CERTIFICATE

Name : Radha Yadav *Class :* B.Sc III 3rd Sem.

Roll No.: *Exam No.:*

Institution _____

This is certified to be the bonafide work of the student in the _____

_____ *Laboratory during the academic*

year 20 /20

No of practicals certified _____ *out of* _____ *in the*

subject of Botany

.....

Teacher in-charge

.....

Examiner's Signature *Principal*

Date : ..... *institution Rubber stamp*

INDEX

S. No.	Name of Experiment	Page No.	Date of Experiment	Date of Submission	Remarks
	Study of Bacteria				
	• Gram staining • pure culture				
	• Streak ~~culture~~ Method				
	• Pour Plate				
	• Spread plate				
	Light microscope				
	• SEM				
	• TEM				
	Study of microbiology				
	- TMV				
	- Bacteriophage				
	- Pox virus				
	- Mycorina.				

PAGE NO. ..... DATE .....

Study of Bacteria

AIM:- Gram staining Bacteria

Requirement :- 24 hour old culture of bacteria, staining tray, inoculating loop, slide blotting paper, spirit loop, microscope.

Reagent:- Crystal violet, gram iodine soln, ethanol, sabrine.

Theory :- Gram staining was developed by Dr. Henery christian gram, its useful staining method for identify and classifiey bacteria into two major group.

(1) Gram (+)	(2) Gram (−)
Crystal violet	Primary stain
Iodine Solution	gnordens
Alcohol	decolcuisiny agent
Sabrine	Counter stain

The bacteria that ratiurm to primary stain are called gram (+), which loose it called gram (−) bacteria.

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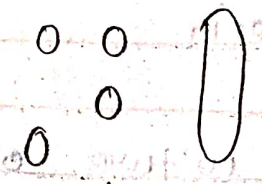
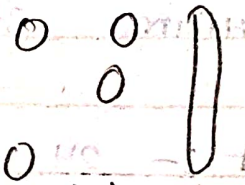
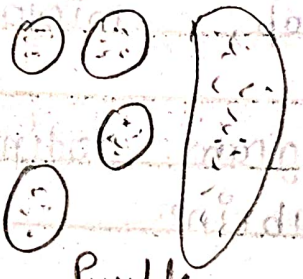
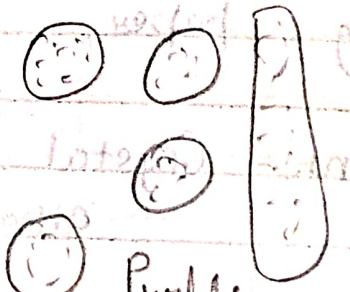
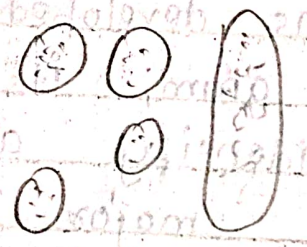
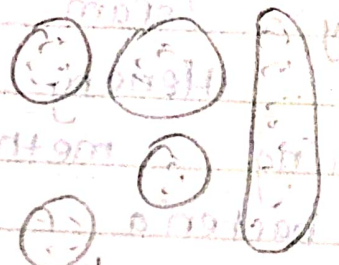
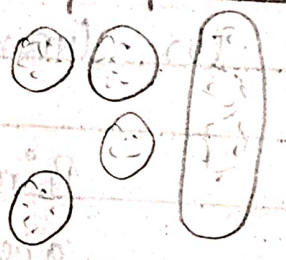
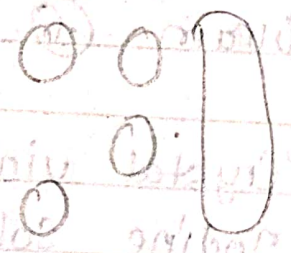
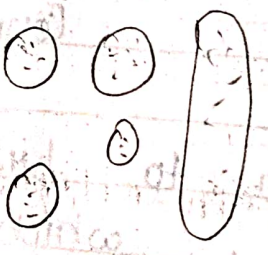
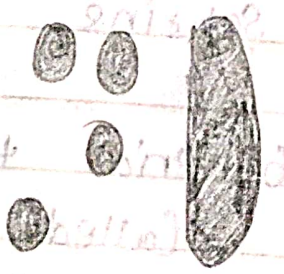
Reagent	Gram-positive	Gram-negative
Heat-fixed cells		
	Colorless	Colorless
Crystal-violet (20 sec.)		
	Purple	Purple
Gram's-iodine (1 minute)		
	purple	purple
Ethylalcohol (10-20 sec.)		
	purple	Colorless.
Safranin (20 sec.)		
	purple	(Red) Pink

PAGE NO. .....

DATE .....

Principle :→ The different stain responses to gram staining can be related to chemical and physical differentiate in their cell wall.

The gram (+) cell wall is this Composition mouth layer higher liquid Contst Addition to protein and mucopeptide.

The hidden layer amount of lipid is being readly dissolution by alcohal loading to be formation a large pores in the cell wall.

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PAGE NO. .....

DATE .....

Pure culture

AIM :→ The aim of the streak plate Method is to isolate pure colonies of microorganisms.

Principle :→ The streak plate technique is essentially a method of dilution but on a solid medium. Number of organisms down to a level that individual cells can be separated and isolated from each other.

Materials :→ bunsen burner, sample culture, a sterile petri dish, an inoculating loop, parafilm, a making pen.

Process :→

- Sterilize the petri dish and agar medium to prevent contamination. Label the dish with than sample information.
- use a burner to sterilize an incoculation loop by heating it until it's red hot. let it cool.
- Dip the loop into a broth or bacterial colony to pick up a small amount of the sample.

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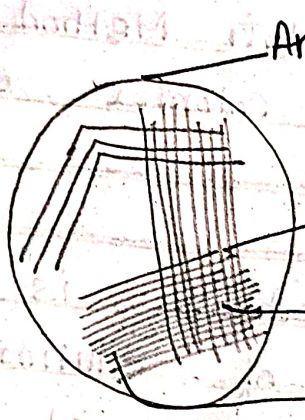
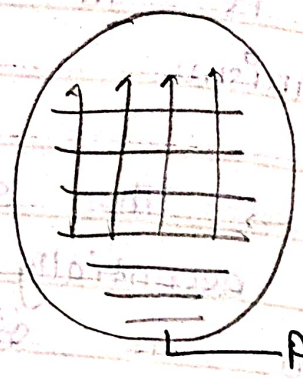
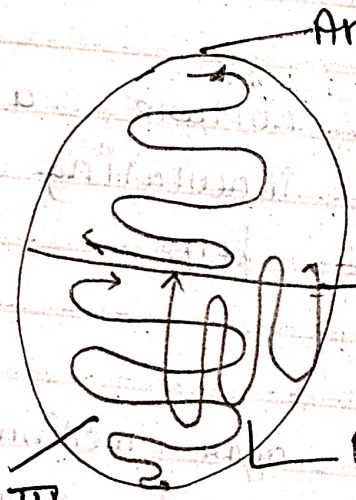

Area II
Area III
Area I
Area IV

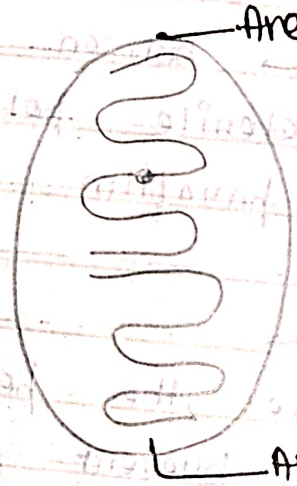
(1)


Area I

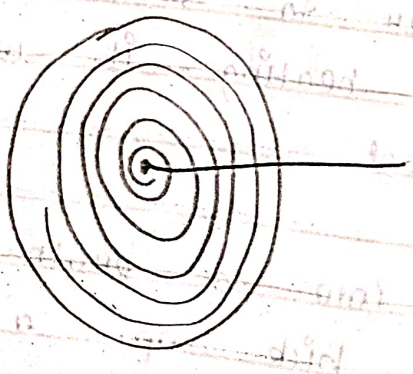
(2)


Area I
mid line
Area II
Area III

(3)


Area A
Area B

(4)


Center of Plate

(5)

PAGE NO. .....

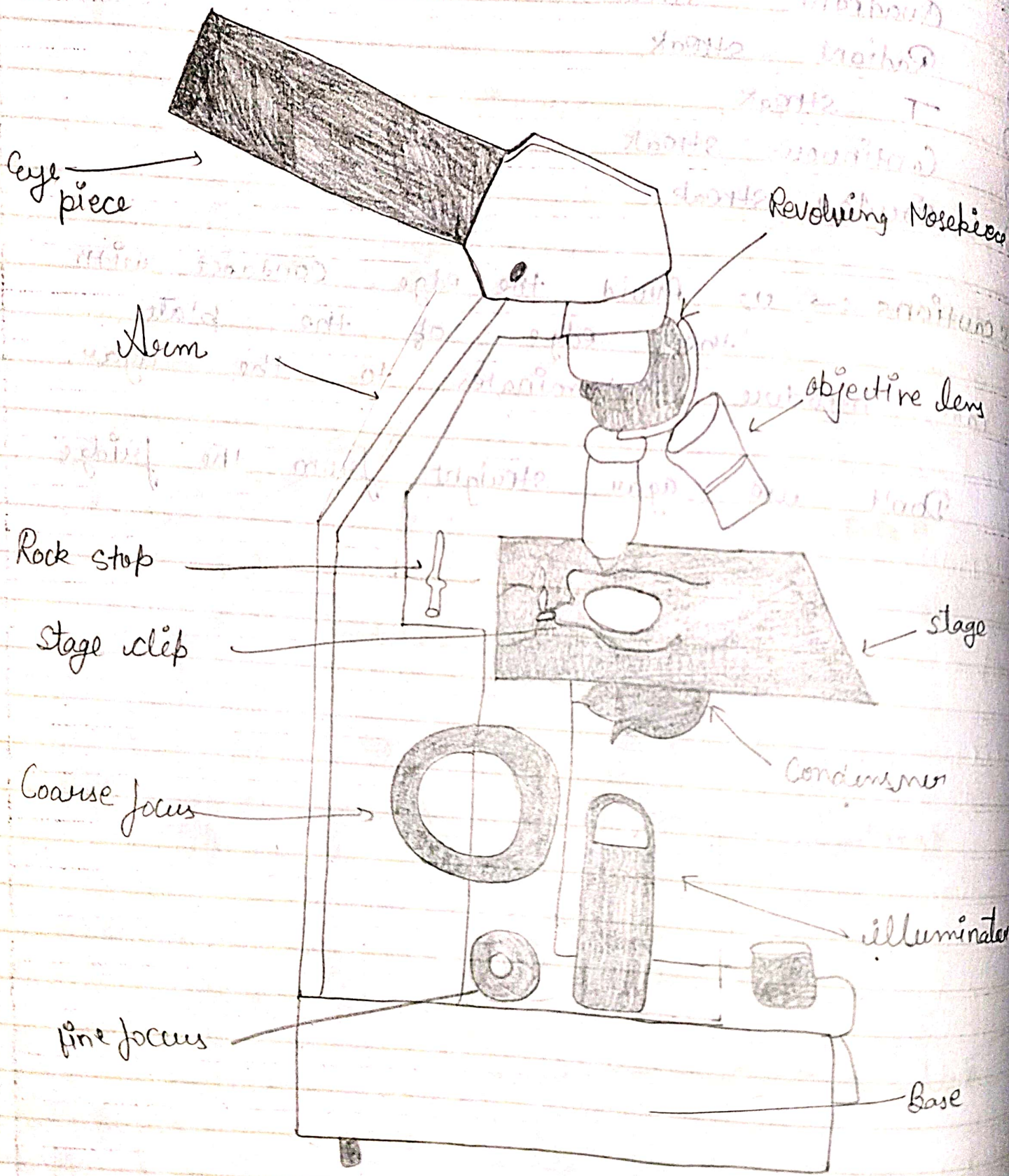
DATE .....

- Plate streaking are five types →

(1) Quadrant streak
(2) Radiant streak
(3) T streak
(4) Continuous streak
(5) Circular streak

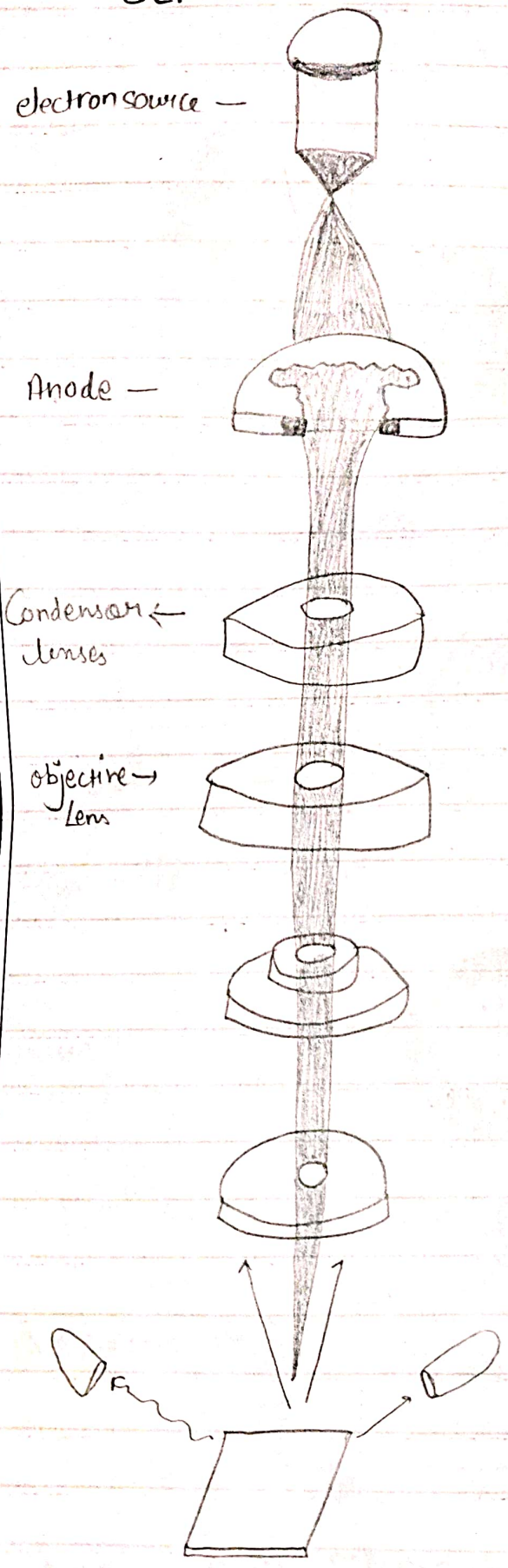
Precautions :→ (1) Avoid the edge. Contact with the edge of the plate can introduce contaminates to the agar.

(2) Don't use agar straight from the fridge

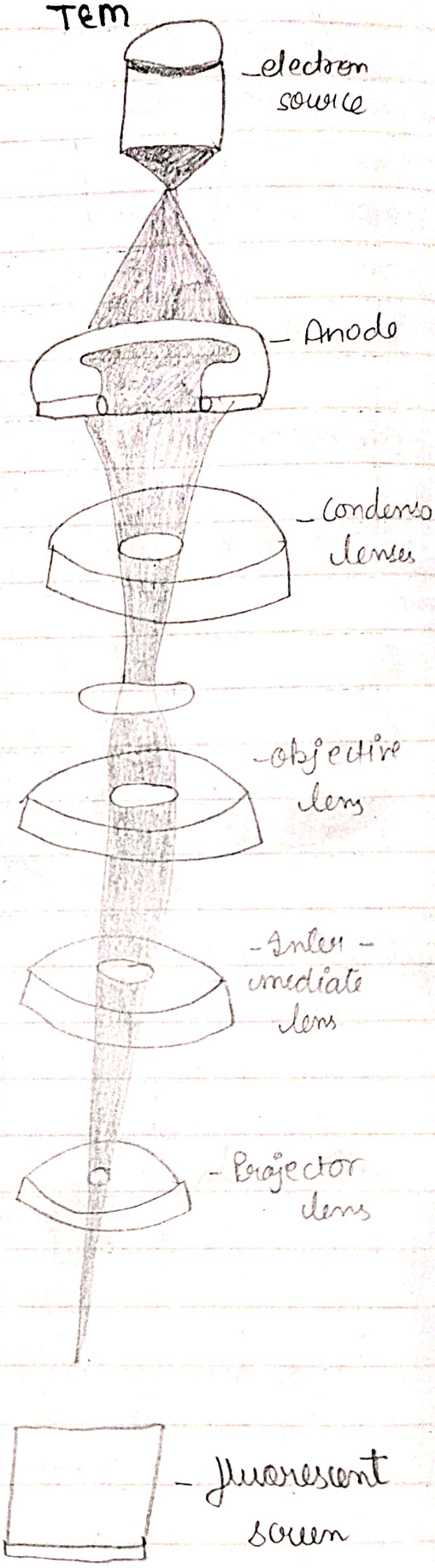


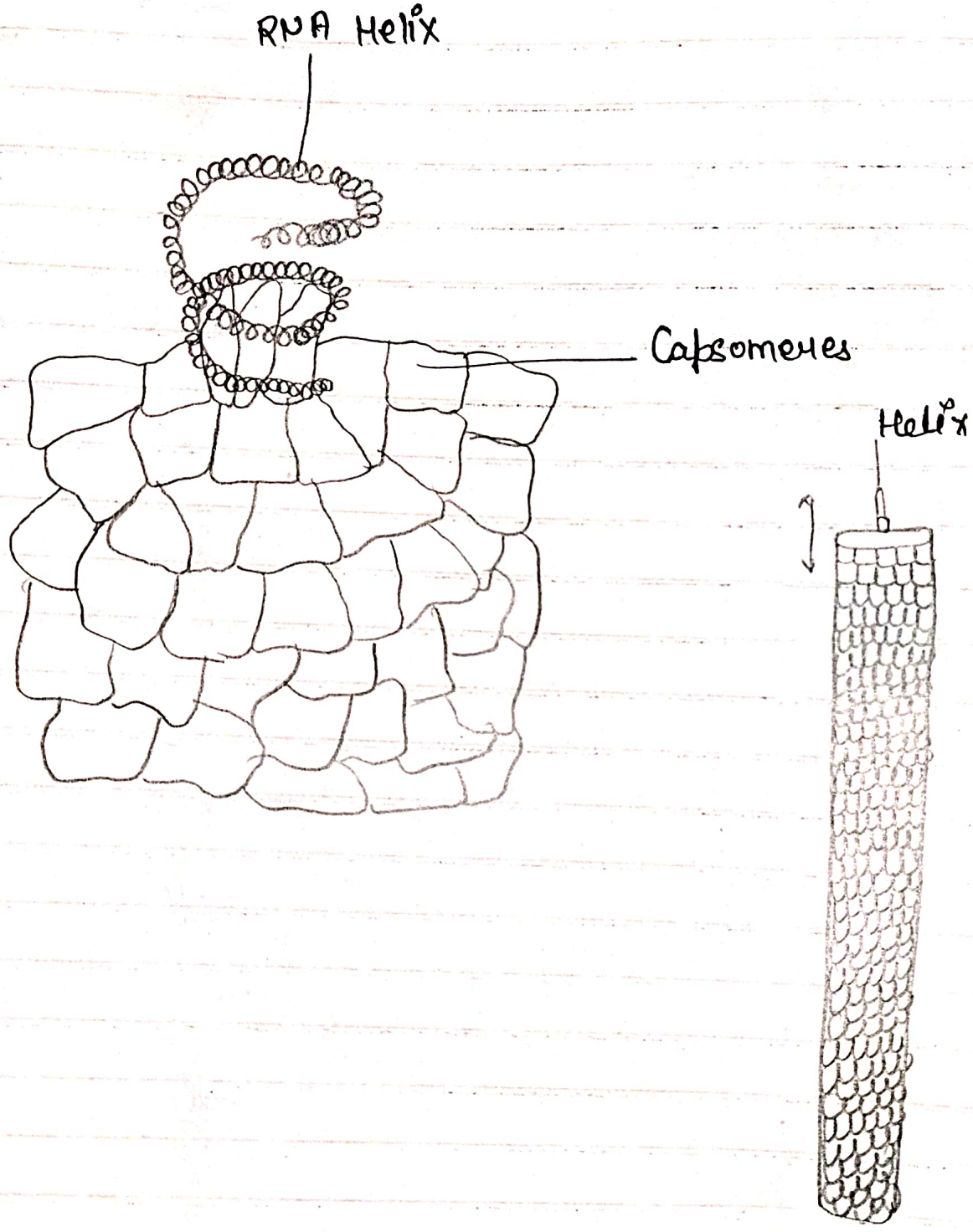
Light microscope

SEM


Electron source
Anode
Condensor lenses
objective Lens

TEM


electron source
Anode
Condenso lenses
objective lens
Inter - mediate lens
Projector lens
fluoresent soreen



Tobacco Mosaic Virus

PAGE NO. .....

DATE .....

Study of Microbiology

Structure of Tabacco Mosaic Virus ⟶ TMV

- The tabacco mosaic virus (TMV) has a rod-like apperance that is 300nm log with a diameter of 18 nm.
- It is covered by a protein shell called Capsid that encloses the virus's genetic material.
- The genetic material is a single-stranded RNA molecule.
- Tabacco mosaic virus that belongs to the genus Tobamovirus.

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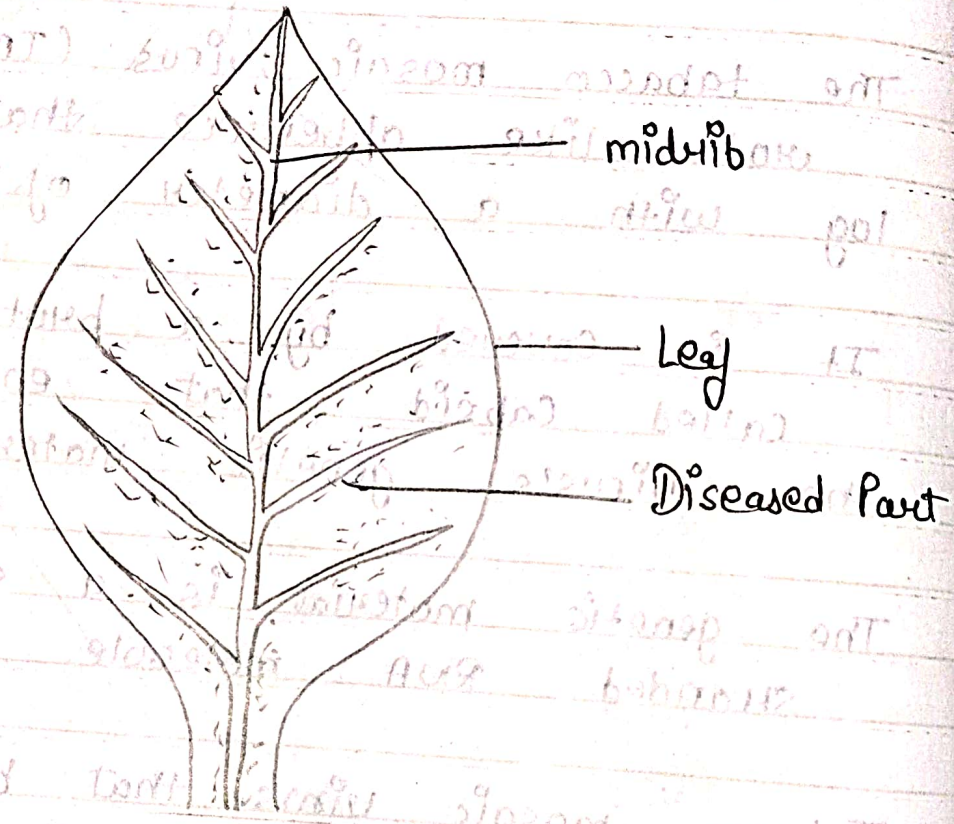

Tabacco Leaves Disease

PAGE NO. .....

DATE .....

Tobacco Leaves Disease

- Tobacco mosaic disease are Affected plants show leaves with mottling or mosaic pattern of light green and dark - green areas.
- Primary symptoms appear on newly formed young leaves as vein clearing, greenish yellow mottling.
- Injection on young plants results in stunted growth, malformation, distortion and puckering of leaves.
- In a bacterial, viral, fungal and other disease are consist.

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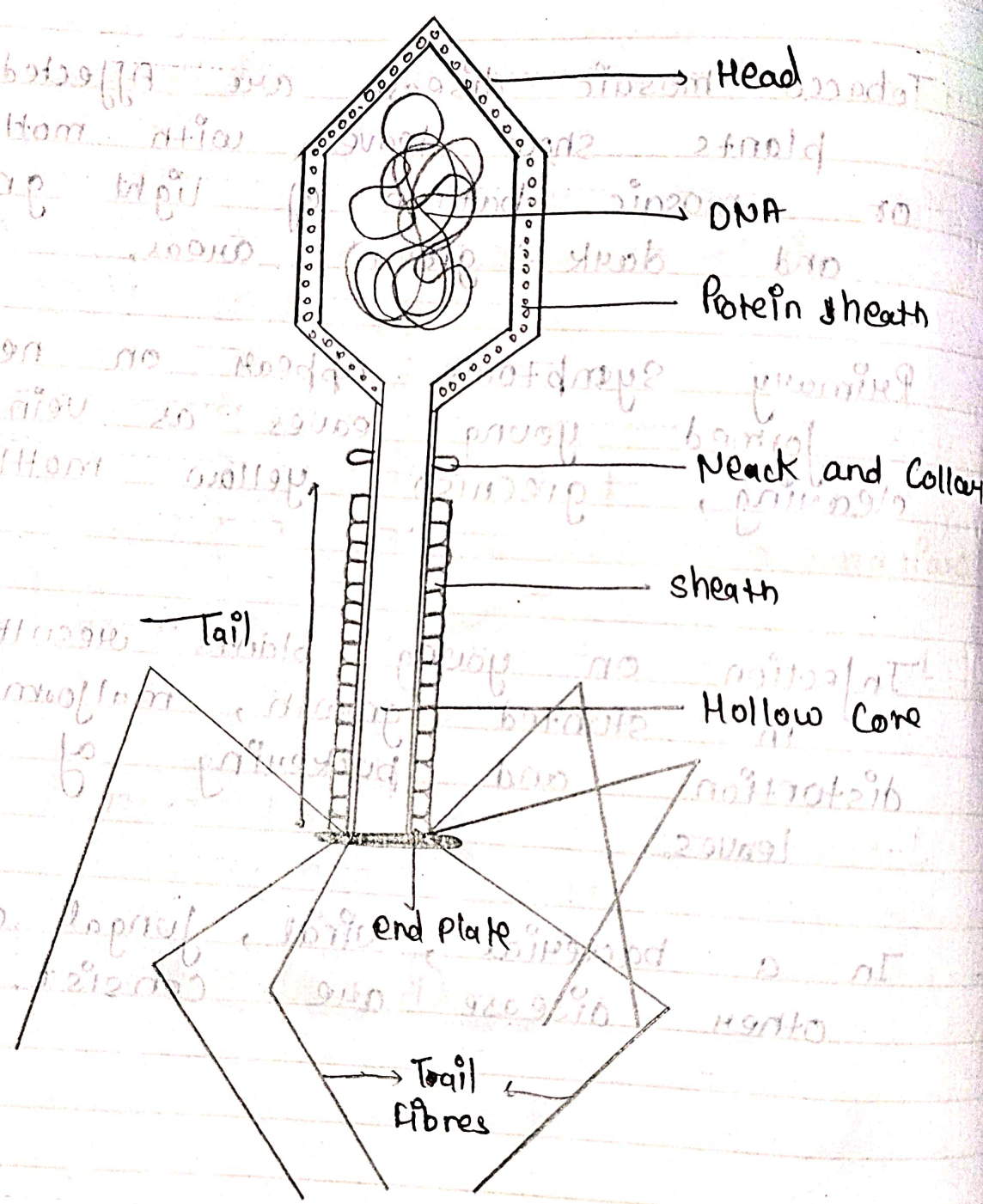


Bacteriophage

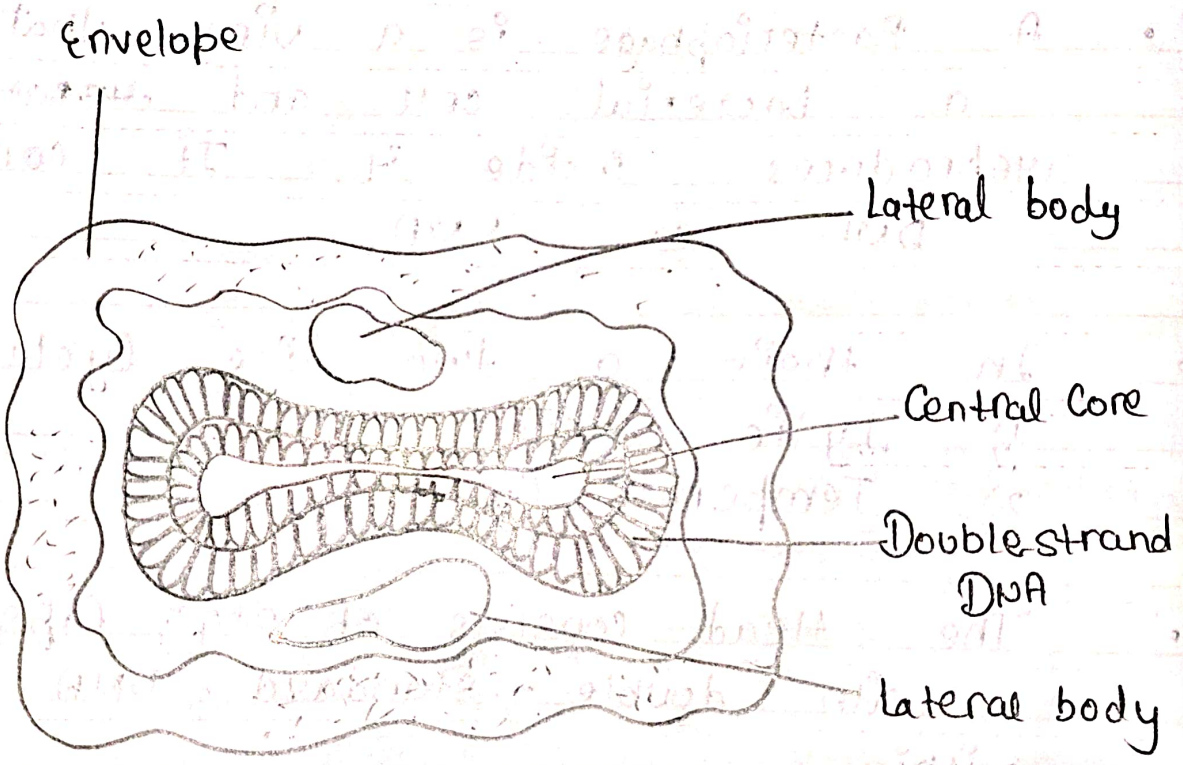
Bacteriophage

- A Bacteriophage is a virus that infects a bacterial cell and reproduces inside it. It contain DNA or RNA.

- In their a two life cycle :-
  1) Lytic Cycle
  2) Temperate Cycle

- The Head consists of 2000 Capsomeres with double - standard DNA enclosed within.

- The tail consists of an inner hollow tube which is surrounded by a contractile sheath with 24 annular rings.


Envelope
Lateral body
Central Core
Double strand DNA
lateral body

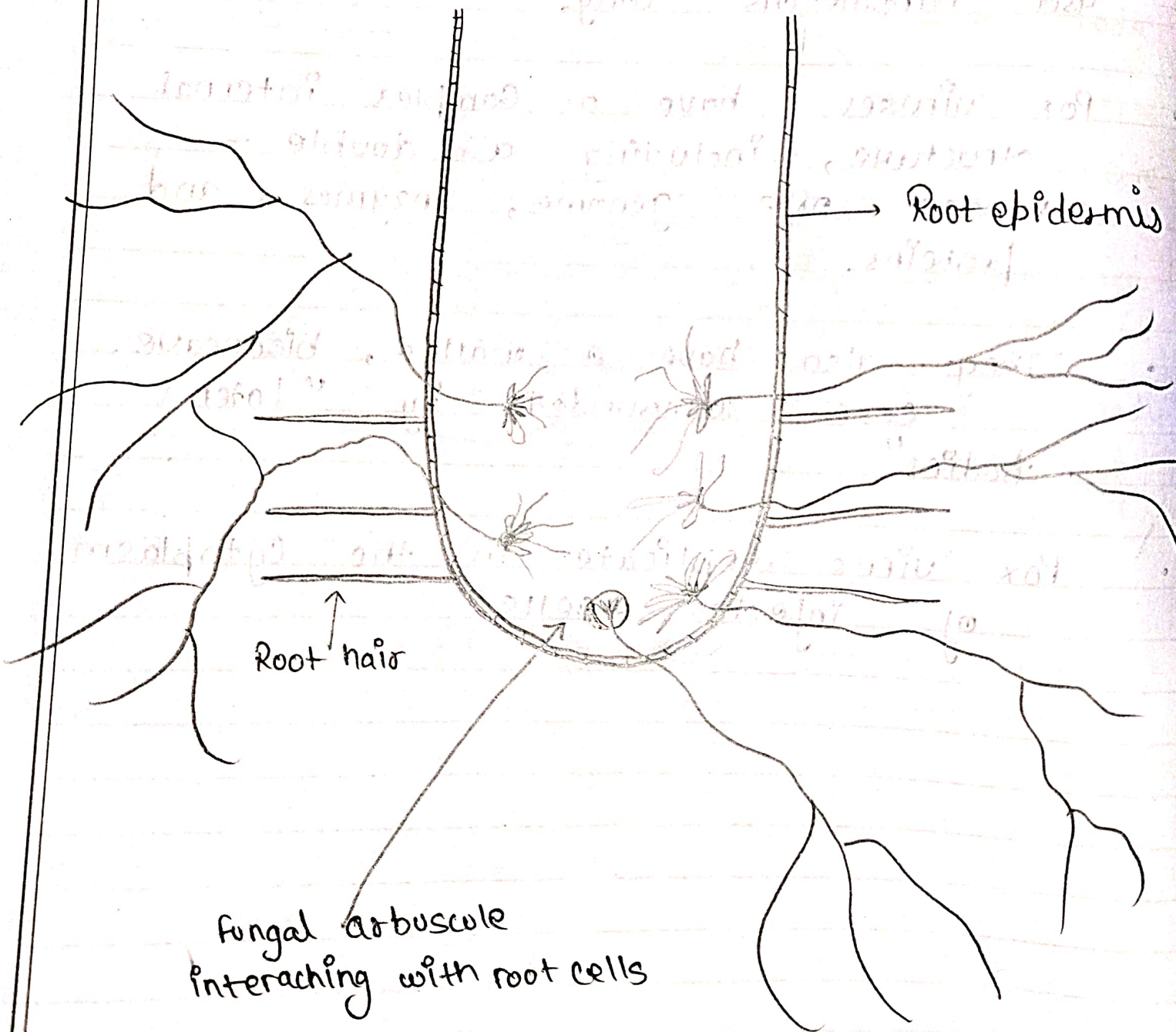
Pox Virus

PAGE NO. .....

DATE .....

Pox Virus

- Pox virus are brick-shaped or oval, and can be between 220 and 450 nanometers long.
- Pox viruses have a complex internal structure, including a double-stranded DNA genome, enzymes, and proteins.
- They also have a walled, biconcave core surrounded by "lateral bodies".
- Pox virus replicate in the cytoplasm of infected cells.


Root epidermis
Root hair
fungal arbuscule
interaching with root cells

MYCORRHIZA

PAGE NO. .....

DATE .....

Mycorliza

- Mycorrhiza is a symbiotic relationship between a plant and a fungus that occurs in the plant's root system, or rhizosphere.
- The word "mycorrhiza" comes from the Greek words mycos, meaning fungus, and rhiza, meaning root.
- Mycorrhiza are found in around 90% of all land plants and have been around for about 400 million years.
- There are different types of Mycorrhizae, including ectomycorrhiza and endomycorrhiza.

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