

Capsaicinoid Yield and the Effect of Growth Hormones in Peppers

Jordan Szabat, Dr. Lawana Adcock, UAH College of Science

Introduction

Capsaicinoids are a class of neurotoxin found in the fruit of plants in the genus *Capsicum*, more commonly known as pepper plants. This compound is a neurotoxin that has uses in different pain studies. This study aims to look at the effect of three different growth hormones on growth of these fruit as well as their final yield of capsaicin.

Materials and Methodology

Different cultivars of pepper plants from the species *Capsicum annuum* and *Capsicum Chinense* were grown. These plants were divided into a control group and groups that had the hormones 1-Naphthaleneacetic acid (1-NAA), Gibberellic acid (GA3), or Kinetin (Kin) applied to them using a foliar application process. As the peppers grew, the flowers and fruit were counted.

For the analysis of capsaicin, dry mass samples of the fruit will be taken and tested using HPLC against a capsaicin and dihydrocapsaicin standard. the resulting data will then be analyzed to determine if any significant changes in yield occurred.



Figure 1: Comparison of plant heights from habanero plants. The treatments in order from left to right are, GA3, Kin, 1-NAA, and the control.

Results So Far

Currently, not enough fruit have been created in order to start the HPLC process and obtain the final yield of the capsaicinoids. But, there are already some noticeable effects from the hormones. The first would be plant height, seen in Figure 1.

The second difference seen would be the number of fruits being produced. As seen in Table 1, the Kinetin treatment has lead to the highest average fruit count in all plants except for the bell peppers. On the other hand, the Auxin treated plants have not produced any flowers or fruit up to this point.

Table 1: Average Fruit Count on Each Cultivar

Hormone Applied	Trinidad Scorpion	Habanero	Bell Pepper
1-NAA	0	0	0
Kin	1.11±1.64	6.89±4.76	3.17±0.29
GA3	0	0.33±0.58	2.50±3.91
Control	0.77±1.07	4.83±2.75	4.50±1.32

Conclusion

As the data is not fully collected due to the fruit not being fully mature. The capsaicinoid analysis cannot currently be done. However, the current data allows for a few conclusions to be drawn so far. The kinetin treatment currently appears to be the most promising to work with, as it has led to larger fruit quantities on average in the capsaicin producing plants. The fruit development also do not appear to be hindered, as they appear to be closer to maturation then the control plants. If this continues hold true, this treatment may be useful in increasing crop yield for these plants.

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