The Presence and Efficiency of Endophytic Nitrogen-Fixing Bacteria in Populus deltoides

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Researchers conducting experiments on Populus trichocarpa discovered the presence of endophytic nitrogen fixing bacteria through the indicator nif h gene. This bacteria allows the plant to have increased growth in nutrient poor environments. Another species of poplar found in the southeastern United States is Populus deltoides. If Populus trichocarpa contained these bacteria, could Populus deltoides contain them as well? My hypothesis was that, if the presence of the nif h gene was tested, then the gene would appear on samples of populus deltoides leaves and xylems. The DNA was extracted and the amount was determined by a nanodrop analyzer. Conducting a One Way ANOVA test on the results and comparing them between the three genotypes tested, it was found there was no significant difference between the genotypes. By conducting a PCR test on various samples, the nif h gene was tested using primer pairs specifically created to find it. Using gel electrophoresis, samples showed varying amounts of banding in the predicted base pair region, between 353 and 389, but five samples showed banding consistent with that of the range of base pairs the nif h gene appears in. Overall, my hypothesis seems to be supported, as the nif h gene was found to be present definitively in five of the samples tested. The One Way ANOVA test found there was no significant difference in the amount of DNA extracted from the three genotypes, showing the consistency in the extraction process.

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