

B.Sc.-III, (Botany Honours)  
Paper - VI, Group 'A'

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## Euploidy

In euploidy, the chromosome number is an exact multiple of the basic or genomic number of the species and these variations are more commonly called polyploidy. When all genomes present in polyploid species are identical, it is known as autopolyploid, and the situation is termed as autopolyploidy. But in case of allopolyploidy, two or more distinct genomes are present. Euploids may have 3 (triploid), 4 (tetraploid), 5 (pentaploid), 6 (hexaploid), 7 (heptaploid), 8 (octaploid) or more genomes making up their somatic chromosome number. In case of autopolyploidy, they are known as autotriploid, autotetraploid, etc., while in case of allopolyploidy, they are known as allotriploid, allotetraploid, etc. Amphidiploid is an allopolyploid that has two copies of each genome present in it, and behaves essentially as a diploid during meiosis.

Autopolyploidy - In autopolyploidy are included triploidy, tetraploidy and higher levels of ploidy. Autopolyploids are produced directly or indirectly through chromosome doubling.

## Applications of Autopolyploidy in Crop Improvement

Autopolyploidy has found some useful applications in crop improvement, including development of commercial varieties in India as well as some other countries.



1. Triploids. Triploids are produced by hybridization between tetraploid and diploid strains. They are generally highly sterile, except in few cases. This feature is useful in the production of seedless watermelons.

In certain species, they may be more vigorous than the normal diploids, e.g. sugarbeets.

2. Tetraploids - Autotetraploids have been produced in a larger number of crop species. Tetraploids may be useful in one of the following ways:

(1) in breeding, (2) improving quality, (3) overcoming self-incompatibility, (4) making distant crosses, and (5) used directly as varieties.

Allopolyploidy - Allopolyploids have genomes from two or more species. Several of our crops are allopolyploids. A large number of new allopolyploids have been produced mainly to create new useful species. Some success has been obtained as Triticale, and some other allopolyploids as new crop species.

Application of Allopolyploidy in crop improvement

Allopolyploidy has three major applications in crop improvement: (1) as bridging species, (2) production of new crops, and (3) widening of genetic base of existing allopolyploid crops.

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