PHARMACOGNOSY II PRACTICE
SPRING SEMESTER
MICROSCOPE LABORATORY PRACTICE

AIM

- We will examine the microscopic elements of the plants carrying the secretory substances.
- The secretion is the name given to the substances found in the plants that are metabolisable but not re-metabolized. Secretions can be found in different cells, tissues and organs in plants.
- Sometimes secretory substances can occur in all the tissues of the plant, such as conifers (Coniferae), sometimes only in special organs and tissues, for example in rose petals , in mentha leaves and in a shell of cinnamon ...

SECRETORY GLANDS

- Essential oil, resin, balsam, oleoresin-secreting organs are called **secretory glands**.

- The secretory glands are 2 groups:

1. External secretory glands: It consists of glandular trichomes.

Glandular trichomes: It consists of two parts, stipe and head. The substance of the secretion occurs in the secretory cells of the head. The secretory substance is collected between the cells and the cuticle. We will examine the glandular trichomes of the Labiatae and Compositae families.

2. İnternal secretory glands:

a) Secretory cells: They hide the substance of the secretion within themselves. Their walls are subdued. There is no starch in the cells that secrete.

b) Secretory pockets: These are gaps in the secretion material. The schizogen may be lysigenic or schizolizigen type.

SECRETORY GLANDS

- b) Secretory pockets:
  - Schizogenous oil glands: The parenchymal cells that secrete multiply and separate from each other. In this way pocket which accumulates the secretion will occurs between these parenchymal cells.
  - Lysigenous oil glands: As the parenchymal cells that secrete are multiplying, a gap is formed between the faces of each other. The secretion accumulates in this space.
  - Schizolysigenous oil glands: The pockets that occured when these two incidents above are happen together.

c) Secretory canals: Extension spaces in paths. These may also be schizogen, lysogenic or schizolizigenic

d) Inner glandular trichomes: A stem is a small secretory hair, which is composed of a head part and is located between cell spaces.

REAGENTS IN MICROSCOPICAL STUDIES

- **Water, distilled**: A useful mountant for starches. Sections which have been bleached with solution of chlorinated soda or similar reagent may be freed from the bubbles of gas which they frequently contain by placing them in freshly boiled distilled water.
- **Chloral hydrate solution:** (chloral 50 g, water 50 ml): A valuable and widely used clearing agent. Dissolved starch, have an effect when heating the preparate.
- **Sartur Reagent** (**Sar**ım ÇELEBİOĞLU & **Tur**han BAYTOP): It allows one to make various diagnoses on the same section.

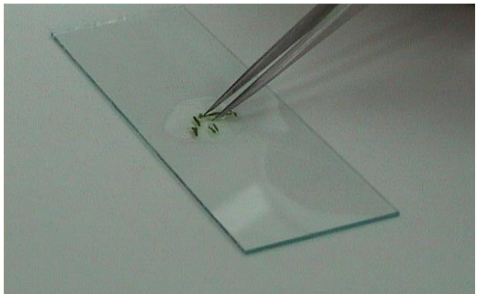
SARTUR REAGENT

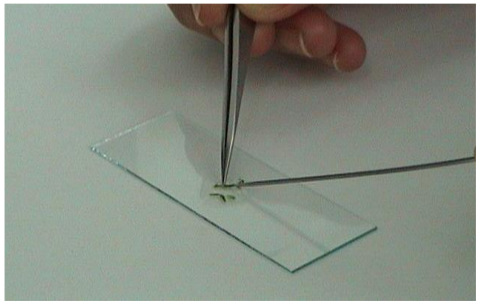
- **Sartur** Reagent (**Sar**ım ÇELEBİOĞLU & **Tur**han BAYTOP):
- **Composition**:
  - Lactic Acid
  - Lactic Acid saturated with sudan III (at cold)
  - Aniline
  - Iode
  - Potasium iodide
  - Alcohol 95%
  - Distilled Water

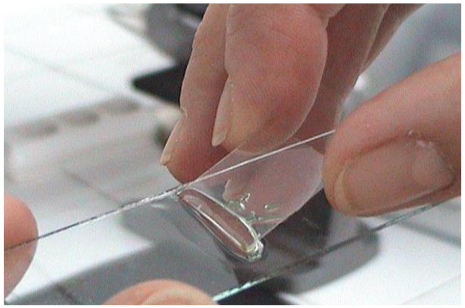
REAGENTS IN MICROSCOPICAL STUDIES

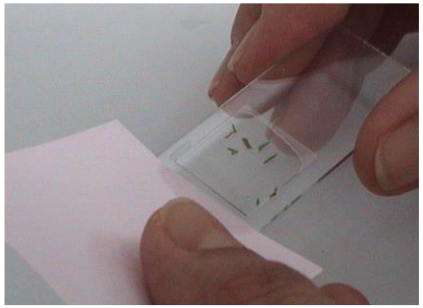
- ***Lactic Acid***: Clarify sections and preparates
- ***Sudan III***: Stains oils and suberized walls (cork tissues) to orange-brown. It is also usefulin the
- examination of secretory cells and ducts.
- ***Aniline:*** Reacts with lignin in acidic conditions and give yellow colour (stains the
- schlerenchyma tissues, xylem, stone cells and scleroids)
- **Iode**: Reacts with starch and stains to blue-purple.
- **Potasium iodide**: It is essential to solve iode.
- **Alcohol** 95% and **water** are the supporting elements for the preparation of reagent.

HOW TO MAKE WET MOUNT?





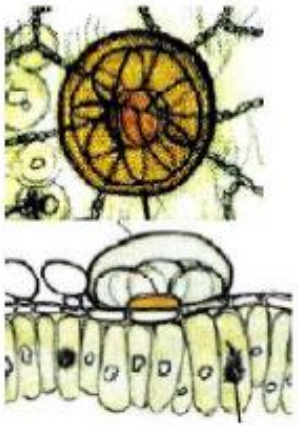




FOLIA MENTHAE

- Drug: Folia Menthae
- Plant: *Mentha piperita*
- Reagent: Chloral hydrate
- Total Magnification: 10 x 40
- Specific anatomic element: Labiatae type glandular trichomes

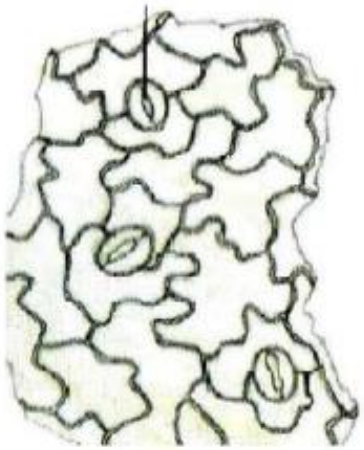
FOLIA MENTHAE



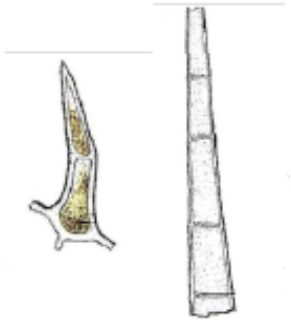
Upper view

Side view

Glandular trichomes



Stomata

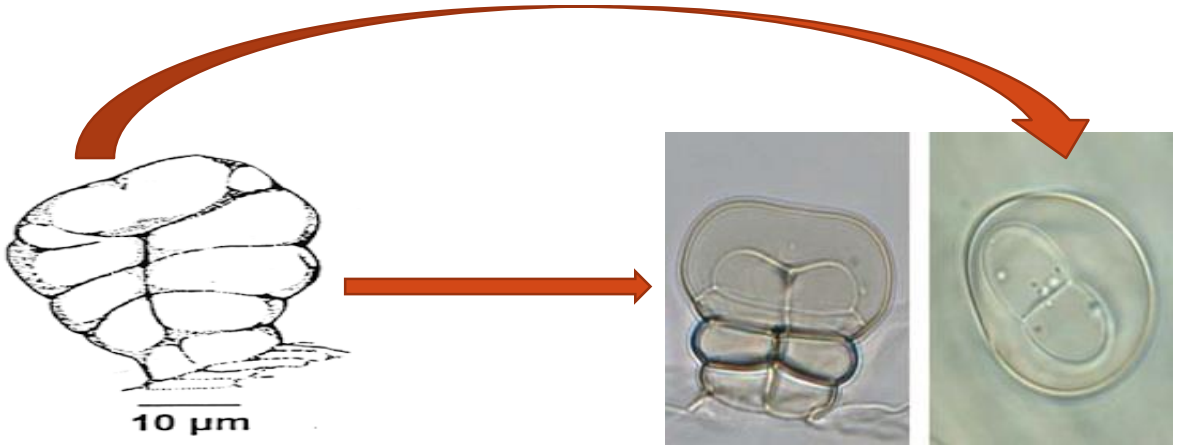


Multicellular trichomes

HERBA ABSINTHI

- Drug: Herba Absinthi
- Plant: *Artemisia absinthium*
- Reagent: Chloral hydrate
- Total Magnification: 10 x 40
- Specific anatomic element: Compositae type glandular trichomes

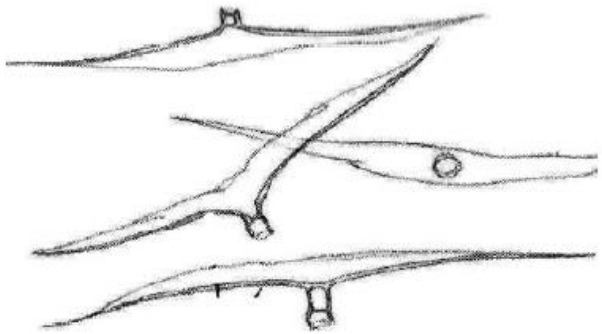
HERBA ABSINTHI



Glandular trichomes

Side view

upper view

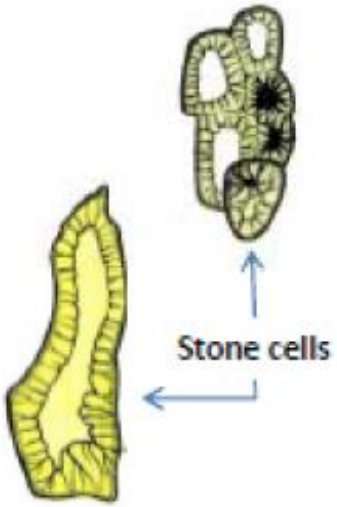


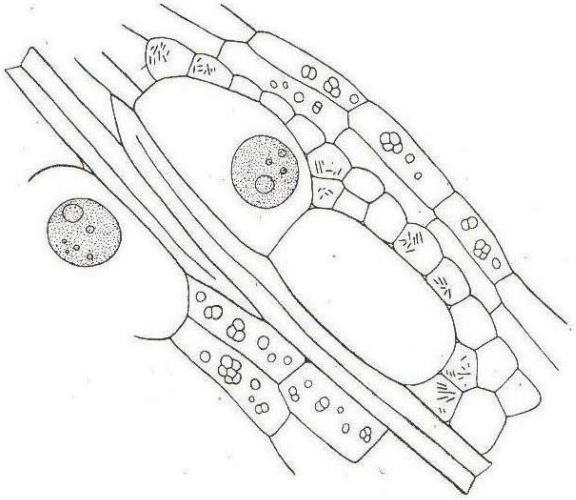
T-shaped trichomes

CORTEX CINNAMOMI

- Drug: Cortex Cinnamomi
- Plant: *Cinnamomum cassia*
- Reagent: Sartur
- Total Magnification: 10 x 40
- Specific anatomic element: Glandular cells between parenchymal cells, Stone cells and sclereids.

CORTEX CINNAMOMI





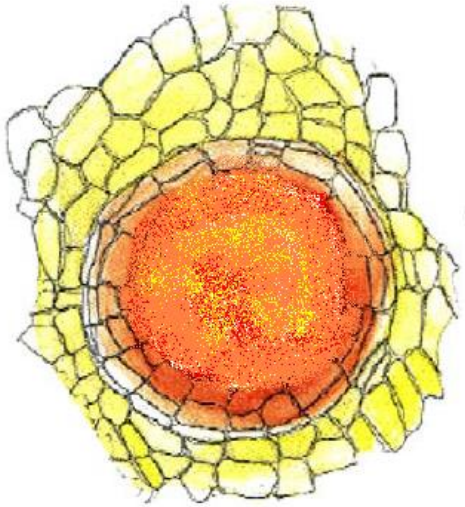
Glandular cells

Sclereids

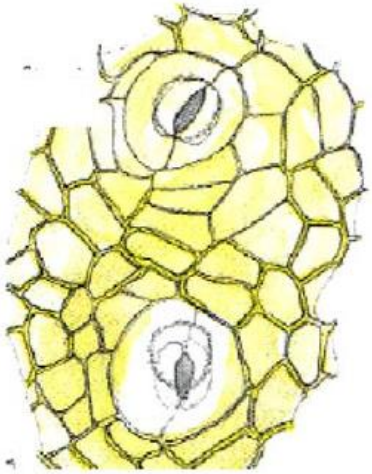
FOLIA EUCALYPTI

- Drug: Folia Eucalypti
- Plant: *Eucalyptus globulus*
- Reagent: Chloral hydrate
- Total Magnification: 10 x 40
- Specific anatomic element: Schizolysigenous oil glands

FOLIA EUCALYPTI



Schizolysigenous oil glands

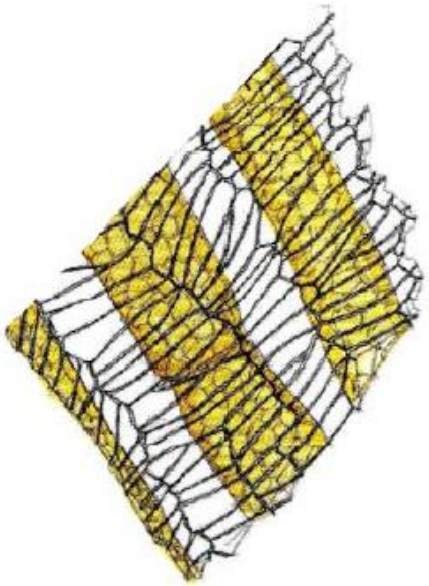


Stomata

FRUCTUS ANISI

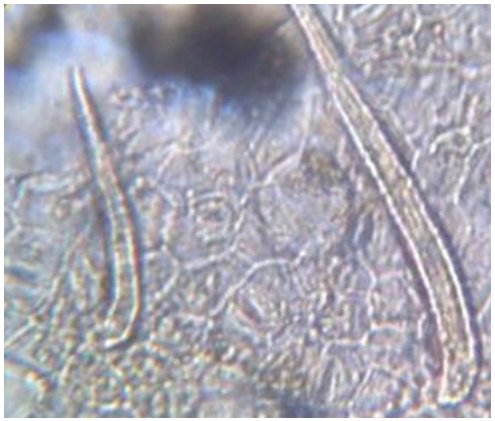
- Drug: Fructus Anisi
- Plant: *Pimpinella anisum*
- Reagent: Sartur
- Total Magnification: 10 x 40
- Specific anatomic element: Secretory canals

FRUCTUS ANISI



Stomata

Druse



Trichomes