



MSA UNIVERSITY
معة أكتوبر للعلوم الحديثة والآداب

pharmacognosy

PHG 112

Fall 2026

Pharmacognosy

PHG 112



potato tubers



ginger rhizome

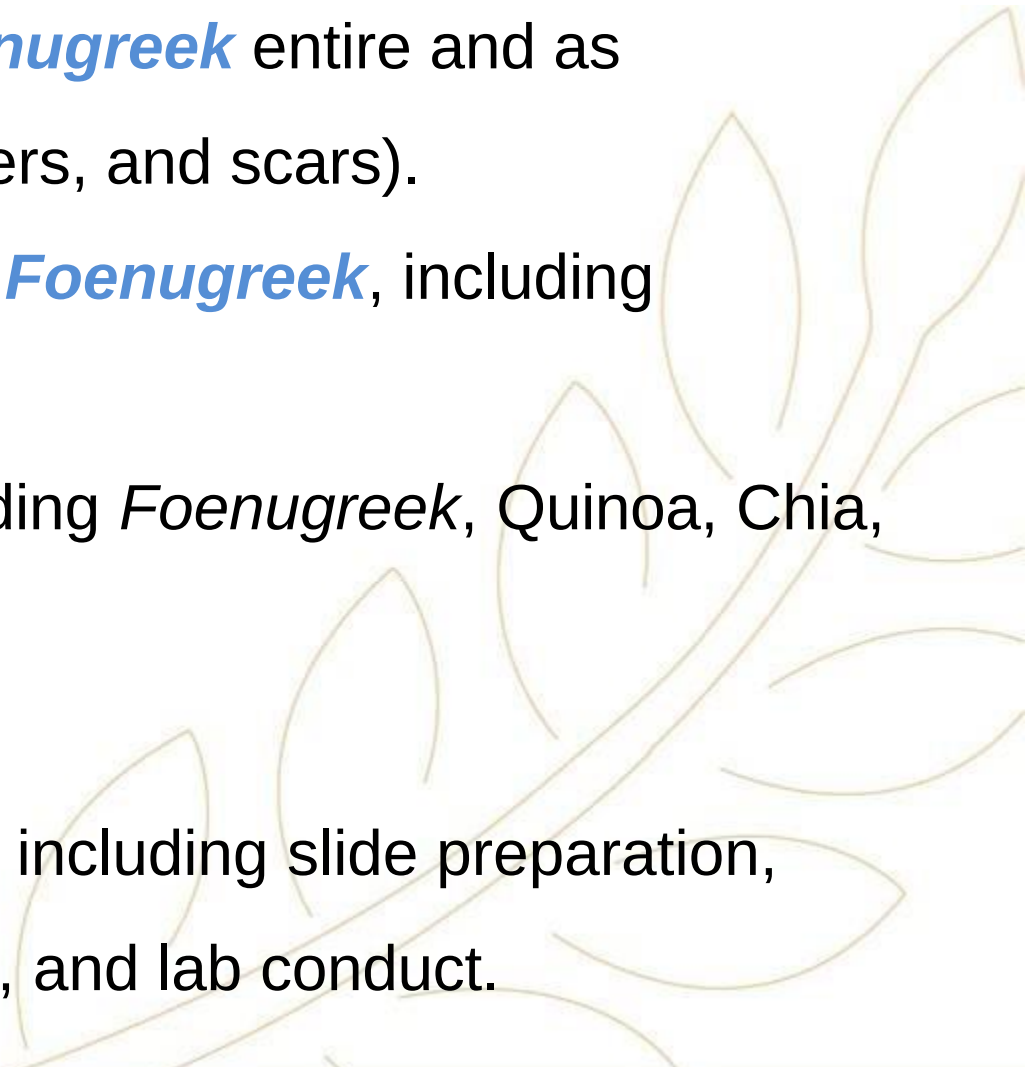
Fall 2026

Lab 2

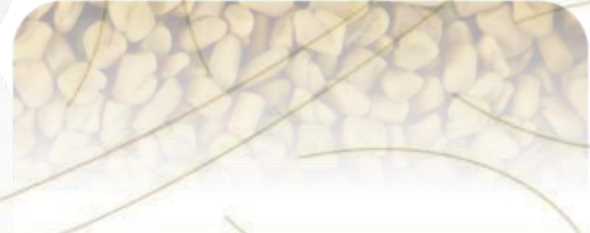


Intended Learning Outcomes (ILOs)

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

- 1. Describe the macroscopic morphology of *Foenugreek*** entire and as powder(shape, color, odor, taste, surface characters, and scars).
 - 2. Identify the microscopic diagnostic features of *Foenugreek*,** including epidermis, and hypodermis.
 - 3. Differentiate the shape of different seeds,** including *Foenugreek*, Quinoa, Chia, Pumpkin and *Nigella sativa* seeds.
 - 4. Recognize the uses of different seeds.**
 - 5. Apply proper laboratory skills and safety rules,** including slide preparation, KOH mounting, accurate drawings, waste disposal, and lab conduct.
- 

Foenugreek



Foenugreek

Origin:

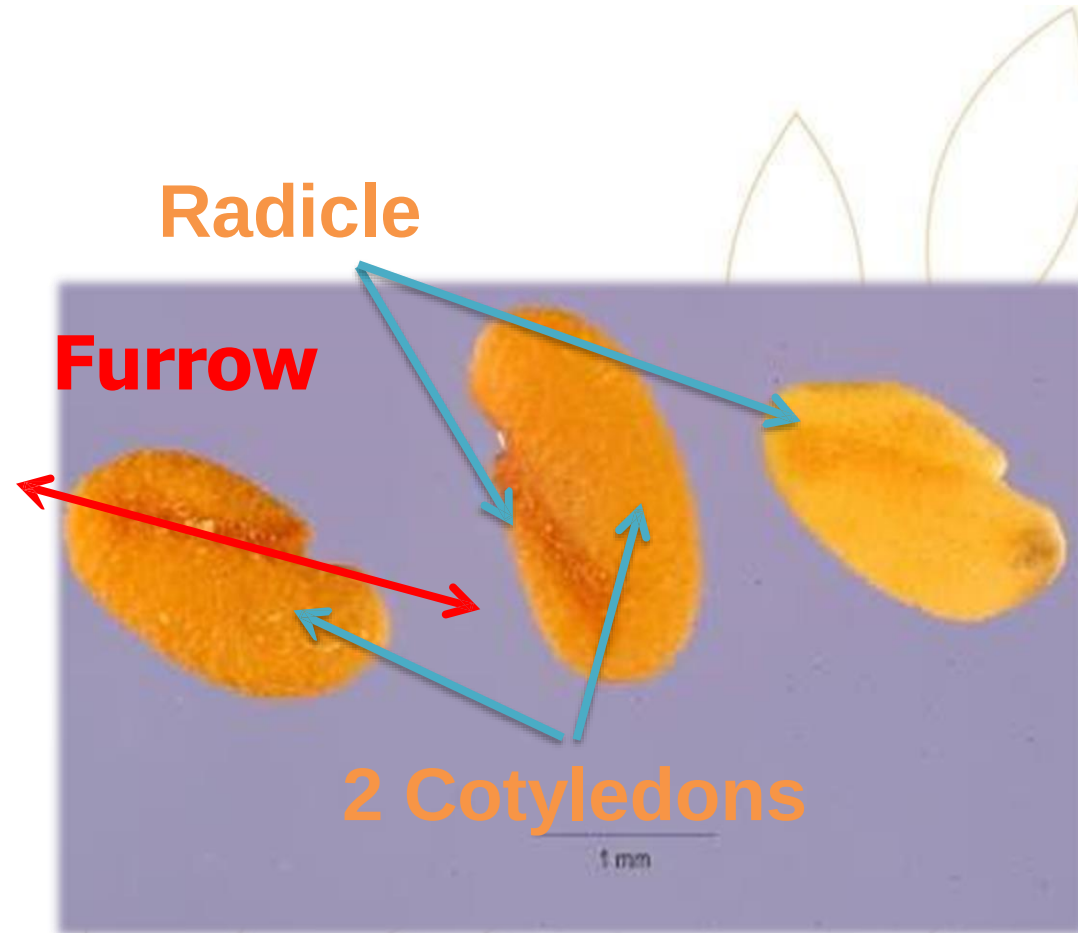
Dried ripe seeds of *Trigonella foenum-graecum*, Linn. Family Leguminosae).



Foenugreek

Morphology:

- **Surface:** leathery.
- **Testa scars:** A furrow runs diagonally to divide the seed into 2 unequal parts (radicle and cotyledons).
- **Odour:** Characteristic odour of foenugreek
- **Taste:** Mucilagenous & slightly bitter
- **Shape:** Oblong, flattened & rhomboidal.
- **Colour:** yellowish-green.

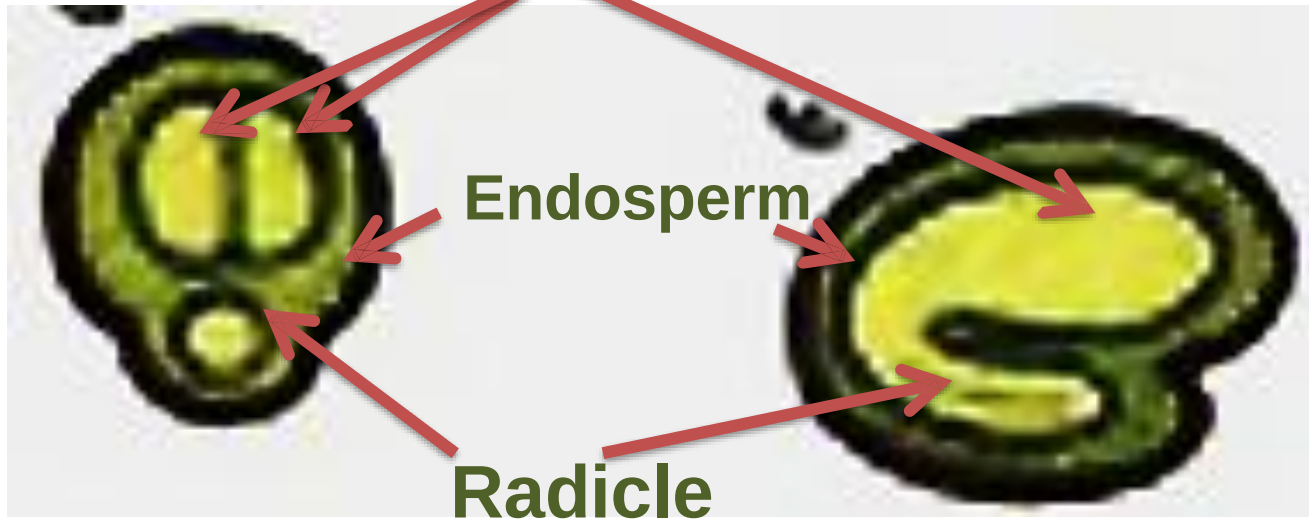


Foenugreek

Morphology:

T-CUT 2 cotyledons

L-CUT



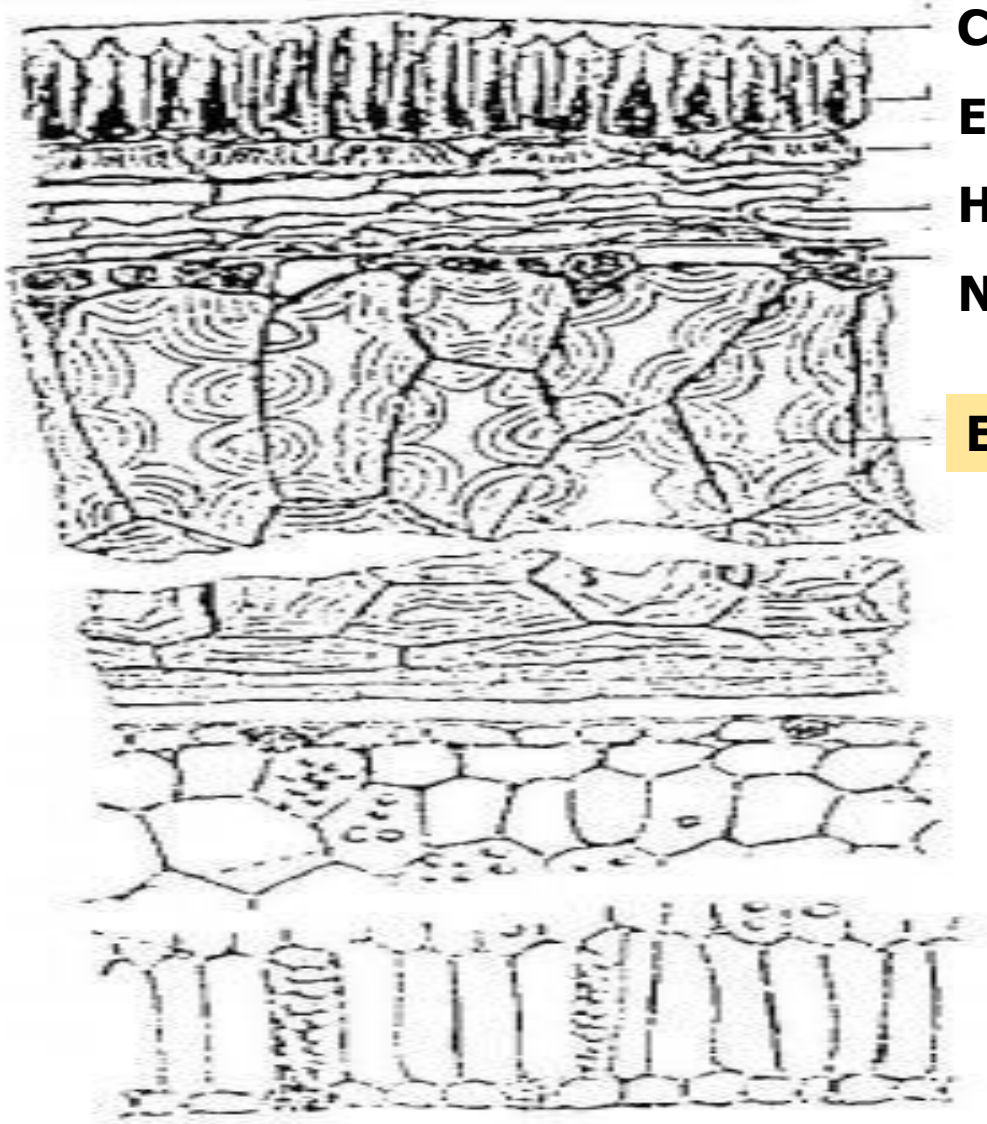
Type of
Embryo??

Accumbent



Foenugreek

T.S.



Cuticle

Epidermis

Hypodermis

Nutritive layer

Endosperm

Embryo

Type of
Kernel??

Albuminous

Foenugreek

Physical characters:

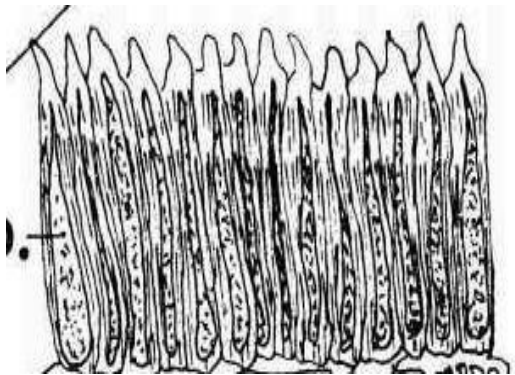
- **Condition:** Homogenous fine powder.
- **Color:** Yellowish-buff color.
- **Odor:** Characteristic odor
- **Taste:** mucilaginous, slightly bitter.



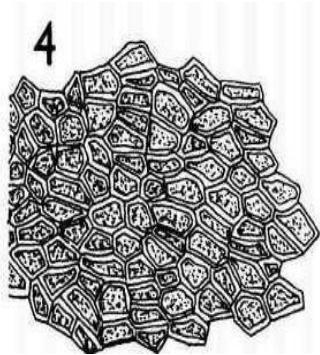
Foenugreek

Microscopical characters:

1) Palisade-like epidermal cells.



Side view



Bottom view



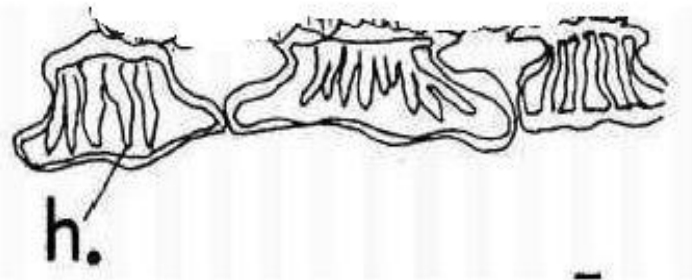
Top view



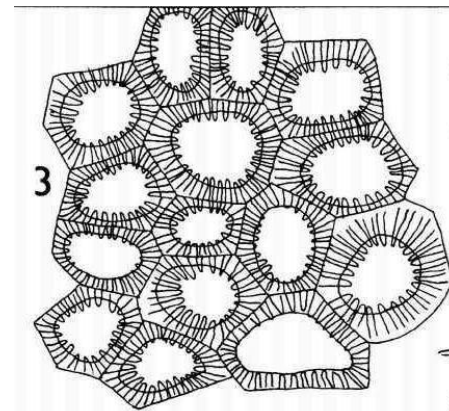
Foenugreek

Microscopical characters:

2) Basket-like hypodermal cells.



Side-view

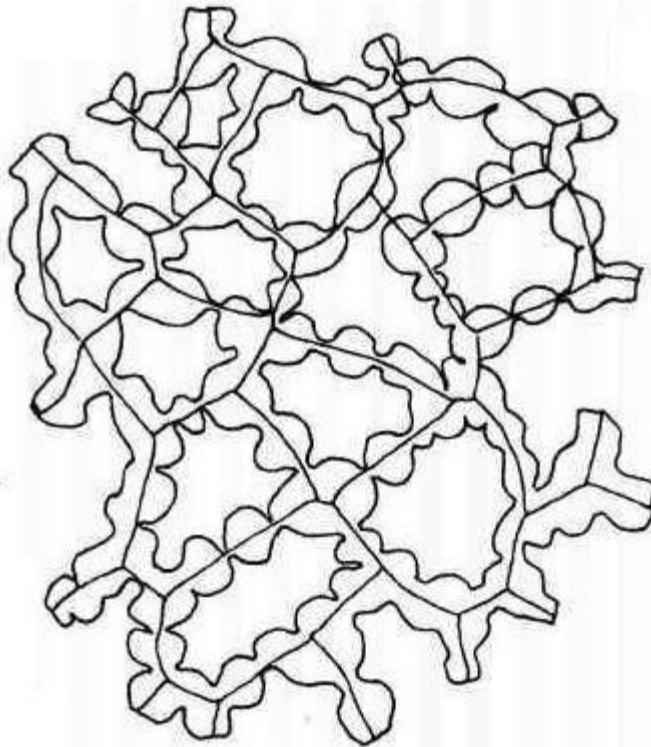


Bottom-view

Foenugreek

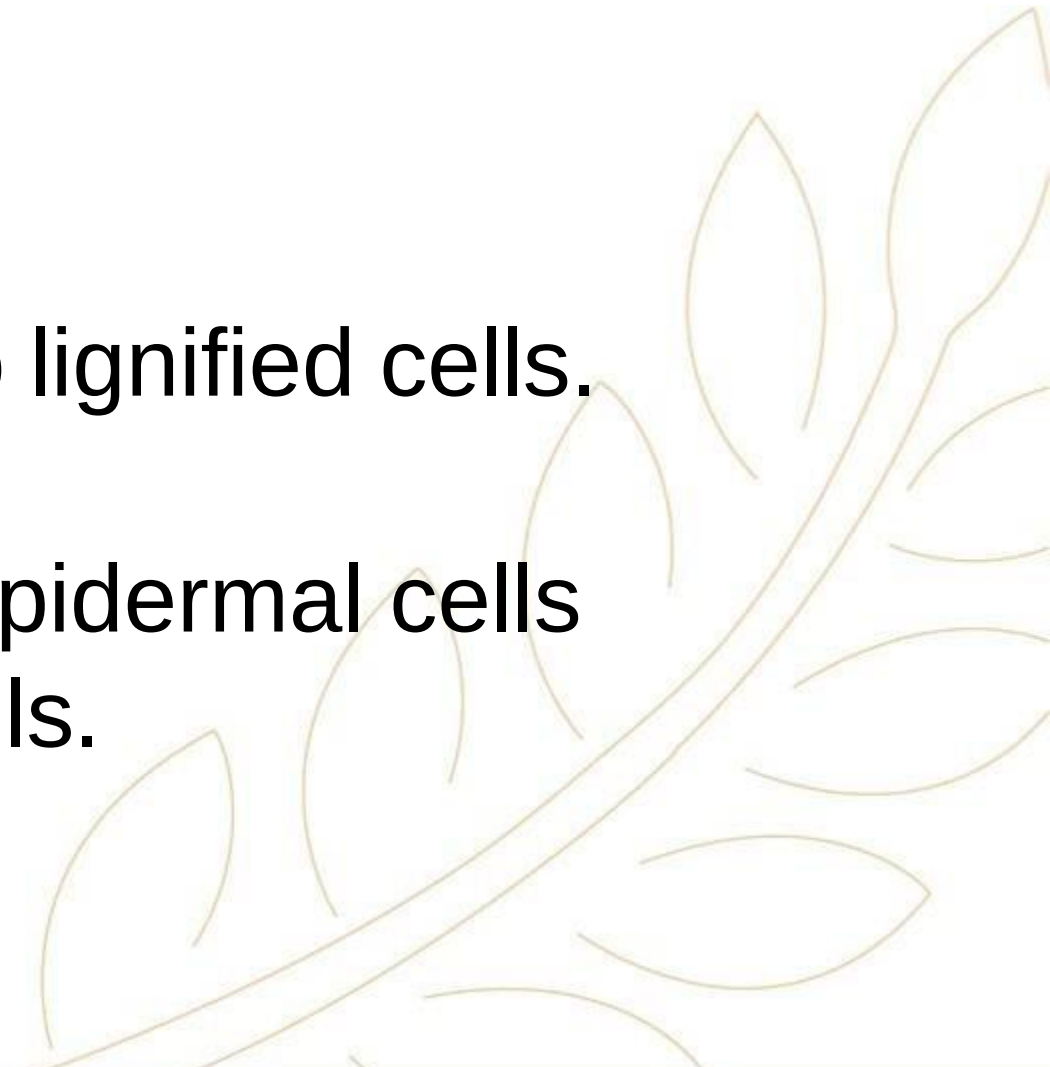
Microscopical characters:

3) Stratified mucilaginous endosperm.



Foenugreek

Microscopical characters:

- **Mount in Water:** Not applied.
 - **Mount in Phloroglucinol:** No lignified cells.
 - **Mount in KOH:** Palisade-like epidermal cells and Basket-like hypodermal cells.
- 

Foenugreek

Uses:

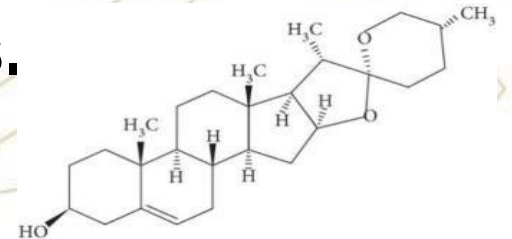
1. Hypoglycemic in diabetic patients.
2. Lactagogue.
3. Treatment of dyspepsia & gastritis.
4. Hypocholesterolemic actions in normal and diabetic humans.



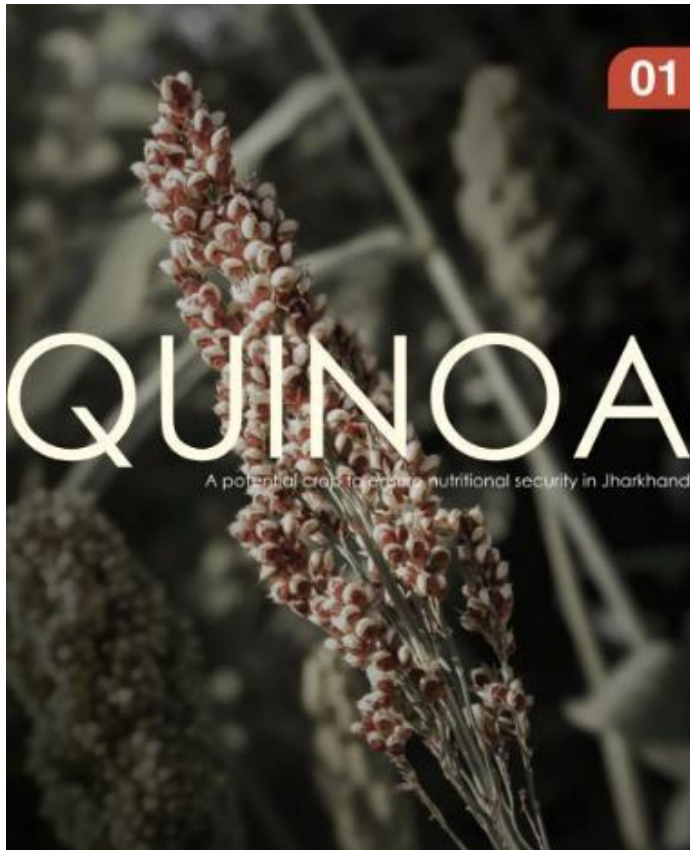
Foenugreek

Uses:

5. It has demulcent, laxative and nutritive properties.
6. Topically for wounds, leg ulcers & to reduce inflammation.
7. Foenugreek seeds are a potential source of diosogenin, a basic compound in the semi-synthesis of steroid drugs such as cortisone and sex hormones.



Quinoa



Dry yellow quinoa



Dry red quinoa



Dry black quinoa



Dry mixed quinoa



Cooked mixed quinoa



Cooked yellow quinoa



Quinoa

Origin:

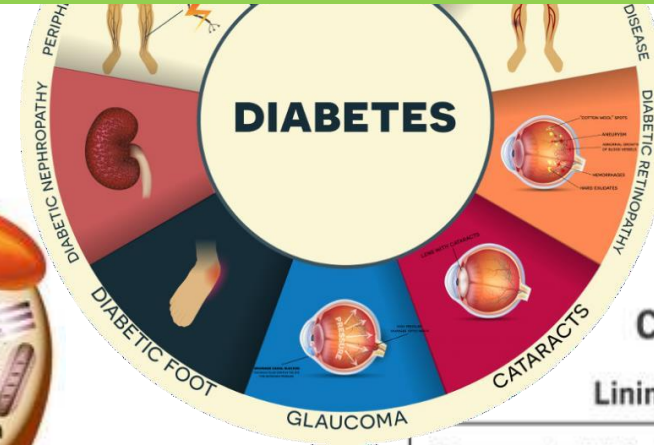
Dried ripe seeds of *Chenopodium quinoa* a flowering plant in the Family Chenopodiaceae



Quinoa

Uses:

1. Antioxidant.
2. Treatment of Celiac disease.
3. Treatment of Obesity.
4. Treatment of Diabetes.



Chia



Chia

Origin:

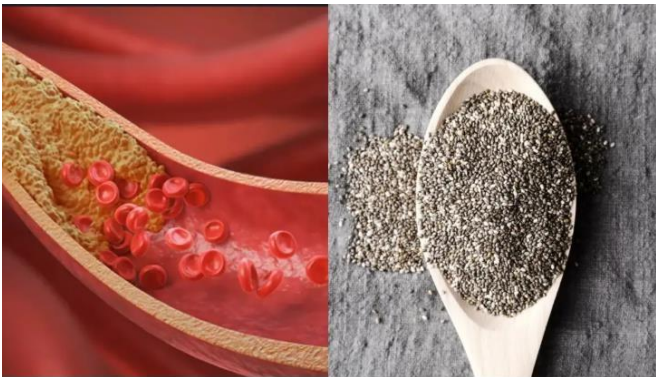
Dried ripe seeds of *Salvia hispanica*, a flowering plant in the Family Lamiaceae



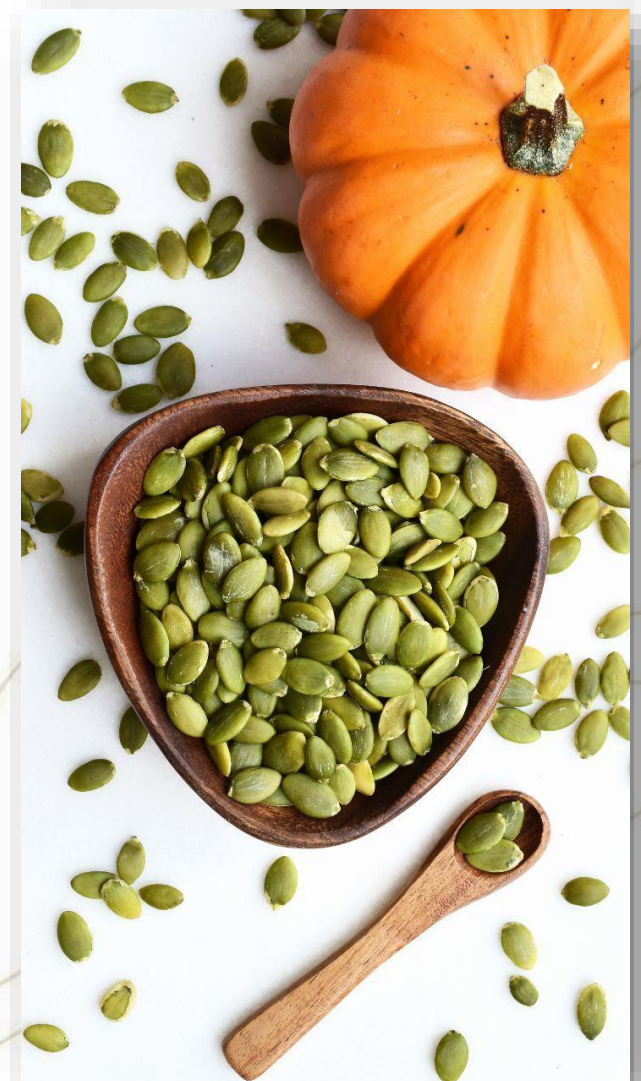
Chia

Uses:

1. Treatment of obesity
2. Diabetes
3. Hypertension
4. Reducing cholesterol



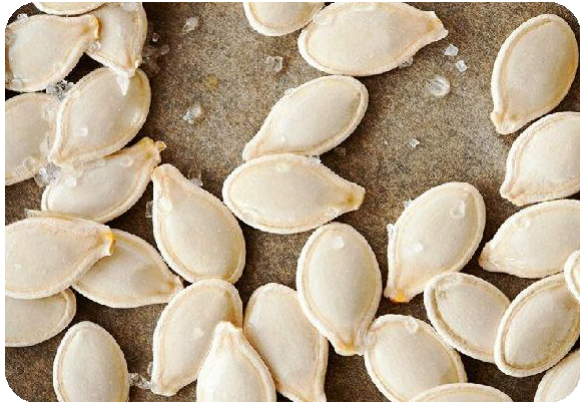
Pumpkin



Pumpkin

Origin:

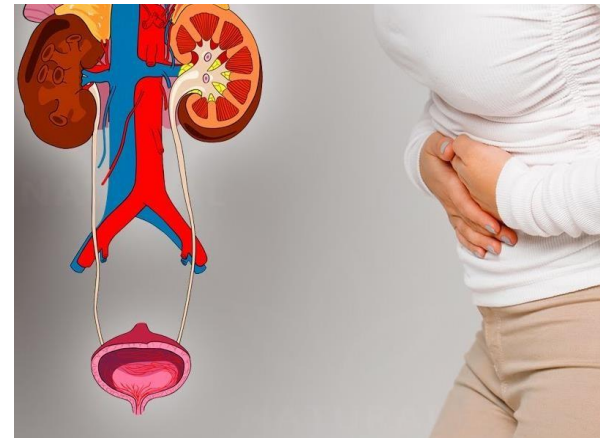
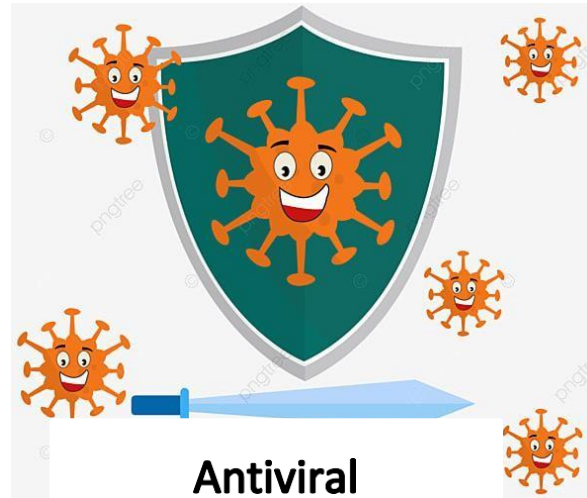
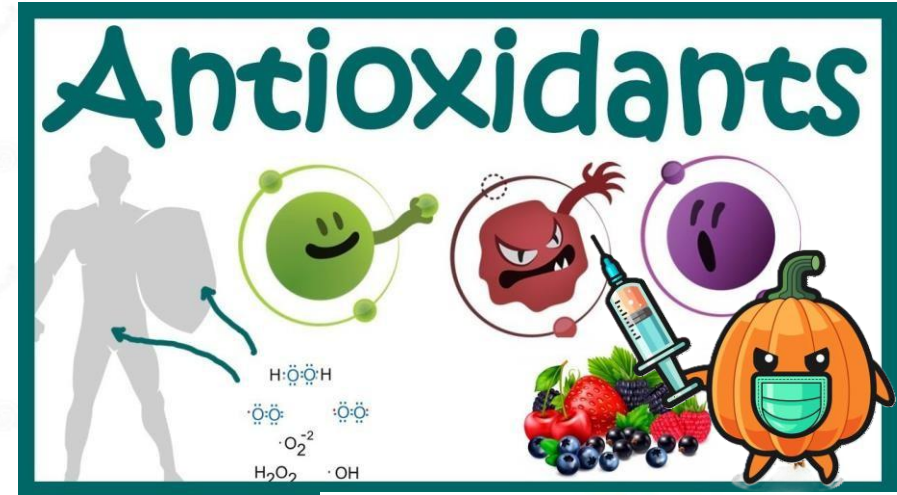
Dried ripe seeds of *Cucurbita pepo*, also known as a *pepita* (from the Mexican Spanish: *pepita de calabaza*, 'little seed of squash'), Family Cucurbitaceae



Pumpkin

Uses:

1. Anti-inflammatory.
2. Antiviral.
3. Analgesic in urinary disorders.
4. Anti-ulcer.
5. Antidiabetic.
6. Antioxidant.



Nigella



Nigella

Origin:

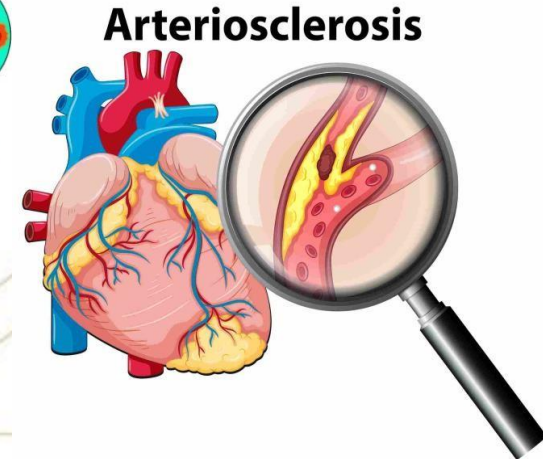
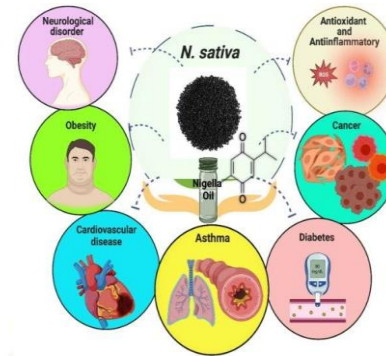
Dried ripe seeds of *Nigella sativa*; Family
Ranunculaceae.



Nigella

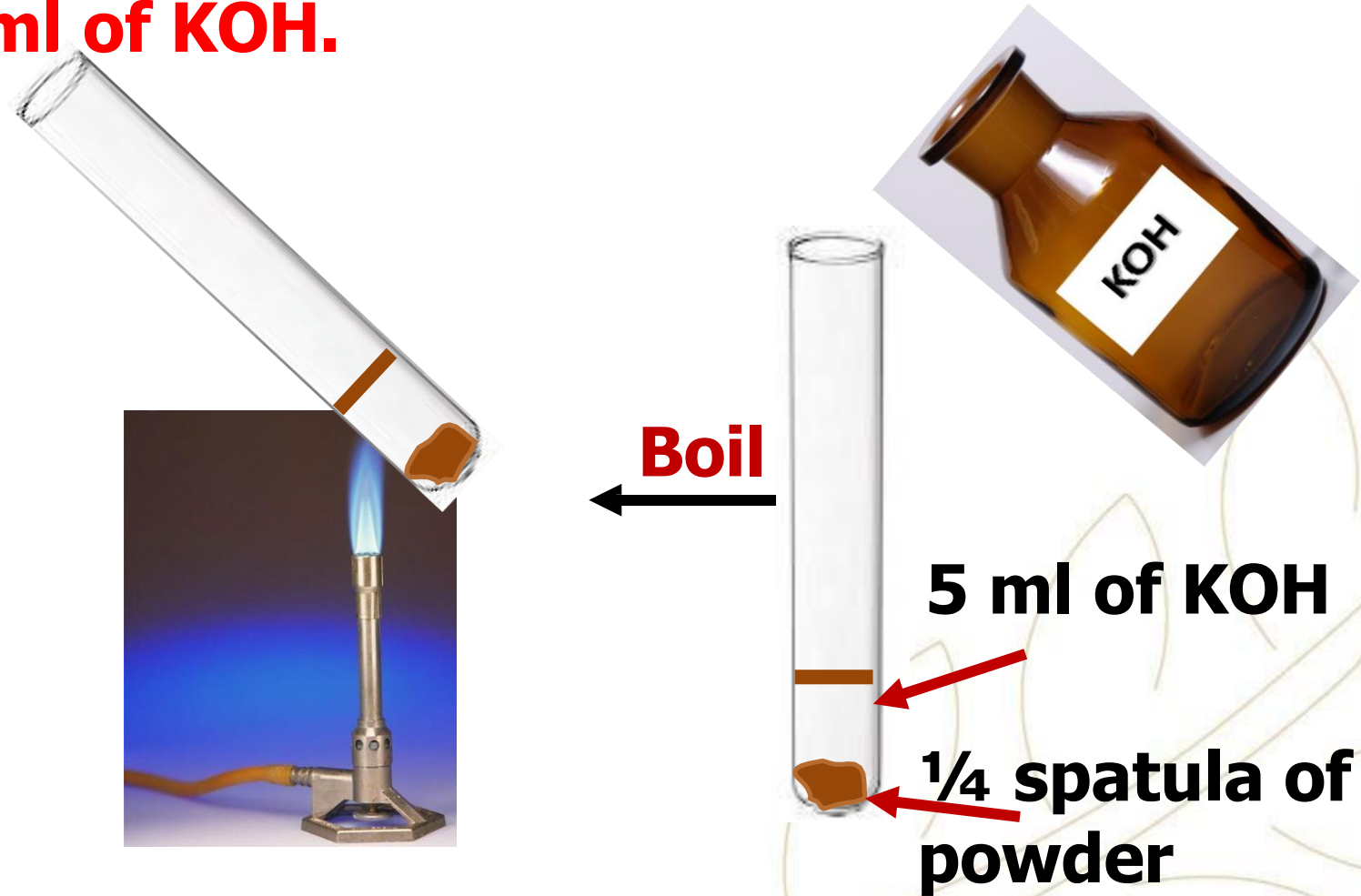
Uses:

1. Enhance the immune system by treating respiratory tract diseases (allergy, cold, cough, bronchitis, flu and asthma).
2. Support blood circulation by decreasing the probability of arteriosclerosis and preventing thrombosis (due to the presence of unsaturated fatty acids (omega 3 & 6).



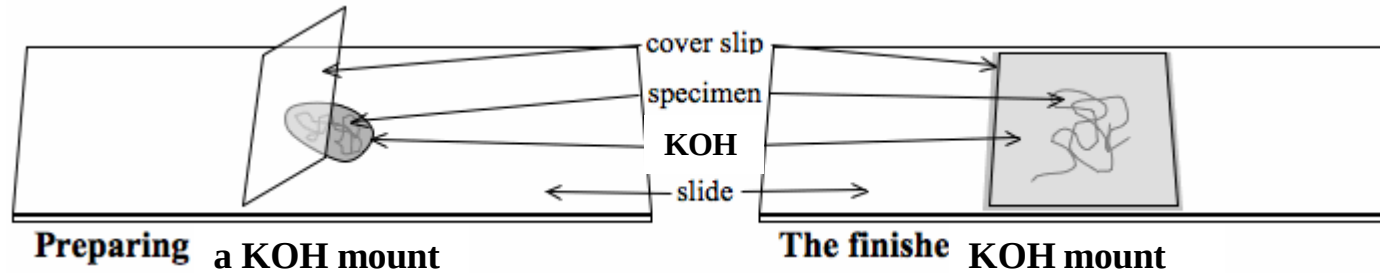
Practical work:

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:

Palisade-like epidermal cells:

1



Side view



Top view



Bottom view

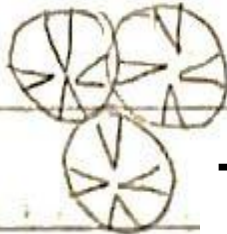


Basket-like hypodermal cells:

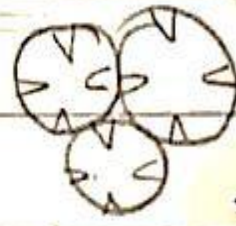
2



Side view



Top view

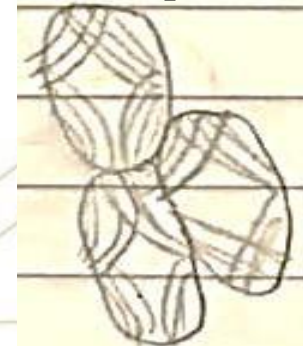


Bottom view

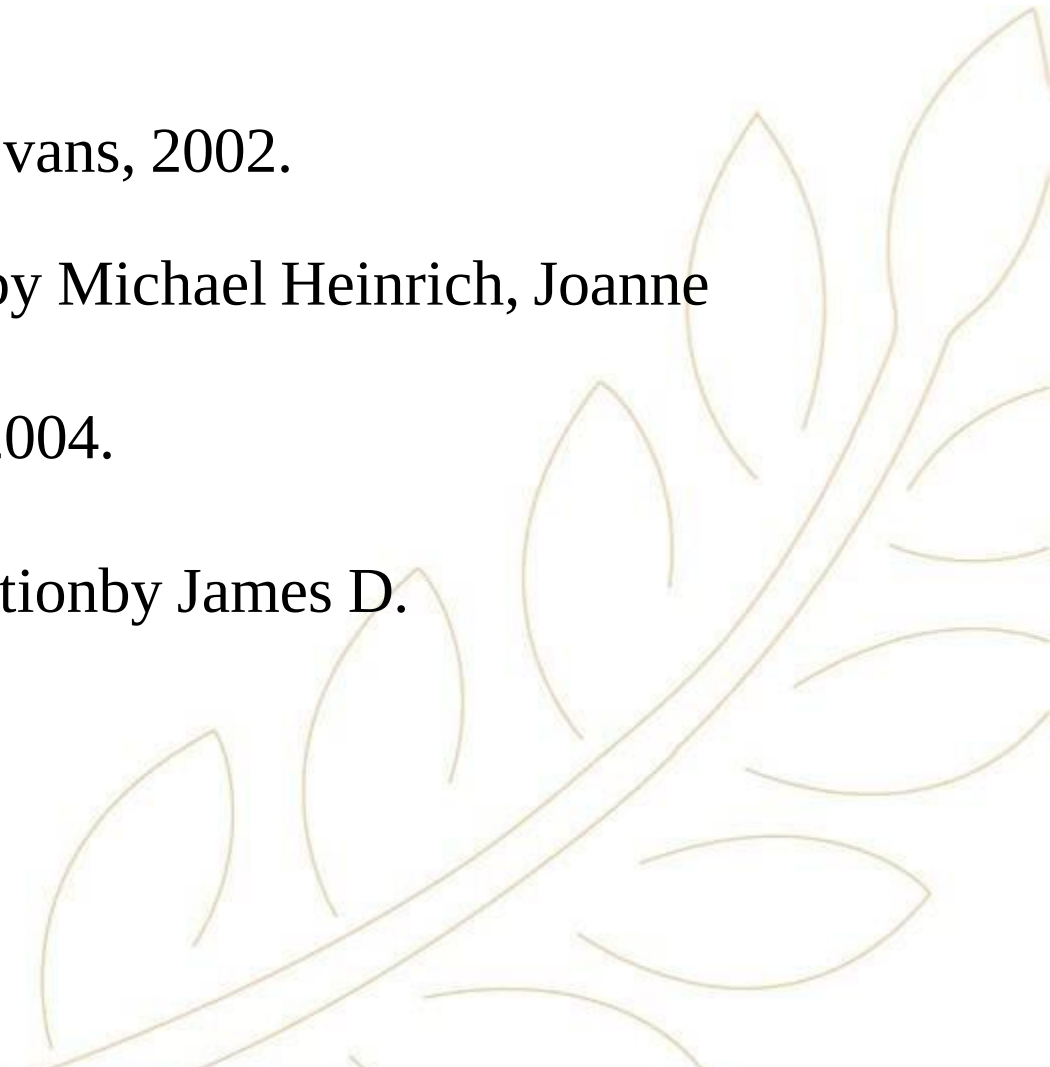


Stratified mucilaginous endosperm:

3



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:

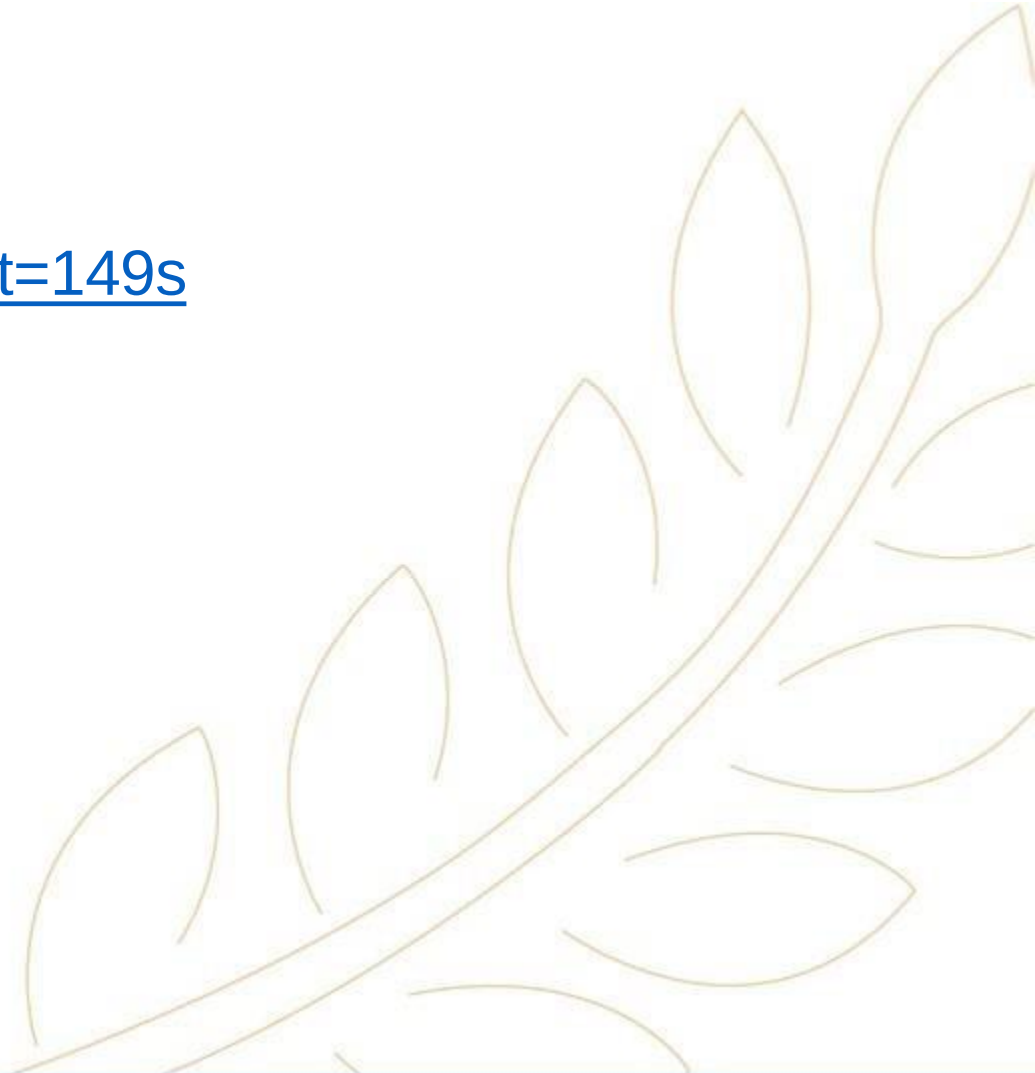
<http://www.herbmed.org/>

https://www.youtube.com/watch?v=un_RdpAi8U8&t=149s

<https://www.youtube.com/watch?v=5pdXfKt1rzY>

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

https://www.youtube.com/shorts/CZyMP0_EBOw





THANK
YOU