2018-06-01

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The Effects Of Larval Population Density And Social Interactions On Adult Fecundity In *Drosophila melanogaster*

Eva Batenhorst, Maria Franco Ramos, & Nick Wanderscheid

### Introduction

- *Drosophila melanogaster* has been used as a model organism to study social interactions and sexual behaviors.
- Previous studies have suggested that fecundity in flies may be affected by larval population density.  
  \[1,2\]
- Other studies suggest that larvae raised in isolation have impaired visual and olfactory development which can lead to low fecundity.  
  \[3,4\]
- We crossed females and males raised in isolation (low density), medium density, and high density larval population densities.
- We hope to gain insight on whether adult fecundity is affected by larval population density in fruit flies.

### Methods

- **20 vials with 1 egg**
- **10 vials with 25 eggs**
- **2 vials with 200 eggs**

Flies were removed from the vials as they eclosed, before having a chance to mate, and were separated by sex.

We set up 9 different pairwise crosses using the virgin flies previously collected.

- Vials were kept in a 25 C incubator in a 12-hour light/dark cycle to grow.
- Food was provided as to not be a limiting factor for both fly parents and offspring.
- Parent flies (Gen 0) were allowed to mate for five days before they were removed, frozen, and measured by wing vein length to obtain overall size measurement.
- In following days, we observed each vial and counted adult offspring until no eclosion was observed.

### Results

**Preliminary data suggest that medium density flies eclose at a faster rate than high density flies, and a greater percentage of eggs develop into adults (Figures 1,3,4).**

**Wing length data suggests that larvae raised in isolation tend to be larger, while larvae raised in high population density tend to be smaller (Figure 2).**

We will continue to run this experiment for a total of 10 replicates of each mating combination.

When complete, this research will contribute to our knowledge about the effects of larval population density and social interactions on adult *Drosophila* fecundity.

### Conclusions

- Preliminary data suggest that medium density flies eclose at a faster rate than high density flies, and a greater percentage of eggs develop into adults (Figures 1,3,4).
- Wing length data suggests that larvae raised in isolation tend to be larger, while larvae raised in high population density tend to be smaller (Figure 2).
- We will continue to run this experiment for a total of 10 replicates of each mating combination.

### References


### Acknowledgments

We would like to thank Doctors Michael Baltzley, and Kristin Latham-Scott for guidance and a tremendous amount of help with data organization and analysis, and Western Oregon University for the facilities and the equipment.