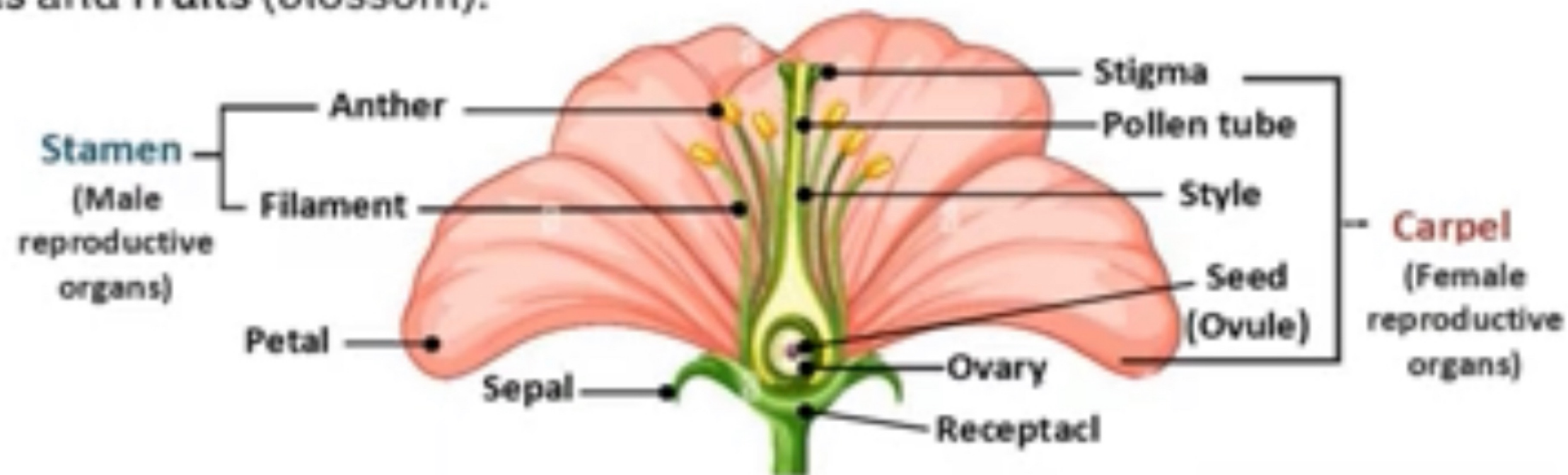


Experiment (5)

Microscopical Identification of Different Flowers and Fruits

- ❖ **Flower:** the specialized part of an angiospermous plant (modified leaves) that possesses whorls of often colorful petals or green sepals and bears the reproductive structures (stamens and carpels) involved in the development of seeds and fruits (blossom).



- ❖ **Pollen:** is a powdery substance produced by seed plants. It consists of pollen grains.
- ❖ **Pollen grains:** are highly reduced microgametophytes compressed of microspores containing a mature or immature male gametes (sperm cell) that are essential for fertilization and sexual reproduction of flowering plants and plants that produce cones.



بساتين زهرية
* flower: specialized Part of an angiospermous Plant (modified leaves) that Possesses whorls of often colorful petals or green speals and bears the reproductive structures (stamens ^{male} and carpels ^{female}) involved in the (development of seeds and fruits (blossom)) → reproductive structure

(Anatomy of flower) → مطلوب

* Pollen: is a powdery substance Producing by seed Plants. It consists of Pollen grains.
→ flowering plant

نسيج الكثره الخبيثه
sexual cells (male)
* Pollen grains: are highly reduced microgametophytes Compressed of microspores containing a mature or immature male gametes (sperm cell) that are essential for (fertilization & sexual) reproduction of flowering plants & Plants that Produce cones.

Experiment (5) Microscopical Identification of Different Flowers and Fruits

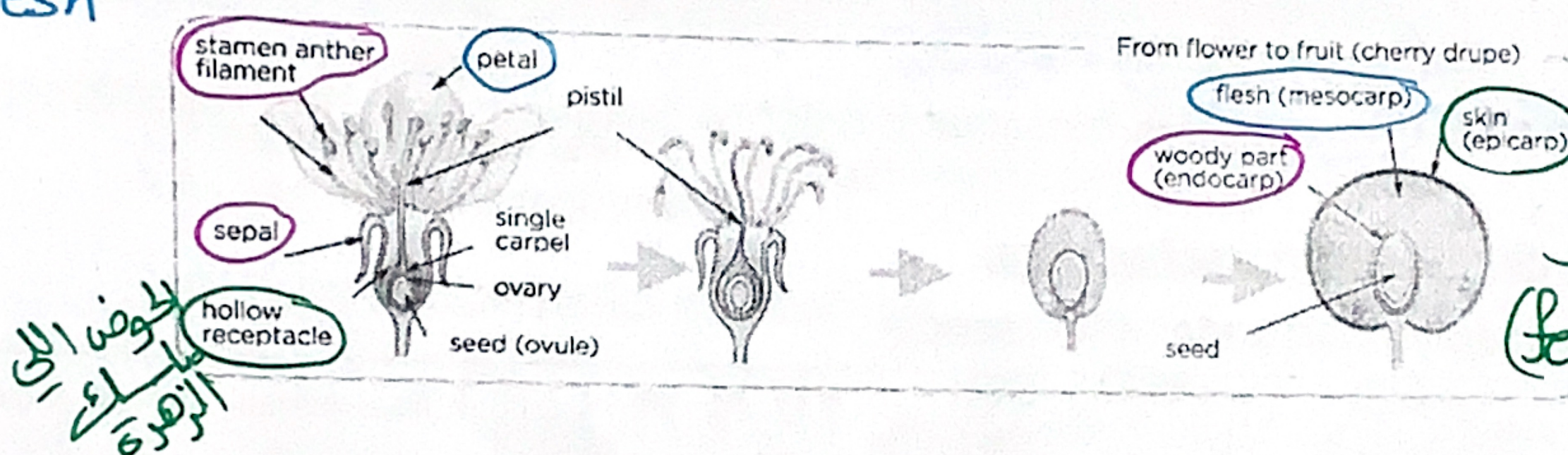
- ❖ **Flower:** a determinate axis with spore-bearing appendages (and usually sterile appendages) and short internodes occurring in the (angiosperm). (Flowering Plant) النباتات الزهرية
- ❖ **Pollen grain:** a microspore wall containing a mature or immature male gametophyte in seed plant المبيض الناضج
- ❖ **Fruit:** the mature ovary or ovaries of (one or more flowers) and sometimes associated structures.

- **Endocarp:** the innermost layer of the ovary wall in the fruit. → woody part

- **Exocarp:** the outermost layer of the ovary wall in the fruit.

- **Mesocarp:** the layer in the fruit between exocarp and endocarp.

الفlesh

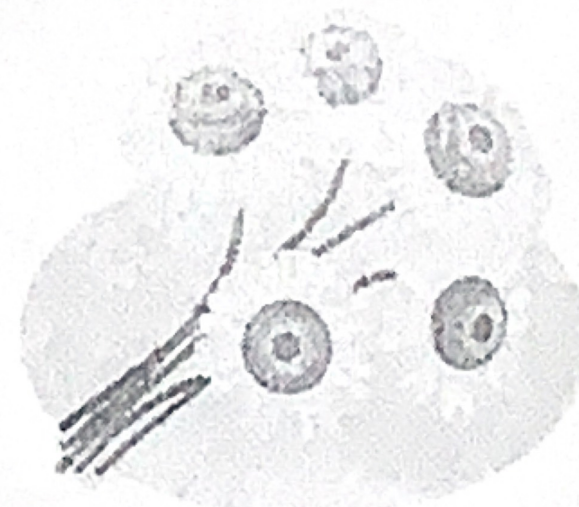


We are going to examine six selected plants:

❖ Flowers:



Clove



Chamomile

❖ Fruits:



Fennel Seeds



Caraway Seeds



Anise Seeds



Cumin Seeds

البابونج

Scientific Name

Family

1. Chamomile Flower: Dried flower of Matricaria chamomilla L. (Asteraceae, Compositae) "German chamomile".

اسم على آخر

➤ Physical characters:

- Color: grayish-brown
- Odor: characteristic aromatic رائحة مميزة
- Taste: pleasant, sweet aromatic طعم لطيف وحلو

➤ Constituents:

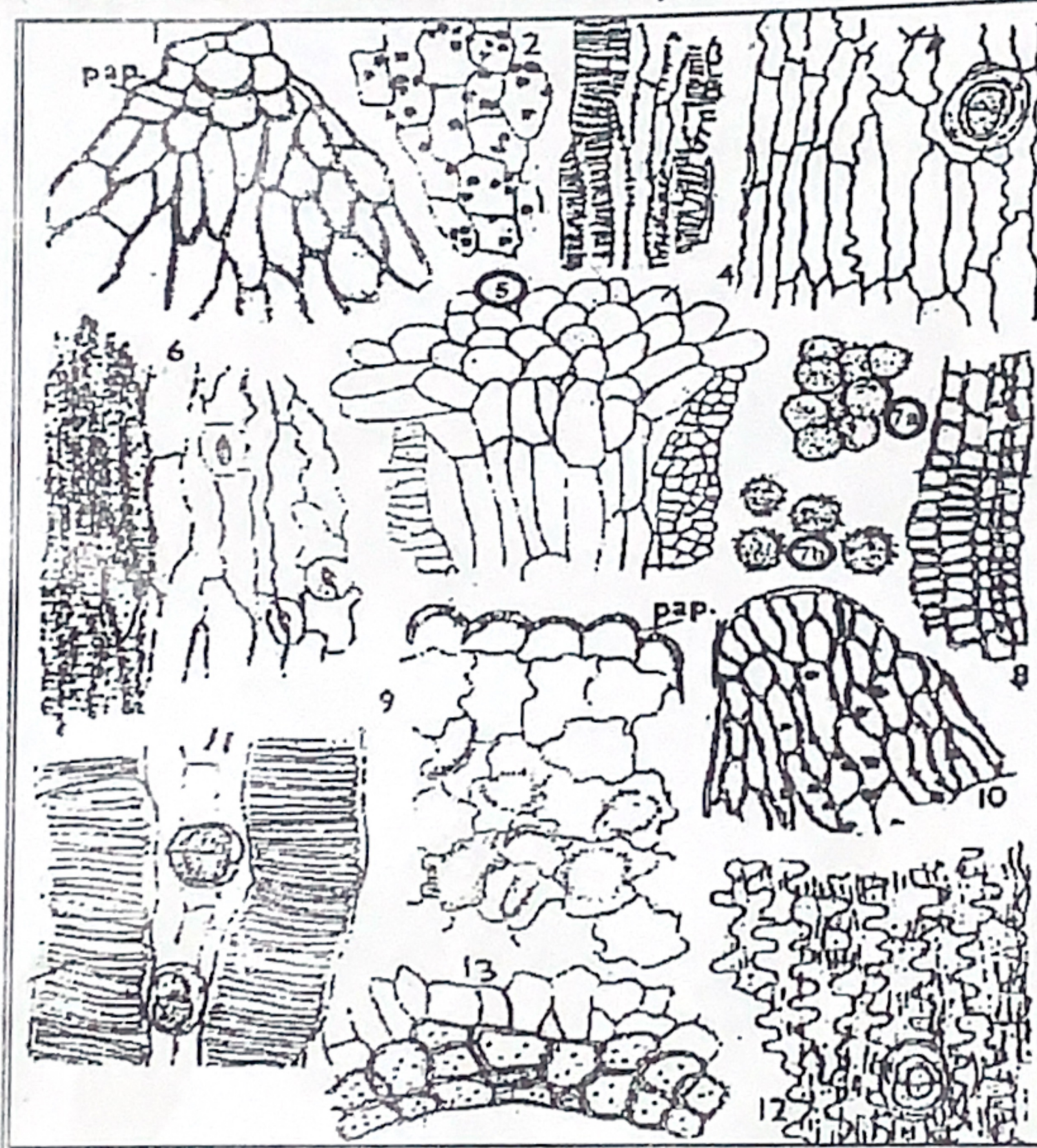
- Volatile oils: α -bisabolol (up to 50%) and chamazulene (1-15%), and Matricin. → to anti-inflammatory activity
- Flavonoids: rutin.
- Coumarins. (anti-coagulant)

➤ Uses:

- Internal use: Dyspepsia, epigastric bloating, impaired digestion, and flatulence. In the treatment of restlessness and in mild cases of insomnia due to nervous disorders. → للأرق بسبب عصبية
- External use: Inflammation and irritations of the skin and mucosa, including irritation and infections of the mouth and gums and hemorrhoids. → بواسير
- Inhalation: Symptomatic relief of irritations of the respiratory tract due to the common cold. ← سعال والتهاب الشعبات

❖ Identification test for lignin

❖ Examination under microscope:



1. Inner epidermis of a lobe of the corolla of a tubular floret in surface view showing a group of papillae near the apex.
2. Cells from the inner tissue of the ovary wall containing clusters of calcium oxalate.
3. Fibrous layer of the anther in surface view.
4. Outer epidermis of the corolla of a tubular floret in surface view showing a glandular trichome.
5. Papillose stigma and part of a style in surface view (KE)
6. Part of a bract in surface view
- 7.a. A group of immature pollen grains
- 7.b. Mature pollen grains
8. Part of the filament of an anther in surface view.
9. Inner epidermis of corolla of a ligulae floret in surface view showing cells of the margin with papillae.
10. the tip of an anther lobe in surface view showing clusters of calcium oxalate in underlying tissue.
11. part of the ovary wall in surface view.
12. outer epidermis of corolla of a ligulae floret showing striations and a glandular trichome.
13. Sclereids from the base of ovary wall.

most distinctive

Papillose stigma
+ Pollen grains

II. القرفة Cloué flower: Dried flower of *Eugenia Caryophyllus* (Myrtaceae).

Scientific Name Family

➤ Physical characters:

- Color: reddish brown بني محمر
- Odor: aromatic like the odor of Pepper and Cinnamon together.
- Taste: pungent & acrid طعنه حاد

➤ Constituents:

- Volatile oil: Eugenol (60-95%), and caryophyllene (5-10%). Active Constituent
- Tannins. (galotannic acid خرقوصا)

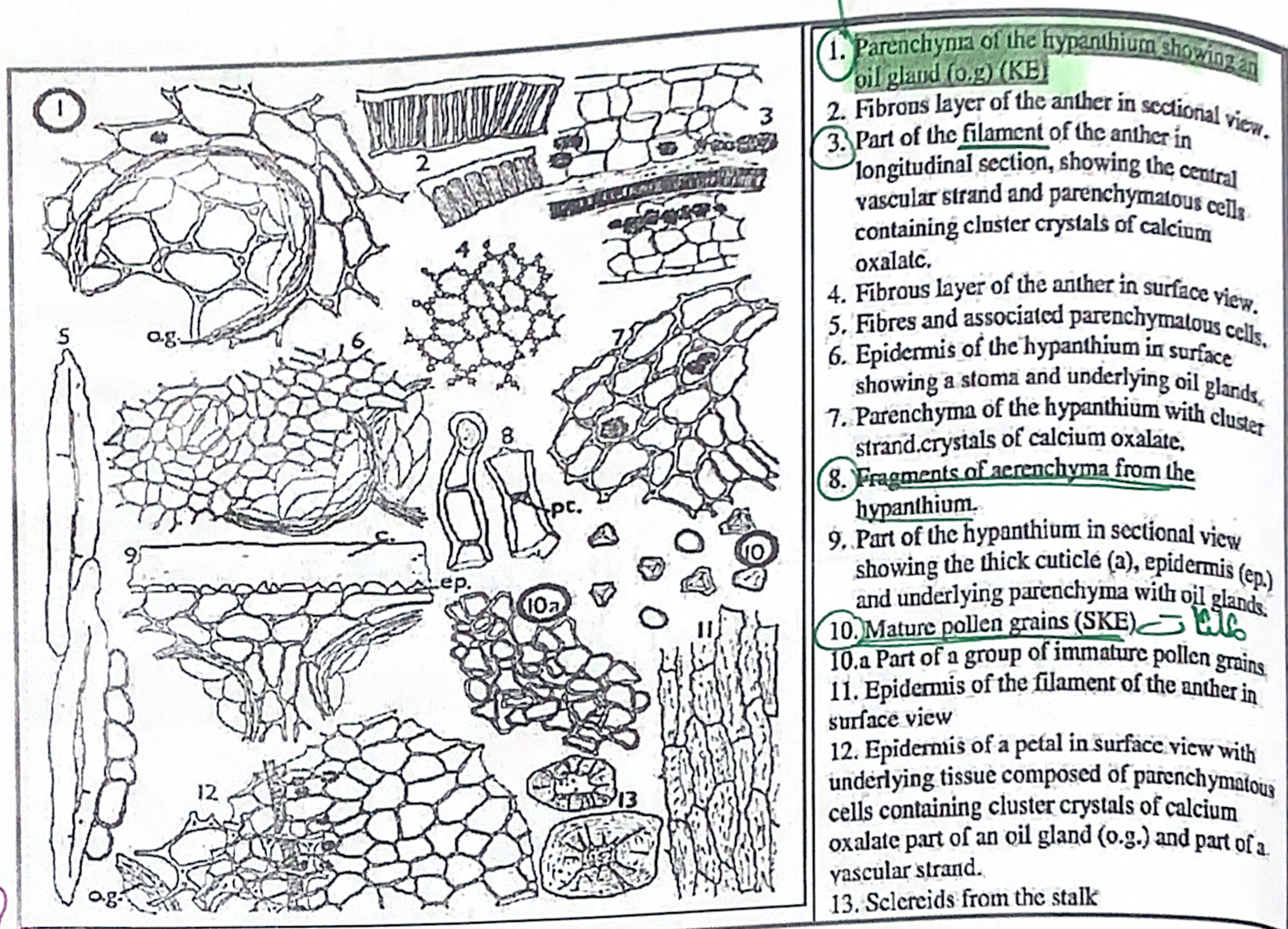
➤ Uses:

- Treatment of toothache and minor infections of the mouth. بمعالج ألم الأسنان
- Antiseptic for minor wounds. مطهر
- Antioxidant.
- Anti-inflammatory.
- Antiviral.

❖ Identification test for lignin

❖ Identification of tannins ✓

❖ Examination under microscope:



Dried fruit

Scientific Name

I. Anise fruit: Dried ripe fruit of Pimpinella anisum (Umbelliferae, Apiaceae)

Family

Physical characters:

- Color: grayish- brown
- Odor: characteristic aromatic
- Taste: pleasant, sweet aromatic

Constituents:

- Volatile oil: anethole (80-95%).
- Coumarins.
- Flavonoids.

Uses:

- Antispasmodic. للتشنج
- Expectorant. مقلع
- Antibacterial, antifungal, and insecticidal. يقتل الحشرات

Examination under microscope:

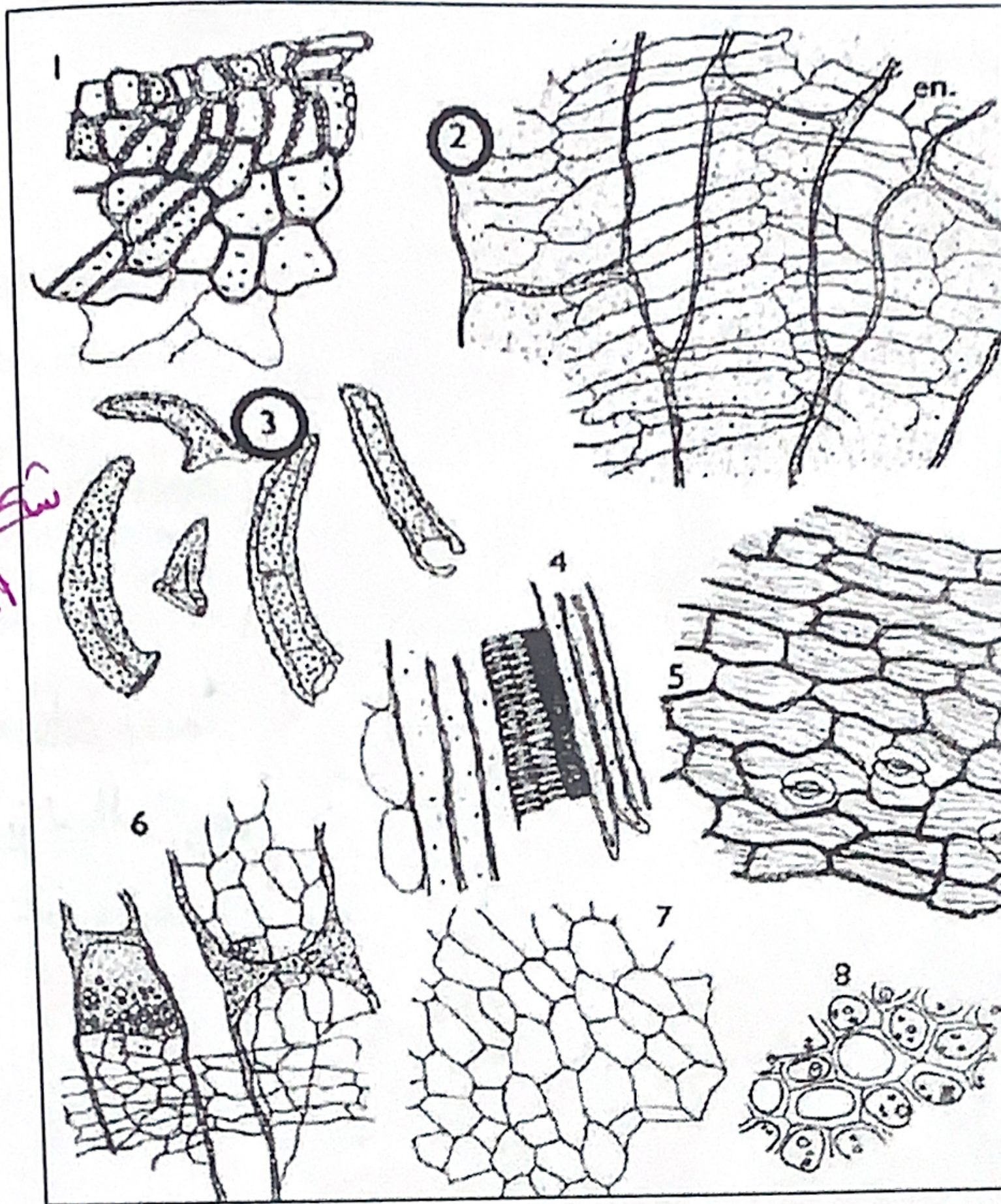
Anise: يحتوي على استروجين

(هرمونات أنثوية) فيحسن من ال

menstrual cycle

ويجعل على تدوير الكلي

عند الحيات



1. A group of sclereids from the mesocarp with adjacent unligified parenchyma.
2. Branching vittae (shown in outline only) and underlying endocarp (en.) in surface view (KE).
3. Covering trichomes.
4. Part of a group of fibro-vascular tissue.
5. Epicarp in surface view showing stomata and striated cuticle
6. Part of two vittae showing transverse septa and part of the underlying endocarp in surface view.
7. Testa in surface view.
8. Endosperm containing microrosette crystals of calcium oxalate

cell wall
والجدار

سكاكها من
الحوز

II. Fennel: Dried ripe fruit of *Foeniculum vulgare* (Scientific Name) → Family Umbelliferae

➤ Physical characters:

- Color: medium brown
- Odor: characteristic aromatic
- Taste: pleasant aromatic

➤ Constituents:

- The major constituent of fennel oil is anethole (phenolic ether) and fenchone (ketone).
- Fixed oils, proteins (present in form of grains called "aleurone grains") and sugar.

→ Pleasant taste

➤ Uses:

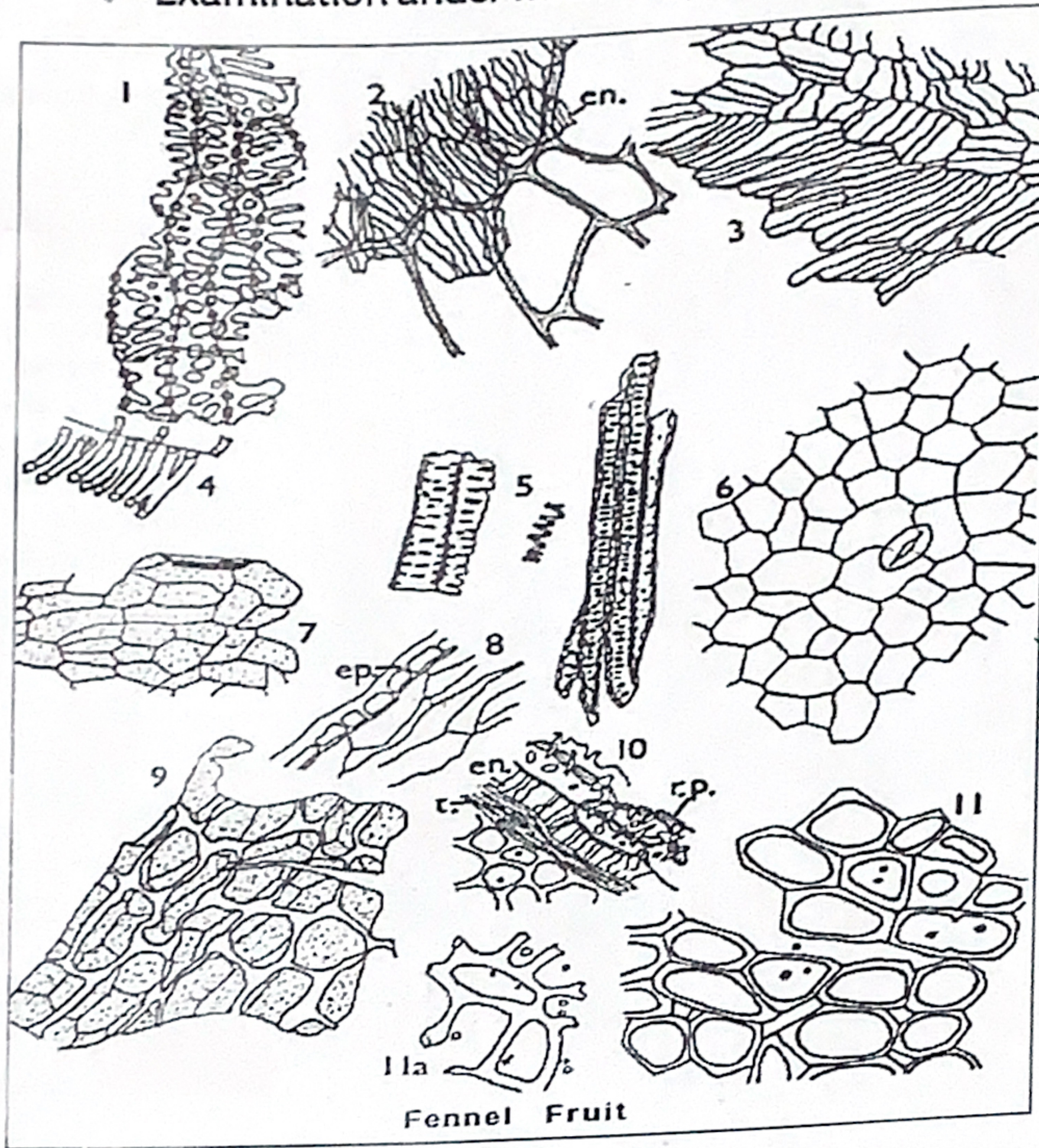
- Carminative & Antispasmodic.
- Flavoring agent.
- Sedative for the menstrual pains in female

للغصن + كاذب
وكيفية
(antiemetic) و

بنفس

- Treatment of inflamed eyes.

❖ Examination under microscope:



Structure under microscope

1. Fragment of a vittae (yellow in color)
2. Reticulate parenchyma (lignified)
3. Vascular bundle.
4. paracuticular layer (diagnostic feature)
5. Endosperm cells (thick walls, gray in color and contain calcium oxalate crystals, fixed oil, and protein grains).

key element

التي تتميز في الصور
عن غيره.

III.

الكراوية

Caraway: Dried ripe fruit of *Carum Carvi* (family *Umbelliferae*)

➤ Physical characters:

- Color: brown, or (pale) brown.
- Odor: characteristic aromatic رائحة
- Taste: aromatic and slightly pungent.

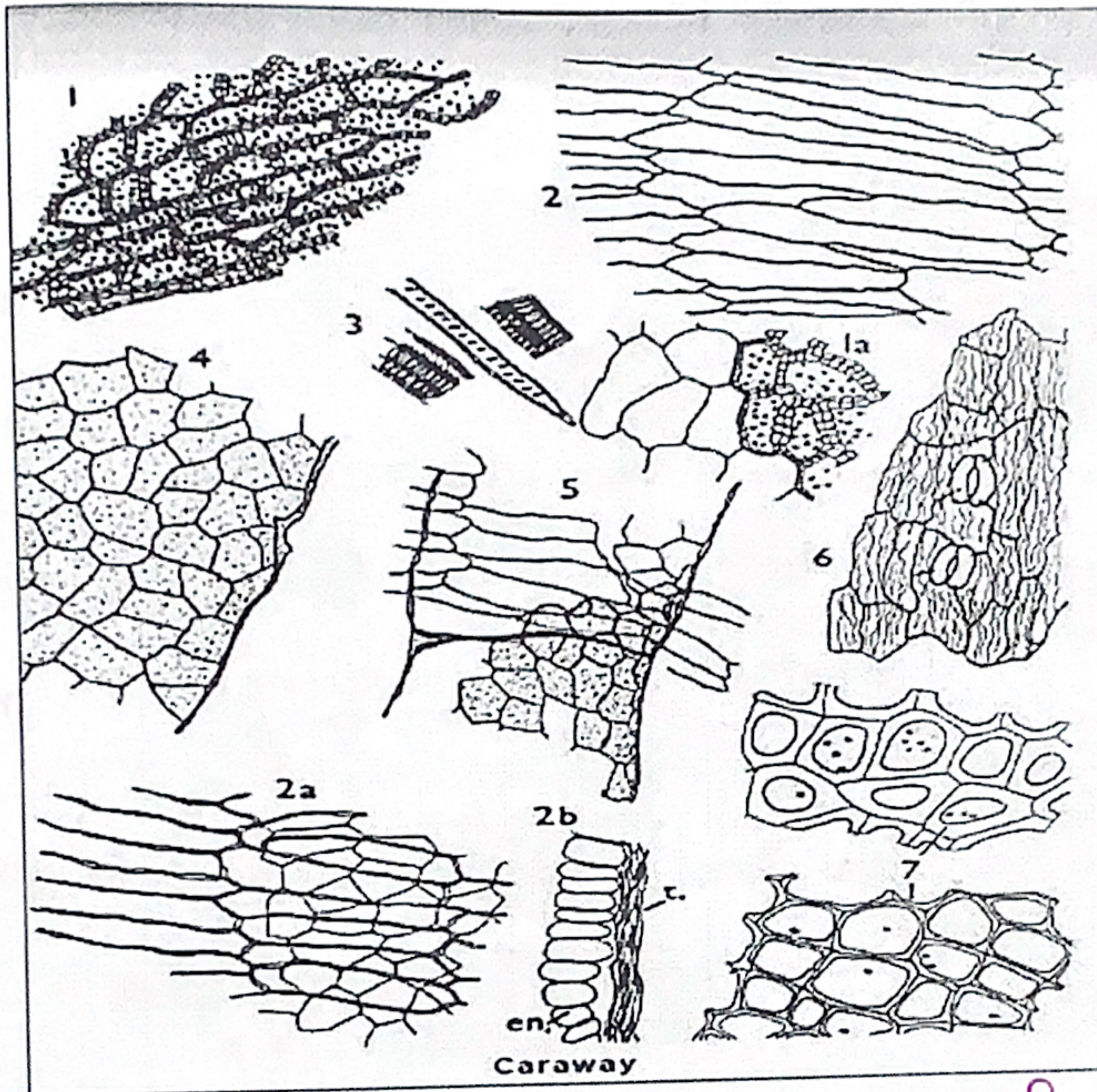
➤ Constituents:

- carvone (ketone)
- Dihydrocarvone
- Carveol
- Limonene (terpene)
- Fixed oil

سبب

- Proteins.
- Uses:
 - Carminative.
 - Lactogenic. *مدر الحليب*
 - Flavoring agent and condiment. *البهارات*

❖ Examination under microscope:



The Structure under microscope:

- (a) sclereid cells.
- (b) vitta.
- (c) Endosperm cells.
- (d) Vascular bundle.

IV. *الكزبرة* Cumin: Dried ripe fruit of *Cuminum cyminum* *Family Umbelliferae*

➤ Physical characters:

- Color: yellow-brown, or yellow-green. *لونه مائل للأصفر/الأخضر (صغير)*
- Odor: aromatic characteristic
- Taste: aromatic spicy somewhat (bitter taste) → *يسير (aldehyde)*

➤ Constituents:

- Cumin contains from 2.5 - 4% of volatile oil the oil contains up to 50 % of cuminic aldehyde, periladehyde, pinene and α - terpineol it contains.
- Fixed oil
- Flavonoids.

➤ Uses:

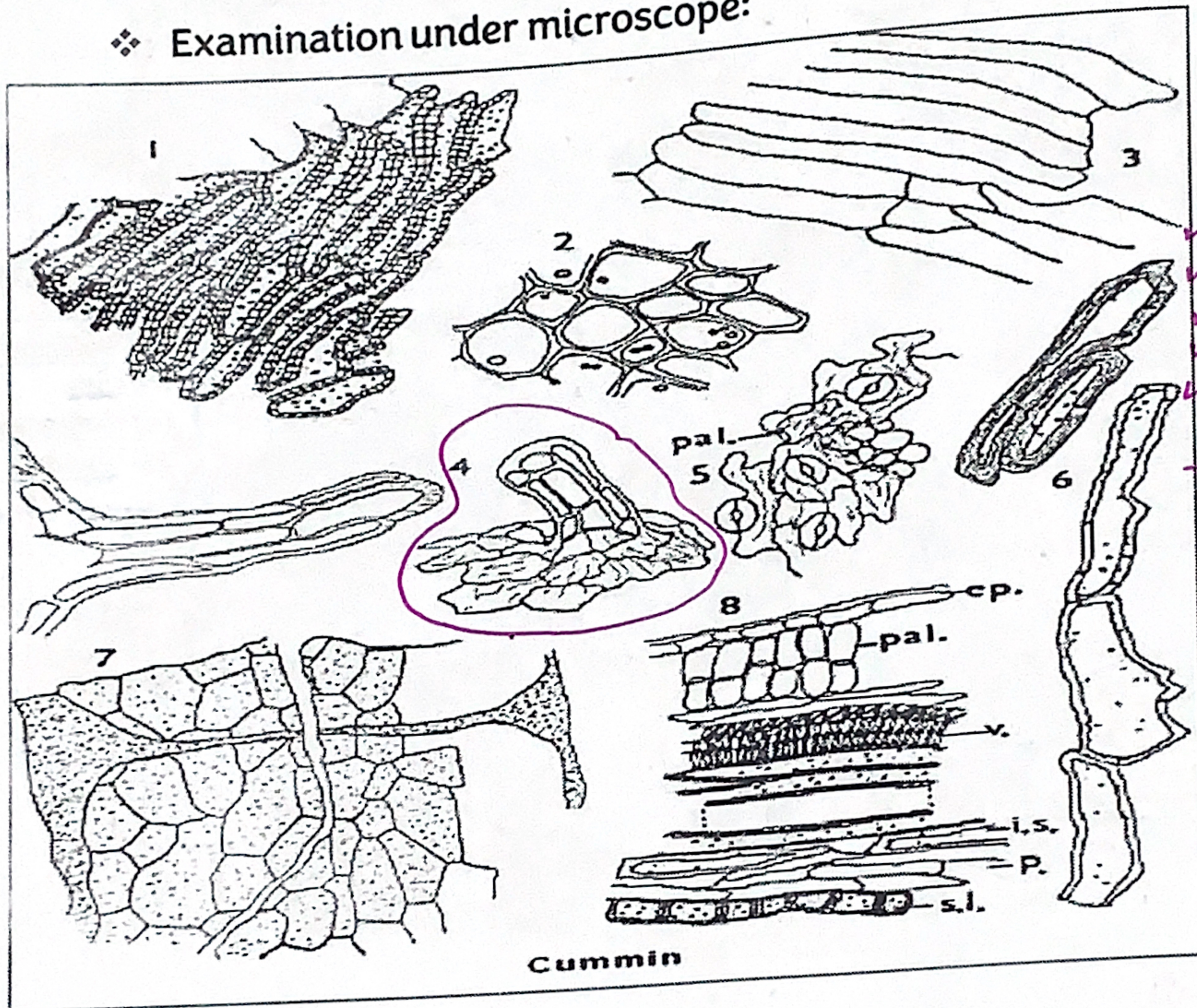
- Carminative.
- Anti-inflammatory.
- Eupeptic, astringent
- Antibacterial.
- Cough remedy and analgesic.

يساعد على
الهضم

* مفيد لسرطان المعدة والأمعاء

* بعالج ارتفاع ضغط الدم
(بخفض الـ B.P)

❖ Examination under microscope:



The Structure under microscope

- (a) sclereid cells.
- (b) vittae.
- (c) Endosperm cells.
- (d) Vascular bundle.
- (e) shaggy hair (multicellular in root diagnostic feature).

trichome
(أفم و حدة)
Shaggy hair

✓ Identification test for tannins: *clove*

- Clove powder (in a test tube) + FeCl_3

Positive result $\longrightarrow$ dark green color.

✓ Identification test for lignin:

- Plant powder (on slide) + (Phloroglucinol + conc.HCL) then cover with cover slip and observe.

Positive result $\longrightarrow$ the pink color on the walls of fibers and vessels.
to red