

Medicinal Plants Lab.3

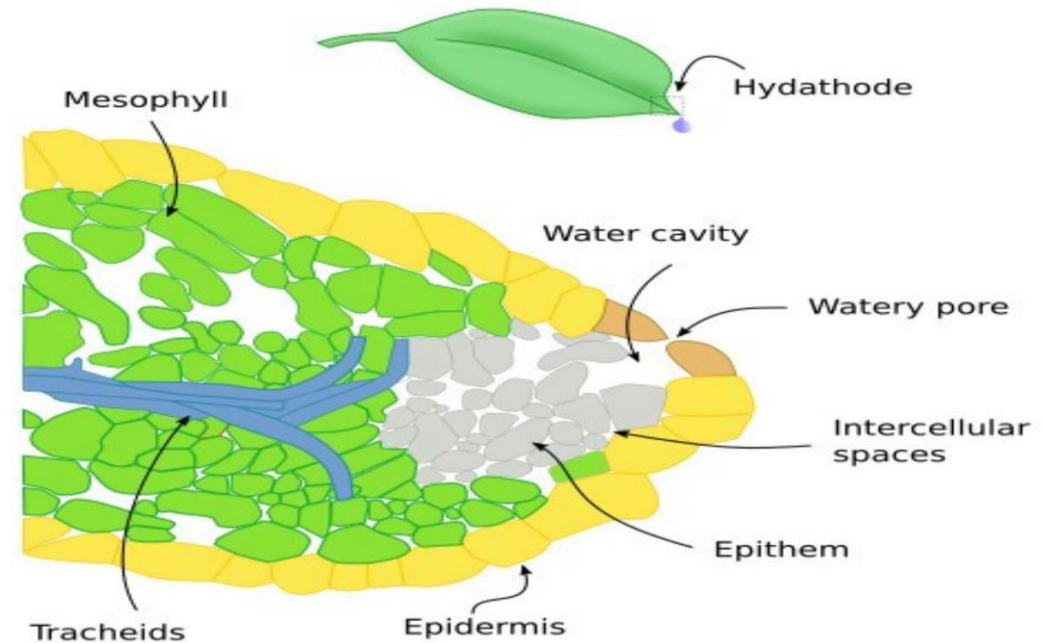
- Glands and Excretory tissues and their roles in storage and excrete the active compounds in medicinal plants.

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 - Plant physiology

The active chemical compounds: which medicinal effects in plants have considered as secondary metabolites in the plants. These compounds accumulated in special secretory structures.

which could be classified as follows:

- **1- External or Dermal glands**
- **2- Internal or Globular glands**
- **3- Secretory canals (Tubular type).**
- **4- Hydrothodes**



- The three first structures will be discussed as follows:

Glands and Excretory tissues in medicinal plants.

- **1: External or Dermal Glands:-**

- a: Glandular hairs:
- B: Nectaries:
- C: Digestive glands

- **2: Internal or Globular glands:**

(الحمضيات, Citrus spp), Eugenia caryophyllata (القرنفل)

- **3: Secretory canals or ducts Tubular):-**

A: Resin ducts: (الارز Cedrus, اللاريكس Larix)

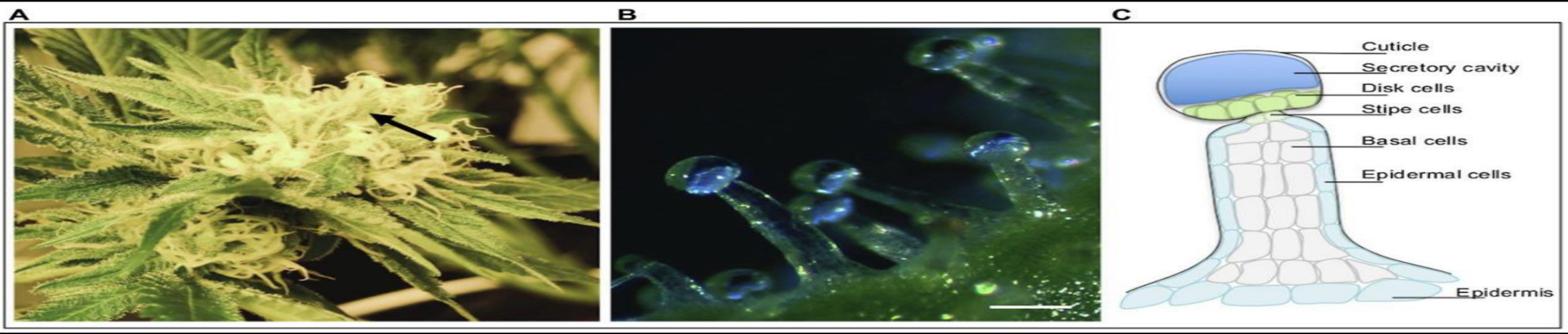
B: Gum canals: *(Gummosis)

C: Lactiferous canals: *(حليب النبات Latex)

4: Hydathodes: مسام خاصة للتخلص من الماء الزائد في النبات (عملية الإدماع)

1- External or Dermal glands:

- These structures produced from multiple divisions of protoderm cells. In certain places of this layer. However, these structures called dermal glands. The external or dermal glands could excrete Nectar, Terpenes, Gums and sugar solutions.
- These types of glands include the following types of glands:
 - a. Glandular hairs.
 - b. Nectaries.
 - c. Digestive glands.



• (A) Glandular hairs:

- Initialed from multiple divisions of the protoderm cells and produce elongated structure similar to the root hairs, that is why they called glandular hairs. These glandular hairs consist of stalk and head, the stalk consist of one or two cells and the head represented by the topical cell. The head considered as the secretory part.

- *Urtica urens*.



- *fritillaria imperia*.



- These compounds which produced by these glands important to as (Anti-inflammatory, help in injuries healing, stimulate the arteries ... etc.).

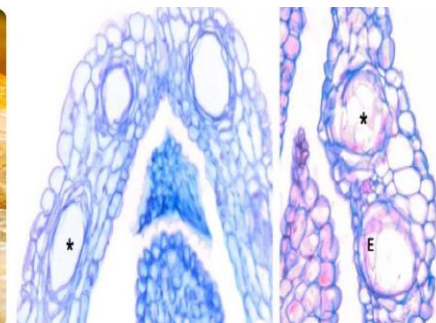
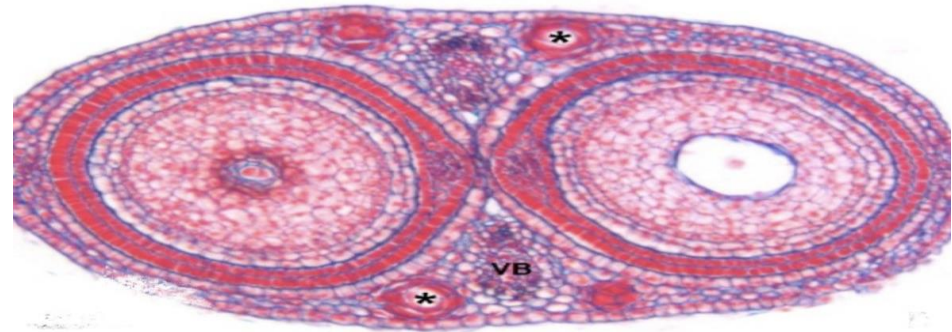
(B) Nectary glands or Nectaries:

- These gland present in those plants which inoculated by flying insects such as the bees. These glands could secrete attractive compounds to these insects which called Nectar. This Nectar secreted from specific parts in the plant which contain those special cells which covered the flowering parts which called Nectary glands or Nectaries.
- These cells differs from normal epidermal calls by morphology which is palisaded and from the parenchyma mature cells by their thin cell wall and their secretional morphology.



2- Internal or Globular glands

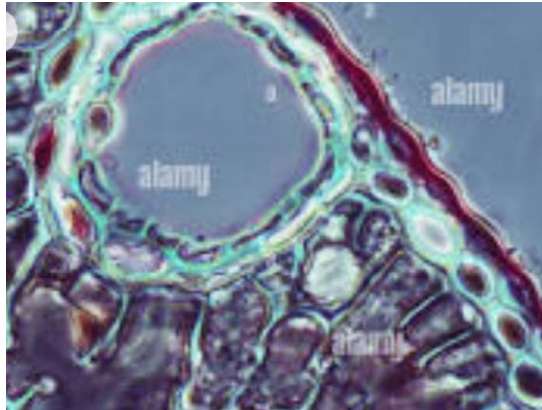
- These glands initiated from the ground meristem, however they are mostly present in the cortex and their morphology is coccoidal. In the transverse section could be seen by naked eyes and consisted from one layer or multiple layers from cells surrounded the central cavity, The central cavity contains the oily secretion which the smelling type.
- The cavity produced by the following ways.
 - (a) Gradual separation of secretarial cells.
 - (b) Lysis of secretarial cells after the secretion of their compounds.
 - (c) Or by both ways mentioned above and then called separated cavities or degenerated cavities or Schizollus genous.
- Example:
 - *Eugenie caryophyllat*. which have this on the flowering buds.
 - (*Citrus spp*). in fruit skins of arranges and lemons.



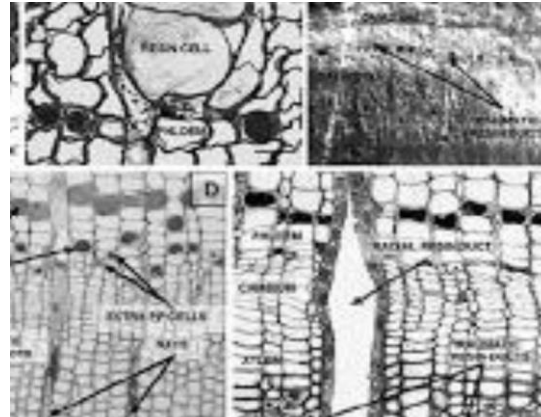
3- Secretory canals or ducts (Tubular type)

- The initiation of these ducts is different in different plants. Such as:
- (a) Resin ducts
- These ducts which are tubular structure consist of empty place surrounded by cells which have thin cell walls (without lignin) and called epithelial cells.
- The Resin ducts considered as a character of the **conifers plants** and these ducts are present as:
- Normal primary or secondary tissues such as those present in **pinus** and **Larix**.
- However they could be present due to the injuries in the plant such as **Cedrus**.

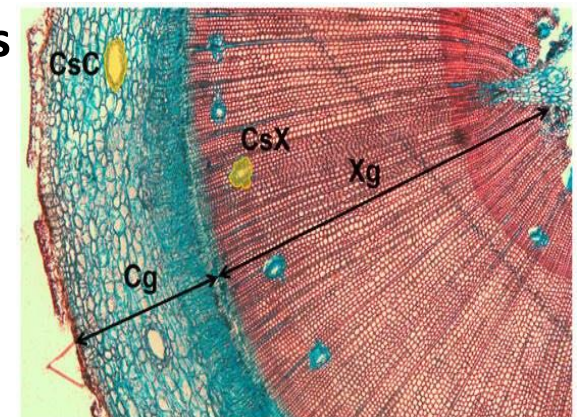
• pinus



• Larix



• Cedrus



(b) Gum canals or ducts:

- These initiated from the modification of compounds in cell walls which converted from cell wall to un crystallized compounds which have the Gum in morphology.
- This secretion called **Gummosis** and this could be common to happen in Barks specially Arabian Gums which produced in rich amount from barks of ***Acacia senegal***.



(c) Lactiferous canals:

- **Secretion structures which secrete gummy compounds consist of plenty of special particles and look like milk in color. This is why these compounds called plant milk (**Latex**).**



- **moraceae, euphorbiaceae, Apocynaceae, and papaveraceae.**