

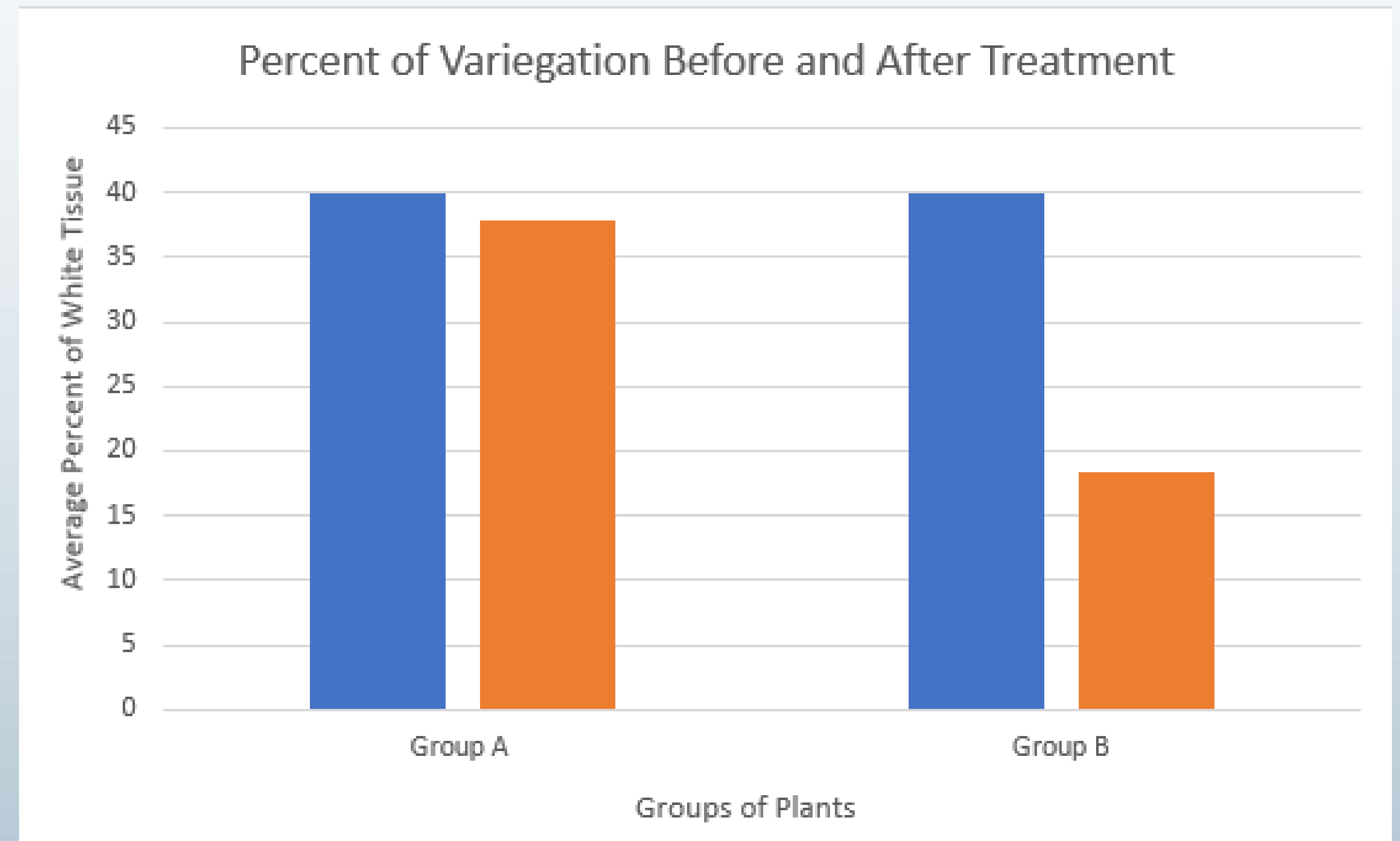
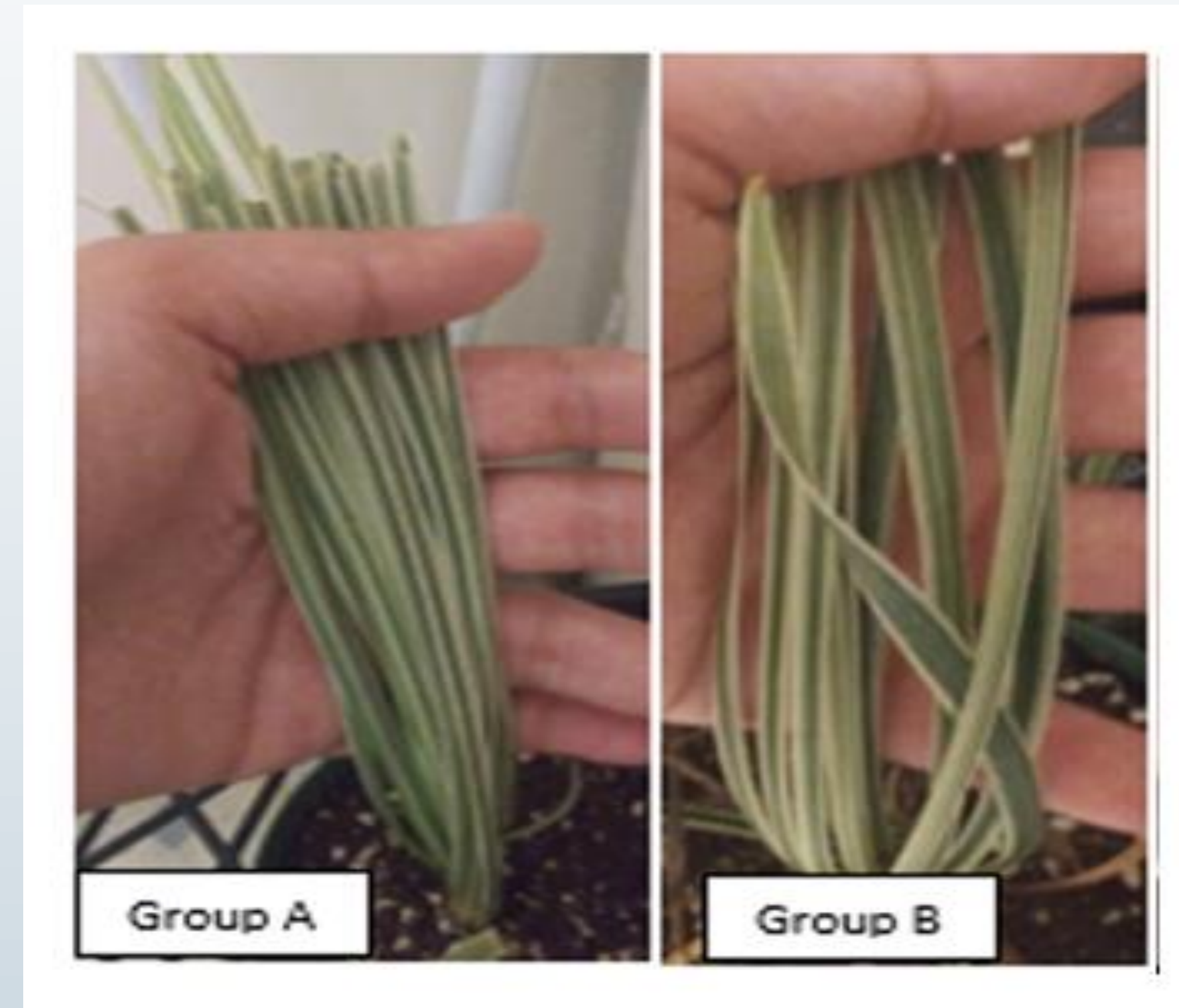
# Analysis of the Influence of Light Intensity on the Expression of Variegation



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## Introduction

Variegation is the dual coloration of leaves and stems of plants and is caused by the lack of chlorophyll B in the white portions of this plant. This desirable trait is used by gardens and landscapers to beautify their gardens, but the variegation is unstable. If the plant needs to increase its rate of photosynthesis, it can do this by developing tissue with more chlorophyll B. This is called reverting. At my workplace, I had to remove several bushes of *Liriope muscari* because they reverted. This inspired me to understand why it happened so that we could avoid this in the future.



## Hypothesis

If *Liriope muscari* is grown in two different light intensity ranges 500-750  $\mu\text{mol}/\text{m}^2/\text{s}$  and 750-1000  $\mu\text{mol}/\text{m}^2/\text{s}$  then it will have the least amount of variegation in the lower light intensity range.

## Materials

- 20 Seedlings of *Liriope muscari*
- Potting soil
- Trays for planting
- Photometer
- Gloves
- Camera
- Notebook

## Method

Purchase seven *Liriope muscari* plants. Divide the plants and repot them. Separate the *Liriope muscari* into three groups. Estimate the amount of variegation per leaf. Water the plants equally and regularly. Measure the highest and lowest amount of light that each leaf gets throughout the day. After four weeks of the differing light treatment, cut off and measured the average percent of white tissue in the new leaves.

## Results

Based on the data I obtained, it is evident that the group exposed to the higher light range had a greater amount of white coloration on the leaves. In both groups, the initial amount of white in each leaf was approximately 40%. As seen in the graph above, Group A only had a slight decrease in the amount of variegation while Group B experienced a significant drop in percentage. The pictures also reveal that the leaves in group B look very similar to the leaves in the original sample while the leaves in Group B are significantly greener and lack numerous white stripes.

Some sources of variation might be due to the conditions that the plants were exposed to before I bought them and general human error during their treatment.

## Conclusion

From the results, I can see that the amount of light did affect the amount of variegation, and I would recommend to anyone growing *Liriope muscari* to keep it in full sunlight to prevent it from reverting. While the plants did not fully revert, there were noticeable differences in the number of white markings in each group.

If I were to redo the experiment, I would spend more time observing the plants so I could collect more data. I would also try to find a growth chamber to grow them in to ensure equal treatment.

## Variegated



## Reverted



## Next Steps

Based on the results of this study, I would recommend providing *Liriope muscari* with between 1200-1500  $\mu\text{mol}/\text{m}^2/\text{s}$  of sunlight in order to prevent a loss of variegation. I would also make sure that the plant has enough nutrients and water to thrive and maintain the white parts of the leaves.

## Sources

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