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

Pharmacognosy

PHG 112

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Fall 2025

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Lecture 5

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

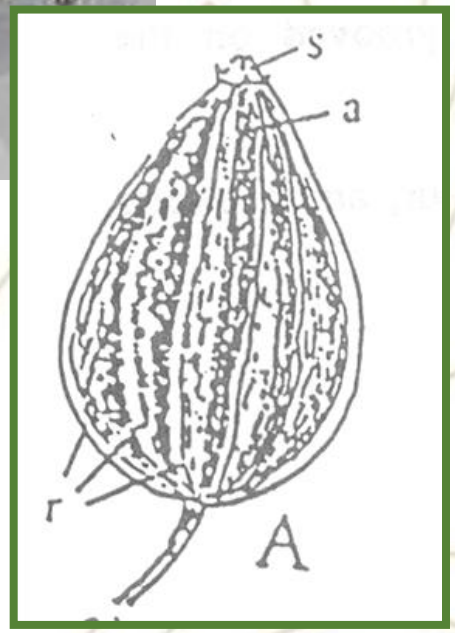
- **Family Umbelliferea as important nutraceutical and cosmeceutical fruits**
- **Other useful fruits**

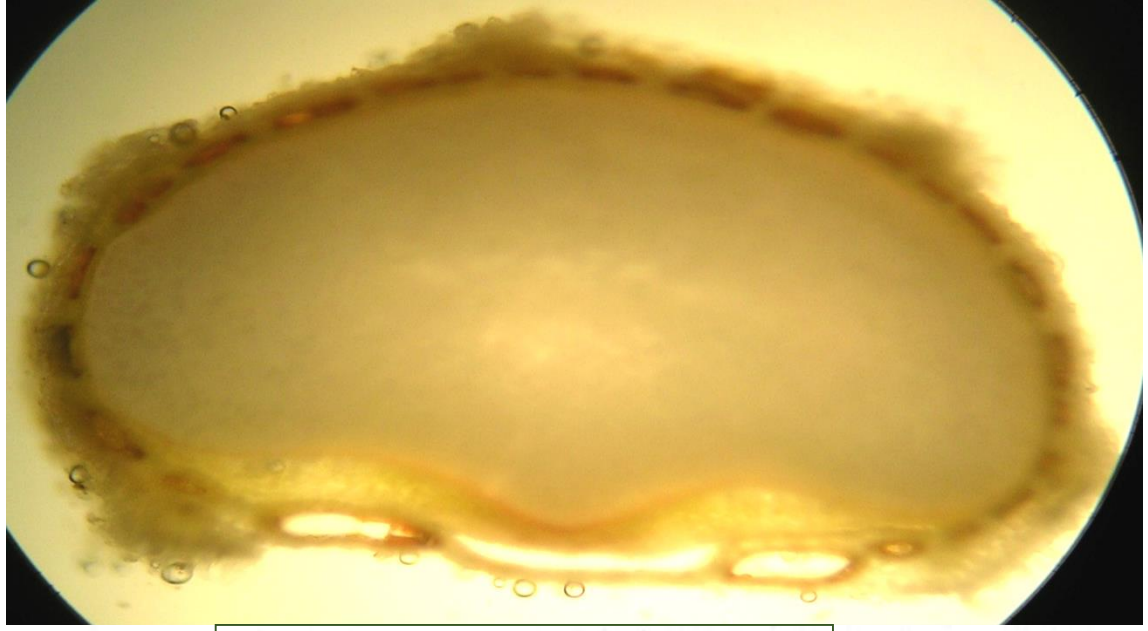
ANISE FRUIT

Thamarul Yansoon

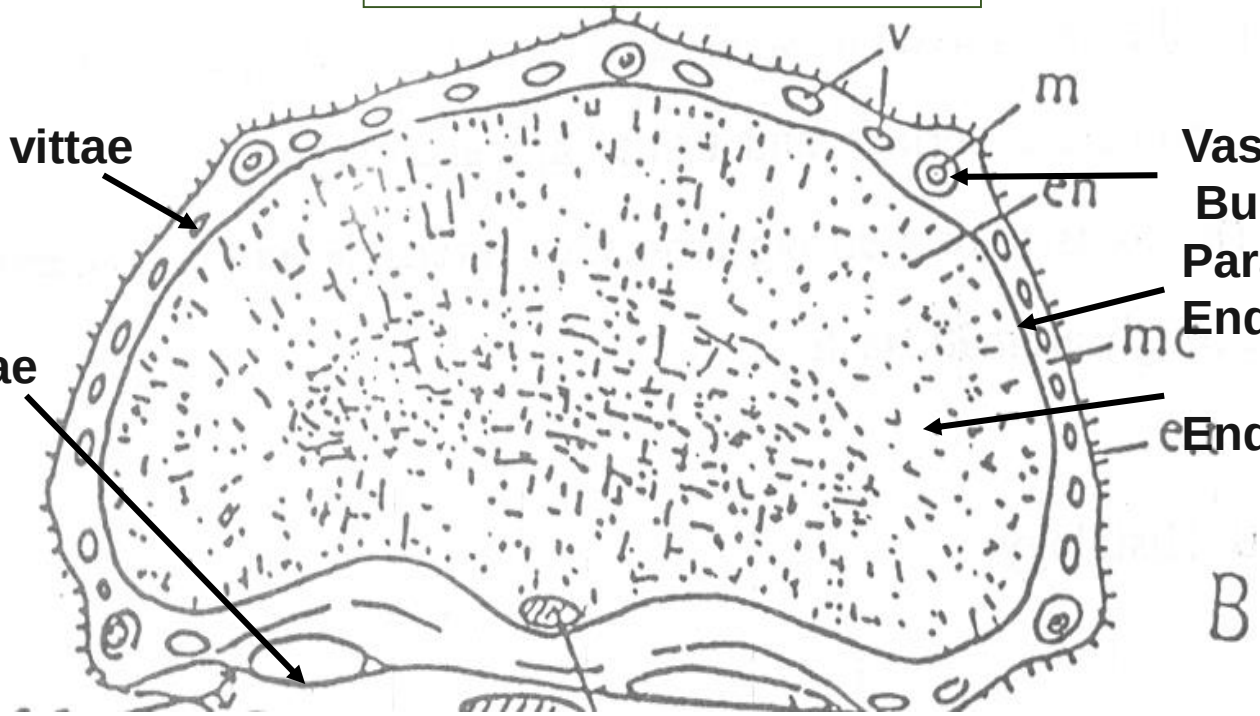
The dried ripe fruit of *Pimpinella anisum* L. (Fam. Apiaceae).

It contains not more than 3 per cent of foreign organic matter, and yields not less than 1.5 % v/w of volatile oil





T. S. of mericarp of Anise



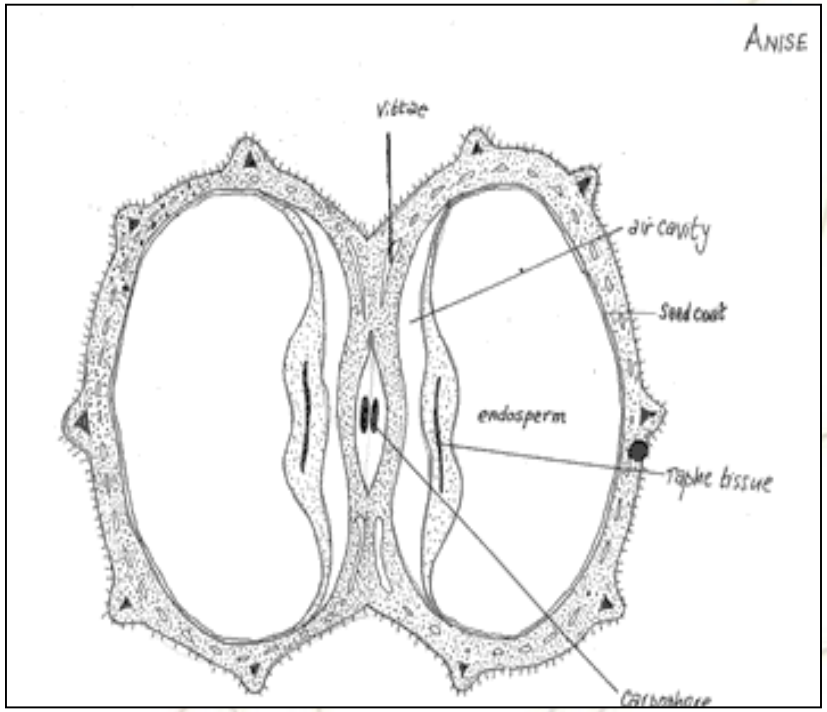
Branched vittae

Simple vittae

Vascular Bundle

Parallel Endocarp

Endosperm



T. S. of cremocarp of Anise

Powder:

Color: Powdered Anise is greenish-brown or yellowish-brown,

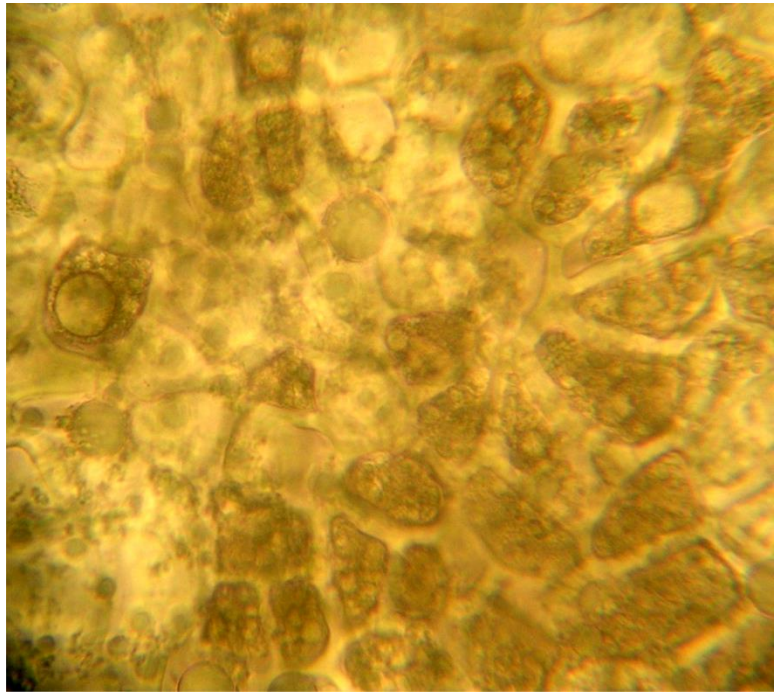
Odour: having a strong aromatic agreeable

Taste : a sweet strongly aromatic.

1- Fragments of pericarp with yellowish-brown branching vittae, usually crossed by the cells of the parallel endocarp.

Powder:

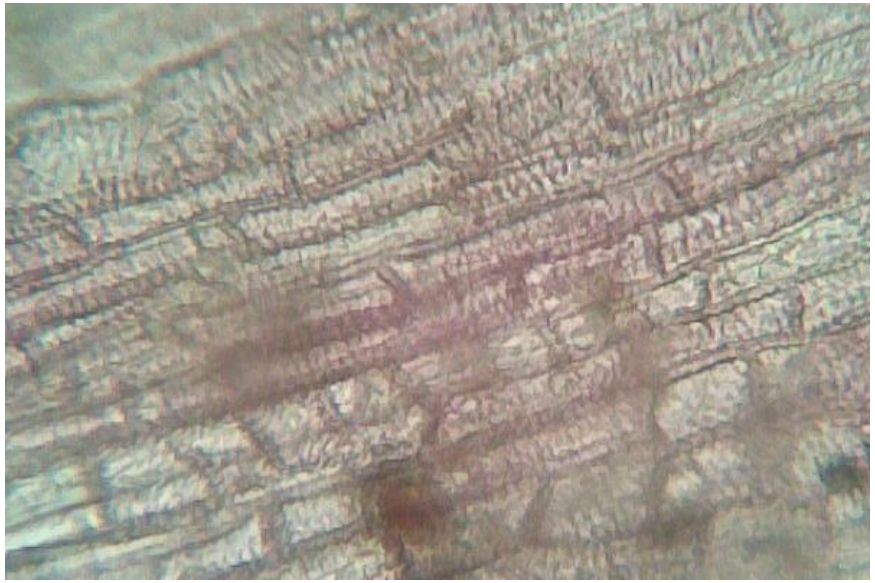
2- Numerous fragments of endosperm.



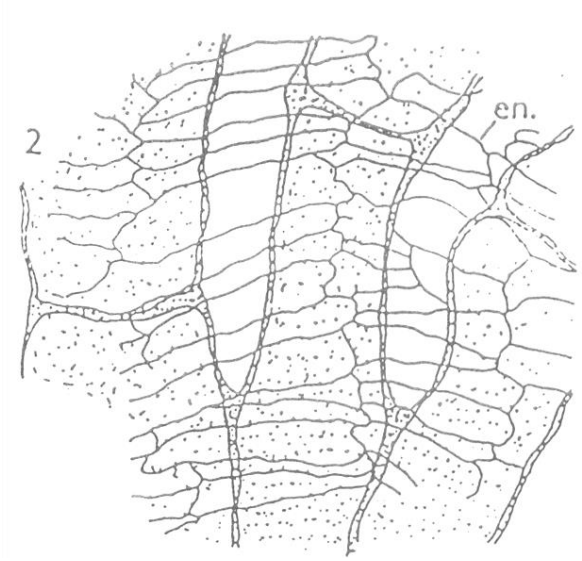
3- Numerous warty simple hairs

Powder:

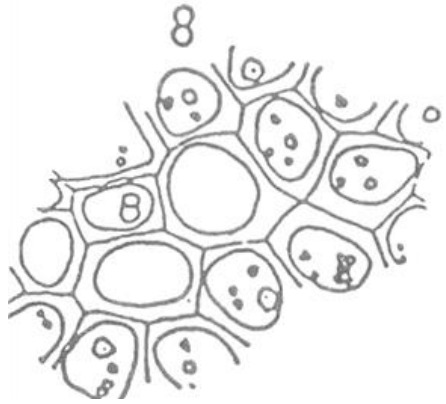
4- Few fibers and very scanty pitted lignified parenchyma



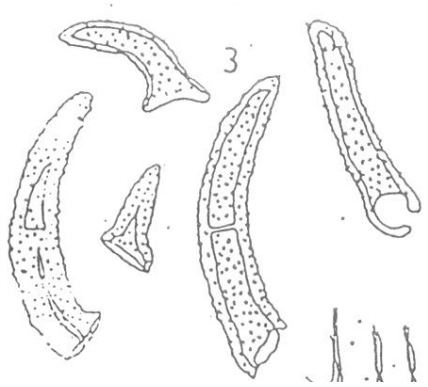
5- Epicarp cells with striated cuticle and non glandular hairs



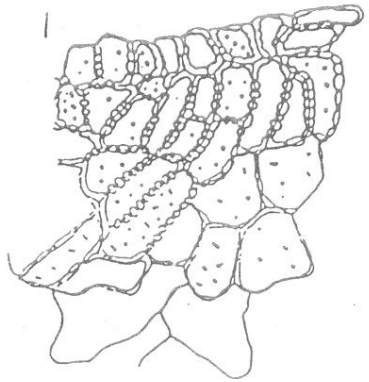
Branched vittae crossed by parallel endocarp



Endosperm



Non glandular hairs



Pitted lignified parenchyma

Epicarp

ACTIVE CONSTITUENTS

1-Essential oil (1.5-5%) containing:

Trans- anethole (80-90%) ,responsible for the taste and smell.

methyl chavicol (1:2%), which also smells like anise but doesn't taste sweet. - Anisaldehyde (1%).

-Sesquiterpene hydrocarbons (2%) and less than 1%monoterpene hydrocarbons (1%)

-The dimers of anethole (dianethole) and anisaldehyde (Dianisidine)

2- Fixed oil, protein & coumarins

USES AND ACTIONS

1- For respiratory tract infections, cough, bronchitis

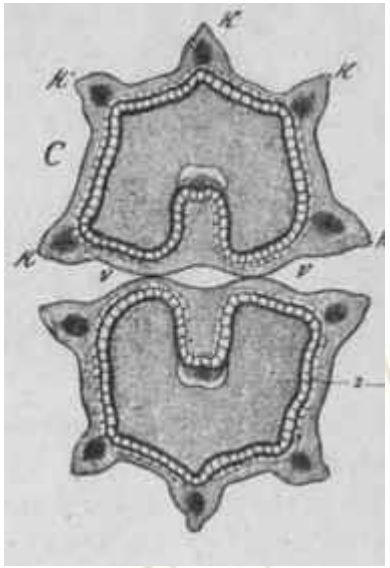
2-Carminative & Relieving colic in children.

5- Oil is also employed in food & drink industry as flavoring agent

3- Has a sedative action.

4- In folk medicine, lactagogue.

CONIUM MACULATUM



Adulteration of Anise was done by Hemlock fruits

[*Conium maculatum* F. Apiaceae]

Comparison between Anise & Hemlock

Anise	Hemlock
❑ Larger in size	❑ - Smaller in size
❑ Strong aromatic, agreeable odor	❑ Slight odor and taste
❑ Branched vittae, non glandular hairs	❑ Absence of vittae and hairs
❑ Essential oil, Fixed oil, protein & coumarins	❑ Coniine alkaloid which is highly toxic
❑ Test for V.O.	❑ Test for coniine

Action of Coniine

- Coniine is a poisonous alkaloid found in poison and contributes to hemlock's fetid smell.
- It is a neurotoxin which disrupts the peripheral nervous system.
- Death caused by respiratory paralysis(Socrates was put to death by means of this poison in 399 BC.)
- A poisoned person will recover if artificial ventilation (breathing) is maintained until the toxin is removed from the receptor.

Detection:

1-Chemical test for alkaloids (Mayer's test)

2-Rubbing the fruits with solution of caustic alkali, it develops a strong mouse-like odor

↘

STAR ANISE

The ripe fruits of *Illicium verum* or (Chinese star anise) F. Magnoliaceae

Japanese star anise (*Illicium anisatum*), a similar tree, is highly toxic and inedible

The fruit is an aggregate of follicles

Active Constituents:

Volatile oil mainly anethole more than 4.5%., which is the same ingredient that gives the anise (*Pimpinella anisum*) its distinctive odor

USES AND ACTIONS

1- Expectorant

& In hard dry cough, it may be used in bronchitis & in whooping cough.

2-For digestive tract problems including upset stomach, loss of appetite&

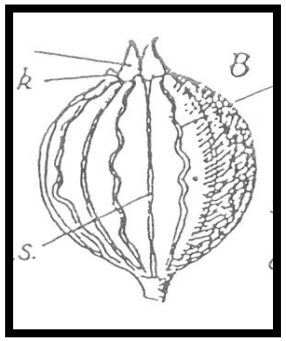
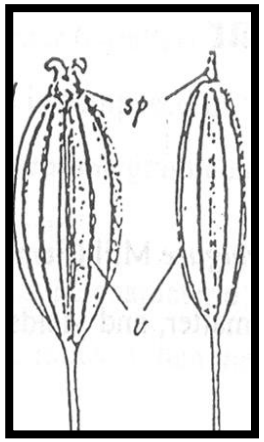
Relieving colic in babies

3- Antimicrobial &Antiviral activity

4- Oil is also employed in food & drink industry as flavoring agent

5-It is a good source of shikimic acid, which is used in the manufacture of oseltamivir (Tamiflu) , a flu treatment

OTHER IMPORTANT UMBELLIFEROUS FRUITS

Name	Active constituents	Uses
1-Coriander 	- **Volatile oil containing linalool ,α and β pinene, γ-terpenene, p-cymene, limonene, anethole, camphor, geraniol and geranyl acetate.** - **Fats (up to 26%); its main fatty acids are oleic and linolenic acids** - **Flavonoid glycosides (quercetin, isoquercetin and rutin)** - **Proteins**	**1-Spice & flavoring agent.** **2- spasmolytic, carminative added to purgative preparations to prevent the gripping effect** **3- It has strong lipolytic activity** **4-The high percent of fats and protein makes distillation residues suitable for animal feed**
2- Fennel 	- **1- Essential oil (4 - 6 %), containing fenchone, estragol (methyl chavicol)** **2- Fixed oil (17-20%)** - **3- Flavonoids (Kaempferol, quercetin)** - **4- Protein (16-20%) & minerals (relatively high Ca and K)**	**1- Carminative. It regulates the peristaltic function of GIT and relieves the associated pain and cramping. Used with purgatives to allay their gripping effect** **2- Lactagogue** **3-Clears the lungs** **4-weight loss.**

Capsicum Fruit

Thamarul Shatta

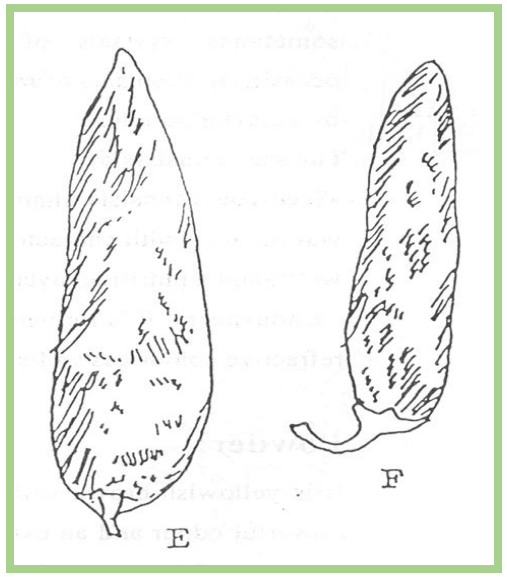
Chillies, Cayenne pepper

Capsicum is the dried ripe fruits of

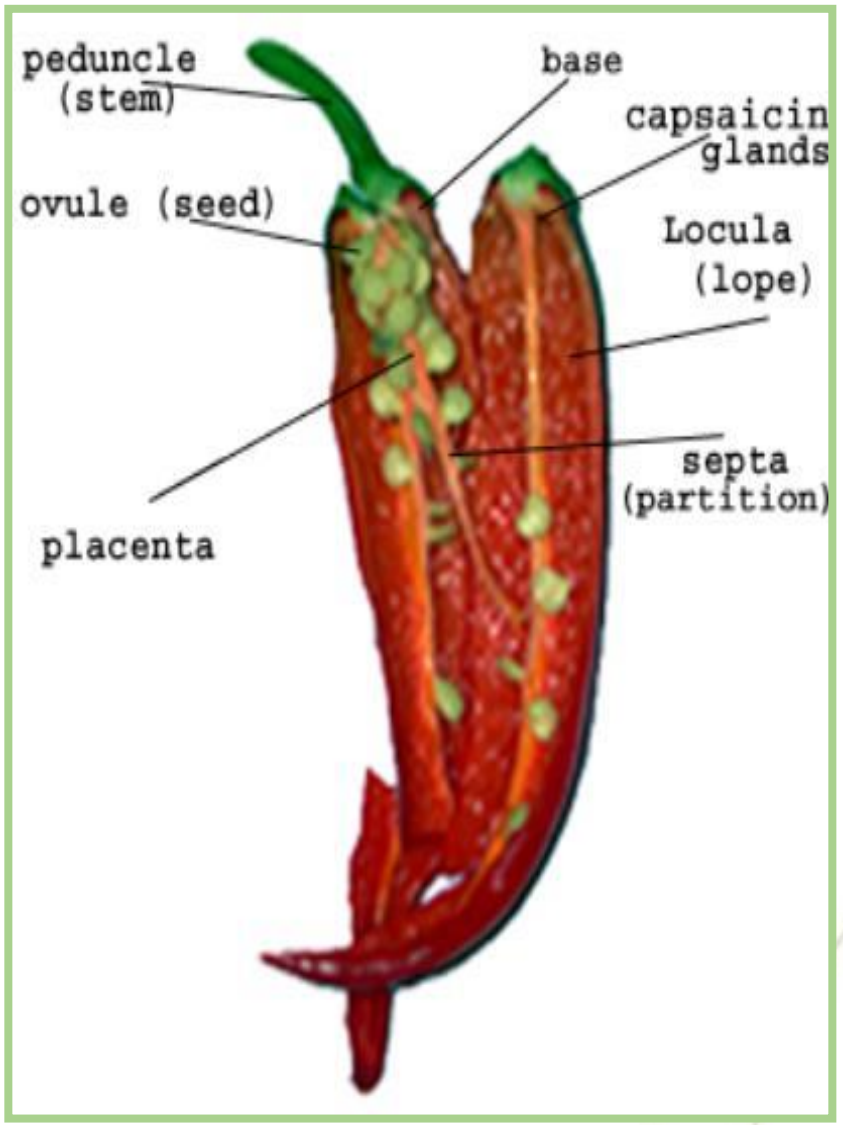
Capsicum minimum **F. Solanaceae.**

The fruit is a berry

It should contains not more than 3% of calyces and pedicels, and not more than 1% of foreign organic matter.



Capsicum Fruit



L. Cut of Capsicum fruit

ACTIVE CONSTITUENTS

1- **Pungent principles named Capsaicinoids** (up to 1.5%), including **capsaicin** (0.1 - 1 %), 6,7 - dihydrocapsaicin, nordihydrocapsaicin, homodihydrocapsaicin , and homocapsaicin

The capsaicin content of fruits varies in a range up to 1.55 and is much influenced by environmental conditions and age of the fruit. It **occurs principally in the dissepiment**

The pungency of capsicum is not destroyed by treatment with alkalis (distinction from gingerol, the phenolic pungent principle of Ginger) **but destroyed by oxidation with potassium dichromate or permenganate**

ACTIVE CONSTITUENTS

2- Fixed oils.

3- Carotenoid pigments (including capsanthin, capsorubin, alpha- and beta-carotene).

4- Steroid glycosides (capsicosides A, B, C, and D).

5- Fats (9 -17%), proteins (12 -15%), vitamins A and C, and trace of volatile oil.

USES AND ACTIONS

1- Condiment (pungent spice)

2- <u>Internally</u>, In dyspepsia and flatulence.

USES AND ACTIONS (cont.)

3- **Externally,** It is used in different formulations (e.g. ointments and plasters) as a **pain controller** for the relief of rheumatism, lumbago, and after *Herpes Zoster* infections and counter irritant

Topical application of capsaicin relieves pain and itching by acting on sensory nerves for a range of conditions, including nerve pain in diabetes (diabetic neuropathy), post-surgical pain, muscle and nerve pain, osteoarthritis pain and rheumatoid arthritis.

USES AND ACTIONS

Side effects

- Allergic reaction to the cream, so the first application should be to a very small area of skin.

-Oral intake can cause burning in the mouth and throat, and can cause the nose to run and eyes to water.

People with ulcers, heartburn, or gastritis should use any cayenne-containing product cautiously as it may worsen their condition.

CHEMICAL TESTS

1- Capsaicin gives a bluish-green colour on addition of few drops of $FeCl_3$

2-Capsaicin dissolved in H_2SO_4 and small piece of sucrose sugar is added, a violet colour is developed after few hours.

Wheat grain

Origin : the dried caryopsis (grain) of *Triticum vulgare* F.Graminae

The fruit is **true , simple, dry indehiscent, grain** (caryopsis)

- **Active constituents**: **starch, protein, vitamins A, B,B2,E, enzymes, wheat germ oil**
- **Uses** :

Starch production

wheat germ oil

wheat bran production

Wheat germ oil

- Is extracted from the germ (embryo) of the wheat kernel
- Very long chain fatty alcohols have been reported to lower plasma cholesterol in humans.
- Wheat germ oil is also very high in **vitamin E** (255 mg/100g),
- Wheat germ oil contains the following **fatty acid :Linoleic acid** (omega-6),Palmitic acid, **Oleic acid, Linolenic acid** (omega-3)
- **Uses include treatment of certain skin conditions**

Home work

- Suggest the types of the following fruits:

  Star anise- wheat- capsicum - hemlock
- How can you differentiate between anise & hemlock
- Mention the uses & contraindications of *capsicum* fruit
- Mention the uses of *coriander &fennel* fruits

Faculty of **Pharmacy**

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Established by Dr.Nawal El Degwi
October Univeristy for Modern Sciences and Arts
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Thank You!

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