

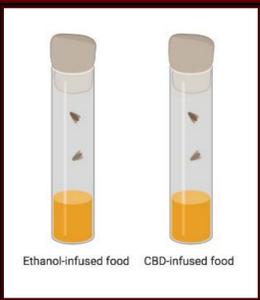
## Methods

### Reproduction:



Allowed the flies to reproduce before beginning the experiment.

### Diet:



Young and old flies were exposed to two diets: media containing ethanol and media containing CBD.

### Phototaxis Test:



This test was used to find sighted flies for the learning and memory tests. Each fly was exposed to darkness for 1 minute. Light was shone on the clear tube, if they moved towards the light, they were sighted and were used for the experiment.

### Aversive Phototactic Suppression Assay (APSA):



Used for the learning and memory tests. Bitter quinine solution was placed in the light tube. The fly was placed in the dark for 1 minute, then light was shone on the quinine side of the tube (Repeated 10 trials in learning tests and 1 time in memory test). Flies are expected to learn/remember to avoid the lighted side of the tube because of the bitter quinine.

## Introduction

Memory is a crucial skill for the survival of several organisms and learning is important for memory. Without memory, we would not be able perform daily tasks. Thus, improving memory has been a topic of interest for scientists throughout the world. Cannabidiol (CBD), a large component of the plant *Cannabis sativa*, has been shown to improve cognitive function of people with existing neurodegenerative diseases. However, there is not much research done on the effect of CBD on young healthy minds. In this study, an Aversive Phototactic Suppression Assay was performed on young *D. melanogaster* to test if exposure to CBD improves their short-term memory.

We hypothesized that exposure to CBD may improve the short-term memory of young *D. melanogaster* when the aversive phototactic suppression assay (APSA) is performed.

## Results

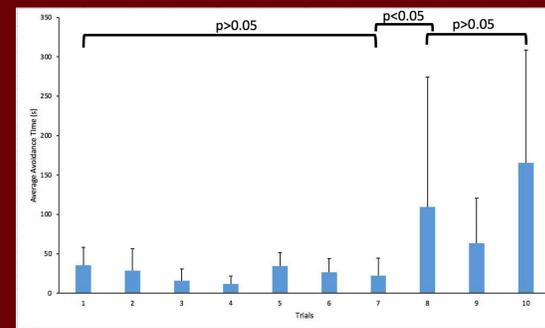


Figure 1: Graph showing the ten trials of the learning test for the flies exposed to control food. The p-values show that the flies learned at trial 8.

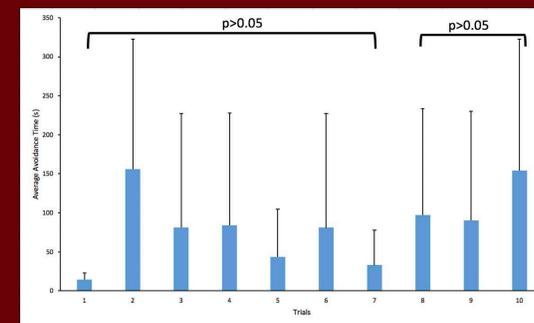


Figure 2: Graph showing the ten trials of the learning test for the flies exposed to CBD-infused food. The p-values show that the flies did not learn at any trial.

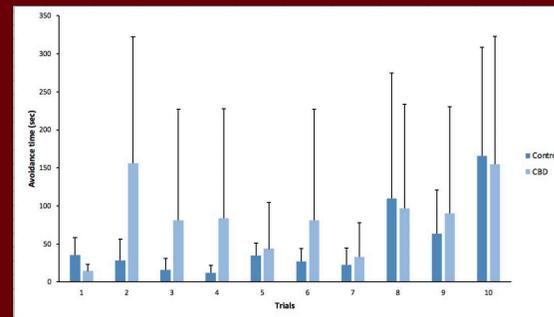


Figure 3: Graph comparing the average avoidance times for each trial in the learning tests for male *Drosophila* in the control and CBD diets.

Fly	Treatment	Sex	Avoidance Time
Fly 1	Control	Male	14.01
Fly 2	Control	Male	70
Fly 3	Control	Male	55.3

Table 1: Table shows the results of the memory test for flies exposed to control food. The threshold avoidance time was 112.9 s. The flies whose avoidance times passed this threshold remembered what they learned. None of the flies remembered what they learned.

Fly	Treatment	Sex	Avoidance Time
Fly 1	CBD	Male	300
Fly 2	CBD	Male	247
Fly 3	CBD	Male	4.49
Fly 4	CBD	Male	21.31

Table 2: Table shows the results of the memory test for flies exposed to CBD-infused food. According to the learning test results, the flies exposed to CBD-infused food did not learn, so they do not have a threshold avoidance time. Since the flies did not learn, they did not remember.

## Conclusion & Future Directions

The results conclude that CBD does not have an effect on the learning and memory of young male *Drosophila melanogaster*. During the learning test when the males were exposed to the control food, there was a steady increase in avoidance time from the 8th trial onwards. When this is compared to the treatment group, the flies did not learn during any of the trials when they were exposed to CBD.

For future direction, we want to repeat this experiment again over a longer period of time and increase the sample size. More variables could be added to our research question, such as; how CBD effects old flies versus young flies or how it affects females compared to males.

## Acknowledgements

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