

Dihybrid cross

It is a genetic cross which involves individuals differing in two characters. Dihybrid inheritance is the inheritance of two separate genes each with two alleles.

Law of Independent Assortment - When two pairs of traits are combined in a hybrid, segregation of one pair of characters is independent to the other pair of characters. Genes that are located in different chromosomes assort independently during meiosis. Many possible combinations of factors can occur in the gametes.

The crossing of two plants differing in two pairs of contrasting traits is called dihybrid cross. In dihybrid cross, two characters (colour and shape) are considered at a time. Mendel considered the seed shape (round and wrinkled) and cotyledon colour (yellow & green) as the two characters. In seed shape round (**R**) is dominant over wrinkled (**r**) ; in cotyledon colour yellow (**Y**) is dominant over green (**y**).

During gamete formation the paired genes of a character assort out independently of the other pair. During the F1 x F1 fertilization each zygote with an equal probability receives one of the four combinations from each parent.

The resultant gametes thus will be genetically different and they are of the following four types:

- 1) Yellow round (**YR**) - $9/16$
- 2) Yellow wrinkled (**Yr**) - $3/16$
- 3) Green round (**yR**) - $3/16$

4) Green wrinkled (yr) - 1/16

These four types of gametes of F1 dihybrids unite randomly in the process of fertilization and produce sixteen types of individuals in F2 in the ratio of 9:3:3:1 as shown in the figure



