DETECTION OF MUTATION IN *Drosophila*

Detection of mutation depends on their types. Morphological mutations are detected either by change in the phenotype of an individual or by change in the segregation ratio in a cross between normal (with marker) and irradiated individuals. The molecular mutations are detected by a change in the nucleotide, and a biochemical mutation can be detected by alteration in a biochemical reaction. The method of detection of morphological mutants have been developed mainly with *Drosophila.* In *Drosophila*, H. J. Muller worked on useful detection procedures for new mutation by developing various ingenious techniques.
Four methods are in common use for detection of mutations in *Drosophila*. They are: **(1)ClB method, (2)Muller's 5 method, (3)CyLPm method and (4)Attached X-chromosome method.**

Q.What do you mean by sex linked lethal mutation? Q.Define sex linked visible mutation? Q. Make a comparative analyses between sex linked lethal and visible mutation
Mutations caused by genes present on X-chromosome are termed sex-linked mutations, which may be of two types: lethal and visible.
Detection of sex linked lethal over visible mutations are relatively easier for reasons given below—
(i)Sex linked lethal mutations are much more frequent than visible mutations.
(ii)Sex-linked lethal are more drastic than visible mutations.
(iii)Presence or absence of lethal mutations can be easily scored by restricting observations to whether wild-type males appear in the F_2 or not.

Q.What is the basic principle of mutation detection?
Prime needs for detection of a mutation can be documented under the following points:
(i)To design a suitable genetic cross in such a way that a mutant allele will make its presence known at the phenotypic level (either by expressing the **trait** or by altering the **sex-ratio**).
(ii)To use known stocks as **markers** against the stocks in which the mutation is to be searched.

Q.Give a short note on Mutation detection in *Drosphila* by attached X method. Q.What is the principle of Mutation detection in *Drosphila* by attached X method?
(a)PRINCIPLE:
(i)For detection of **sex-linked visible mutation** attached X-chromosomes were used. The attached X- females (XXY) have a special advantage, when these females are crossed to an **irradiated** male, X-chromosome of **irradiated** male goes either to **supermale** or to the sons.
(ii)Attached-X (XXY) female on mating produces father-like sons and mother-like daughters, as sons receive the X-from father and daughters their both Xs from mother. Thus, **a mutagenized male if develops a sex-linked visible mutation will have sons with altered phenotype, based on this principle, the method is followed.**
Conclutory remark:
Since in sons there is a single X-chromosme, any visible induced mutation will immediately express itself and can be easily scored.
(b)DESIGNING OF CROSS:
Attched-X female *Drosophila* were mated to mutagenized male flies to score various progeny classes.

(c)RESULTS AND OBSERVATIONS:
As recorded from survivors progenies
(i)Sons were either with altered phenotype or with parental phenotype.
(ii)Daughters were mother-like.