Classification of *Drosophila*

Kingdom : Animalia

Phylum : Arthropoda

Class: Insecta

Order : Diptera

Family : Drosophilidae

Genus : *Drosophila*

Species : *melanogaster*

Breeding of *Drosophila*

The age of Drosophila is depend on :

1- Type of manipulation. 2- Culture conditions. 3- Race of flies.

- The wild type has long lifespan about (100) days, in order to incorporate *Drosophila* in the laboratory, its necessary to maintain cultures of flies as backup for any events may occurred.
- To breed *Drosophila* you need (Breeding bottles or vials, media and incubators).

- **Breeding bottles and Vials**

- Morgan used glassy milk bottles in his experiment and they were vary in size, large and small ones, the large bottles were used in large populations while the small bottles for small populations, bottles and vials must be sterilized and clean to prevent the outbreak of any pest and disease. “Students can use plastic vials”. Vials size 96*25 mm and the plug may be cotton or rubber.

- **Media**

- The first step in breeding is by adding the food media which may be already prepared and dehydrated or prepared “Cooked” in laboratory.

- **Cooking media consist of:**

- 20g Agar (for make the media hard)
- 100g Dry yeast (flies food)
- 100g Flour
- 100g Sugar
- 1000ml Distal water
- 0.3ml Propionic acid (to prevent fungi outbreak)
- Cooking media could be stored in the refrigerator for several weeks the media must be warmed to room temperature before adding flies.1/5th to 2/5th of vials and bottles should be filled with the cooking media. The media must keep in the room for overnight (24 hours) to cure, vials must be covered with a cloth to prevent females from

laying eggs in them. The next day add yeast (several grains) and plug before adding flies.

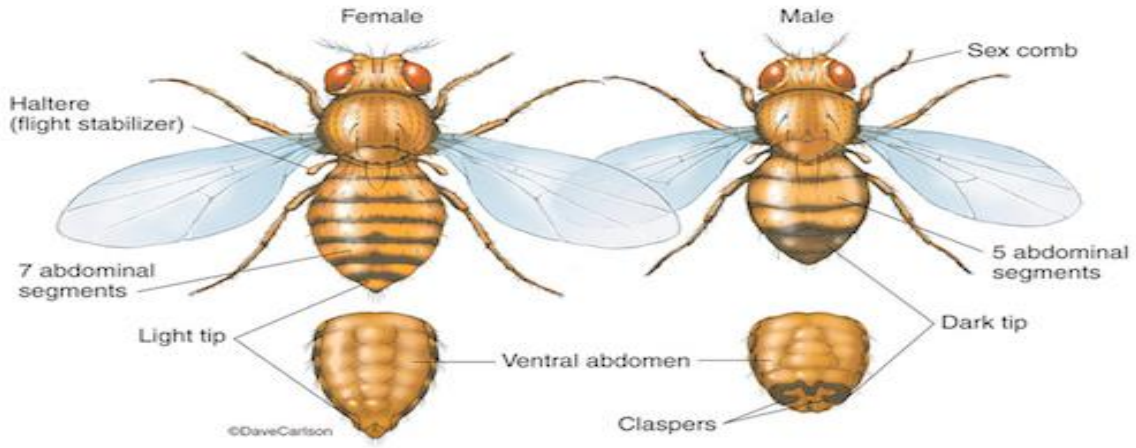
- Agar put in the cold distal water and mixed gently after that the mixture put on the heater, then sugar, yeast and flour with continuous mixing for 5-10 minutes until reach the boiling mixture. The mixture put away until be cool. After that the media fill culture vial and bottle.

Drosophila melanogaster (Wild type)

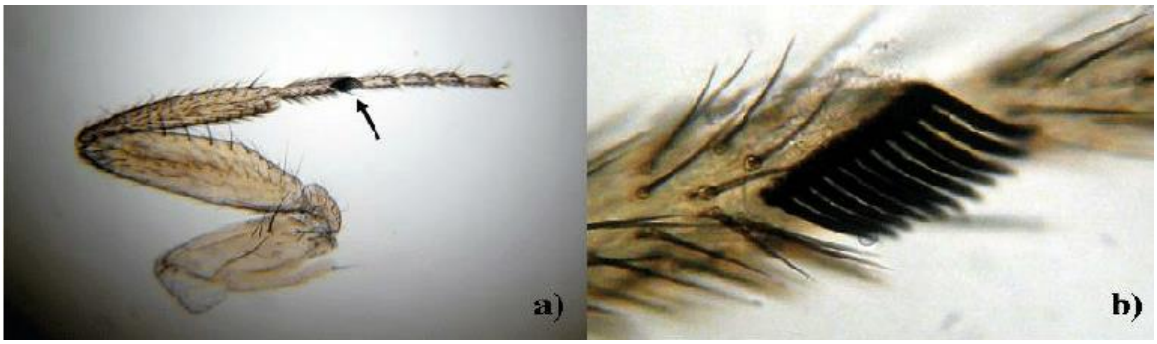
Or what it's called fruits flies have red eye, gray (yellow-brown) body and have transverse black rings across their abdomen. They exhibit dimorphism, females long about 2.5mm while males are smaller.

The differences between males and females of *Drosophila*

Males	Females
smaller than females	Longer than males (2.5mm)
Has rounded abdomen	Has pointed abdomen
"Dorsally" has black-tipped abdomen	Have dark lines on the tip
"Ventrally" the abdomen has dark region at the tip due the presence of claspers	The female lack this region
Have sex combs on the forelegs	Don't have



***Drosophila melanogaster* (Wild type) male and female**



Sex combs of *Drosophila melanogaster* "Males"

Life cycle of *Drosophila melanogaster*

- *D. melanogaster* exhibit complete metamorphism (egg, larvae "worm" pupa, adult).

Life cycle by days:

Day 0 : The females lay eggs which contain pairs of spike helping them to attach the surface.

- **Eggs stage**

Day 1 : eggs hatch.

- **Larvae stage**

Day 2 : first instar (one day)

Day 3: second instar (one day)

Day 5+6 : final instar (two days)

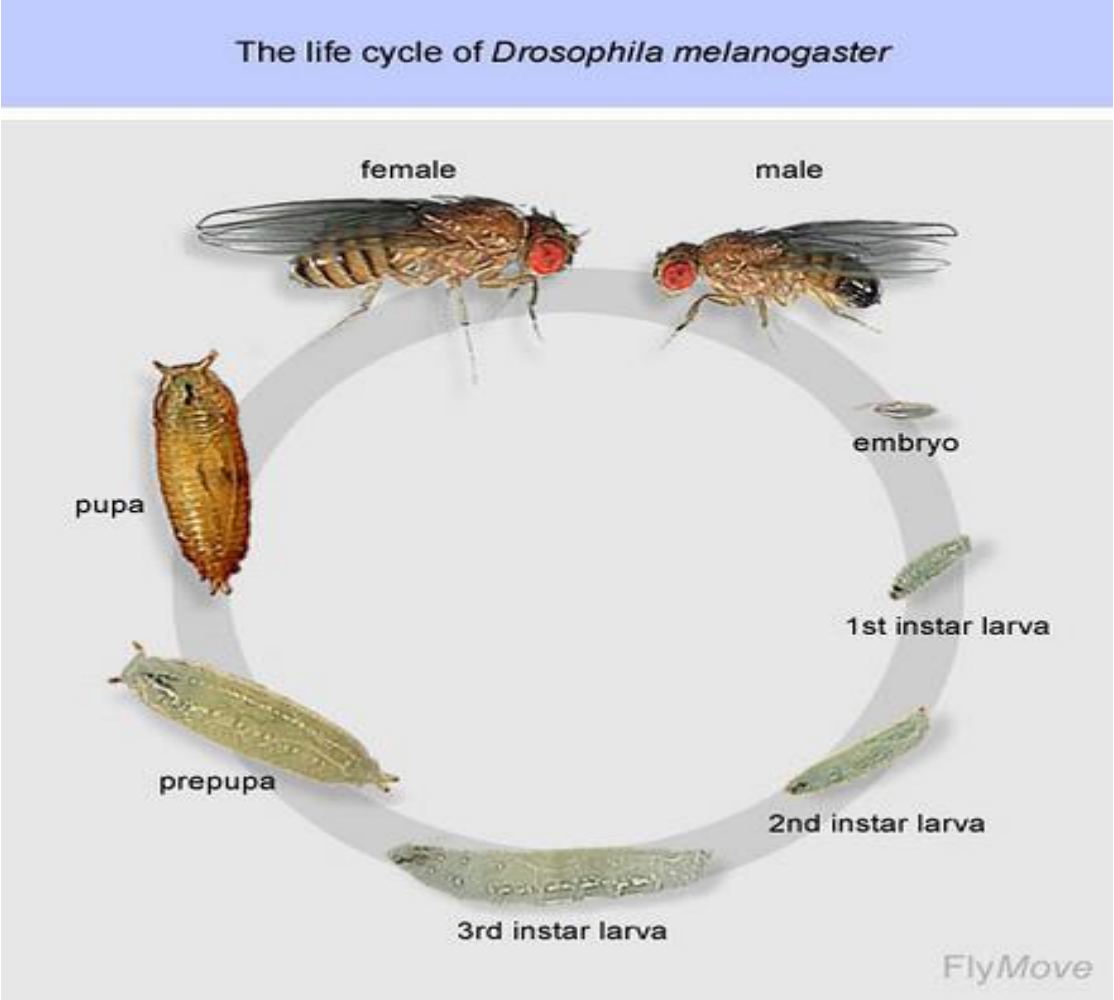
- **Pupal stage**

Day 7 : larvae begin roaming stage (pupa stage) takes five days “120 hours” after laying eggs.

- **Adult stage**

Day 11-12 : **Eclosion** (Adult emerge from pupa). Females become sexually mature after 8-12 hours after eclosion.

- The time of *Drosophila* life cycle is temperature-dependent, the temperature must be (21-23)Cº, any change in the temperature of incubator will effect on the generation time, for example high temperature causes faster generation time while low temperature (18)cº causes slower generation time, after hatching of eggs small larvae will appear in the medium.



Life cycle of *Drosophila melanogaster*