

# ***Pharmacognosy***

PHG 112  
PG 102

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Fall 2024

# Lecture 4



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

- **Fruit formation and key morphological and histological features**
- **Family Umbelliferae as important nutraceutical and cosmeceutical fruits**
- **Ammi visnaga and Ammi majus their chemical constituents & uses**

# Fruit Formation

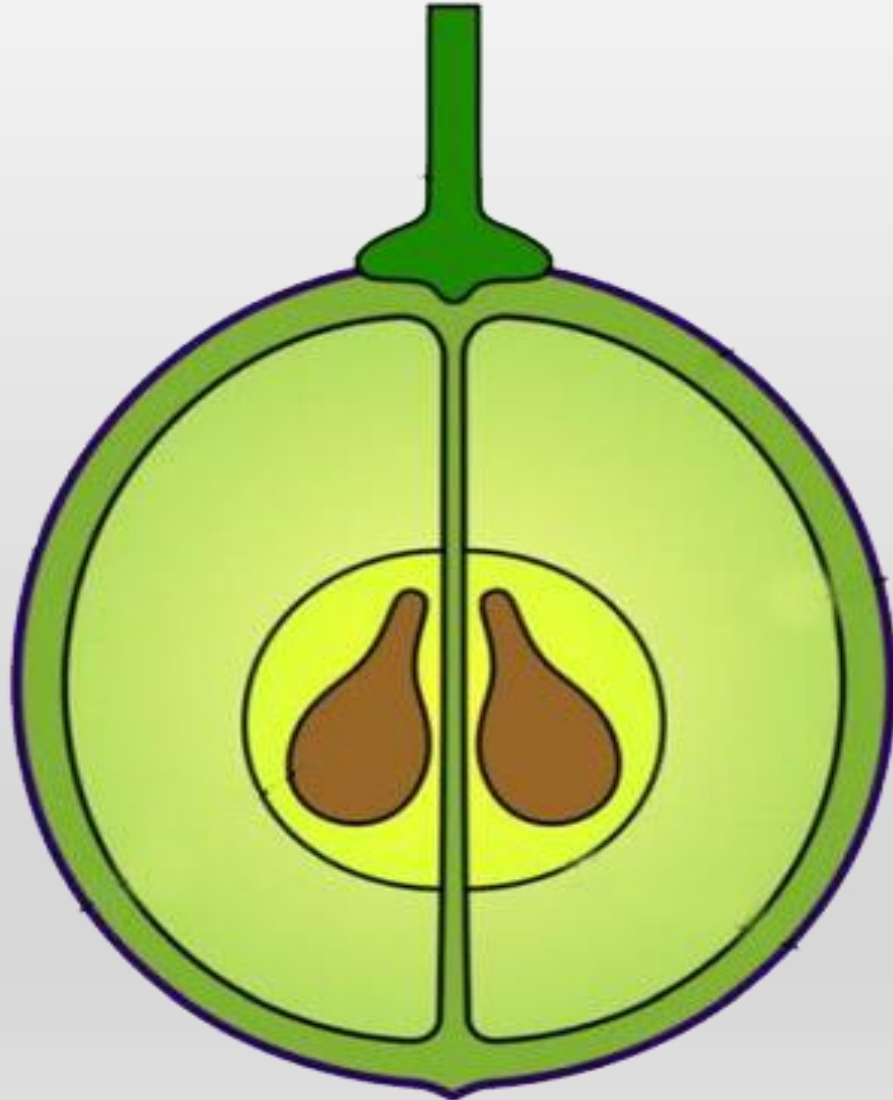


# The Fruit

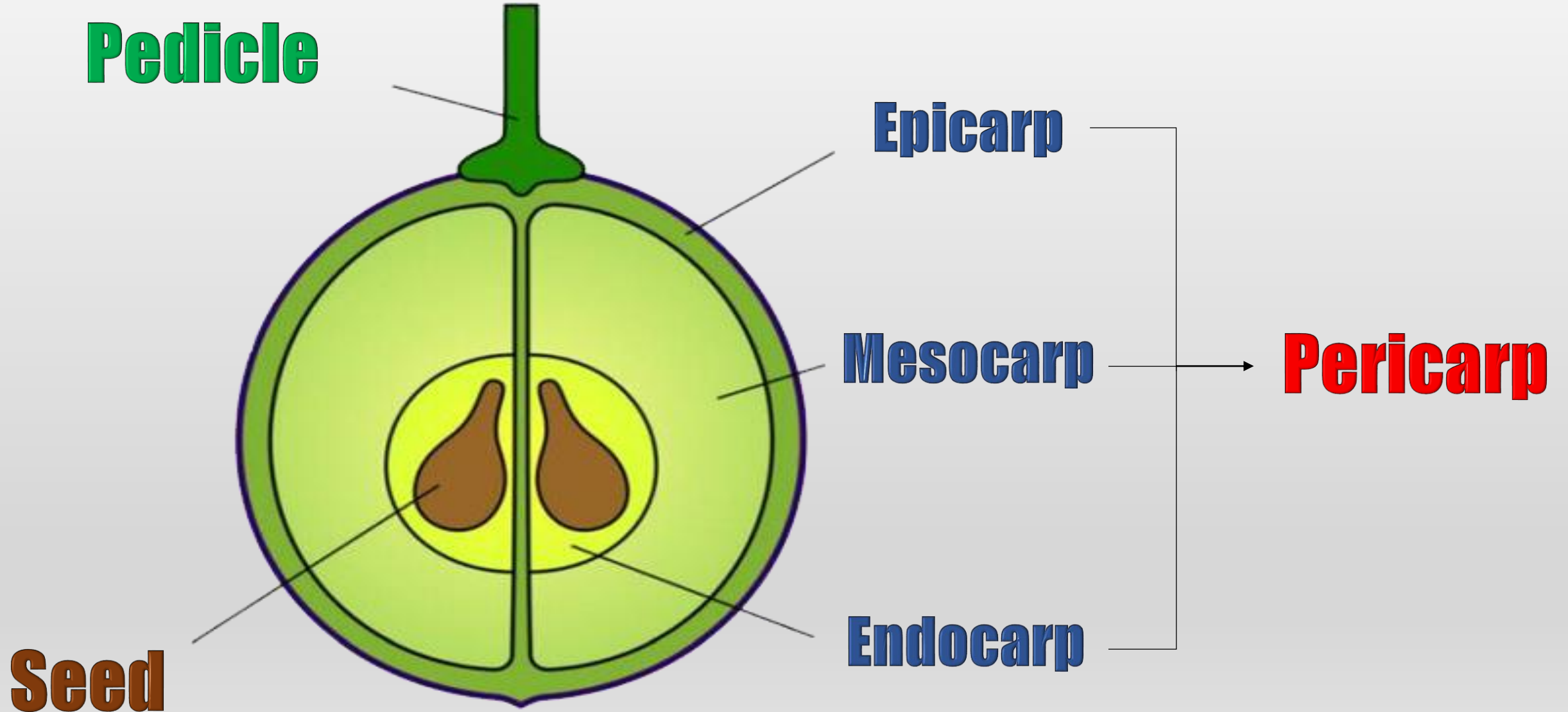
The whole product of the development of the **gynaecium** as a result of fertilization



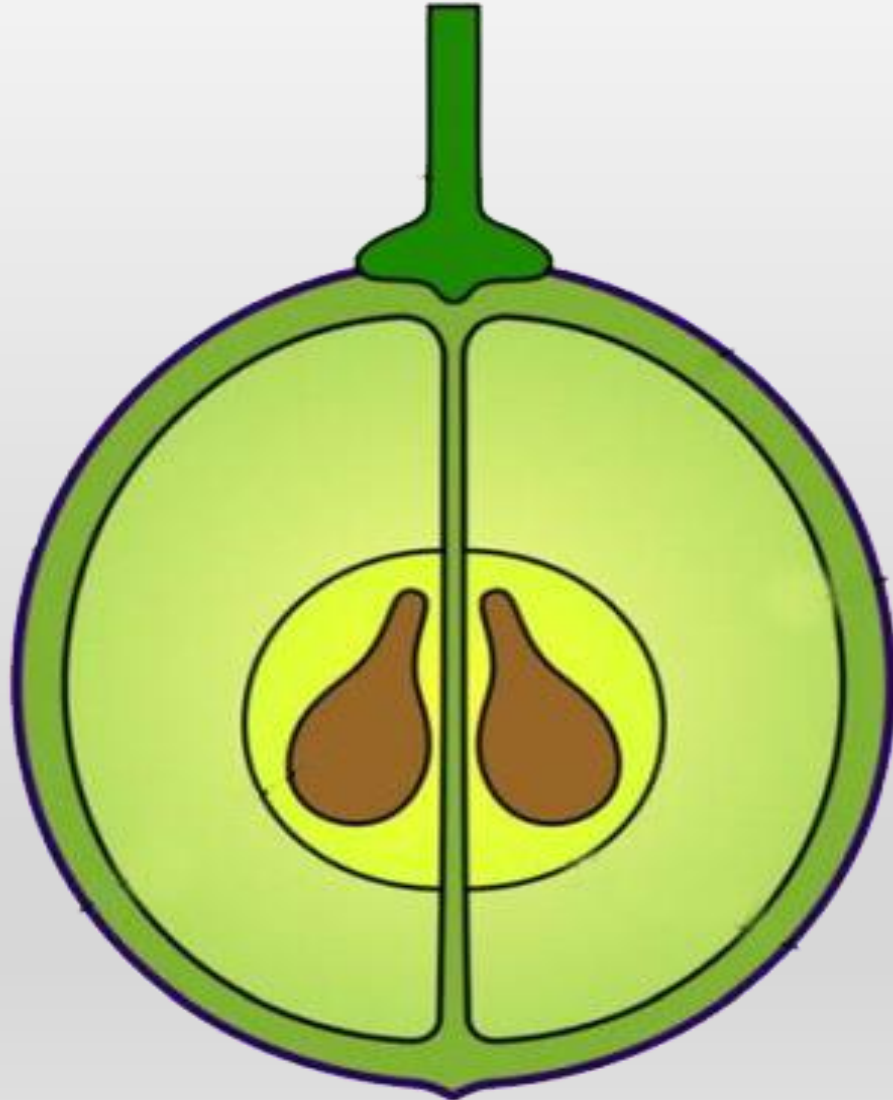
# Parts of the Fruit



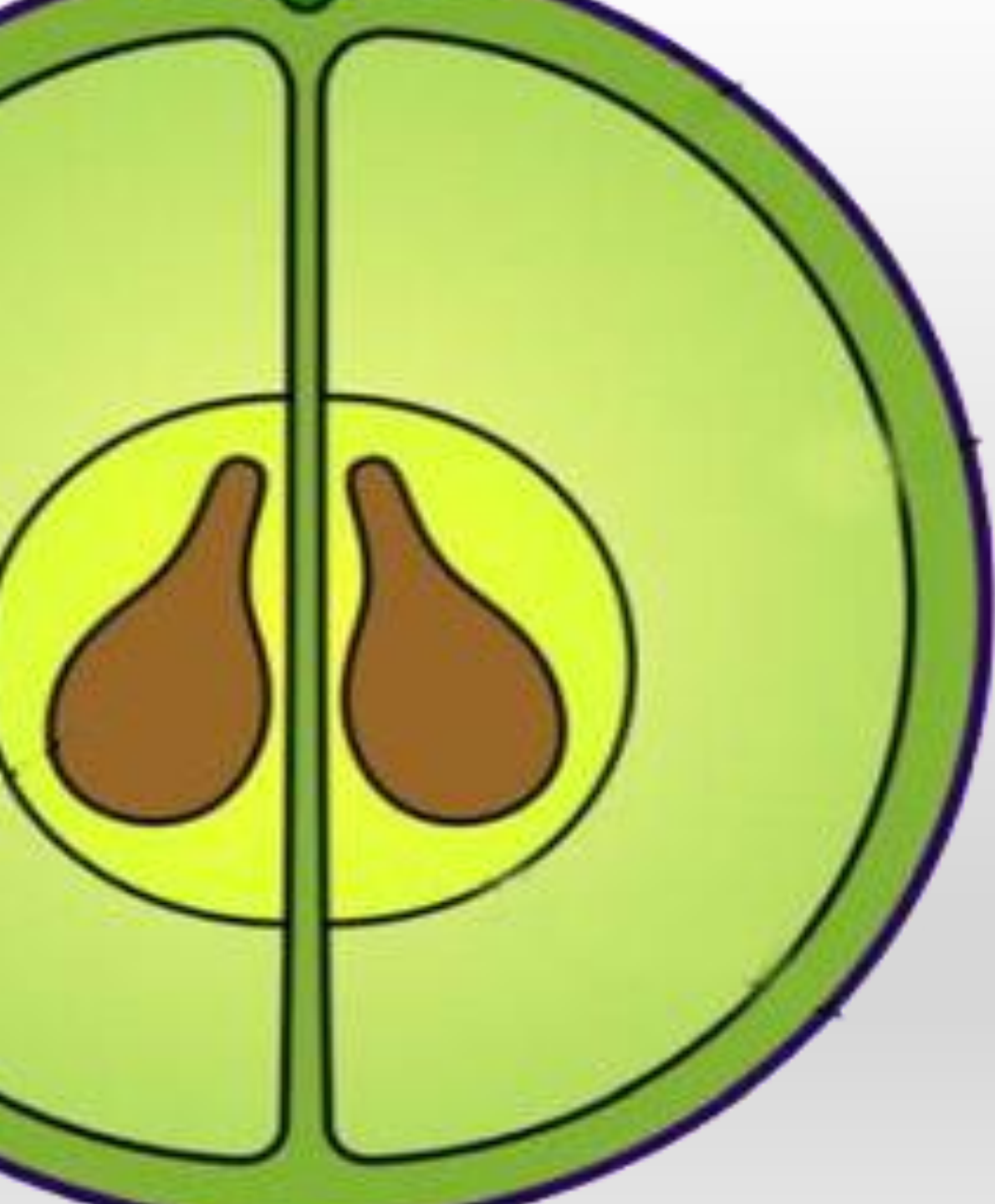
# Parts of the Fruit



# 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.

# CLASSIFICATION OF FRUITS

```
graph TD; A[CLASSIFICATION OF FRUITS] --> B[A- True]; A --> C[B- False]; A --> D[C- Composite (collective)]; B --> E[Gynaecium of a single flower only]; C --> F[Gynaecium with other parts of the flower]; D --> G[Whole inflorescence];
```

**A- True**

**Gynaecium  
of a single  
flower only**

**B- False**

**Gynaecium  
with other  
parts of the  
flower**

**C- Composite  
(collective)**

**Whole  
inflorescence**

# CLASSIFICATION OF FRUITS

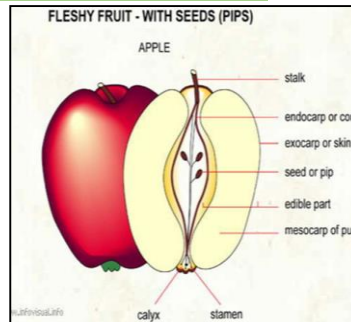
**A- True**

**B- False**

**C- Composite  
(collective)**

**I- Simple  
(one carpel or  
united carpels)**

**II- Aggregate  
(free carpels)**



**Synconium**

**Sorosis**



**Of achenes**



**Of follicles**

**Figs**

**Mulberry**

# I- Simple Fruits

**Dry**  
(Leathery or woody pericarp)

**Succulent**  
(Fleshy pericarp)

**Dehiscent**

**Indehiscent**

**Wheat Grain**



**Nuts**



**Anise**



**Schizocarpic**



**Berry**



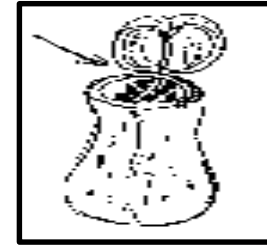
**Drupe**



Dry

Dehiscent

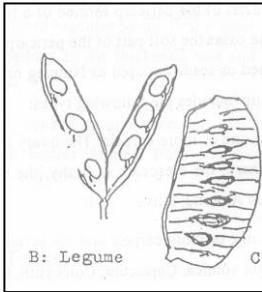
Hyoscyamus



1- Legume

2- Follicle

3- Capsule  
by valve  
by Lid  
by holes



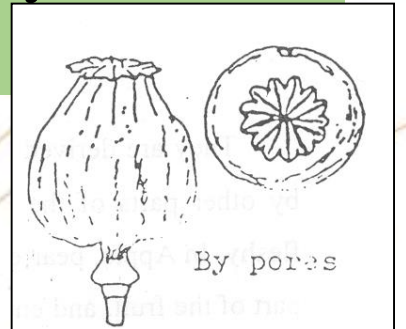
Senna



Milkweed



Cardamom

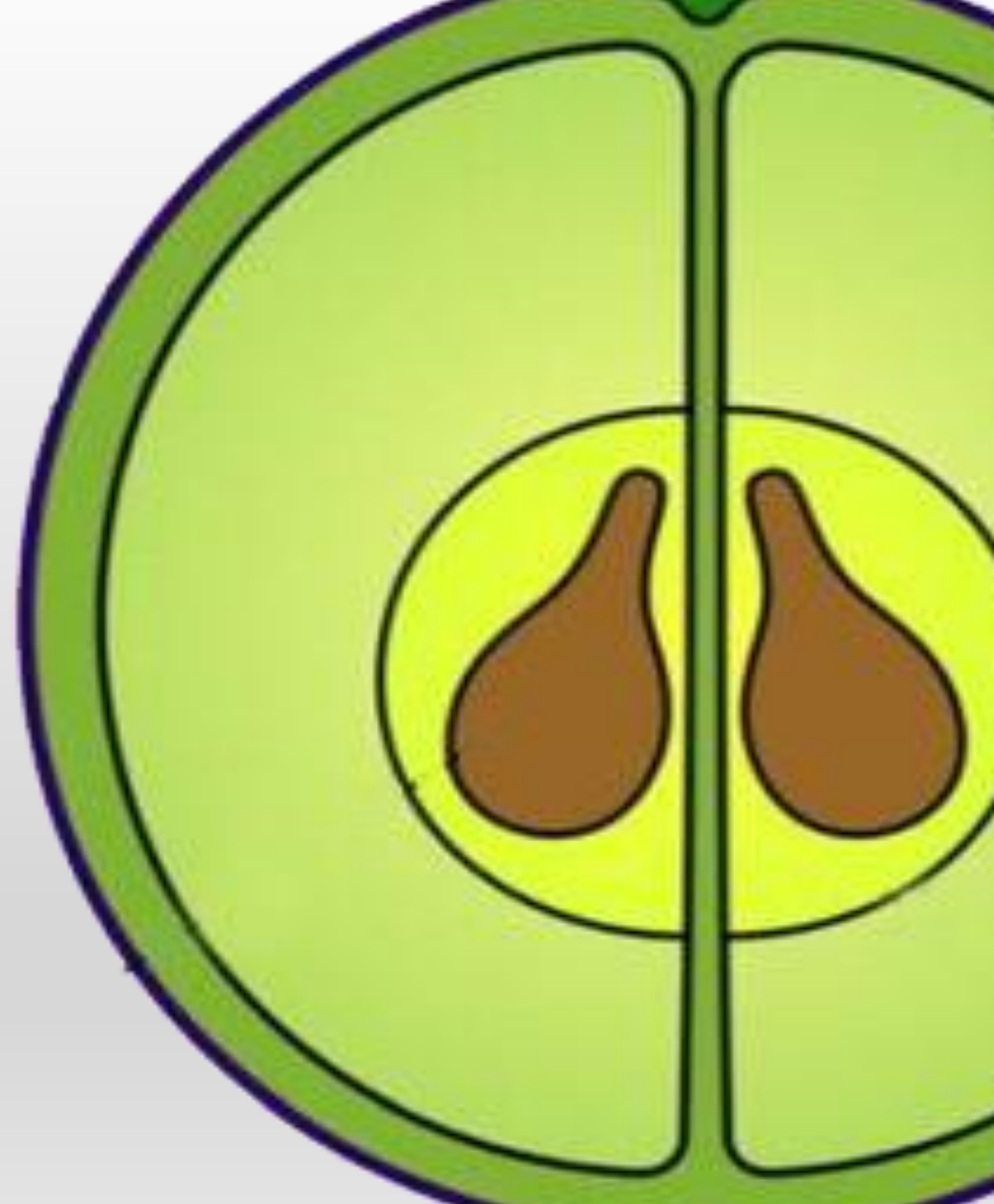


Poppy



# Seeds

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

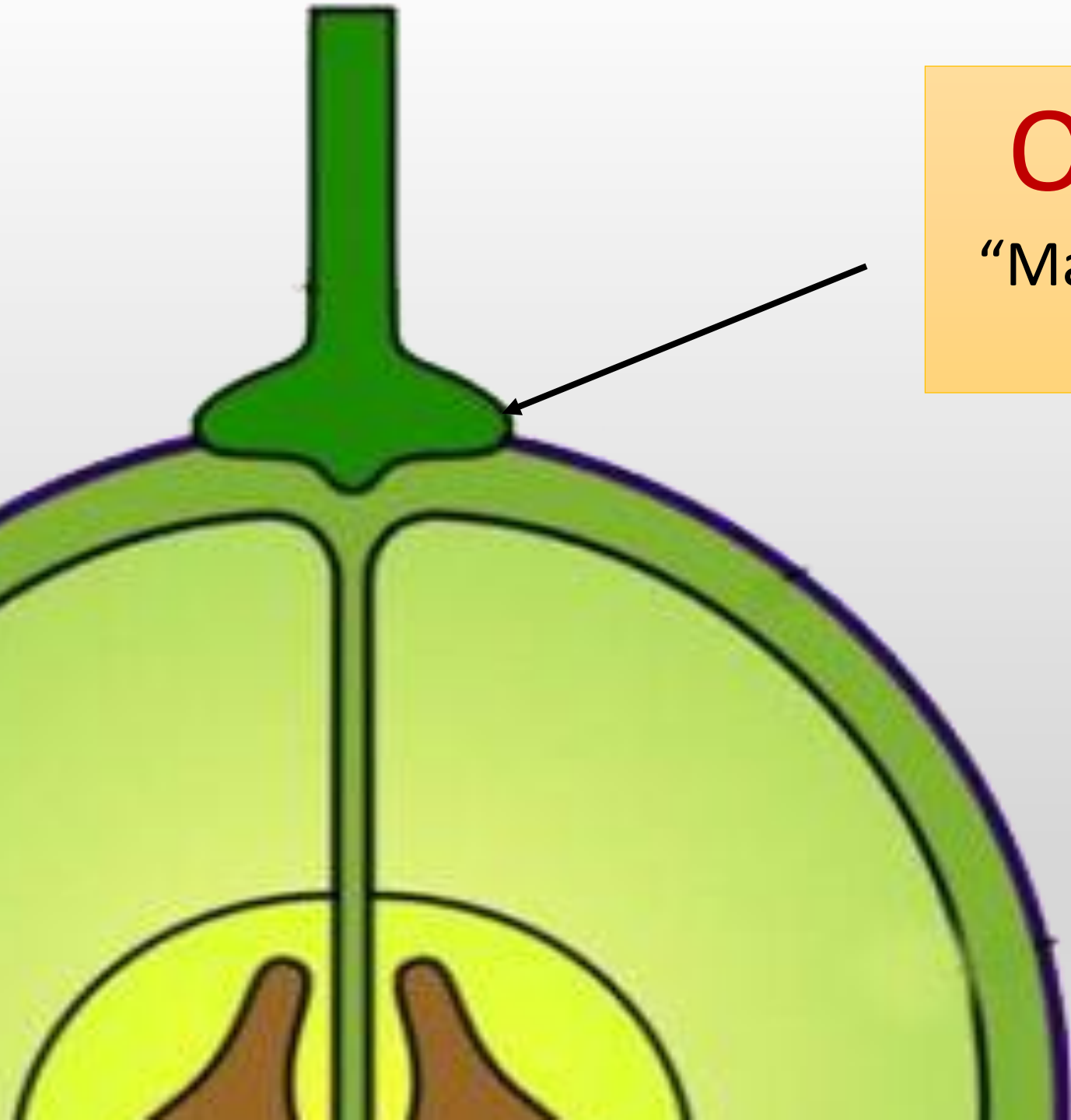




## Apical and minute

“Marking the remains of style and stigma.”



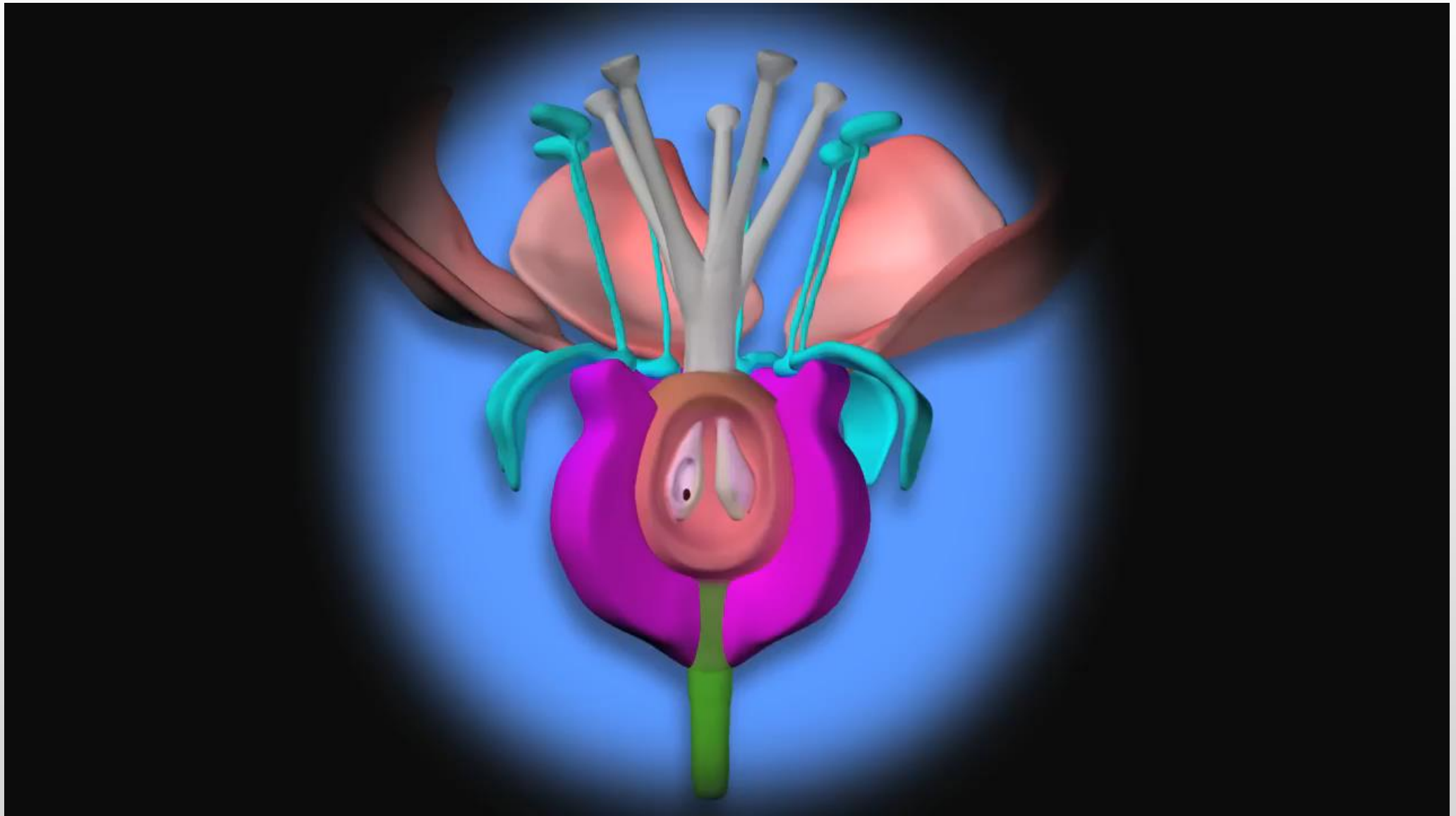


# One at the base

“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**



**Family**

**Umbelliferaea**

# 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**



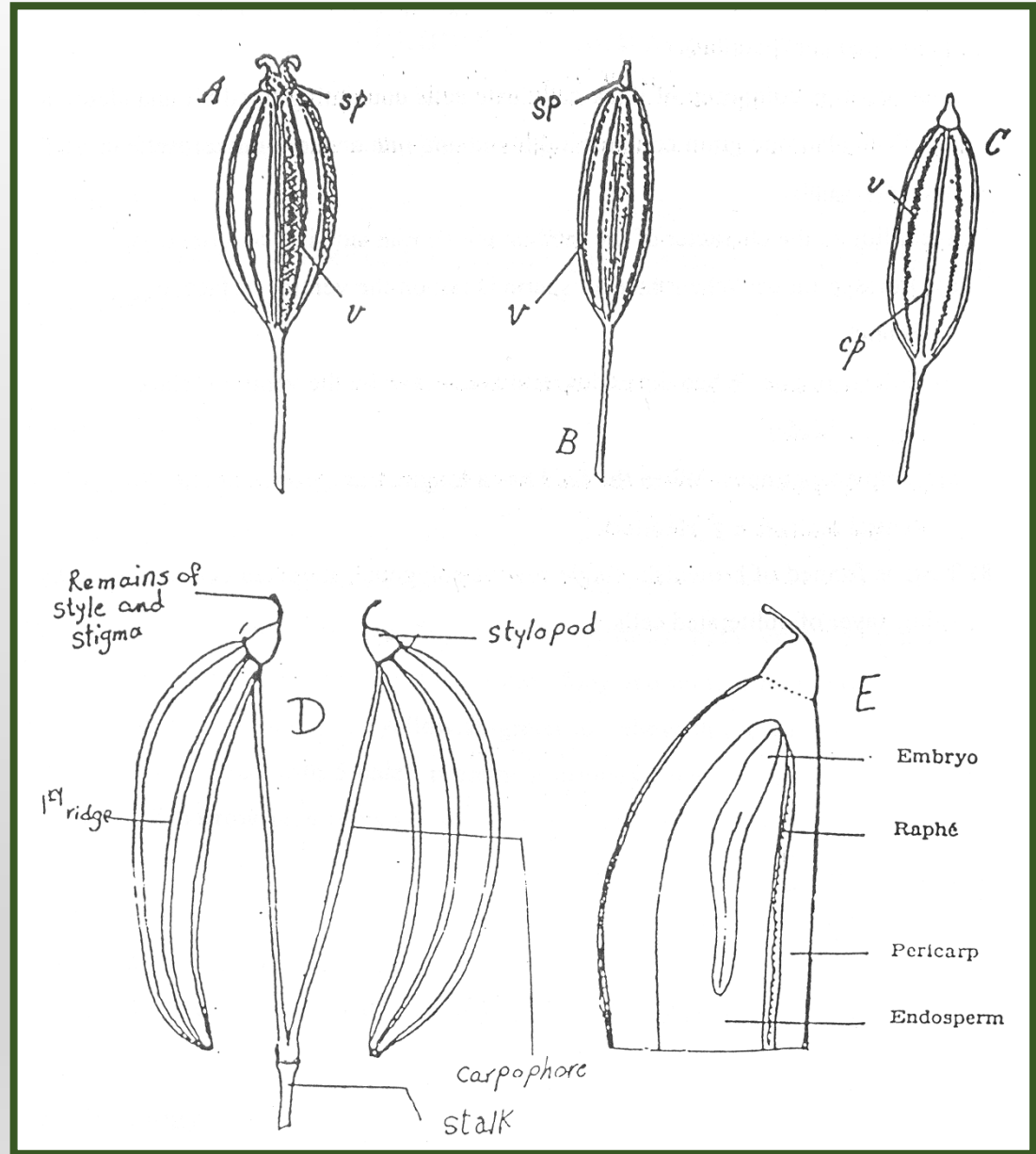
1) The fruit is true, simple, dry, schizocarpic, cremocarp that splits upon drying into two indehiscent one seeded mericarps.

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**

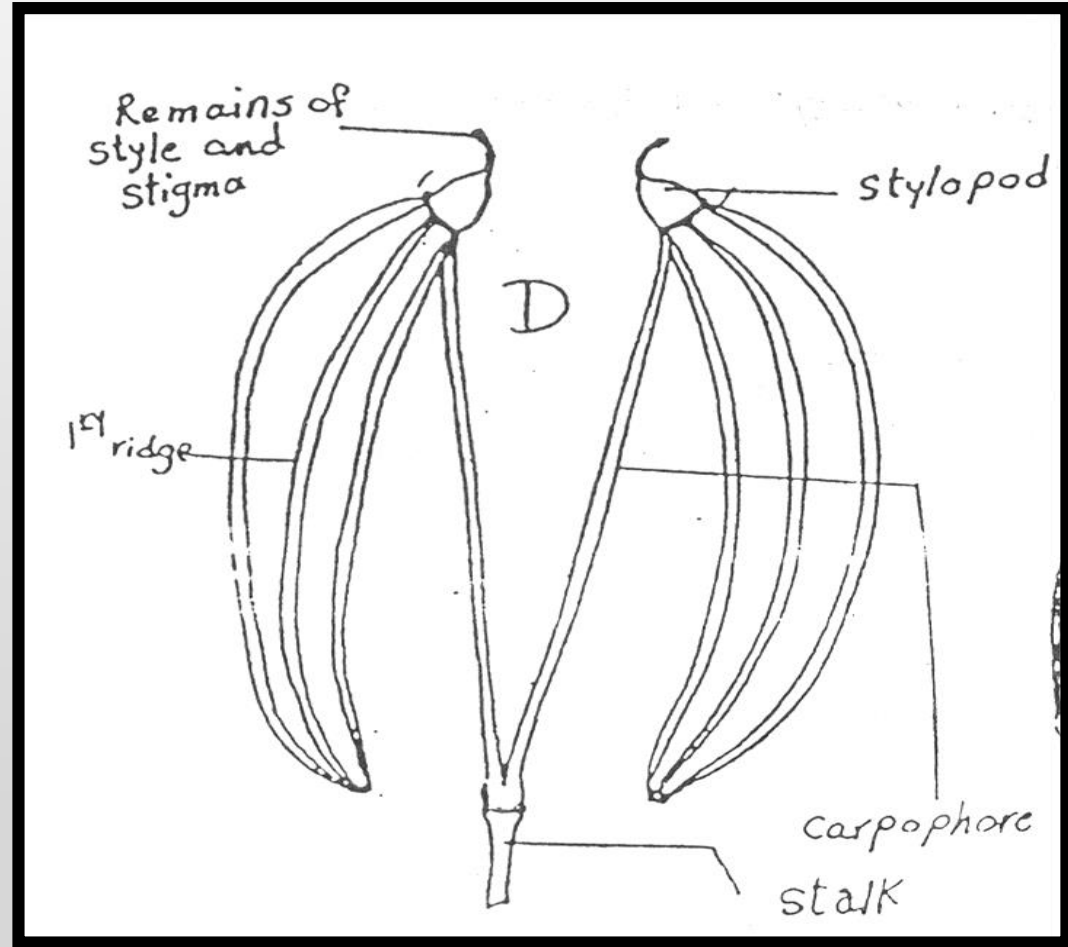


3) Surface of the cremocarp is characterized by the presence of 10 primary ridges(5 on each mericarp) over the vascular bundles & 8 secondary ridges over the vittae

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



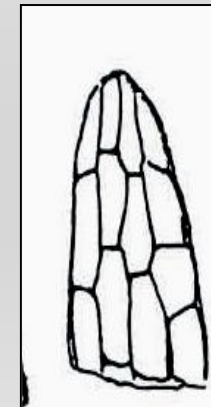
General characters of family  
Umbellifereae

# 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.

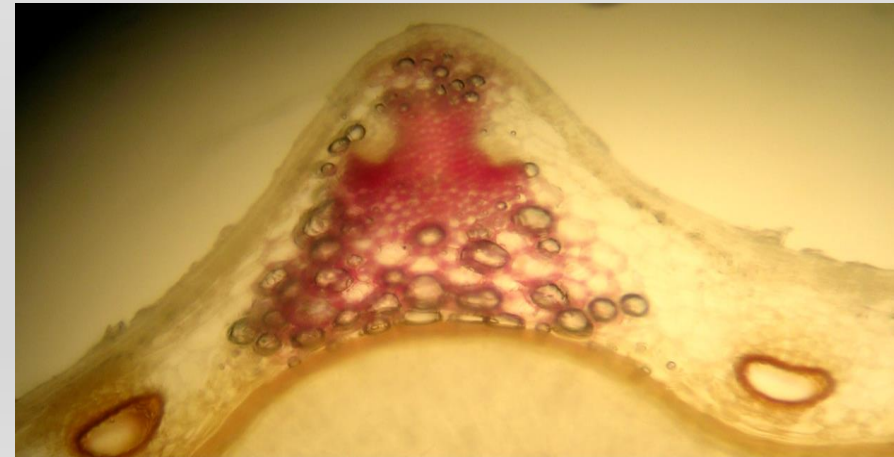


General characters of family  
Umbellifereae

# 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.



***Ammi visnaga***



# *Ammi visnaga*

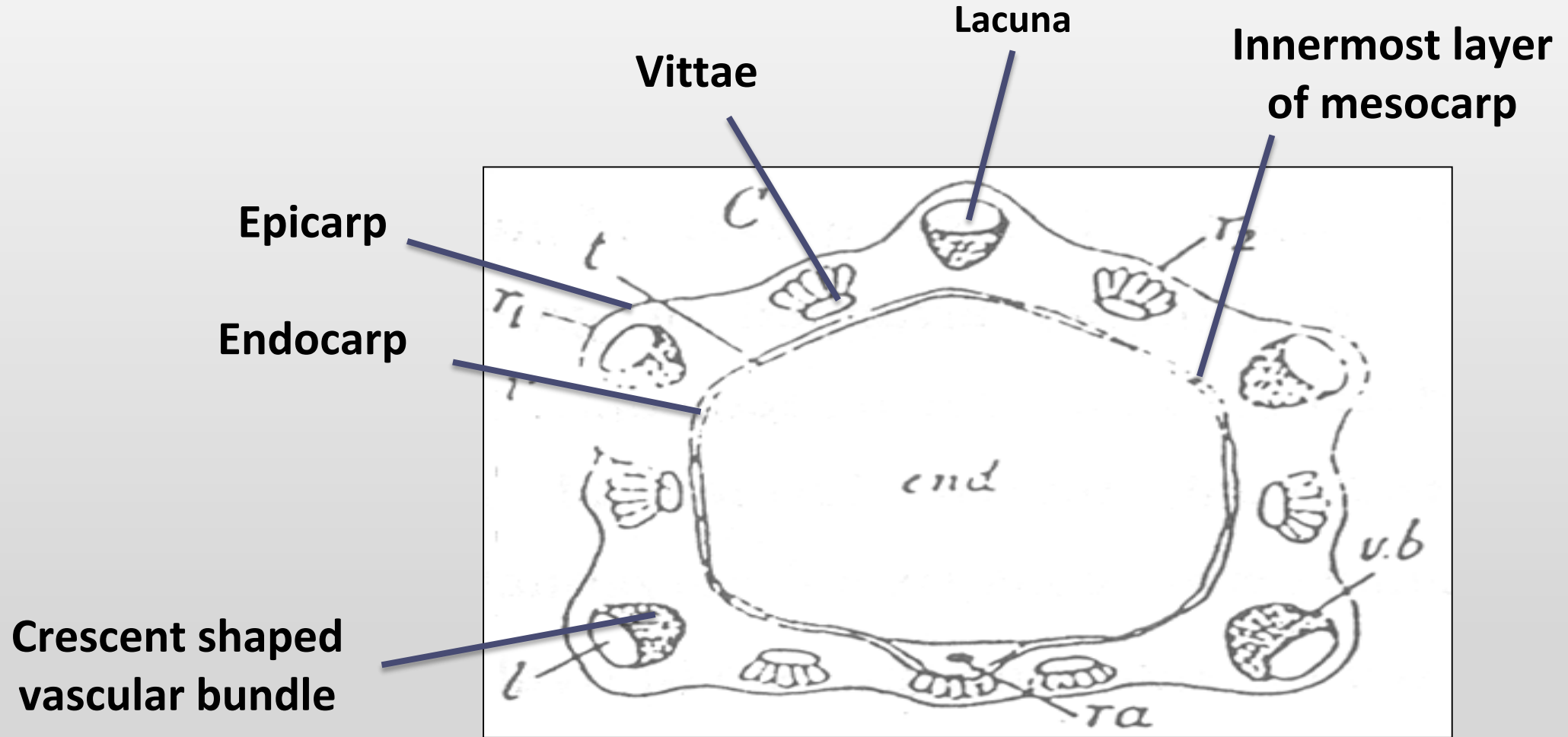
Origin: The dried ripe fruit of  
*Ammi visnaga* Lam.

F. Umbelliferae ( Apiaceae).



ammi-visnaga (Zahnschere)  
P. 8/20/2018

# *Ammi visnaga*



**T. S. of *Ammi visnaga* mericarp**

# *Ammi majus*

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



*Ammi majus* T.S

[www.cognosy4all.blogspot.com](http://www.cognosy4all.blogspot.com)

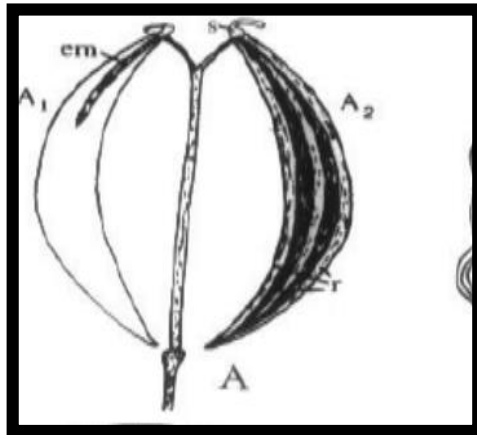


**T.S of mericarp of *Ammi majus***

# *Ammi visnaga*

**Violet** tinge

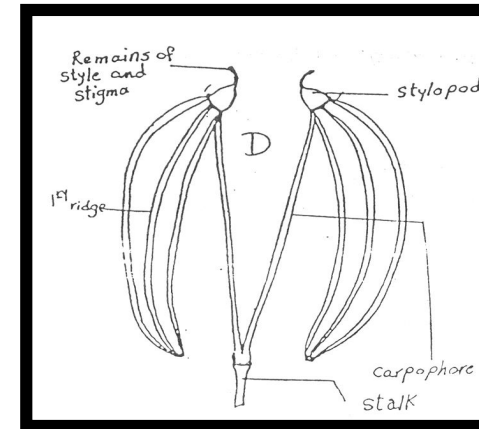
**Simple** Carpophore



# *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  $\alpha$ -  
terpineol and linalool**

**Fixed oil & protein**

# ***Ammi majus***

**Bitter principles: Psoralene  
and Ammidin**

**Fixed oil & protein**

**Active constituents**

# *Ammi visnaga*

## Uses

# *Ammi majus*

**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.**

**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**



## Home work

- Suggest the types of the following fruits:  
apple- peas- wheat-pear- senna- tomato- olive
- How can you differentiate between seeds & fruits morphologically
- How can you identify an umbelliferous fruit morphologically
- Mention the uses & contraindications of *Ammi visnaga* fruit
- Mention the uses & contraindications of *Ammi majus* fruit
- How can you test for *Ammi visnaga* & *Ammi majus*



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