YEAST (
Saccharomyces)

Classification :-

Saccharomyces is commonly known as
Yeast. It belongs to the Division : Eumycota
Sub- Division :
Ascomycotina Class :
Hemiascomycetes Order :
Endomycetales

Order Endomycetales (Saccharomycetales)includes about 69 genera and295 species.Members are yeast-like unicellular or often mycelial) . Sexual reproduction involves fusion of two vegetative cells, two gametangia or two ascospores. The zygote, derived from such a sexual fusion , is ultimately transformed into an ascus. Martin (1961)recognized four families of this order.

1. Ascoideaceae
2. Endomycetaceae
3. Spermophthoraceae
4. Saccharomycetaceae

Lifc cycle : Guilliermond (1940) recognized three different patterns of life cyclesin Yeast as describe below.

Haplobiontic life cycle :- This type of life cycle is found in Schizosaccharomyces octosporus and some other yeasts. In these yeasts the vegetaive stage is predominantly haploid and the diploid stage is very short. The diploid stage is represented by the zygote cell only which undergoes meiosis immediately after nuclear fusion.

Here each somatic cell acts as a potential gametangium. During sexual union two cells fuse (plasmogamy) and this is followed by the fusion of the two nuclei (karyogamy).
The fusion or zygote nucleus divides thrice of which the first division is meiotic one. Now the zygote cell becomes ascus containing eight ascospores. After their liberation from the ascus the ascospores behave as vegetative cells.

Diplobiontic life cycle : This type of life cycle is found in Saccharomyces ludwigii . In this case the diploid phase is long and the haploid phase is very short . The vegetative cells are diploid. They reproduce asexually by budding .

In this case , the ascus produces 4 ascospores usually 2 at each pole. The sexual reproduction occurs between the two ascospores either belonging to same pole, opposite poles or even 2 different asci . The two ascospores copulate within the ascus. The plasmogamy and karyogamy results in the formation of diploid cell . This cell germinates within the ascus and produces a germ tube which pushes through the wall of ascus. It act as sprout mycelium from which diploid yeast cells are formed by successive budding . Most of the life cycle is passed in this stage . Each one of these cells may behave as ascus, divideds b meiosis and produces 4 ascospores. Again fusion occurs in ascospores .
Thus , a very short haploid phase is representd by ascospores.

Haplo-diplobiontic type: This type of life cycle occurs in Saccharomyces cerevisiae. Here both the haploid and diploid phases are of long duration.

The sexual fusion occurs between the two haploid vegetative cells which results in the formation of a diploid cell. It multiplies by budding and produces a large number of diploid vegetative cells. At a certain stage of life cycle the diploid cell starts behaving as ascus . The diploid nucleus divides by meiosi

resulting in the formation of 4 haploid ascospores. These liberate from asci, multiply by budding and behave as somatic cells. Thus the haploid as well as the diploid phases are equally important in the life cycle . The haploid vegetative cells ae slightly smaller than the diploid vegetative cells.

-Sonjira Hazarika