



MSA UNIVERSITY

جامعة أكتوبر للعلوم الحديثة والآداب

Pharmacognosy

PHG112

3 GOOD HEALTH
AND WELL-BEING



4 QUALITY
EDUCATION



Course Instructors

Dr. Ibrahim Ezz

Lecturer of Pharmacognosy

iezz@msa.edu.eg

Dr. Passant Mohamed

Lecturer of Pharmacognosy

pabdelbaki@msa.edu.eg

Office: G42

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 4

Introduction to Fruits *Introduction to Family* *Umbelliferea*

Interactive teaching methods and activities



QUIZIZZ



socrative

Learning Outcomes

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

Knowledge / Remembering

- **Define** a fruit as the product of the development of the gynoecium after fertilization.
- **Identify** the general morphological features of fruits (apex, base, stylopod, carpophore).
- **List** the classification of umbelliferous fruits (true, simple, dry, schizocarpic, cremocarp).
- **Recognize** the botanical origin and family of *Ammi visnaga* and *Ammi majus*.
- **Recall** the main active constituents of *Ammi visnaga* and *Ammi majus*.

Comprehension / Understanding

- **Explain** the structure of a cremocarp and how it splits into two mericarps.
- **Describe** the histological features of umbelliferous fruits
- **Discuss** the difference between *Ammi visnaga* and *Ammi majus* based on morphological and histological features.
- **Summarize** the pharmacological actions of khellin and psoralene.

Learning Outcomes

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

3. Application

- **Apply** morphological characters (carpophore type, stylopod shape, ridges) to distinguish between *Ammi visnaga* and *Ammi majus*.
- **Use** chemical tests (NaOH test, UV fluorescence) to identify each drug.
- **Relate** the presence of bitter principles or furocoumarins to their therapeutic uses.

4. Analysis

- **Differentiate** between true and false fruits with examples.
- **Compare** the vascular bundle arrangement and mesocarp structure of the two Ammi species.
- **Analyze** the therapeutic indications and side effects of each fruit drug

Learning Outcomes

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

5. Synthesis / Creating

- **Construct** a labeled diagram of a typical cremocarp showing stylopod, mericarps, ridges, and carpophore.
- **Design** a comparison table summarizing origin, morphology, histology, constituents, uses, and chemical tests.

6. Evaluation

- **Evaluate** the clinical importance of *Ammi visnaga* in bronchial asthma and angina.
- **Assess** the risk-benefit ratio of using psoralene-containing preparations in skin disorders.
- **Judge** the importance of morphological and histological identification in preventing adulteration.



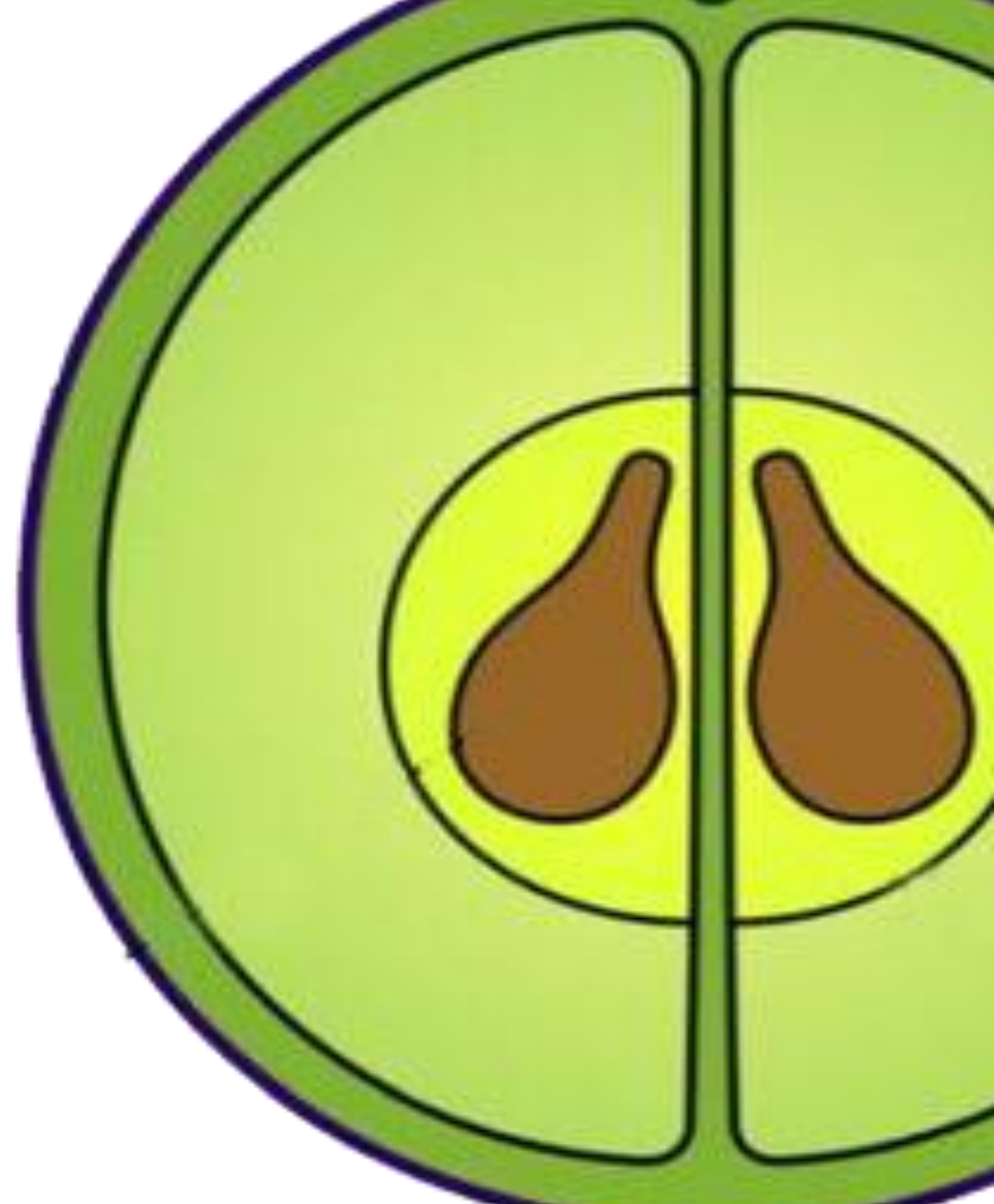
Introduction to Fruits

Fruit Formation

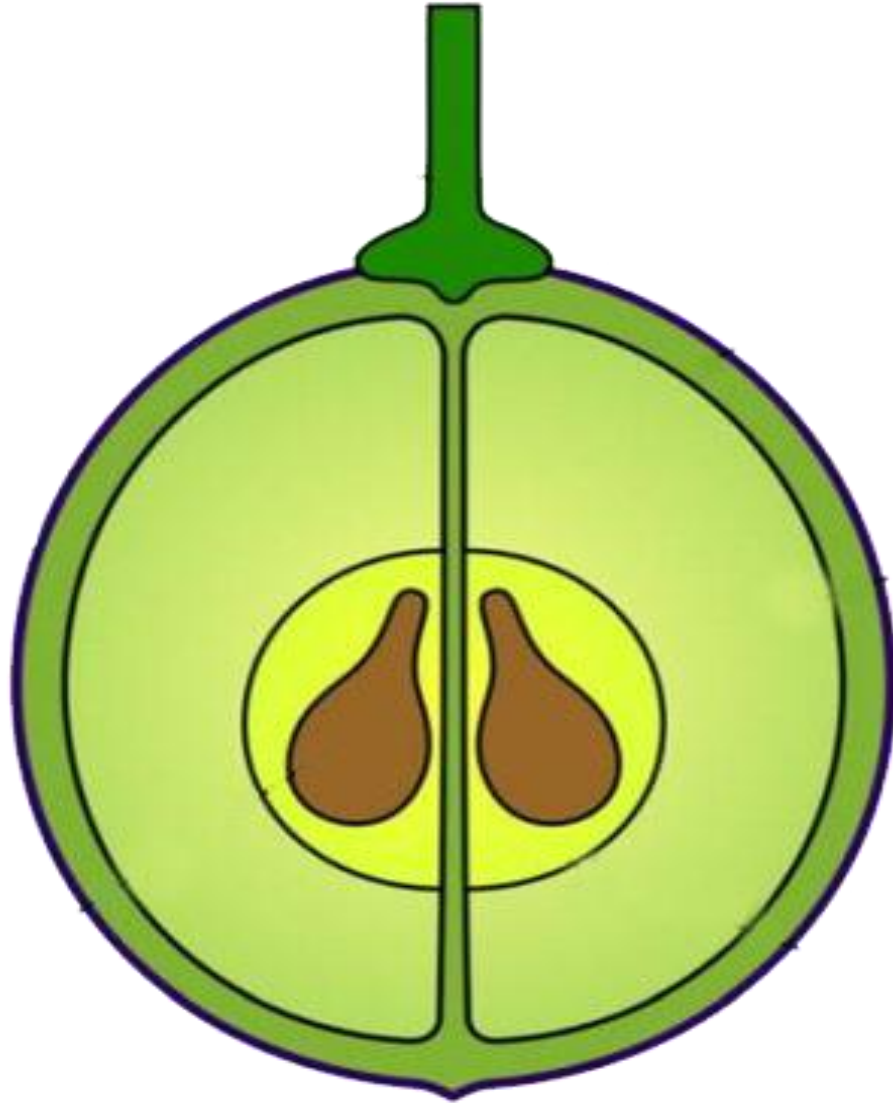


The Fruit

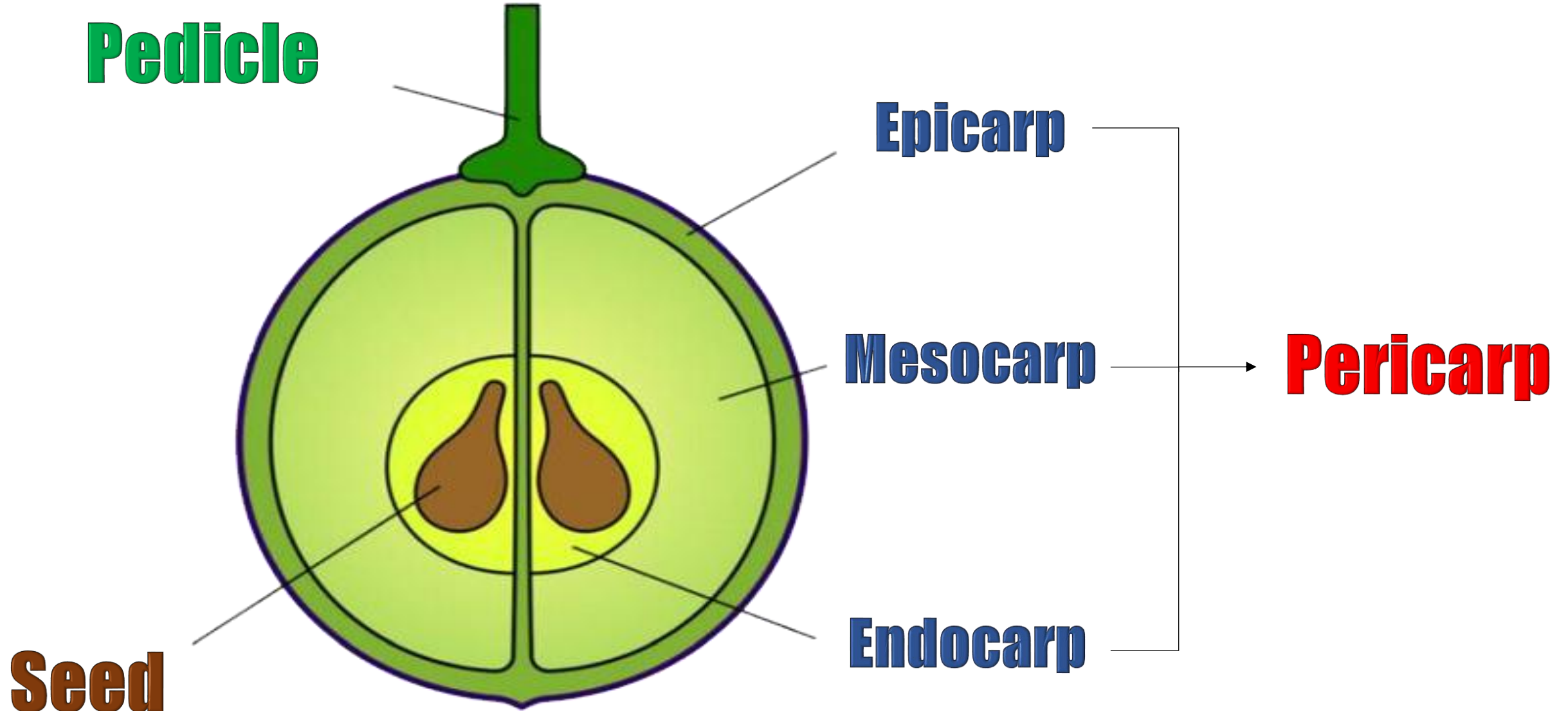
The whole product of the development of the **gynaecium** as a result of fertilization



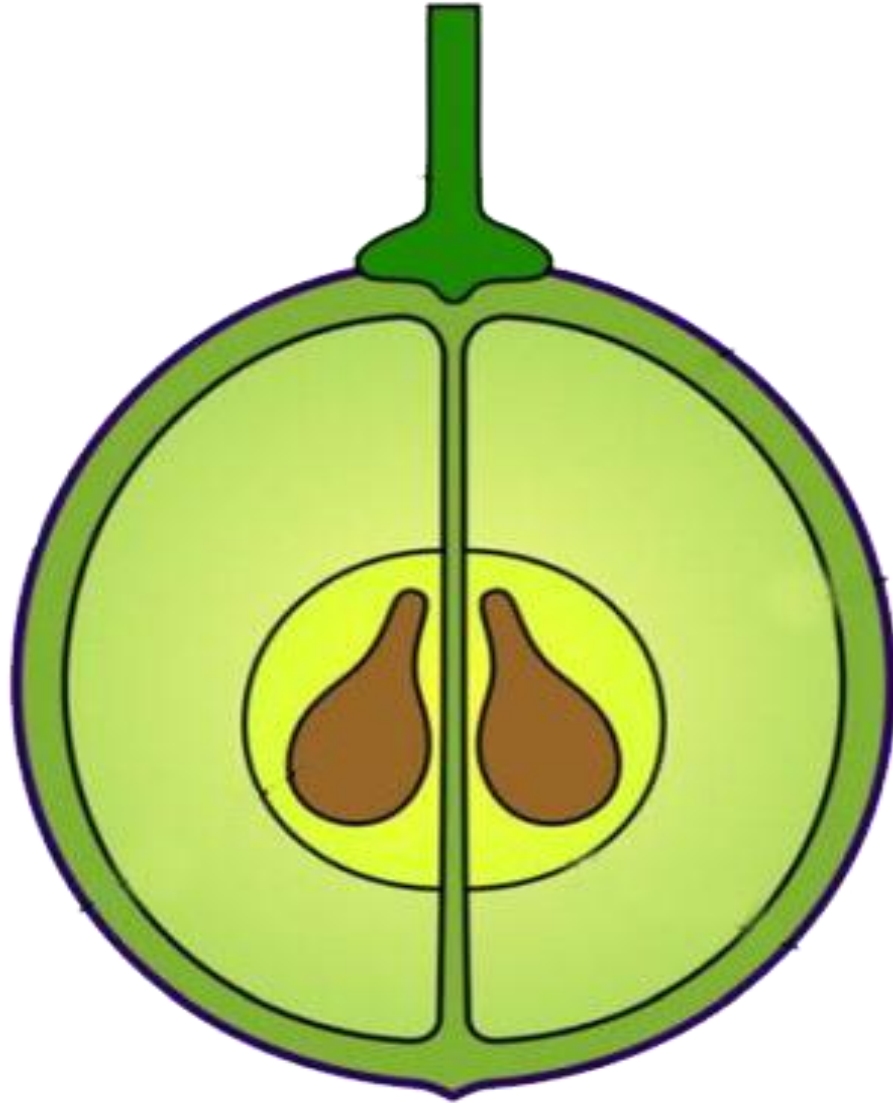
Parts of the Fruit

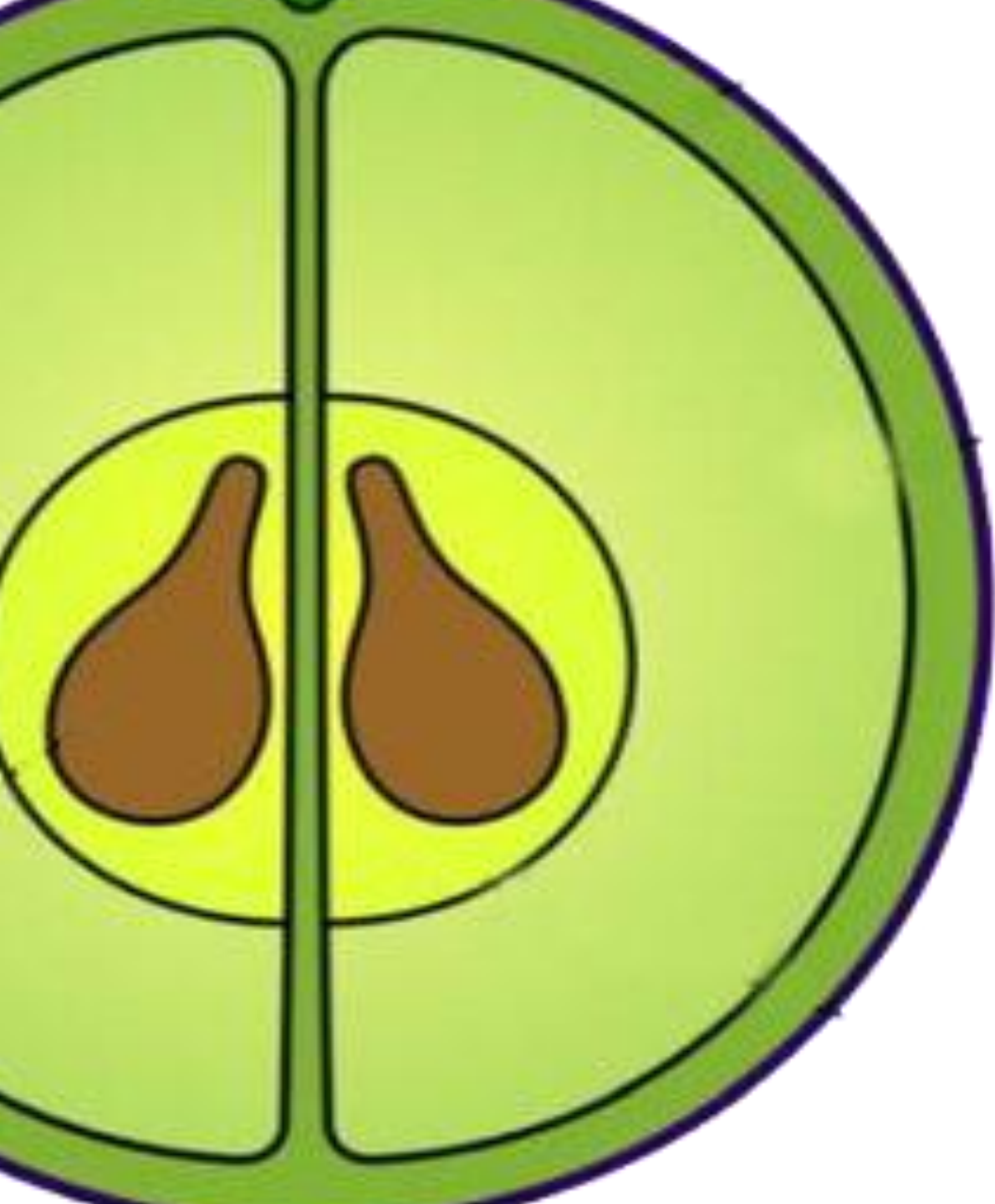


Parts of the Fruit



Parts of the Fruit





Pericarp

The fruit wall enclosing the seed and is typically made up of three distinct layers: the **epicarp**, which is the outermost layer; the **mesocarp**, which is the middle layer; and the **endocarp**, which is the inner layer surrounding the ovary or the seeds.

Pericarp

Dry



Wheat Grain



Cardamom



Nuts

Succulent



Capsicum



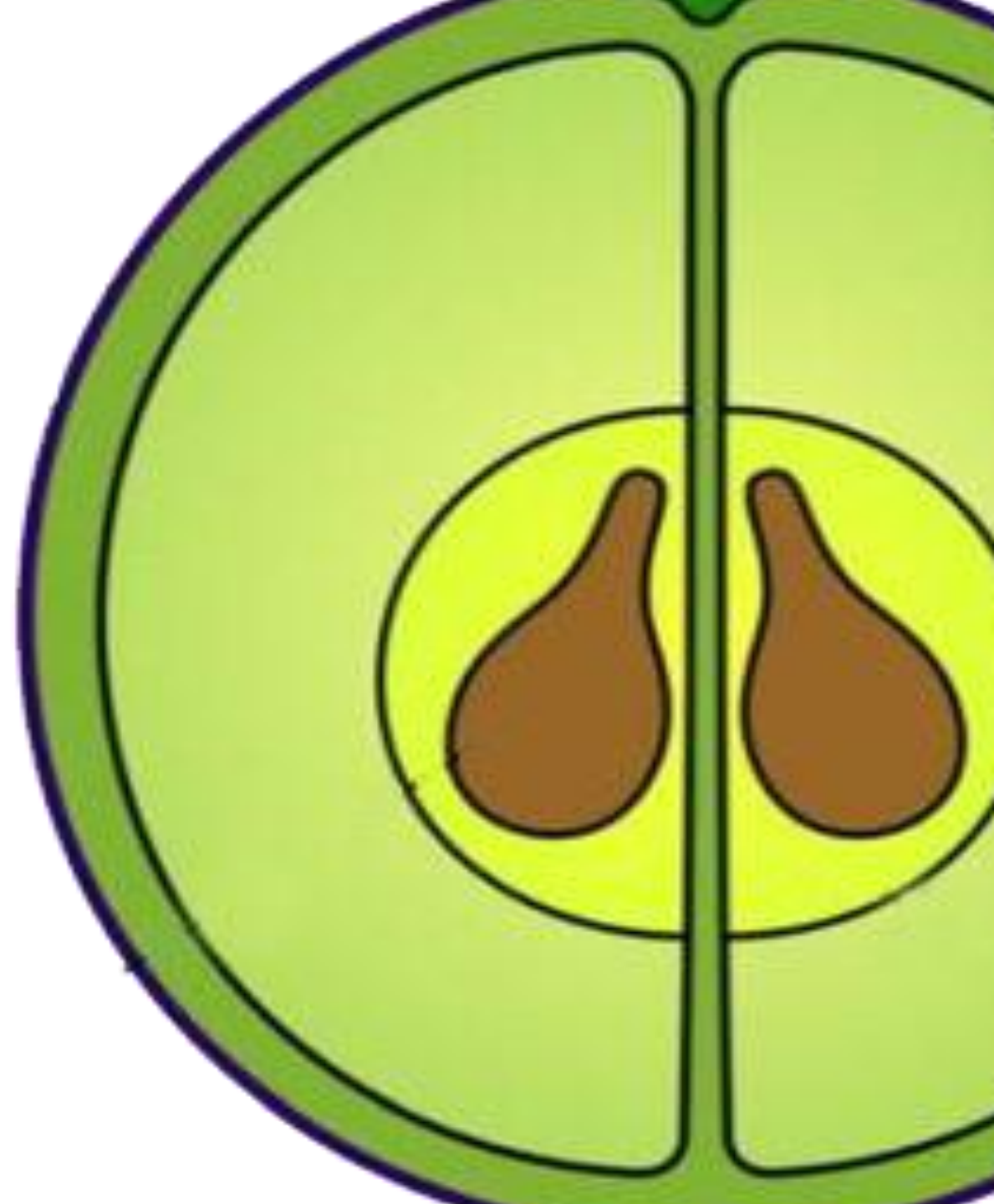
Orange



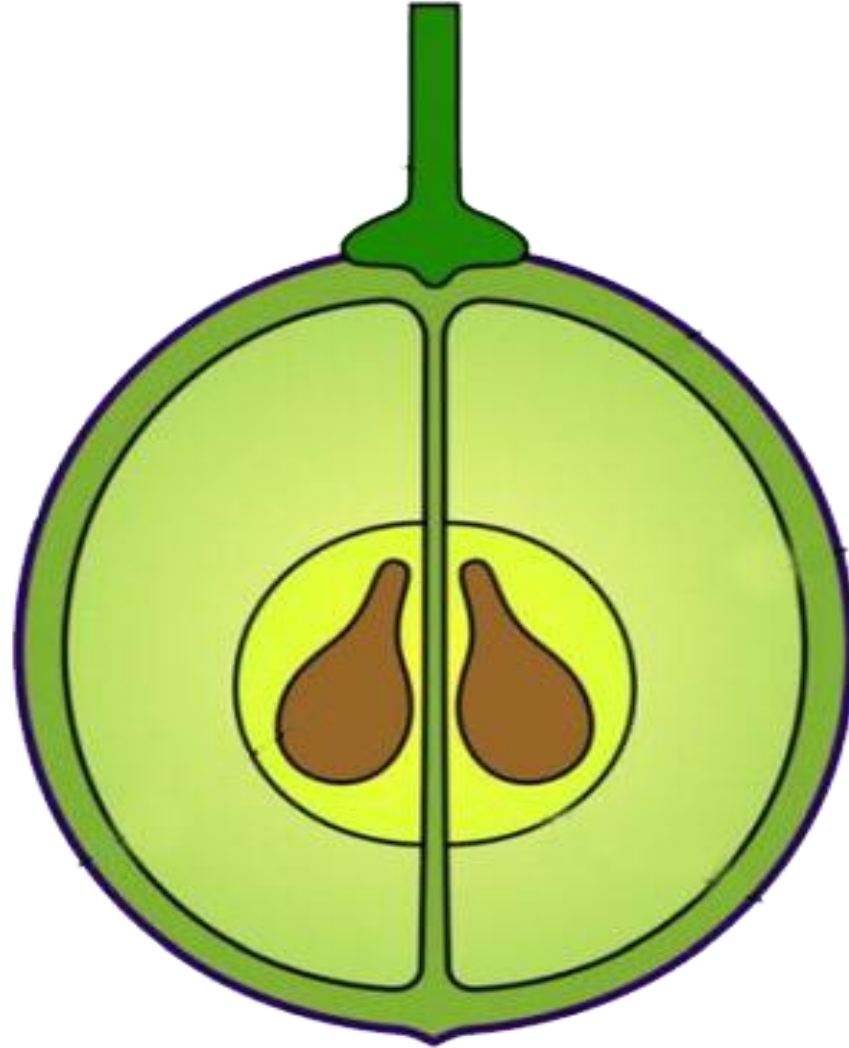
Tomatoes

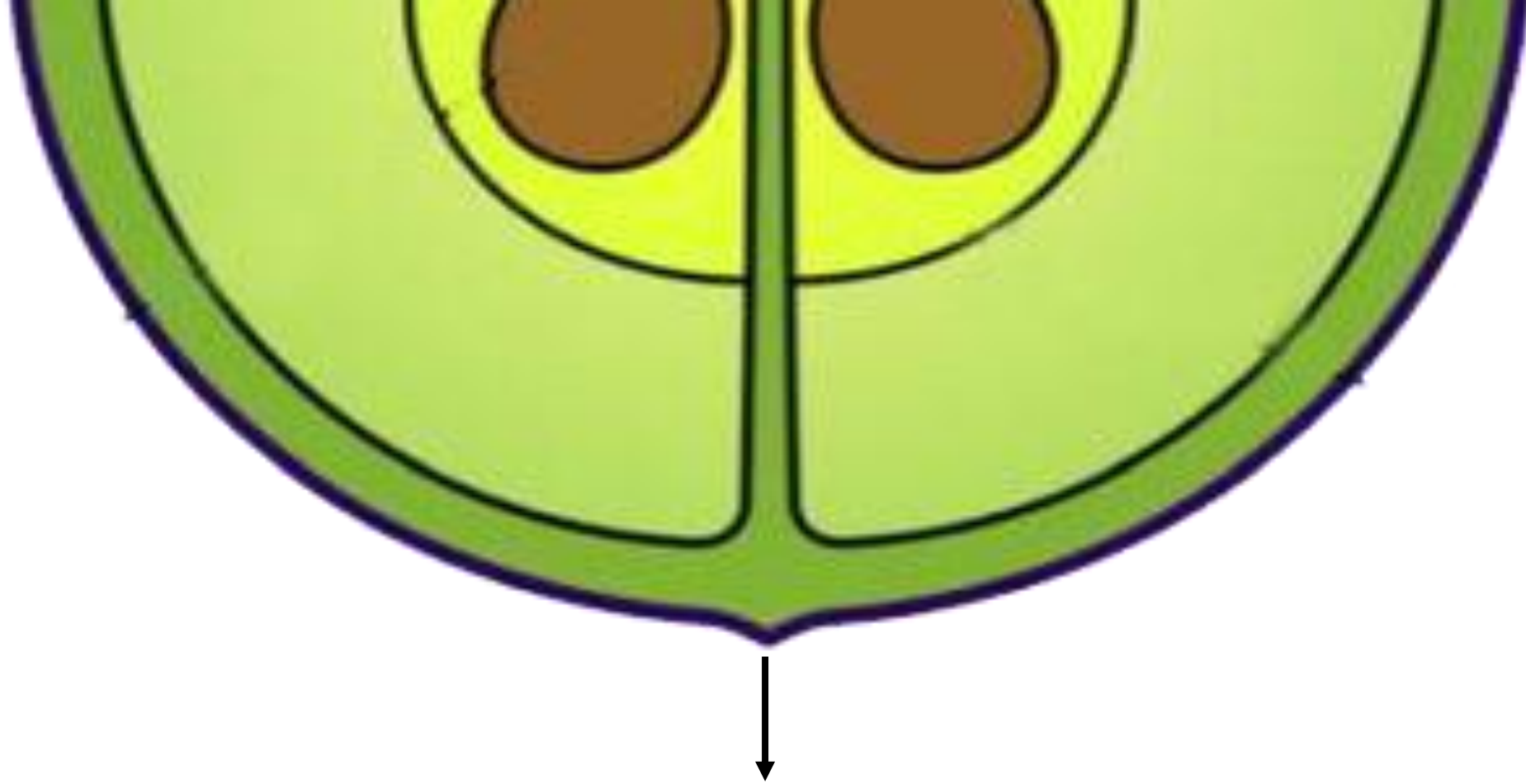
Seeds

Mature fertilized plant **ovules** and they are considered the unit of reproduction of a flowering plant, capable of developing into another such plant



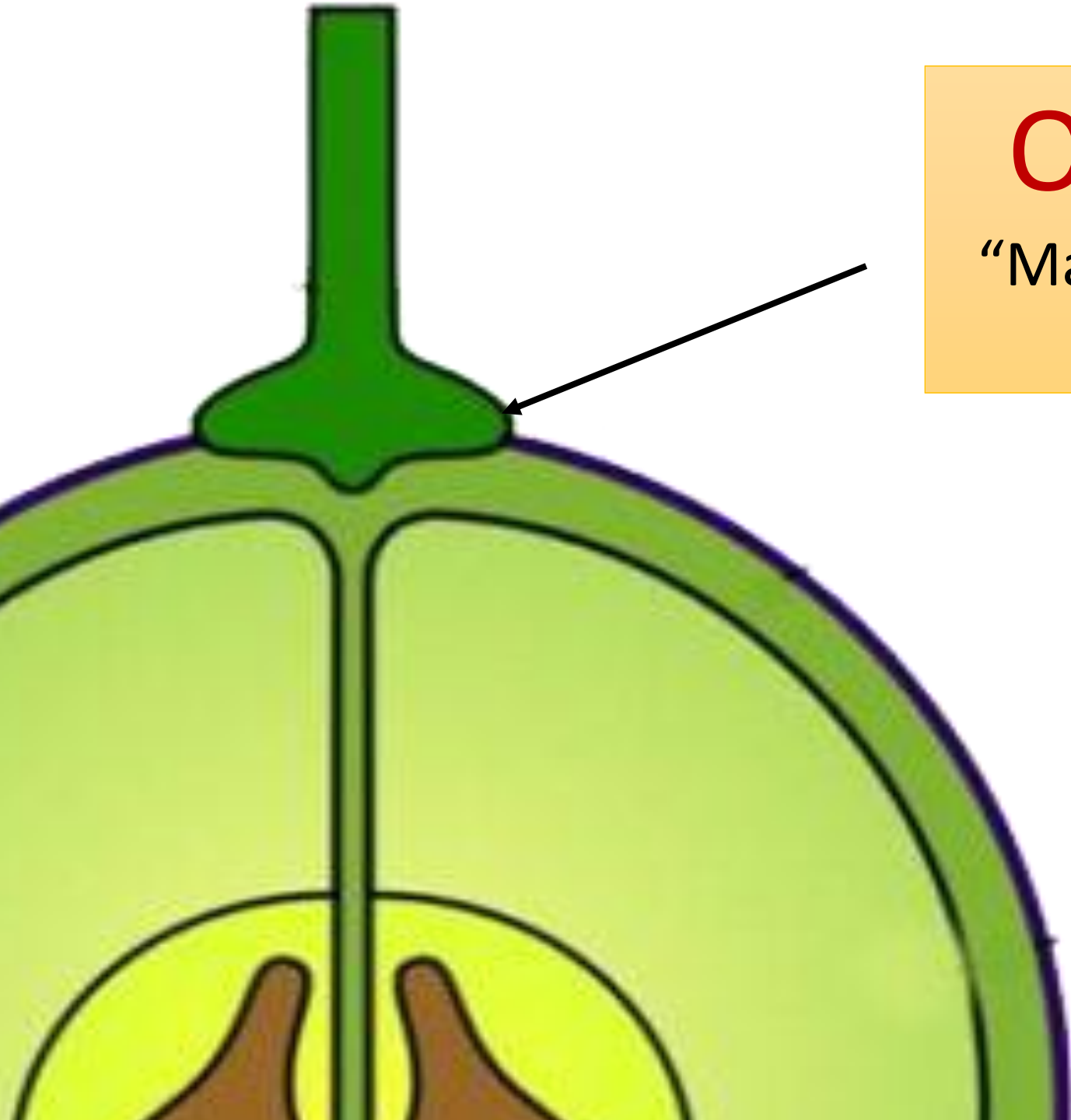
Fruit Scars





Apical and minute

“Marking the remains of style and stigma.”

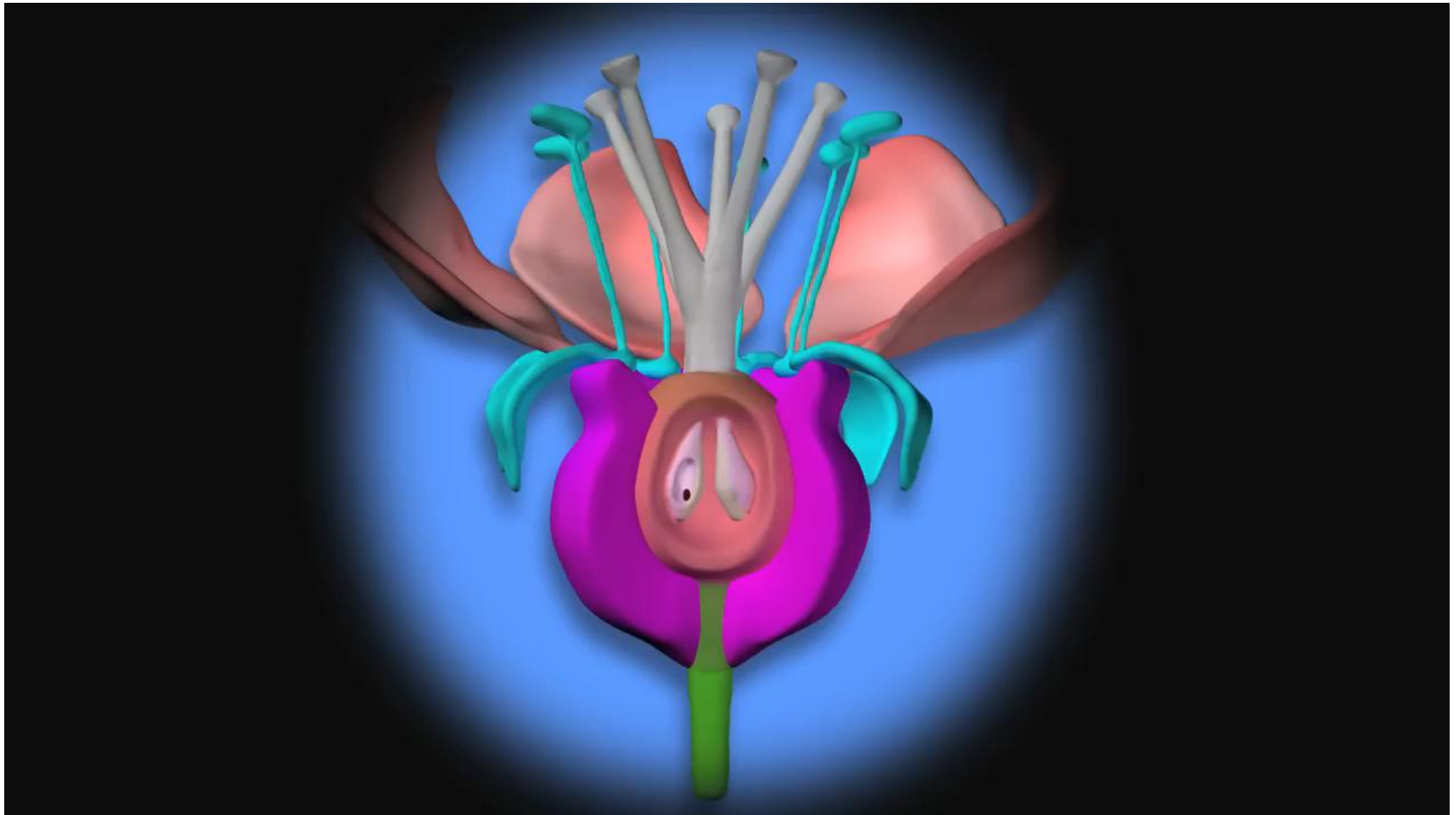


One at the base

“Marking the attachment to the stalk or parent plant”

Sometimes **other parts**
of the flower in
addition to the
gynaecium participate
in the production of
the fruit.





False Fruit

False Fruit



Apple



Pear



Introduction to Family Umbelliferea

Family Umbelliferaea



Fennel



Anise



Ammi visnaga

Type of fruit: True, Dry, Simple, Schizocarpic

Name of fruit: Cremocarp

General characters of family Umbellifereae



General characters of family Umbellifereae

Morphology

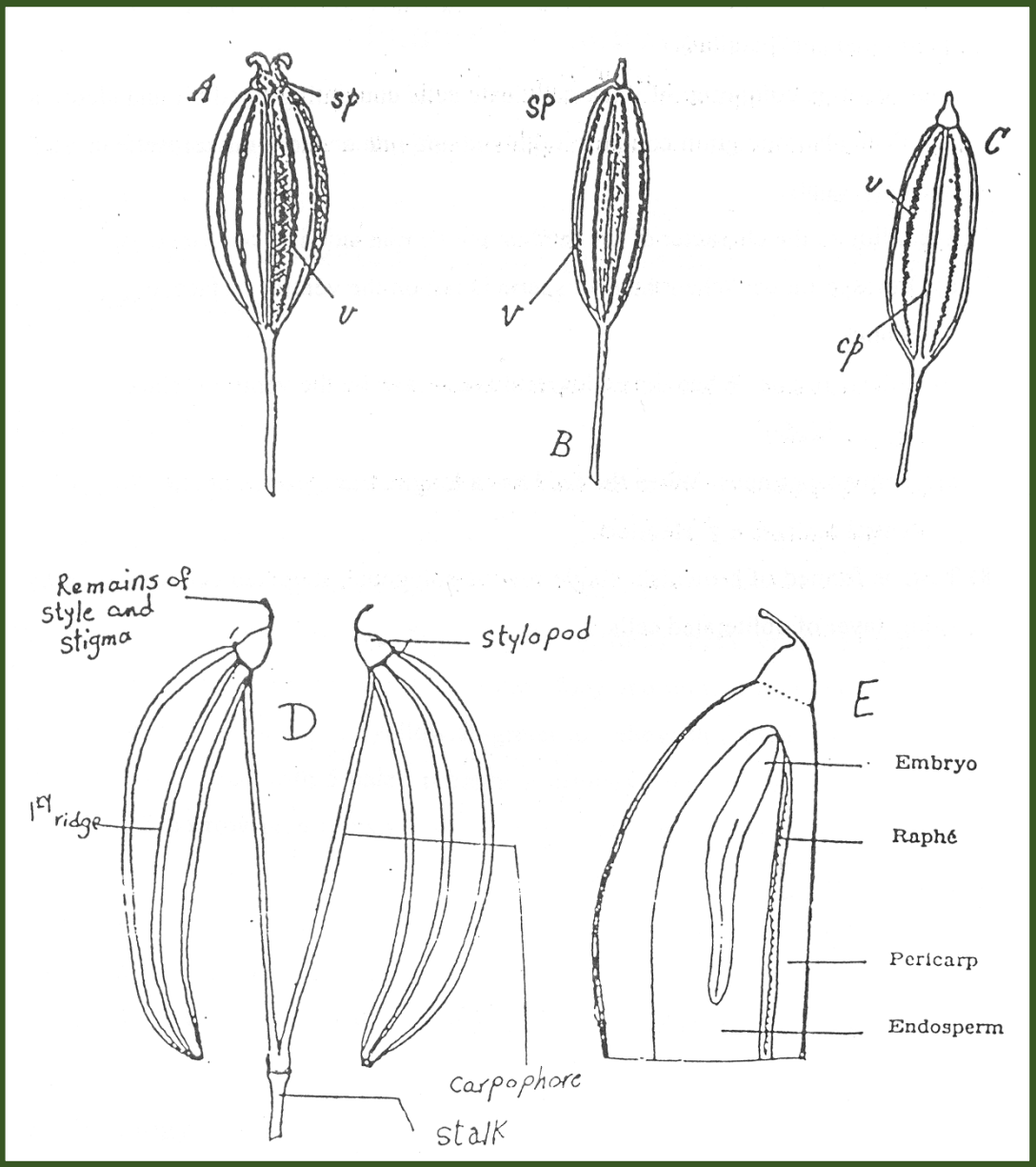


1) The fruit is true, simple, dry, schizocarpic, cremocarp that splits upon drying into two indehiscent one seeded mericarps.

2) The apex of the fruit is crowned with a conical structure named stylopod (represents the remains of the style, stigma and nectary disc).

General characters of family
Umbellifereae

Morphology



General characters of family Umbellifereae

Morphology



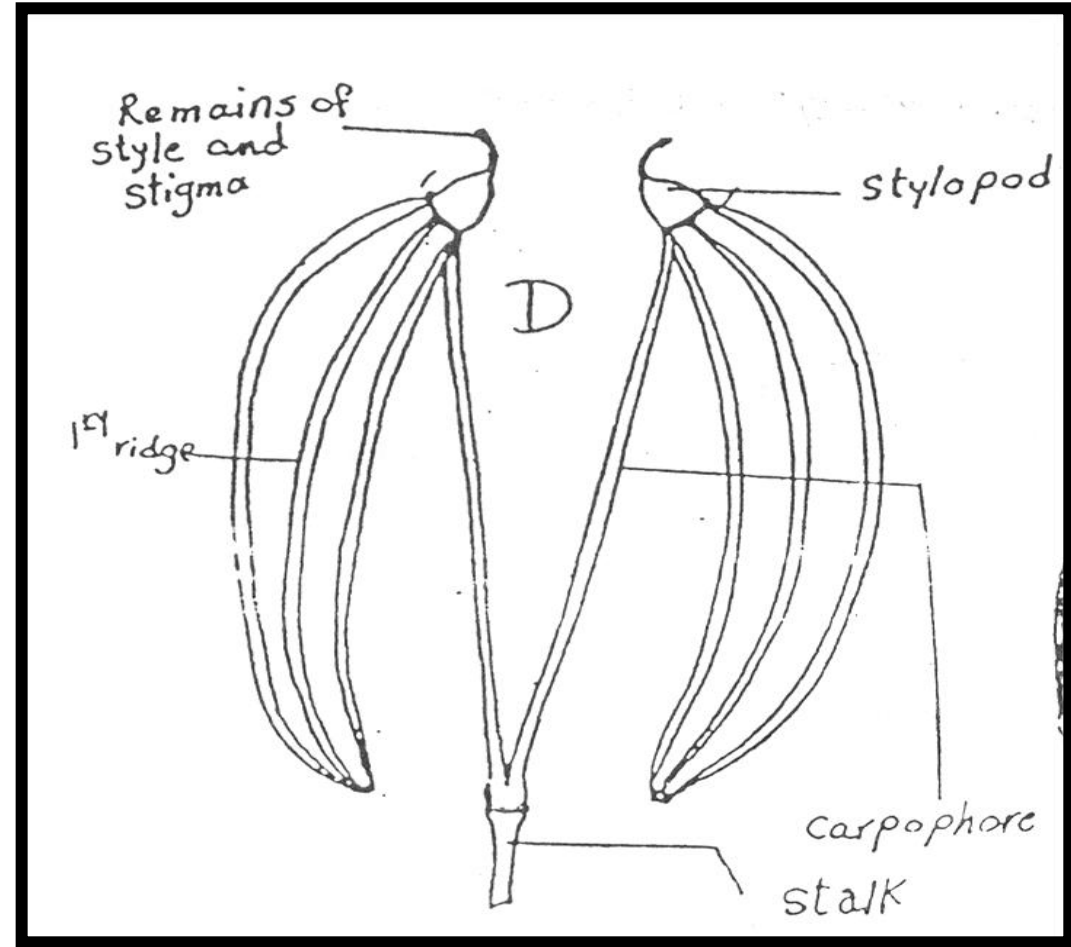
3) Surface of the cremocarp is characterized by the presence of 10 primary ridges(5 on each mericarp) over the vascular bundles & 8 secondary ridges over the vittae

4) Carpophore is a minute thread lies between the two mericarps.

It is an elongation of the receptacle between the carpels

General characters of family Umbellifereae

Morphology



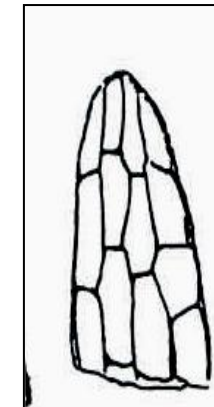
**General characters of family
Umbellifereae**

Histology



1) Epicarp is usually one row (epidermis)

2) Glandular trichomes are rare, while non-glandular trichomes occur as unicellular to multicellular having a shaggy form



**General characters of family
Umbellifereae**

Histology



3) The fruits are characterized by the presence of schizogenous secreting ducts (vittae) in the mesocarp, containing volatile oil or bitter principles; they are six in number in each mericarp.

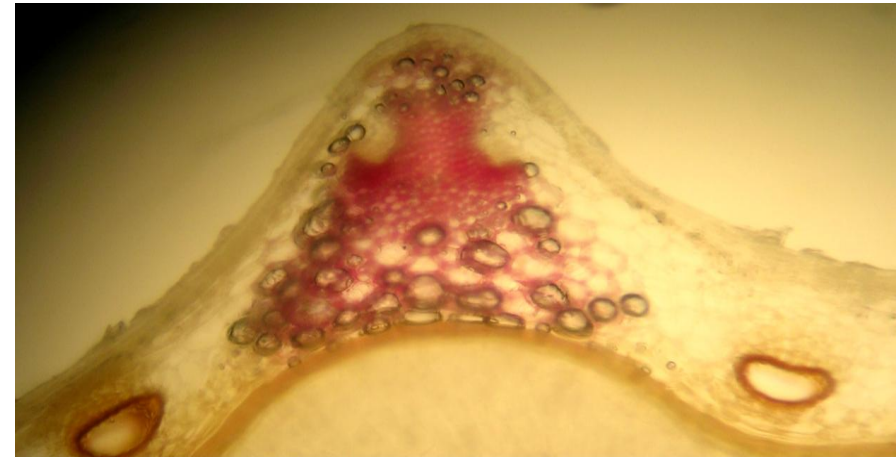


**General characters of family
Umbellifereae**

Histology



4) The vascular bundle is bicollateral fibro-vascular bundle and sometimes accompanied by reticulate parenchyma cells. They are five in number in each mericarp and located in the mesocarp in **primary ridges**.



General characters of family Umbelliferae

Histology



5) The endocarp is composed of one row of narrow elongated cells. It appears in surface view as parallel cells, arranged in groups, either in parquetry or non - parquetry manner.



Fruit Example
Ammi visnaga & Ammi
majus



Ammi visnaga

Ammi visnaga

Origin: The dried ripe fruit of
***Ammi visnaga* Lam.**
F. Umbelliferae (Apiaceae).



Ammi majus

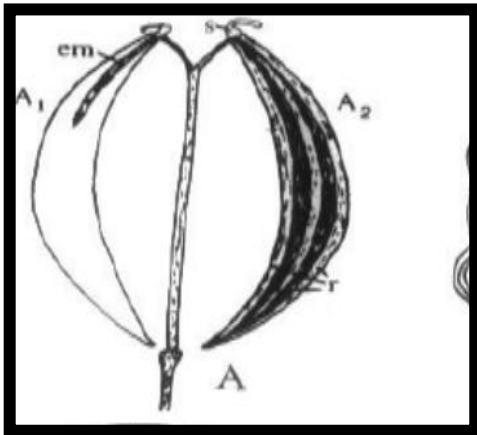
**Origin: The dried ripe fruit of *Ammi majus* Lam.
F. Umbelliferae (Apiaceae).**



Ammi visnaga

Violet tinge

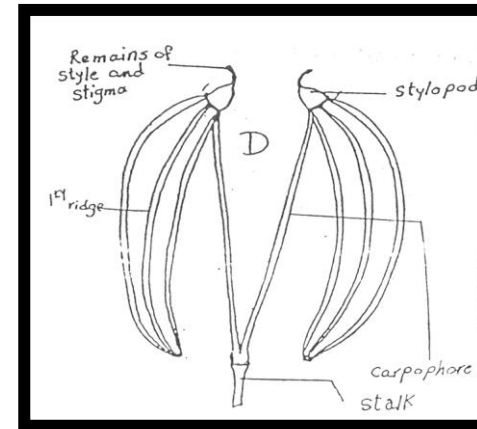
Simple Carpophore



Ammi majus

NO Violet tinge

Forked Carpophore



Morphology

Ammi visnaga

Crescent shaped Vascular bundle

Porous inner most layer of mesocarp

Finely striated epicarp

Ammi majus

Oval Vascular bundle

Non-Porous inner layer of mesocarp

Distinctly striated epicarp

Histology

Ammi visnaga

Bitter principles: **Khellin**,
visnagin and **visnadin**

Flavonoids: quercetin

Essential oil containing α -
terpineol and linalool

Fixed oil & protein

Ammi majus

Bitter principles: **Psoralene**
and **Ammidin**

Fixed oil & protein

Active constituents

Ammi visnaga

Spasmolytic especially on the muscles of the **bronchi, GIT, biliary tract, urogenital system, and coronary vessels**

1- Whooping cough It is now given for bronchial asthma and is safe even for children

2- Cramp-like conditions of **GIT, biliary colic, and painful menstruation.**

Uses

Ammi majus

Psoralene stimulates **pigment production** in skin exposed to **UV light.**

It is used externally as liniments and lotions for treating **vitiligo, alopecia, and psoriasis.**



Ammi visnaga

3- It is used for the removal of **gall bladder** and **kidney stones** by relaxing the muscles of the ureter.

4- The drug relaxes the **coronary arteries**, helps to improve the blood supply to the heart muscle, and thereby eases **angina pectoris**.

5- Can be used externally as ***Ammi majus***

Ammi majus

Uses



Ammi visnaga

In **pregnancy** due to **uterine stimulating** activity of khellin.

Photodermatitis in sensitive individuals

Prolonged use may cause nausea, constipation, lack of appetite, headache, allergic symptoms (itching) and sleeplessness

Ammi majus

Photodermatitis in sensitive individuals

Contraindications and side effects

Ammi visnaga

Ammi visnaga boiled in **water**
then add **NaOH** → **Rose red**
colour

Ammi majus

Ammi majus boiled in **water**
then add **NaOH** → **NO** **Rose red**
colour

The **alcoholic** extract of ***Ammi***
majus fruit gives a **blue**
fluorescence in ultraviolet light

Chemical test



Google notebook link:

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

THANK YOU!