

Benha University.
 Faculty of Science.
 Botany Department.



Exam(4th Micro&che).

Time:-1 hours.

Jan 2015

Host-parasite

Answer the following questions:-

- 1- Mechanical inoculation of virus, bacteria and fungi ?
- 2 – Modern methods for detecting changes after infection?
- 3 - Role of Toxins contribute to establish infection?
- 4- How are fungal disease managed?
- 5 - **Write briefly on :-**
 - a – Hypersensitive reaction .
 - b- Damping – off.
 - c – Protein related pathogenesis.

With best wishes.

1- Mechanical inoculation of virus, bacteria and fungi

	Virus	Bacteria	Fungi
Penetration	Through wounds	Wounds& Natural opening	Wounds& Natural opening
Contact	More necessary than bacteria		Less
Infection	Localized/ systemic	Localized at the site of penetration	
Mechanism	No secretion	Secret polysaccharide ,enzyme	Secret toxin ,enzyme

2 – Modern methods for detecting changes after infection

A – Morphological:- Chlorosis, Mosaic, Necrosis, Downey mildew ,Powdery mildew ,Rust ,Smut ,Rot ,leaf spot ,Gall ,Hypertrophy and Hyperplasia.

B –Histological :- (Structural) by light microscope or electron microscope (ultra- structure) .

C –Biochemical :- HPLC high performance liquid chromatography .

Electrophoreses .

ELISA enzyme linked immunoasorbant assay.

D – Molecular :- PCR polymerase chain reaction .

3 - Role of Toxins contribute to establish infection

Toxins:

Produced by necrotrophs ,poison plant cells ; toxins affect a wide variety of plants and contribute to the ability of pathogen to infect plant and cause disease. Toxin contribute to the development of chlorosis and necrosis in infected plant tissues. They can be divided into two broad groups: Host specific toxins and General or non-Host specific toxins.

Host Specific toxins ↓	Host Non -specific toxins
A virulent factors(disease severity)	Virulent factor(pathogenicity)
Effect on certain organ in plants& damage it .	Affect wild variety of plants(random)
Required for infection by pathogen successfully	Contribute to infect plant &cause disease
e.g Hv (Victorin) ,Hm (Helminthosporin)	Several compound protein ,nucleic acid, ML

4 -How are fungal disease managed ?

1 -Avoidance

Choose planting sites and planting times to avoid environmental conditions favoring disease.

2 -Exclusion

a -Impose quarantines (local and international).

b -Plant pathogen-free seed or stock

3 -Eradication

- a -Rotate to non-host crop.
- b -Remove weed hosts.
- c -Destroy infested plant debris.
- d -Apply fungicides

4 -Protection

- a -Apply fungicides.
- b -Minimize leaf wetness.
- c -Plant resistant hosts.

5 –a Hypersensitive reaction (HR) .

The HR is a pathogen-induced, rapid and localized cell suicide at the spot of infection in which the plant cells react to the invading pathogen by a kind of programmed cell death consisting of electrolyte leakage from the cytoplasm and oxidative burst. The knowledge on signal transduction in the HR ,several interesting genes have already been identified, including protein kinases and phosphatases, calmodulin genes and others biochemical function that ultimately activate transcription of defense response genes. Localized acquired resistance in a ring of cells surrounding necrotic lesions ensure that they become fully refractory to subsequent infection.

B -Damping-off - This term describes the rapid death and collapse of young seedlings. Often the seedlings will appear to be almost broken at the soil line. It may be observed in flats of plants begun in greenhouses and can result from infection of the seedlings by the fungal organisms *Fusarium*, *Phytophthora*, *Pythium*, *Rhizoctonia*, or *Thielaviopsis* .

C - Protein related pathogenesis:

Protein possess role in suscbtability :-

- 1 – PL(pectin lysis).
- 2 –PG(polygalactronase).
- 3 –PME(pectin methyl esterase).
- 4 –Phenyl alanine layasis .

Protein possess role in resistant:-

- 1-Lysosime ,digest cell wall of bacteria .
- 2 –Glucanase, digest cell wall of fungi .
- 3 Chitinase , digest cell wall of fungi .

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Exam(pre- master).

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Microbial Ecology

Answer the following questions:-

1-Role of microorganisms in ecology?

2-Chemical factors affecting the microbial growth?

3-Explain the role of microbes in treatment of waste water ?

4-Role of microorganisms in disposing of pollutants oil spots environment?

5-Role of microorganisms in biological control?

6-Role of microorganisms in Biodegradation of Pesticides and Herbicides?

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Soil microbiology

Answer the following questions:-

1-Effect of soil microorganisms on the growth of higher plant?

2-Interaction between microorganisms and higher plants?

5-Interaction among microbe – microbe populations in soil?

6-Comment on the following:-

A- Rhizosphere

B- Influence of plants upon soil microorganisms .

With best wishes.