



MSA UNIVERSITY
معة أكتوبر للعلوم الحديثة والآداب

Pharmacognosy

PHG 112

Spring 2026

Pharmacognosy

PHG 112



potato tubers



ginger rhizome

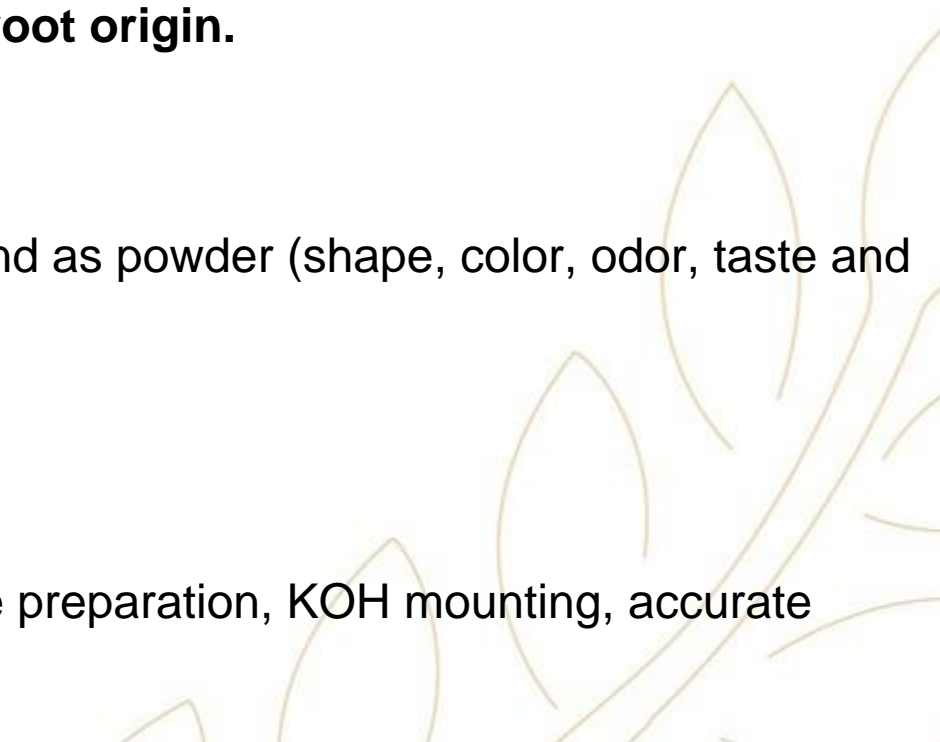
Spring 2026

Lab 8



Intended Learning Outcomes (ILOs)

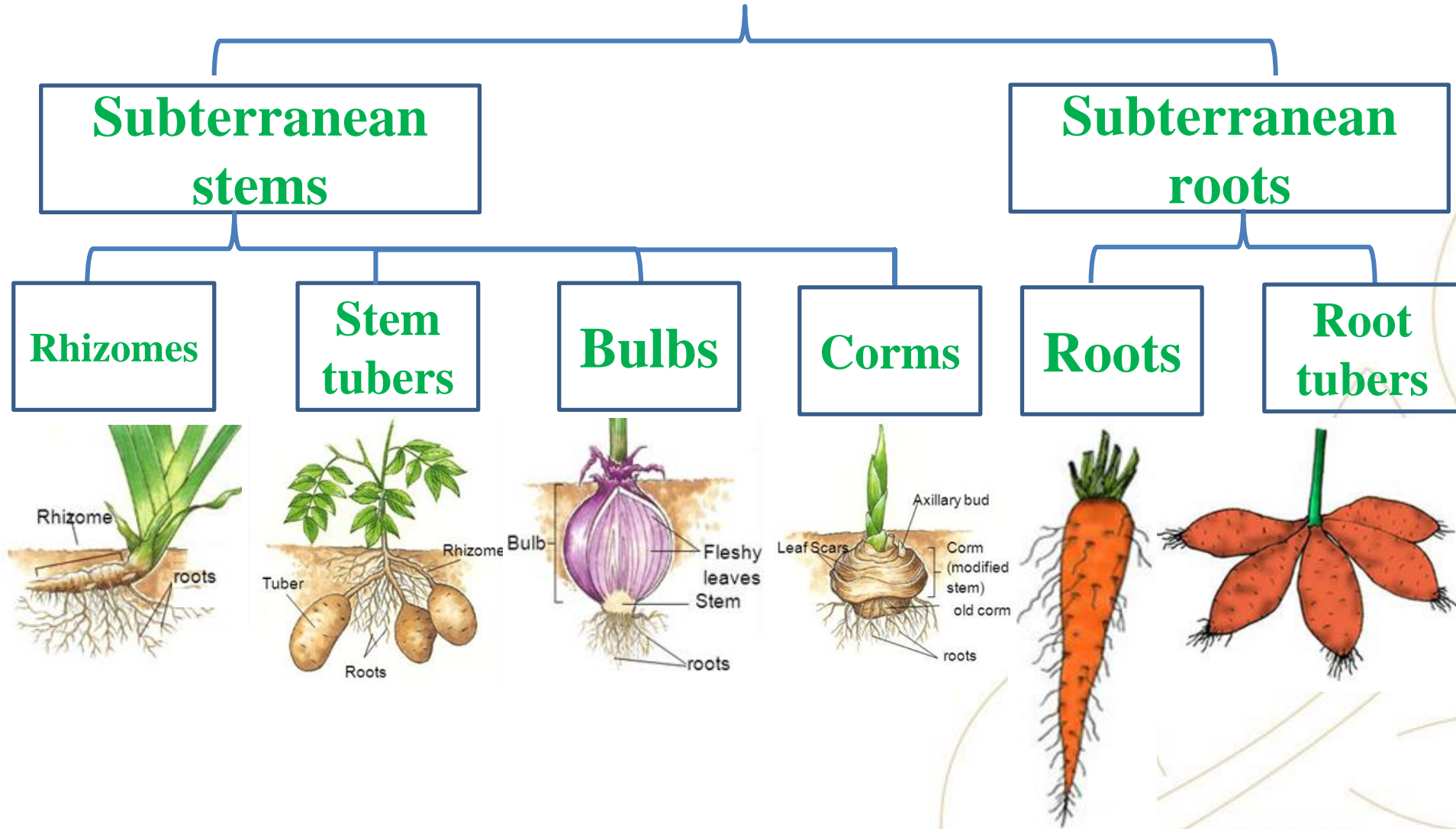
By the end of this laboratory session, students will be able to:

1. Learn to differentiate between subterranean stem origin or root origin.
 2. Differentiate the shape of different Subterranean.
 3. Describe the macroscopic morphology of *Liquorice* entire and as powder (shape, color, odor, taste and surface characters).
 4. Identify the microscopic diagnostic features *Liquorice*.
 5. Apply proper laboratory skills and safety rules, including slide preparation, KOH mounting, accurate drawings, waste disposal, and lab conduct.
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Subterranean Organs



Subterranean organs



Subterranean Organs

All underground organs

Root origin

Characterized by

- 1- Never develop leaves
- 2- No nodes and internodes
- 3- No buds



Stem origin

Characterized by:

- 1- Bearing scaly leaves
- 2- Has nodes and internodes
- 3- Axillary buds with scaly leaves



العرقسوس Liquorice



Liquorice

Origin:

Dried peeled or unpeeled roots and rhizomes of
Glycyrrhiza glabra var typica known as Spanish
liquorice, or *Glycyrrhiza glabra var glandulifera*
known as Russian liquorice Family
Leguminosae.



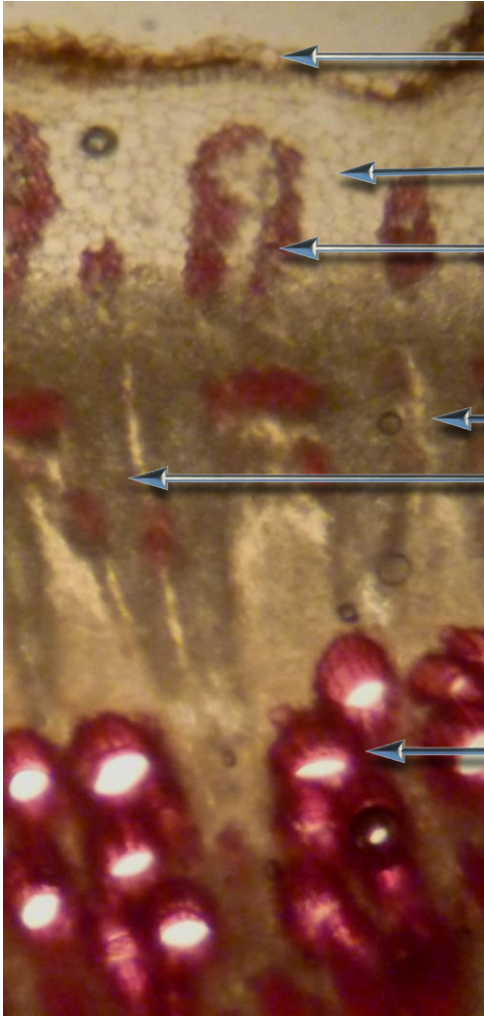
Why peeled?

The Cork:

- 1- Less Amount of active constituents.
- 2-Increasing the weight.
- 3-Having un desirable taste.



Transverse section:



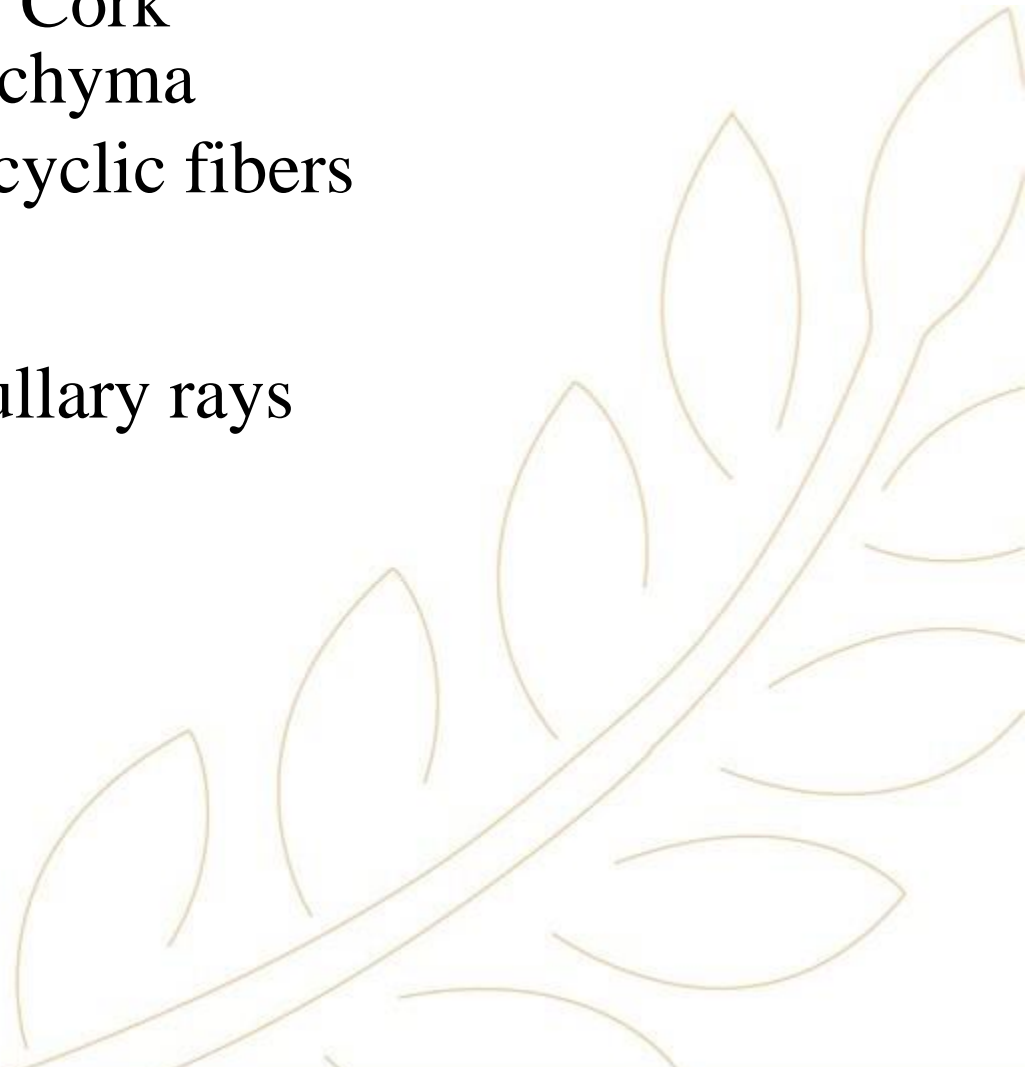
Cork

Parenchyma

Pericyclic fibers

Medullary rays

Xylem



Powder:

Physical Characters:

Homogeneity: Heterogenous

Condition: Ash like

Color: Yellow

Odor: Faint odor

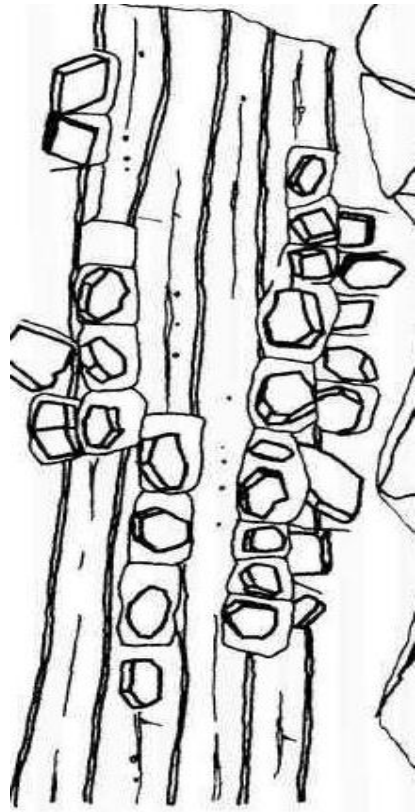
Taste: Very sweet free from bitterness



Key elements:

1- Crystal sheath

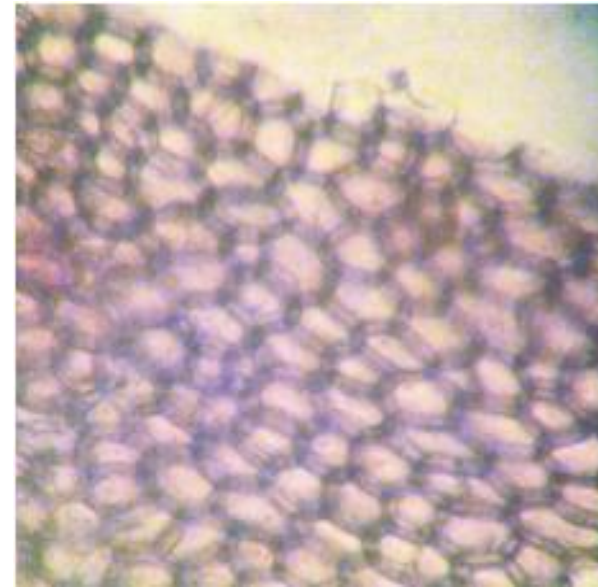
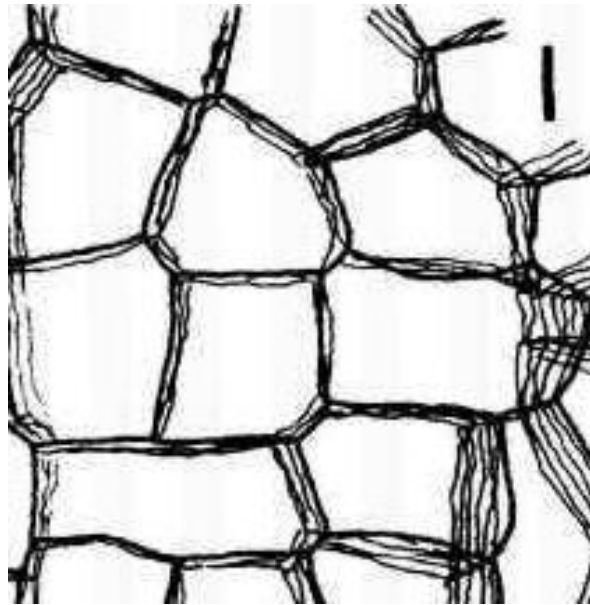
Parenchyma cells containing prisms of CaOX arranged on fibers



Key elements:

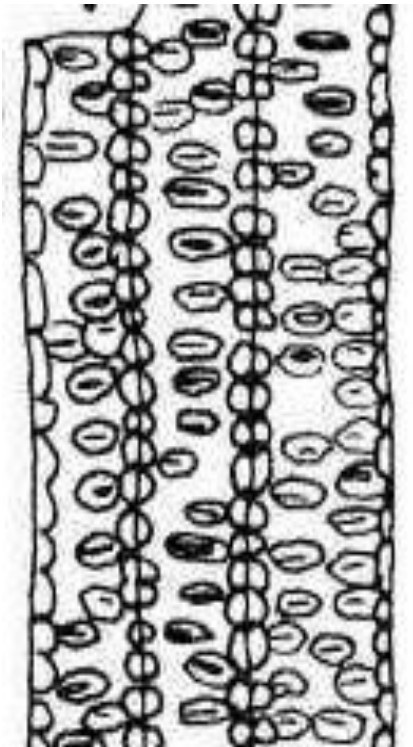
2- Cork cells

Thick, brown, formed of several layers of flattened polygonal cells.



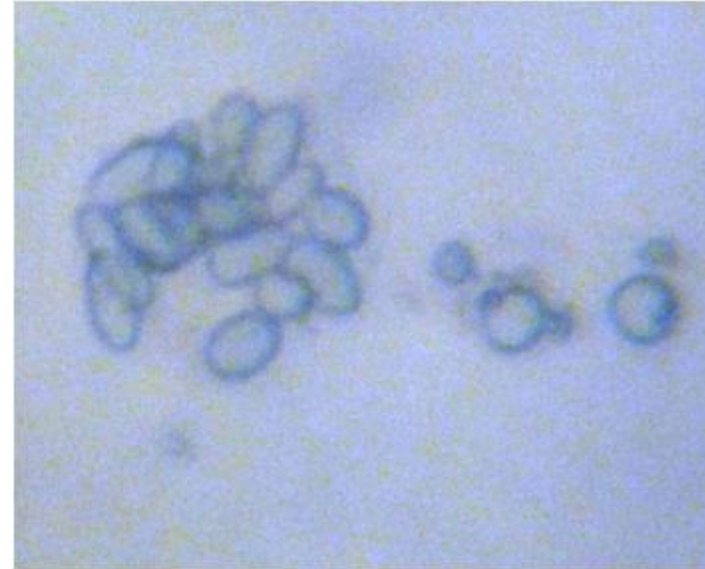
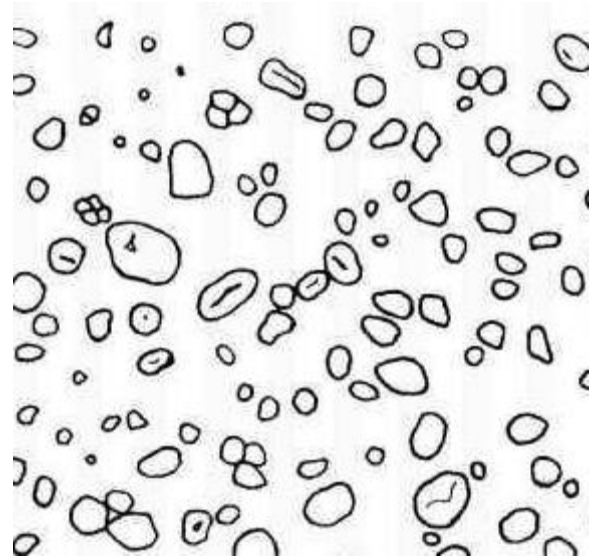
Key elements:

3- Bordered pitted lignified xylem vessels



Key elements:

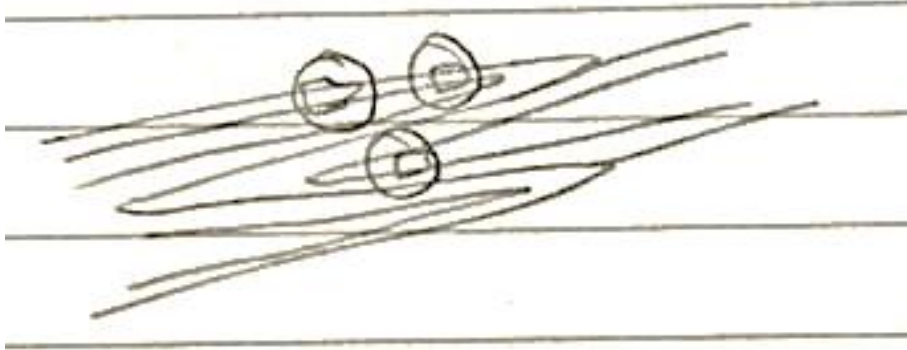
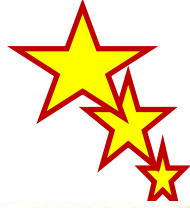
4- Starch granules



Main Key Elements Drawings:

1

Crystal sheath.



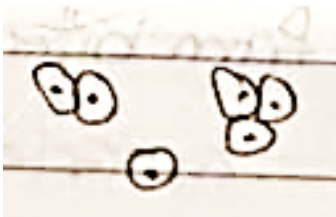
2

Cork cells.



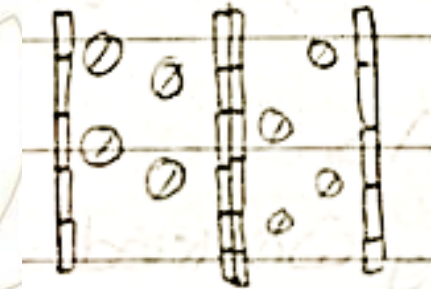
3

Starch granules.



4

Bordered pitted lignified xylem vessels.



Chemical test:

Froth test:

Pd. + Water in a test tube and shake well

→ Persistent froth stable for more than 1 min.



Vigorous
Shaking

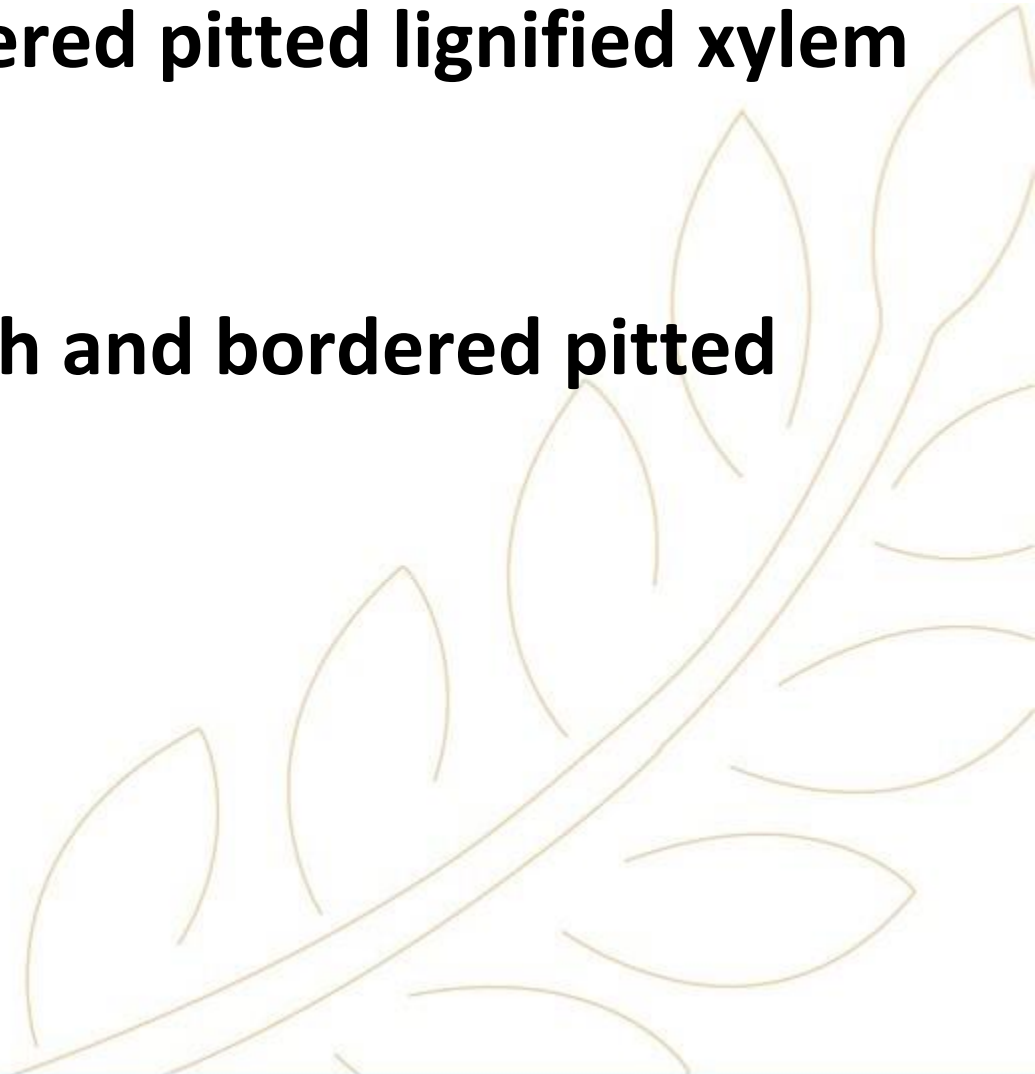


Microscopical Character:

Mount in KOH: Crystal sheath and bordered pitted lignified xylem vessels.

Mount in Phloroglucinol : Crystal sheath and bordered pitted lignified xylem vessels.

Mount in Water: Starch granules.



Uses

1- Demulcent and mild expectorant.

2- Sweetening agent.

3- Anti-inflammatory for gastric and duodenal ulcer and rheumatoid arthritis (due to presence of cortisone like compounds).

4- Mild laxative.



5- Mouth wash for mouth ulcer.



Turmeric (Curcuma)

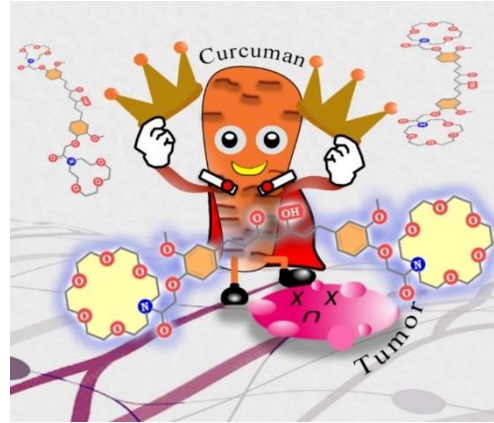
Origin:

It is the dried prepared rhizome of *Curcuma domestica* or *Curcuma longa* F. Zingiberaceae.



Uses

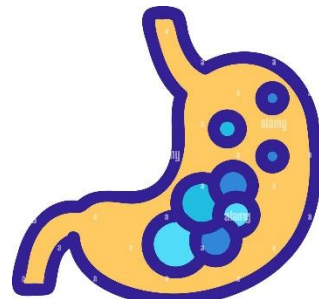
1- Anti-inflammatory.



3- Antihepatotoxic.



5- Carminative.



2- Antioxidant.

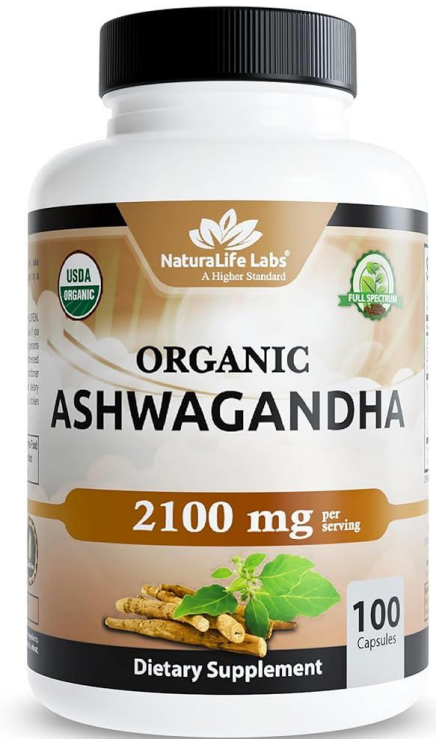


4- Colouring agent.



Ashwangda

It is the dried roots of *Withania somnifera* (Ashawagandha)
F. Solanaceae

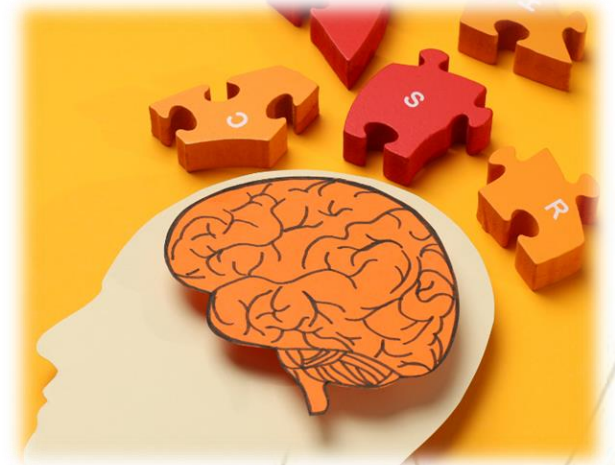


Uses

1- Sleep aid.



2- Memory enhancement.



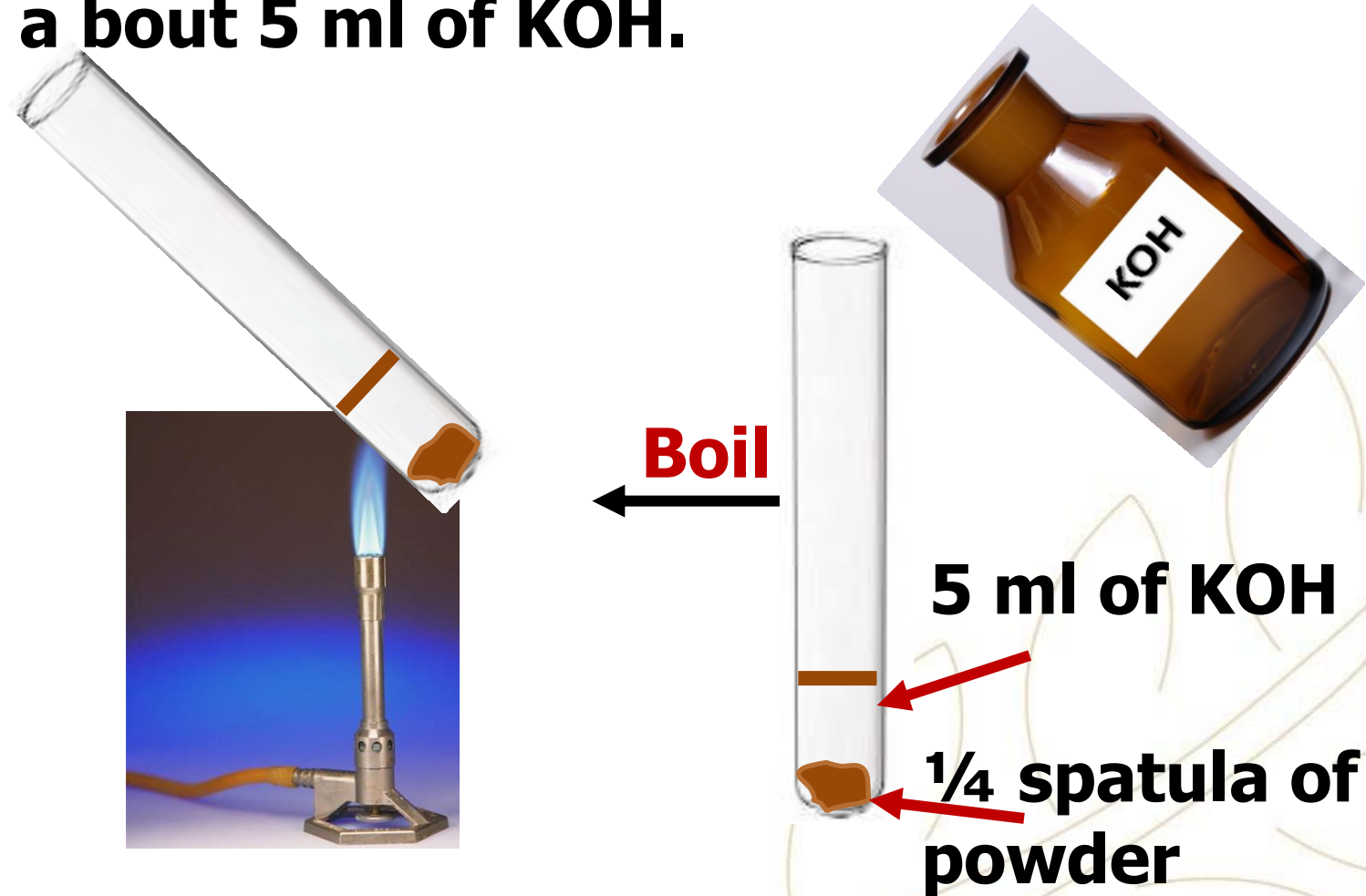
3- An adaptogen to help increase energy and resistance to stress (e.g., in

case of mental and physical fatigue related to stress).



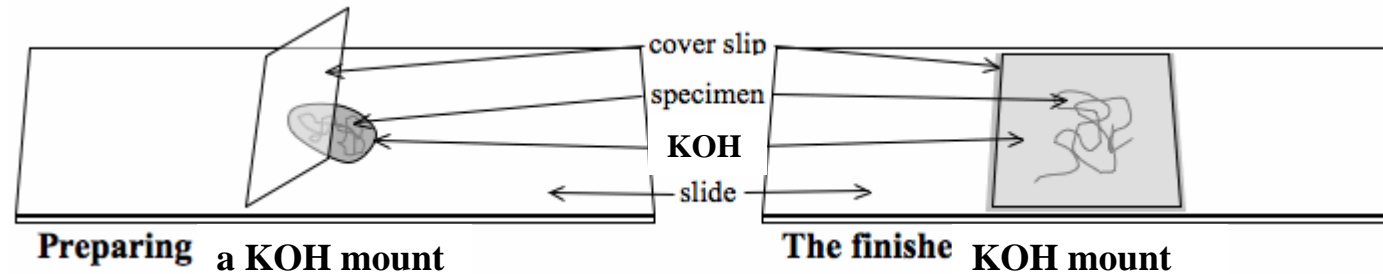
Practical work:

1- Boil a quarter spatula of the powdered seed in a bout 5 ml of KOH.



Practical work:

2- Prepare your slide and check the key elements.



3- Complete your drawings.

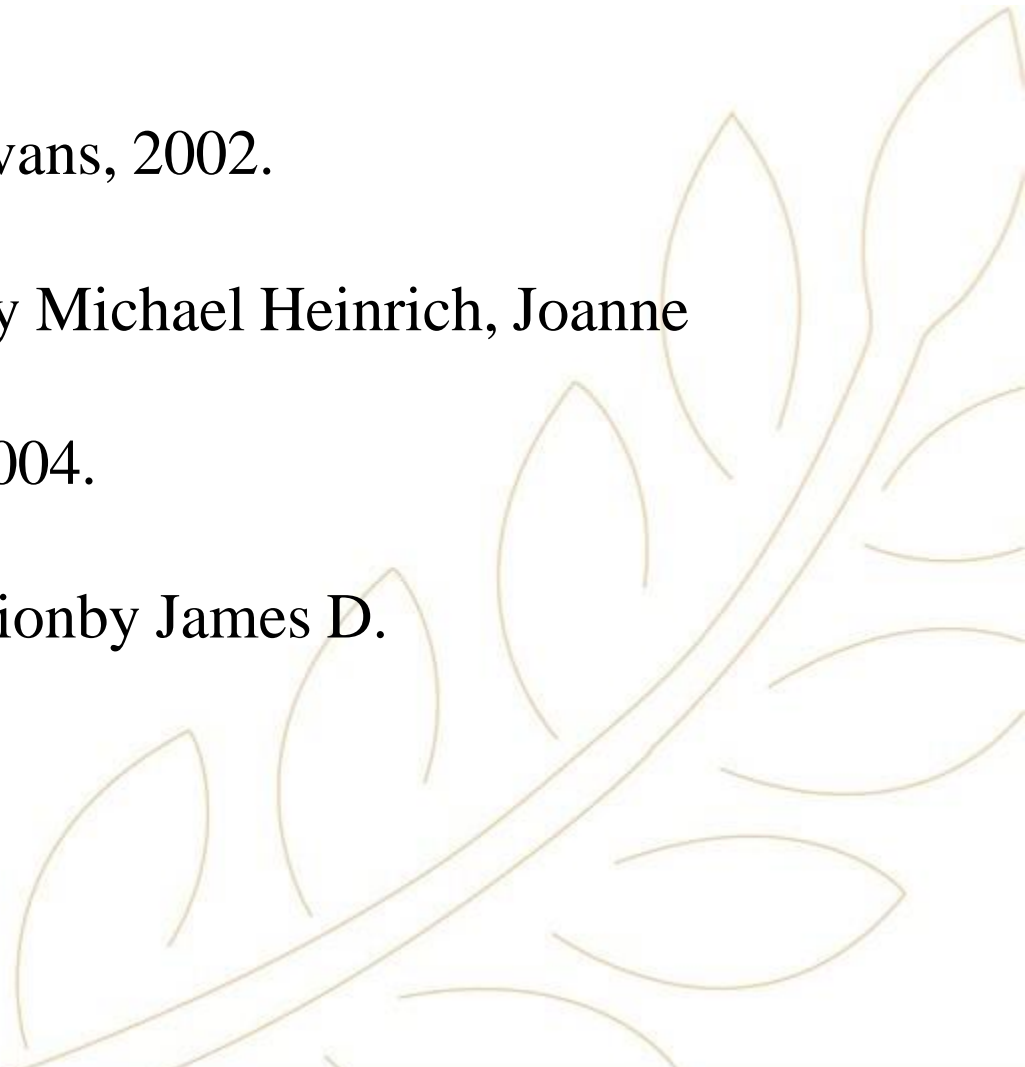
P.S.



Keep your work place and tools clean.

Dispose the left KOH in the container not in the sink.

References:

1. Trease & Evans' Pharmacognosy by William Charles Evans, 2002.
 2. Fundamentals of Pharmacognosy and Phytotherapy by Michael Heinrich, Joanne Barnes, Simon Gibbons, and Elizabeth M. Williamson, 2004.
 3. Botany :An introduction to Plant Biology, Third edition by James D. Mauseth, 2008.
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Useful links:

<https://www.youtube.com/watch?v=rbiyMxQ3ERs>

<https://www.youtube.com/watch?v=CuiiYTgakxY>

https://www.youtube.com/watch?v=NMolSd_FVII



THANK YOU!