Behavioral Mechanisms Involved in Oviposition Preference in *Drosophila melanogaster*

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ABSTRACT:

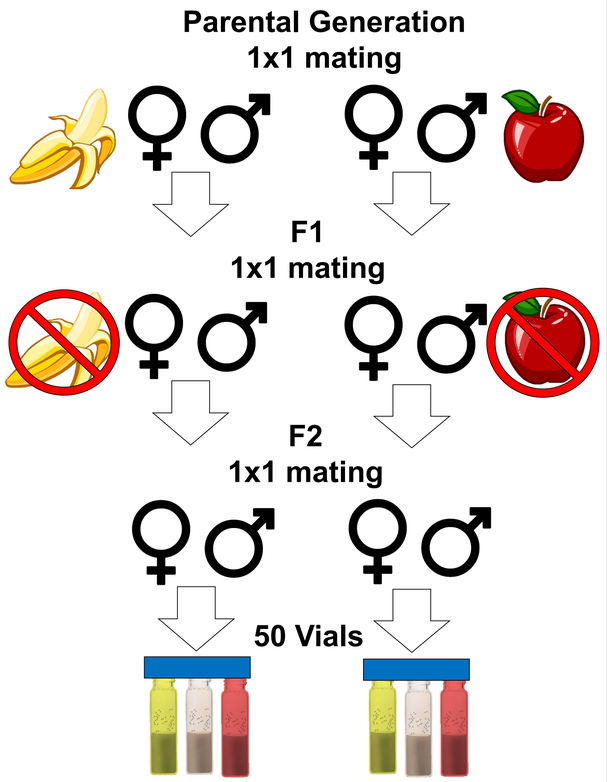
- *Drosophila* oviposition choices were compared for pairs of food flavorings
- *Drosophila* is known to use the presence of the yeast *Saccharomyces cerevisae* and acetic acid as oviposition guides, food flavor preferences are largely unknown
- Hypothesized that our data will show that exposure in earlier stages of development, and even in parental larval enviroments, may modify *Drosophila* food preferences

INTRODUCTION:

- In generalist insect species, like *Drosophila melanogaster,* progeny survival and fitness are reliant on suitable oviposition sites
- Mechanisms regulating how environmental factors and innate choice preferences are integrated and balanced remain unknown
- As seen in the apple maggot fly *Rhagoletis pomonella,* exposure to more than one suitable host may give rise to subgroups exhibiting different traits
- This divergence of personal preference may lead to speciation

METHODS:

- All natural apple and banana extracts from Olive Nation were used
- Control media lacked additional food flavoring and was only given only to the F1 generation
- 1 mL of extract per 200 mL of standard food made from scratch (corn syrup, yeast, corn meal, agar and anti-fungal) was the standard concentration when extract was used
- The flies were kept in an incubator with 12 hour light and dark cycles
- Virgins used at every mating and given 3 days to mate before being removed
- Flies were counted at day 8 and 10 after removing mating pairs, number of offspring from F2 flies in each vial was taken as choice preference



RESULTS:

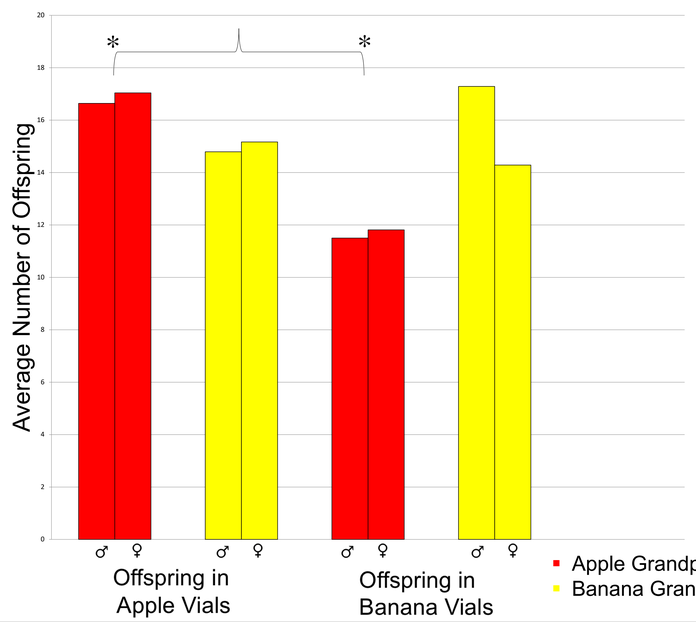
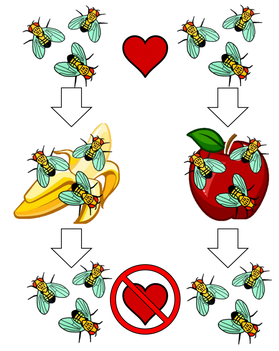


Figure 1: **Mean offspring that were found in either banana or apple vials.** A significant difference between the mean number of offspring recovered from apple and banana vials was observed (heteroscedastic two-tailed t-test, p=0.000493)



CONCLUSION:

- Females with grandparents raised on apple food chose to lay their eggs in apple food more than the flies with grandparents raised on banana food
- Epigenetic modifications in behavior are heritable, which suggests that behavioral experience in adult life may influence gene expression in subsequent generations

FUTURE WORK:

- More trials using genetically monomorphic population are needed to confirm the pattern seen

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