

QUALITATIVE AND QUANTITATIVE CHARACTERS

The phenotype of any individual can be classified into two types:

1) **Qualitative characters** and 2) **Quantitative characters**

1. Qualitative characters: The characters are governed by one or few major genes with each gene having large and detectable effect on the phenotype. These characters do not show continuous variation since F₂ population can be separated into clear cut, distinct phenotypic classes, less influenced by the environment and cannot be measured easily. Qualitative characters are also known as classical mendelian traits. Eg: 1) Corolla colour – Red white or pink 2) Seed shape – Round and wrinkled; variation is not continuous.

2. Quantitative characters are governed by many genes (polygenes) with each gene having small, undetectable but cumulative effect on the phenotype. These characters show continuous variation since F₂ segregating population cannot be separated into distinct phenotypic classes, highly influenced by the environment. These characters are easily measurable traits and hence these characters are also known as metric traits. The data obtained from such characters is known as quantitative data. This data can be subjected to statistical analysis and the branch of science which deals with such analysis is known as quantitative genetics or biometrical genetics.

Eg: Yield, Plant height

Quantitative (Metric characters) Vs Qualitative (mandelian) characters

	Quantitative (Metric) characters or polygenic inheritance	Qualitative characters or classical mandelian traits or mono/oligogenic inheritance
1.	These characters deals with metric traits or traits of degree Eg: Plant height, seed weight, yield etc.,	These characters deals with traits of kind Eg: seed shape, apperance, corolla colour etc.,
2.	These characters show continuous variation	These characters show discontinuous variation
3.	These characters are controlled by polygenes or several genes, with each individual gene having small, undetectable, but cumulative effect on phenotype (polygenic trait)	These characters are controlled by one or few genes (mono/oligogenic), with each gene having large and detectable effect on phenotype (monogenic trait). No cumulative effect of each gene.
4.	Effect of environment is high on polygenic characters	Effect of environment is low
5.	These characters can be measured easily (metric characters) and statistical analysis of quantitative data is based on mean, variance, standard deviation.	These characters cannot be measure easily and statistical analysis is based on frequencies and ratios.
6.	F ₂ population cannot be segregated into distinct phenotypic classes	F ₂ population can be segregated into distinct phenotypic classes
7.	Dominance effect is not present	Dominance effect exists
8.	Since these characters are affected by environment, they are less stable and have low heritability.	Since these characters are not affected by environment, they are highly stable s stable and have high heritability.

