BIOLOGY

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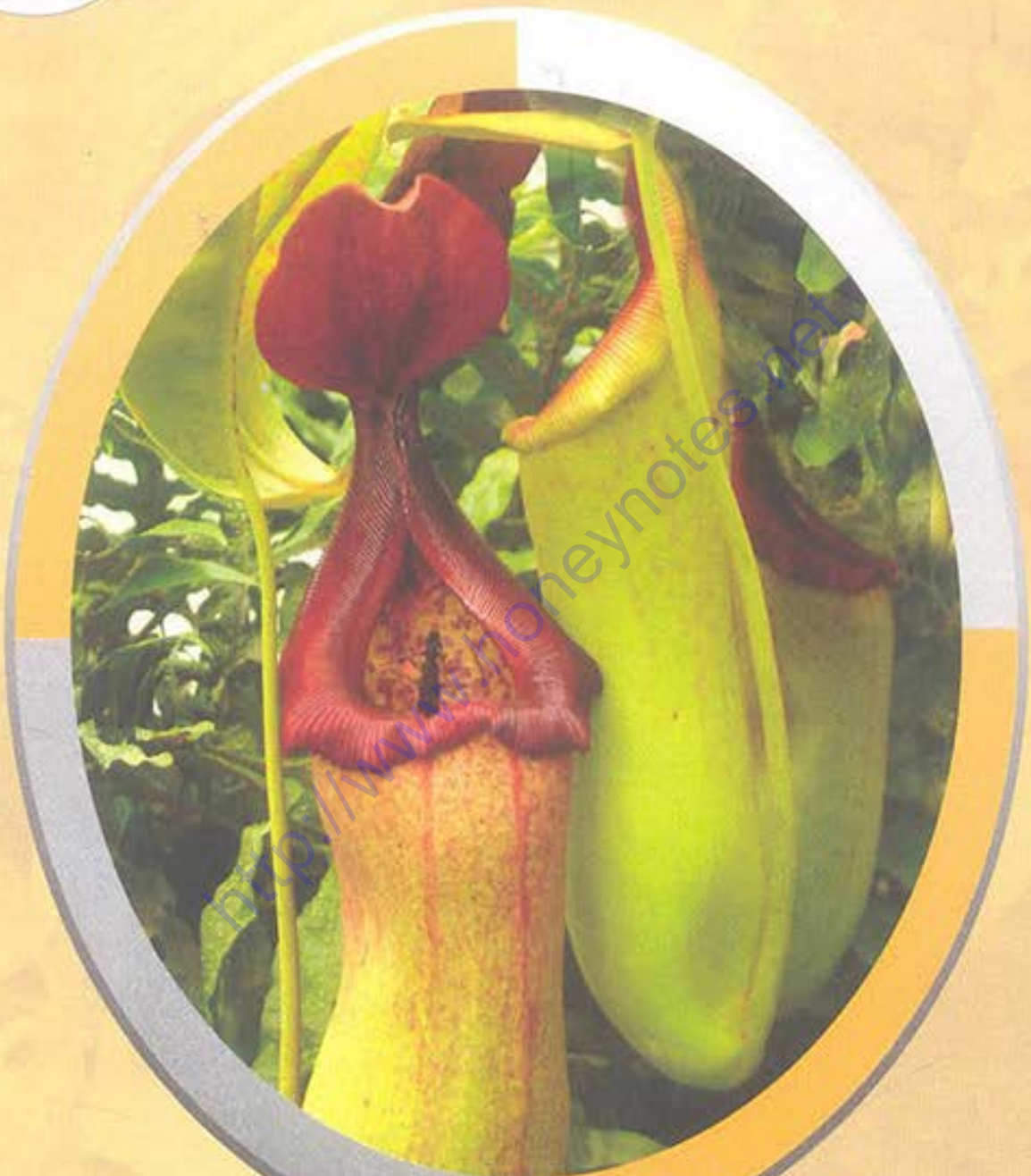

Kingdom Fungi
CHAPTER – 8

KINGDOM FUNGI

"Fungi are a group of unicellular to multicellular, thalloid, heterotrophic, eukaryotic living organisms having a body called MYCELLIUM, made up of HYPHAE which are non-chlorophyllous & have cell wall (made up of chitin). Reproduction is usually ASEXUAL by means of spores".

FUNGI ARE NEITHER COMPLETELY PLANTS NOR ANIMALS

Previously fungi were regarded as plants as they resemble the plants in many characteristics. But in addition fungi have many qualities just like the animals. So they are regarded in the midway between plants and animals.

PLANT LIKE CHARACTERISTICS OF FUNGI

Fungi resemble the plants in

- Having Cell Wall
- Lacking Centrioles
- Being non-motile

ANIMAL LIKE CHARACTERISTICS OF FUNGI

But Fungi also resemble with animals as they are

- Heterotrophic
- Lack cellulose in their cell wall
- Presence of chitin

It means that

Fungi are neither completely plants nor animals.

CONFIRMATION

Detail studies also confirm that Fungi are different from all other organisms.

NUCLEAR MITOSIS

They have a characteristic mitosis called Nuclear-mitosis, during which nuclear membrane does not break & spindle is formed with in the nucleus.

SOME REPRESENTATIVES OF KINGDOM FUNGI

Some imp. Examples are as follows:-

- YEAST
- MUSHROOMS
- PENICILLIUM
- MOLD
- MUCOR
- RHIZOPUS

STRUCTURE OF BODY OF FUNGUS

MYCELIUM

The complete multicellular body of fungus is called MYCELIUM, which is composed of white fluffy mass of branched hyphae.

HYPHAE

A few of true fungi are unicellular (such as yeast) but most have multicellular body (mycelium) consisting of long, slender, branched, tubular, thread like filaments called as Hyphae which spread extensively over the surface of substrate.

HYPHAE

TYPES OF HYPHAE

Hyphae can be divided in to two types:

1. Septate or Multicellular Hyphae
2. Non-septate or multinuclear or coenocytic hyphae.

1.SEPTATE HYPHAE

DEFINITION

"Those hyphae which are separated by cross-walls called "septa" into individual cells containing one or more nuclei , are called "Septate Hyphae"

EXAMPLE: Mushrooms

2. NON-SEPTATE HYPHAE

DEFINITION

Those hyphae, which lack septa & are not divided into individual cells, instead these are in the form of long, multinucleated large cells are called Non-septate or Coenocytic Hyphae.

EXAMPLE Mucor & Rhizopus

CELL WALL OF HYPHAE

CHITIN is the chief component present in the cell wall of most fungi, Because it is more resistant to decay than are the Cellulose & lignin which make up plant cell wall.

CYTOPLASM OF HYPHAE

In septate Hyphae —– Cytoplasm flows through the pores of septa from cell to cell, carrying the materials to growing tips & enabling the hyphae to grow rapidly, under favorable conditions. In non-septate hyphae —— cytoplasm moves effectively, distributing the materials throughout.

NUCLEI OF HYPHAE

All fungal nuclei are HAPLOID except for transient diploid zygote that forms during sexual reproduction.

MAIN FUNCTION OF HYPHAE

Extensive spreading system of Hyphae provides enormous surface area for absorption.

NUTRITION IN FUNGI

ABSORPTIVE HETEROTROPHS

All fungi lack chlorophyll & are heterotrophs (obtain carbon & energy from organic matter, They obtain their food by direct absorption from immediate environment & are thus "ABSORPTIVE HETEROTROPHS".

DIFFERENT MODES OF HETEROTROPHIC NUTRITION IN FUNGI

Being Heterotrophic, fungi can exist as

1- Saprotrophs or saprobes (Decomposers)
2- Parasites
3- Predators
4- Mutualists

1. SAPROBIC OR SAPROTROPHIC FUNGI (DECOMPOSERS)

Saprobic fungi along with bacteria, are the major decomposers of biosphere, contributing to the recycling of the elements (C,N,P,O,H & etc) used by living things.

DEFINITION

"Those fungi which obtain their food (energy, carbon & nitrogen), directly by digesting the dead organic matter are called "SAPROBIC FUNGI" OR "DECOMPOSERS"

MECHANISM OF ABSORBING FOOD (DEVELOPMENT OF RHIZOIDS)

FOOD SPOILAGE

Saprophytic fungi cause tremendous amounts of spoilage of food stuff. 15-20% of worlds fruit is lost each year due to fungal attack.

SPOILAGE OF WOOD & LEATHER ARTICLES

Many fungi spoil leather goods, woods, wool, books, timber, cotton & etc. WOOD-ROTTING FUNGI destroy not only living trees but also structural timber. BRACKET/SHELF FUNGI cause lot of damage to store cut lumber as well as stands of timber of living trees.

TOXINS

Many fungi are poisonous . AMANITA VERNA is a mushroom, which produces deadly poisonous substance known as AMANITIN, which causes serious problems in respiratory system & blood circulatory system.

FOOD POISONING

Some fungi during decomposing food release certain poisonous substances collectively known as MYCOTOXINS. Mycotoxins are the major source of food poisoning.

DISEASES

Fungi cause a number of diseases in plants as well as in human beings.

PLANT DISEASES CAUSED BY FUNGI

Fungi destroy many agricultural crops, fruits, ornamentals & other kinds of plants because they produce several enzymes that can breakdown cellulose, Lignin and even cutin. Following are some of the serious plant disease caused by Fungi.

RUST & SMUT DISEASES

Rust & smut diseases are serious diseases of WHEAT, RICE, CORN &other cerial crops. They cause extensive damage.

POTATO BLIGHT

A serious disease of potato caused by a fungus known as PHYTOPTHORA INFESTANS. Other plant disease are.

- Powdery mildews (on grapes, rose, wheat & etc).
- Ergot of rye
- Red rot of sugar cane
- Potato will
- Cotton root rot
- Apple scab
- Brown rot of peaches, plums, apricots & cherries.

ANIMAL DISEASES CAUSED BY FUNGI

Following are some of the fungal diseases in man.

SKIN DISEASES

RING WORM & ATHELETE'S FOOT are superficial fungal infection caused by certain Fungi Inperfecti

ORAL THRUSH

CANIDIA ALBICANS, a yeast causes oral & Vaginal thrush.

ASPERGILLOSIS

Aspergillosis is the disease of ear & lungs caused by ASPERGILLUS. It occurs only in person with defective immune system such as AIDS & cause death.

CANCER

Some strains of ASPERGILLUS FLAVUS produce one of the most carcinogenic (cancer causing) mycotoxins called AFLATOXINS.

ERGOTISM

Ergotism is caused by eating bread made from PUROLE ERGOT- Contaminated flour. The poisonous material in the ergot causes nervous spasm, convulsions, psychotic delusion & even gangrene.

HISTOPLASMOSIS

Histoplasmosis is a serious disease of lungs caused by inhaling spores of a fungus, which is common in soil contaminated with bird's feces.