

Botany and Medicinal Plants

PG 101

Intended learning outcomes

- ▶ Upon completing this practical course you should be able to
- ▶ 1-understand the function of different parts of microscope
- ▶ 2-identify different cellular structures and components of plants
- ▶ 3-Identify microscopic characters of chosen plants with medical importance
- ▶ 4-Investigate different plant specimen using microscope.
- ▶ 5-conduct chemical tests to identify the constituents of chosen medicinal plants.
- ▶ 6-write scientific reports regarding samples under investigations.
- ▶ 7-work in a team and gain the skills to represent your work.

Introduction to microscopy & cell types

Section 1

Objectives

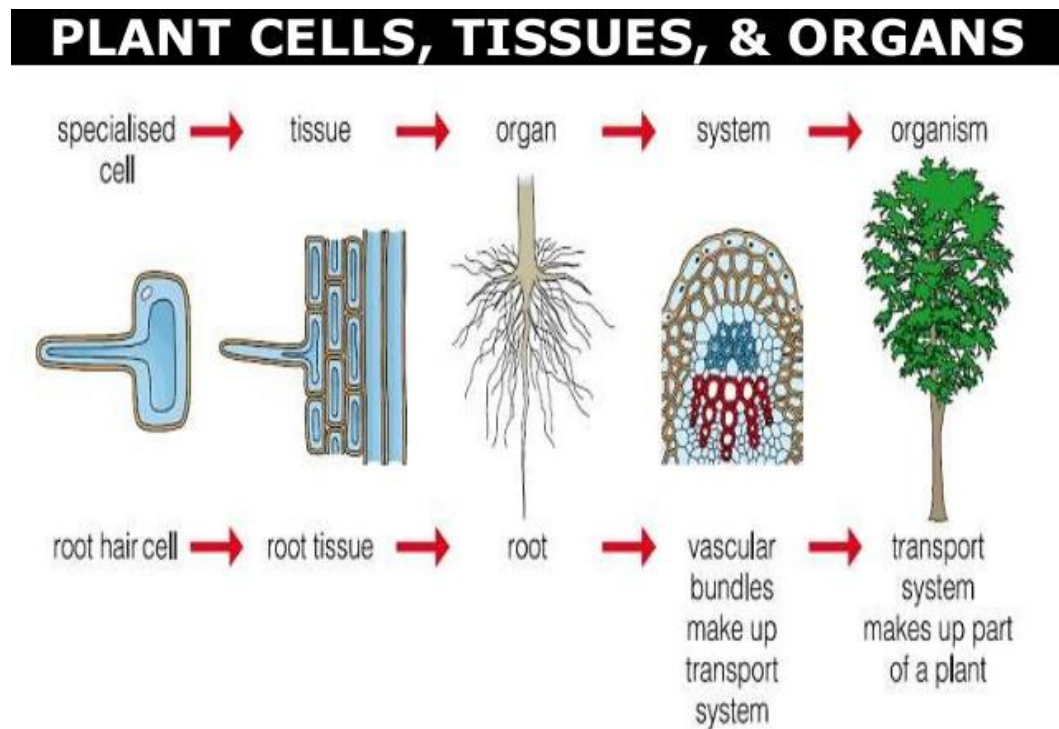
- ▶ Enumerate types of the tissues in the plant.
- ▶ Realize the relationship between the nature of the cells and the function of the tissue
- ▶ Recognize different types of cells under the microscope.

Cell types

Histology of plants

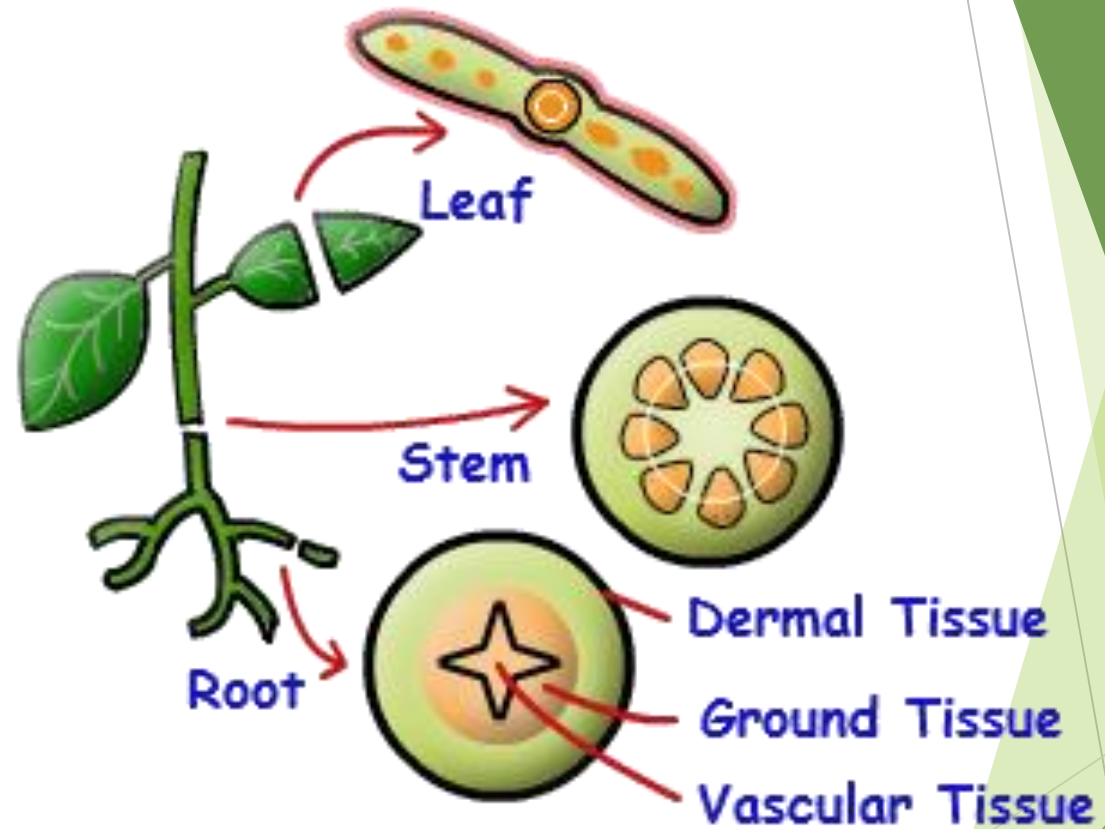
Histology of plants

- ▶ As any living being, plants have different organs which consist of different tissues which consist of cells.
- ▶ so the basic unit in living beings is the cell.

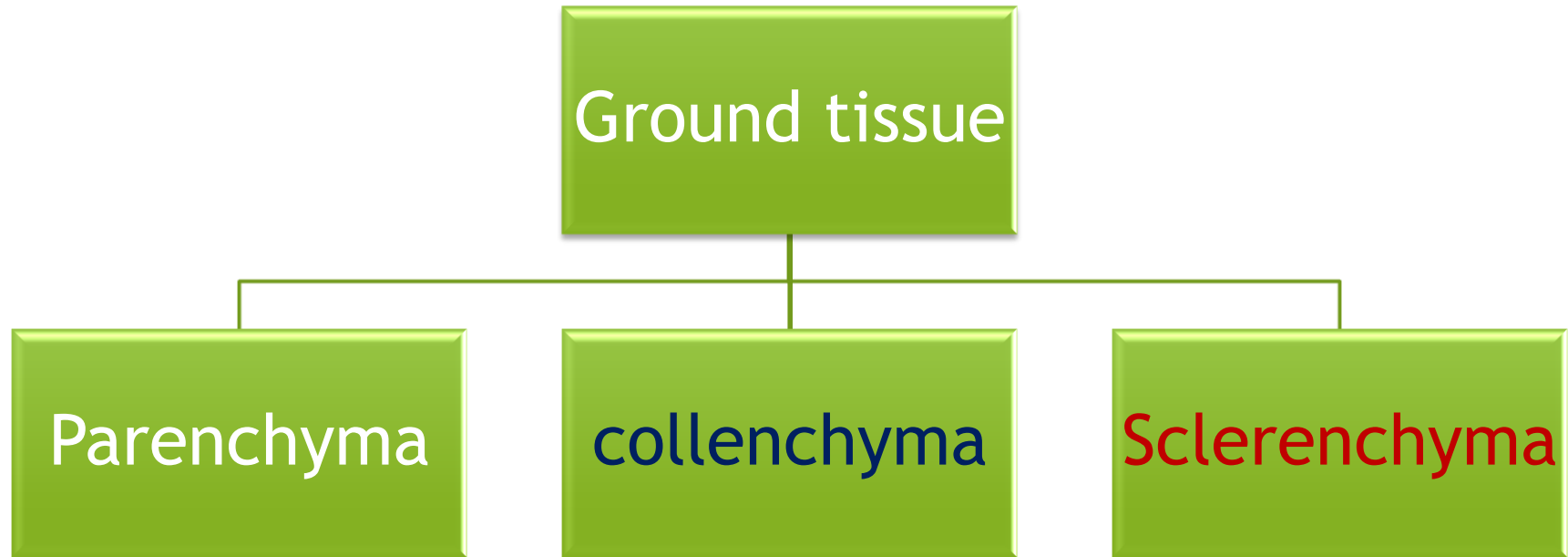


General classification of tissues in plants

- ▶ The ground tissues
- ▶ The dermal tissues
- ▶ The vascular tissues
- ▶ The secretory tissues



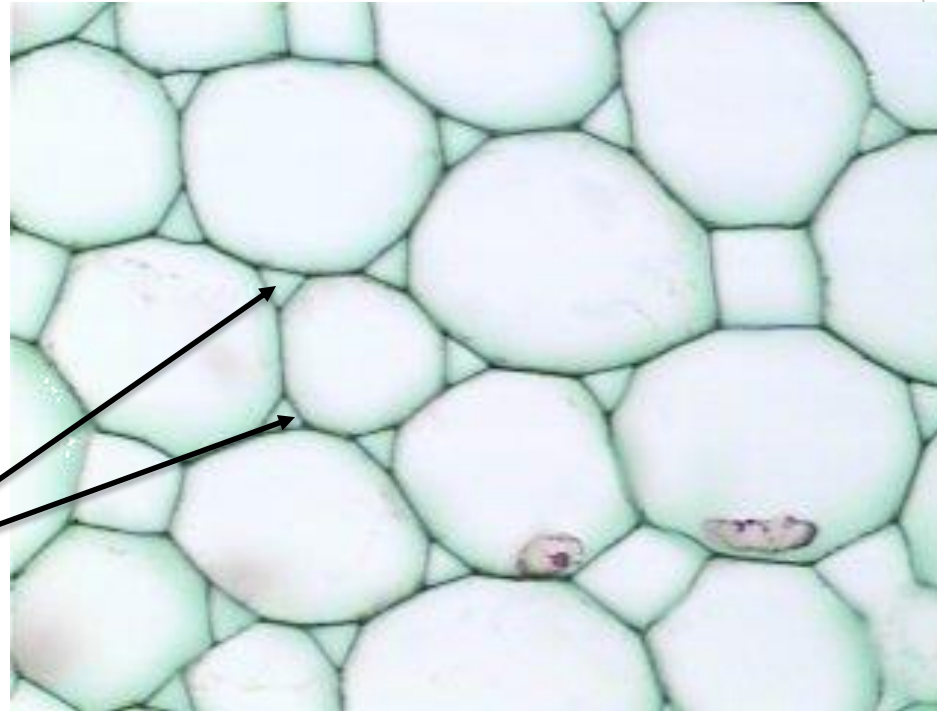
I-The ground tissue



I-The ground tissue

- ▶ A-Parenchyma
- ▶ living cells, having a large vacuole and thin wall
- ▶ Isodiametric or elongated
- ▶ Retain their ability to divide
- ▶ Large intercellular space

Intracellular space



I-The ground tissue

A-Parenchyma

Some times they're modified to do special functions

Chlorenchyma

- ▶ Parenchyma having chloroplast to do the photosynthesis

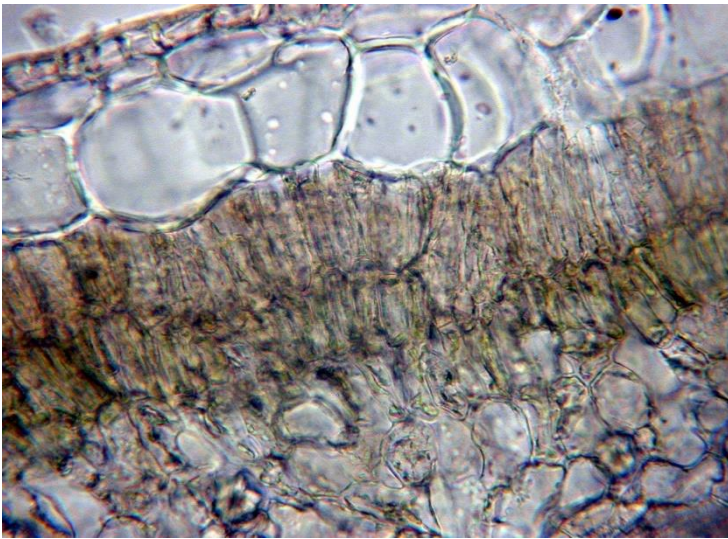
Aerenchyma

- ▶ Cells having in between large air spaces
- ▶ Found in aqueous plants

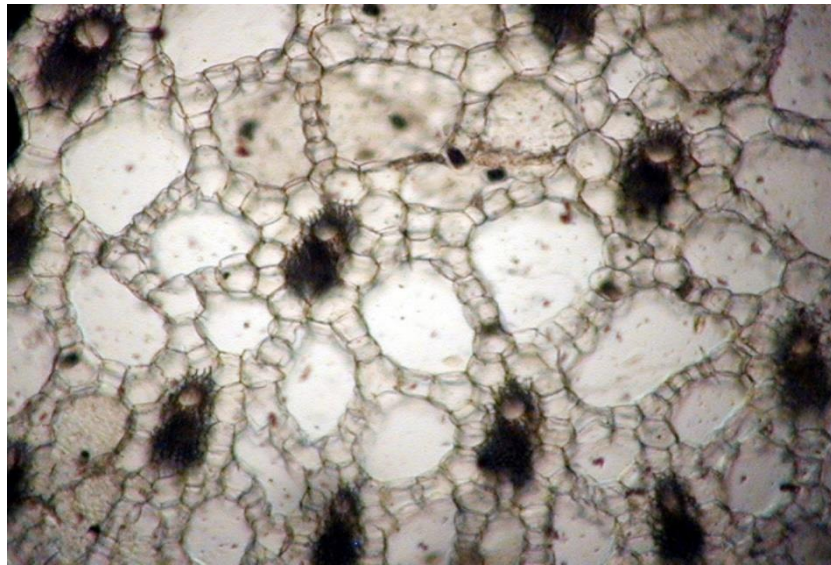
I-The ground tissue

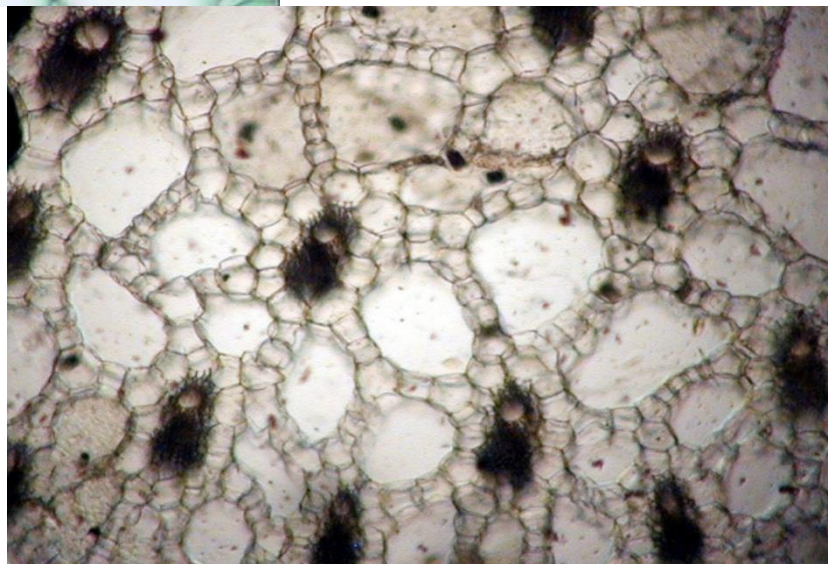
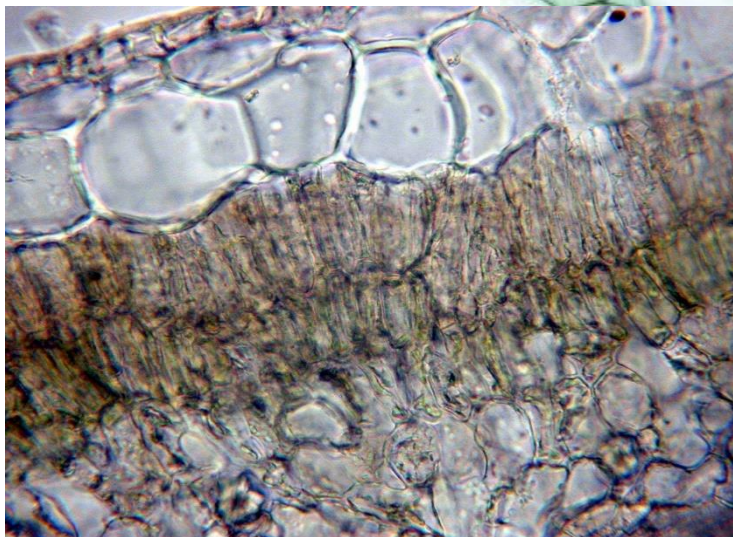
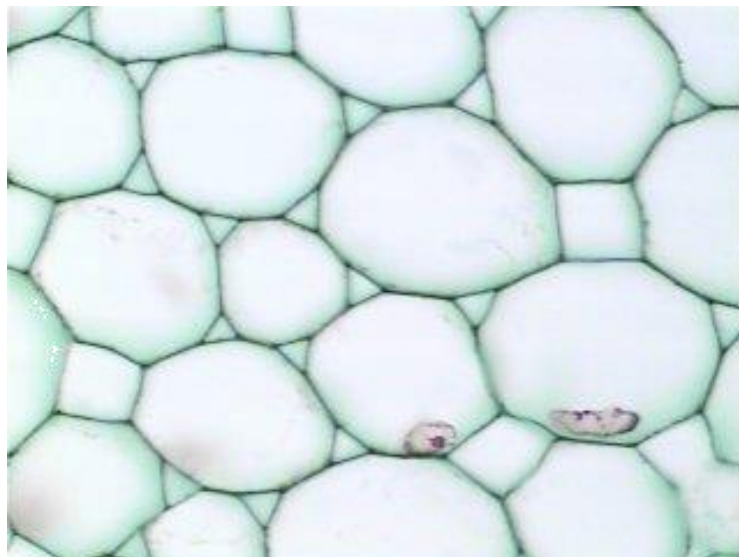
Some times they're modified to do special functions

Chlorenchyma



Aerenchyma





I-The ground tissue

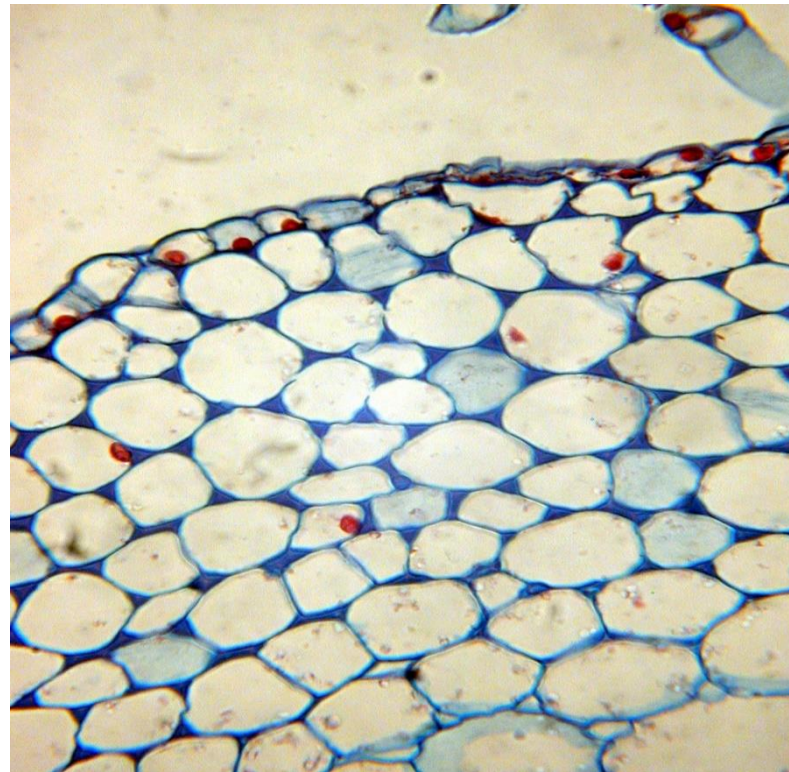
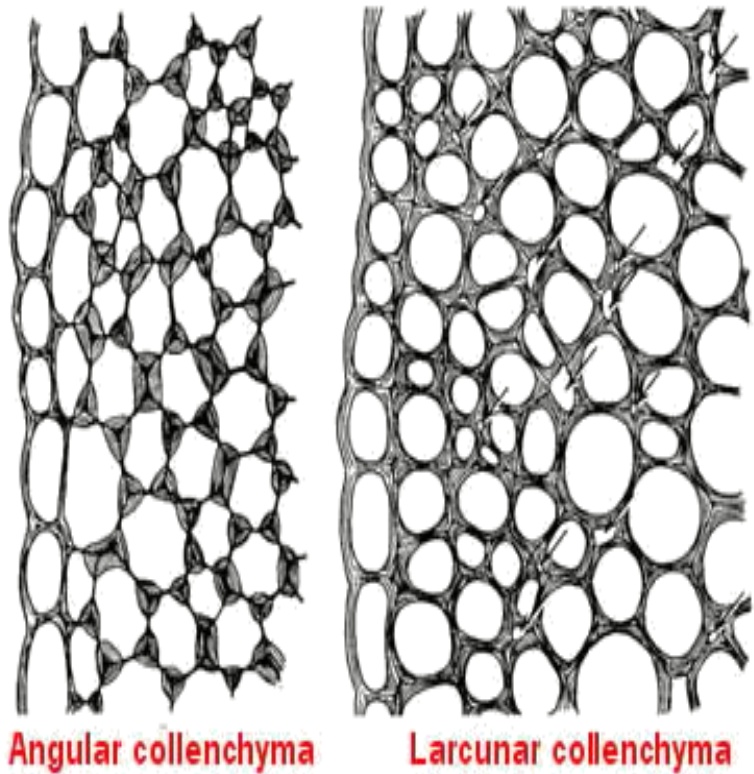
► B-Collenchyma

- Living cells
- More elongated and narrower than parenchyma
- Have cellulosic walls of irregular thickness.
- No intracellular space
- For stretching power and Supporting tissue

I-The ground tissue

► Collenchyma types

1. Thickness on corners (angular)
2. Thickness with intercellular space (lacunar)



I-The ground tissue

▶ C-Sclerenchyma

- Non living cells
- Their walls consists of :cellulose , hemicellulose and lignin
- Work as supporting tissue in plants
- ▶ They are considered as lignified elements
- ▶ gives red color with phloroglucinol/HCL

I-The ground tissue

C-Sclerenchyma Types

1-Sclerides

- ▶ Short, rounded or rectangular sclerenchymatous cells with wide lumen

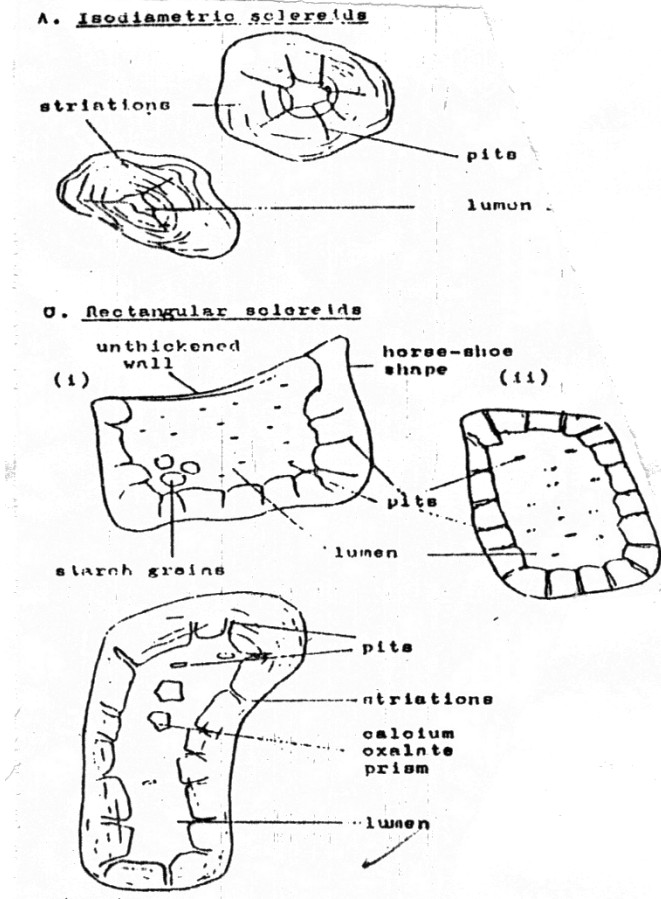
2-Fibers

- ▶ Very long and narrow sclerenchymatous cells with tapering ends

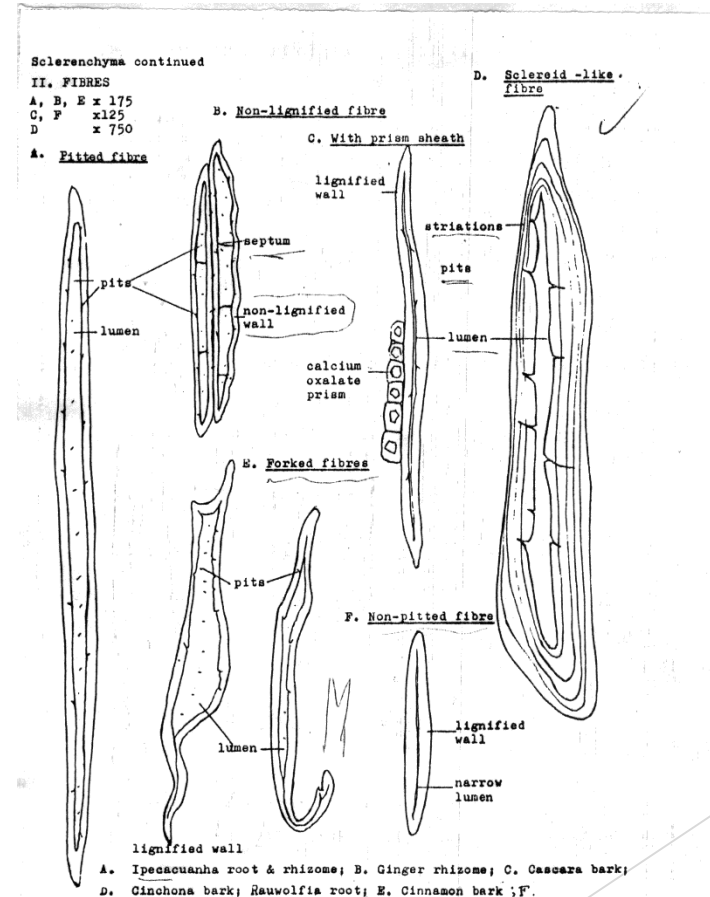
I-The ground tissue

C-Sclerenchyma Types

1-Sclerides



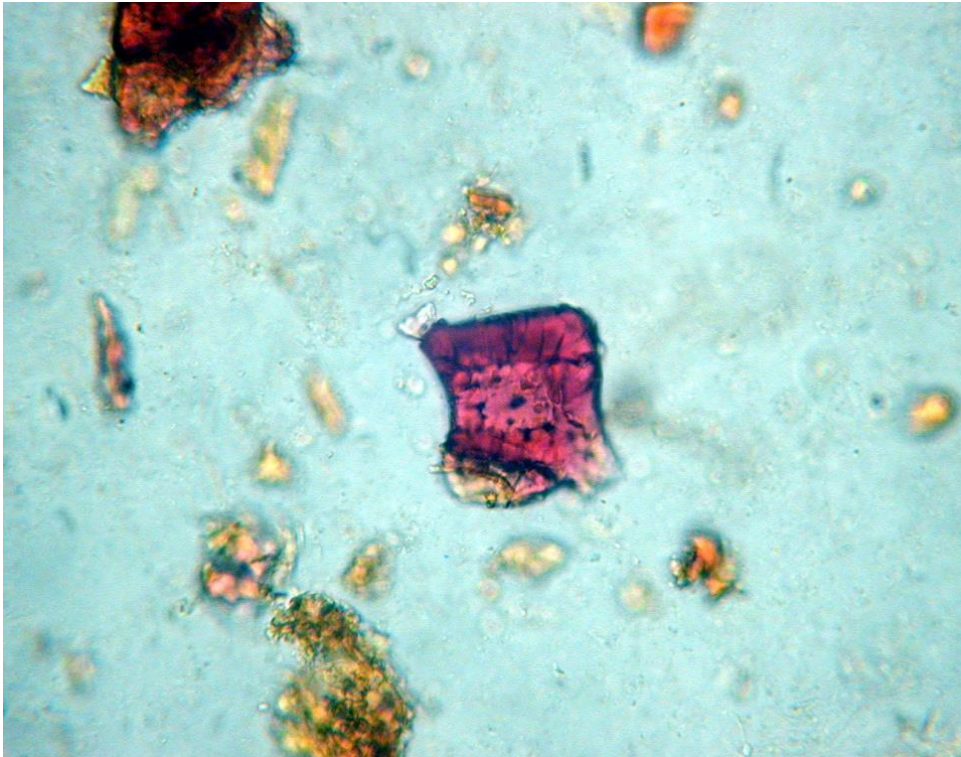
2-Fibers



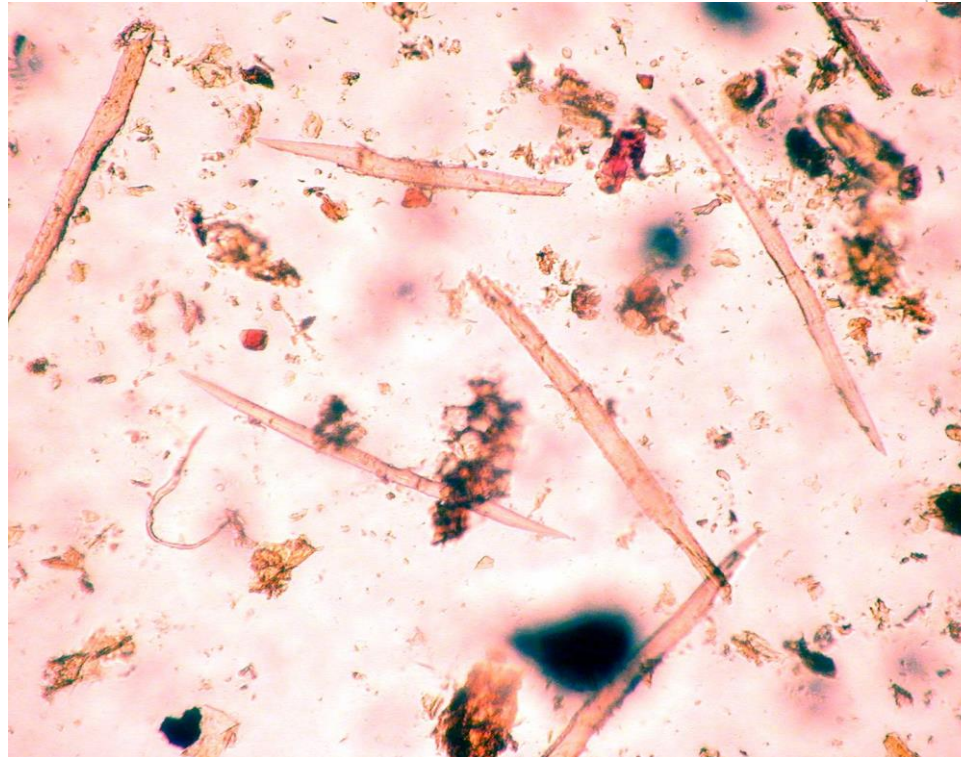
I-The ground tissue

C-Sclerenchyma Types

1-Sclerides



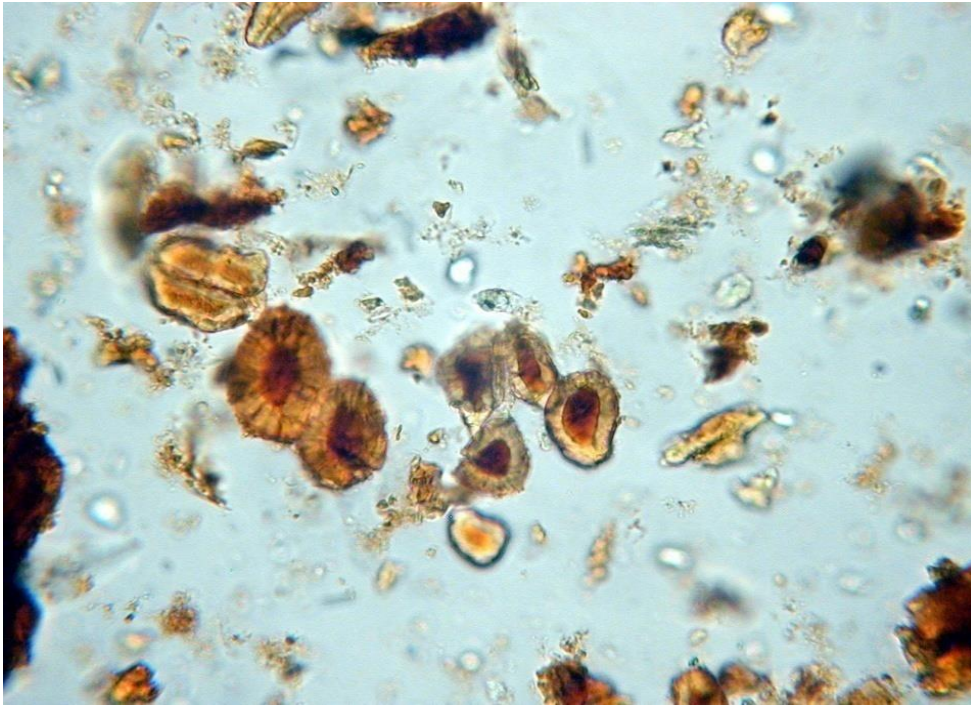
2-Fibers



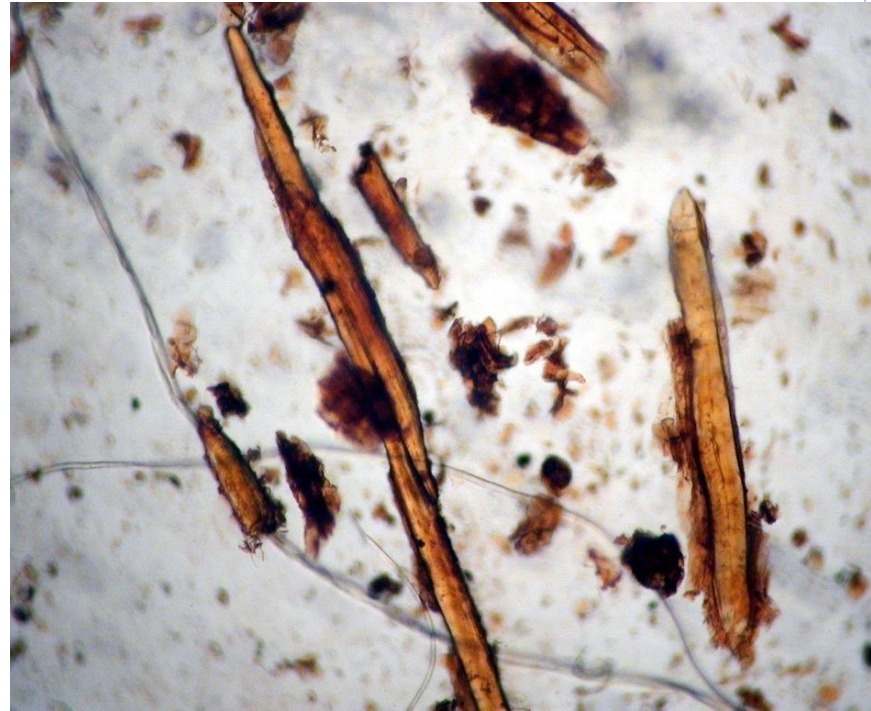
I-The ground tissue

C-Sclerenchyma Types

1-Sclerides

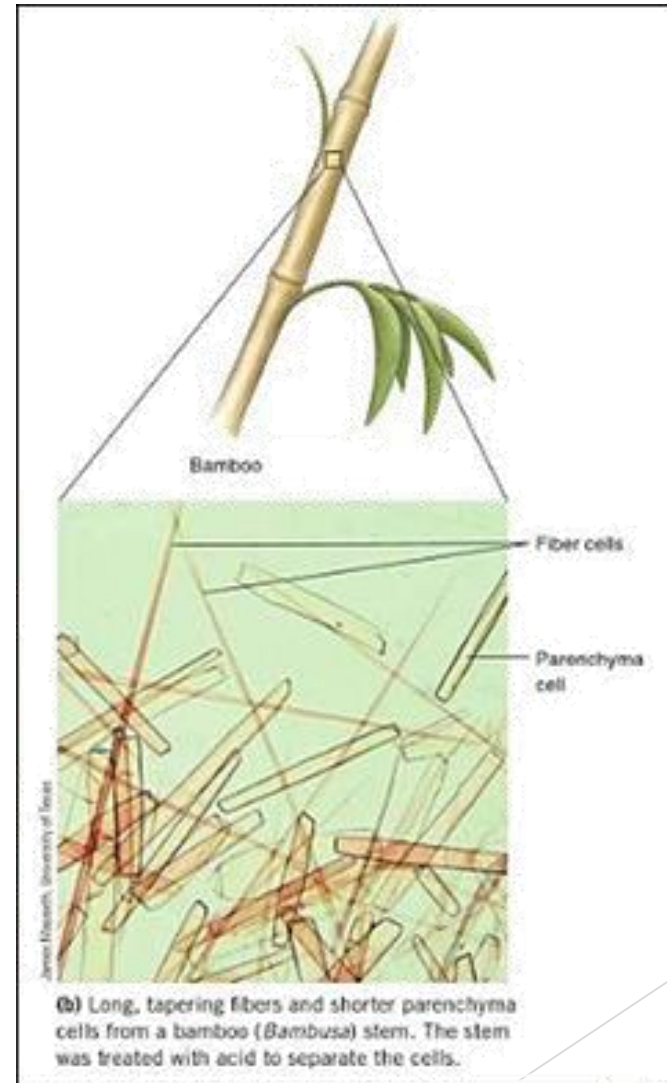
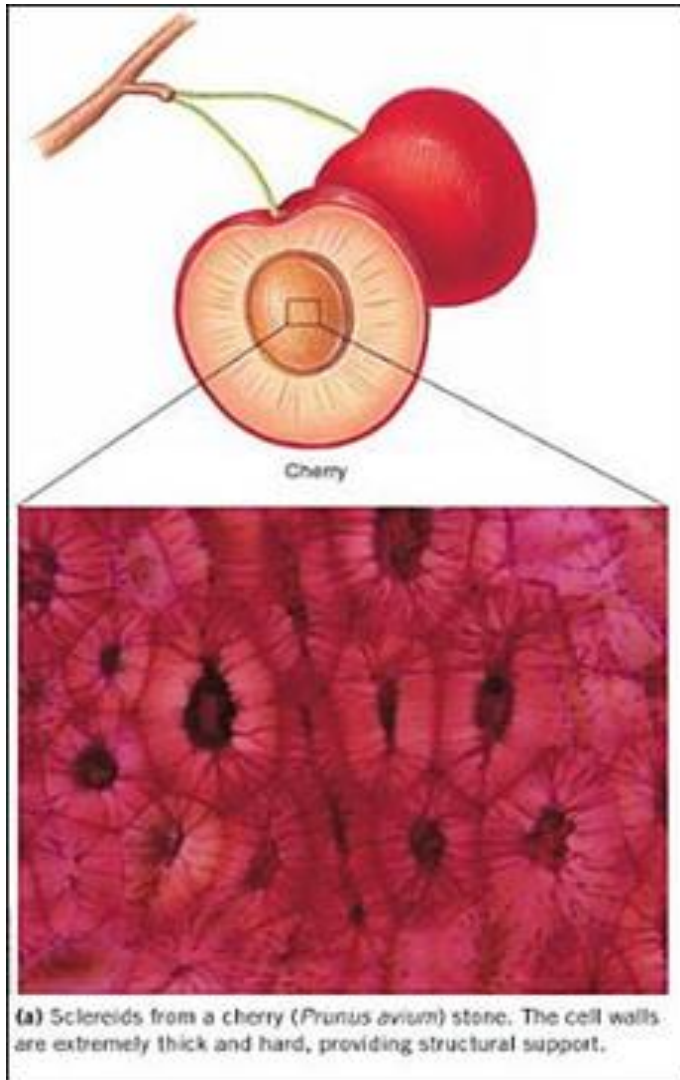


2-Fibers



I-The ground tissue

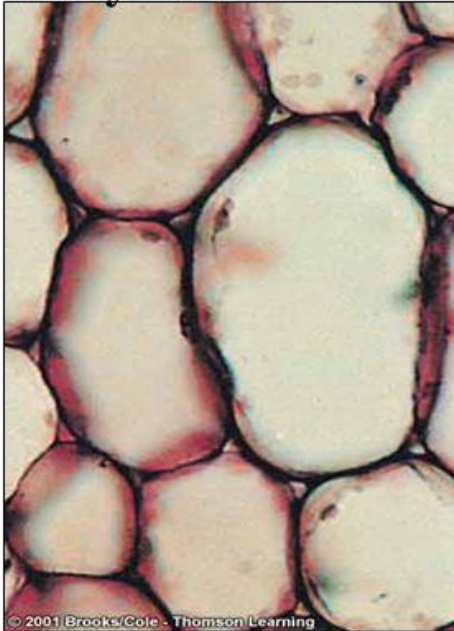
C-Sclerenchyma Types



I-The ground tissue

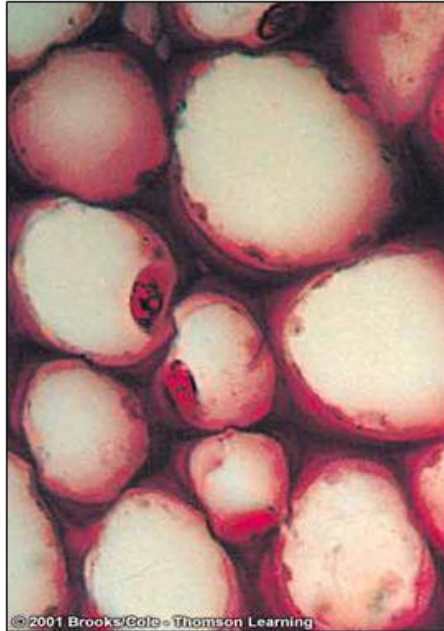
Plant Ground Tissues

- Thin cell wall
- Storage & photosynthesis



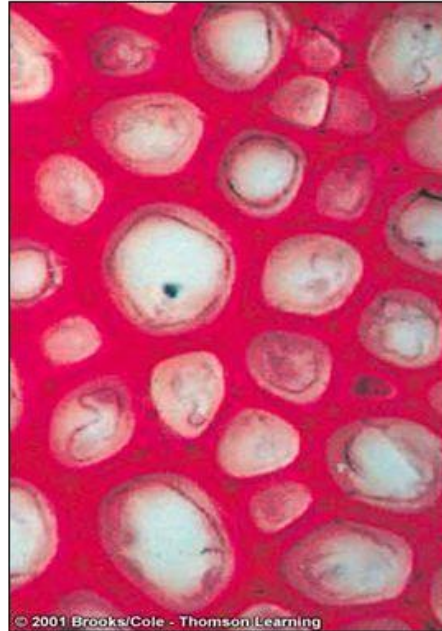
PARENCHYMA

- Uneven cell wall
- Flexible support



COLLENCHYMA

- Thick cell wall
- Strength and support

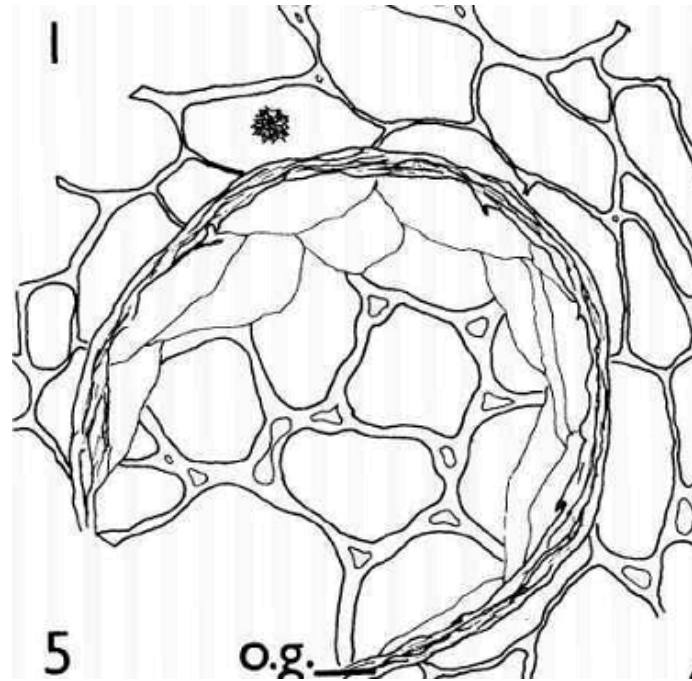
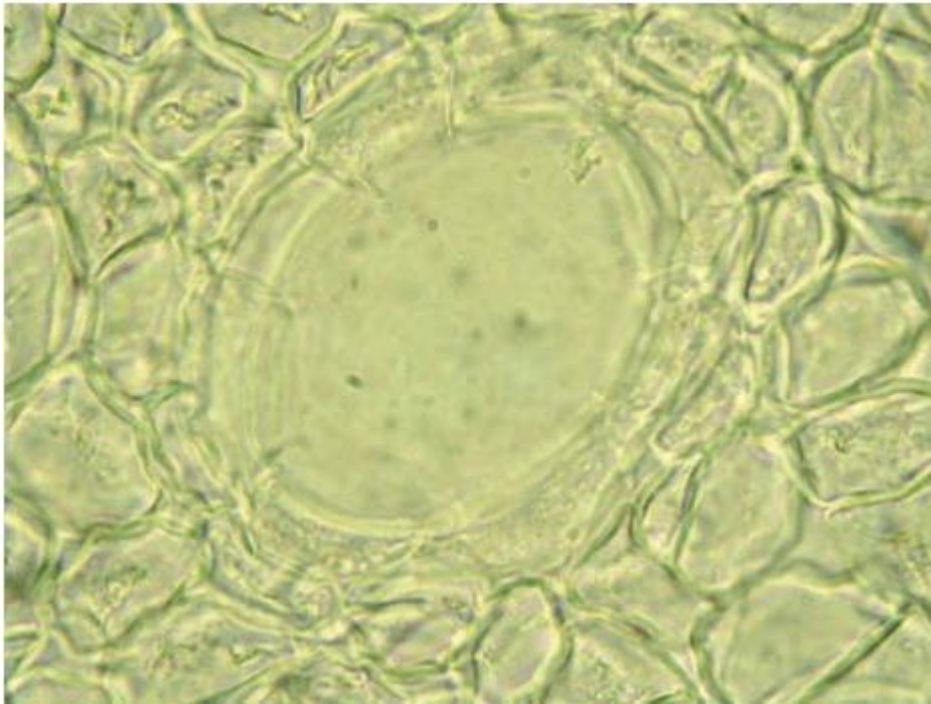


SCLERENCHYMA

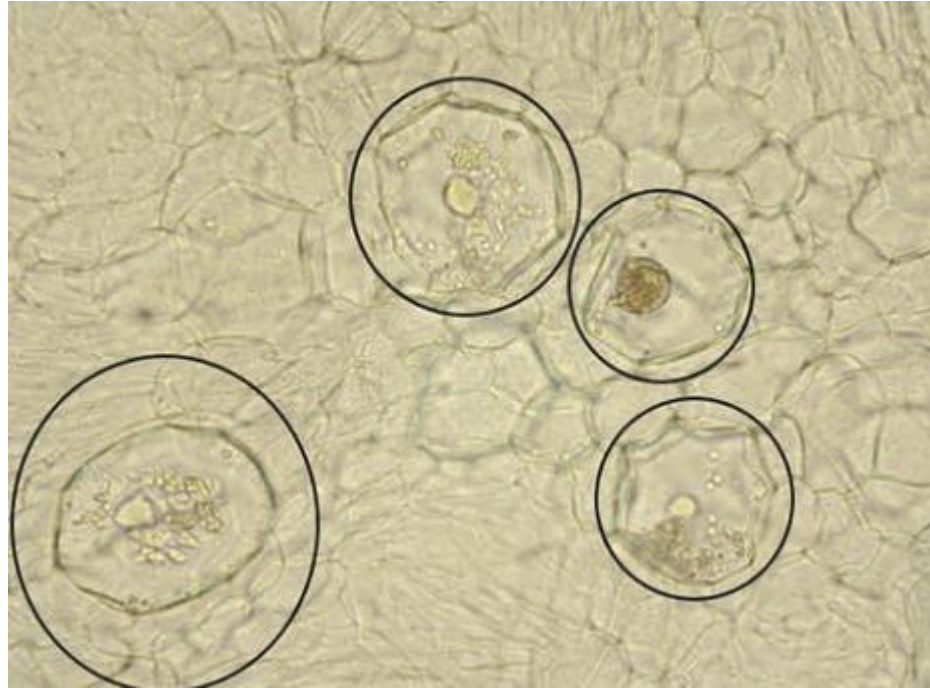
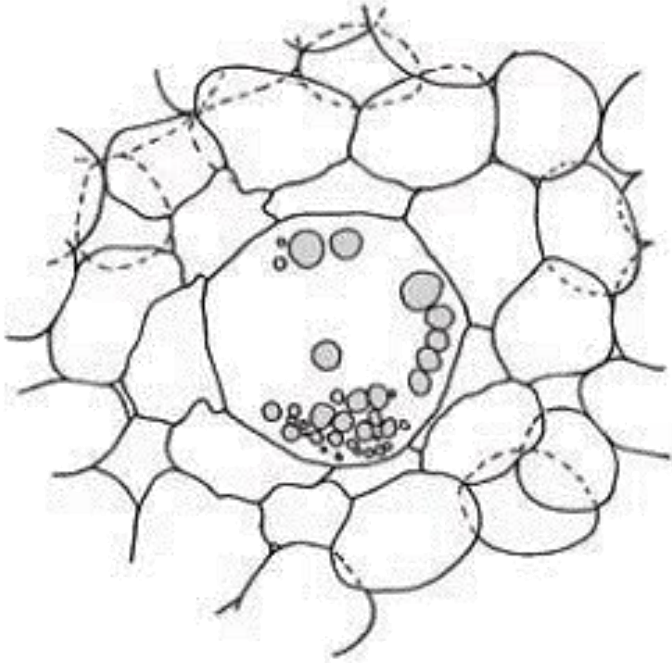
Secretory tissue

- ▶ Secretory cells, ducts, and cavities occurs within plant organs rather than on surface tissue.
- ▶ Secretory cells and tissues are generally classified according to the nature of their secretion.
- ▶ When it is ovoid, it is called a cavity, and when it is elongated, it is termed a duct or canal

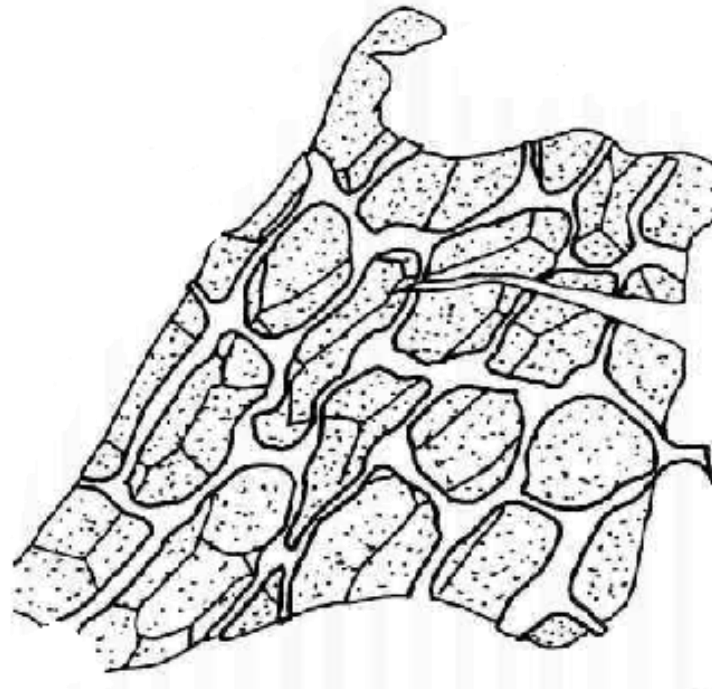
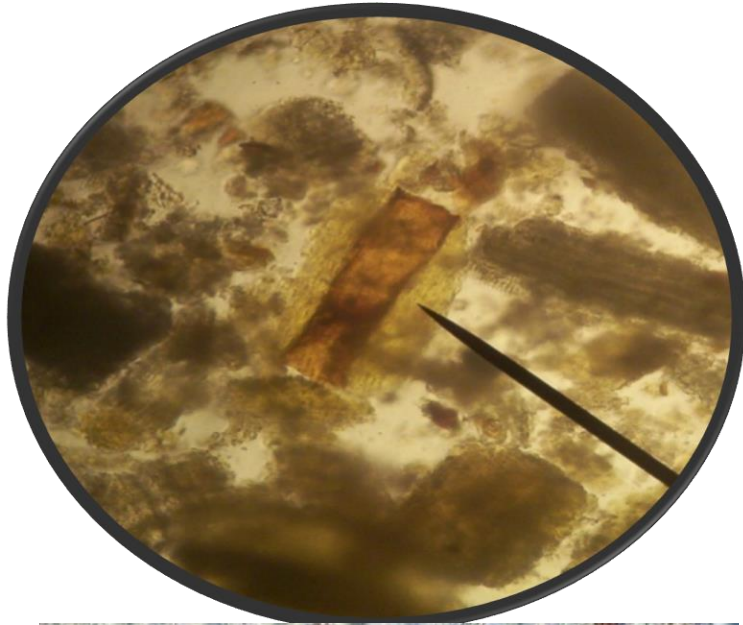
- Schizolysogenous oil gland in clove bud flowers



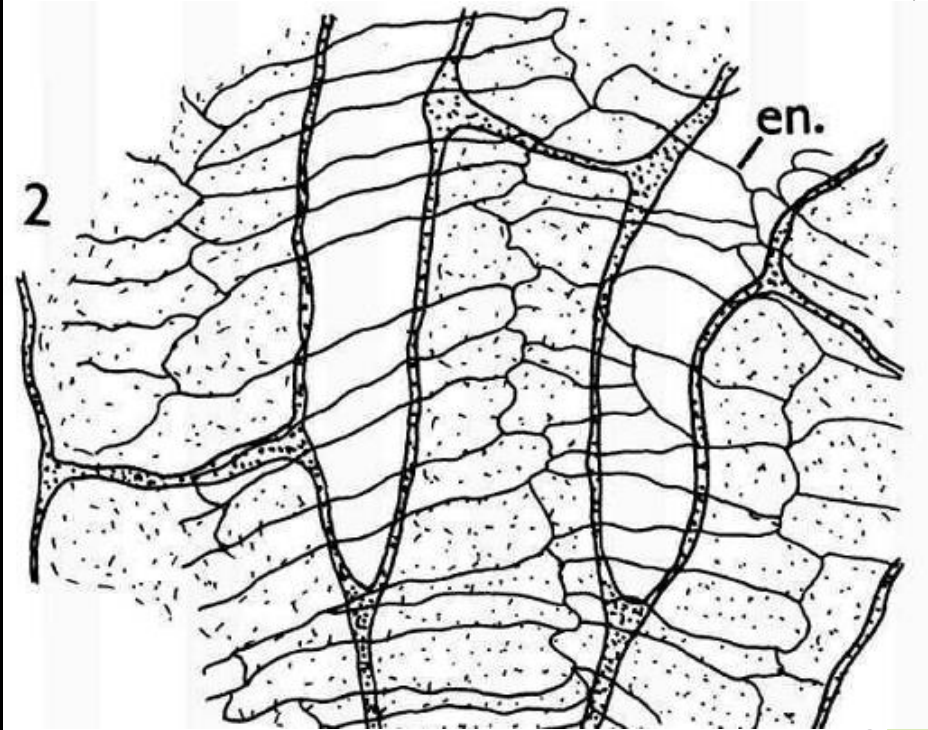
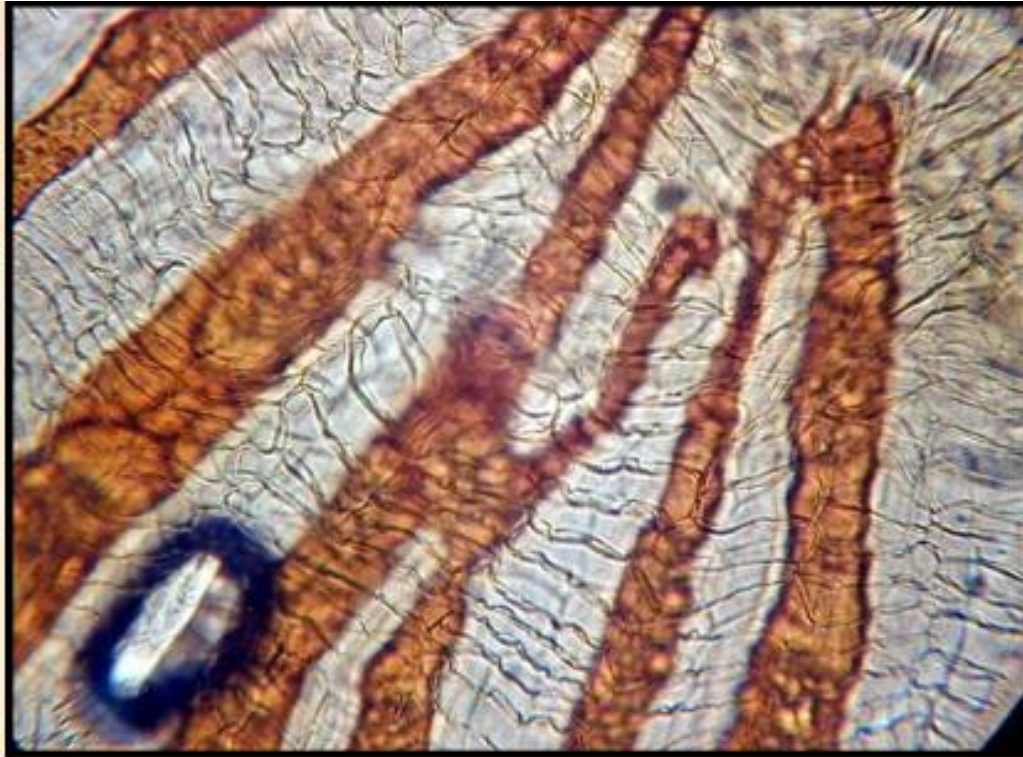
- Oil glands in ginger rhizome



Unbranched vittae of fennel fruit



Branched vittae of Anises fruit



Home work

- ▶ Compare between different types of cells in the ground tissue.

Thank you