

Experiment (3)

Microscopical Identification of Different Barks and Woods

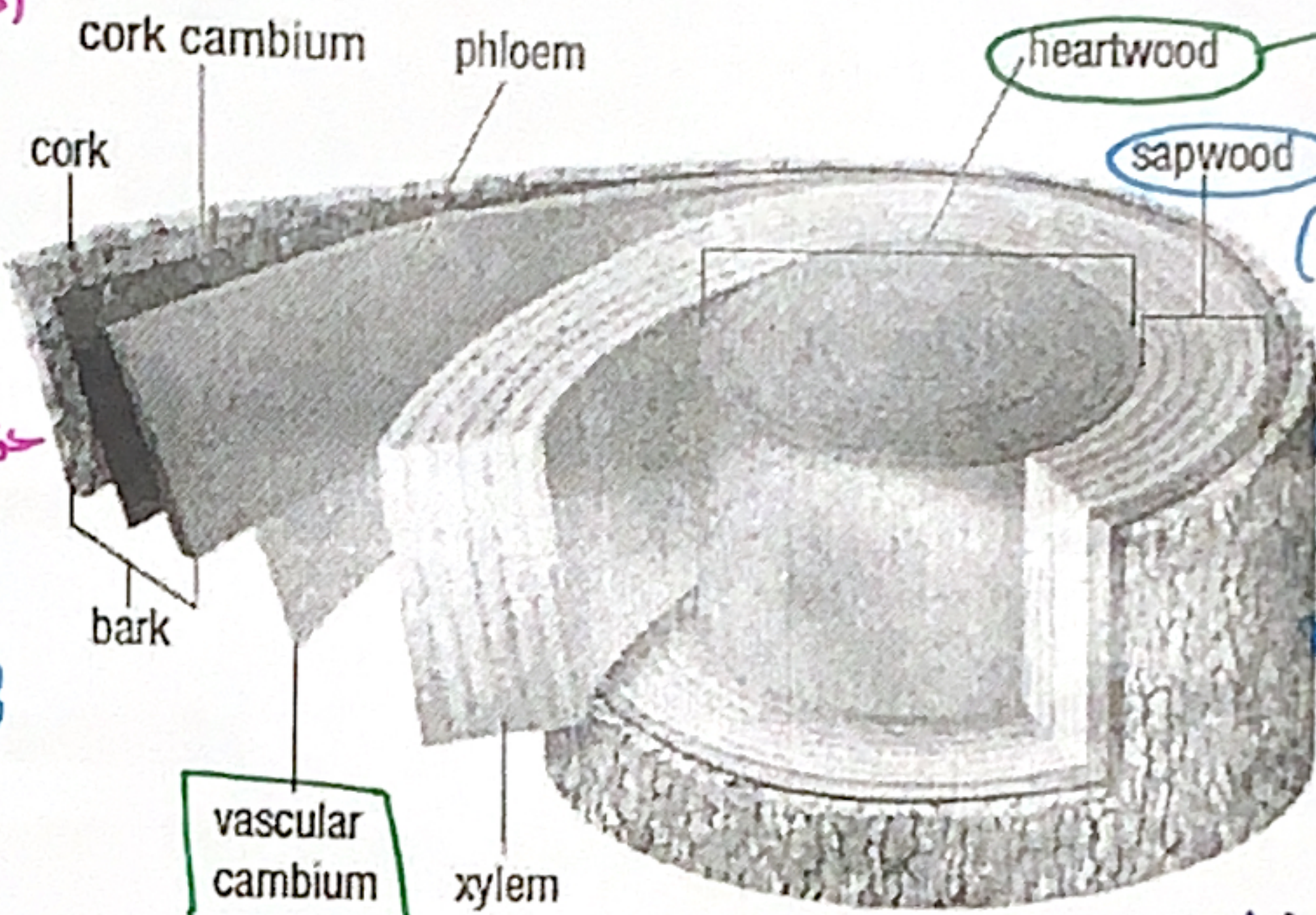
The layers of mature woody stem include (ordered from outside to the inside):

1. Cork فلين
2. Cork cambium فيلم
3. Cortex
4. Phloem نخيل
5. Vascular cambium فيلم
6. Xylem شجر

outermost layer
①
Bark

Phloem
cork cambium

②
Wood
innermost layer



not functionally
(we can use it medicinally)

outer wood
(functioning)
transport of water & nutrient
(not used medicinally)

Transverse section of mature woody stem.

جزء مهم بشكل من خلاله
Bark cell ← outward
wood cell ← inward

❖ Xylem: ❖

One of the two types of transport tissue (vascular tissue) in plants, phloem being the other. It is the principal water-conducting tissue of the plant. Xylem is a compound tissue made up of parenchyma, fiber, and tracheary elements (tracheids and vessel members). Tracheids and vessel elements are distinguished by their shape; vessel elements are shorter, and are connected together into long tubes that have pores at each end, while tracheids have no pores.

الخلايا التي
تساعد على
إرسال الماء
لأجزاء النبتة.

Overlap + Single

❖ Phloem: ❖

function (by sieve tubes)

Is a compound tissue and is responsible for the transport of food. It contains parenchyma, sclerenchyma and sieve element. The sieve tubes are the most highly specialized cell composed of a vertical series of elongated cells, interconnected by perforation in their walls in areas known as sieve plates. Sieve elements are usually broken during powdering while phloem scleride (stone cell) are important in the identification of certain barks.

Sieve tube ←
مكون النبتة يتكسروا لكن Phloem scleride بقدر أشونه

عُيَانُ الْقَرْفَةِ

I. Cinnamon Bark:

الاسم العلمي

Family

Dried bark of Cinnamomum zeylanicum B. (Lauraceae).

➤ Physical characters:

- Color: reddish brown (وممكن يكون - yellowish brown)
- Odor: pleasant and aromatic رائحتها جميلة
- Taste: warm, sweet, and aromatic.

➤ Constituents:

- Cinnamaldehyde (60-75 %)
- Volatile oils (up to 4%)
- Eugenol
- Tannins

➤ Uses:

- Uses described in Pharmacopeias: لفقران الشهية
Dyspeptic conditions, fullness, flatulence, and loss of appetite, also used to treat abdominal pain with diarrhea.

- Experimental pharmacology:

Antiseptic + Antibacterial and antifungal (O-methoxy cinnamaldehyde).

Carminative activity (essential oil). Antispasmodic due to (Cinnamaldehyde).

وتستخدم أيضا (Flavoring agent) و sweetening agent

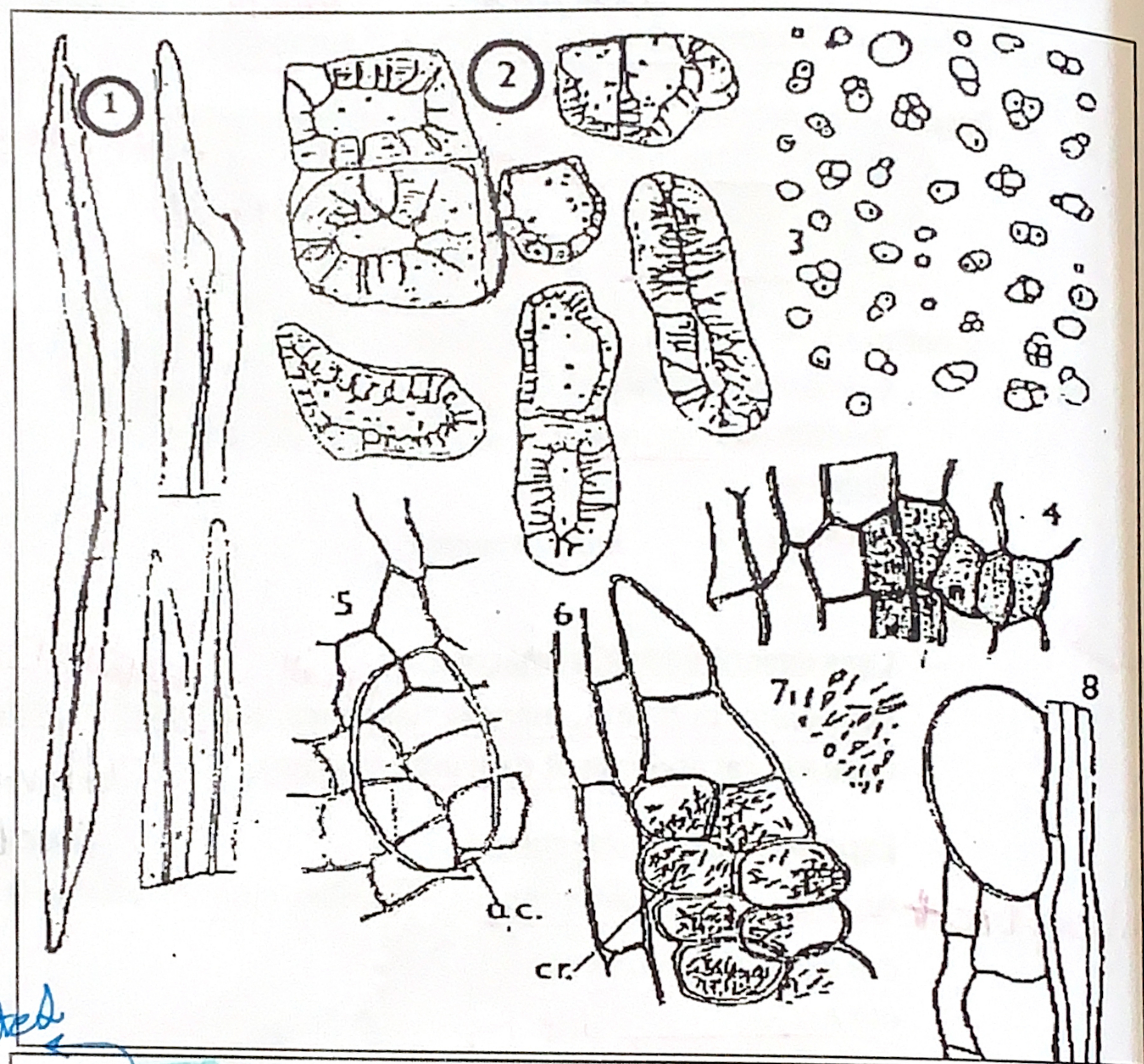
❖ Identification test of tannins:

- Cinnamon + FeCl₃: dark green color produced.

❖ Examination under microscope:

⚙ key element

- stone cell
- sclerids
- fibers



elongated

1. Fibers (SKE)
2. Sclereids (KE) (Stone cells)
3. Starch granule
4. Cork
5. Phloem parenchyma and an oil cell
6. Part of medullary ray with some of cells containing acicular crystals of calcium oxalate
7. Calcium oxalate crystals
8. Part of fiber

II. Quassia Wood: خشب المر

Family

Dried wood of *Picrasma excels* P. (Simaroubaceae).

➤ Physical characters:

(Pale) فاتح

- Color: pale yellow to bright yellow
- Odor: odorless
- Taste: very bitter.

➤ Constituents:

- Bitter quassinoids: ^①quassin, ^②isoquassin and ^③neoquassin

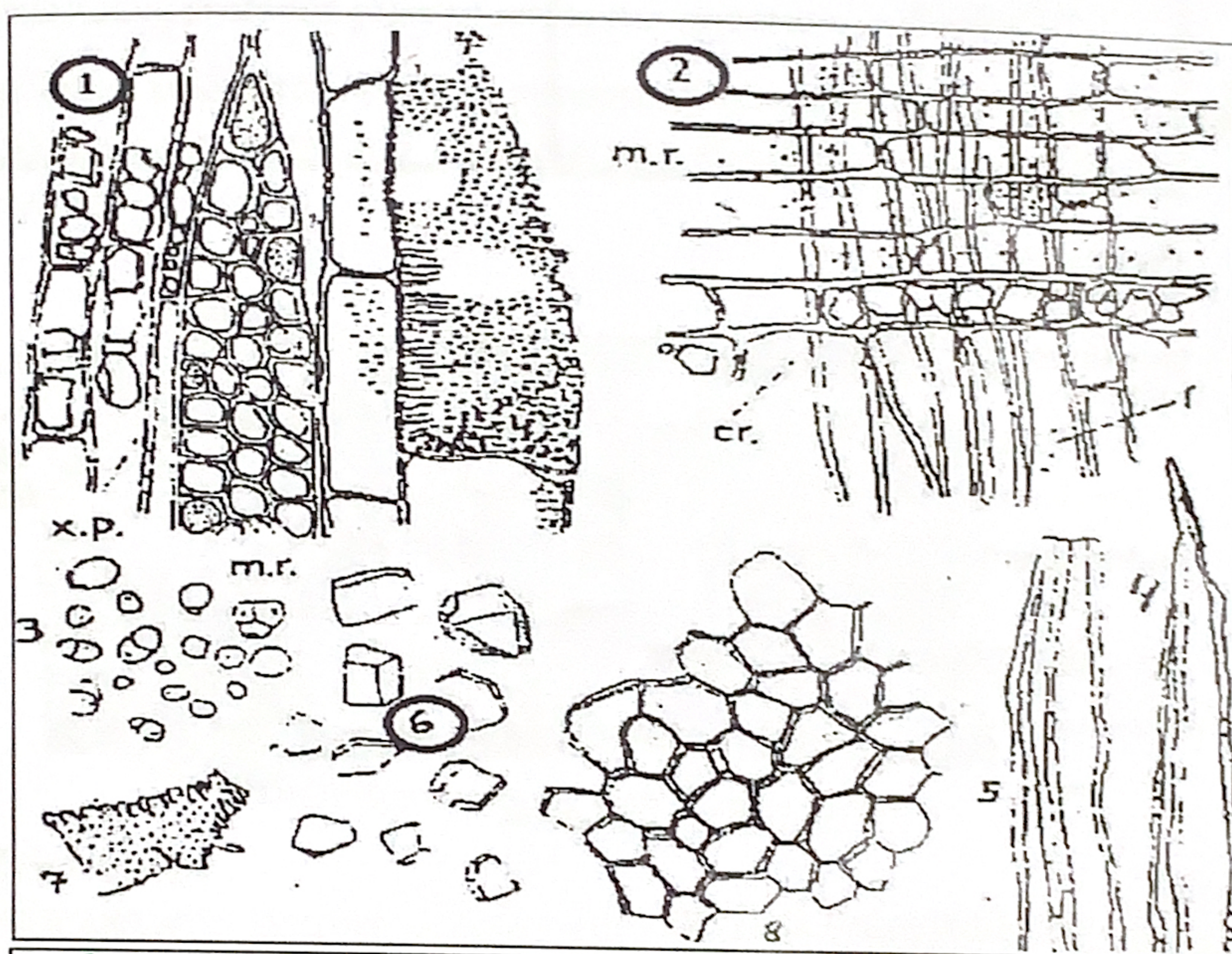
➤ Uses:

- Insecticide ^{مبيد حشرات}
- Remedies for infestation of ^{قمل}lice and ^{دباب}worms (Anti Parasite)

❖ Identification test for lignin:

- Quassia powder + Phloroglucinol + conc.HCL: pink color on the walls of fibers and vessels.

❖ Examination under microscope:



key element

1. Part of the xylem in tangential longitudinal section showing xylem parenchymatous cells (x.p.) some containing prisms of calcium oxalate part of a medullary ray (m.r.) and (a bordered pitted vessel) (KE)
2. Part of xylem in radial longitudinal section showing medullary cells (m.r.) containing prisms of calcium oxalate (c.r.) with underlying fibers (f.) and xylem parenchyma.
3. Starch granules
4. Fibers from phloem
5. Xylem fibers
6. Calcium oxalate prisms
7. Fragment of pitted vessel
8. Cork in surface view.

واضحة جداً
→ very distinctive



Artery Academy