

Pharmacognosy

PHG 112
PG 102

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The background features a dark blue gradient with a large, stylized green shape on the left side that resembles a thick, curved arrow or a leaf. On the right side, there is a thin, golden-brown outline of a branch with several leaves.

Faculty of **Pharmacy**

Lecture 5



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

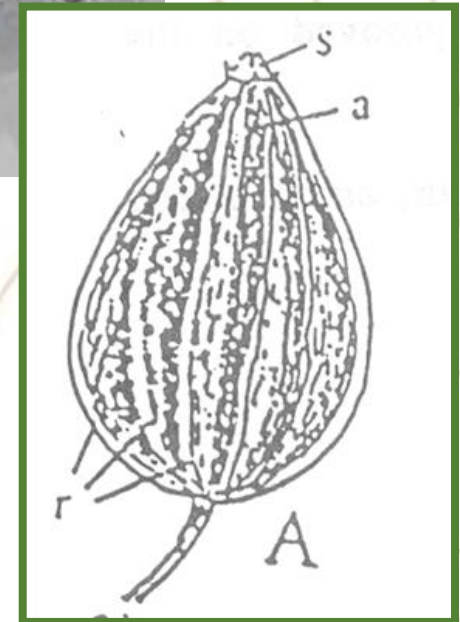
- **Family Umbelliferea as important nutraceutical and cosmeceutical fruits**
- **Other fruits**

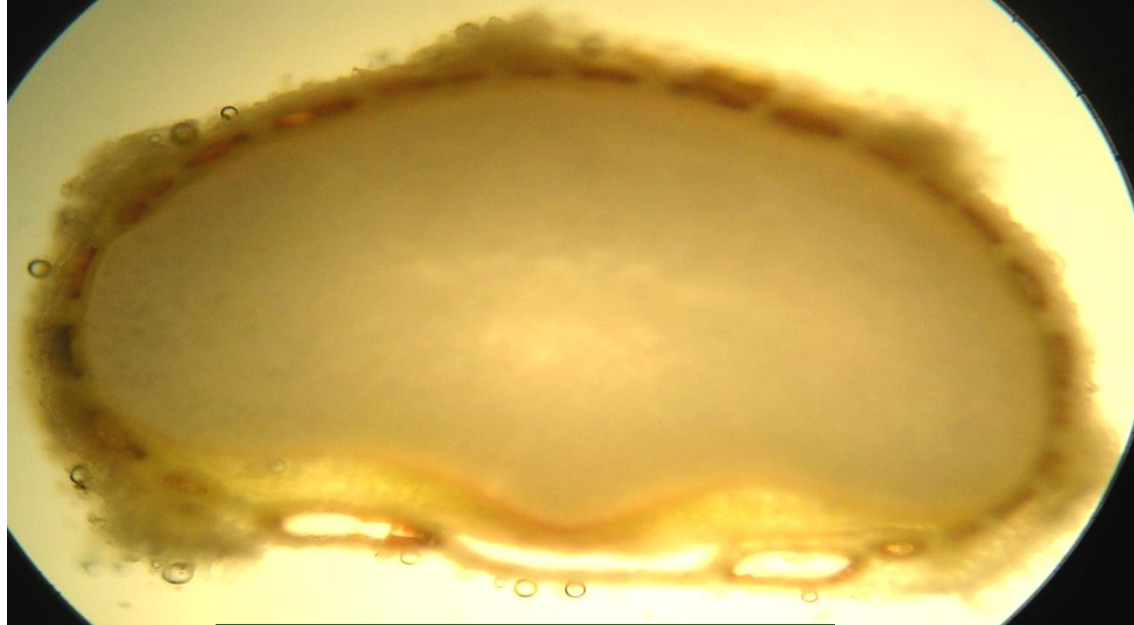
ANISE FRUIT

Thamarul Yansoon

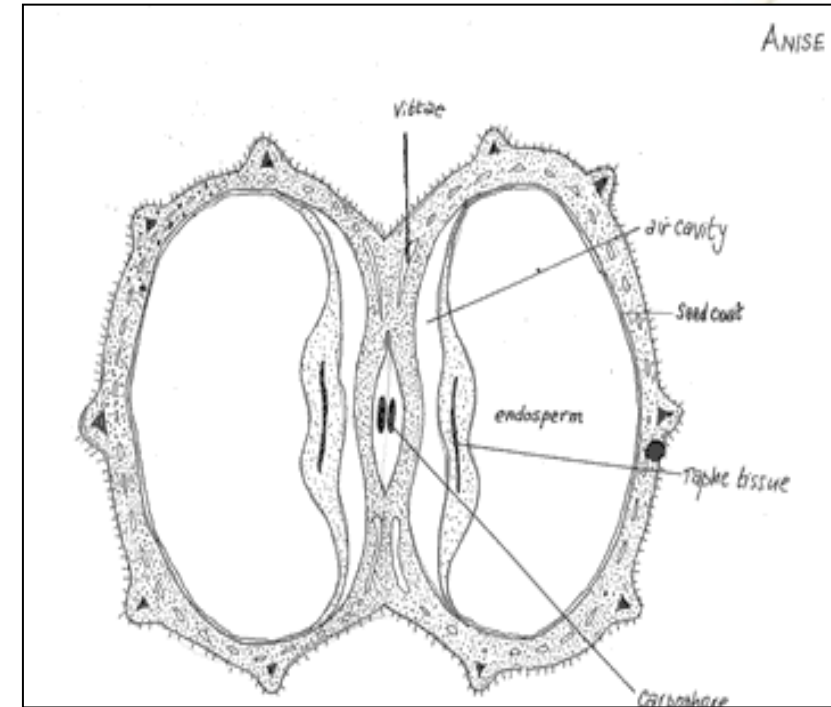
The dried ripe fruit of *Pimpinella anisum* L. (Fam. Apiaceae).

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



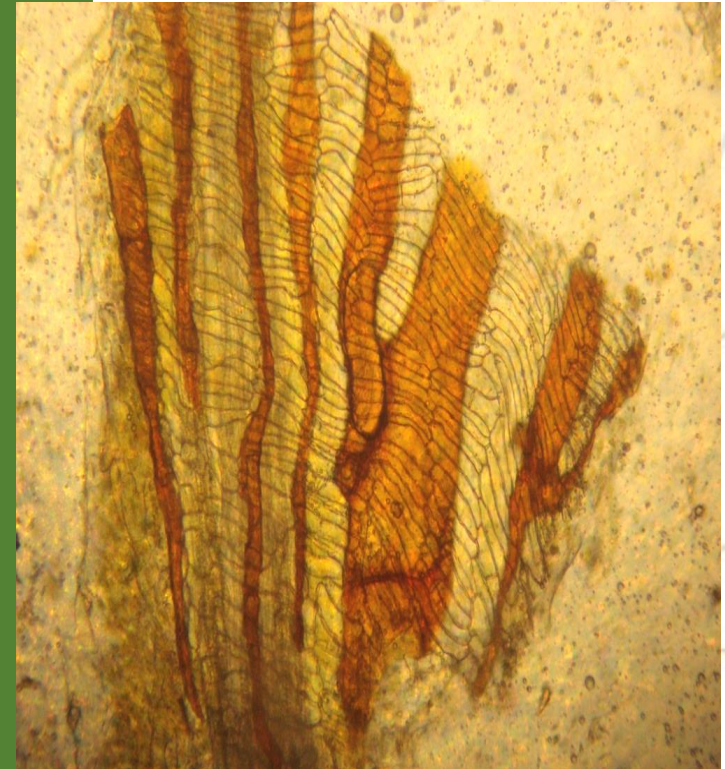
T. S. of cremocarp of Anise



Powder:

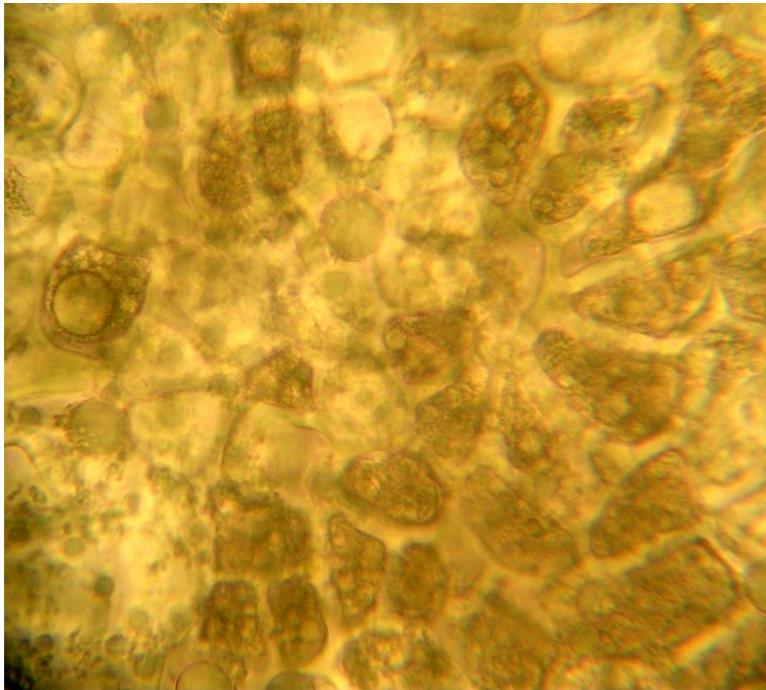
Color: Powdered Anise is greenish-brown or yellowish-brown,
Odour: having a strong aromatic agreeable
Taste : a sweet strongly aromatic.

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

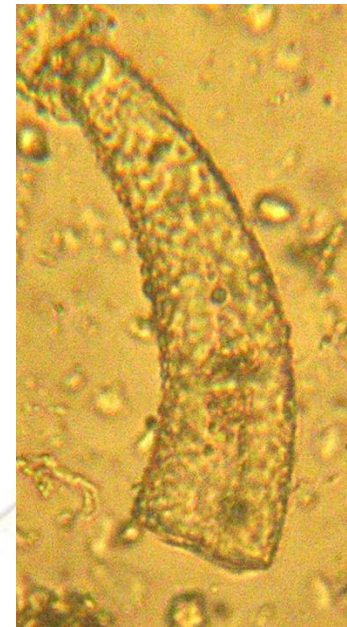


Powder:

2- Numerous fragments of endosperm.

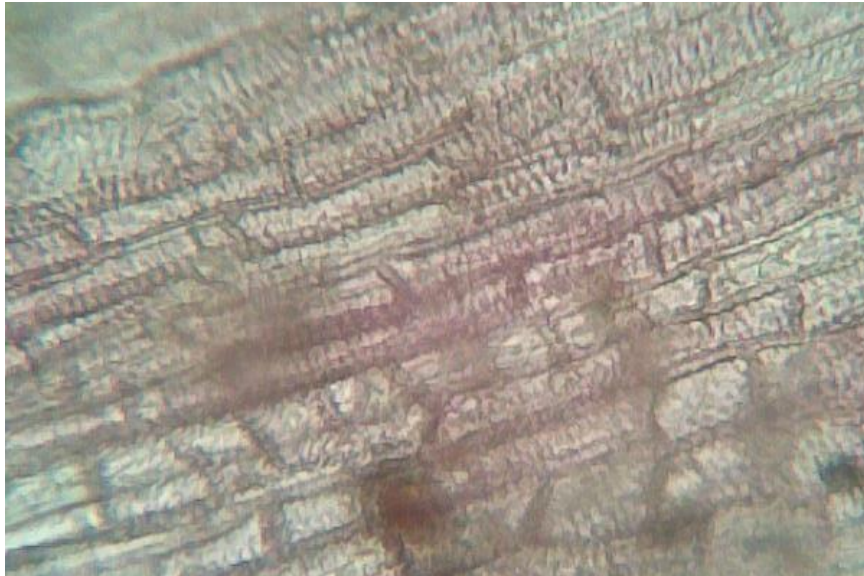


3- Numerous warty simple hairs



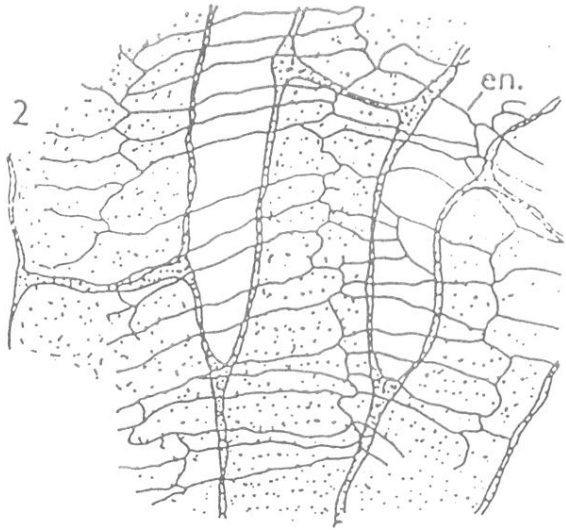
Powder:

4- Few fibers and very scanty pitted lignified parenchyma



5- Epicarp cells with striated cuticle and non glandular hairs

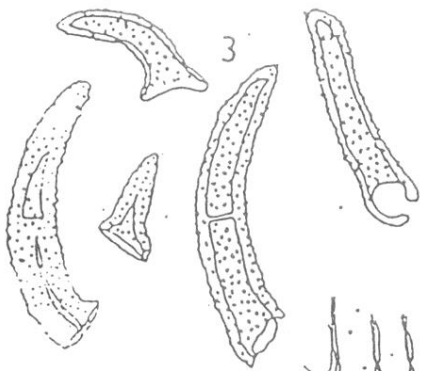




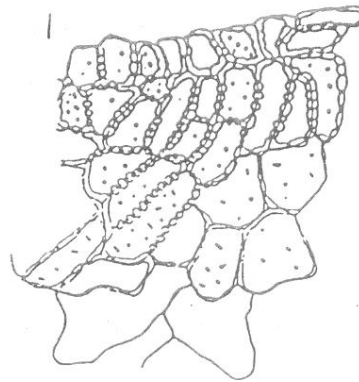
Branched vittae crossed by parallel endocarp



Endosperm



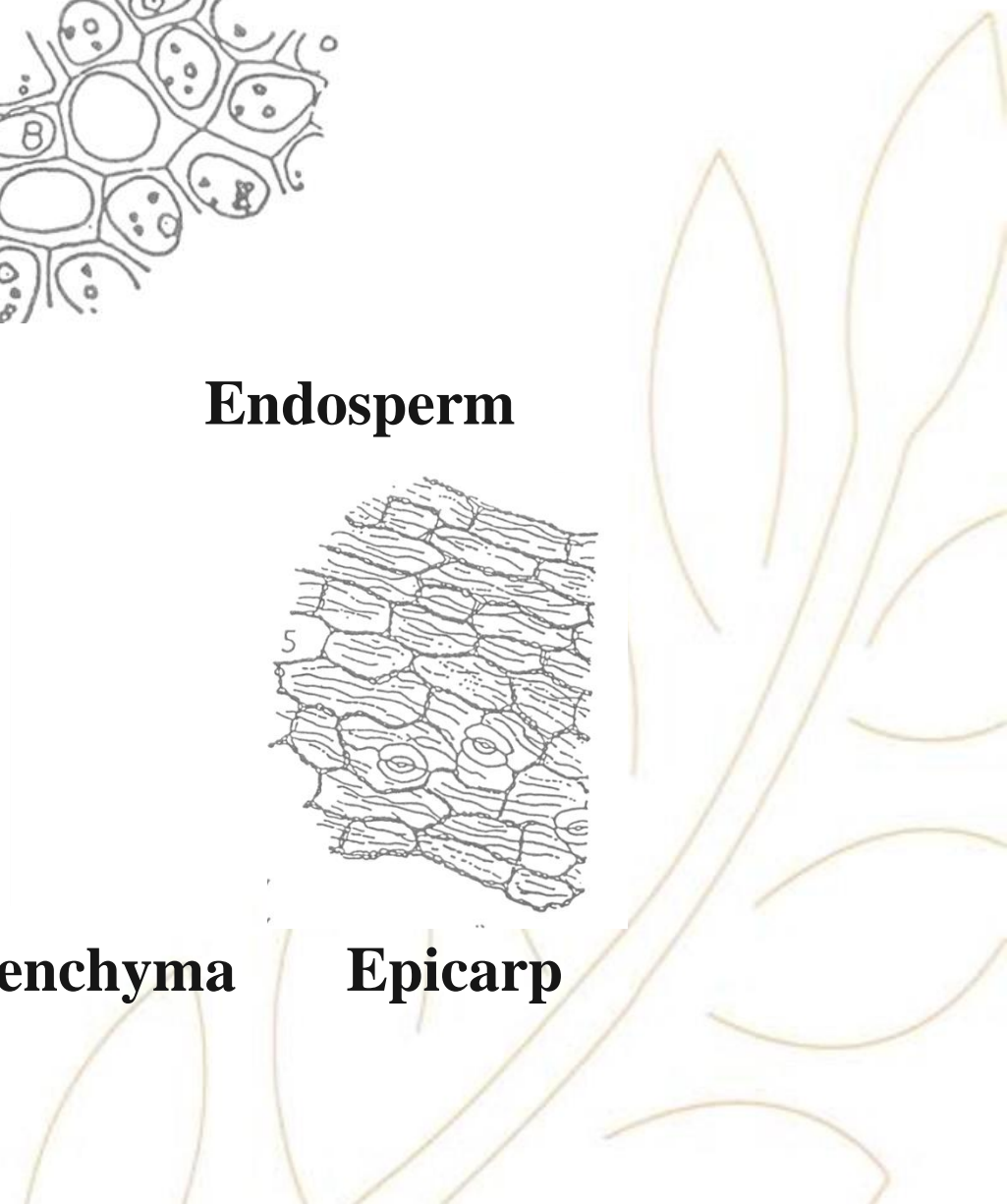
Non glandular hairs



Pitted lignified parenchyma



Epicarp



ACTIVE CONSTITUENTS

**2- Fixed oil,
protein &
coumarins**

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)

1- For respiratory tract infections, cough, bronchitis

2-Carminative & Relieving colic in children.

3- Has a sedative action.

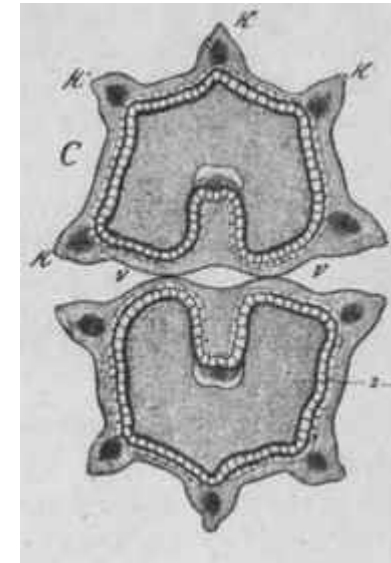
4- In folk medicine, lactagogue, emmenagogue

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

**USES
AND
ACTIONS**



CONIUM MACULATUM



Adulteration of Anise was done by Hemlock fruits
[*Conium maculatum* F. Apiaceae]

Comparison between Anise & Hemlock

Anise

- Larger in size
- Strong aromatic, agreeable odor
- Branched vittae, non glandular hairs
- Orthospermous endosperm
- Essential oil, Fixed oil, protein & coumarins
- Test for V.O.

Hemlock

- Smaller in size
- Slight odor and taste
- Absence of vittae and hairs
- Campylospermous endosperm
- Coniine alkaloid which is highly toxic
- 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.

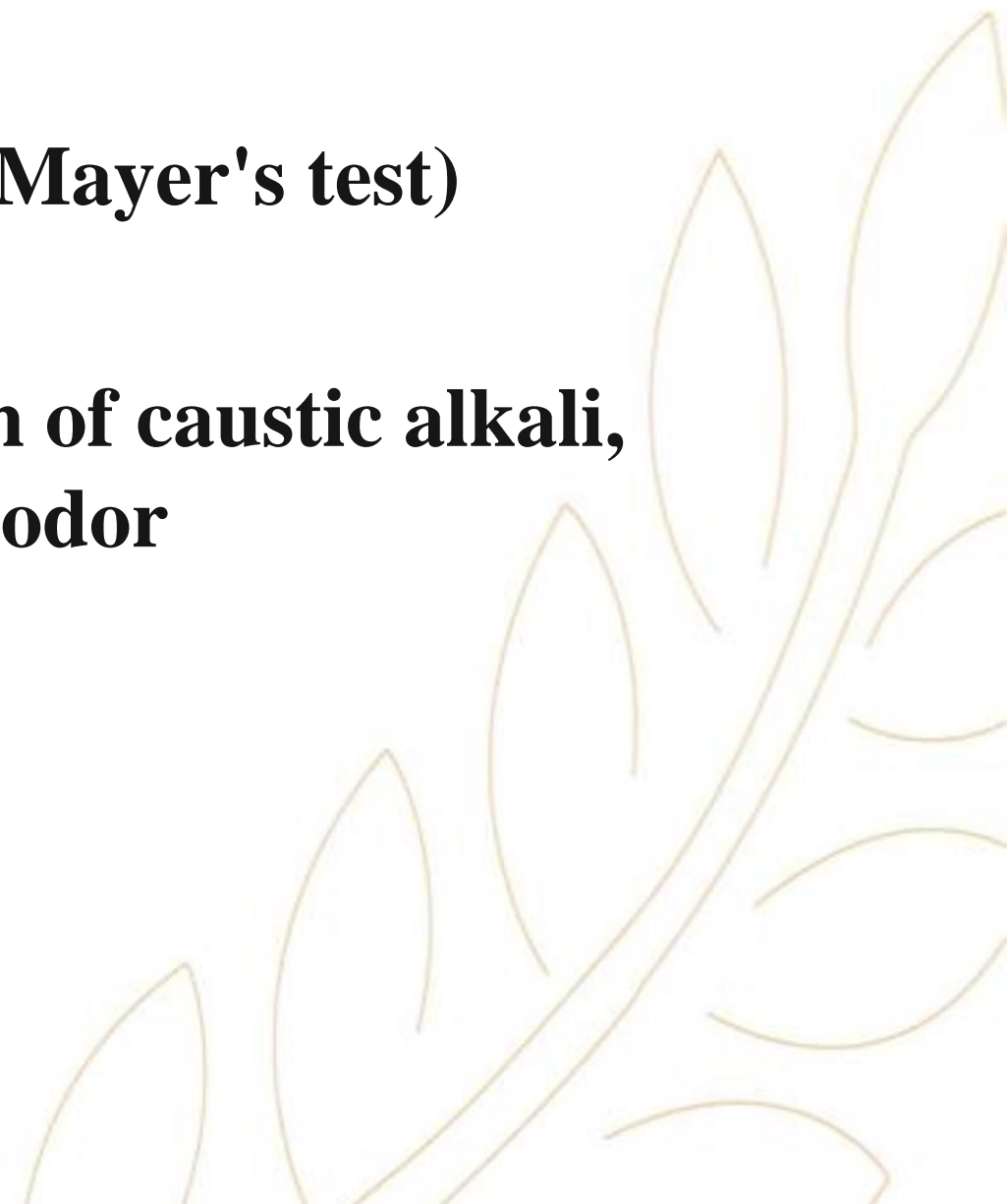
Death caused by respiratory paralysis(Socrates was put to death by means of this poison in 399 BC.) •

- A poisoned person will recover if artificial ventilation (breathing) is maintained until the toxin is removed from the receptor.

Detection:

1-by 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



**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**

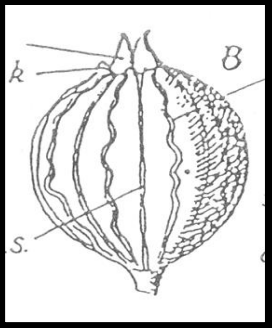
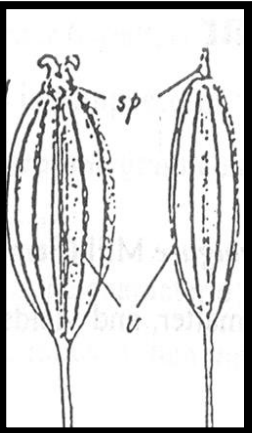
**USES
AND
ACTIONS**

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

**3-
Antimicrobial
&Antiviral
activity**

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

OTHER IMPORTANT UMBELLIFEROUS FRUITS

Name	Active constituents	Uses
<p>1-Coriander</p> 	<ul style="list-style-type: none"> - <u>Volatile oil containing linalool</u>, α and β pinene, γ-terpenene, p-cymene, limonene, anethole, camphor, geraniol and geranyl acetate. - <u>Fats</u> (up to 26%); its main fatty acids are oleic and linolenic acids - <u>Flavonoid glycosides</u> (quercetin, isoquercetin and rutin) - <u>Proteins</u> 	<ol style="list-style-type: none"> <u>1-Spice & flavoring agent.</u> <u>2- spasmolytic, carminative</u> added to purgative preparations to prevent the gripping effect <u>3- It has strong lipolytic activity</u> <u>4-The high percent of fats and protein makes distillation residues suitable for animal feed</u>
	<ul style="list-style-type: none"> - 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) 	<ol style="list-style-type: none"> <u>1- Carminative. It regulates the peristaltic function of GIT and relieves the associated pain and cramping. Used with purgatives to allay their gripping effect</u> <u>2- Lactagogue</u> <u>3-Clears the lungs</u> <u>4-weight loss.</u>

Capsicum Fruit

Thamarul Shatta

Chillies, Cayenne pepper

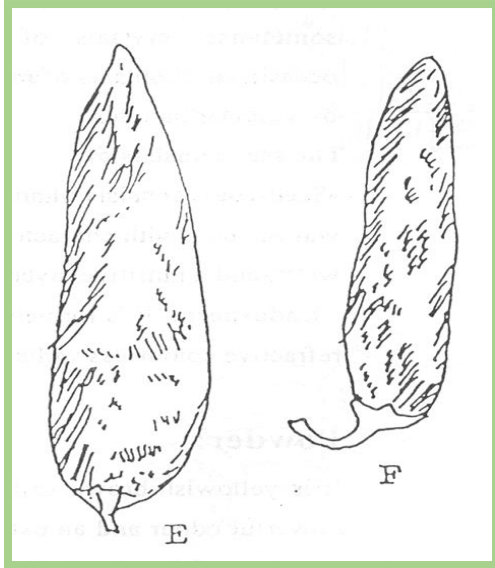
Capsicum is the dried ripe fruits of

Capsicum minimum F. Solanaceae.

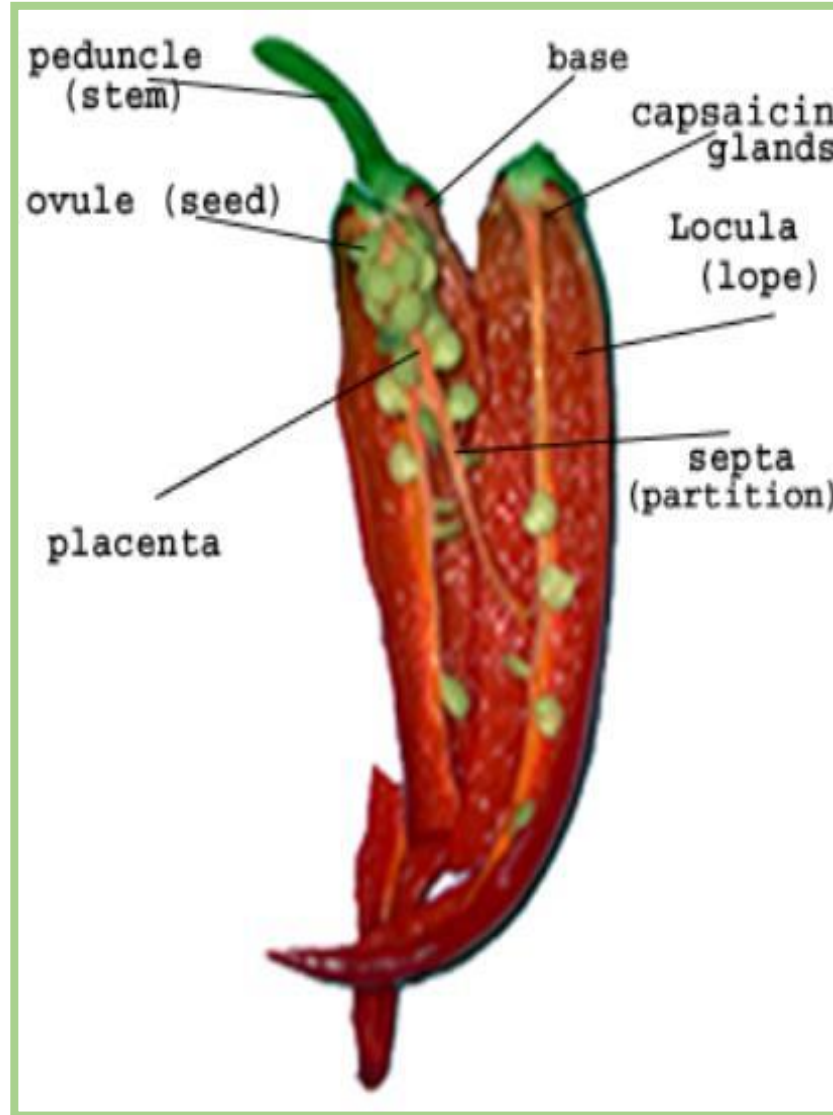
It should contains not more than 3%

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 permanganate



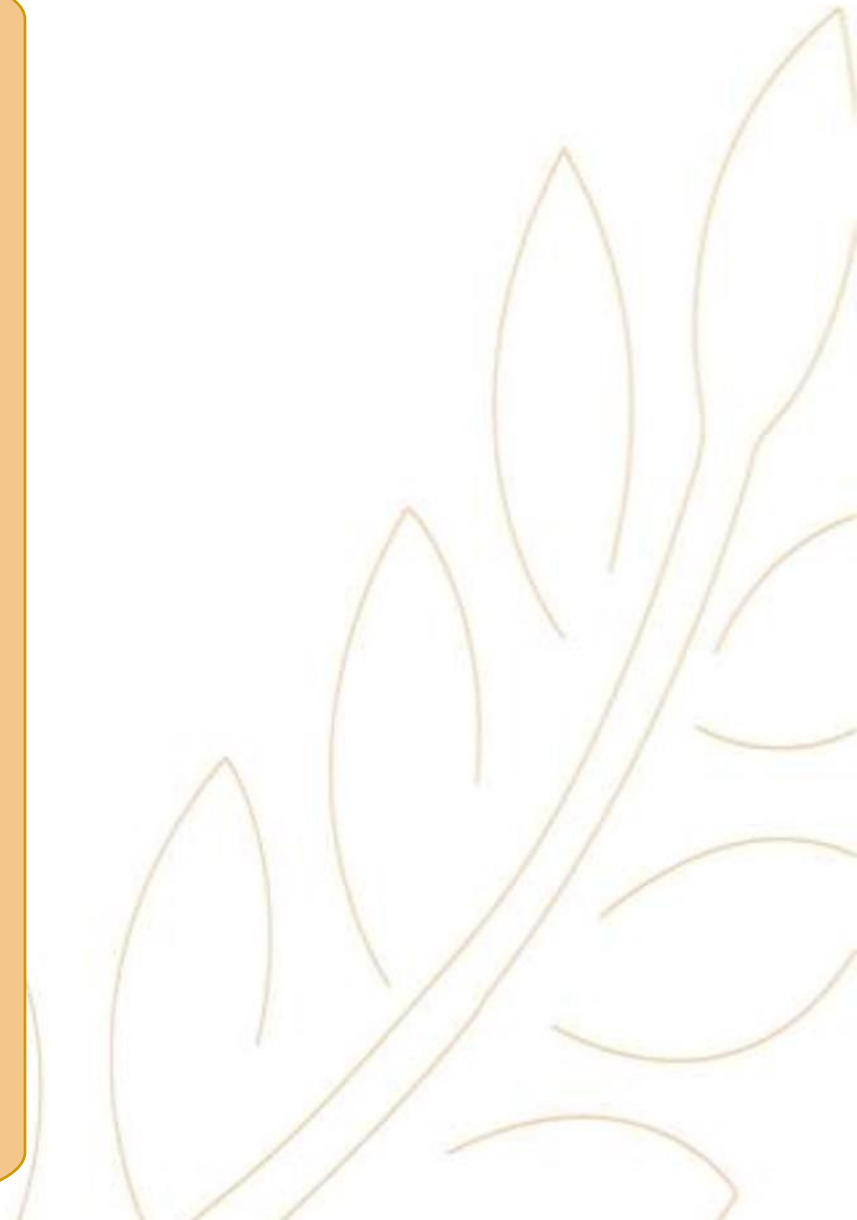
ACTIVE CONSTITUENTS

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



2- Internally, In atonic 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.

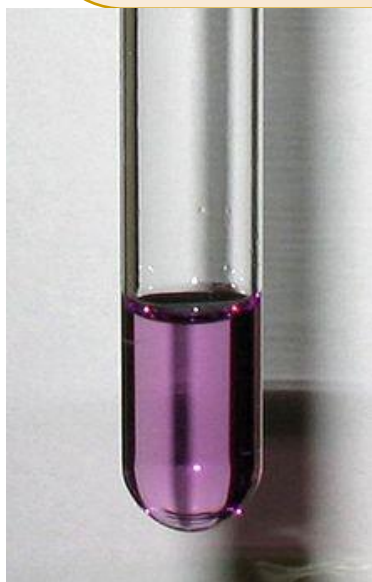
People with ulcers, heartburn, or gastritis should use any cayenne-containing product cautiously as it may worsen their condition.

-Contraindications

Application on injured skin, allergies to cayenne preparations

CHEMICAL TESTS

1- Capsaicin gives a **bluish-green** colour on addition of few drops of **FeCl₃**



2-Capsaicin dissolved in H₂SO₄ and small piece of sucrose sugar is added, a **violet** colour is developed after few hours.

COLOCYNTH FRUIT

THAMARUL HANDTHAL

Colocynth is the dried unripe, but fully grown fruits of *Citrullus colocynthis* F. Cucurbitaceae, deprived of its seeds and outer hard pericarp.



↙
The fruit is a pepo
Part used: The Pithy Pulp

Colocynth fruit

ACTIVE CONSTITUENTS

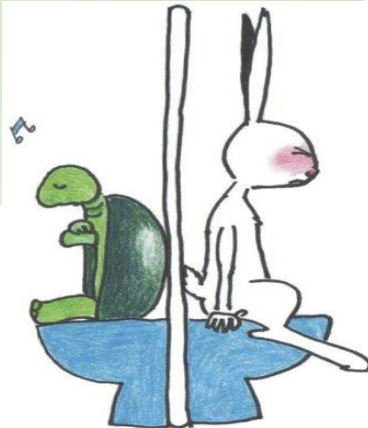
1- Resin
soluble in
ether and
chloroform
which is a
powerful
purgative.

2- A
crystalline
alcohol,
citrullol

3-
Cucurbitacins
cucurbitacin
E, B, L, and
cucurbitacin-
L-glucoside

4- Flavonoids
as vitexin,
isovitexin,
acacetin and
acacetin 7-O-
glycoside.

1- Powerful purgatives, acting as a hydtragogue cathartic



2- The cucurbitacin has necrosing activity. The drug as well as the cucurbitacins are reported as potent cytotoxic

3- In folk medicine it is used as antirheumatic

4- The flavonoidal contents have moderate antimicrobial activity.



WHEAT GRAIN

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

■ **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](#) of the [wheat kernel](#),
- Wheat germ oil is particularly high in [octacosanol](#) - a 28-carbon long-chain saturated primary alcohol found in a number of different vegetable waxes.
- Octacosanol has been studied as an exercise- and physical performance-enhancing agent. Very long chain [fatty alcohols](#) obtained from plant waxes and beeswax 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



PHG112 MIDTERM



Established by Dr.Nawal El Degwi
October Univeristy for Modern Sciences and Arts
جامعة أكتوبر للعلوم الحديثة والآداب

↙

Thank You!

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