Ch.2/Doc.2: Transmission of Allelic Genes

- Explain how a hereditary trait can be transmitted to the next generation.

Transmission of alleles in the case of Complete Dominancy

1) The body color gene is autosomal. Consider the crossing of two mice of different true-breeding lines, one coding for black color & the other for gray coat color. The first generation, called F1, is formed of gray mice.

   Explain the above results.

2) A series of crosses are now made between members of the F1 generation producing 51 mice in the F2 generation, 37 gray & 14 black.

   Determine the proportions of the different phenotypes observed in F2 generation.

3) Indicate the genotype for each of the parents & F1 individuals.

4) Make a factorial analysis to verify the results of the crosses done above.

5)

   a. A mouse is gray. Specify its possible genotypes.

   b. A mouse is black. Specify its possible genotypes.

6) A mouse is gray. Identify, through a factorial analysis, the results of a test-cross if the mouse is:

   a. Homozygous.

   b. Heterozygous.

Transmission of alleles in the case of Codominancy

7) If a man of AB blood type marries a woman of o blood type, indicate the genotypic & phenotypic percentages for their possible future offsprings.

8) Specify the relation that exists between A & B blood alleles.

Transmission of alleles in the case of Incomplete Dominancy

9) Pro.1 In snapdragon plants, a cross is performed between 2 true-breeding lines (pure races), one having red flowers & the second having white flowers. All offsprings are pink.

   a. Explain the above results.

   b. Carry out a factorial analysis to verify the obtained results & to predict the results of a self-cross.

Transmission of Lethal Alleles

10) Pro.4

   a. Define a lethal allele.

   b. Explain the results obtained in doc.f/ P.45.

   c. Make the necessary factorial analysis to verify the above results.

11) Pro.5 Identify the monohybrid cross(es) in which the phenotype always reveal the genotype.

12) Pro.6 Establish a comparative summary table for monohybrid crosses.