

obtained.

In one experiment, two viruses used were tobacco mosaic virus (TMV) and Holmes rib-grass virus (HRV). Reciprocal hybrids using RNA of one strain and protein of the other strain is obtained. It was found that when these hybrids were used for infection, the progeny had proteins which corresponded to virus from which RNA infecting virus particles was derived.

DNA (Deoxyribonucleic Acid)

Occurrence: DNA is found in the cells of all living organism except plant virus. In bacteriophages and virus there single molecule of DNA found, which remain coiled and is enclosed in the protein coat. In bacteria, mitochondria and plastid of eukaryotic cells DNA is circular and lies in cytoplasm. In the nuclei of eukaryotic cells

DNA occurs in the form spirally coiled. The no. of DNA molecule is equivalent to the no. of chromosome per cell.

Chemical Composition :

The chemical analysis has indicated that DNA is composed of three different types of compounds :

1. Sugar molecule represented by a pentose sugar, the deoxyribose or 2'-deoxyribose.

2. Phosphoric Acid.

3. Nitrogenous bases: There are nitrogen containing organic ring compounds. These are of the four

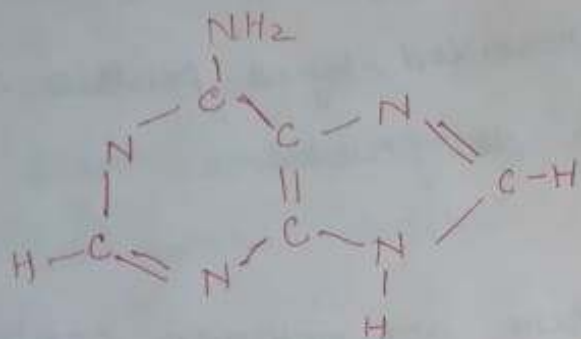
- types :
- i) Adenine represented by - A
 - ii) Thymine represented by - T
 - iii) Cytosine represented by - C
 - iv) Guanine represented by - G

These four nitrogenous bases separated into two categories —

1. Purines : These are two ringed nitrogenous compound. Each molecule dicyclic, formed of nine atoms. There is one pyrimidine ring

of six atoms and an imidazole ring of five atoms are numbered anticlockwise in pyrimidine ring but clockwise in imidazole ring. The two rings share carbon atoms present on 4th and 5th position. The

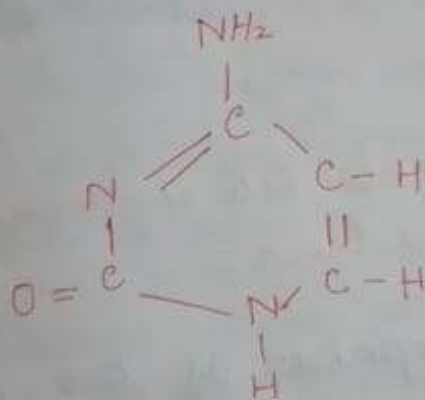
Nitrogen atoms in purine ring are four in no. present at 1st, 3rd, 7th and 9th position.



Adenine

2. Pyrimidine: These are formed of one ring only. The ring is hexagonal and heterocyclic. It is formed of four carbon and two nitrogen for atoms. These atoms in the ring are numbered clockwise. Nitrogen atoms are present at first and third position occupied by carbon atoms. Such a ring called pyrimidine

being Pyrimidine nitrogenous bases found in DNA are cytosine and thymine. But in RNA they are cytosine and uracil. In all the three nitrogenous bases carbon atom present in second position has an oxygen atom attached with double bond. The three pyrimidine nitrogenous bases differ in functional groups present on C-5 carbon atom and presence of C=O or C-NH₂ groups at C-4 carbon.



Cytosine (Pyrimidine)

Chargaff's Base Ratio:

Chemical analysis of DNA further reveals three fundamental features described by Chargaff and called Chargaff base ratio.

1. Regardless of the source, the purine and pyrimidine component occur equal amount of in DNA molecule.

2. The amount of Adenine (A) is equivalent to the amount of thymine (T) and cytosine (C) is equivalent to guanine (G).

3. The base ratio $A = T / G = C$ may vary in the DNA of different groups of animals but is constant for a particular species.

Salient features of double helical model of DNA by Watson and Crick:

- The double helix comprises of two polynucleotide chains.
- The two polynucleotide chains are