

3 GOOD HEALTH  
AND WELL-BEING



4 QUALITY  
EDUCATION



9 INDUSTRY, INNOVATION  
AND INFRASTRUCTURE



MSA UNIVERSITY  
معة أكتوبر للعلوم الحديثة والآداب

# *Pharmacognosy*

PHG 112

Spring 2026

# Pharmacognosy

PHG 112



potato tubers

potato tubers



ginger rhizome

ginger rhizome

Spring 2026

# Lab 1



## كلية الصيدلة

### رؤية الكلية

كلية الصيدلة جامعة أكتوبر للعلوم الحديثة والآداب تساهم بفاعلية في تحقيق رؤية مصر المستقبلية والوصول لترتيب متميز قوميا وإقليميا وعالميا.

### **Vision**

The Faculty of Pharmacy, October University for Modern Sciences and Arts, contributes effectively to achieving Egypt's future vision and reaching a distinguished ranking nationally, regionally, and globally.

## كلية الصيدلة

### رسالة الكلية

تلتزم كلية الصيدلة جامعة أكتوبر للعلوم الحديثة والآداب بتقديم برامج تعليمية متطورة بشراكة دولية لإعداد صيدلي قادر على المنافسة والابتكار وريادة الأعمال قوميا وإقليميا وعالميا وتقديم أفضل الخدمات الصحية في إطار أخلاقيات المهنة، كما تلتزم الكلية بإجراء بحوث علمية تطبيقية، المشاركة المجتمعية الفعالة متبنيه بذلك أهداف التنمية المستدامة

### **Mission**

The Faculty of Pharmacy, October University for Modern Sciences and Arts, is committed to providing advanced educational program with international partnership to prepare a pharmacist capable of competition, innovation, and entrepreneurship nationally, regionally, and globally, and to provide the best health services within the framework of professional ethics. The Faculty is also committed to conducting applied scientific research and effective community services, thereby adopting the goals of sustainable development.

## الأهداف الإستراتيجية للكلية

- تحسين تنافسية جودة الطلاب والخريجين
- الارتقاء بمنظومة البحث العلمي وتطوير برامج الدراسات العليا
- بناء كوادر تدريسية وإدارية متميزة.
- استدامة الجودة الشاملة لرفع مستوى الاداء التنافسي للمؤسسة
- رفع مستوى المشاركة المجتمعية وتعزيز فرص التنمية المستدامة

# Intended Learning Outcomes (ILOs)

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

1. **Define seeds** and explain their formation, types of ovules, and biological functions in plants.
2. **Differentiate between types of seeds** (albuminous and exalbuminous) and identify the main seed layers and embryo types.
3. **Describe the macroscopic morphology of linseed** (shape, color, odor, taste, surface characters, and scars).
4. **Identify the microscopic diagnostic features of linseed**, including epidermis, mucilage, pigment layer, hypodermis, sclerides, endosperm, and embryo.
5. **Perform and interpret basic chemical tests** related to linseed constituents (e.g., cyanogenic glycosides test).
6. **Apply proper laboratory skills and safety rules**, including slide preparation, KOH mounting, accurate drawings, waste disposal, and lab conduct.

# Pharmacognosy Lab

## Grades:

Practical 1 + Spots → 15

Practical 2 + Spots → 15

Lab evaluation → 5

Drawings → 5



# Pharmacognosy Lab

**Lab evaluation → 5:**

**-Attendance:**

-(only 15 min late is allowed)

-(sign ONLY 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).



# Pharmacognosy Lab

Lab evaluation → 5:

-Work place and tools:



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

-Behavior:



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

# Pharmacognosy Lab

**Drawings → 5**

**-(Better to be during lab time).**

**-(Must be in a specific note using pencil).**



**-Note book corrections:**

- Midterm Practical revision.**
- Final Practical revision.**



# Pharmacognosy Lab

## Organs:

**Seeds**

**Fruits**

**Herbs**

**Subterranean**

**Unorganized**



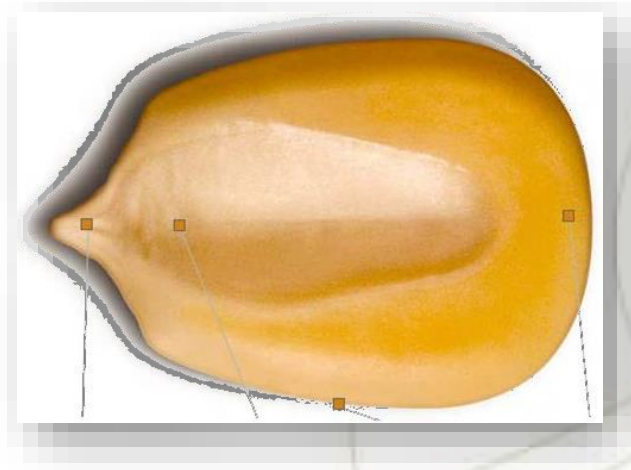
SEEDS



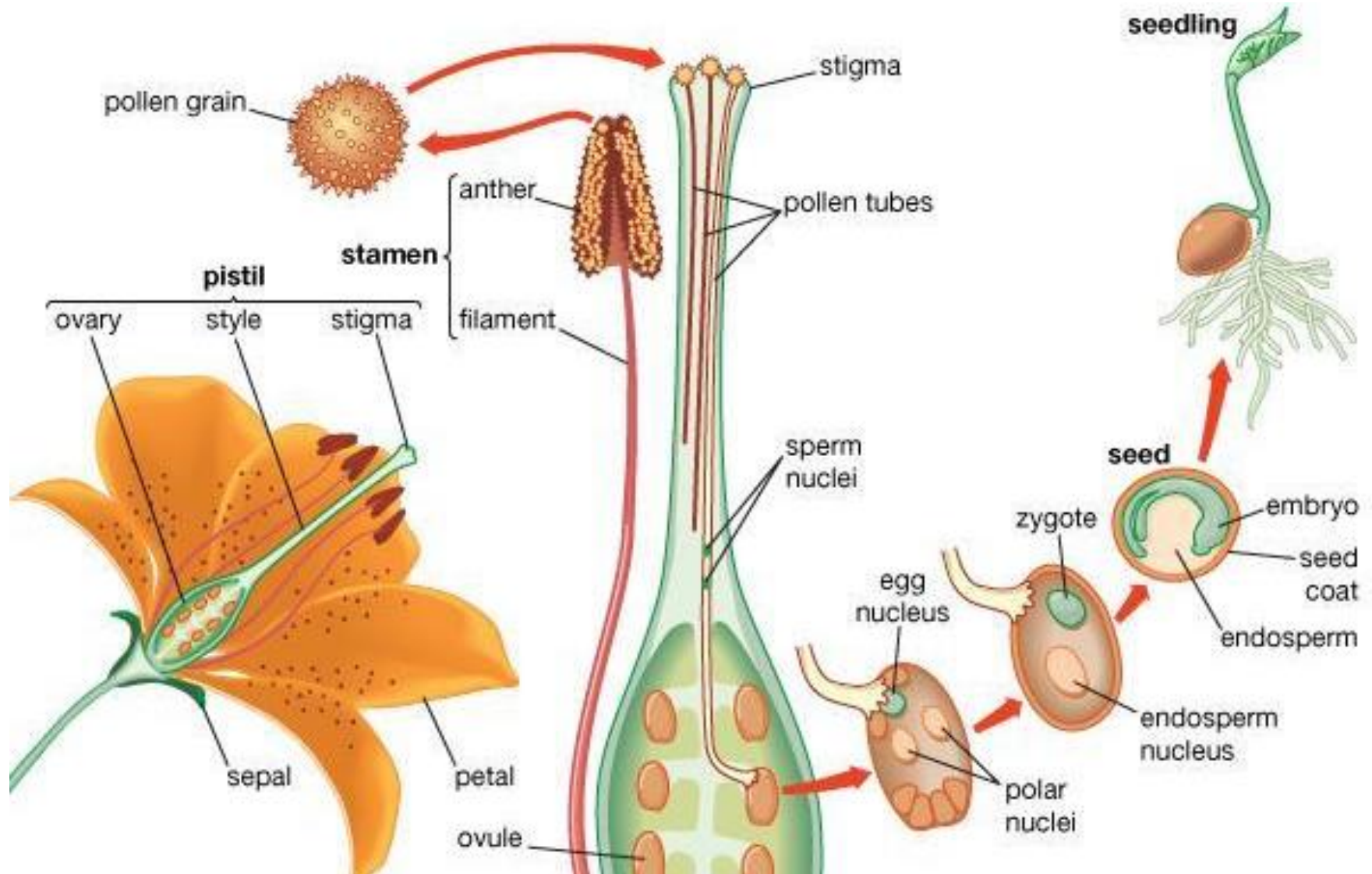
# Definition:

**Mature fertilized ovule that contains an embryo.**

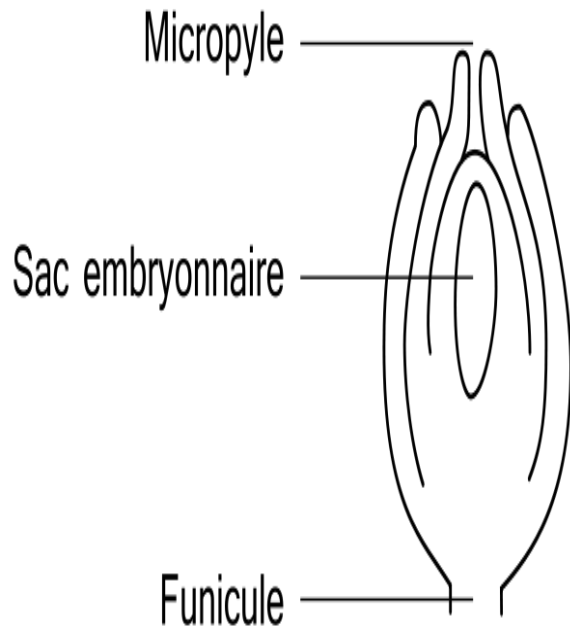
**Its function is to facilitate transportation and to ensure continuation and distribution of the plant.**



# Seed formation:



# Types of ovules



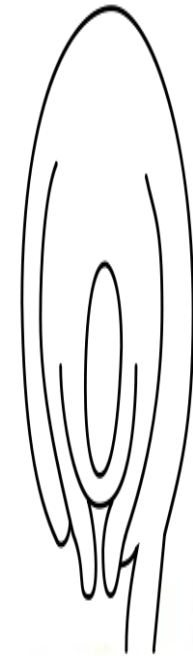
Ovule  
Orthotrope



Ovule  
Campylotrope



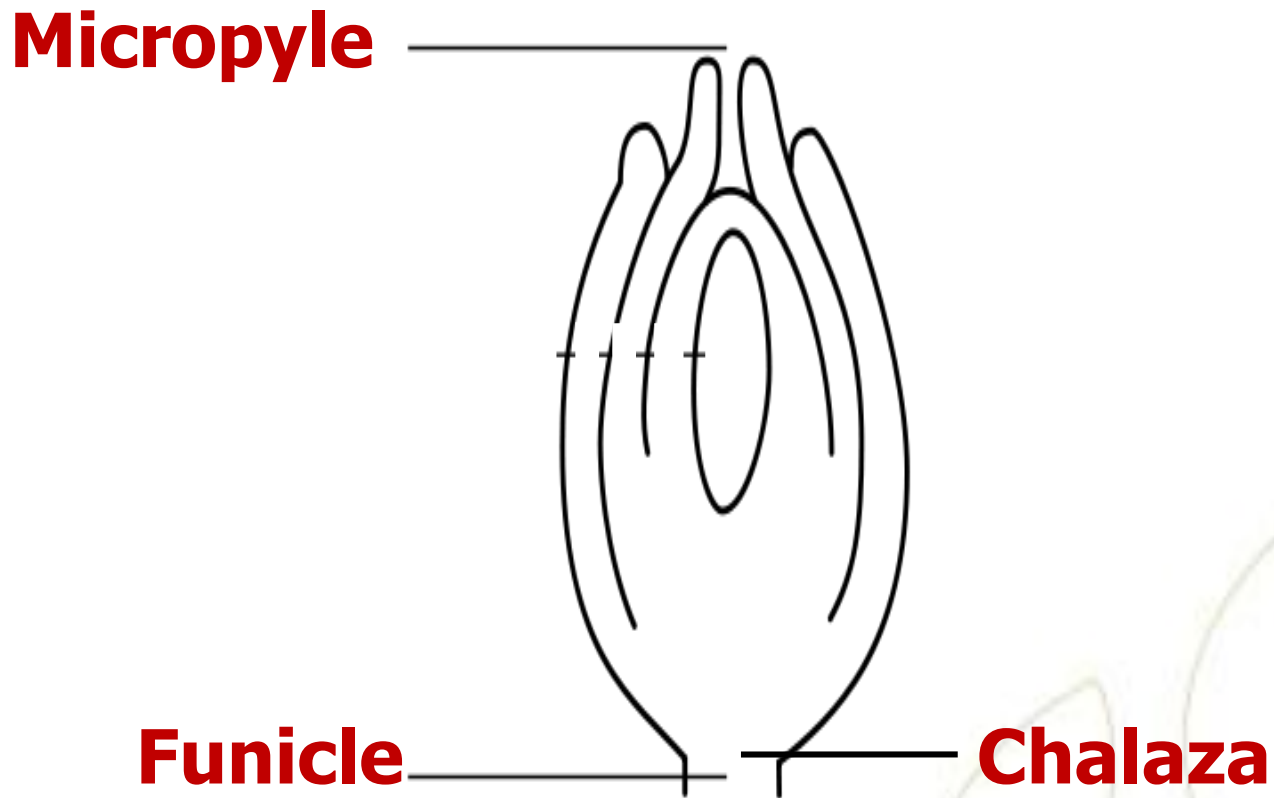
Ovule  
Amphitrope



Ovule  
Anatropous

# Types of ovule:

## 1-Atropous ovule(Orthotropous).

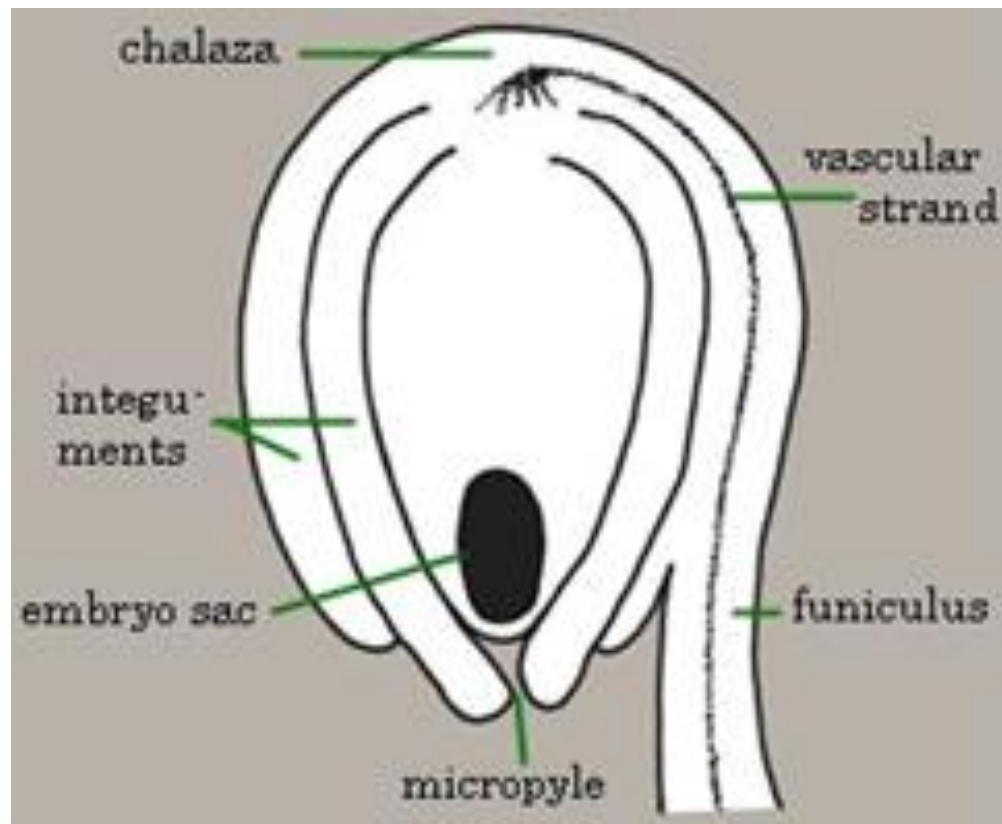


# Types of ovule:

## 2-Anatropous ovule:

### Inverted ovule

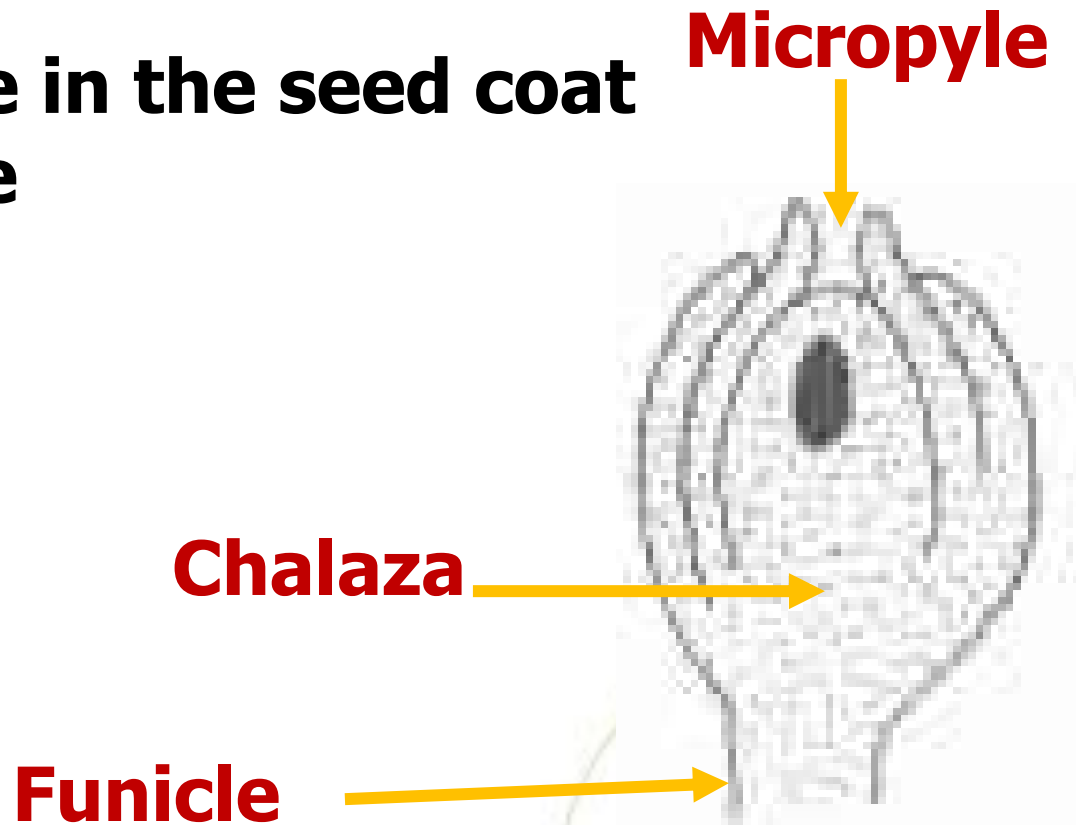
❑ Raphe present half circum (Zingiberaceae, Linaceae).



## Types of scars:

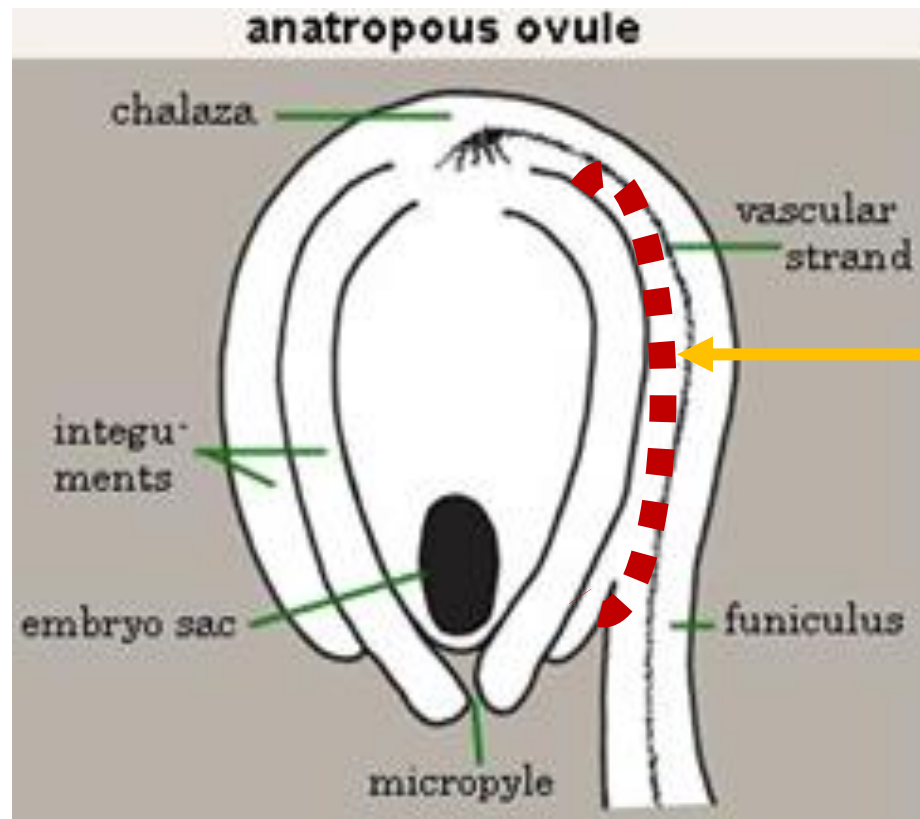
**1-Hilum:** Scar left after removal of seeds from its funicle

**2-Micropyle:** Pore in the seed coat for gas exchange



## Types of scars:

**3-Raphe:** Ridge of vascular tissue on the seed coat **or** line running from hilum to chalaza.



# Typical layers of seed:

1-Testa (seed coat)

2-Perisperm

3-Endosperm

4-Embryo

**Kernel**



# Types of seeds:

## Kernel

**Typical albuminous seed**



endosperm  
perisperm  
embryo

**Albuminous seed**



endosperm  
embryo

**Exalbuminous seed**

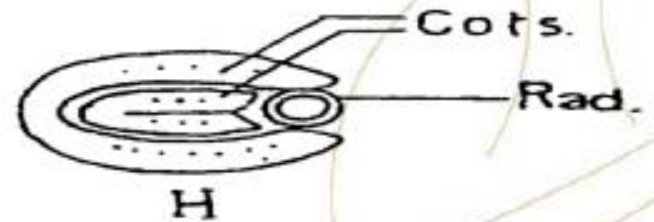
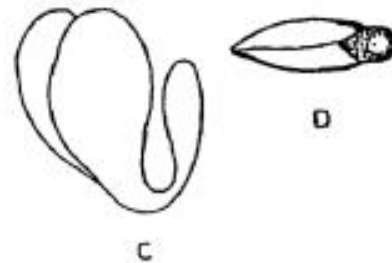
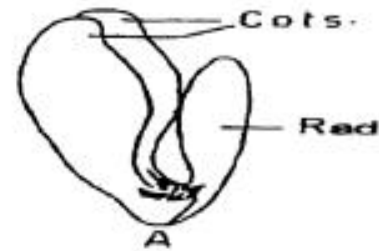
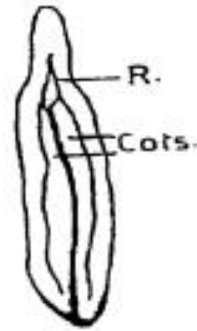


embryo



# Types of Embryo

- Straight
- Accumbent
- In accumbent
- Orthoplocous



# Morphology of the seed

**1- Shape**

**2-Color**

**3-Odour**

**4-Taste**

**5-Scars left on the seed**



# Seeds

## 1-Linseed بذر الكتان



- **Origin:** It is the dried ripe seeds of *Linum usitatisimum* Family: Linaceae.



*Linum* “linear” → Linin  
*usitatisimum* “the most useful”



## **Morphology:**

**Shape:** Elongated ovate nearly flate, rounded at one end, pointed at the other end.

**Odor:** Very slight, characteristic when crushed.

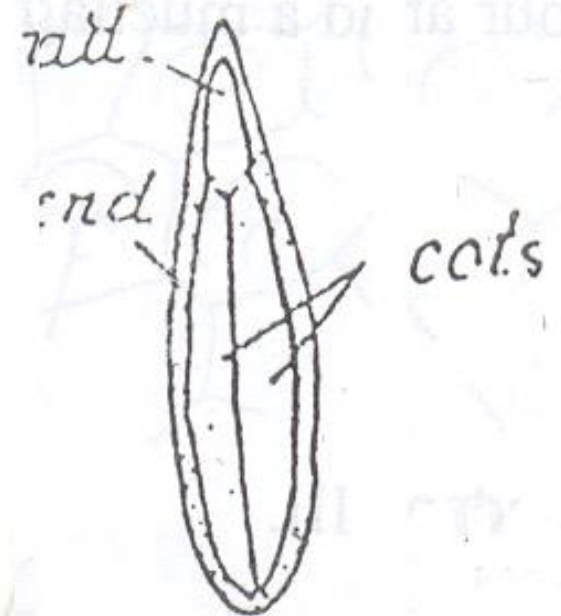
**Surface:** Flattened

**Color:** Glossy brown

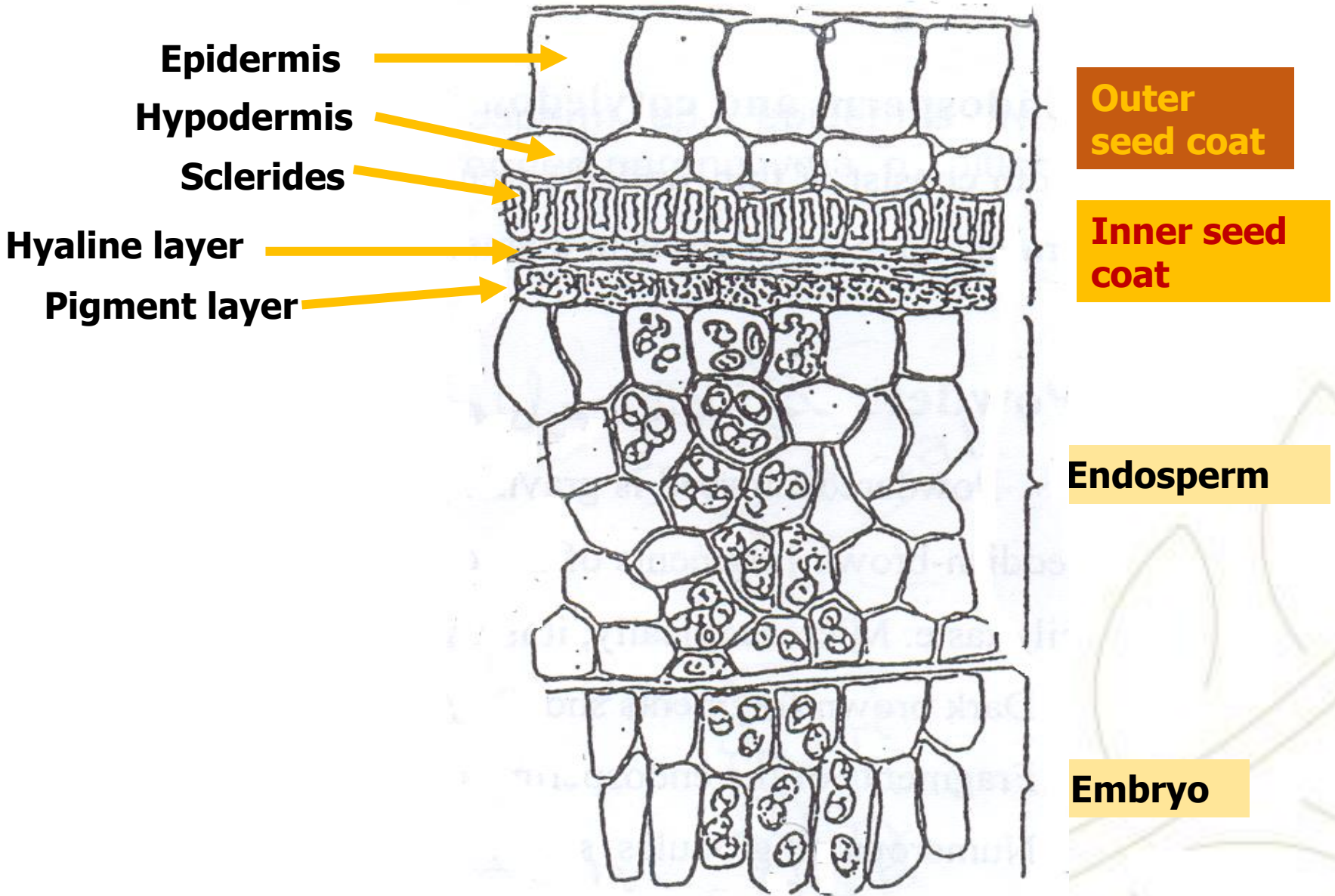
**Taste:** Mucilaginous oily taste



- **Testa:** Smooth, shining, pitted.
- **Hilum and micropyle:** Distinct as a small hollow on the edge near the pointed end.
- **Raphe:** Distinct yellow ridge from the hilum to the rounded end.
- **Ovule:** Anatropous ovule



T.S.



**Powder:**

**Condition:** Fine powder

**Color:** Yellowish brown with dark particles

**Odor:** Oily characteristic odor of linseed

**Taste:** Mucilaginous oily



# Microscopical Examination (Key elements):

**Mucilage**    **Epidermis**

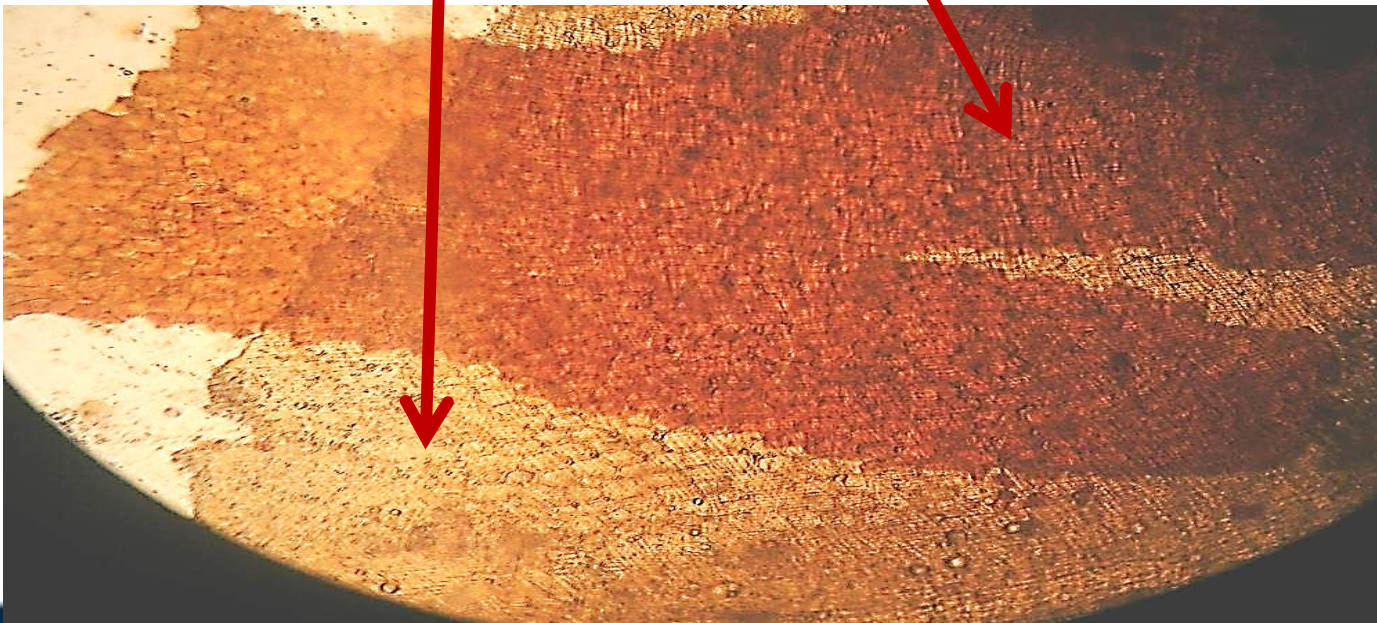
**Collapsed layer**

**Sclerides**

**Hypodermis**

**Pigment layer**

**Matt-like Structure**



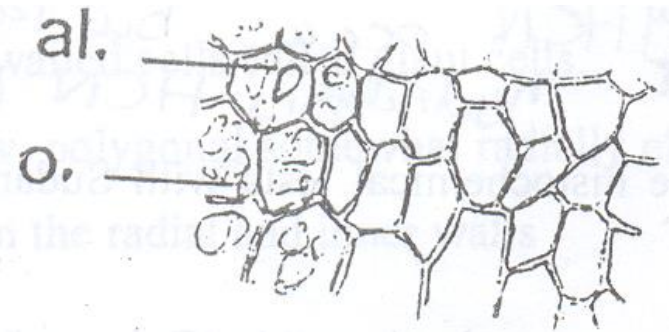
# Microscopical Examination (Key elements):



**Pigment layer**

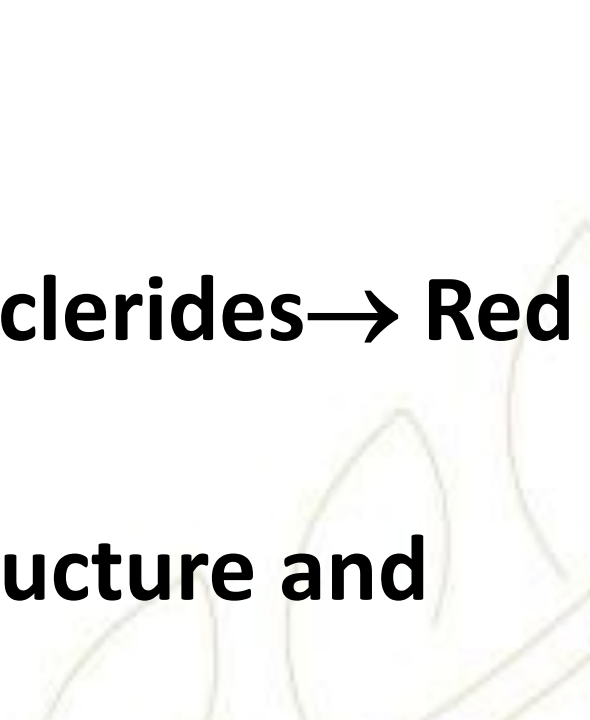


**Embryo**



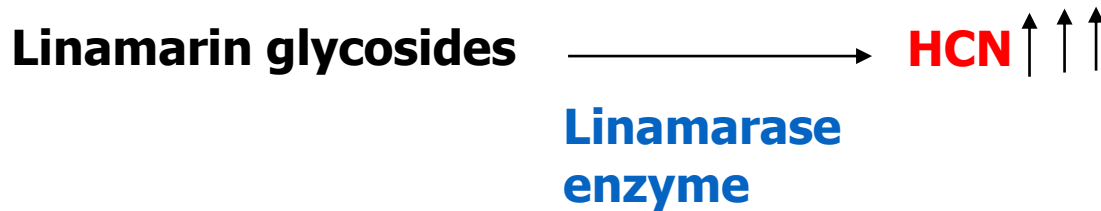
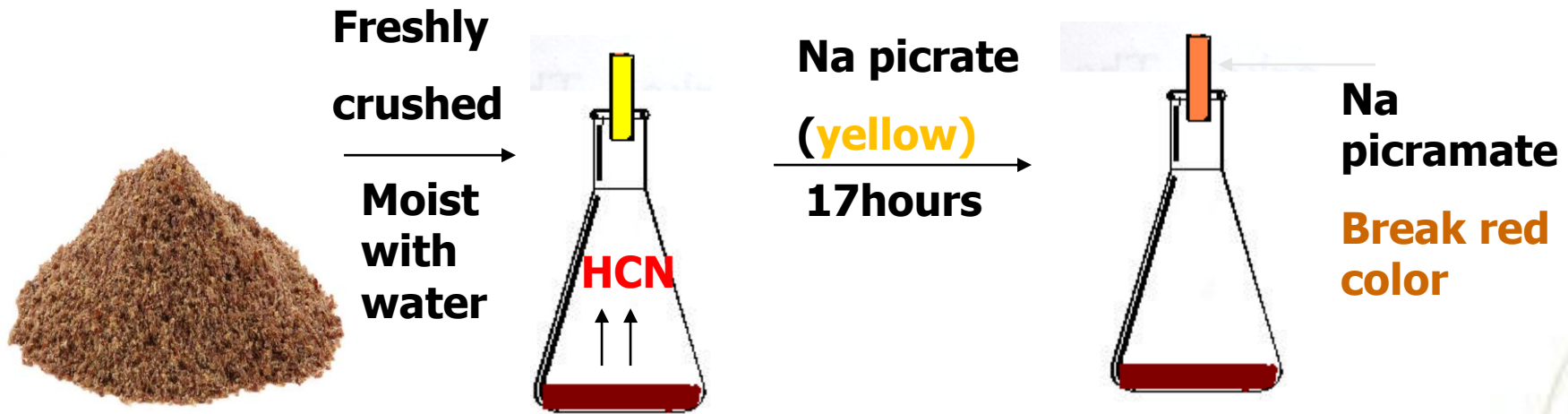
**Endosperm**

# Microscopical Characters

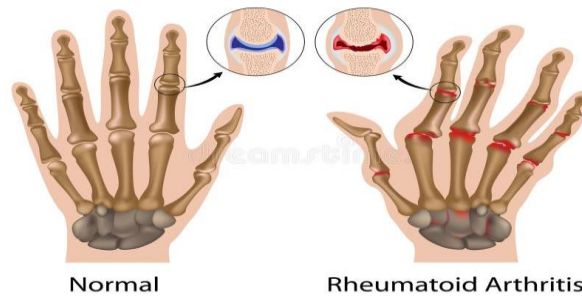
- **Mount in Water: Starch (undeveloped seed).**
  - **Mount in Phlouroglucinol: Sclerides → Red**
  - **Mount in KOH: Matt-like Structure and Pigment layer.**
- 




# Chemical test:

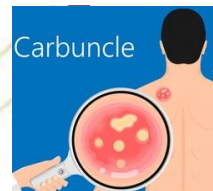
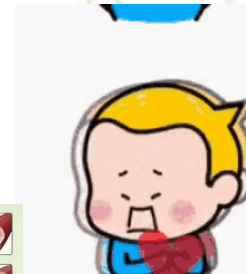
## General test for cyanogenic glycoside:



# Uses

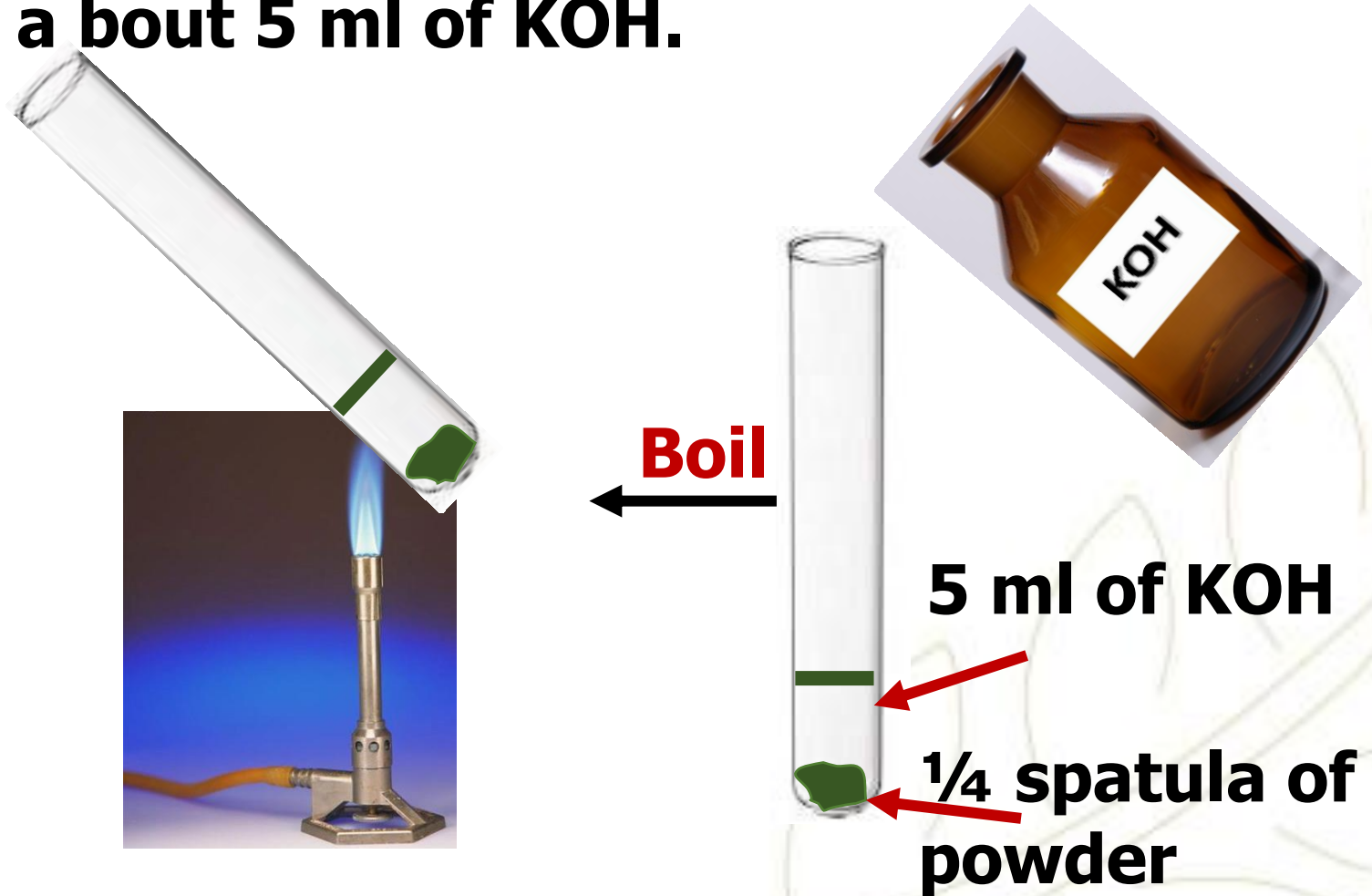


1. Used in patients with **rheumatoid arthritis** and **psoriasis**.
2. **Demulcent** in acute or chronic gastritis 
3. **Bulk laxative** in habitual constipation, due to its mucilage & fixed oil which have a lubricant effect.
4. **Anti-inflammatory**, Omega-3-fatty acids have demonstrated effect due to reduced production of inflammatory mediators).
5. **Heart protecting against angina pectoris**, since Omega-3 fatty acids reduce the whole Blood viscosity & lower cholesterol level. 
6. **Externally**, used as an **emollient** in poultices for boils, carbuncles and other skin infections. 



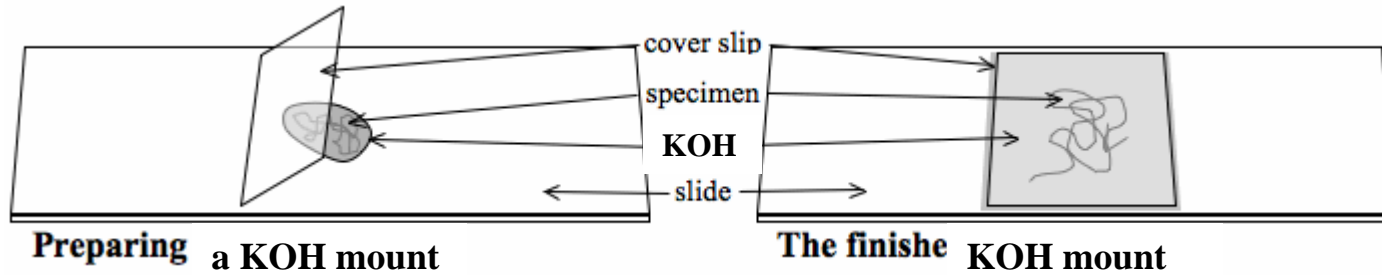
# Practical work:

**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.**



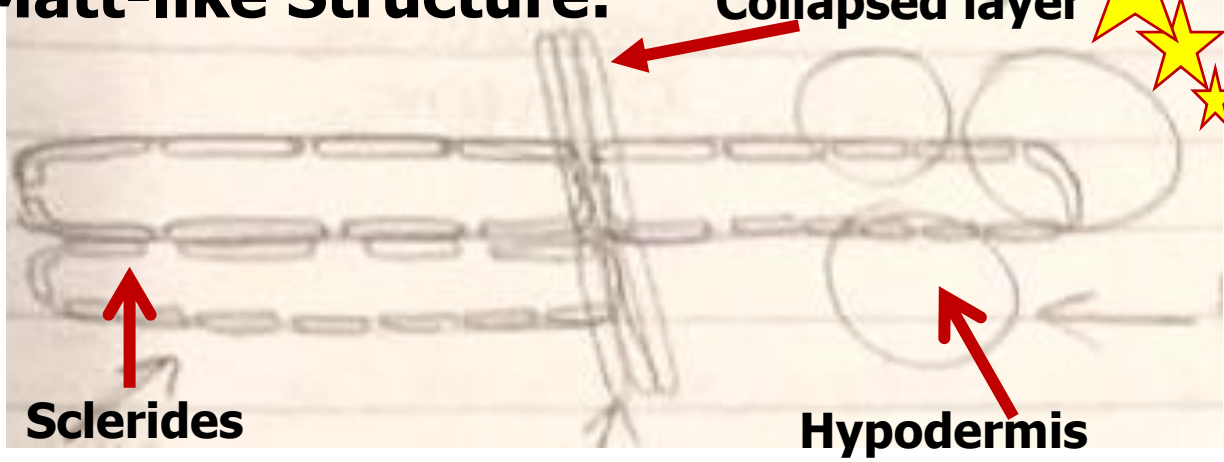
**Keep your work place and tools clean.**

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

# Main Key Elements Drawings:

1

Matt-like Structure:



Embryo:

4



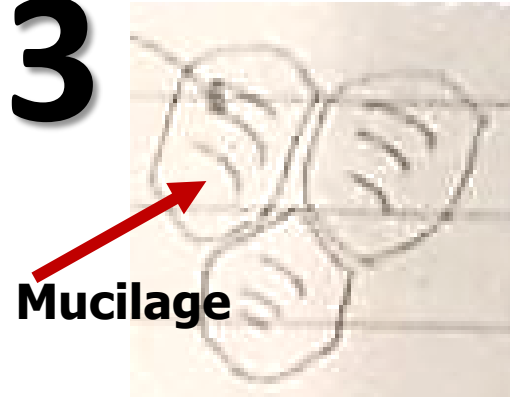
2

Pigment layer:



3

Epidermis:



Endosperm:

5



# References:

**1. Trease & Evans' Pharmacognosy by William Charles Evans, 2002.**

**3. Fundamentals of Pharmacognosy and Phytotherapy by Michael Heinrich, Joanne Barnes, Simon Gibbons, and Elizabeth M. Williamson, 2004.**

**2. Botany : An introduction to Plant Biology, Third edition by James D. Mauseth, 2008.**

## **Useful links:**

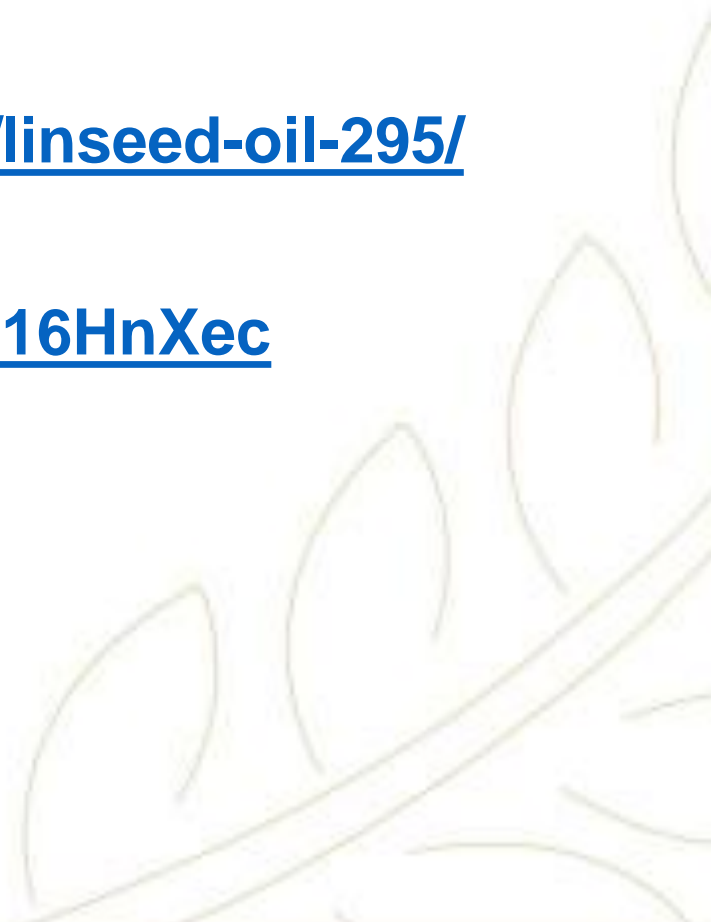
<https://youtu.be/Tb8XeTeTq8E>

<https://www.pharmacy180.com/article/linseed-oil-295/>

<https://www.youtube.com/shorts/sEvn16HnXec>

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

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



# THANK YOU!

