The Effects of Auxins and Cytokinins on the Survival of Azospirillum lipoferum and Azospirillum brasilense and the Root Colonization of Zea mays

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The purpose of this research has been to study the effects of phytohormones, specifically the auxin 1-Naphthaleneacetic acid and the cytokinin 6-Benzylaminopurine, on their ability to inhibit the growth of rhizobacteria Azospirillum lipoferum and Azospirillum brasilense. In addition, these phytohormones were applied to Zea mays (corn) plants that were inoculated with Azospirillum lipoferum and Azospirillum brasilense. This was in an effort to test the ability of phytohormones to promote root colonization. It was hypothesized that the inhibition of growth testing would result in decreased bacterial growth as volume of phytohormones increased. Inversely, it was hypothesized that root colonization would occur as a result of phytohormone application. This is because the hormones were not directly being applied to the bacteria. Experimental methods for the inhibition of growth testing included performing a Kirby-Bauer test to identify a zone of inhibition around a disk containing phytohormones in the petri plate. Moreover, the root colonization testing involved growing inoculated plants, applying phytohormones, and then utilizing PCR, cloning, and DNA sequecning techniques to determine whether the roots were colonized. Literature on both Azospirillum lipoferum and Azospirillum brasilense and phytohormones was extensively reviewed prior to experimentation. However, no information was able to be located that directly related to this research. Such a finding promotes the idea this research is original and unique in design. The Kirby-Bauer test did not result in statistically significant inhibition of growth, and was inconclusive enough to warrant continued research. Furthermore, the root colonization testing resulted in very little colonization taking place.

Awards Won:

American Statistical Association: Certificate of Honorable Mention