

Date

MJ-01. (BOTANY)

Experiment No.

Experiment Name

FM = 60,

Time - 3:15
Date

Group - A

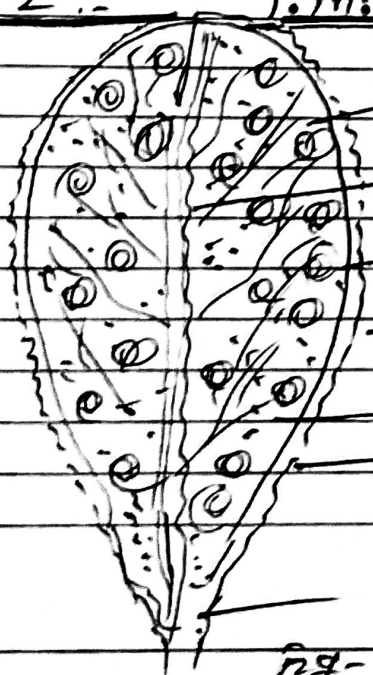
Q.N. 1 - M.C.B. type

125 = 5

- a) Fruiting body of peziza - Apothecia.
- b) Club fungi are known as - Basidiomycetes
ex. Ruccionia, Wartlage, Agaricus
- c) who studied first crystalline virus
W.M. Stanley in (1935)
- d) Bacteria with Flagella, all over the body is called - Peritrichous
ex. salmonella.
- e) white rust of crucifer is caused by the fungus - Cystopus candidus

Q.N. 2 :- T.M.V. (Tobacco mosaic virus)

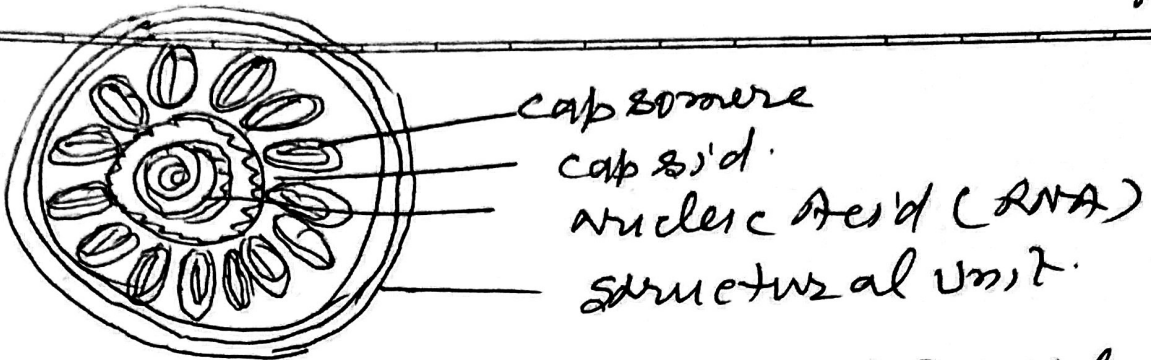
⑤



- veins
- midrib
- lesions
- leaf margin
- chlorotic veins
- thick musclogenous sheath
- leaf base

Teacher's Signature

fig - infected leaf Tobacco mosaic



capsomere
 capsid
 Nucleic Acid (RNA)
 structural unit.

Figure - Structure of viral particles



R.N.A Helix.
 capsomere.
 (protein subunit)

Figure - TMV. shows R.N.A Helix & capsomere

Q.3. Economic importance of lichens

- ① many crustose lichen growing on rocks, dissolve and disintegrate them into soil particles and limestone.
- ② humus soil is formed, where lichen prepare ground for succession of vegetation.
- ③ some common lichen e.g. Iceland moss, Parmelia, and Lecanaria: used for food and feeding purpose by man and animals.
- ④ Cladonia rangiferina is commonly known as "Reindeer moss" used for reindeer & cattle feeding.

(5) **Medicinal importance** :- Rethigora cantona
The dog lichen grow in dense forest used in hydrophobia and Lobaria pulmonaria used under lung disease central.

(6) **Chemical uses** :- The lungwort lichen are also used in tannings and perfumigant purposes. Instead this Rocella and Lecanora used in colouring of woolen and silk fabrics.

Group - B

Question No - 4 :-

3 + 12 = 15

a) **Holocarpic** :- The simplest unicellular chytrids are normally holocarpic, where the entire mycelial structure has been consumed to form the reproductive structure ex: Synchytrium.

b) **Life cycle of Synchytrium** :-

Fungus - Synchytrium endobioticum causing black wart disease of potato (Solanum tuberosum).

Disease considered as holocarpic and intercellular.

- Infected portion of potato tuber shows hyper trophy in potato. In unfavourable condition summer spores are formed. Under golden brown in colour. Under favourable condition monoflagellated zoospores are formed. with smelling of potato. Genus reproduces under 2 methods -

(A) **Asexual reproduction** :- Asexual mode of reproduction is completed with the help of uniflagellated zoospore inside the sporangia. The uniflagellated mass of cytoplasm get metamorphosed into zoospore. Diagrammatically it is represented as follows

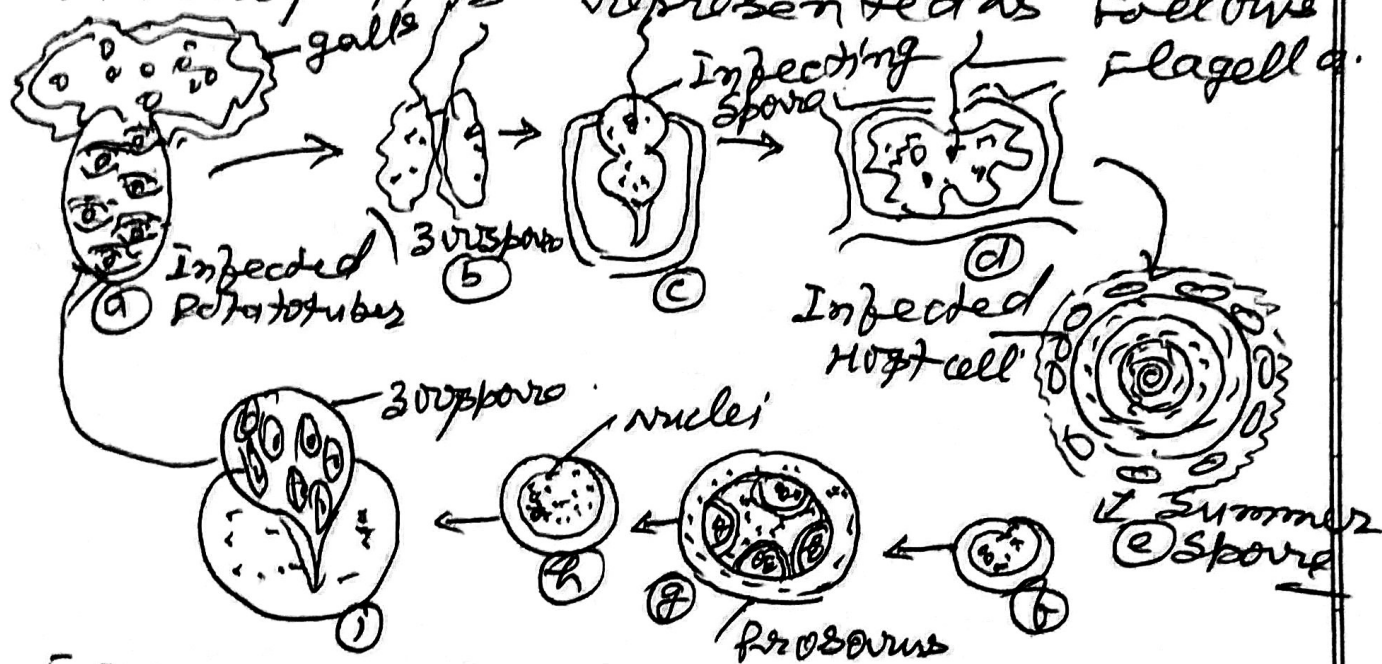


Figure - Diagram shows. Asexual reproduction in Synchytrium.

(B) **Sexual reproduction** :- The mode of sexuality is isogamous means genetic fusion occur between two identical gamete, outside the host cell. After fusion diploid zygote is

formed, such formed zygote penetrate the host cell. In this way all of the host plant get damaged and sporangium is formed.

mode of meiosis and mitosis takes place in such sporangium, where multiple nucleus is formed. In this sexual sporangium is formed successively such sporangia get metamorphosed into meiospore, which laterally forming disease symptoms under the formation of gametangium.

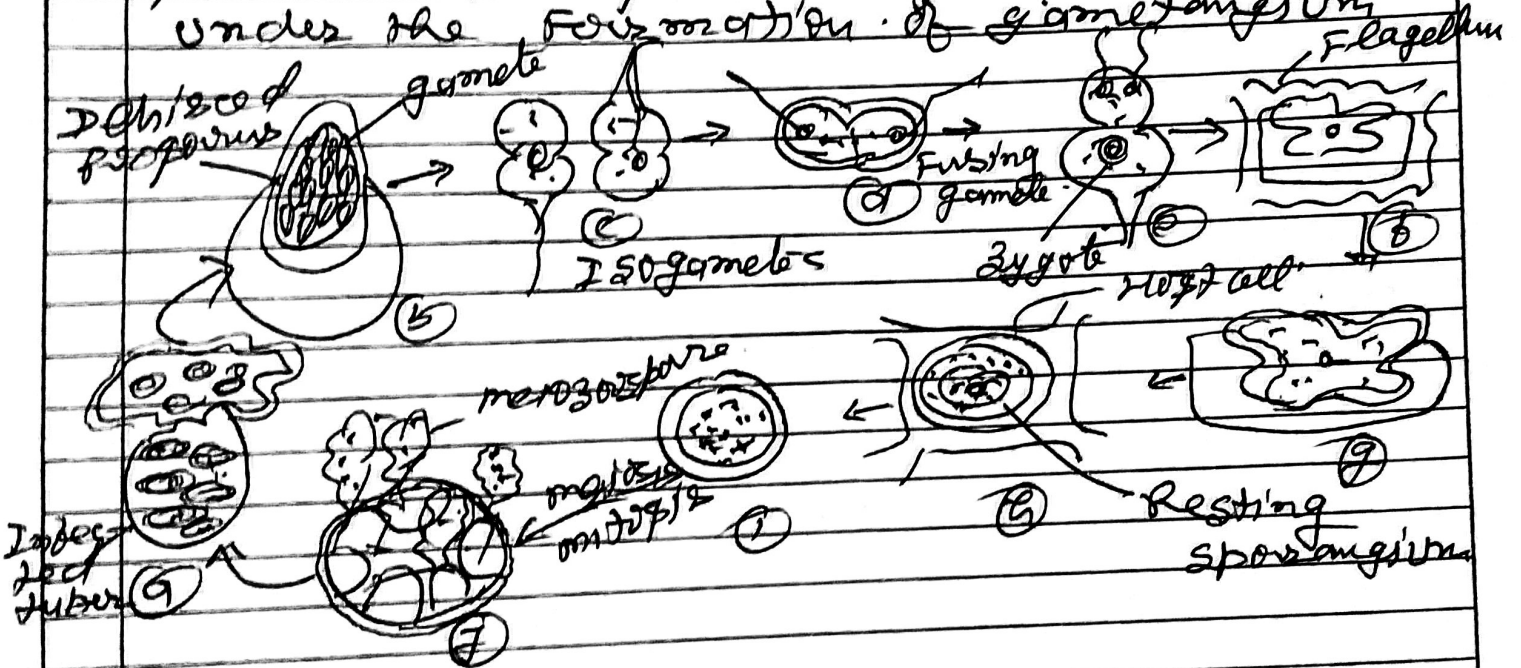


Figure - Sexual mode of reproduction in Synchytrium.

Teacher's Signature: _____

Q.N 5 - **Heteroecious Fungi** - the life cycle of Rhizoctonia graminis tritici completes on two different host called primary and secondary host and therefore this is called heteroecious fungus. primary host wheat and secondary host Barberry.

Life cycle of Rhizoctonia is life cycle of Rhizoctonia possessing two host and 5 kind spores, where fungus causing disease Black stem rust of wheat/Barberry. Fungus producing Inter-cellular endophytic, branched septate mycelium having monokaryotic & dikaryotic. Disease cycle having 5 stages with respective spores.

Uredia cum Uredospores: the mycelium in Rhizoctonia is dikaryotic observed from primary host wheat. The Uredospore always develop in a group called Uredosporia.

Each Uredospore is stalked, oblong, bilobed thick and brown in colour. Symptoms of the disease observed from leaf in the month of January - February.

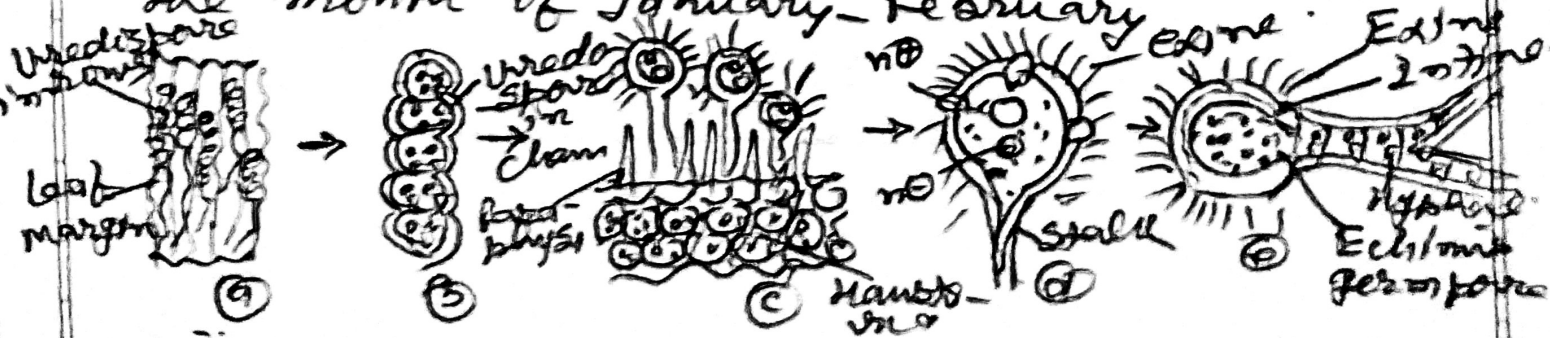


Figure - Uredopustules with Uredospore.

(ii) **Telia cum Teliospore** :- After the formation of Uredospore with dikaryotic mycelium, Teliospore developed. Such spore infect the wheat leaf where dark brown to black colour Telia' develop. (Teliospore), observed in the month of March at lower surface of the leaf. Teliospore having bicelled binucleated in structure. It germinate to form basidia and basidiospore. ^{not epidermis}

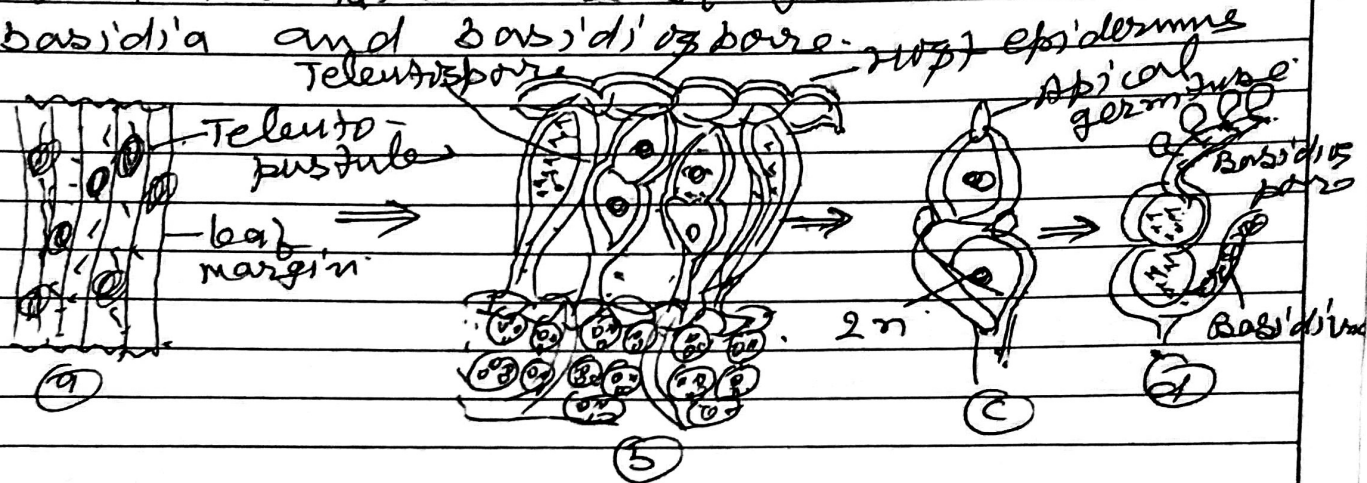


Figure - Telia cum Teliospore in (and)

(iii) **Basidia cum Basidiospore** :- Under the harvesting of wheat crop, infected portion of wheat leaf lying at the earth surface, which accumulate favourable condition of environmental factors, it germinate to form finger like structure called Fragmaobasidium known as Basidiospore. Each Basidiospore

be the monokaryotic, which infect the secondary host plant Barberry. A single Basidiospore develops on each sterigmata, four Basidiospores are produced on the basidium in which two of (-) strains and two of (+) strains

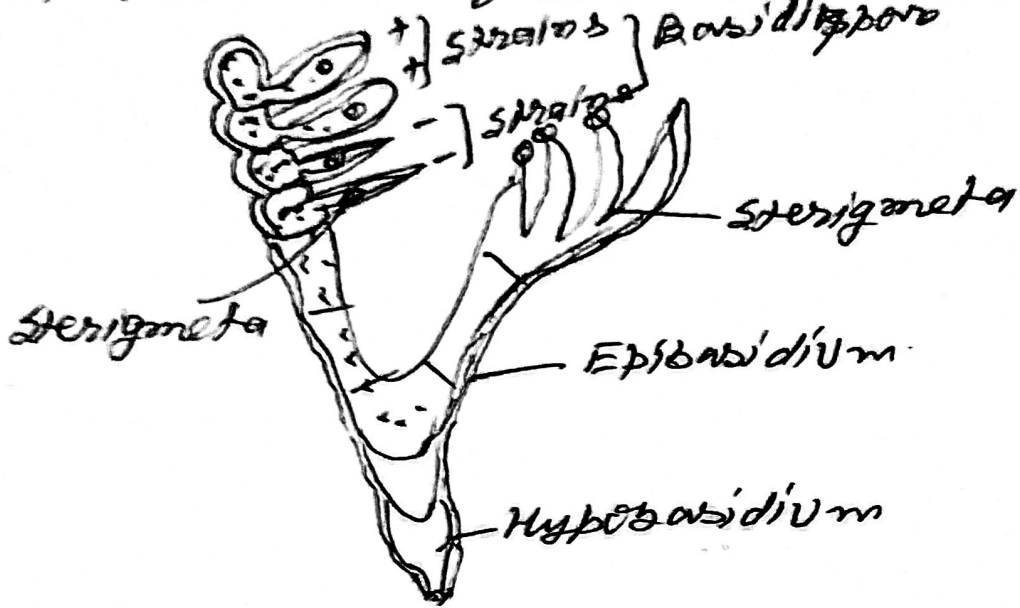


Figure structure of Basidia & Basidiospore

(iv) Pyrenia with Pyreniospore: The monokaryotic mycelium accumulate beneath epidermis of alternate host, develop into flask like structure called Pyrenidium producing Pyreniospore. Pyreniospores are rounded oval, haploid and uninucleate. On this dikaryotic mycelium, the aeciospore are produced.

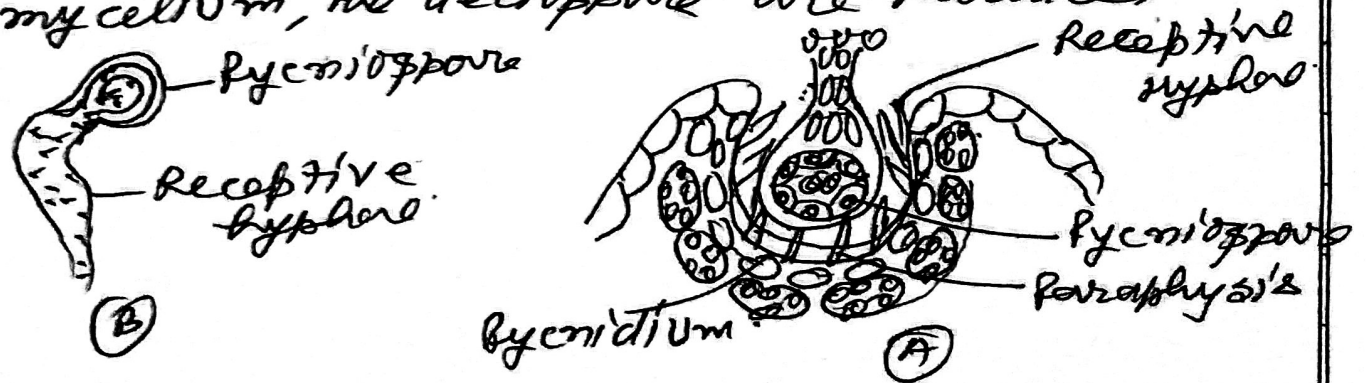


Figure - (A) & (B) shows Pyrenia with Pyreniospore

(v) Aecia cum Aeciospores :- Such stage detected from the lower surface of the Barberry leaf. Aeciospores developed from the hymenium layer, which are made up of Pseudoparenchymatous tissue. Aeciospores develop into a chain with intercalary cells hexagonal to polygonal in shape. Such stage having bicelled, binucleated condition connected with disjunctive cell.

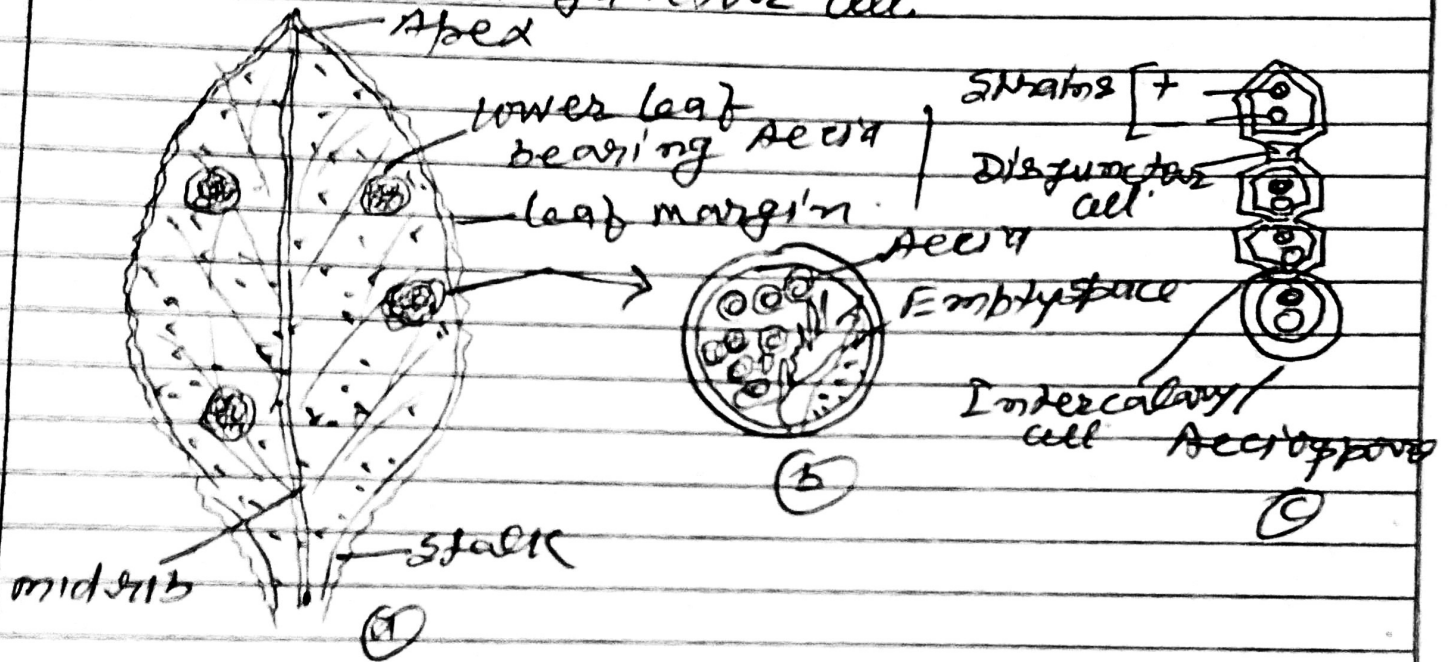


Figure - Structure of Aecia with Aeciospores

Control measurement :- Following methods are used for controlling of disease

- (1) Apply summer ploughing for destroy of spores
- (2) Use early maturing variety of wheat such as Arjuna, Pratah, K-2062 Mexican wheat
- (3) Use fungicides such as Dithane Z-78, zineb and Actidione, 2-3 times in standing crops.

Q6- Application of Fungi in 5755-15

(a) Food industry b) Enzyme c) Antibiotics

(1) Role of Fungi in Food Industry :- species of Penicillium used in processing of food. Penicillium camemberti used in ripening of cheese. Aspergillus ventii is employed in processing soyabeans under the looser of hard tissue of the bean. Agaricus campestris is edible mushroom and cultivated for its fructification as vegetable purposes. Saccharomyces cerevisiae is used in bread industry. Yeasts are used in "microbial-farming" for the large scale production of yeast food being an efficient source of vitamins. Morchella esculenta is another important edible fungus rich with vitamins.

(2) Role of Fungi in Enzyme Preparation

Various important and useful enzymes are obtained from fungi.

S.No	Name of enzymes	Source of fungi
1	Trypsinase	<u>Neurospora</u> , <u>Crassa</u>
2	Invertase	<u>Saccharomyces cerevisiae</u>
3	Zymase	<u>yeast</u> and <u>Rhizopus sp</u>
4	Amylase	<u>Aspergillus niger</u>
5	Pectinase	<u>Aspergillus versicolor</u>
6	Digestive enzymes	<u>Aspergillus niger</u>

Enzymes are biocatalytic substances profusionaceous in nature, regularise biochemical reaction in the body.

© Role of Fungi in Antibiotics :-

conservative cum preservative nature of medicine be the antibiotics In India at Simpsi and Rishikesh. There are big factories of antibiotics main aim of antibiotics is to kill pathogenic micro-organisms is called Antibiosis, some common and important antibiotics are Penicillin, Tetracyclins, Neomycin, cephalosporin, Kanamycin and Novobiocin etc. Use of Antibiotics with concerning disease is as follows

1. Penicillin - Disease Tetanus, pneumonia and Rheumatic fever control
2. Streptomycin - T.B., meningitis, pneumonia control measurement
3. Chloramphenicol - Typhoid, cough, T.B and diphtheria control
4. Erythromycin - Whooping of cough and diphtheria control.

Q.N.7. - Attempt following - 57575 = 15

a) Discovery of viruses :-

- Virus is an ultramicroscopic nucleoprotein entity, becomes active inside a living being.
- Term virus was firstly used by L. Pasteur in (1880) - As poisonous in nature.
- In (1886) Adolf Mayer discovered TMV and D. Ivanowski in (1892) discovered virus as infective fluid.

- Beijerinck in (1896) called virus extract of plant disease as contagium vivum fluidum.
- Lysis of bacteriophage - discovered by Twort in (1915) and d. Herelle in (1917)
- W.M. Stanley in (1935) studied chemical nature of TMV. (In crystalline form)
- Hershey and Chase in (1952) - studied genetic material (DNA) in bacteriophage.

(b) Living & Non Living feature of viruses.

Living Properties

- They can live only in a living cell. Infect healthy plant just like bacteria and fungi.
- multiply in no. and grow in size as the living organism. reproduce and grow.
- They respond to stimuli, such as acids, alkalis, light and temperature.
- they have physiological specialization in relation to the insect vectors & the plants.

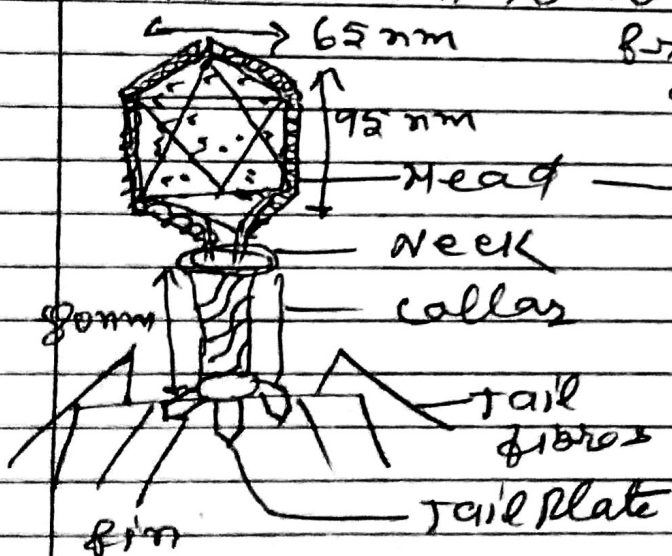
Non-living Properties

- they are too small to be observed under visible light.
- they retain infectivity even in very low concentration.
- they can be crystallized like a chemical reaction.
- they can be precipitated by a no. of chemical substance and they retain the power of infection even after 31 years in non living tobacco leaves.

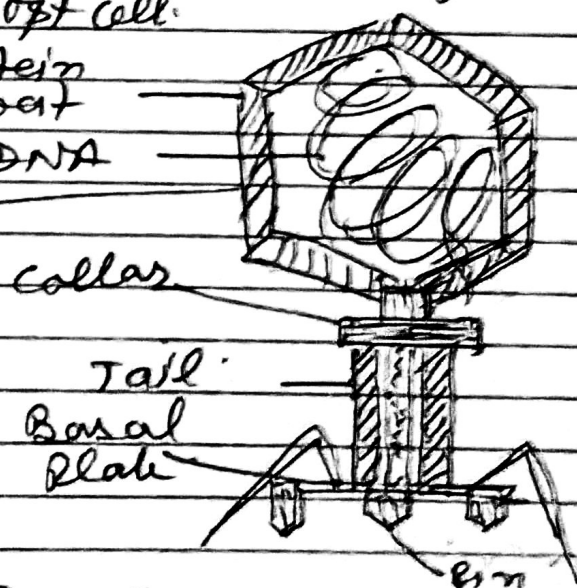
(c) General Structure of Bacteriophage

- Bacteriophages are viruses which parasitize upon bacteria, they were discovered by Twort in (1915) and d. Herelle in (1917)
- The viruses have all types of N.A. they are numbered in T₁ - T₇.

- T₂ bacteriophage is a virus which infects E. coli. Such bacterial virus having tadpole in structure with a head & tail.
- Head is icosahedral in structure, has a protein cover (capsid).
- capsid having 2000 subunits called capsomeres. Internally head having double stranded DNA.
- In between head and tail is a presence of connector, the connector has 2 parts neck and collar.
- Bacteriophage measured under 65 nm in diameter and 95 nm in length and 80 nm the length of the tail.
- Tail end in a hexagonal basal plate having fins (legs) and long tail fibres.
- Tail fibres take part in a recognition of receptor sites of the host where legs help in attachment to the host cell.



(A) External structure of bacteriophage



(B) Internal structure of bacteriophage

Question No. 5 - Describe causal organism, general symptoms, etiology and control measurement of citrus canker?

Introduction - Disease citrus canker observed from leaf, stem and fruits. The rain can also cause the infectious form of disease. Disease spread through stomata.

Host - lemon plant

Pathogen - Xanthomonas citri

- Symptoms** - Citrus canker is mostly a leaf spotting and fruit spotting disease.
- yellowish to brownish blackish patches appeared at fruit, leaf and stem.
 - Taste of leaf and fruit be oily.
 - water soaked margin and yellow ring with gold lesion in leaf may fall out creating a shot hole effect.

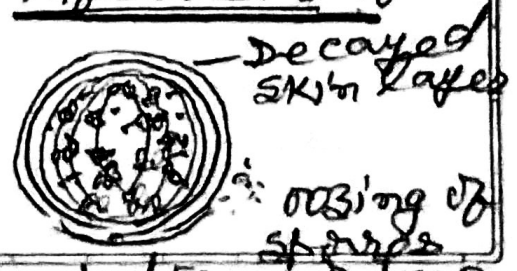
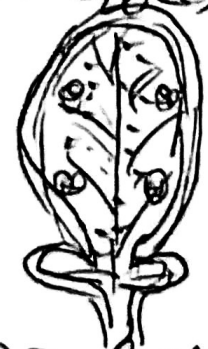
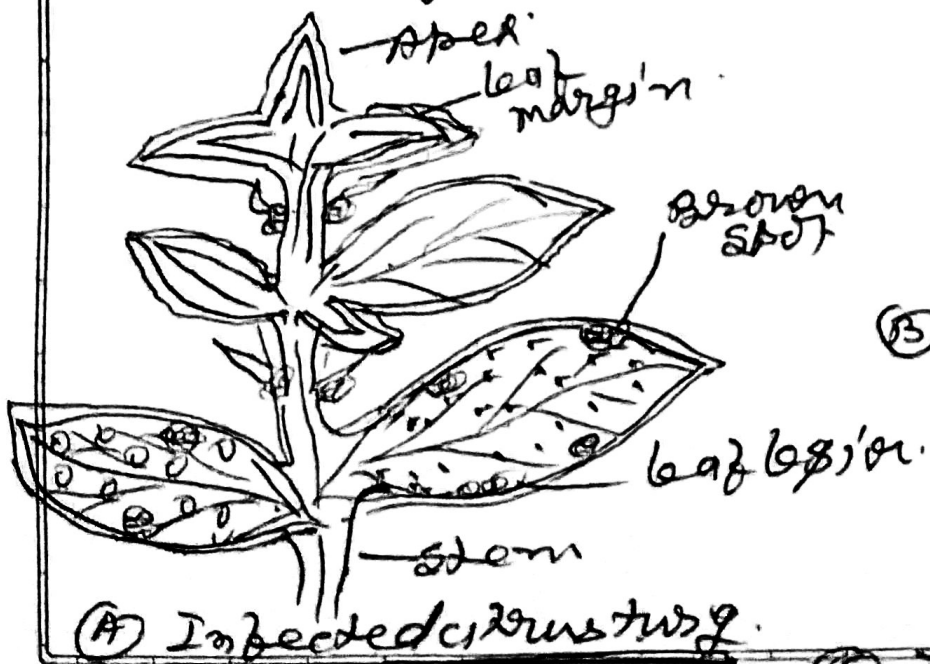


Figure Diagram A, B, and C shows symptoms of citrus canker.

Etiology cum disease cycle. Disease

Citrus canker caused by bacterium *Xanthomonas citri*, which reproduced by binary fission in canker layer in citrus leaf, stem and fruits. When moisture comes into contact with these lesion, the bacteria ooze out onto the surface of the plant tissue and can be dispersed by wind and driven rain.

Control measurement of the disease.

- ① Use resistant nursery stock of lemon.
- ② Infected portion be destroyed immediately.
- ③ Infected fruit of lemon shows gray appearance.
- ④ Spray copper fungicides into rainy season, 3-4 times at 15 days of intervals.
- ⑤ Infected fruit discarded immediately.

- (G) Remove dead cotton well below imbedded area.
- (F) Avoid planting in early spring and fall, where bacteria are most active.