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Heredity And Evolution

Sexual reproduction

- The mode of reproduction that involves two individuals; one male and one female. They produce sex cells or gametes which fuse to form a new organism.

Genes

- Gene is the functional unit of heredity.
- Every gene controls one or several particular characteristic features in living organisms.

Heredity

The process by which the features of an organism is passed on from one generation to another is called heredity.

- The process is done by genes, which define the characters the organism.

Mendel's work

- Gregor Johann Mendel, known as 'Father of Genetics', was an Austrian Monk who worked on Pea plants to understand the concept of heredity.
- His work laid the foundation of modern genetics.
- He made three basic laws of inheritance - The Law of Dominance, The Law of Segregation and The Law of Independent Assortment.

Dominant traits

The traits that express themselves in an organism in every possible combination and can be seen are called Dominant traits.

- In Mendel's experiment, we see that tall trait in pea plants tends to express more than the short trait.
- Therefore, the tall trait of the plant is said to be dominant over the short trait.

Recessive traits

A trait which is not expressed in presence of a dominant allele is known as recessive.

So, recessive character/trait is present in an organism but cannot be seen if a dominant allele exists.

Monohybrid cross

- When only one character is considered while crossing two organisms, then such a cross is known as monohybrid cross.
- The ratio of characters, arising out of this cross, at F₂ generation is called monohybrid ratio.
- E.g., If tall plant (TT) is crossed with a dwarf plant (tt), we get 3 tall:1 short plant at the end of the F₂ generation.
- So, 3:1 is monohybrid ratio.
- Here, the height of the plant is considered at a time.

Dihybrid cross

- When two characters are considered while crossing two organisms, then such a cross is known as a dihybrid cross.
- The ratio of characters, arising out of this cross, at F₂ generation is called dihybrid ratio.
- E.g., If a plant with round and green pea is crossed with a plant with wrinkled and yellow pea,
- The first generation plants would all have round and green pea.
- On crossing the same for an F₂ generation, we would observe four combinations of characters in the ratio of 9:3:3:1.
- Thus, 9:3:3:1 is the dihybrid ratio.

Inheritance

In Biology, inheritance pertains to the transfer of traits from one generation to another.