

Subject-Botany
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DIVERSITY OF VIRUS,BACTERIA AND FUNGI

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TOPIC-FUSARIUM (WILT OF ARHAR) (FUNGI)

Kingdom- Mycota

Division- Eumycota

Sub- division- Deuteromycota

Class- Hyphomycetes

Order- Moniliales

Familii- Tuberculariaceae

Genus- Fusarium

Host: Cajanus Cajan

Pathogen: Fusarium oxysporum f.udum

HABIT AND HABITAT:

fusarium is represented by large no. of species, which occur both in temperate and region of the world. Majority of the species are saprophytic, some are mild facultative parasite while some species are parasitic and cause serious diseases like wilt or rot of economically important plant.

Symptoms of Wilt Disease:

The susceptible plants are attacked when young about five to six weeks old. The symptoms are variable. Typically the first symptom is the premature yellowing of the leaves. The next symptom is the wilting or withering of the leaves of the diseased plants. The plant is in a blighted condition.

The leaves appear to be affected progressively from the bottom towards the top. Sudden wilting is rare. Finally the entire plant completely dries up. In severe cases of the infection more than half the plants in the field may fall victim to this disease.

The wilting is brought about by the plugging of the vascular tissue of the stem and roots of the host plant by dense masses of mycelial hyphae. The free flow of water to the leaves is thus interfered with.

This results in drooping and wilting of the leaves of the host plants. In addition the fungal hyphae produce toxic substances which kill the plant cells concerned in the ascent of sap. In cases where plugging of the vascular tissue of the host takes place on one side only, the wilting is partial.



Fig. 1. *Fusarium*. Wilt of *Cajanus cajan* (arhar)

Causal Organism

The causal organism is *Fusarium oxysporum*, f. *udum* Butler.

Vegetative Structure:

Mycelium is branched, septate, hyaline or coloured. The hyphae are Inter- or intracellular and uninucleate to multinucleate.

Disease Cycle /Reproduction (Fig.):

Asexual reproduction (Fig.-22.20) takes place by the formation of three kinds of spores, microconidia, macroconidia and chlamydoconidia.

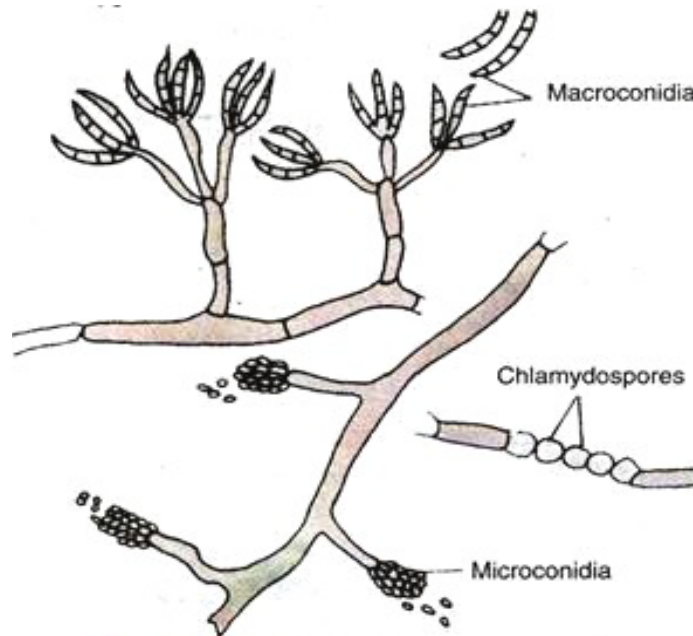


Fig. 22.20. *Fusarium*. Asexual Reproduction.

- (i) The microconidia (Fig.A) are generally tiny structures produced in large numbers from the tips of conidiophores which are indistinguishable from the vegetative hyphae. The spores may be rounded, curved or elliptical and are formed within the tissues of the host. Usually the microconidia are unicellular, sometimes with one or two septa. In cultures they are held together in a ball or false head.
- (ii) Macroconidia (Fig. B) are long, sickle-shaped or crescent-shaped spores. They are septate (with 3-4 septa) and have pointed tapering ends. The macroconidia are produced at the tips of short conidiophores which arise from the upper surface of cushion- shaped stromatic mass of hyphae.

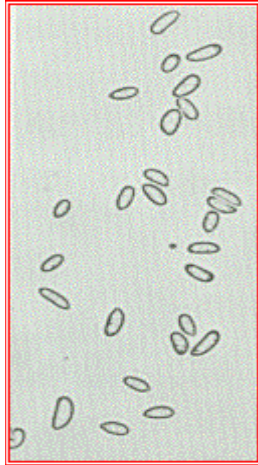


Fig –A Microconidia



Fig- B Macroconidia

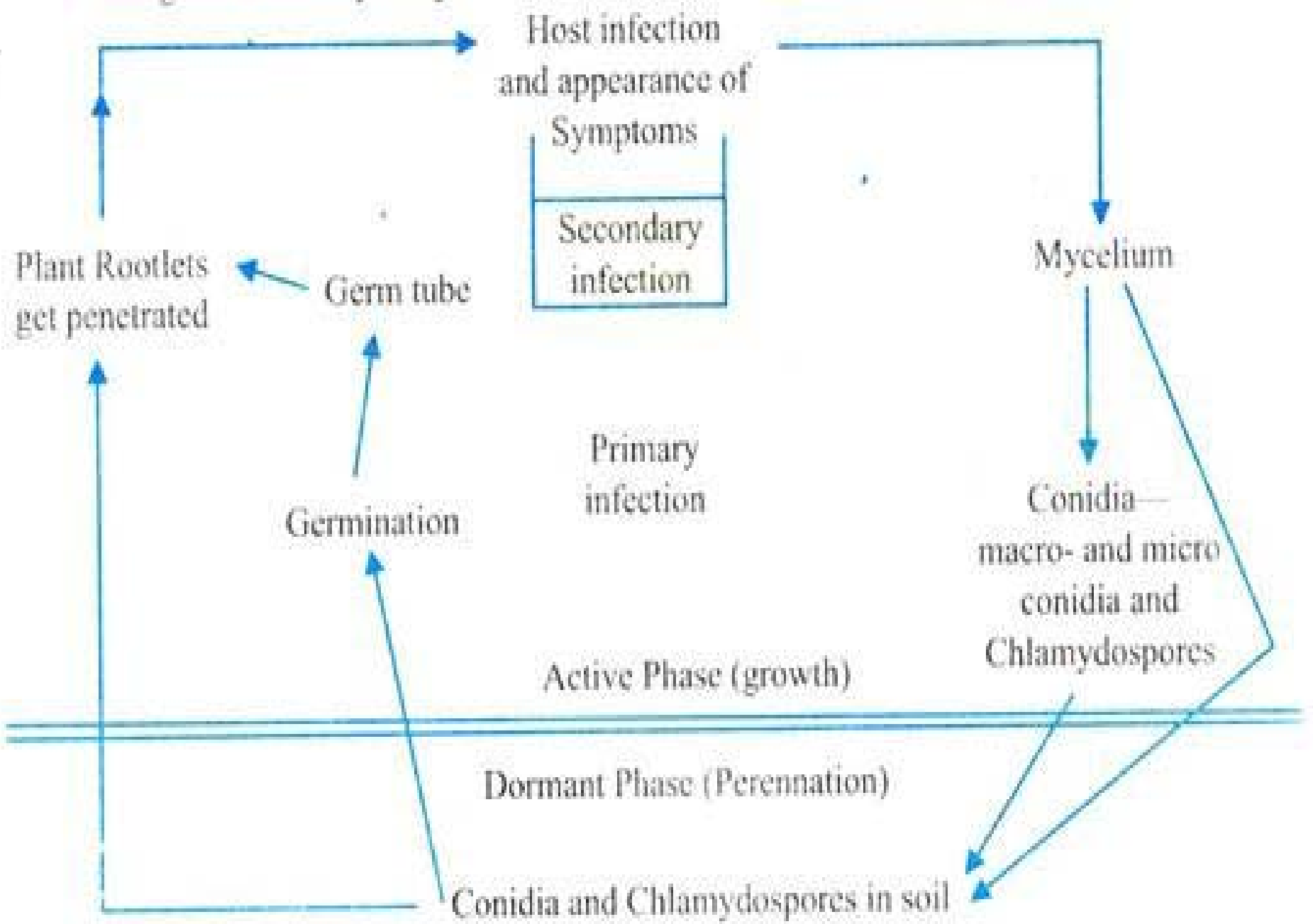


Fig. 22.22. Disease cycle of wilt of Arhar.

The whole fruit body is called the sporodochium (Fig. 22.21). The macroconidia are shed as soon as they reach maturity.

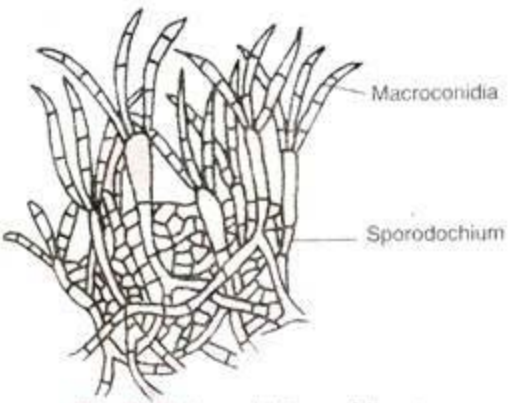


Fig. 22.21. Sporodochium of *Fusarium*

(iii) The chlamydospores (Fig. 22.20) are thick-walled, rounded or oval cells formed in the hyphae. They occur singly or in chains and may be terminal or intercalary. The chlamydospores become separated from the parent hypha after maturing. They function as resting spores.

Infection of wilt disease

Wilt of arhar is a soil borne disease. The microconidia, macroconidia and chlamydospores remain viable in the soil. At the sowing time the spores germinate and initiate new infections.

Infection takes place through the young roots or rootlets possibly through the root hairs
Infection of the aerial parts of the plant through air-borne spores never takes place.

The fungus mycelium also exists in the soil as an active facultative saprophyte so long the dead host roots and other parts are present in the soil. It gains entry into the host through the rootlets and finally

Life cycles of fusarium wilts

