
MSA
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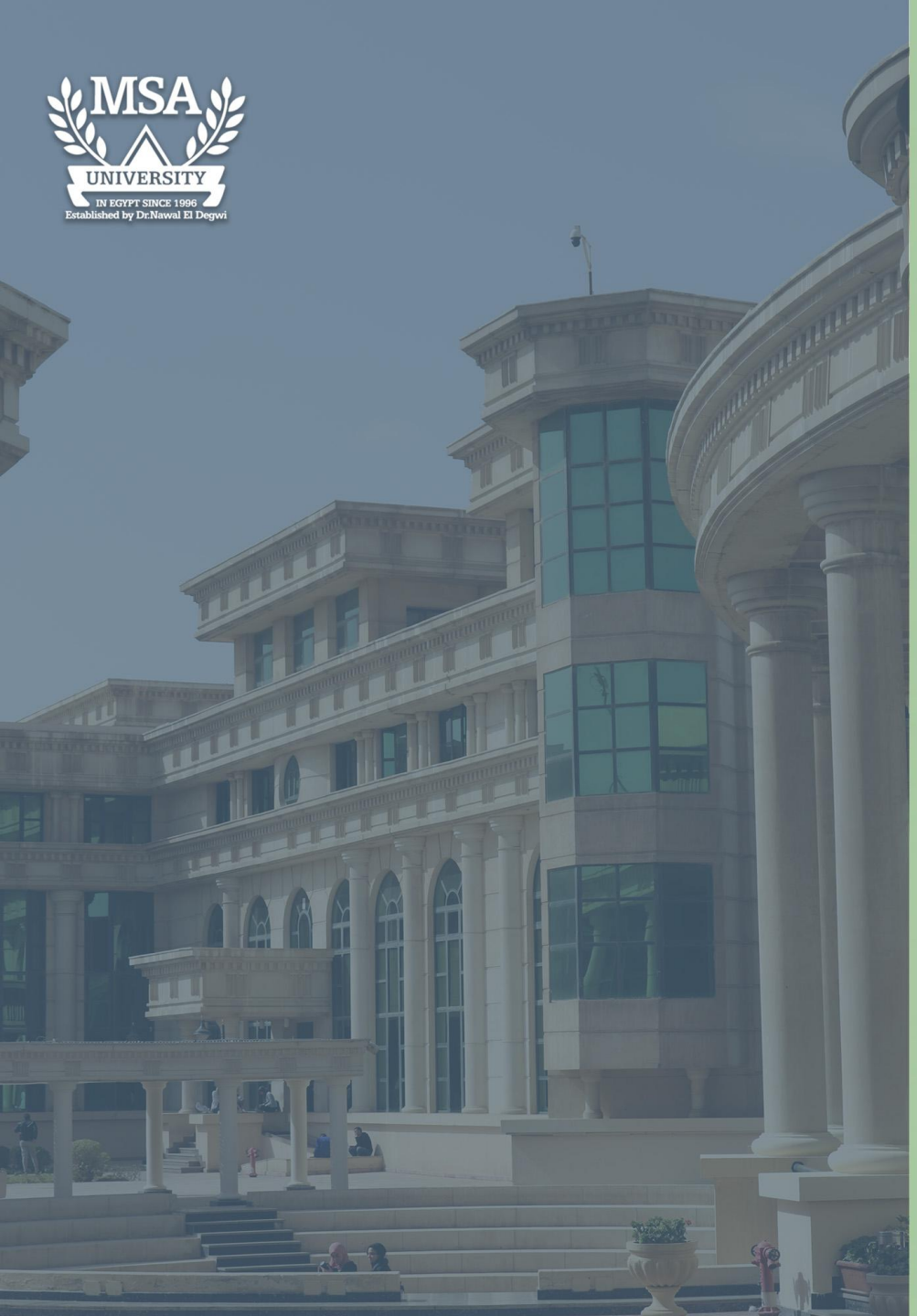
IN EGYPT SINCE 1996
Established by Dr.Nawal El Degwi
MSA UNIVERSITY
جامعة أكتوبر للعلوم الحديثة والآداب

Pharmacognosy
PHG112



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References

Author	Date	Title	Publisher	ISBN
Michael Heinrich, Joanne Barnes, Simon Gibbons, Elizabeth M. Williamson.	2012	Fundamentals of Pharmacognosy and Phytotherapy	Elsevier Health Sciences	0702052310, 9780702052316
Biren Shah, Avinash Seth	2012	Textbook of Pharmacognosy and Phytochemistry	Elsevier Health Sciences	8131232603, 9788131232606
William Charles Evans	2009	Trease's Pharmacognosy, 16th edition	Elsevier Health Sciences	0702041890, 9780702041891

Lecture 2

Examples of seeds

Interactive teaching methods and activities

QUIZIZZ

socrative

https://www.youtube.com/results?search_query=linseeds
https://www.youtube.com/watch?v=b7j2RMNtAYk
https://www.youtube.com/watch?v=bUjVHUf4d1I
https://www.youtube.com/watch?v=74A4yVggSjY

Learning Outcomes

By the end of this lecture, students should be able to:

1. Knowledge / Remembering

- Identify the botanical sources and families of linseed, fenugreek, strophanthus, and psyllium.
- List the main active constituents of each seed (fixed oils, mucilage, alkaloids, saponins, cardiac glycosides).
- Recognize the characteristic powder and microscopic features of each seed.
- Recall the principal therapeutic uses of each seed drug.

2. Comprehension / Understanding

- Explain the pharmacological basis of linseed and psyllium as bulk laxatives.
- Describe why linseed is considered non-toxic despite containing cyanogenic glycosides.
- Discuss the hypoglycemic and hypocholesterolemic effects of fenugreek.
- Summarize the cardiotonic action of strophanthus and how it differs from digitalis.

Learning Outcomes

By the end of this lecture, students should be able to:

3. Application

- Apply microscopic and powder characteristics to distinguish between different medicinal seeds.
- Use appropriate chemical tests to detect mucilage, fixed oils, proteins, saponins, or cyanogenic glycosides.
- Relate the chemical composition of each seed to its therapeutic action.

4. Analysis

- Differentiate between mucilage-containing seeds (linseed, psyllium, fenugreek) based on composition and mechanism of action.
- Analyze the role of cardiac glycosides in strophanthus and their clinical significance.
- Compare the contraindications and side effects of psyllium and linseed.

Learning Outcomes

By the end of this lecture, students should be able to:

5. Synthesis / Creating

- Construct a comparative table summarizing botanical source, active constituents, uses, and chemical tests of the seeds discussed.
- Propose a suitable herbal formulation for constipation, diabetes, or cardiovascular support using the studied seeds.

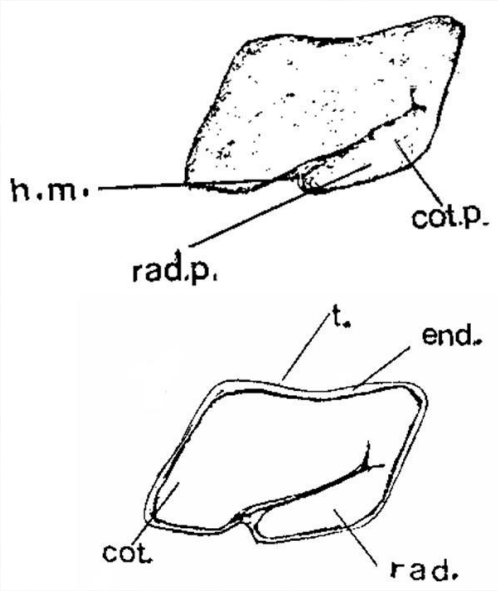
6. Evaluation

- Evaluate the safety considerations when using mucilage-containing seeds as laxatives.
- Assess the importance of chemical and microscopic tests in quality control of seed drugs.
- Judge the therapeutic value of seed-derived drugs in comparison to conventional pharmaceutical agents.

Fœnugreek seed

Fœnugreek
Semen Fœnugreek

- **The dried ripe seeds of *Trigonella foenum-graecum* Linne Family Leguminosae.**



- **Contains not more than 2 % of foreign organic matter.**

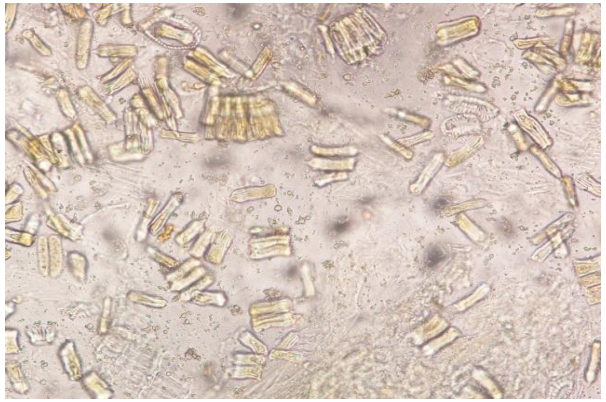
- **Albuminous seed**

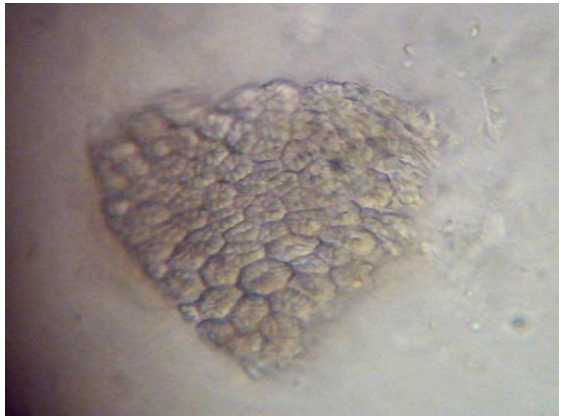
Powder

Yellowish in colour, with strong characteristic odour and a mucilaginous slightly bitter taste.

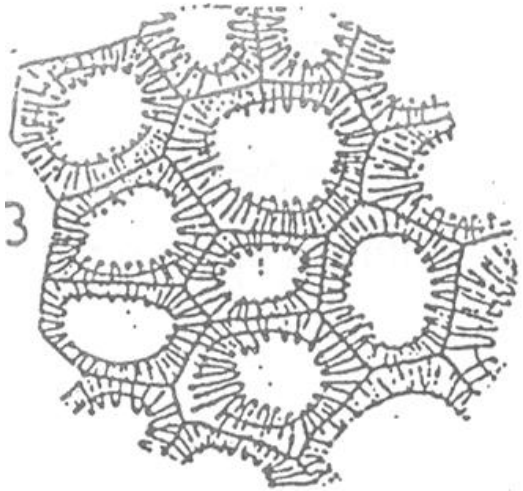
It is characterized by:

1. Fragments of testa showing the palisade like epidermal cells, the basket-like cells of the sub-epidermal layer.





palisade like epidermal cells

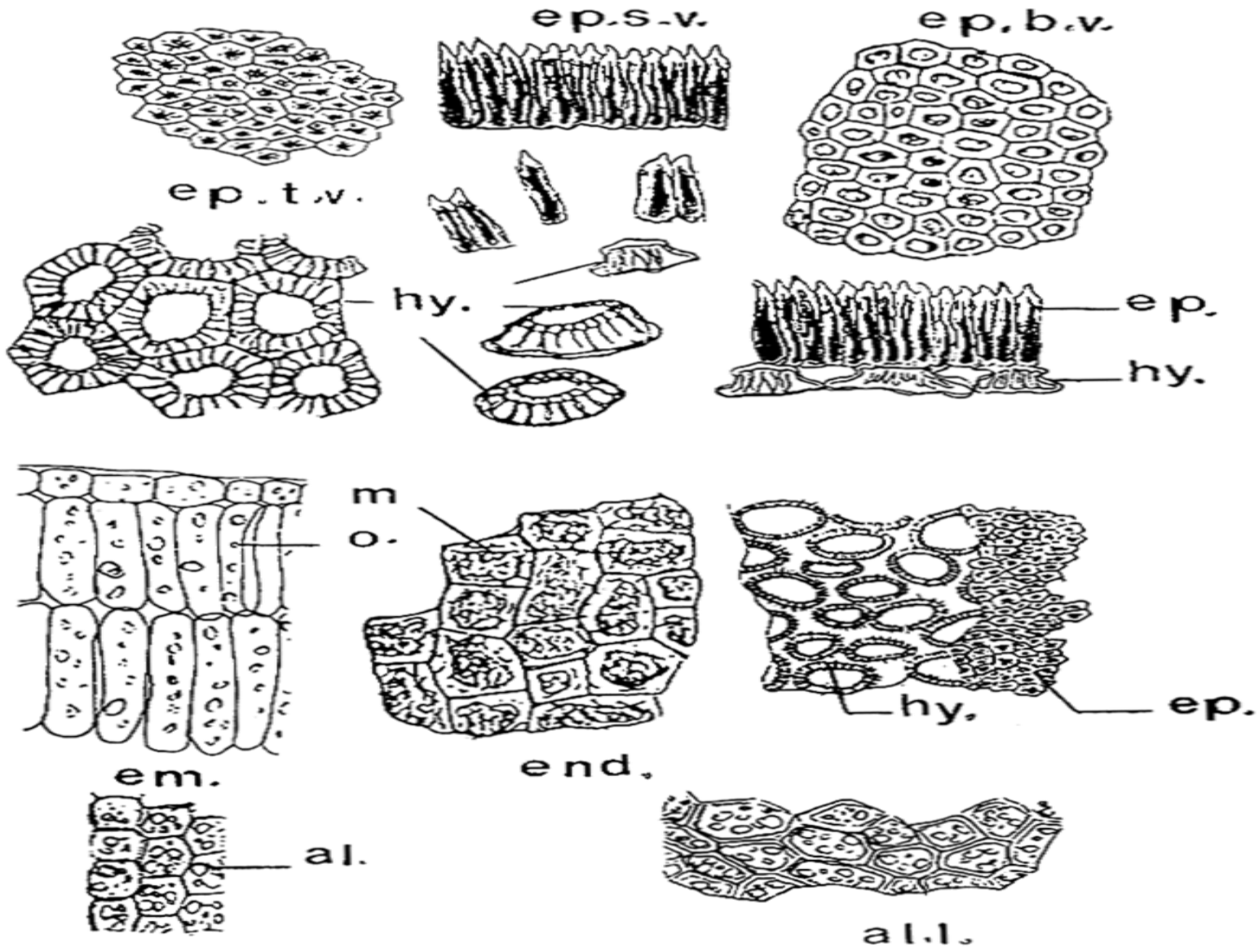


basket-like cells

2. Fragments of endosperm with mucilaginous cells.

3. Fragments of the cotyledons containing fixed oil and aleurone grains.

4. Very few small starch granules.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Active Constituents

28 % of Mucilage

Alkaloids: Gentianine trigonelline & choline

23-25% Proteins & amino acids.

Flavonoids Apigenin, luteolin, vitexin & quercetin.

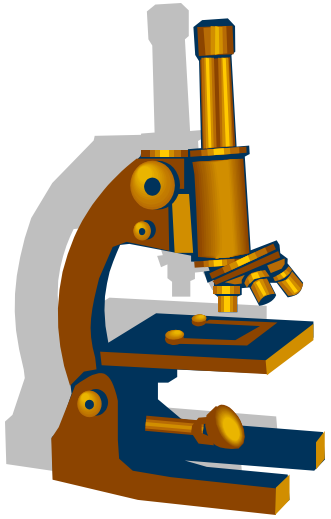
Saponins glycosides Steroidal sapogenin, 0.6-1.7 % gitogenin,

Coumarin (5-8 %)

Vitamins (nicotinic acid) & minerals (a rich source of selenium).

Volatile constituents responsible for the flavor of Fœnugreek.

Chemical tests

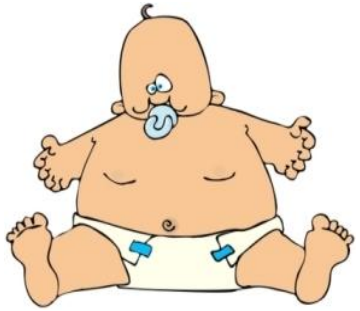


- **It gives positive histochemical tests with sudan III and methylene blue**
- **Positive test for saponin (Froth test)**

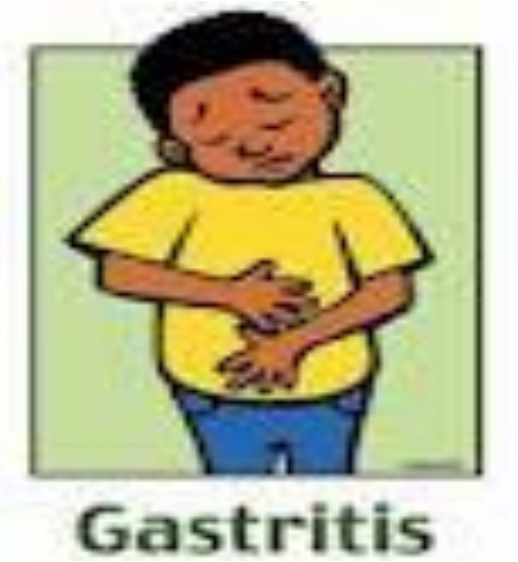
Medicinal Uses and actions

1-Hypoglycemic in diabetic patients.

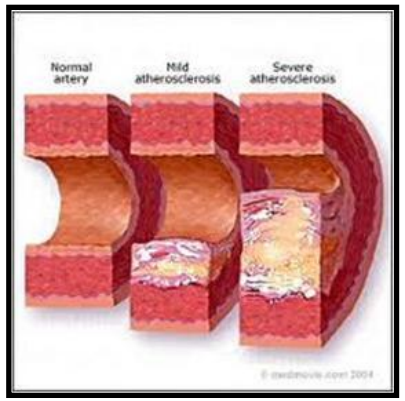
2- Lactagogue.



3-Treatment of dyspepsia & gastritis



Medicinal Uses and actions



4-Hypocholesterolemic actions in normal and diabetic humans.

atherosclerosis

5- It has demulcent, laxative and nutritive properties.

6-Topically for wounds , leg ulcers & to reduce inflammation

Side effects and/or toxicity

1-Repeated external applications can result in undesirable skin reactions.

2-Minor gastrointestinal symptoms, such as diarrhea and flatulence.

Contraindications

1-The hypoglycemic activity of fœnugreek may interfere with an existing hypoglycemic therapy.

2-Oxytoxic and uterine stimulant activity ,the use of fœnugreek during pregnancy and lactation in doses greatly exceeding those normally encountered in foods is not advisable.

Fœnugreek Preparation

Nutraceutical

Cosmeceutical

Cosmeceutical Applications

- It helps **strengthen hair follicles**, promote healthy hair growth, and reduce issues like hair breakage and thinning.

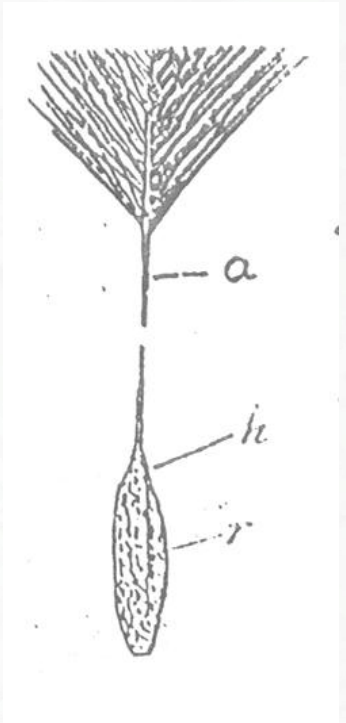
- **Skin rejuvenation**: Incorporate fenugreek oil into your skincare routine to revitalize and rejuvenate your skin.
- **Anti-collagenase** activity and increased collagen production anti-aging remedy
- It helps **moisturize**, soothe inflammation.

Strophanthus seed

Strophanthus Seed

Strophanthus is the dried ripe seeds of *Strophanthus kombe'*, S . *hispidus* & S. *gratus*

Family Apocynaceae deprived of their awns.



Active Constituents

8 – 10% of a mixture of cardiac glycosides

K – strophanthin &

K - strophanthoside

4 - 8 % of ouabain (G - strophanthin)

Kombic acid

Uses and actions

1- Cardiac stimulant and cardiotonic

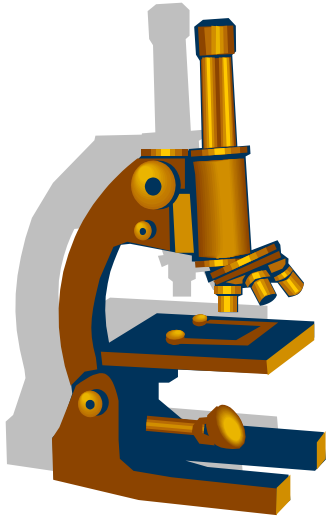
2-It controls the blood pressure

3- Efficient diuretic.

In certain cases, it is <u>used as substituent for digitalis</u> :

It is <u>not cumulative</u> and <u>less liable than</u>

<u>digitalis to produce gastric& intestinal irritation</u>.



Chemical test

Mount a section of Strophanthus in sulphuric acid (66 % v/v) .

The endosperm acquires a green colour

The embryo acquires a Green in S. *kombe or*

Reddish brown colour in S. *hispidus* (Strophanthin glycoside) *or*

Red colour in S. *gratus* (Ouabain)

Effect of 66% sulphuric acid

	S. Kombe	*S. hispidus*	*S.gratus*
The endosperm	**Green**	**Green**	**Green**
The embryo	**Green**	**Reddish brown**	**Red**
The glycoside	**K-strophanthin**	**H-strophanthin**	**Ouabain**

Psyllium seed

Psyllium Seed

The dried ripe seeds of *Plantago psyllium* and *Plantago albicans* , F . Plantaginaceae.

Active constituents :

1-Acidic mucilage (10 – 12 %)

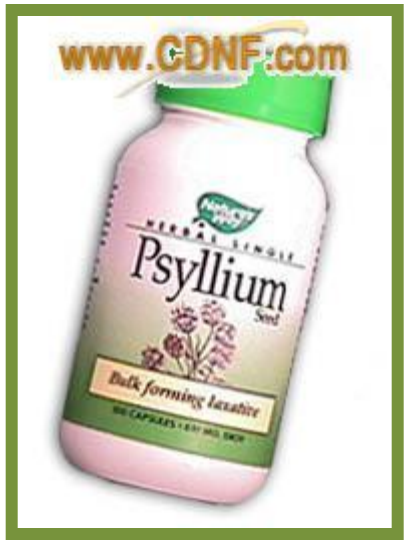
2- Small amount of glycosides.

3- Fixed oil - protein.

•Uses:

1-Bulk laxative
(alone or associated with other purgatives as: Senna & Cascara) especially during pregnancy

2- Promising in lowering cholesterol and controlling diabetes.



- **Psyllium husk:**

- **Psyllium seed husk are indigestible and are a source of soluble dietary fibres.**

- **The seeds are placed in water , the seed coat swells (the epidermal cells) forming layers of mucilage around the seed which are peeled & left to dry.**

- **It is then purified and used as laxative (in chronic constipation).**

- **Contraindications**

- The indigestible fiber in psyllium seed can cause **flatulence** and abdominal discomfort.

- If psyllium seed is not taken with adequate water, it can clump together in a mass and **block the digestive tract.**

  Sufficient fluid is essential to the safe and successful use of psyllium seed.

HOME WORK

1- Enumerate scars on the surface of the seed

2-What is meant by: albuminous seed, exalbuminous seed, kernel

3-Complete the following statements:

a- Linseed is an example of……seed

b- Linseed is not toxic because……., ……., …….

c- Linseed is tested by…….

d- Active constituents in Linseed are ……, ……,…….

e- Linseed is used ……, ……..,……, ……

f- Foenugreek is an example of……seed

g- Foenugreek is used for ……., ……., …….

h- Foenugreek is tested by…….

i- Active constituents in Foenugreek are ……, ……,…….

j- Strophanthus is used ……, ……..

k-Strophanthus is tested by……..

l- Psyllium husk is defined as……..

Google notebook link:

https://notebooklm.google.com/notebook/96593c06-07ca-4d98-81f2-e03b066011c0?authuser=1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