

OCTOBER UNIVERSITY
FOR MODERN SCIENCES AND ARTS
جامعة أكتوبر للعلوم الحديثة والآداب

Pharmacognosy

PHG 112

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Lecture 3



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

Other important seeds

- **-The chemical constituents & uses of the different seeds**



Seeds Having Nutraceutical Applications



Chia seeds

Chia seeds are the edible seeds of *Salvia hispanica* a flowering plant in the mint family (Lamiaceae)

Chemical constituents:

- Dietary fibres
- Protein ↘
- High amount of omega-3 fatty acids
- Vitamins (A , B1& B3)
- Minerals; calcium, iron, magnesium, phosphorous



Uses:

- Treatment of obesity
- Diabetes
- Hypertension
- Reducing cholesterol

Side effects:

-When it is consumed in lots of quantities the body may find it difficult to digest it properly. One should stick to an ideal quantity of chia seeds in a day and not consume more. Consuming more of these tiny seeds can cause **diarrhea**, **bloating** and **stomach cramps**

-It is known that high levels of omega-3 fatty acids may increase the **risk of bleeding**. Therefore, it is advised to avoid taking chia seeds with foods or supplements rich in omega-3 fatty acids

Quinoa

The seeds of *Chenopodium quinoa* Family Chenopodiaceae

It is a flowering plant grown as a crop primarily for its edible seeds

Chemical constituents:

- 1-One of the best vegetable sources of protein. Essential amino acids such as lysine and methionine.
- 2- Large quantities of vitamins (thiamin, vitamin C) and minerals
- 3- High content of fibre, carotenoids
- 4-Terpenoids, flavonoids, phenolic acids, and steroids.



Uses

- Treatment of Obesity.
- Diabetes.
- Celiac disease.
- Antioxidants.



Name	Origin	Active constituents	Uses
1-Nigella seed 	The dried ripe seeds of <i>Nigella sativa</i> F. Ranunculaceae 	<u>Volatile oil (1.4 %)</u> <u>Thymoquinone,</u> <u>Carvone , Fixed oil</u> <u>*Unsaturated fatty acids</u> [Oleic acid , Linoleic acid Δ^3 , Linolenic acid Δ^6 , Stearic acid] <u>*Saturated fatty acids</u> [Myristic acid , Palmitic acid]. Protein ,Vitamins (B 1,2,6), Minerals (Ca , Fe , Zn , Cu)	<u>1-Treatment of respiratory tract conditions (Allergy , cough, colds , bronchitis , Flu , asthma)</u> <u>2- Support circulatory and immune system</u> <u>3- Decrease the probability of arteriosclerosis and prevents thrombosis, due to the presence of unsaturated fatty acids</u>
2-Pumpkin seed 	The dried ripe seeds of <i>Cucurbita pepo</i> , F. Cucurbitaceae	-<u>Sterols</u> (e.g. β-sitosterol, β- tocopherols) - <u>Triterpenes</u> (squalene), tetraterpene (β-carotene) - <u>Unsaturated fatty acids</u> (omega 6 & omega 3)	<u>Antiinflammatory, antiviral, analgesic in urinary disorders, anti-ulcer, antidiabetic and antioxidant</u> 

Seeds Having Cosmeceutical Applications



Jojoba



Jojoba oil is extracted from the seeds of the Jojoba plant also known as the *Simmondsia chinensis* plant

Jojoba oil is rich in vitamins B, E, and C and minerals like copper and zinc

Benefits Of Using Jojoba Oil For Hair

1. Moisturises Hair
2. Promotes Hair Growth & Thickness
3. Repairs Hair Damage From Heat & Styling Tools
4. Maintains Scalp's Natural Balance
5. Controls Dandruff

How To Use Jojoba Oil For Hair?

1. Direct Application
2. Mixing it With Other Products
4. Use it as a Hair Mask Ingredient



Castor seeds

Origin

The dried ripe seeds of *Ricinus communis*, F. Euphorbiaceae.

Active constituents

- 1- Alkaloids: Ricinine
- 2- Ricin (a lectin that inhibits protein synthesis in animal cells and leads to cell death).
- 3- Fixed oil and protein.

Uses

- 1- The oil is a powerful purgative (the seeds are toxic).
↓
- 2- Externally, the oil has been recommended for tinea, forms a light coloured odourless soap or in the form of pastes.
- 3- Castor oil provides hydration and conditions the hair since it's rich in ricinoleic acid and fatty acids, which serve as natural emollients for the hair.



Side effects and toxicity:

The plant including the seeds contains an irritant substance named Ricin that poisons the blood.

N.B: One of the most potent natural toxins known. One seed can kill a child

The oil is safe because the poison remains in the seed where seeds themselves and the cake left after the expression of the oil are violently purgative.



N. B. Applying castor oil just once a month can boost hair growth up to five times the usual rate. It can moisturize a dry, irritated scalp. Castor oil's antibacterial and antifungal properties can reduce dandruff. It can help grow hair in other parts of the body, like the eyebrows and eyelashes

Other Common Seeds



Some Common Seeds

Name	Origin	Active constituents	Uses
1-Colchicum 	Dried ripe seeds of <i>Colchicum autumnale</i> family Liliaceae 	1- 0.2 0.8% of <u>alkaloid colchicine</u> 2- 1% of fixed oil 3- 5% glucose	<u>1-It relieves the pain and inflammation of acute gout</u> - <u>2- Plant hormone, it induces polyploidy</u> <u>3- Cytotoxic effect</u>
2-Calabar beans	The dried ripe seeds of <i>Physostigma venenosum</i> F. Leguminosae	<u>Alkaloids (physostigmine also known as eserine)</u>	- <u>Contract the pupil, manage ocular pressure in glaucoma,</u> - Reverse the toxicity of certain other drugs - <u>Semi synthesis of rivastigmine used to treat dementia in Alzheimer disease</u>

Calabar beans



Pharmaceutical preparations containing
physostigmine (eserine)



↓
Bi-miotic

Anticholium

Antilirium



Name	Origin	Active constituents	uses
3-Evening primrose 	Dried ripe seeds of <i>Oenothera biennis</i> F. Onagraceae	<u>Protein</u> (essential amino acids, containing sulphur) <u>Fixed oil</u> (- gamma-linolenic acid (GLA) Cellulose -	- <u>EPO is used for skin disorders such as eczema, psoriasis, and acne</u> - <u>It is also used for rheumatoid arthritis, weak bones</u> - <u>High cholesterol & heart disease</u>

Evening primrose oil is a source of phytoestrogens, or compounds that mimic the effects of estrogen in the body. It is often used to help balance hormones, particularly in women.

It can be beneficial for symptoms related to hormonal imbalances (low estrogen), such as Premenstrual Syndrome (PMS) and menopausal symptoms. The GLA in primrose oil helps regulate hormone levels in the body.

Side effect: Causes blood thinning which may lead to bleeding



Activities



Question : Choose the correct answer:

1- Proteins in seeds can be tested by.....

- a- Mayer's b-Iodine c- Sudan III d- Millon's

2- Nigella seeds are mainly used in treatment of.....disorders

- a- CNS b-Respiratory c-Urinary d- Digestive

3-seeds are usually employed as phytoestrogens

- a-Evening primrose b- Linseed c-Pumpkin d- Chia

4- Is a term used to describe any product derived from food sources with extra health benefits

- a- Cosmeceuticals b-Pharmacognosy c-Nutraceuticals d-Herbal medicine

5- The stem growing point is known as.....

- a-Hilum b-Embryo c-Cotyledon d-Plumule

6- Fixed oils in seeds can be tested by.....

- a- Mayer's b-Iodine c- Sudan III d- Millon's

7- Chia seeds are mainly used as

- a-Analgesic b-Antiobesity c-Anticancer d- Antiinflammatory

8-seed oil is applied to protect hair from heat and styling damages

- a-Foenugreek b-Castor c-Jojoba d- Chia

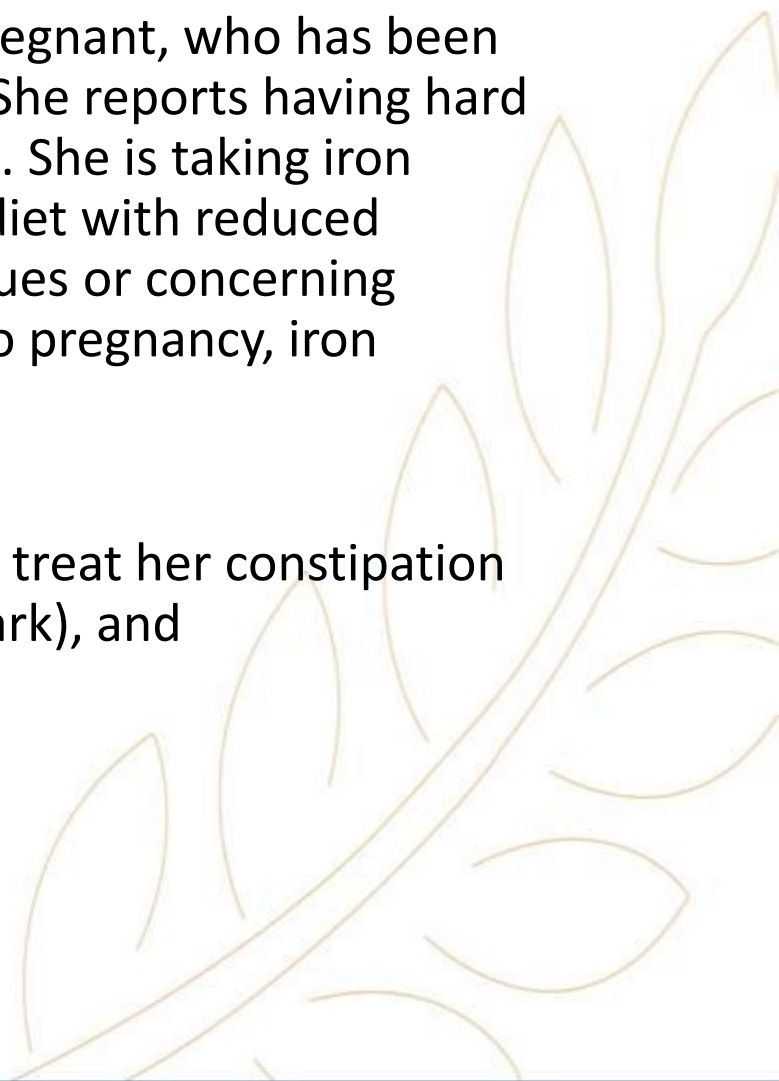
9- is formed of one or two seed coats

- a- Testa b-Endosperm c-Embryo d-Perisperm

10- The is the scar left by the removal of the seed from its funicle or stalk is known as.....

- a-Hilum b-Radical c-Micropyle d-Raphe

- Read carefully the following cases and answer the corresponding questions (22 marks)
- S. I, is a 31-year-old woman, 28 weeks pregnant, who has been experiencing constipation for the past week. She reports having hard stools and straining during bowel movements. She is taking iron supplements for anemia and has a low-fiber diet with reduced physical activity. She has no other medical issues or concerning symptoms. Her constipation is likely related to pregnancy, iron supplements, and lifestyle factors.
- I- Suggest a crude drug that can be used to treat her constipation (1 mark), provide its active constituents (1 mark), and contraindications (2 marks).





Faculty of **Pharmacy**



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Thank You!

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