetic variability among the sixty-nine actinobacteria studied and allowed the identification of strains with high potential as biocontrol agents of *P. ananatis*.

Keywords: actinomycetes; biological control; foliar disease.

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