

Practical Pharmacognosy

2nd Stage

2nd semester

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Lab.3



Cell Contents

- Cell contents which concerned in **pharmacognosy** are those which can be identified in vegetable drugs by **microscopic** examination or by **chemical** and **physical tests**.
- These cell contents represent either food **storage** products e.g. starch or by **products of metabolism** and these include carbohydrates, proteins, fixed oils, fats, alkaloids, purines, glycosides, V.O., gums, mucilage resins, tannins, calcium oxalate, calcium carbonate, and silica.



Starch:

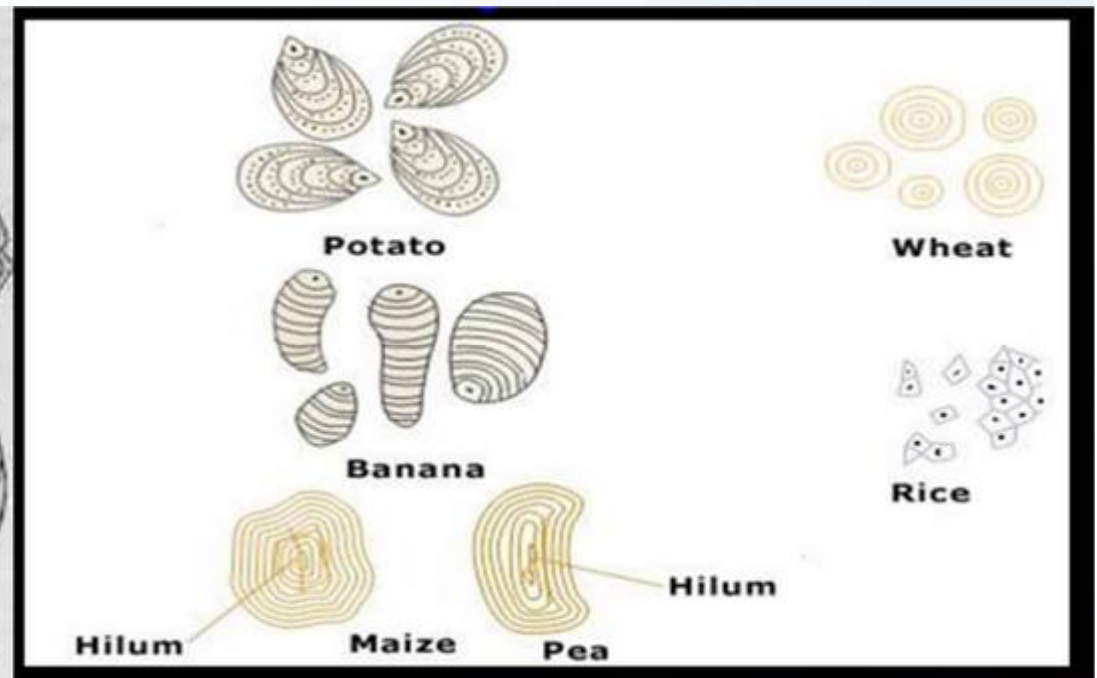
- Starch occurs in granules of varying sizes in almost all organs of plants, found in **roots, rhizomes, fruits, and seeds.**
- Starch granules may be **simple or compound.**



- Compound granules formed by **aggregations** of a large numbers of simple granules *e.g. rice starch*.



- **Hilum** is the starting point of formation of starch granules, the position of the hilum either **central** or **eccentric**.
- There are different shapes of hilum (dot, curved, multiple clefts).
- **Concentric rings or striations** (deposition of successive layers around the hilum) also appear in starch granules.



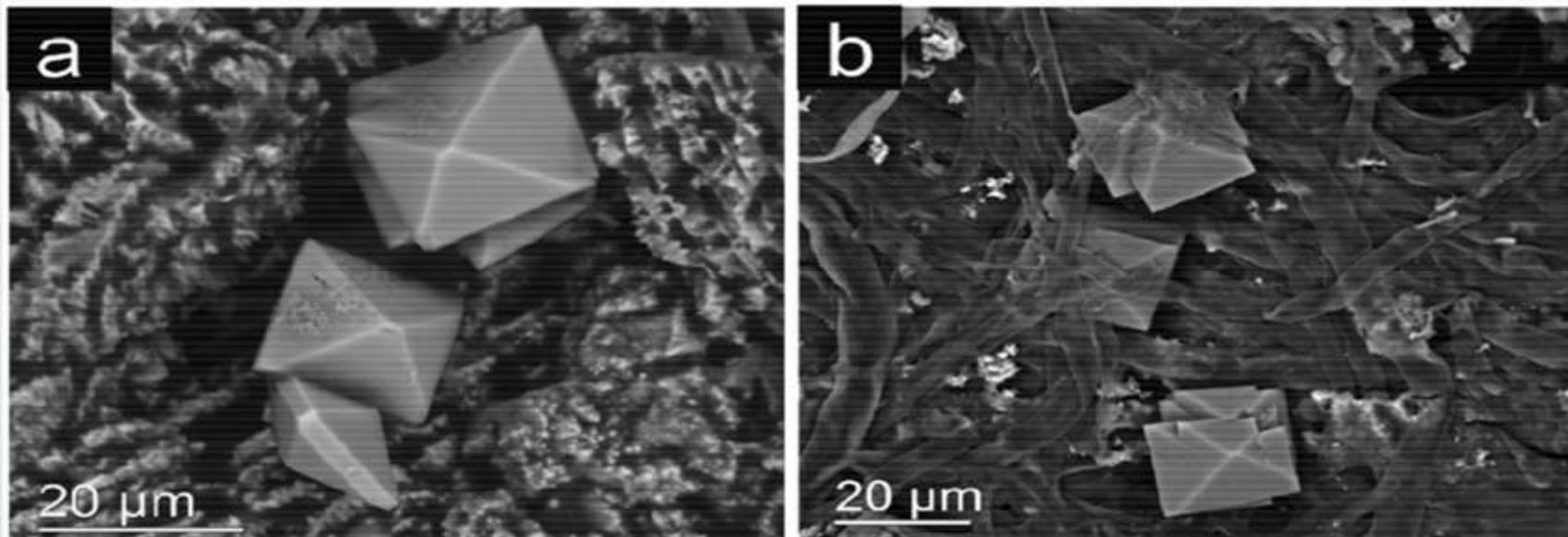
Types of starch	Shape	Size (um)	Hilum
Maize starch	Simple, polyhedral or sub spherical	10-30	Central triangles or 2-5 stellate clefts without striations.
Rice starch	Compound granules, polyhedral with sharp angles	4-6	Central point without striations.
Potato starch	Simple granules, mussel shapes.	45-65	Point eccentric with well-marked striations.

Calcium Oxalate:

➤ Calcium oxalate is a **dimorphous salt** and both types occur in plants, these are **tetragonal** or **monoclinic** systems, these both types differ in the **amount of water of crystallization**.

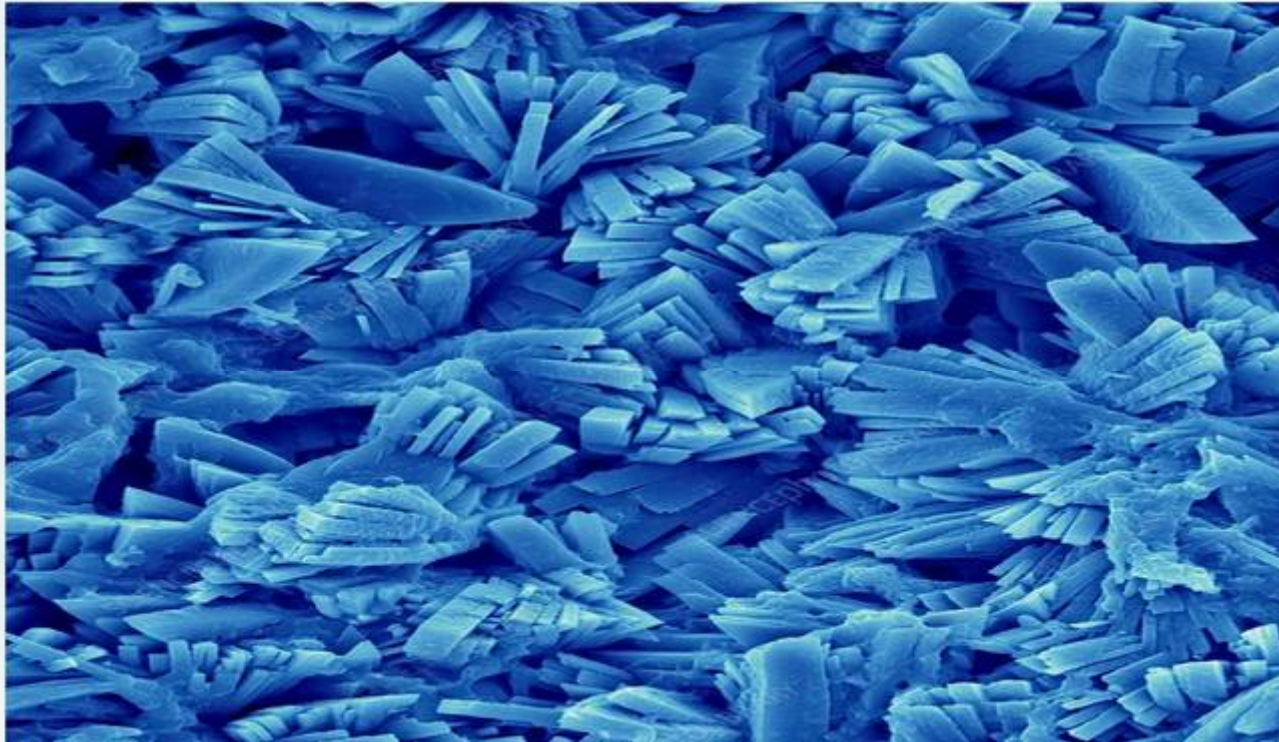
1) Tetragonal system ($\text{CaC}_2\text{O}_4 \cdot 3\text{H}_2\text{O}$)

e.g. Prism (Senna, Hyoscymus), Rosset (Rhubarb, Strmonium).



2) **Monoclinic system** ($\text{CaC}_2\text{O}_4 \cdot \text{H}_2\text{O}$). Excess oxalic acid shine in polarized light.

e.g. Raphide (Squill), Single needle crystal , Monoclinic prism.



How to prepare wet slide

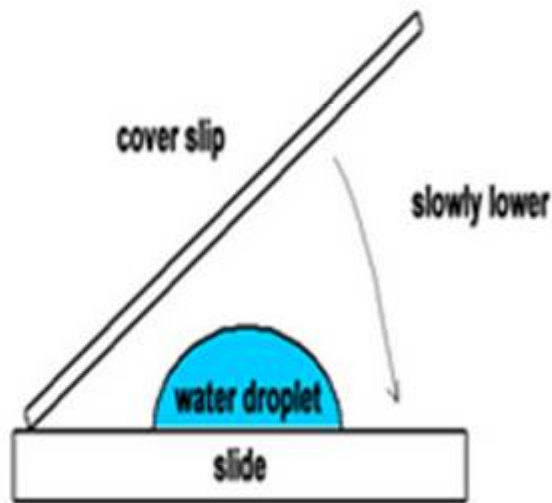
- In order to view some specimens under a microscope, they must be prepared on a slide within a **liquid** medium. This type of preparation is called a **wet mount**.

STEP 1: Place your specimen on a **clean, dry** slide.

STEP 2: Using an eye dropper, put **1-2** drops of **water** or **stain** on your specimen.

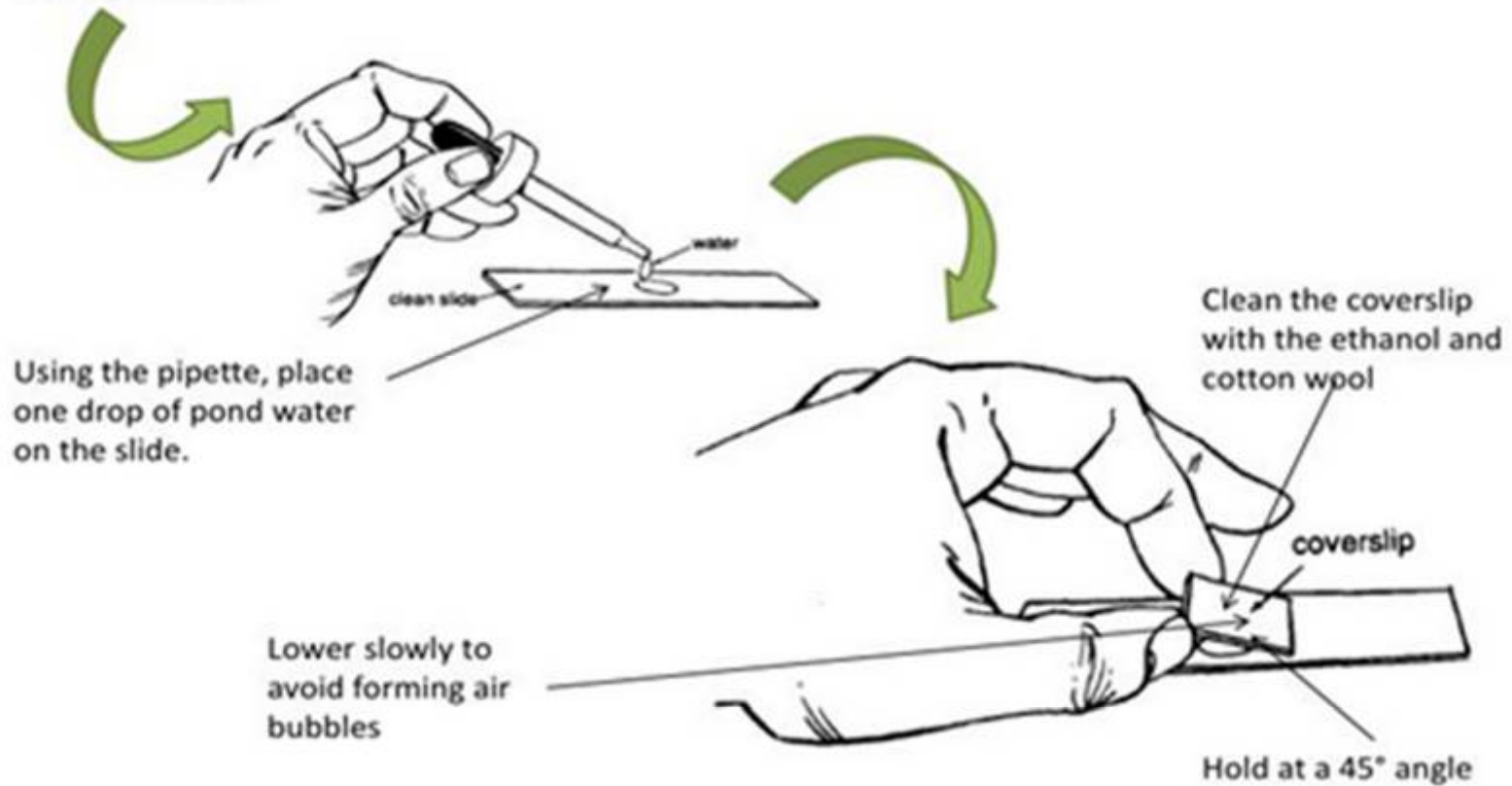
STEP 3: Place a **coverslip** at the edge of one side of the liquid at a **45 degree angle** and slowly lower the cover slip to prevent **bubbles**

STEP 4: Use a bit of **paper towel** to blot any **excess** liquid on the slide.



Preparing a slide

Before adding the sample, clean the slide with ethanol and cotton wool.



Observing Potato Starch Grains under microscope

Materials: a potato, knife, slides, cover slips, water, iodine

Procedure:

- 1) Cut the potato in half and scrape a little of the potato onto the microscope glass slide. by use knife There should not be any large potato pieces on the glass.
- 2) Place a small drop of **water** on the “potato juice” and then place the glass cover slip on top.
- 3) Observe using the microscope.
- 4)repeat experiment but Place a drop of the dilute **iodine** instead of water on potato juice and then place cover glass.
- 5) You should be able to see how the starch grains change color. The iodine will react with the starch and turn it blue-black.

EXTRACTION OF STARCH FROM POTATO

Aim: 1) To isolate the starch from the given potato sample .
2) Calculate the yield of starch.

Principle:

- Starch is an important polysaccharide found in plant sources.
- The microscopic appearance of starch is in the form of granules.
- Starch is insoluble in water and rapidly.

Materials Required: Potato, Muslin Cloth, Watch Glass, Mortar and Pestle, Distilled water.

Procedure:

1. Take the weight of potato sample
2. Cut raw potato into small pieces, and record the initial weight.
3. Grind them in a mortar and pestle with sufficient water.
4. Collect the potato homogenate into a beaker and add enough water.
5. Then filter the homogenate through a muslin cloth to remove the particles.
6. Allow the filtrate to settle. Starch rapidly settles at the bottom. Decant the starch free supernatant carefully
7. Wash 3-4 times and decant the supernatant. Collect the compact mass of starch and allow it to dry.



Calculation

1) The weight of potato sample = () g

2) The weight of filter paper = () g

3) The weight of filter paper with starch = () g

3) The yield of starch = () g

A purple rectangular tag with a hole on the left side is the central focus. It is placed on a rustic wooden surface. Three white daisies with yellow centers are scattered around the tag: one in the foreground to the right, and two in the background. A light-colored string is looped around the tag. The overall scene is warm and appreciative.

Thank
you!