

# Pharmacognosy

## PHG112

### Lab

# 7





# Faculty of **Pharmacy**

# REMEMBER

## Lab evaluation → 5:



**-Attendance:**

-(only 15 min late is allowed)

-(sign for yourself).



**-Lab coat:**

-(not allowed to be in the lab without it).

-(take it on and off before and after you get to the lab).



-(during the lab time).

**-Drawing:**

-(in a specific note using pencil).



**SAVE YOUR  
MARKS**



## Lab evaluation → 5:

### -Work place and tools:



- (waste disposal → don't throw anything in the Sink).
- (microscope → switch it OFF ).

### -Behavior:

(may get you to loose the whole 5 marks).





# Subterranean Organs



# Subterranean organs

Subterranean stems

Subterranean roots

Rhizomes

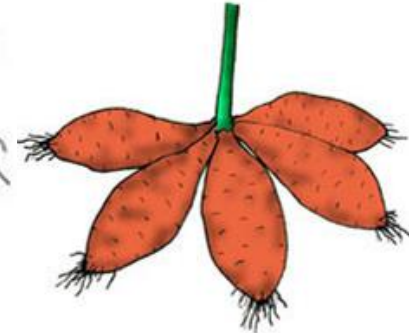
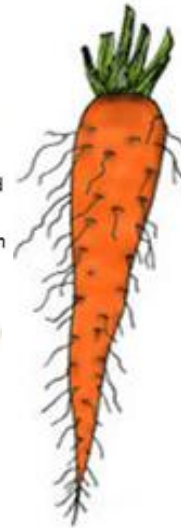
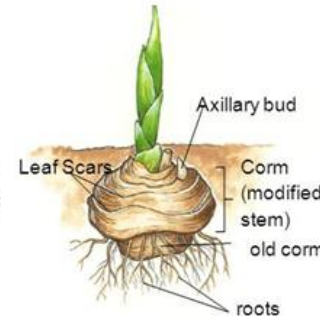
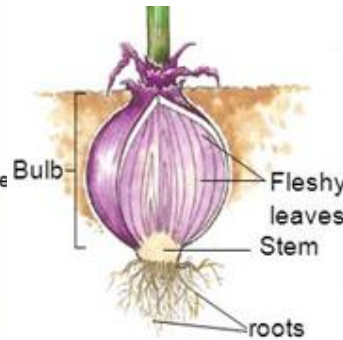
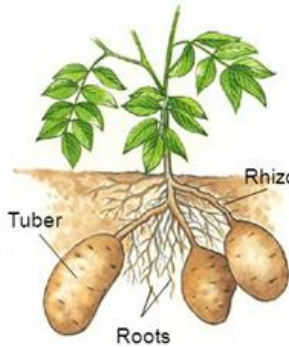
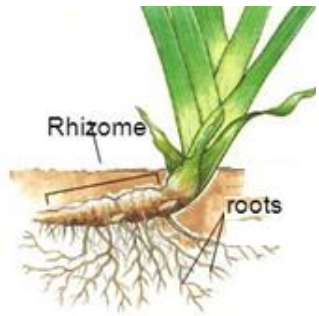
Stem tubers

Bulbs

Corms

Roots

Root tubers





# 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.



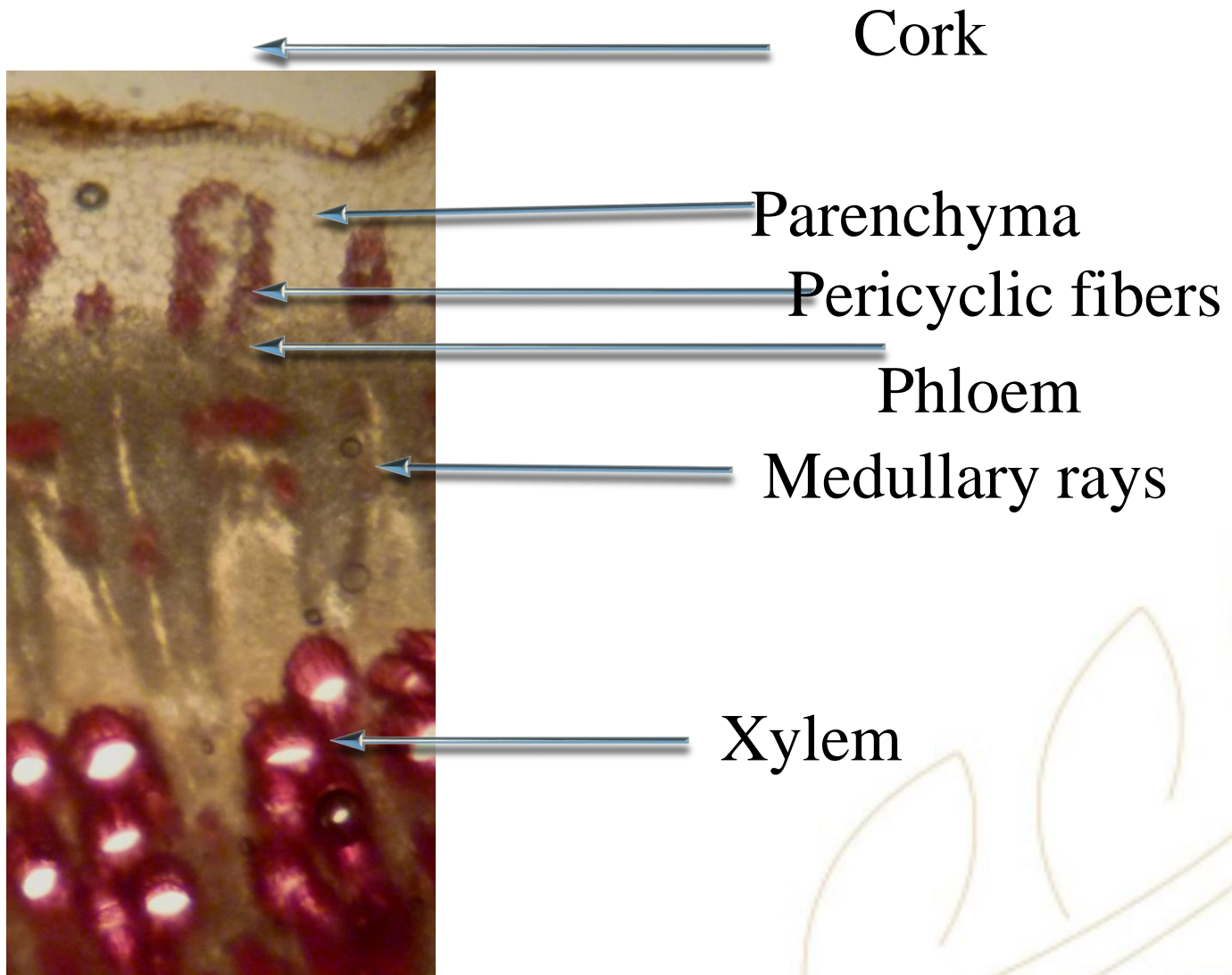
# Why peeled?

## The Cork:

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



# Transverse section:





# Powder:

## Physical Characters:

Homogeneity: Heterogenous

Condition: Ash like

Color: Yellow

Odor: Faint odor

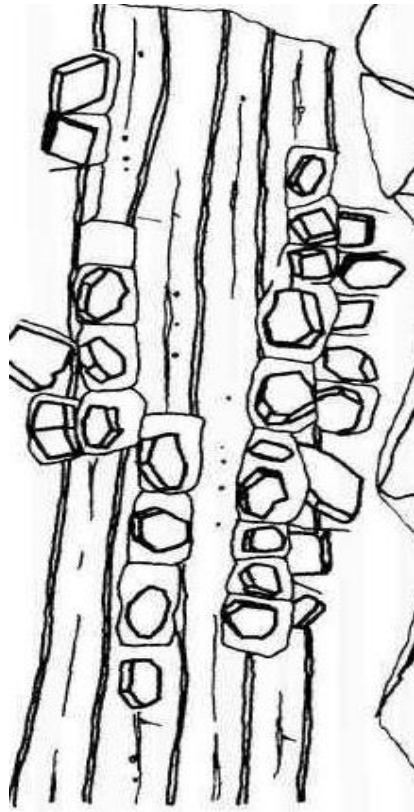
Taste: Very sweet free from bitterness



# Key elements:

## 1- Crystal sheath

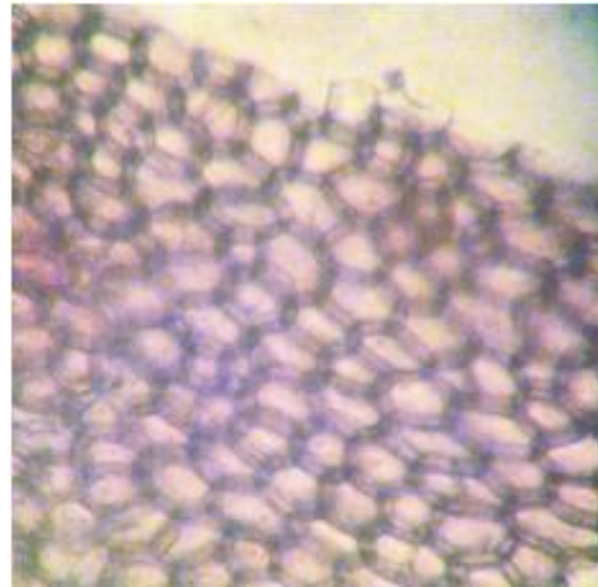
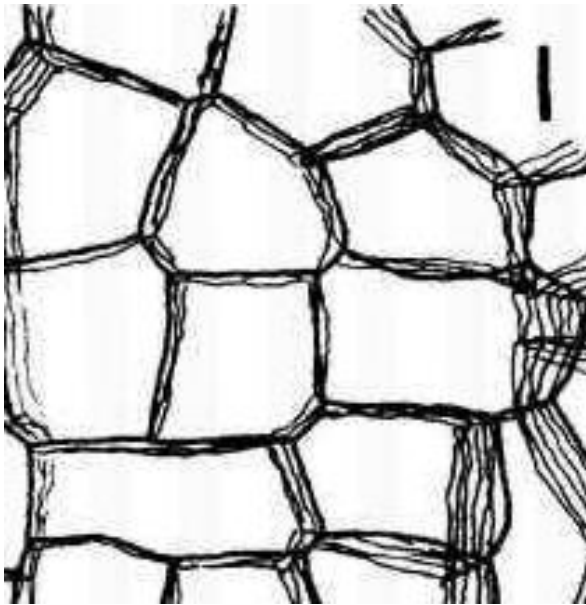
Parenchyma cells containing prisms of CaOX arranged on fibers



# Key elements:

## 2- Cork cells

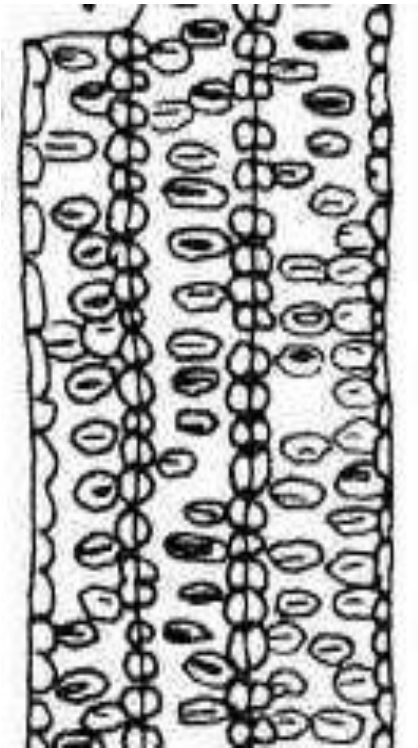
Thick, brown, formed of several layers of flattened polygonal cells.





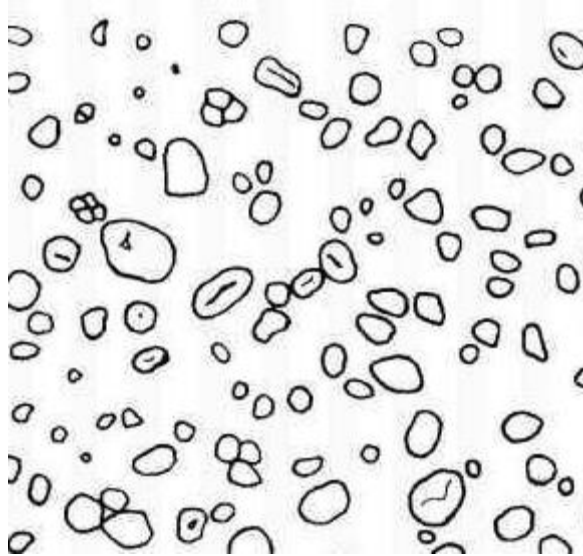
# Key elements:

3- Bordered pitted lignified xylem vessels



# Key elements:

## 4- Starch granules



# Chemical test:

## Froth test:

Pd. + Water in a test tube and shake well

→ Persistent froth stable for more than 1 min.



Vigorous  
Shaking →





# Microscopical Characters:

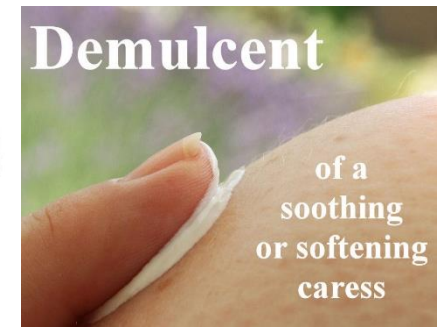
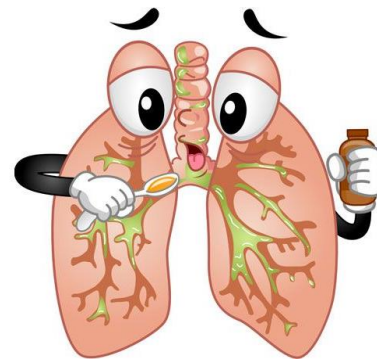
- **Mount in KOH: All key elements**
- **Mount in phloroglucinol: Crystal sheath and Xylem vessels**

**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.



# GINGER

# الزنجبيل





# Ginger

## Origin:

It is the fresh or dried rhizome of *Zingiber officinale* family Zingiberaceae.

It is deprived from the dark outer surface and collected as peeled ginger.





# Liming:

It is coating with very thin protective layer of  $\text{CaCO}_3$  to protect against insect attacks.



# Powder:

Physical properties:

Condition: Powder

Colour: Yellowish brown

Taste: Pungent taste

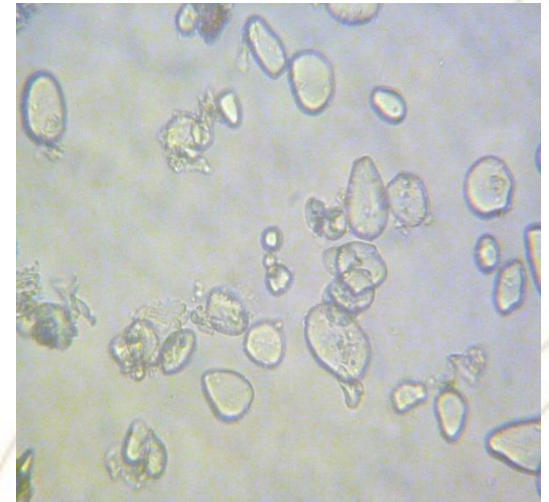
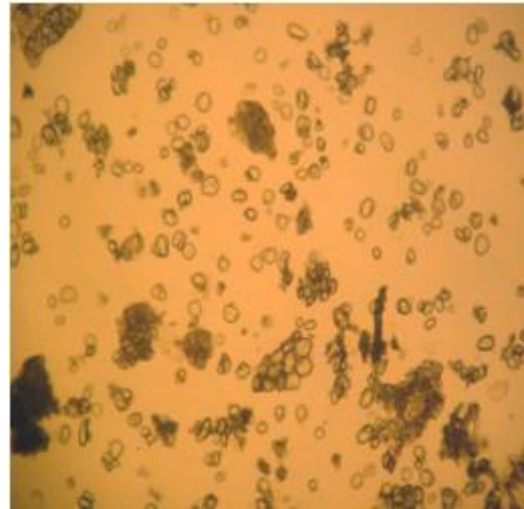
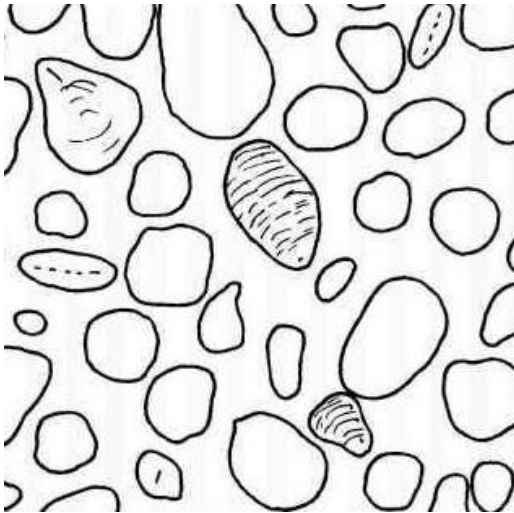
Odour: Aromatic



# Key elements:

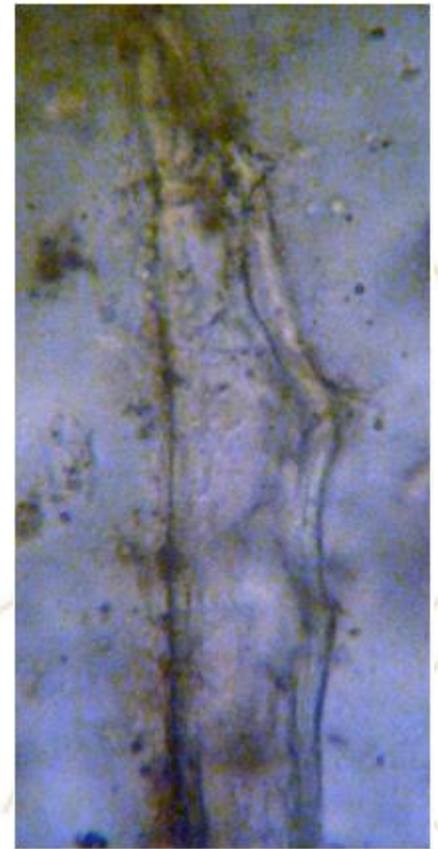
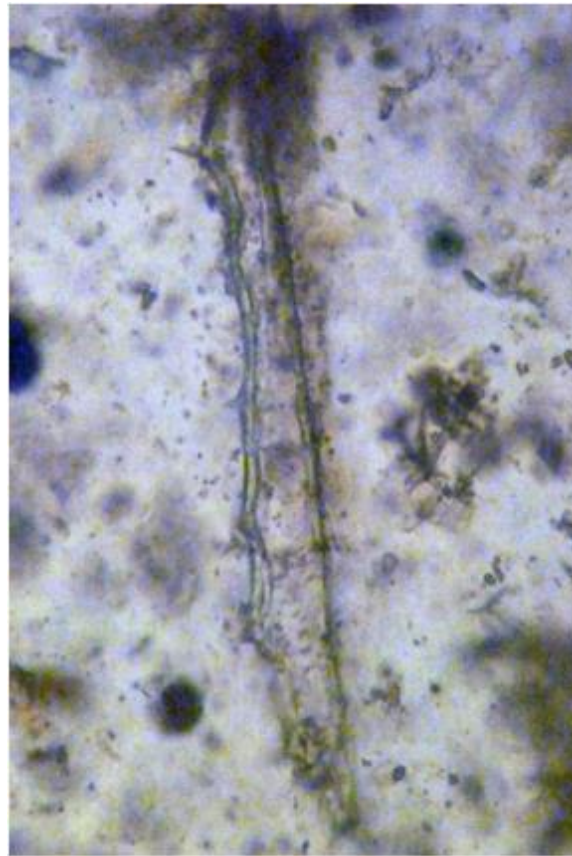
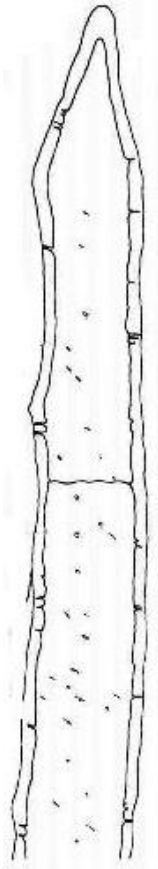
1) Scitamineous starch granules with transverse striation.

## Mount in Water



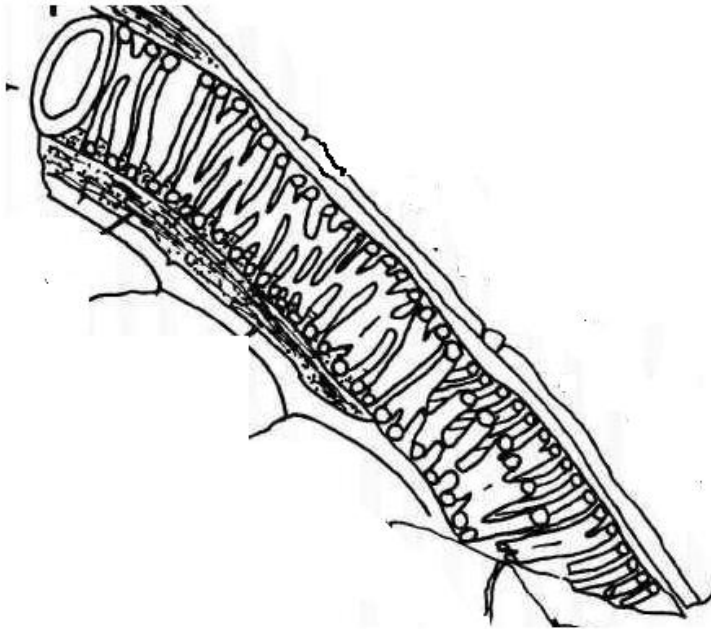


2) Septate fibers with tortuous margin and transverse pectosic septa (pectin)  
(non lignified except middle lamella)

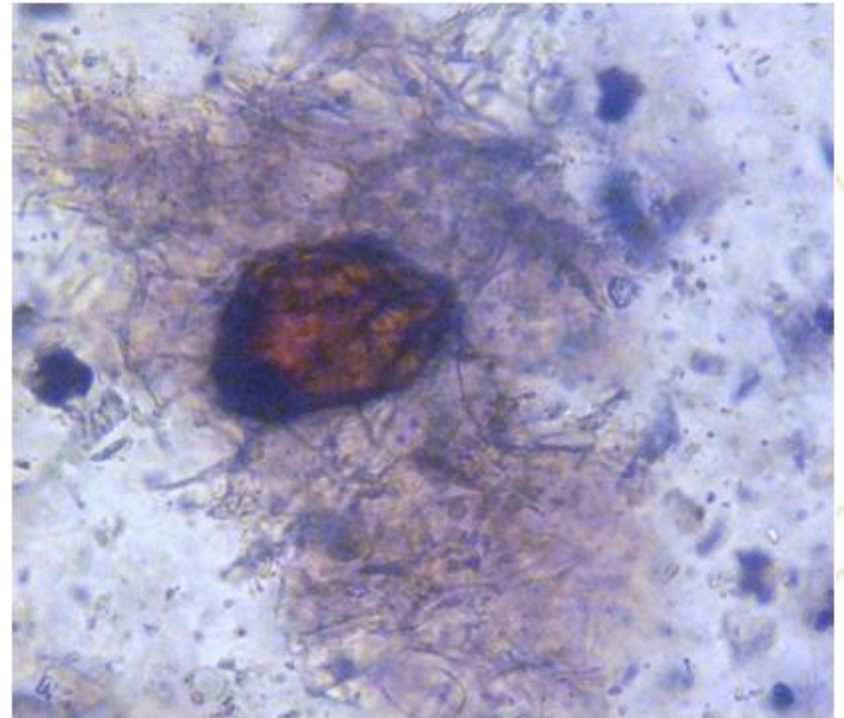
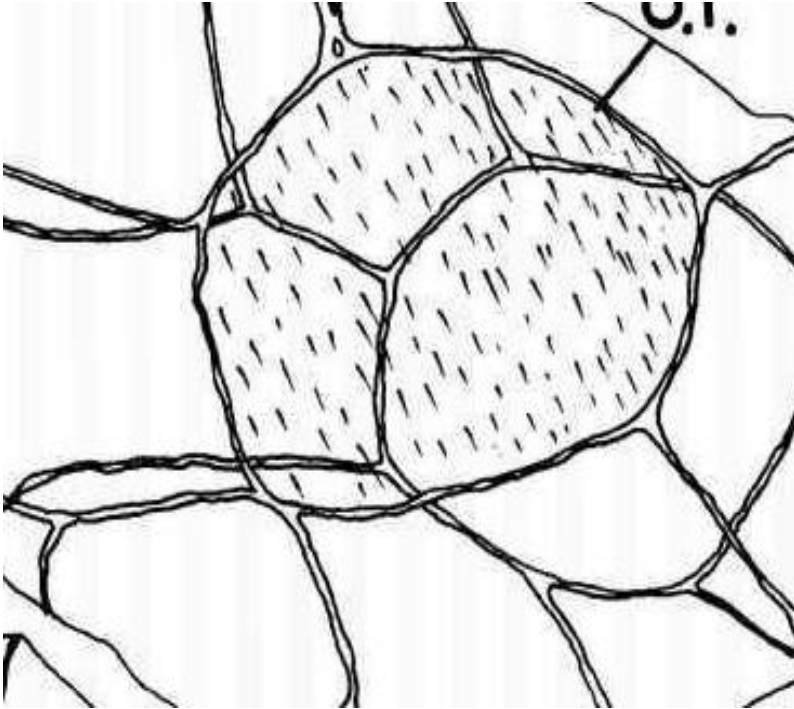




### 3) Reticulate, non lignified xylem vessels.



## 4) Oleoresin cells with yellowish orange content



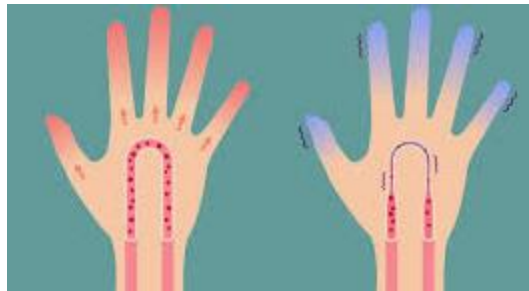
# Microscopical Characters:

- **Mount in KOH: All key elements**
  - **Mount in phloroglucinol: Xylem vessels**
- Mount in water: Scitamineaceous starch granules**



# Uses

- 1- Powerful anti-emetic. In motion sickness.
- 2- Carminative & flavouring agent.
- 3- Improve circulation and antihypertensive
- 4- Cough mixtures
- 5- Antioxidant





# RHUBARB

# الراوند



# Rhubarb:

## Origin:

It is dried rhizome and big roots of *Rheum palamtum*, *Rheum officinale* and all *Rheum* species except *Rheum raponticum* Family *Polygonaceae* deprived of cork and outer cortex.

# Powder:

## Physical characters:

Condition: Powder

Colour : Reddish brown

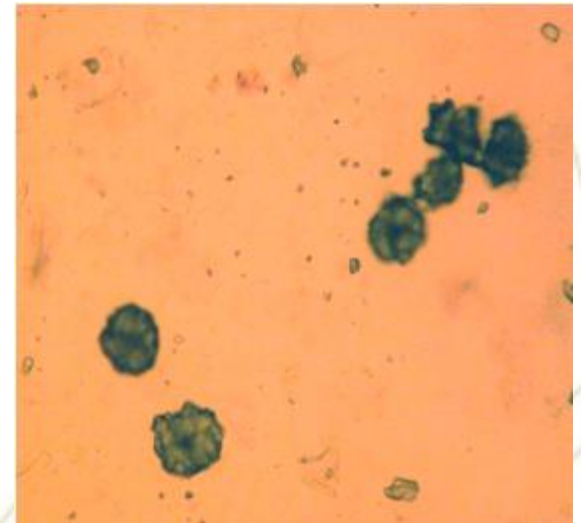
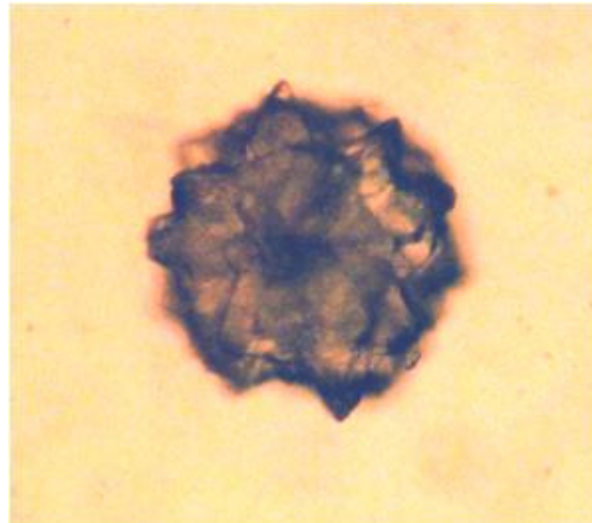
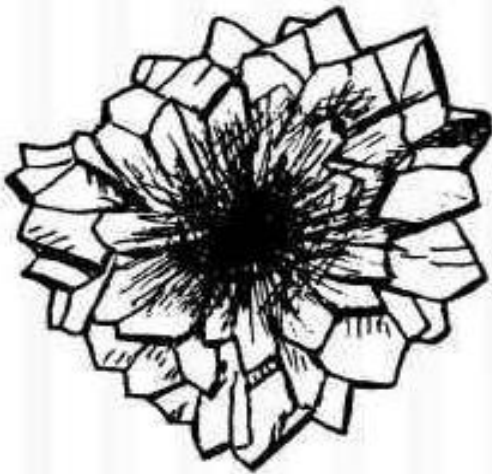
Odour: Aromatic odour

Taste: Bitter astringent with gritty taste



# Key elements:

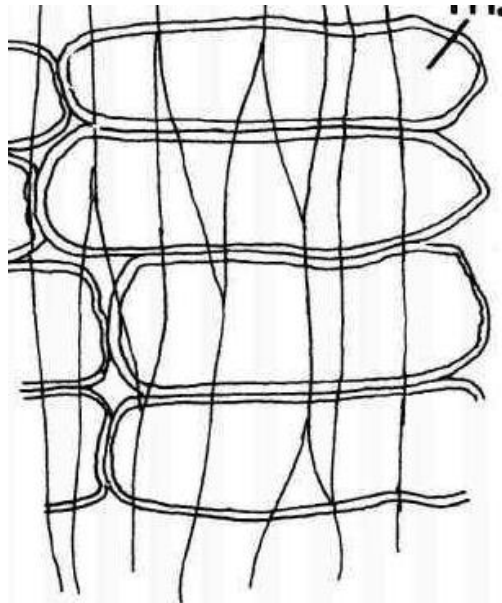
1) Cluster crystals of CaOX coming from phelloderm





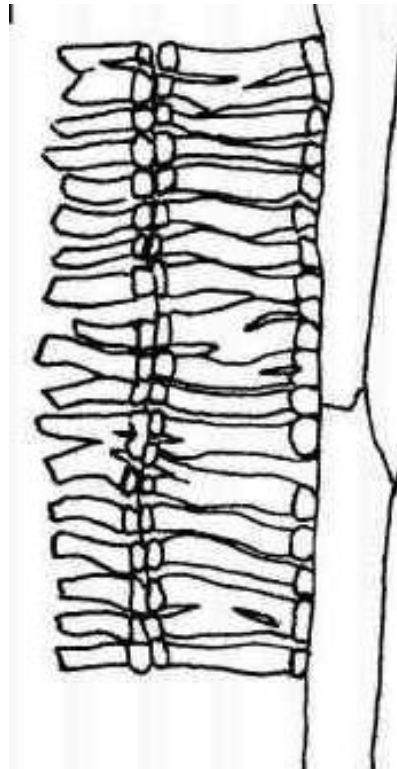
# Key elements:

2) Medullary rays with reddish brown content



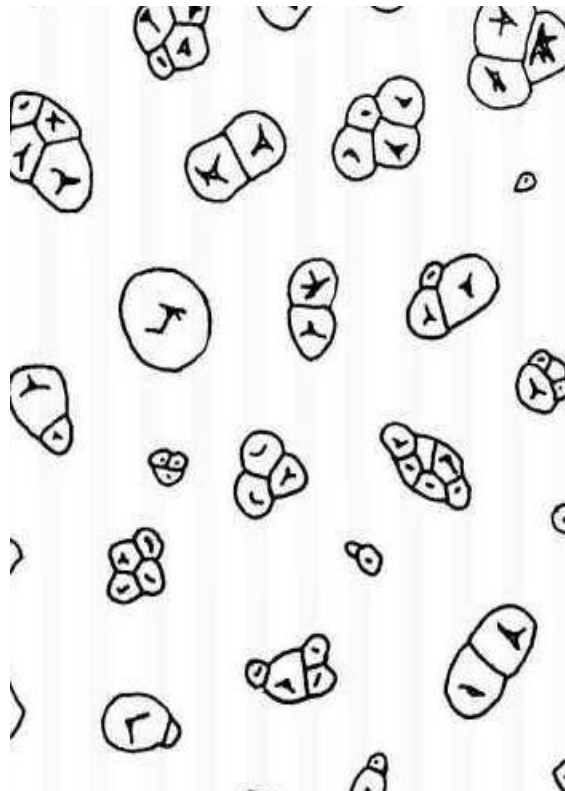
# Key elements:

3) Broad non lignified reticulate xylem vessels



# Key elements:

4) Mullar shaped starch granules with  
fissured hilum



# Microscopical Characters:

- **Mount in KOH: All key elements**
- **Mount in phloroglucinol: Xylem vessels**

**Mount in water: Starch granules and Cluster crystals of CaOX**





# Uses

**1- Laxative.**

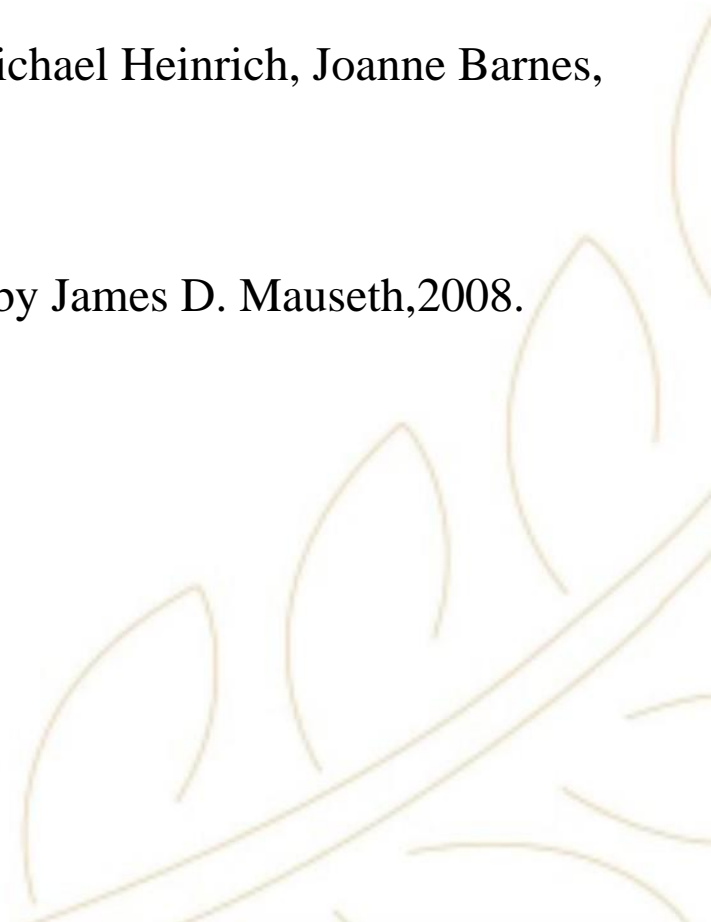
**2- Antiinflammatory.**

**3- Effective in lowering blood sugar levels in type 2 diabetes patients.**



# 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.



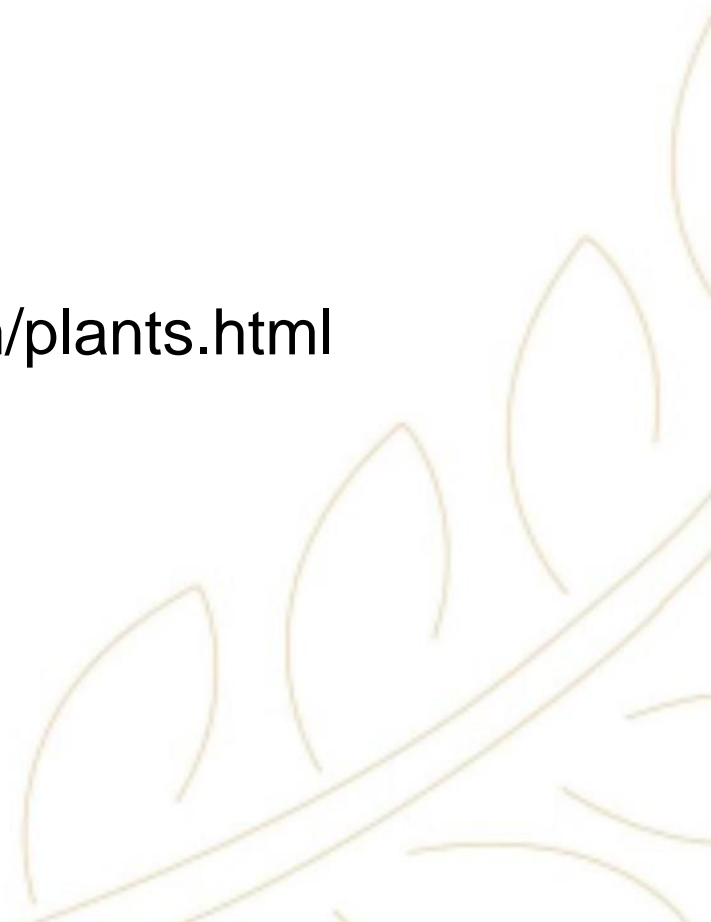
## Useful links:

<http://www.hort.purdue.edu/newcrop/med-aro/default.html>

<http://www.herbmed.org/>

<http://www.danish-schnapps-recipes.com/plants.html>

<http://www.botanical.com/>





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# Thank You!

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