

(D) Significance of *Neurospora*

Neurospora has been widely used for various biochemical and genetic studies by scientists as it is

- (i) quickly reproducing, haploid in nature.
- (ii) fast growing.
- (iii) easy to culture.
- (iv) can survive in minimal medium.

Due to the above parameters *Neurospora crassa* (especially) dominated the field of biochemical and genetic research fields as a model organism prior to *E. coli* and yeast. Several land marking works were done with the use of this organism as an experimental material that opened the facts for other eukaryotes.

The first historical report on *N. crassa* dates back to 1843. B. Dodge first worked on the basic genetics of this organism and later with C. Lindergren developed the genetics of *Neurospora* in T.H. Morgans laboratory in 1930s.

N. crassa became very famous for Beadle and Tatam put forth their 'one gene-one enzyme' hypothesis on the study of biochemical mutation in this organism. Since then many works have been done with this. M. Mitchel reported the first gene conversion in the species.

In 1953, first maternally transmitted non-Mendelian mutants were reported which was later shown to be due to mutation in mitochondrial DNA. The species was used conveniently for the study of mitochondrial functions and biogenesis. The first sequencing of mitochondrial DNA was done with this fungus. The species was also used to study the mechanism of protein import into mitochondria.

Other areas of biological research that was done with it include recombination mechanism, DNA repair, differentiation and morphogenesis, DNA methylation and silencing etc. The mechanism of genome defense was studied first in this organism. The repeat-induced point (RIP) mutation described so far only in fungi, represents a fascinating genome defense strategy with evolutionary consequences for *Neurospora*. Thus in many way *Neurospora* has contributed to understand several aspects of biochemical and genetic functionings. It is therefore regarded as the *Drosophila* of plant kingdom.