Subdivision: Zygomycotina (Mucorales)

General characters of Zygomycotina

Majority of them are saprobic some are coprophilous some are weak parasites attacking plants. It produces well-developed, branched coenocytic mycelium. Cell wall is composed of chitin –chitosan. Asexual spores are non-motile and are called sporangiospores. Sexual spores are zygospores.

Key to the classes of Zygomycotina

Class: Zygomycetes

Saprobic or, if parasitic or predaceous, mycelium immersed in hot tissues

Order: Mucorale*s*

Asexual reproduction is by means of non -motile, but sometimes appendaged, spores or by sporangioles or conidia. The sporangiospores are formed in sporangia or merosporangia.

Order: Mucorales

Family	Genera
1. Mucoraceae	*Mucor, Rhizopus, Phycomyces, Absidia, Zygorhynchus, Syzgites, Rhizomucor*
2. Choanephoraceae	*Choanephora, Blakeslea*
3. Endogonaceae	*Endogone*

Fruit rot of jack caused by *Rhizopus artocarpii, R. nigricans*

It is a soft rot; rotting and decaying of fruits or tubers.

Systematic position

Subkingdom: Mycota

Division: Eumycota

Sub-division: Zygomycotina

Class: Zygomycetes

Order: Mucorales

Family: Mucoraceae

Genus: *Rhizopus*

Species: *R. artocarpi*

Symptoms

It causes soft rot of young fruits and male inflorescens. A large number of the infected fruits fall off early. In the first stage of attack the fungus appears as a greyish growth with abundant mycelia, which gradually becomes denser forming a black growth.

Pathogen

Mycelium is non-septate, brown coloured, profusely branched; aerial hyphae bends at certain points and produce repeatedly branched root - like structure called rhizoids (holdfast) for anchorage on substratum. The hypha in between two groups or rhizoids is called stolon. Sporangiophores are short, stiff, brown, unbranched, erect, arise in groups from stolons, almost opposite to rhizoids, which bear a terminal sporangium; Sporangia are spherical, dark brown or black and contains sporangiospores; Sporangiospores are round, single celled, non-motile, brown individually but black in mass; Zygospore are thick walled black and warty; two layered (outer warty exine and inner intine).

Disease cycle

In the asexual stage, the sporangiospores are produced within the sporangia. The spherical sporangia are separated from the sporangiop40re by a septum which later bulges and projects into the former as a dome-shaped structure called columella. The spherical structure including the columella is called the sporangium. The protoplasm cleaves into numerous multinucleate segments; each of which secretes a wall and becomes a spore called the sporangiospore. When the sporangial wall dissolves on maturity, the spores are released. The aplanospore germinate by forming germ tube and develops into a fluffy well branched white aerial mycelium.

Sexual reproduction occurs through fusion of morphologically similar gametangia designated as plus (+) and minus (-) (gametangial copulation) and subsequent production of a thick walled zygospore. It is heterothallic species and sexual reproduction is effected only when physiologically different strains are brought together. Two hyphal branches lie parallel to each other producing a lateral tubular outgrowth called as progametangium. The tips of the pro gametangia swell and meet each other. A septum is formed in each pro gametangium dividing it into two, the terminal portion becoming the gametangium and the other portion becoming the suspensor.

At the point of contact the walls between the gametangia are dissolved and a single fusion cell results. Plasmogamy occurs in the fusion cell which develops as a zygospore. Zygospore after a resting period of about nine months germinate, produce germ tube which functions as sporangiophore and develops a germ sporangium at its tip. The sporangium is of usual columella type. The germ sporangia contain all plus (+) or all minus (-) spore or mixture of both. These spores called germ spores or microspores. They germinates and form fresh mycelium.