

3 GOOD HEALTH
AND WELL-BEING



4 QUALITY
EDUCATION



9 INDUSTRY, INNOVATION
AND INFRASTRUCTURE



MSA UNIVERSITY
معنة أكتوبر للعلوم الحديثة والآداب

Pharmacognosy

PHG 112

Fall 2026

Pharmacognosy

PHG 112



potato tubers

potato tubers



ginger rhizome

ginger rhizome

Fall 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 .

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.

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 متبنييه بذلك أهداف التنمية المستدامة

The Faculty of Pharmacy, October University for Modern Sciences and Arts, is committed to providing advanced educational program with international partnerships to prepare pharmacists 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.

رسالة البرنامج

يسعى برنامج بكالوريوس الصيدلة (PharmD)، ضمن شراكته الدولية، إلى المساهمة في رفع كفاءة المنظومة الصحية من خلال تخريج صيادلة ذوي كفاءة عالية، ملتزمين بأخلاقيات المهنة، وقادرين على المنافسة والابتكار وريادة الأعمال قوميا وإقليميا وعالميا ، والمساهمة في تطوير البحث العلمي التطبيقي لخدمة المجتمع، متبنيا أهداف التنمية المستدامة.

The Bachelor of Pharmacy (PharmD) program, through its international partnership, seeks to contribute to raising the efficiency of the healthcare system by graduating highly qualified pharmacists who are committed to professional ethics and capable of competing, innovating, and leading businesses nationally, regionally, and globally. It also seeks to contribute to the development of applied scientific research to serve the community, while implementing 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

Weekly Plan

Labs

Week	Topic
One 23/9/2026	Introduction to Seeds + Linseed
Two 30/9/2026	Fenugreek + (Quinoa, Chia, Pumpkin, Nigella)
Three 7/10/2026	Intro Fruit + Fennel
Four 14/10/2026	Anise + Ammi visnaga
Five 21/10/2026	Scheme I + Quiz I
Six 28/10/2026	Practical I + Spot I
Midterm exam (31/10 till 5/11)	
Seven 11/11/2026	Introduction to herb Mentha + Lobelia
Eight 18/11/2026	Introduction to subterranean + Ginger
Nine 25/11/2026	Liquorice + Rhubarb
Ten 12/12/2026	Unorganized Drugs
Eleven 9/12/2026	Scheme II + Quiz II
Twelve 16/12/2026	Practical II + Spot II
Thirteen 23/12/2026	Assignment Discussion
Final Exam (27/12)	

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).**

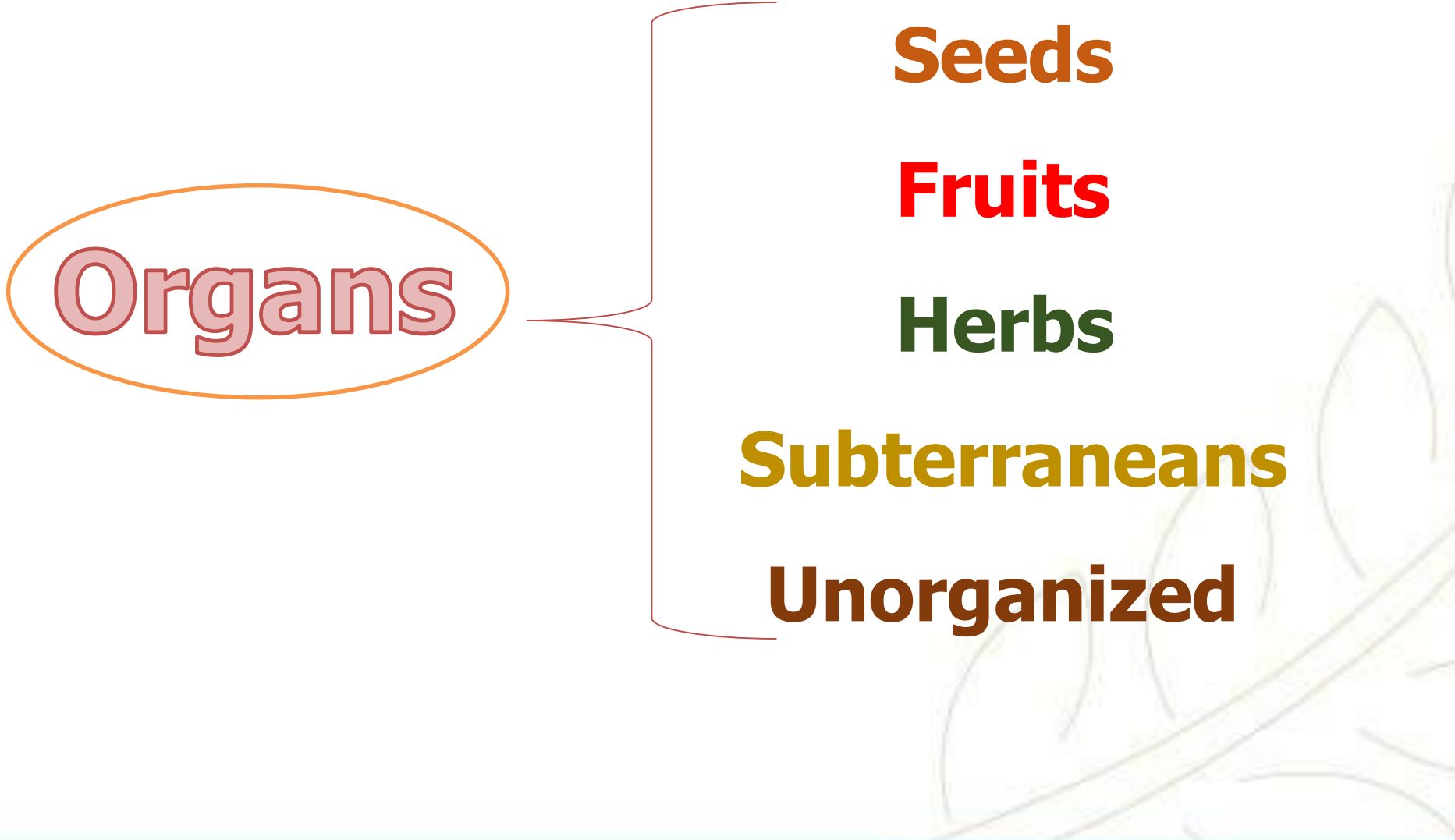
-Note book corrections:

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



Pharmacognosy Lab

Organs



```
graph LR; Organs([Organs]) --- Seeds[Seeds]; Organs --- Fruits[Fruits]; Organs --- Herbs[Herbs]; Organs --- Subterraneans[Subterraneans]; Organs --- Unorganized[Unorganized];
```

Seeds

Fruits

Herbs

Subterraneans

Unorganized

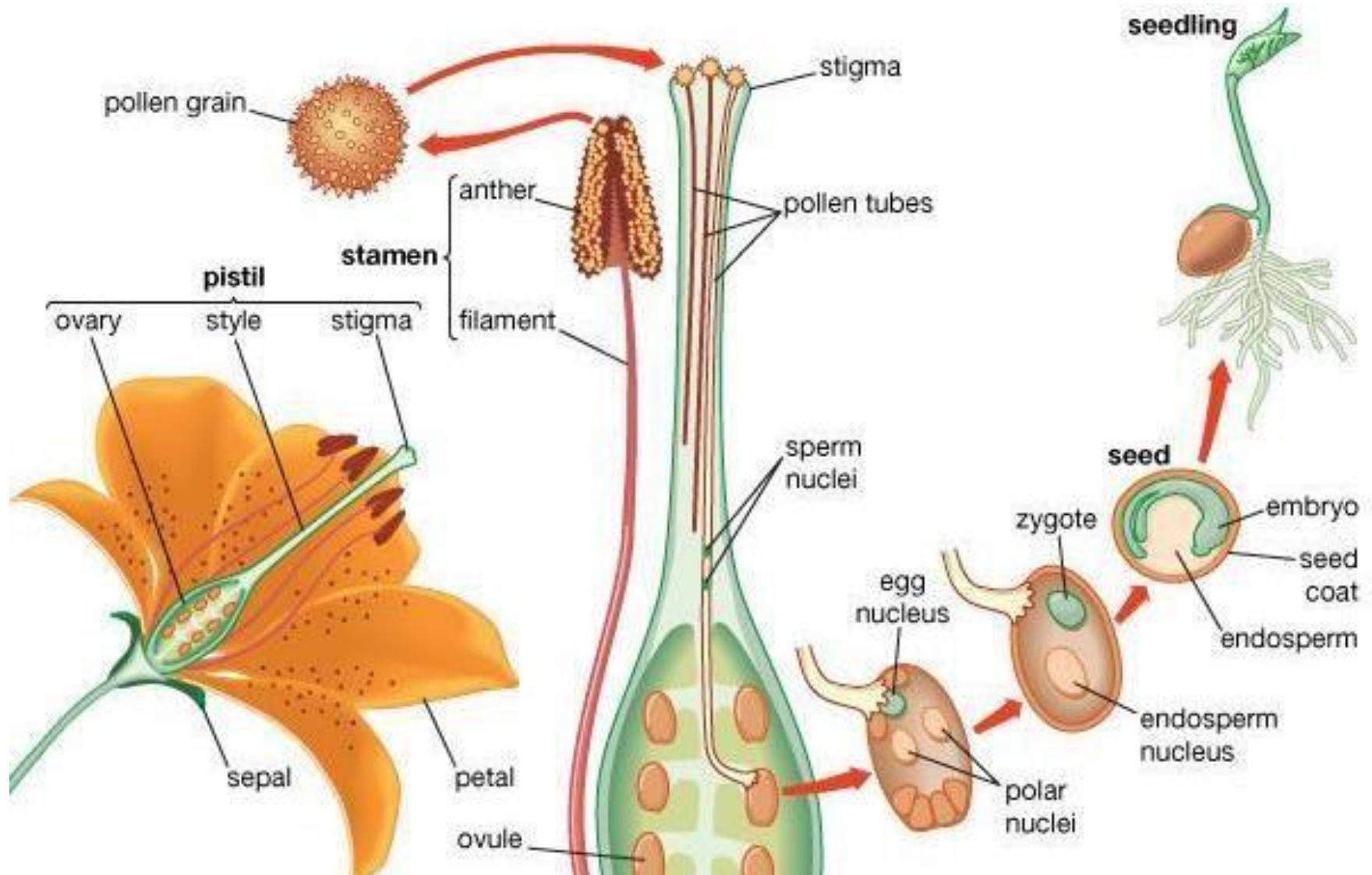


Definition:

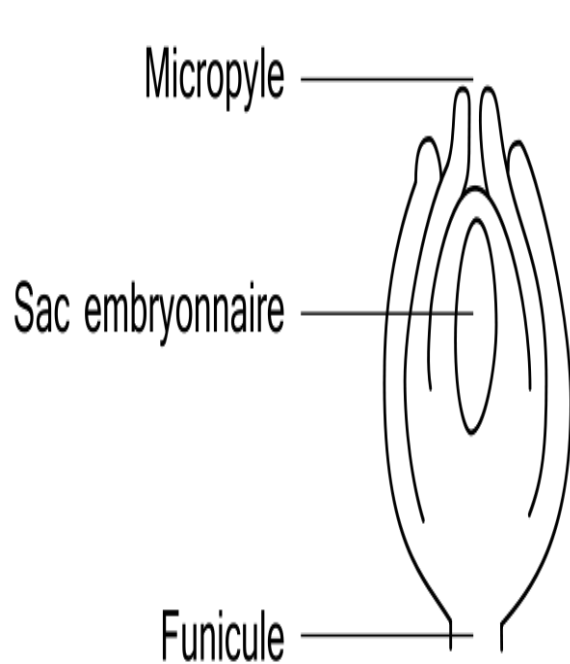
- Mature fertilized ovule that contains an embryo.
- Its function is to facilitate transportation and to ensure continuation and distribution of the plant.



Seed formation:



Types of ovules



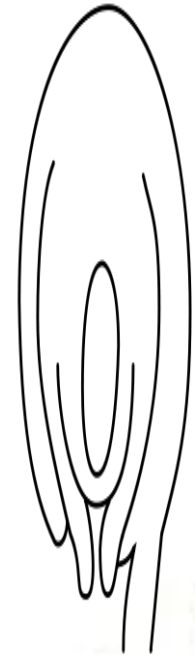
Ovule
Orthotrope



Ovule
Campylotrope



Ovule
Amphitrope



Ovule
Anatrope

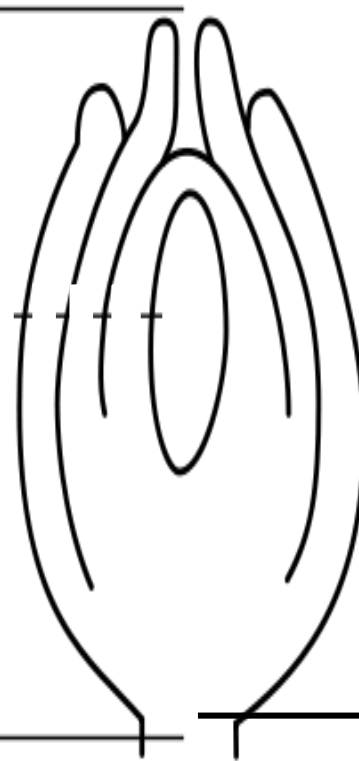
Types of ovule:

1-Atropous ovule (Orthotropous).

Micropyle

Funicle

Chalaza

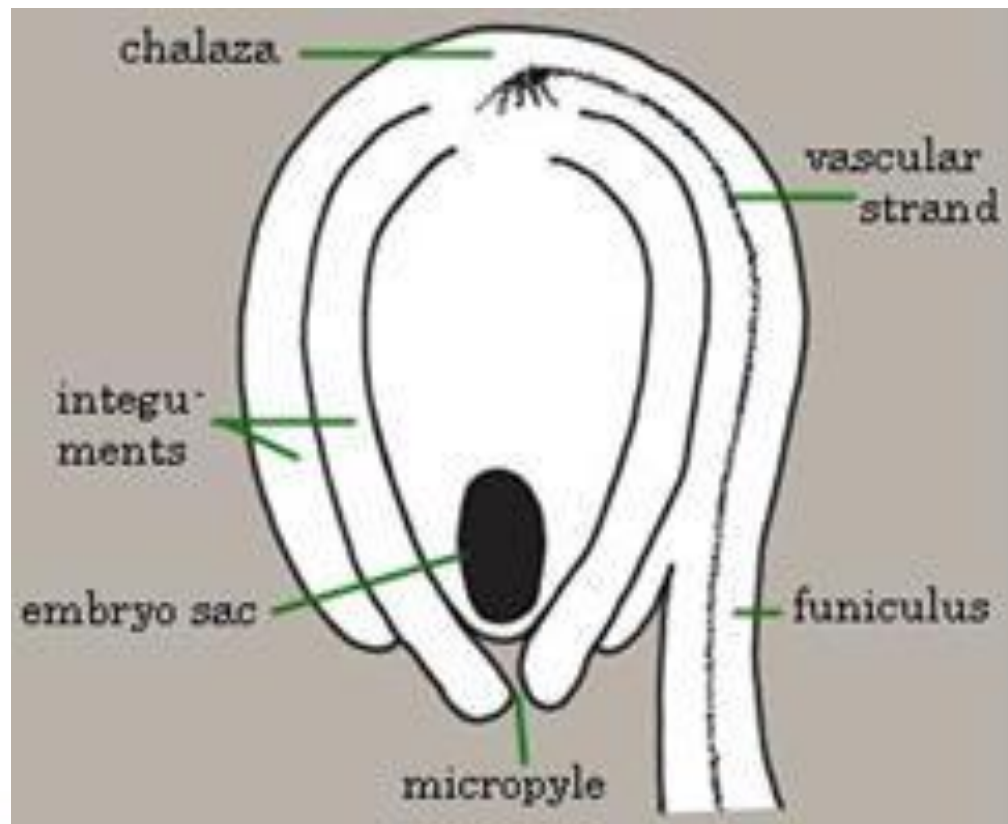


Types of ovule:

2- Anatropous ovule:

Inverted ovule

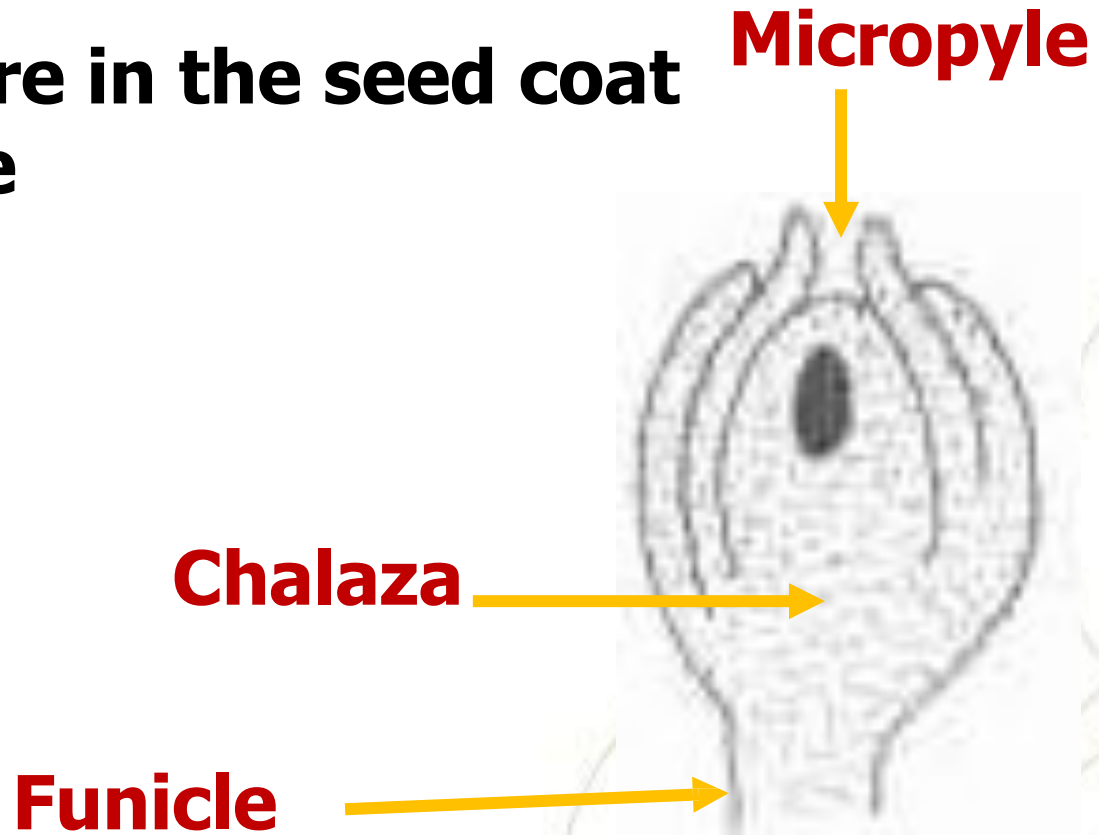
❑ Raphe present half circum (Zingiberaceae, Linaceae).



Types of scars:

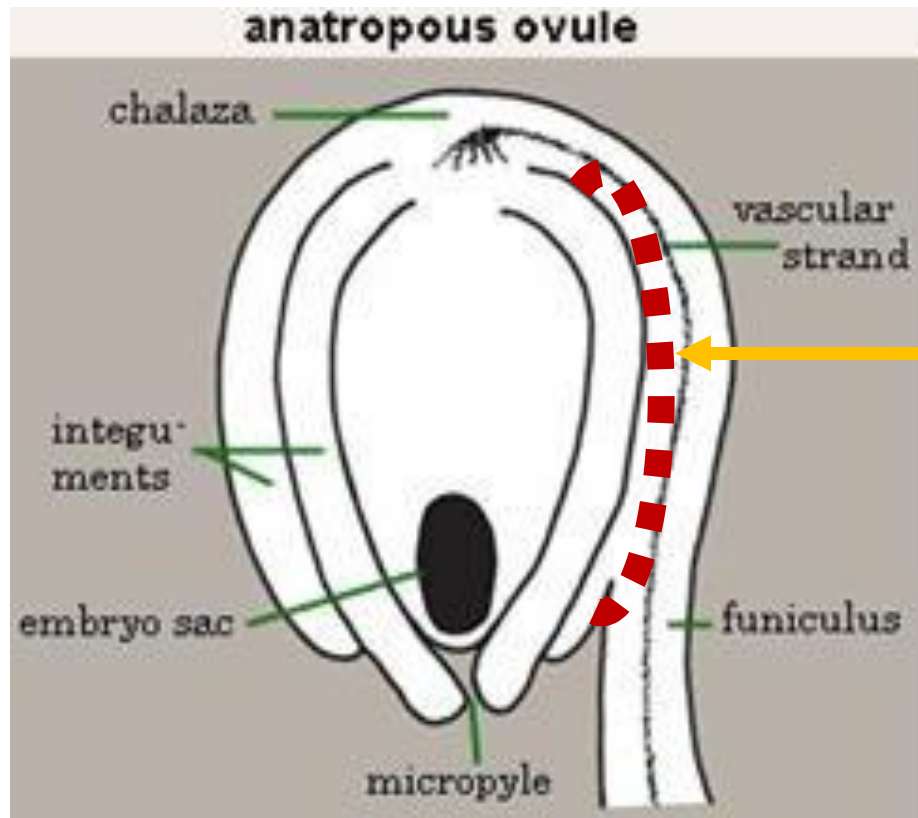
1) Hilum: Scar left after removal of seeds from its funicle

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.



Raphe

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

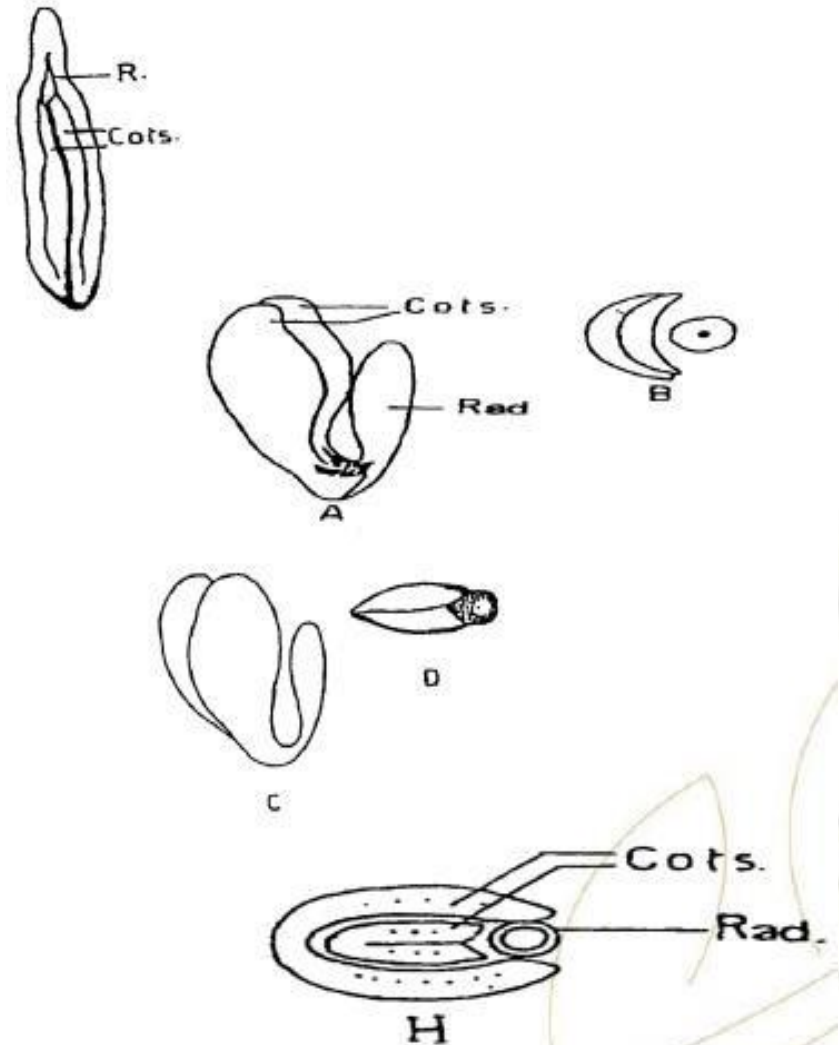


embryo



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



- **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.

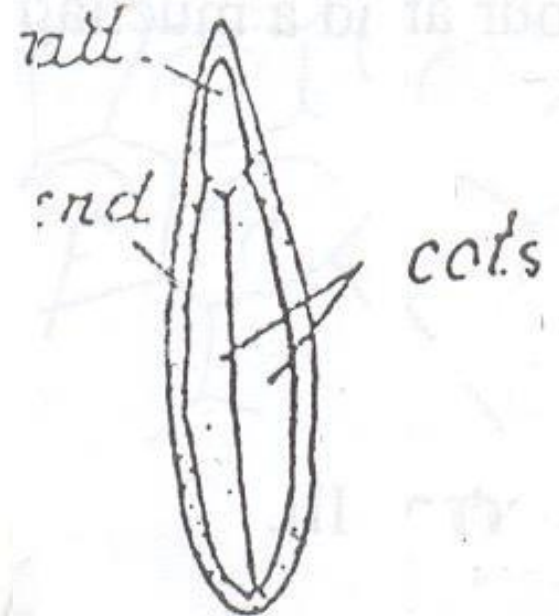
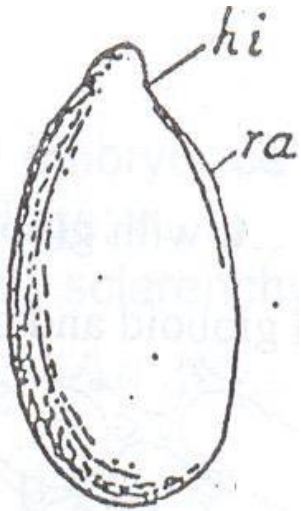
Surface: Flattened

Color: Glossy brown

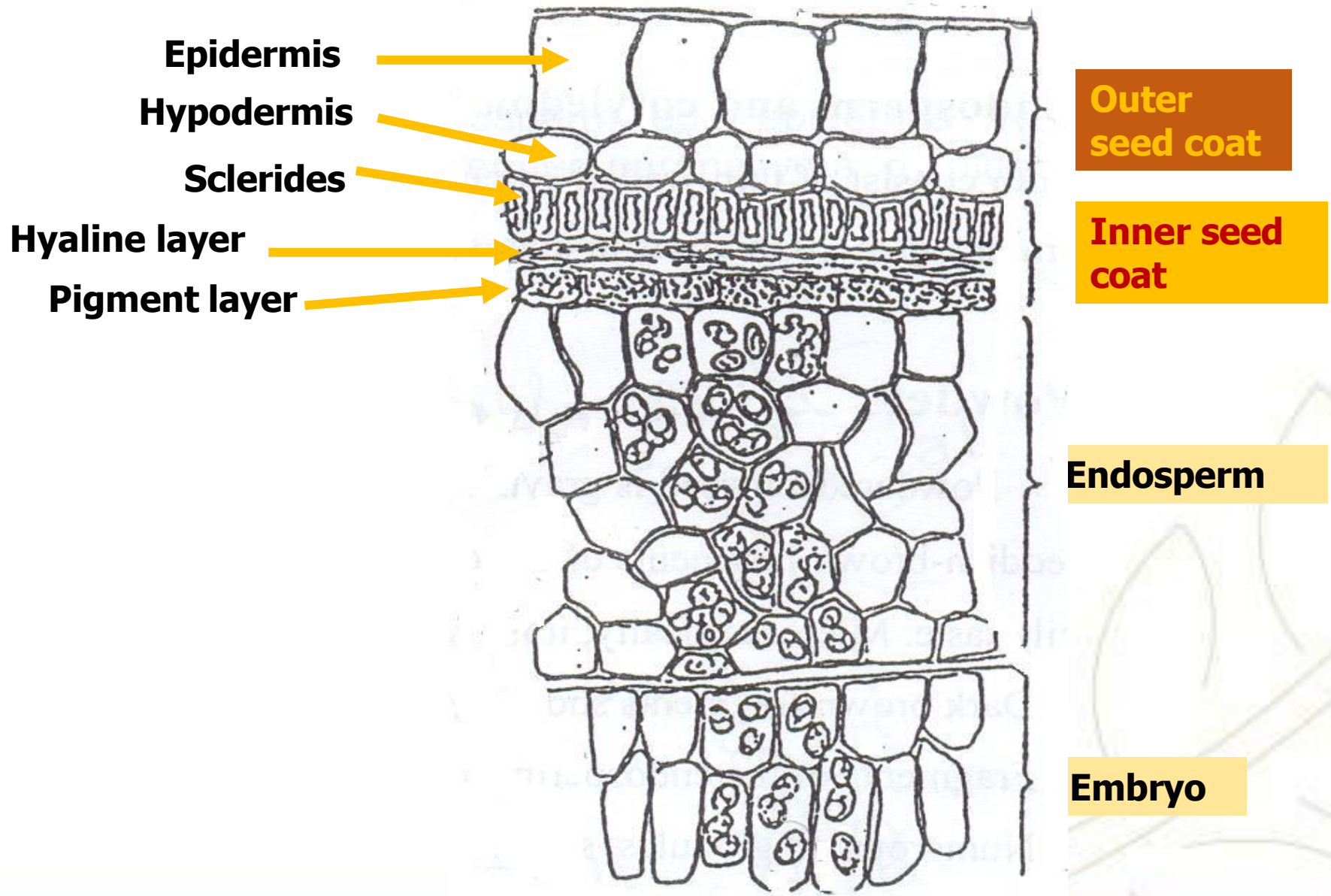
Taste: Mucilaginous oily taste



- **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**

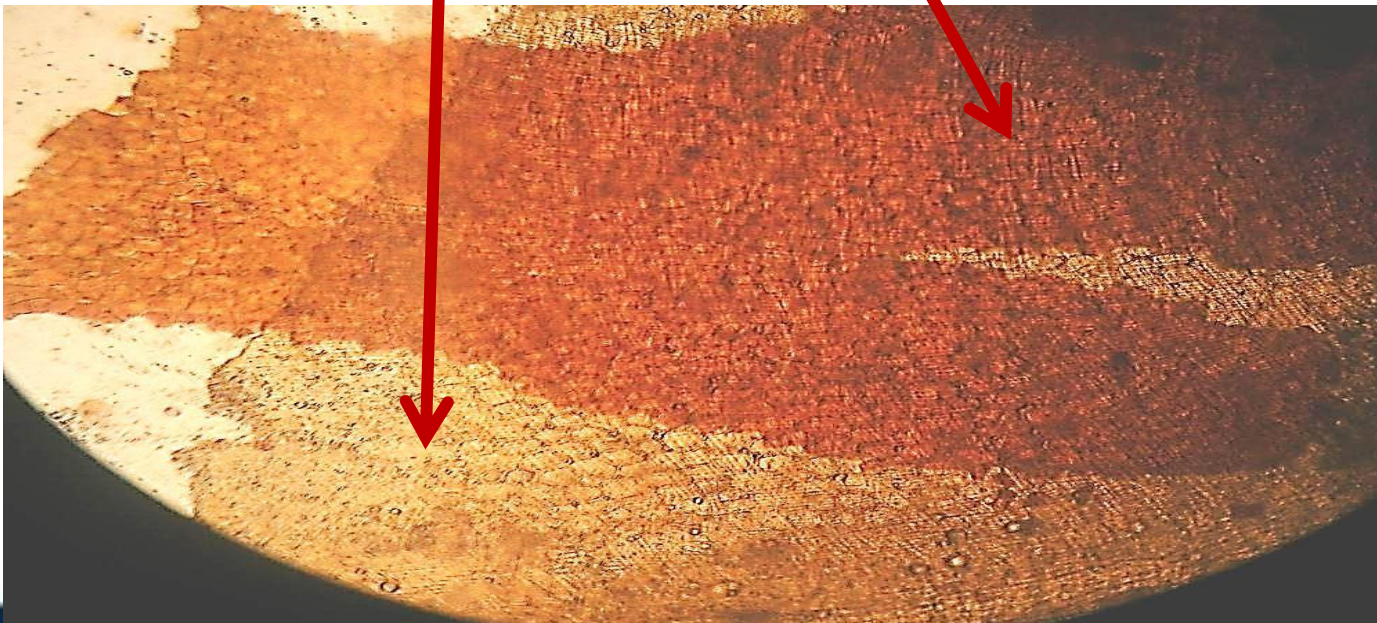
Collapsed layer

Sclerides

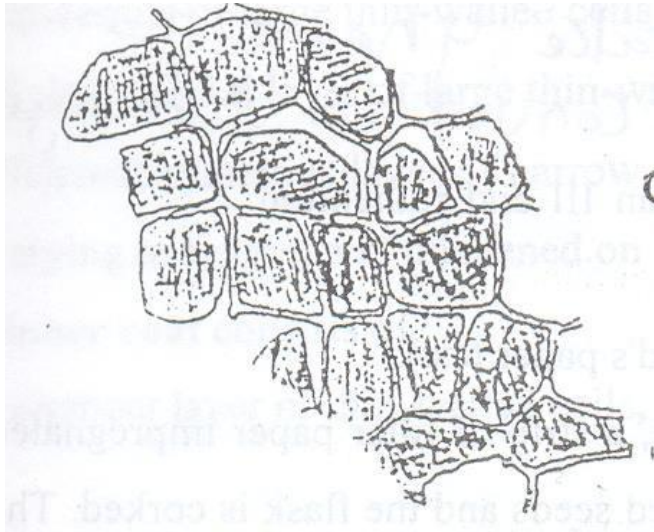
Hypodermis

Pigment layer

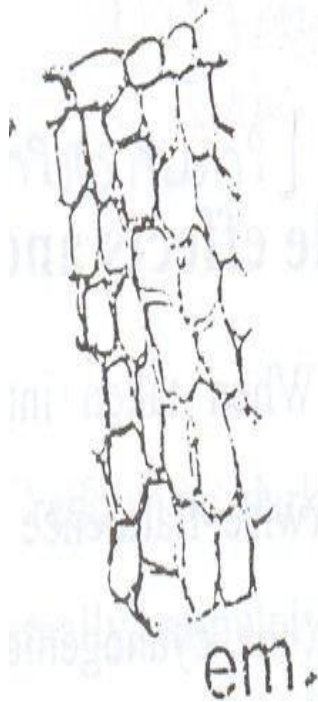
Matt-like Structure



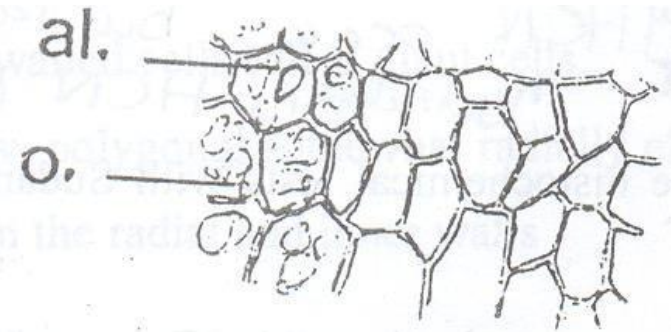
Microscopical Examination (Key elements):



Pigment layer



Embryo



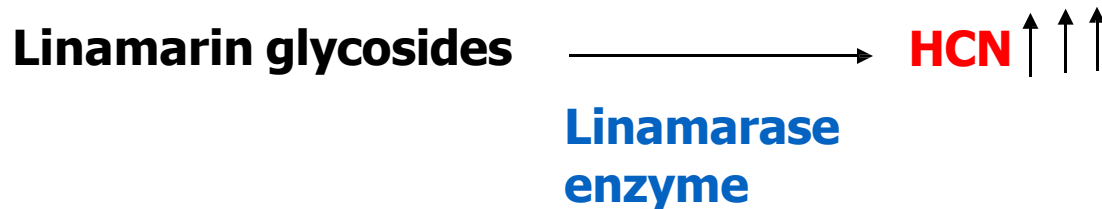
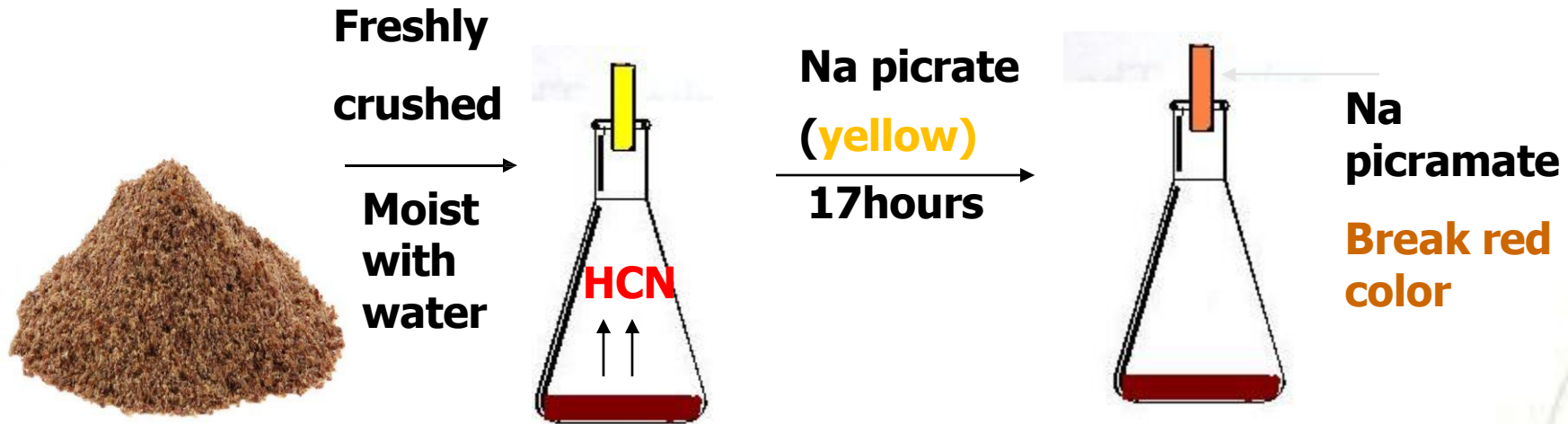
Endosperm

Microscopical Characters

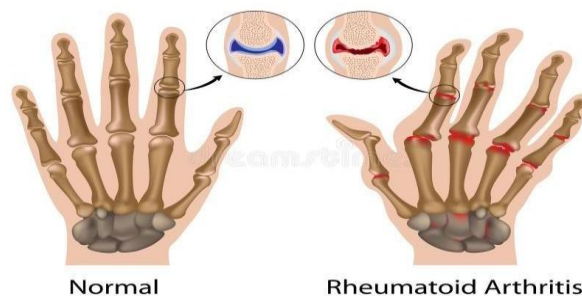
- **Mount in Water:** Starch (undeveloped seed).
- **Mount in Phlouroglucinol:** Sclerides → Red
- **Mount in KOH:** Matt-like Structure and Pigment layer.

Chemical test:

General test for cyanogenic glycoside:



Uses



1. Used in patients with **rheumatoid arthritis** and **psoriasis**.

2. **Demulcent** in acute or chronic gastritis

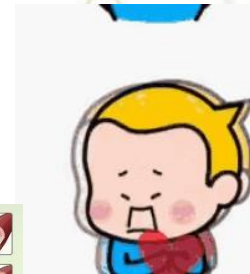


3. **Bulk laxative** in habitual constipation, due to its mucilage & fixed oil which have a lubricant effect.

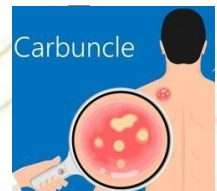


4. **Anti-inflammatory**, Omega-3-fatty acids have demonstrated effect due to reduced production of inflammatory mediators).

5. **Heart protecting against angina pectoris**, since Omega-3 fatty acids reduce the whole Blood viscosity & lower cholesterol level.

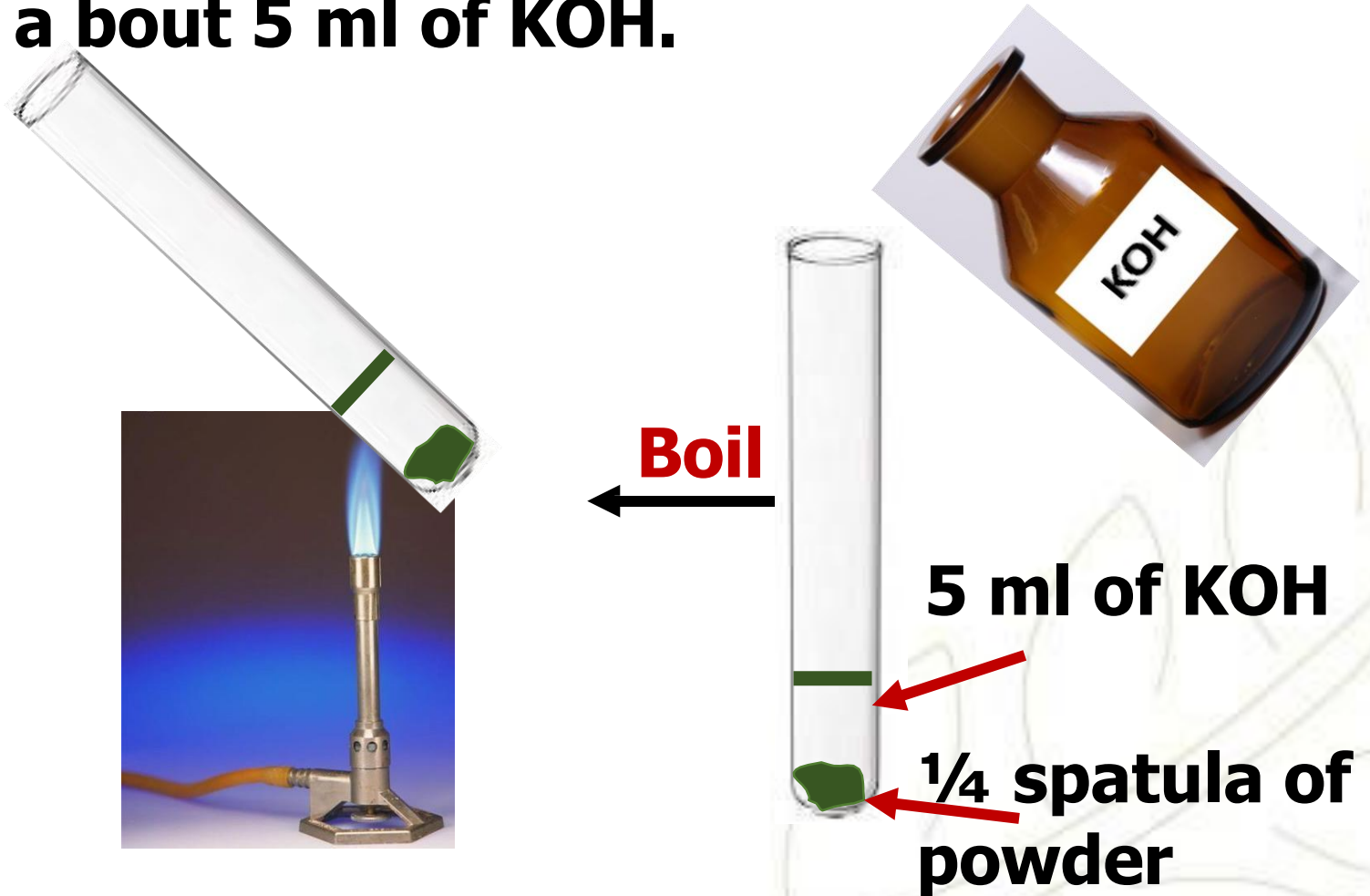


6. **Externally**, used as an **emollient** in poultices for boils, carbuncles and other skin infections.



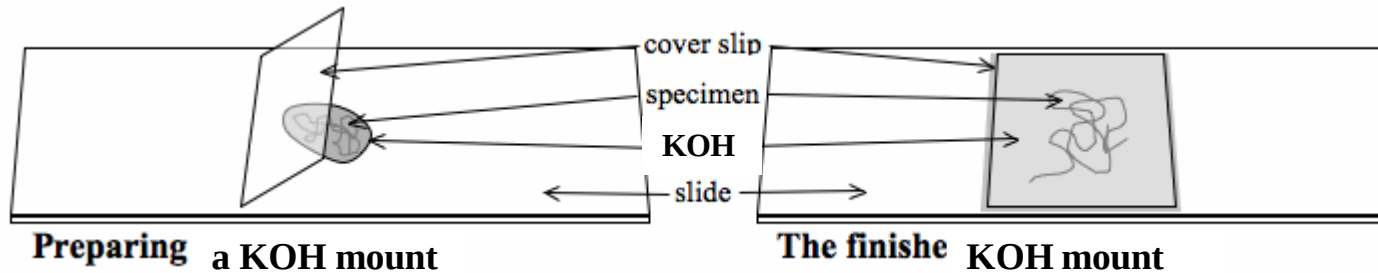
Practical work:

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.



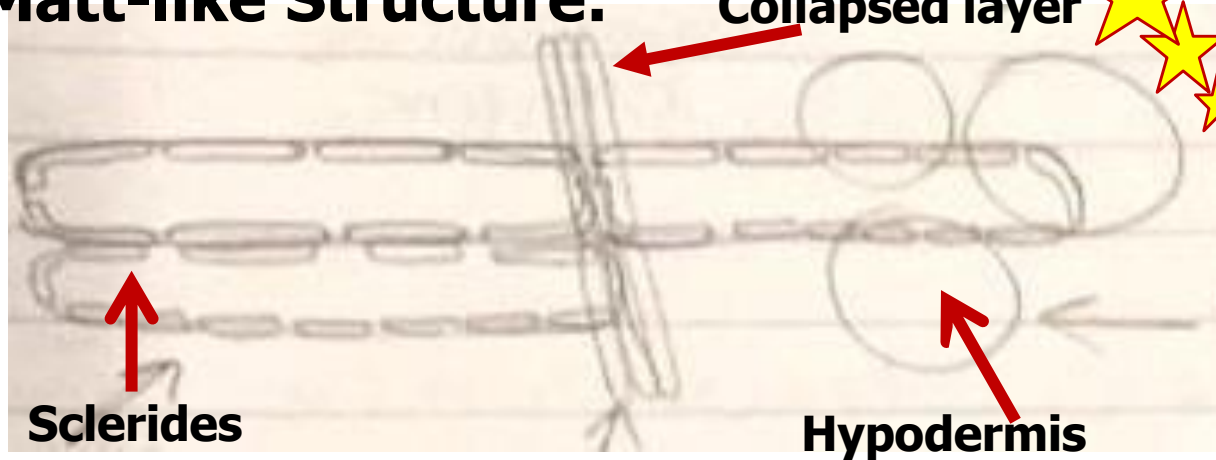
Keep your work place and tools clean.

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

Main Key Elements Drawings:

1

Matt-like Structure:



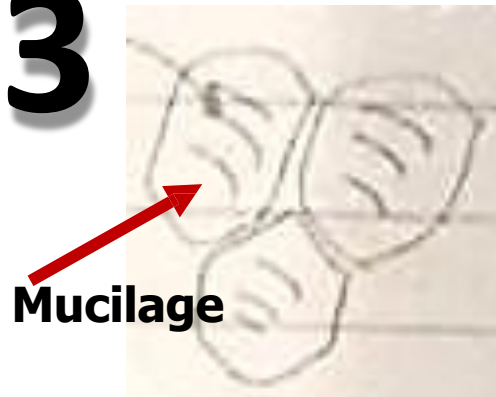
2

Pigment layer:



3

Epidermis:



4

Embryo:



5

Endosperm:



References:

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

Useful links:

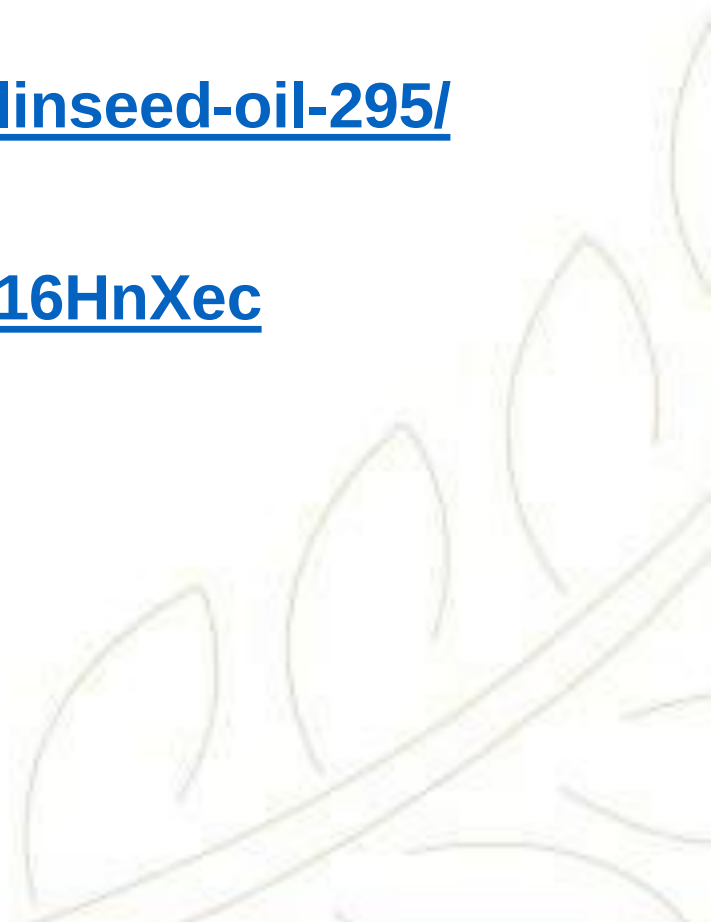
<https://youtu.be/Tb8XeTeTq8E>

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

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

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

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



THANK YOU