Spectrophotometric Analysis of the Effects of Insect Growth Regulators on Tenebrio molitor

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This project focused on discovering how mealworms will be affected by Insect Growth Regulators, specifically focusing on the Juvenile Hormone Mimics pyriproxyfen, methoprene, and hydroprene. The objectives of this project were to find the average size change caused by each of the Juvenile Hormone Mimics and the average protein changes caused by each of these compounds. In addition, an analysis was done to establish which of the JH mimics: hydroprene, methoprene, and pyriproxyfen was most effective in generating these changes. It was hypothesized that the Juvenile Hormone Mimics would cause the mealworms to grow much larger than they would naturally. Hydroprene, methoprene, and pyriproxyfen are produced in the insect brain, which forces the insect to remain in a juvenile state. It was predicted that this would cause the insect to continue to grow excessively large when in the larval stage. The Biuret method was used to test for the protein content in the four different mealworm groups. Ten mealworms were broken down using HCL; trying to recreate the human digestive system. Albumin was also tested using the same procedure. This was done to create a base line graph for the other results to be compared with. There was also a control group that was not treated with anything. The other groups were treated with the IGR Hydroprene, Methoprene, and Pyriproxyfen. The results of these experiments were not as expected. Both Pyriproxyfen and Hydroprene did not produce increased protein levels. Protein concentrations from these two IGR's were less than the control group that had not been treated. Methoprene, however, produced protein levels that were slightly higher than the control. These results indicate that increased protein availability may be possible from this new source.

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