Genetics

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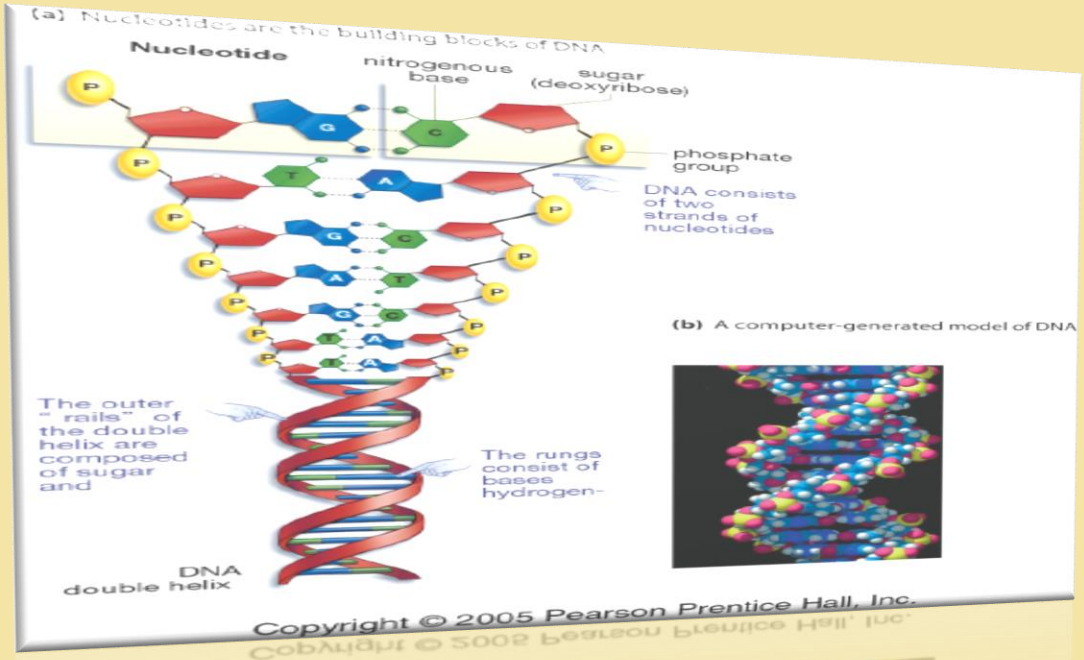


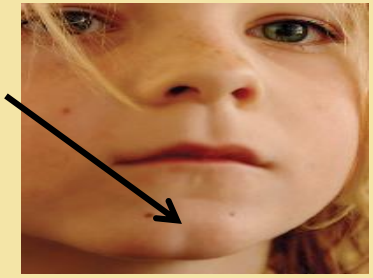
Introduction to Genetics

Drosophila melanogaster

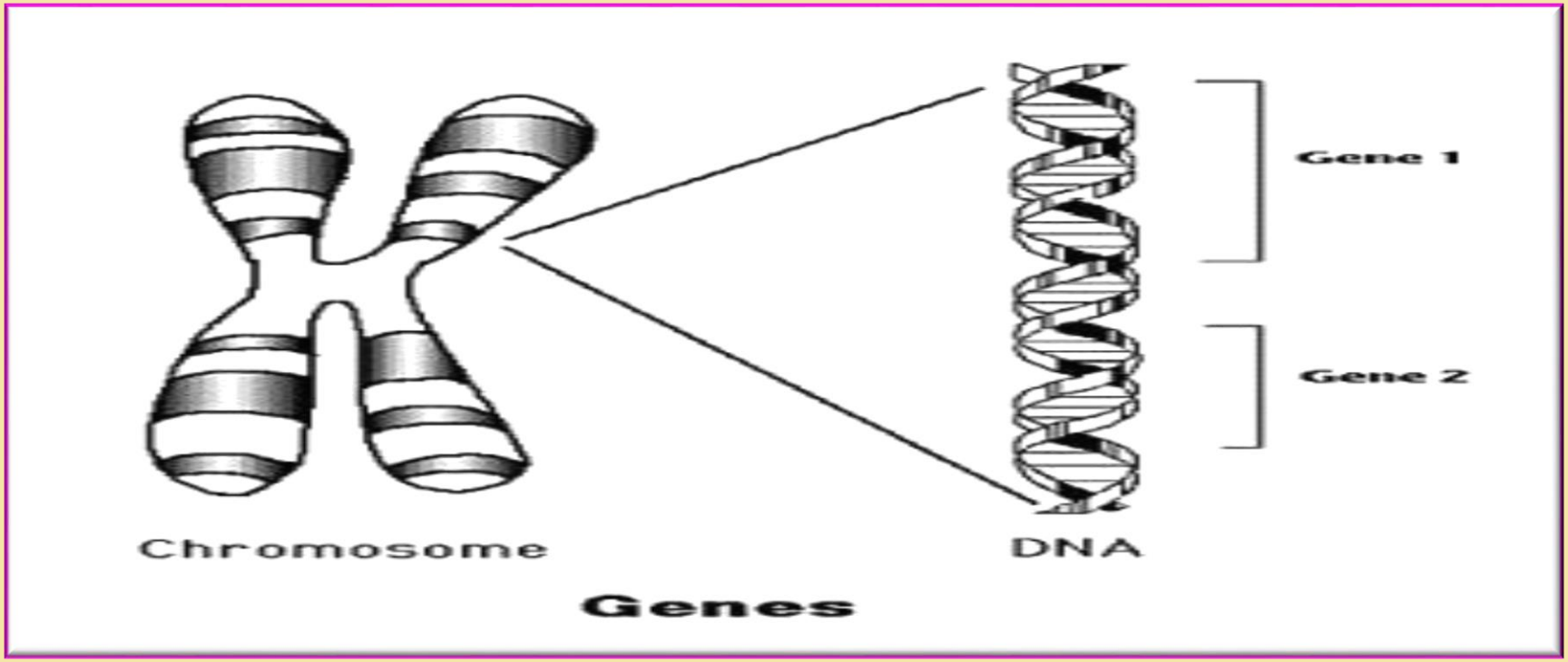
Lab 1

What is Genetics?

- Genetics – study of how **traits** are passed from **parent** to **offspring** (It is the passage of genetic traits from one generation to the next)



* It’s controlled by **the chromosomes** in the nucleus of cells.
* Chromosomes are composed of smaller units called **genes**[DNA]



Drosophila melanogaster

STATS

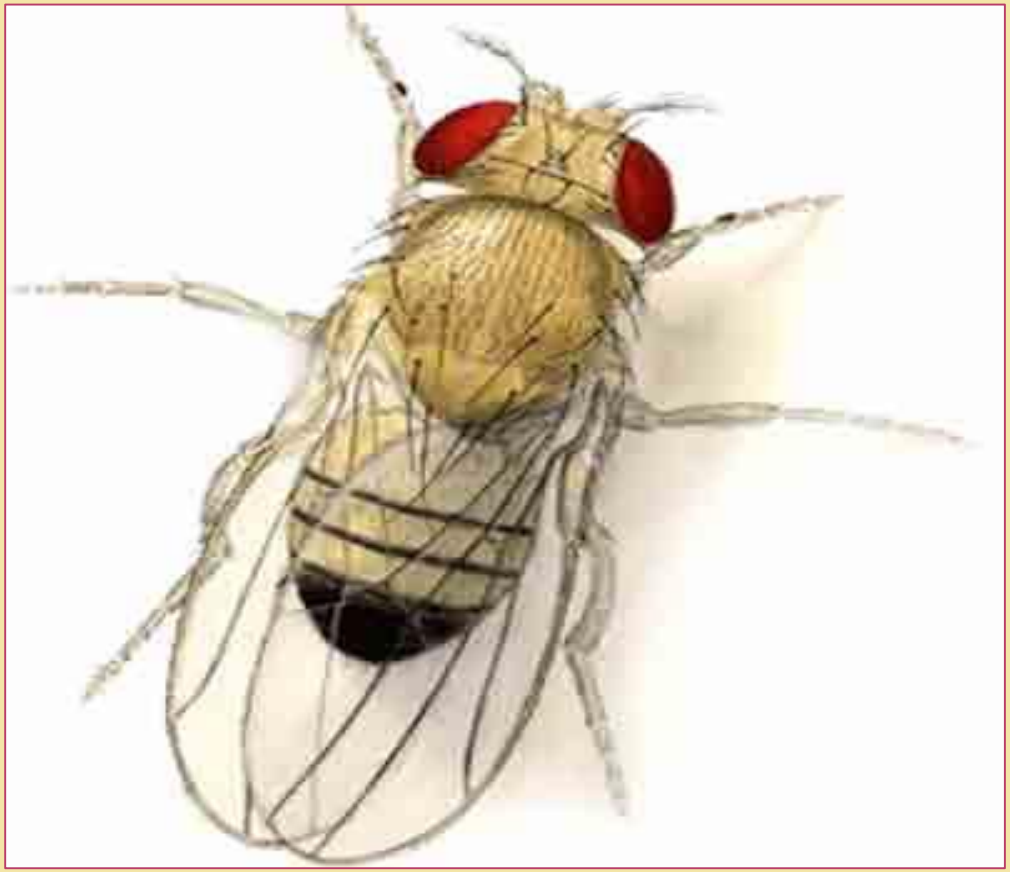
Taxonomy:	Insect
Size:	2–3 mm in length
Anatomy:	3 body segments, 6 legs, 1 pair of wings
Habitat:	Feeds and reproduces on fruit

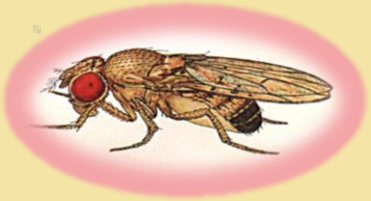
* **Is a small (about 3mm long), common fly found near unripe and rotted fruit, so that it called fruit or vinegar fly.**
* **They exist in almost all parts of the Earth, so studies and research on them has been by geneticists.**
* **Thomas Hunt Morgan was the preeminent biologist studying Drosophila early in the 1900's. (study of mutation).**
* **Due to its small size, ease of culture,short generation time , and is cheap and easy to keep large numbers geneticists have been using Drosophila ever since.**

Drosophila melanogaster

* **They feed in nature on yeasts, so they are easy to collect from orchards, especially banana and grape orchards.** (Likes rotting fruit, yeast)
* **We can found it most in places where we live such as homes, fruit shops, fermentation and export places.**

Drosophila melanogaster





Why use Drosophila?

1. They are small , easily handled and easy to keep in a laboratory
2. Have a short generation time.
3. Have a number of easy to see inheritable characteristics and many mutations to study.
4. Have a chromosome number of 8 (4 pairs of chromosomes).
5. You can anesthetize them easily and manipulated individuals with very unsophisticated equipment.

6. Drosophila are sexually dimorphic (males and females are different), making it is quite easy to differentiate the sexes.
7. It is easy to obtain virgin males and females as they are distinctive from mature adults.
8. Flies have a short generation time (10-12 days) and do well at room temperature.
9. The care and culture requires little equipment, is low in cost and uses little space even for large cultures.
10.It Have Giant polytene chromosomes (unique to insects) in their larval stage, That chromosomes may be visualized with staining technique for study and can be used for genetic mapping.

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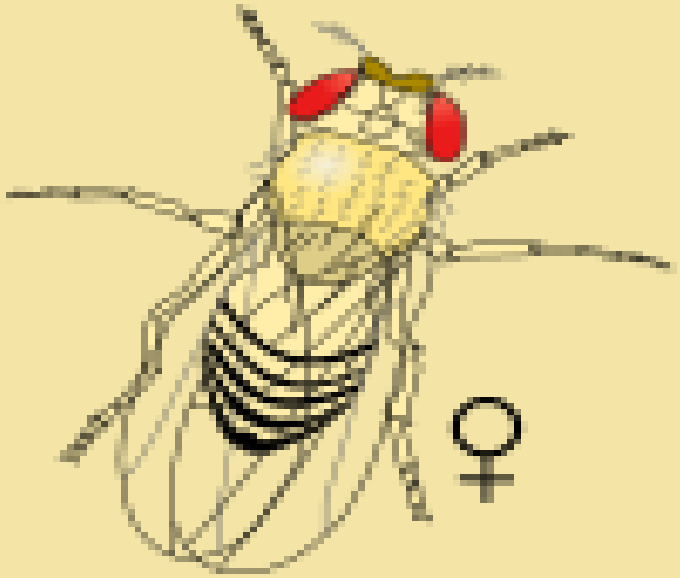
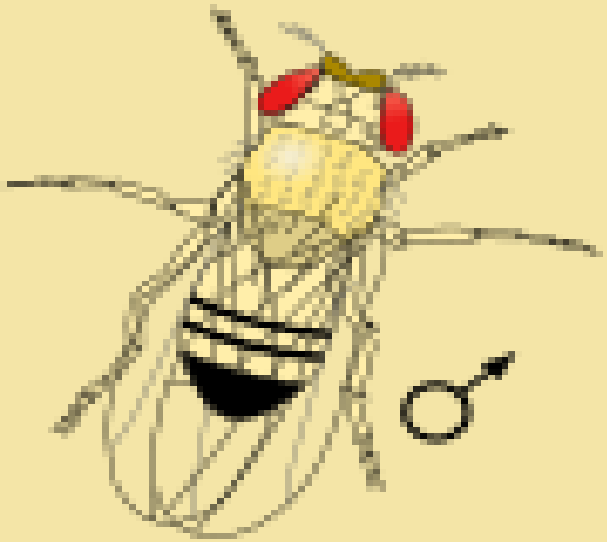
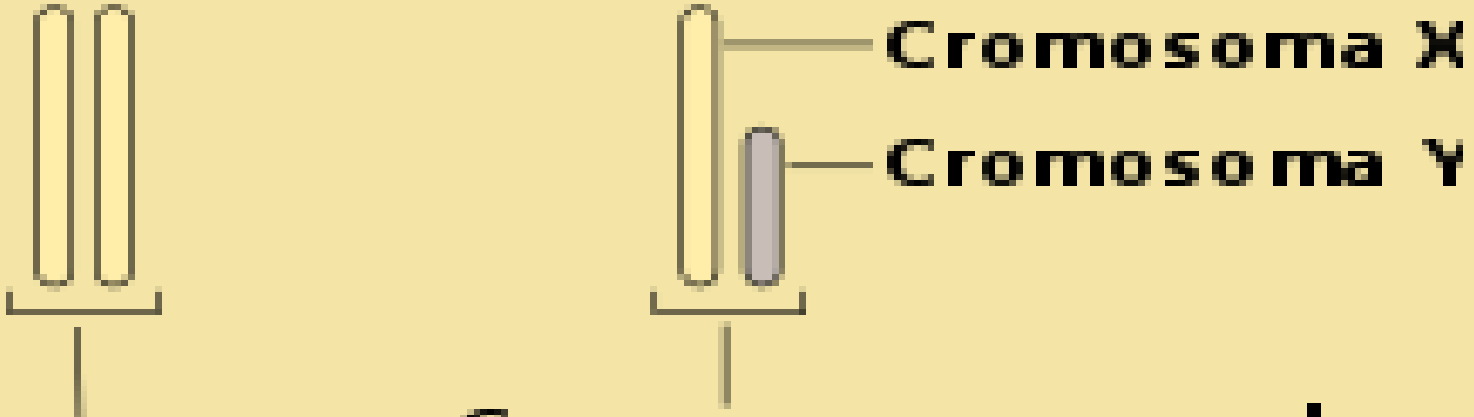
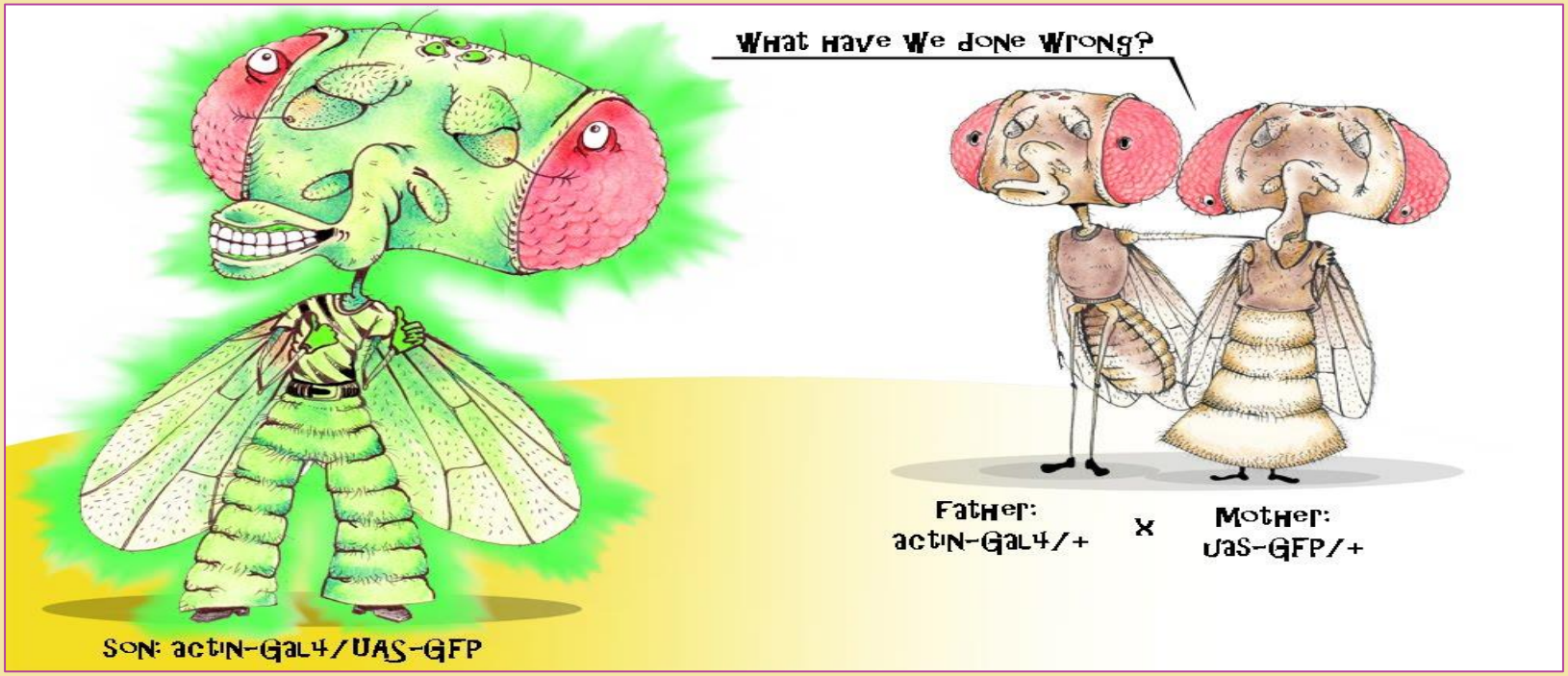




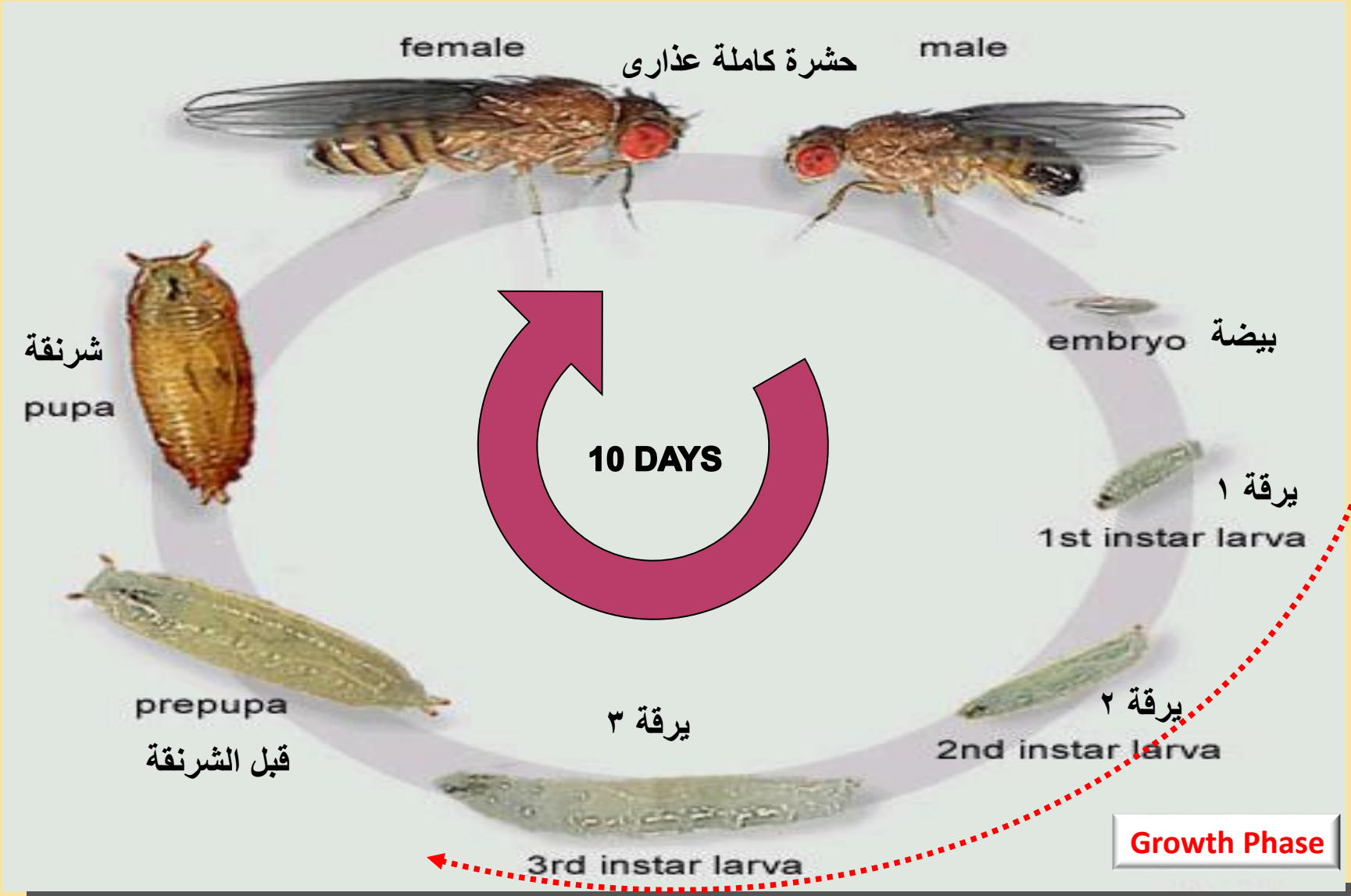


the female is longer than the male

The sexual ratio between male and female is 1: 1 at 25 ° C.

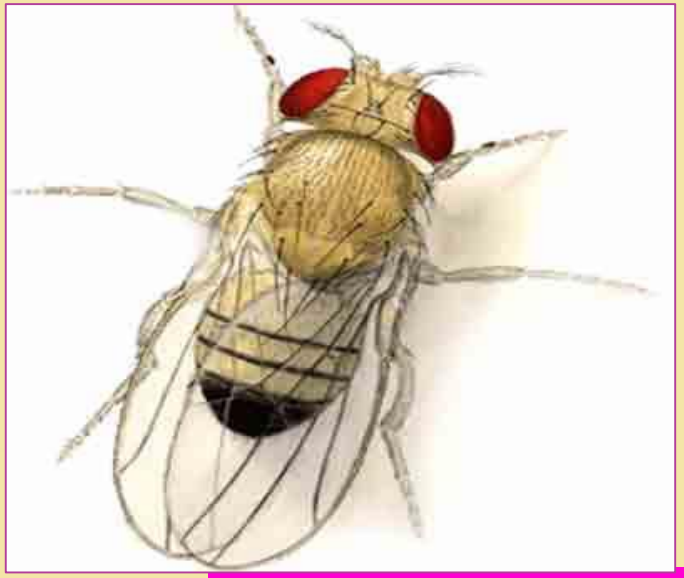


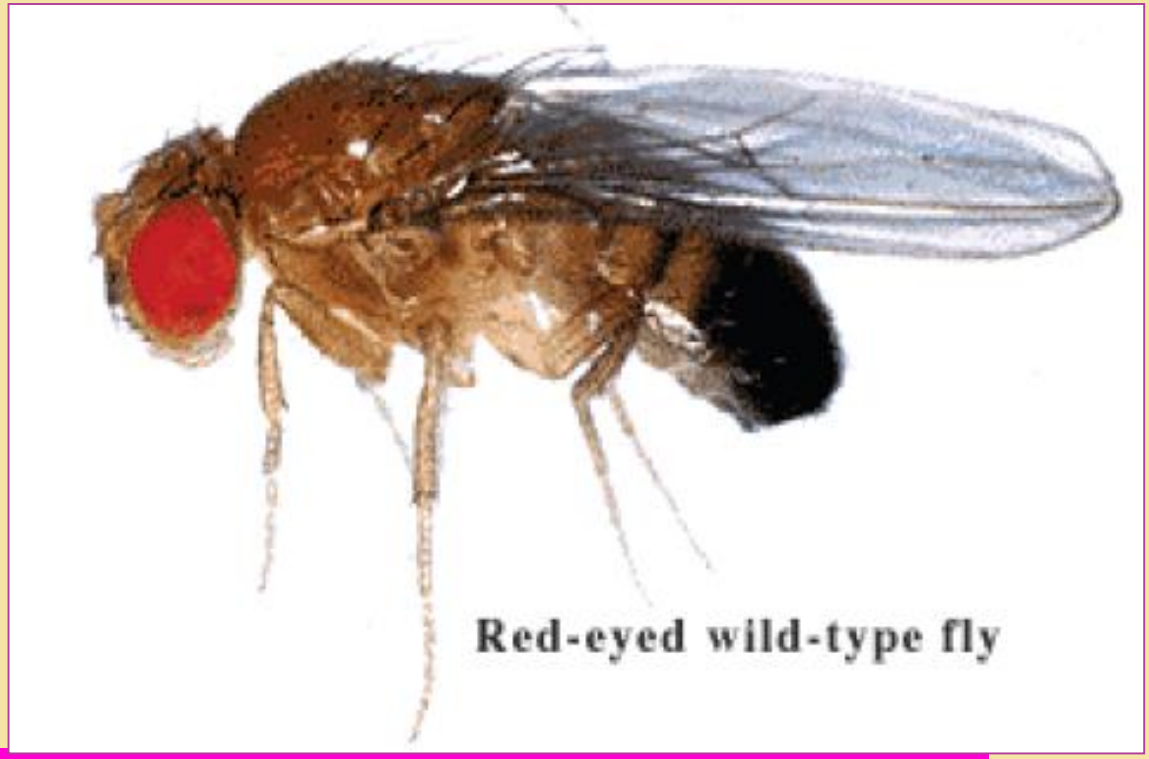
Drosophila melanogaster Life Cycle



Wild types

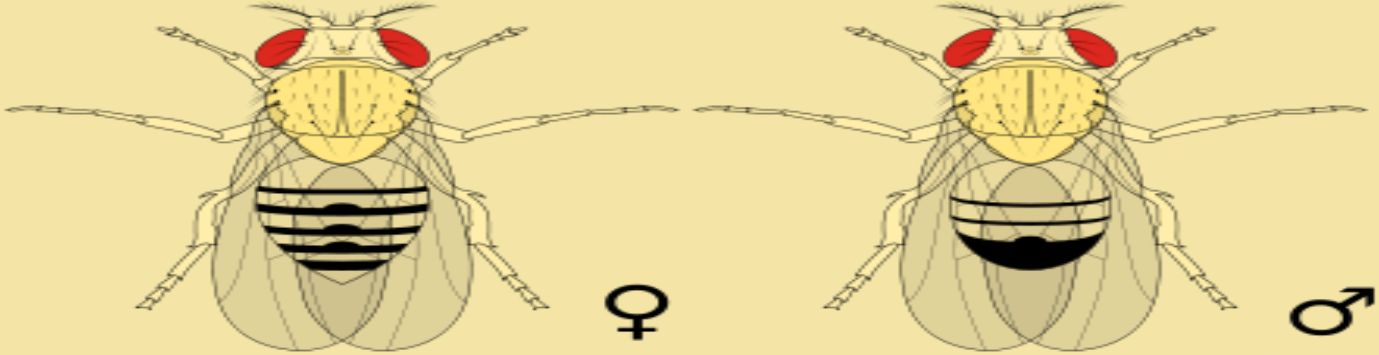
- The body color is gray or light brown
- The wings are long and extend to the back of the abdomen
- The eyes are red





Red-eyed wild-type fly

Sex characteristics of the fly



female	male	adjectives
Larger size	Smoler	Size
pointed (contains an egg machine) There are six black segments	Round Black with two black segments	stern
More full	Less full	Abdomin
	Small lock of hair on the front legs (sexual comb)	

A figure showing the difference in male and female size

A figure showing the structure of male sexual comb.

Female (left) and male (right) *Drosophila*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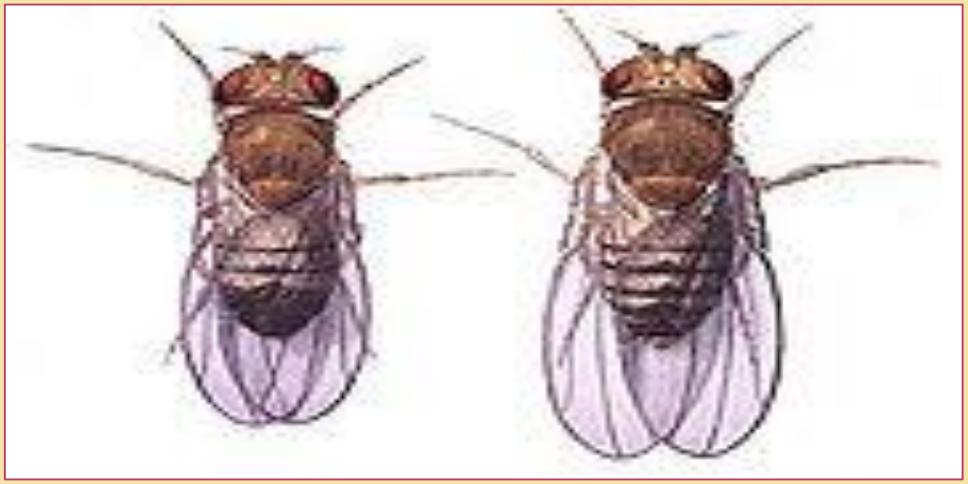

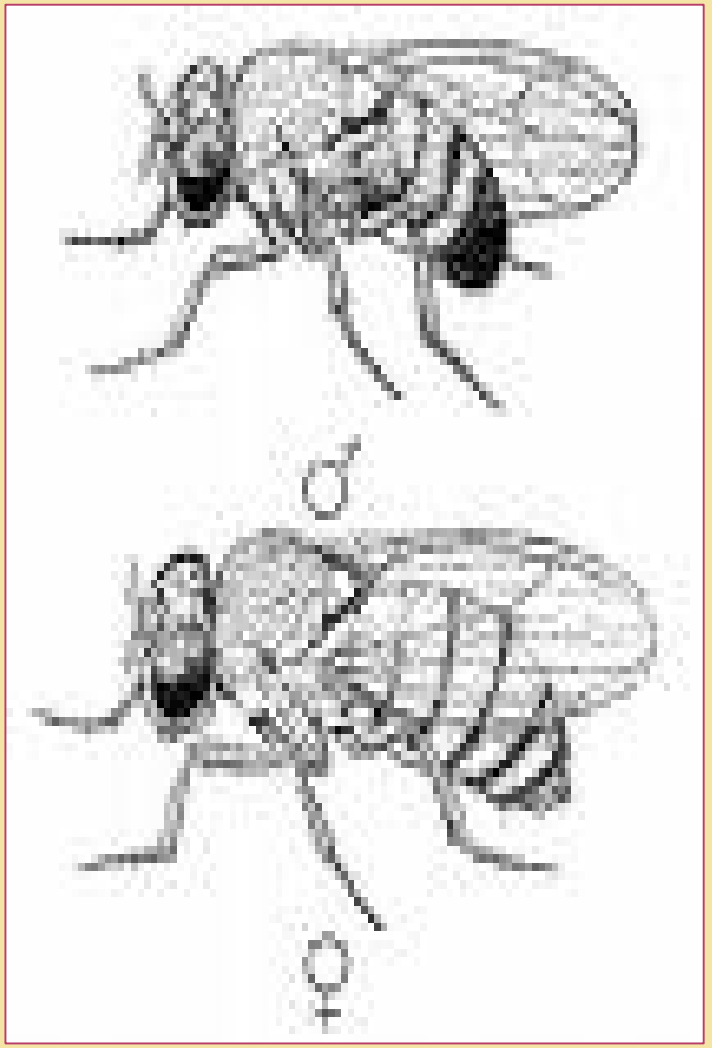
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CULTURING DROSOPHILA

We grow flies in vials with about 2 cm of food on the bottom and a foam or cotton plug in the top. At the beginning of the semester, the food will be made by the lab preparator. The foam plugs are necessary to keep foreign flies out.

* **Fruit Fly Culture Media(Sugar media):** 30 gm flour, 50gm yeast , 100gm sugar, 15 gm agar, 5 ml proprionate acid (for preventing molds from growing), and 1 liter distal water.

Procedure: Mix all ingredients then heat until boiling. Quickly pour mixture into clean culture jars. Cap and let cool to room temperature. This mixture can be stored in the refridgerator with a tightly capped lid until ready for use. When ready to use add fruit flys. Proprionate acid is a mold inhibitor used in bread.

Environments used in insect breeding


منيره الدوسري
Thank You