Using Guaiacol to Measure the Effect of a Hormone with Antioxidant Properties (N-Acetyl-5-Methpxytryptamine) on the Rate of Photosynthetic Reactions in Plants via Oxygen Production

Olivanti, Chase (School: Wiregrass Ranch High School)

The overall purpose of this project was to study the impact of melatonin on plant physiology. Specifically, I wanted to test the effect it had on the light dependent reactions in photosynthesis. There is research to suggest that melatonin can act as an antioxidant. Melatonin can have a dramatic impact on plant cells, which would be them lowering the cells ability to function. I used a spectrophotometer to determine the amount of oxygen that my different amount of melatonin produced. I then used that information combined with research to draw my conclusions. As far as data, I had an average of 14% transmittance for the least amount of melatonin, meaning there was not very much light making its way through, meaning photosynthetic reactions were occurring, just at a slightly slowed rate. I had an average of 81% transmittance when I introduced the largest amount of melatonin, meaning there was a lot of light making its way through, meaning there was little to no photosynthetic reactions occurring. I then ran an ANOVA and Post-Hoc Turkey HSD test on my data, and determined that the p-value would be low. Because of my ANOVA, I am able to reject my null hypothesis with a 99% confidence, and say that there is indeed a statistical significance between melatonin and photosynthetic reactions. This helps establish the reliability of my alternative hypothesis, that there is indeed a statistical significance between the amount of melatonin I introduced to the solution and the rate of light dependent reactions, which helps support my alternative hypothesis.

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