11. To study wing shape and eye colour in *Drosphila*.

Date : / /

Aim: To study the genetic variation of traits in *Drosphila melanogaster*.

Requirements: Glass jar, petri dish, banana pieces, muslin cloth, bell jar, slide, cover slips, graded series of alcohol, xylene, DPX, etc.

Figure :

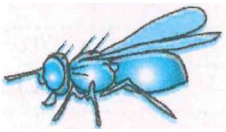
Colour

Wildtype

Ebony $^{-/-}$ (e)

Yellow $^{-/-}$ (y)

Other



Antp $^{+/}$ (Antp)

Eyes

White $^{-/-}$ (W)

Mini white (W^{+})

Bar $^{+/-}$ (B)

Drop $^{+/-}$ (Dr)

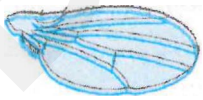
Irregular Facets $^{+/-}$ (if)

wings

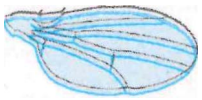
Curly $^{+/-}$ (Cy)

Serrate $^{+/-}$ (Ser)

Vestigial $^{-/-}$ (vg)



Wildtype



Dichaete (D)

Bristles

Humeral $^{+/-}$ (Hu)

Pin $^{+/-}$ (Pin)

Stubble $^{+/-}$ (Sb)

Singed $^{-/-}$ (sn)

Procedue:

I. Preparation of culture beds

1. Peel the ripe banana fruit. Discard the skin and mash the fruit into a soupy pulp.
2. Take a clean sterilized glass jar or petridish and place the banana pulp in it.
3. Add few grains of yeast.
4. Keep a small blotting paper to absorb excess moisture from the pulp and also to provide substratum for pupation of the larvae.
5. Many culture beds can be prepared by the above method for the different varieties of fruit fly.

II. The culturing of *Drosophila* :

6. The pulp in the culture beds attracts the *Drosophila*. Cover the culture beds with a bell jar after the *Drosophila* have reach the pulp. They complete their life cycle within 48 hours.
7. Capture the *Drosophila* and fix it into 70 % alcohol.
8. Process the *Drosophila* flies through 70%, 90% and 100% graded series of ethyl alcohol for 10 minutes each.
9. Place *Drosophila* in Xylene for 5 min. and clear it properly.
10. Mount it on glass slide with DPX and observe under the microscope.

Observation and Result :

	Eye Color	Pattern of Wing	No. of segments in a leg
Culture 1	Red(wild)	Normal	Nine number of segments
Culture 2	Black (mutant)	Vestigial	Less number

Questions

1. Why T.H. Morgan used *Drosophila melanogaster* in his genetic experiments ?

T. H. Morgan used fruit flies for his genetical experiments for the following reasons-
1) Fruit flies have a short life cycle so genetic traits can be studied in many generations in a short span.
2) They reproduce rapidly and produce many offsprings.
3) They have four pairs of polytene chromosomes which are large and can be easily seen under a light microscope.

2. What are the differences between male and female Drosophila?

	Females	Males
Body shape	Pointed abdomen with a "spike" on dorsal surface at rear	Rounded abdomen
Colour	Each abdominal segment carries a narrow dark band	Rearmost abdominal segments almost uniformly dark
Genitalia	Few structures visible	Complex structures visible on ventral surface
Sex combs	None	A short row of thick, closely spaced bristles appearing as a dark mass on the fourth segment of the front legs (often seen best with fly lying on its back)

3. What is linkage ?

The physical association of non-parental gene combinations is called linkage.

4. What kind of eye colour and pattern of wing is present in wild fruit fly?

The wild-type eye color of Drosophila is dull red
Wild type wings have wings that are flat and wide.

5. Is the inheritance of wing type/eye colour in drosophila-multigenic or multiallelic.

the inheritance of wing type/eye colour in drosophila is multigenic

Multiple Choice Questions

1. The mechanism of sex determination in *Drosophila* is ___

a. XX - XO type
b. XX - XY type
c. ZZ - ZW type
d. XX - ZZ type

2. How many different alleles are seen in wing series of *Drosophila*?

a. 3
b. 6
c. 5
d. 4

3. How many pairs of chromosomes are present in somatic cell of *Drosophila*?

a. 7
b. 8
c. 12
d. 4

4. Wing shape in *Drosophila* is an example of _____ ___

a. co-dominance
b. multiple alleles
c. pleiotropy
d. incomplete dominance

5. How many linkage groups do occur in female *Drosophila*?

a. 4
b. 8
c. 2
d. 7

Remark and Signature of Teacher .....