

# Cytotaxonomy

## CYTOTAXONOMY

Cytotaxonomy is a biology dealing with the classification and relationships of organisms using detail studies of chromosomes. The properties (number, structure, and behaviour) of chromosomes are of great value in taxonomy, because the chromosome number being the most widely used and quoted character in biology. Chromosome numbers are mainly determined at mitosis and quoted as the diploid number ( $2n$ ). Another important taxonomic character is the position of the centromere. Meiotic behaviour sometimes shows the heterozygosity of inversions. Cytological data is significant than other taxonomic evidence.

## CYTOTAXONOMICAL APPROACH IN CLASSIFICATION

### 1. THE GENETIC COMPLIMENT

DNA is the essential materials of heredity (It comprises the genome and plasma). It is believed that the heterochromatic segments are associated with differences in the metaphase thickness. Even now, it is unknown that a given amount of DNA and protein is stimulated at mitosis to become distributed into a particular member of chromosomes.

### 2. DNA Hybridization:

The hybridization between single stranded DNA components from different origins can occurs provides a psychochemical means for assuming genetic relatedness among the species. It is known that DNA is extracted from organisms and made to hybridise in vitro with the cell lines of other organisms. The DNA matching

techniques is much easier for solving complex taxonomic problems. The taxonomy implications of those have been studied by Hoyer et.al. 1960 "The Incomplete fossil".

### 3. Karyological Studies:

Chromosomal cytology has been more extensively used by plant taxonomists rather than animal taxonomists. The Karyotype characterised by chromosome numbers, size and morphology, is a definite and constant character of each individual species. The number shape banding of chromosomal can be determined by using various dissecting and staining techniques chromosomal taxonomy can be quite useful both in determining the phylogentic relationships of the taxa as well as in the segregation of sibling cryptic species.

### SIGNIFICANCE OF CYTOTAXONOMY

The role of cytotaxonomy is very important in taxonomic studies. Cytotaxonomy is more significant over physiological taxonomy because this process is dealing with the comparative study of chromosome and with this method minute variation among the individuals can be detected. DNA is present in the every chromosome and the variations in each DNA are responsible for the variation among the individuals, species, genus and everything. When the differences in physiological variation are too less among the individuals of same species and other higher taxa.

Cytotaxonomy is a part of taxonomic biology that deals with the classification of organisms. Cytotaxonomy classify these organisms based on their function and cellular (DNA) structure.