

MENDEL'S LAW OF INHERITANCE \Rightarrow

Gregor Mendel, conducted hybridisation experiment on garden peas for seven years (1856-1863) & proposed the law of inheritance in living organisms.

He done statistical and mathematical calculation

Mendel's work remained buried for about thirty years.

In 1900 law of segregation was discovered by three workers DeVries, Correns & Tschermak.

Factor (gene) is a unit of inheritance which is passed from one generation to successive generation through gametes & able to express its effect - in haploid, or along with another factor of similar allelic type

Alleles (Mendelian factors) present on the same locus on homologous chromosomes and control the same trait.

Dominant - Alleles which expresses itself in the hybrid as well as homozygotes state, denoted by capital letter.

Recessive factor - An allele which is unable to express its effect in the hybrid or in the presence of alternate allele, denoted by small letter a expresses its effect only in the homozygous state.

5.1 MENDEL'S LAWS OF INHERITANCE

It was during the mid-nineteenth century that headway was made in the understanding of inheritance. Gregor Mendel, conducted hybridisation experiments on garden peas for seven years (1856-1863) and proposed the laws of inheritance in living organisms. During Mendel's investigations into inheritance patterns it was for the first time that statistical analysis and mathematical logic were applied to problems in biology. His experiments had a large sampling size, which gave greater credibility to the data that he collected. Also, the confirmation of his inferences from experiments on successive generations of his test plants, proved that his results pointed to general rules of inheritance rather than being unsubstantiated ideas. Mendel investigated characters in the garden pea plant that were manifested as two opposing traits, e.g., tall or dwarf plants, yellow or green seeds. This allowed him to set up a basic framework of rules governing inheritance, which was expanded on by later scientists to account for all the diverse natural observations and the complexity inherent in them.

Mendel conducted such artificial pollination/cross pollination experiments using several true-breeding pea lines. A true-breeding line is one that, having undergone

continuous self-pollination, shows the stable trait inheritance and expression for several generations. Mendel selected 14 true-breeding pea plant varieties, as pairs which were similar except for one character with contrasting traits. Some of the contrasting traits selected were smooth or wrinkled seeds, yellow or green seeds, inflated (full) or constricted pods, green or yellow pods and tall or dwarf plants (Figure 5.1, Table 5.1).

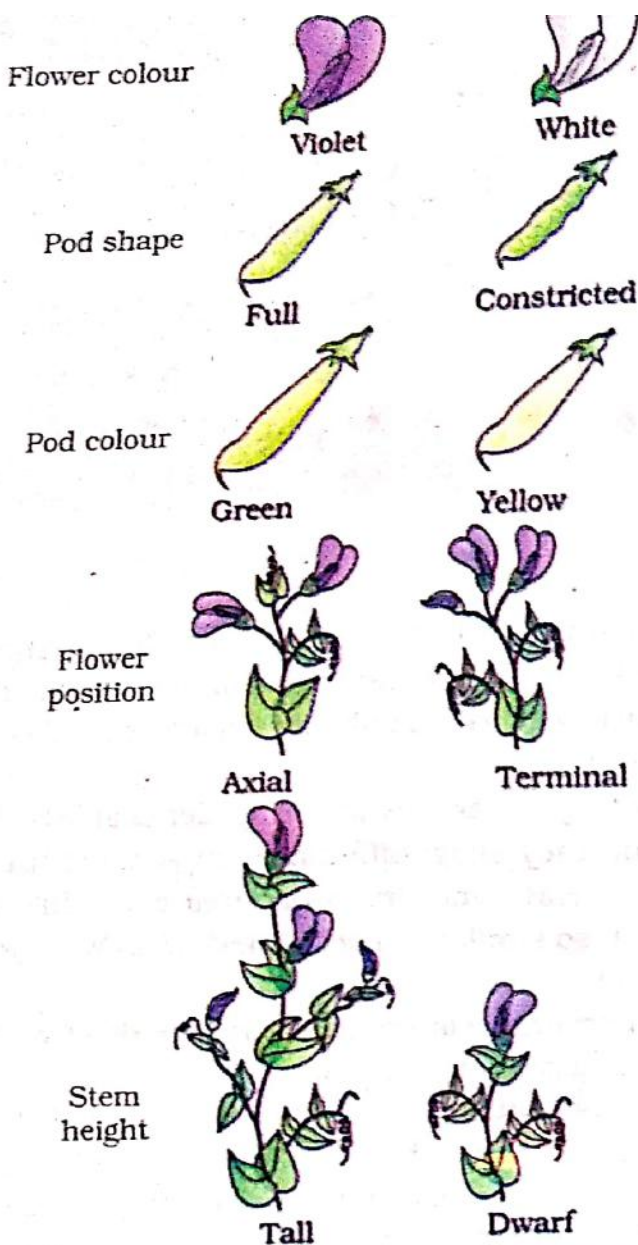


Figure 5.1 Seven pairs of contrasting traits in pea plant studied by Mendel