FOUNTAIN OF YOUTH

Exploring the Effects of a Telomerase Activator in the Alfalfa Leaf Cutting Bee

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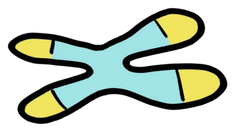
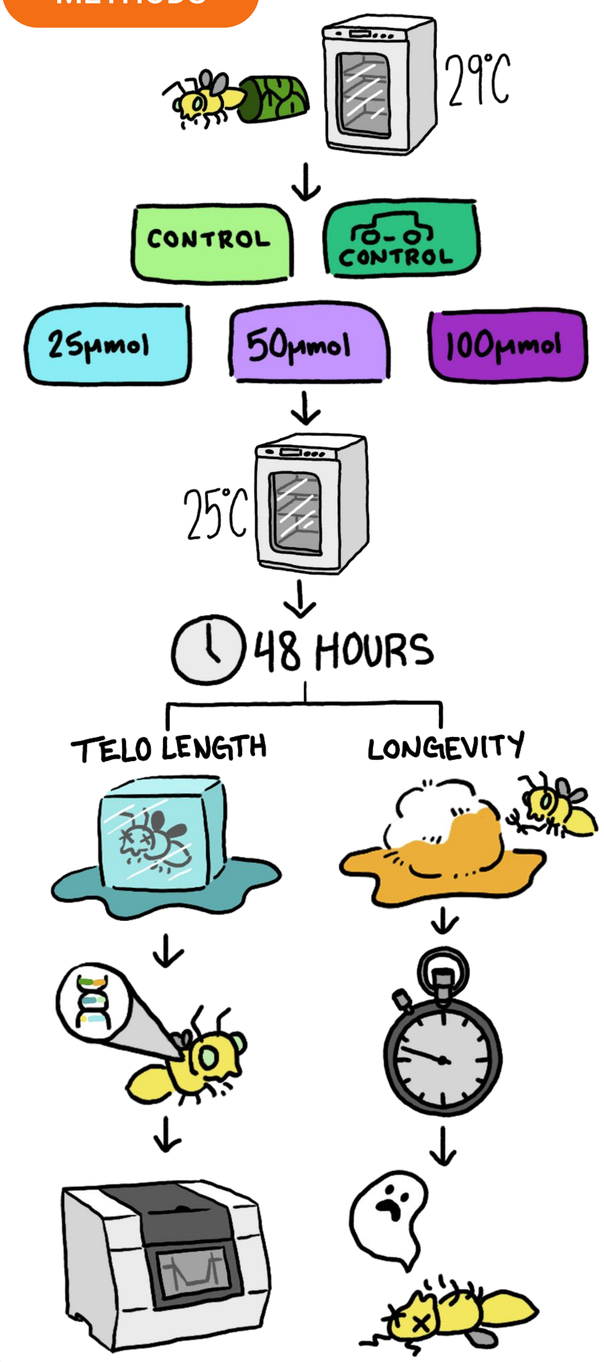
INTRODUCTION

- Telomeres, repetitive, non-coding DNA sequences on the end of chromosomes, protect DNA during cell replication
- Telomeres shorten during cell replication, due to this, it is thought to be a biological marker of aging
- Critically short telomeres can lead to cell death
- Telomeres are repaired by the enzyme, telomerase, which declines in activity with age
- Cycloastragenol claims to promote telomerase activity which could lead to an increase in lifespan
- This project aims to examine the effects of cycloastragenol on the relative telomere length in alfalfa leaf cutting bee

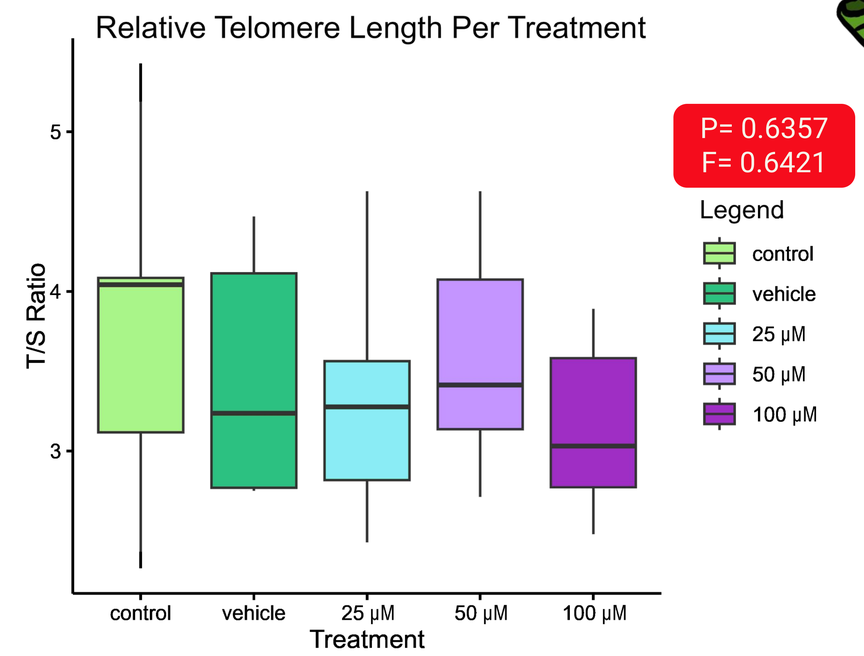


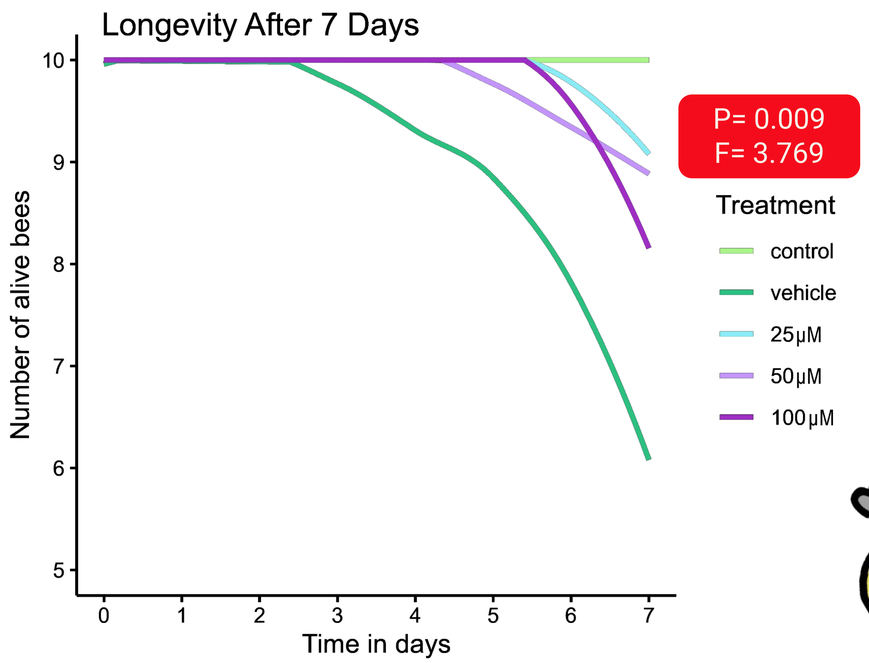
HYPOTHESIS Feeding cycloastragenol to alfalfa leaf cutting bees will change telomere length and lifespan

METHODS



RESULTS





DISCUSSION

- T/S ratio is commonly used as a relative measurement of telomere length

$$\frac{\text{Telomeric DNA primer (T)}}{\text{Reference gene (S)}}$$

- Cycloastragenol did not have a significant impact on the relative telomere lengths in our treatment groups
- Given our 7 day preliminary results for the longevity study, it suggests that the drug is not increasing telomerase activity when fed to our bees
- The increased mortality rates may be due to the adverse effects of DMSO, the carrier of the drug

FUTURE RESEARCH

- Longevity is ongoing to examine lifespan of bees when given cycloastragenol
- Alternative methods of dosing bees:
  - Injection
  - Longer feeding time
  - Higher dosages
- Trap assay
  - Measures telomerase activity

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