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Streptomyces sp. N2A INTERACTS WITH THE RHIZOPLANE OF ARABIDOPSIS THALIANA, GENERATING POSITIVE EFFECTS ON ITS GROWTH AND DEVELOPMENT

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The use of plant growth promoting rhizobacteria (PGPR) has proven to be a promising strategy in sustainable agriculture as a possible replacement for the currently agrochemicals. In this context, our working group previously isolated and characterized the *Streptomyces* sp. N2A strain from soybean roots [*Glycine max* (L.) Merr], which then was shown to promote growth development and yield of soybean plants under greenhouse and field conditions after seed inoculation. Now, we are interested in the study if this actinobacteria isolated from soybean plants interacts and promotes the growth of other plants such as *Arabidopsis thaliana*. In this work we evaluate a potential positive effect on the growth development of *A. thaliana* and how *S. sp. N2A* interacts with root structures, and particularly, how the production of phytohormones (IAA) or cellulases by this actinobacteria can affect the interaction with the plant. After treatment with *Streptomyces* sp. N2A, seeds were sown in pots and several developmental parameters were compared between treated and untreated plants (control) using *A. thaliana* Col-0 ecotype seeds. Plants treated with *Streptomyces* sp. N2A showed a significant increase in number of leaves, rosette area, rosette dry weight, root weight, silique weight, flowering time and stem height compared to the non-inoculated control (p-value <0.05). At the same time, using an eGFP expressing strain of *Streptomyces* sp. N2A, confocal microscopy revealed the interaction of the filaments of this bacterium with the *A. thaliana* root cells, demonstrating a superficial distribution of these filaments in its rhizoplane. The GFP fluorescence decreased markedly as the tissue was observed deeper, suggesting that the bacteria are localized predominantly in the outermost layer of the root, without penetrating into the innermost tissues. Then, a cellulase-null mutant of N2A was shown to be deficient on the growth promotion of *A. thaliana*, suggesting that the interaction of *Streptomyces* with roots require interaction with the cell wall. In addition, we are studying the possible effect of inoculation with this actinobacteria on auxin hormone perception and signaling in *A. thaliana* roots. The results obtained demonstrate that *Streptomyces* sp. N2A interacts with the rhizoplane of *A. thaliana* plants, promoting growth development and improving yield, allowing us to understand the way that *Streptomyces* sp. N2A

can be used as a growth-promoting agent for various plant species.

Palabras clave: Streptomyces, Arabidopsis thaliana, PGPR, Inoculantes