



وزارة التعليم العالي والبحث العلمي

جامعة الانبار / كلية الزراعة

قسم وقاية النبات

(امراض خضر - Vegetable diseases)



Fourth stage

المرحلة الرابعة

Plant Protection Dept.

قسم وقاية النبات

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Plant diseases caused by fungi

Fungi are small, generally microscopic, eukaryotic, usually filamentous, branched, spore-bearing organisms that lack chlorophyll. Fungi have cell walls that contain chitin and glucans (but no cellulose) as the skeletal components.

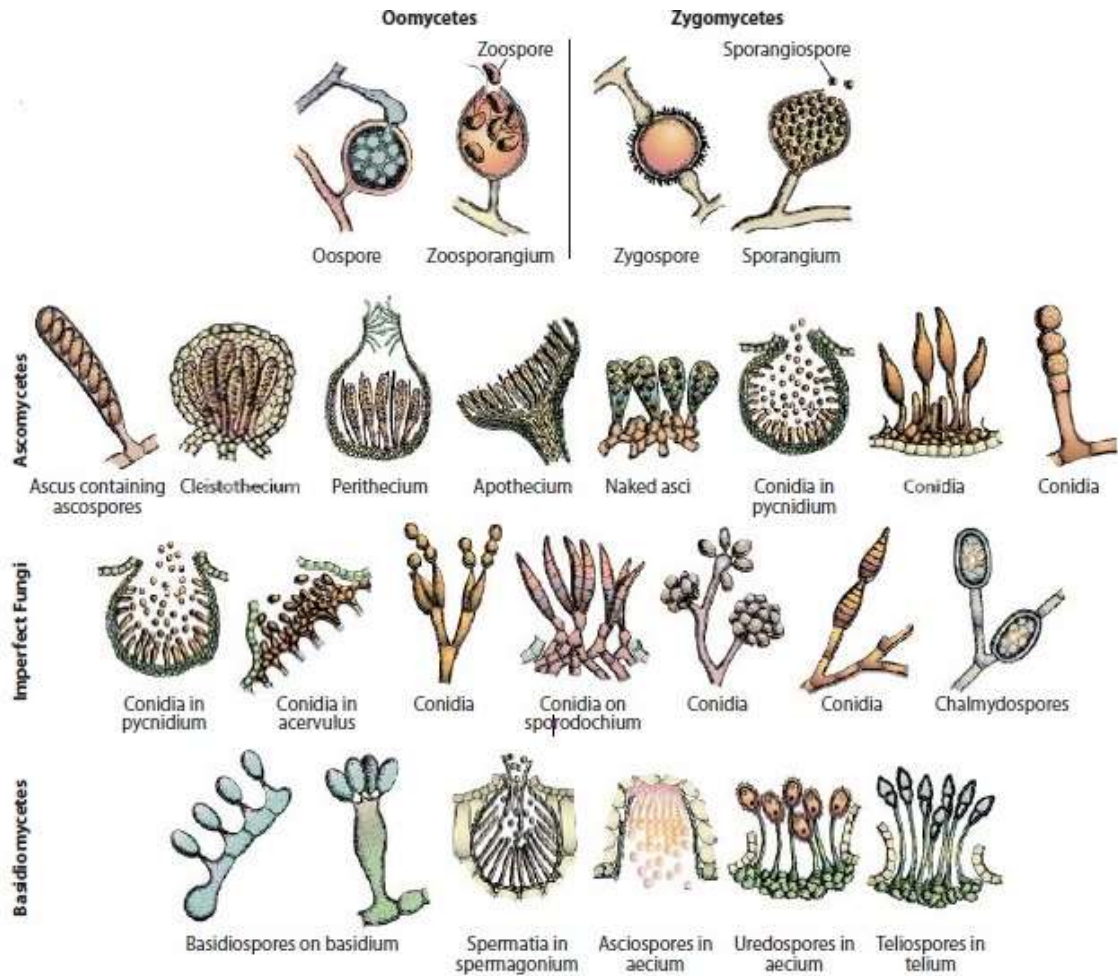
Characteristics of plant Pathogenic fungi

Morphology

- 1-Most fungi have a filamentous vegetative body called a mycelium.
- 2-The individual branches of the mycelium are called **hyphae**.
- 3-In some fungi the mycelium consists of many cells containing one or two nuclei per cell.
- 4-In others the mycelium contains many nuclei, which may or may not be partitioned by cross walls (septa).
- 5-Some lower fungi lack true mycelium instead of mycelium produce a naked, amoeboid, multinucleate body called **plasmodium**.



FIGURE 11-4 Isolation of fungal pathogens from infected plant tissue.



Symptoms caused by fungi on plants

Fungi cause local or general symptoms on their hosts and such symptoms may occur separately or concurrently or may follow one another. In general, fungi cause local or general necrosis of plant tissues, and they often cause reduced growth (stunting) of plant organs or entire plants. A few fungi cause excessive growth of infected plants or plant parts. The most common necrotic symptoms are as follows.

1-Leaf spots: Localized lesions on host leaves consisting of dead and collapsed cells.

2-Blight: General and extremely rapid browning and death of leaves, branches, twigs, and floral organs.

3-Canker: Localized necrotic lesion on a stem or fleshy organ, often sunken, of a plant.

4-Canker: Localized necrotic lesion on a stem or fleshy organ, often sunken, of a plant.

5-Root rot: Disintegration or decay of part or all of the root system of a plant.

6-Damping-off: Rapid death and collapse of very young seedlings.

7-Basal stem rot: Disintegration of the lower part of the stem.

8-Soft rots and dry rots: Maceration and disintegration of fruits, roots, bulbs, tubers, and fleshy leaves

9-Anthracnose: Necrotic and sunken ulcer-like lesion on the stem, leaf, fruit, or flower of the host plant caused mainly by a certain group of fungi.

10-Scab: Localized lesions on host fruit, leaves, tubers, etc., usually slightly raised or sunken and cracked, giving a scabby appearance.

In addition to those just given, four groups of symptoms may be added.

Wilt: Generalized loss of turgidity and drooping of leaves or shoots.

Rust: Many small lesions on leaves or stems, usually of a rusty color.

Smut: Seed or a gall filled with the mycelium or black spores of the smut fungi.

Mildew: Areas on leaves, stems, blossoms, and fruits, covered with whitish mycelium and the fructifications of the fungus.

Diseases Caused by Oomycetes

Oomycetes are members of the kingdom Chromista that have mycelium but have no cross walls except to separate living (cytoplasmic) parts of hyphae from old parts from which the cytoplasm has been withdrawn. They produce oospores as their resting spores and zoospores or zoosporangia as their asexual spores. The most important plant pathogenic Oomycetes belong to two orders, namely Saprolegniales and Peronosporales. Of the Saprolegniales, only one genus, *Aphanomyces*, has important plant pathogens, one causing root rot diseases of many annual plants, particularly of pea and sugar beet.

The order Peronosporales includes several of the most important genera of plant pathogens known these are *Pythium* and *Phytophthora*, each consisting of many very important plant pathogenic species, and several genera causing downy mildews. Another genus, *Albugo*, causes the less important white rust on crucifers. *Pythium* sp., one of the most common and most important causes of seed rot, seedling damping-off, and root rot of all types of plants, and also of soft rots of fleshy fruits in contact with the soil *Phytophthora* sp., one causing late blight of potato and several others causing root rots, fruit rots, and blights of many other annual and perennial plants, and root and stem rots, cankers and diebacks of trees

Bremia, *Peronospora*, *Plasmopara*, and *Pseudoperonospora*, causing the very destructive diseases known as downy mildews of dicotyledonous plants, such as lettuce, tobacco, grape, and cucurbits *Peronoslerospora*, *Sclerophthora*, and *Sclerospora*, causing the downy mildew diseases of monocots such as corn, sorghum, and sugarcane

Kingdom Protozoa		Myxomycetes Physarum	Plasmodiophoromycetes Plasmodiophora	Polymyxa	Spongospora
Kingdom Chromista		Oomycetes Aphanomyces	Pythium	Phytophthora	Albugo
		The Downy Mildews Plasmopara	Bremia	Peronospora	Pseudoperonospora
Kingdom Fungi		Chytridiomycetes Olpidium	Physoderma	Synchytrium	Urophlyctis
		Zygomycetes Rhizopus	Mucor	Choanephora	

FIGURE 11-7 The most common protozoa and chromista (stramenopiles) and some of the fungi that cause disease in plants. a, Antheridium; gs, germinating sporangium; h, haustorium; m, mycelium; og, oogonium; os, oospore; p, plasmodium; pws, pustule with sporangia; rm, rhizomycelium; rs, resting spore; rsa, resting sporangium; s, sporangium; sp, sporangiophore; ss, sporangiospore; th, thallus; z, zoospore; zs, zoosporangium; zy, zygospore.

Myxomycetes Slime mold	Plasmodiophoromycetes Clubroot of crucifers	Powdery scab of potato	Chytridiomycetes Black wart of potato	Crown wart of alfalfa	Brown spot of corn	
Oomycetes	Seed rot	Seedling damping off	Root and stem rot	Blight	Tuber rot	Soft rot
	White rust	Upper side	Lower side	Mildews	Oospores on soybean seed	
Zygomycetes	Rhizopus soft rot (e.g. sweet potato)	Rhizopus fruit rot	Choanephora squash rot	Bread mold		

FIGURE 11-8 The most common symptoms caused by some fungal-like organisms and some fungi.

References

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