

BIOLOGY 1100

VANCOUVER COMMUNITY COLLEGE

Instructor: Maria Morlin

November 2020 – hybrid course

Drosophila fly lab – monohybrid cross

Outline

- Objectives
- Background information
- Robyn – demonstration summary
- Results of cross experiment
- Analysis and conclusion of parent genotypes
- Notes on flies
- Resources

Objectives

- Investigate the efficacy of using *Drosophila* (fruitflies) for genetics studies
- Distinguish between morphologies
- Conduct a monohybrid or dihybrid cross
- Collect and count the F1 generation
- Analyze results

Fruit flies in genetics studies (just ask David Suzuki – he spend years in a fly lab)

- Fruit flies – *Drosophila melanogaster* – have been used in genetics studies for years – a model organism – because:
 - Brief generation time
 - Produce large numbers of externally laid embryos
 - Can be genetically modified
 - Low cost
 - Genome 60% homologous to human genome
 - Can be used to discover mechanisms controlling development and survival.
 - 14000 genes – each with a dedicated page on “Flybase”
 - Has led to a few Nobel Prizes in Physiology or Medicine

Demonstration

Robyn demonstrated:

1. The fruit fly life cycle
2. The vial in which chosen genotype males and females were placed to mate.
3. Traits are either wildtype (normal), or mutants
 - Red eyes are wildtype, white and sepia eyes mutants
 - Normal wings are wildtype, vestigial wings are mutant
1. She showed the difference between males and females: females have a larger abdomen, and no sex combs. Males have a darker abdomen.
2. Robyn demonstrated how the flies are kept on ice for counting on a petri dish under the dissecting scope.
3. Robyn then counted the F1 generation of the Red eye X sepia eye cross: counting males and females and their phenotypes

Results

Drosophila melanogaster Genetics Lab – Class Summary Results

Table 1: Sepia Eye vs. Red Eye (Wild Type)

Robyn Wood, Nov 12th, 2020

Category	1	2	3	4	5	6	7	8	Total
Male, Red eyes									24
Male, Sepia eyes									5
Female, Red eyes									31
Female, Sepia eyes									9

<u>Male vs Female</u>
Total # Male:
Total # Female:
Overall Total #:

<u>Sepia vs Red Eyes</u>
Total # Red:
Total # Sepia:
Overall Total #:

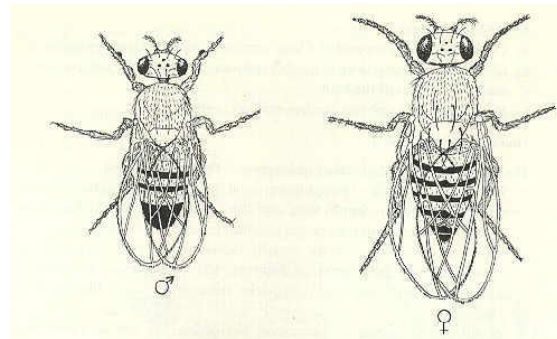
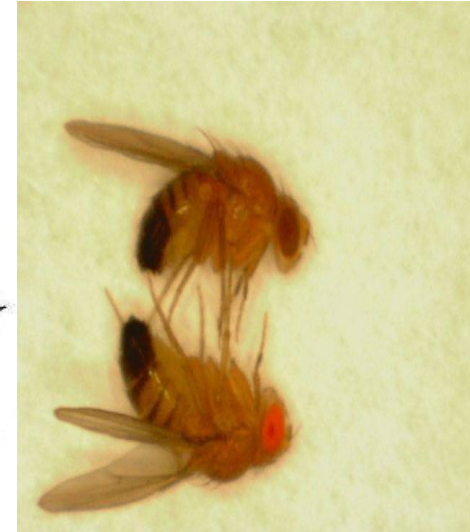
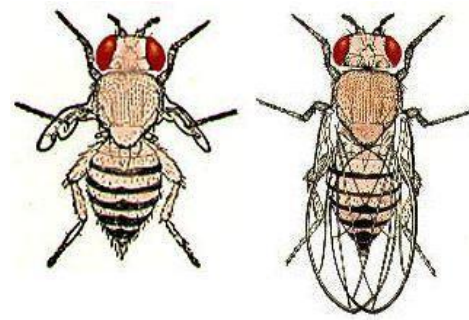
Analysis

- Students will analyze the preceding data and determine:
 - Whether alleles for eye colour are sex-linked or autosomal
 - Genotypes of the parent generation

Notes on flies



Plate I. Some eye colors in *Drosophila melanogaster*. (After E. M. Wallace, in *An Introduction to Genetics* by Sturtevant and Beadle, Saunders, 1938.)



Males versus Females

- Male has sex combs on front legs (appear as small black dots)
- Male is smaller
- Male abdomen is more rounded and darker

Resources

For more information I would recommend reading:

<https://www.sciencedirect.com/science/article/pii/S1369702111701134>