**Name(s)**

Anna Afasizheva

**Project Number**

S1601

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**Project Title**

Color Crime

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**Objectives/Goals**

Plants are found all around us, and often arouse a healthy interest. So, I designed a project intended to increase my knowledge of the world I live in. Five experiments were conducted comparing the pigment composition of various parts of different plants, thus determining what happens to it in different scenarios.

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**Methods/Materials**

For each experiment, pigment was extracted from the specified plants. Then, for each sample, a chromatography strip was prepared and run for one and a half hours. The remaining pigment extracts from each sample were analyzed with a UV/VIS spectrophotometer at particular wavelengths. Finally, as an addition to the original experiment, some well-separated strips of the chromatograms were cut out to elute the individual pigments. In turn, each individual pigment was analyzed with the same spectrophotometer at the matching wavelengths.

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**Results**

Ex. 1: [What happens to pigment as leaves change color with seasons?] It was shown that in a series of green, yellow, red, and brown leaves the quantities of different pigments diminish or increase accordingly to replace the previous color of a leaf.

Ex. 2: [Why are two leaves of the same tree different in color intensity - one is lighter while the other is darker green?] The lighter leaf contained more of the lighter chlorophyll a, while the darker leaf contained more of the darker chlorophyll b.

Ex. 3: [Does the temperature of a refrigerator have an effect on a plants pigment composition?] The refrigerated plant showed no difference* in composition when compared to a fresh plant.

Ex. 4 and 5: [Compared different, yet similarly colored parts of the plant to determine whether or not the coloring pigment was the same] The root-crops, leaves, and petals showed no difference* in composition when compared to each other.

*it is meant that the graphs constructed from the spectrophotometer’s data had corresponding peaks.

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**Conclusions/Discussion**

Ex. 1: The pigment in a leaf deteriorates with time, giving way to another pigment, causing a change in color.

Ex. 2: The color intensity difference is caused by varying forms of chlorophyll as well as the amounts of pigment found in each leaf.

Ex. 3: The temperature of a refrigerator has no effect on the pigment composition of a plant.

Ex. 4 and 5: The pigment which gives a certain color to various parts of the plant is the same in all those places.

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**Summary Statement**

"Color Crime" is designed to create a better understanding of our surrounding flora through analyzing and comparing their pigment composition.

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**Help Received**

Assistance with handling equipment was received from Inna Afassijeva Ph. D.; Lab space provided at University of California in Irvine by Assistant Professor Ruslan Aphasizhev