

# ***Pharmacognosy***

PHG 112  
PG 102

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Spring 2025



# Faculty of **Pharmacy**

# Lecture 1

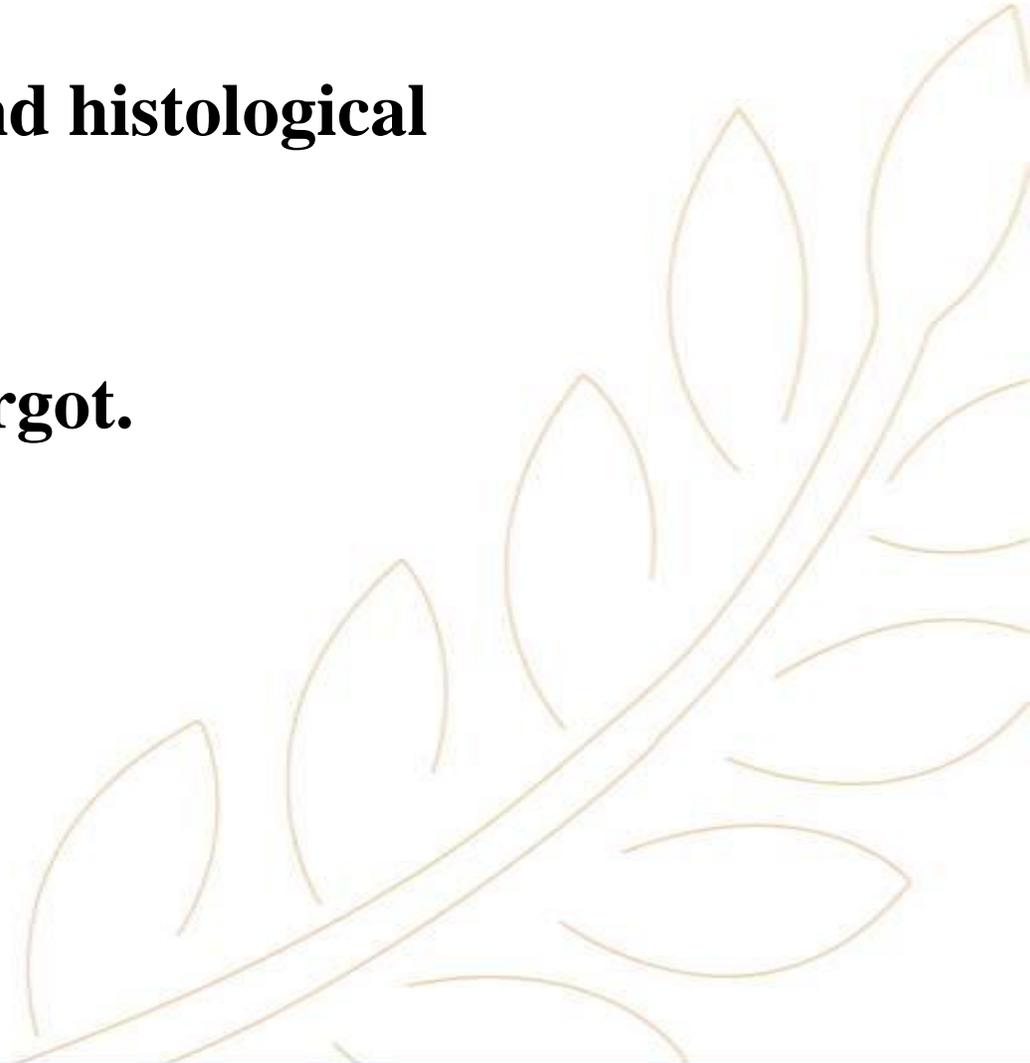


# HERBS ( HERBA )



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

- **Herb; definition, function, morphological and histological features.**
- **Examples of medicinal herbs:**
  - Herbs containing alkaloids *e.g.* lobelia & ergot.**
  - Herb containing resin *e.g.* cannabis.**

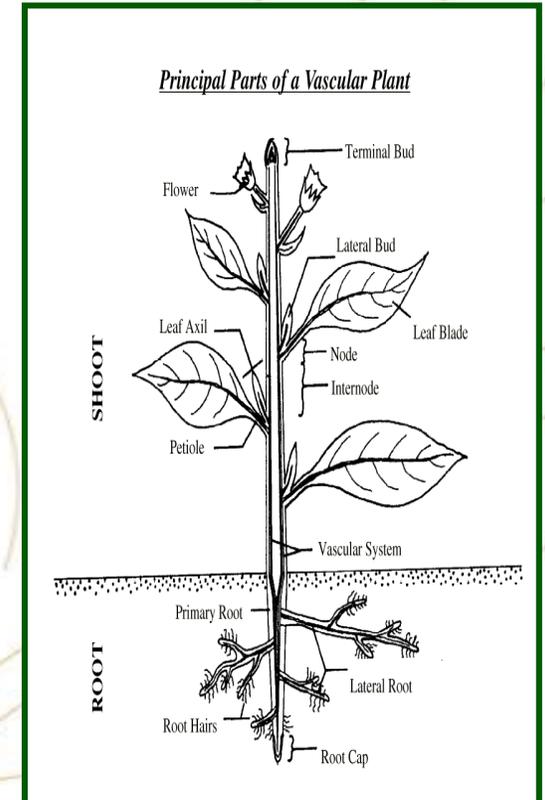


# HERBS ( HERBA )

## What is an herb?

Herb is a drug composed usually of the tender parts of the plant axis.

(the stem + leaves + flowers + fruits).



## Herbs include

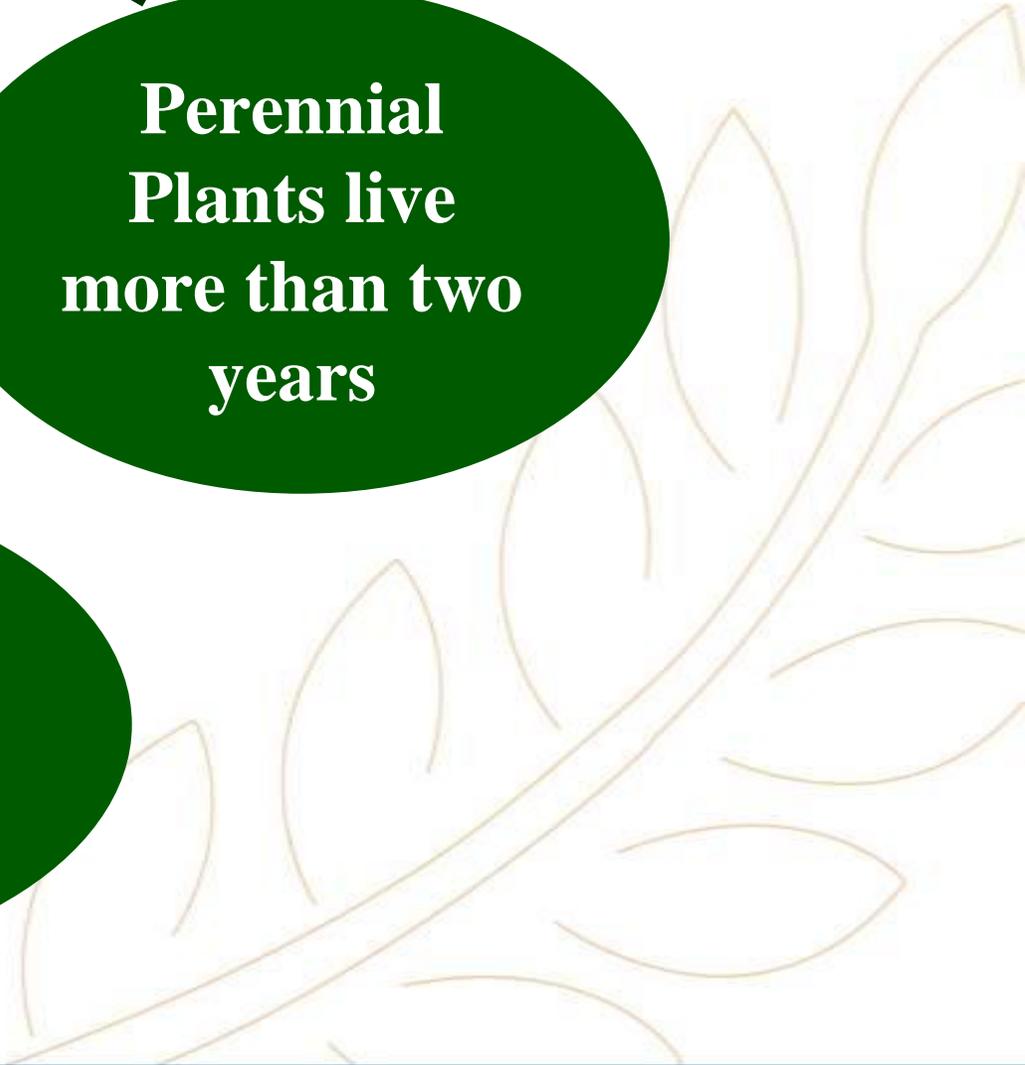
- 1- Flowering tops (young stem, leaf, flower, fruit )
- 2- Aerial parts (old stem, young stem, leaf, flower and fruit )
- 3- Whole plant (aerial parts plus root)

# Herbs are classified according to life duration into

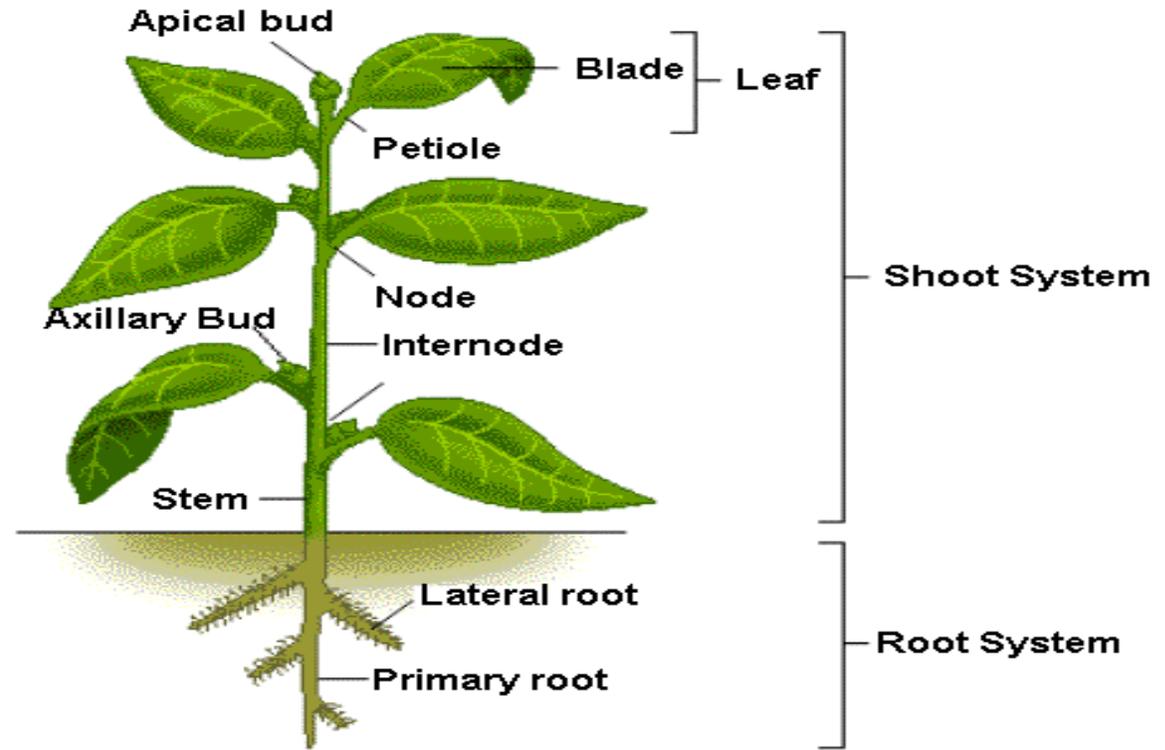
**Annual**  
Herbs live one  
season and dies.

**Perennial**  
Plants live  
more than two  
years

**Biennial**  
Herbs live two  
seasons and dies.



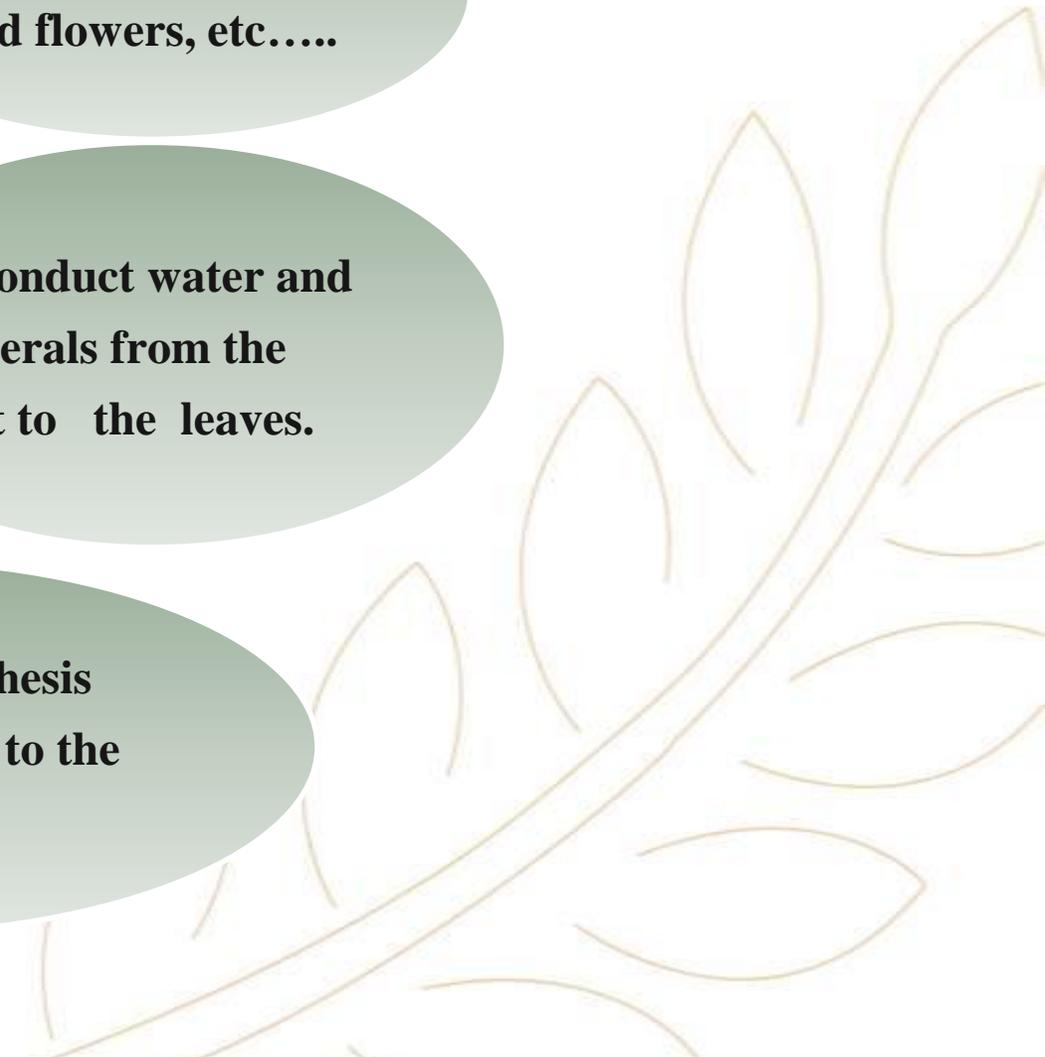
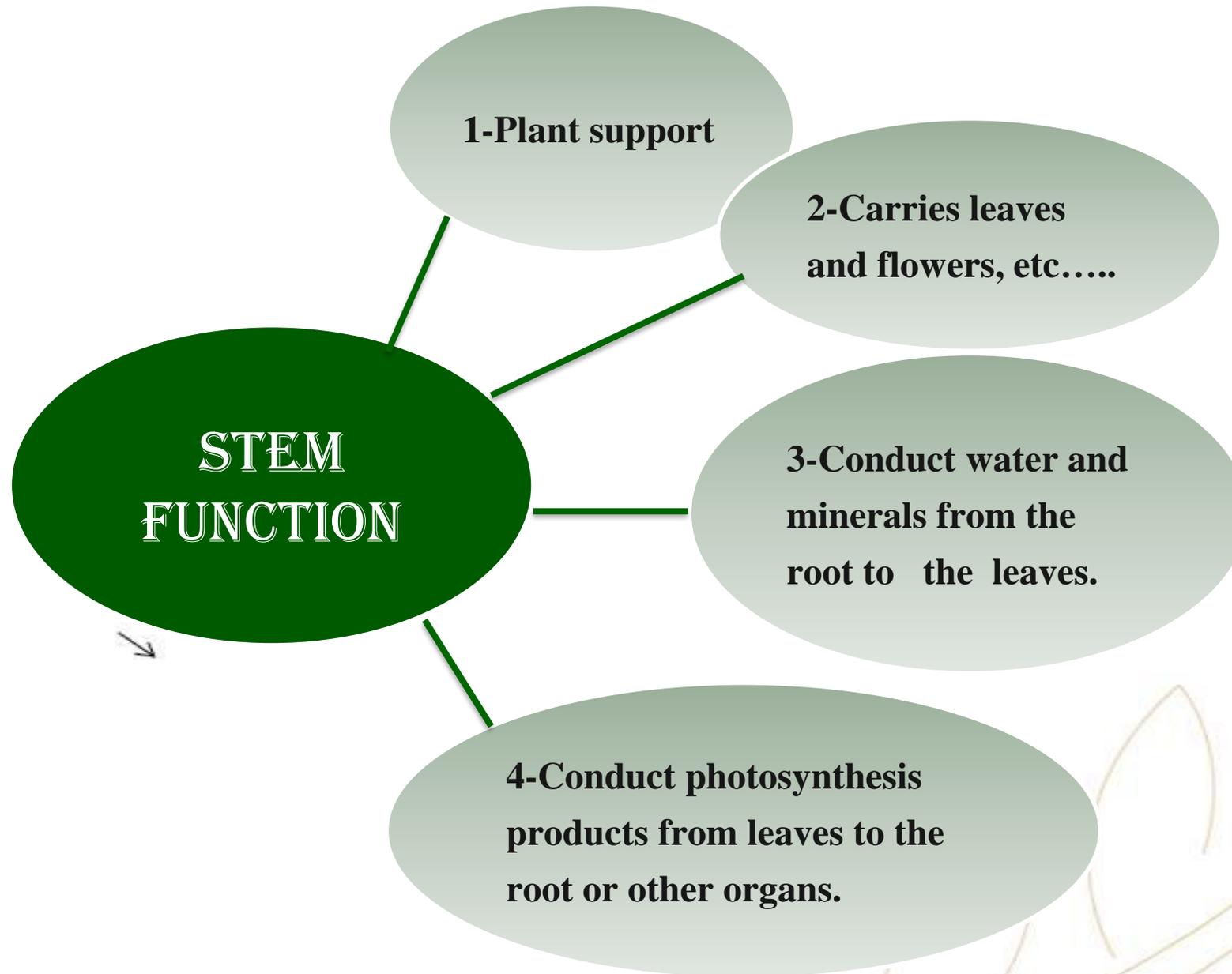
# The Stem



## Definition

**Stem: - It is a part of the plant which carries the leaves and other plant organs.**

**- It has nodes and internodes.**



# Structure of The Stem

**Epidermis:**  
with cuticle,  
stomata and  
hairs

**Endodermis:**  
inner most  
layer of  
cortex.

**Pericycle:**  
parenchyma,  
collenchyma,  
fibers, sclereids.

**Pith:**  
parenchyma;  
pitted lignified

**Cortex:**  
Parenchyma,  
Collenchyma

**Cambium:** Responsible for  
2ry thickening giving 2ry  
phloem outside and 2ry  
xylem inside.

**Phloem**

**Xylem:** Vessels ( Spiral,  
annular, pitted.

Fibers and wood  
parenchyma)

**N.B.**

**Stele:** All tissues inside the endoderm .

# LOBELIA HERB

(Indian tobacco)

**Asthma weed, Duchan Hindi**

**Origin:** Is the dried aerial parts of *Lobelia inflata* F. Campanulaceae.

↙  
**It is used by North American Indians as domestic medicine as a cigarette for asthma.**



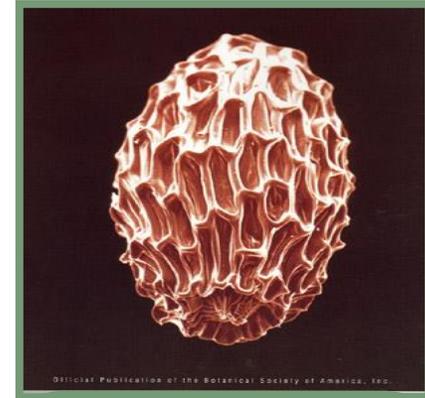
## Macroscopical characters :



Flowers: Pale blue flowers



Fruits: Capsule containing about 500 small seeds.



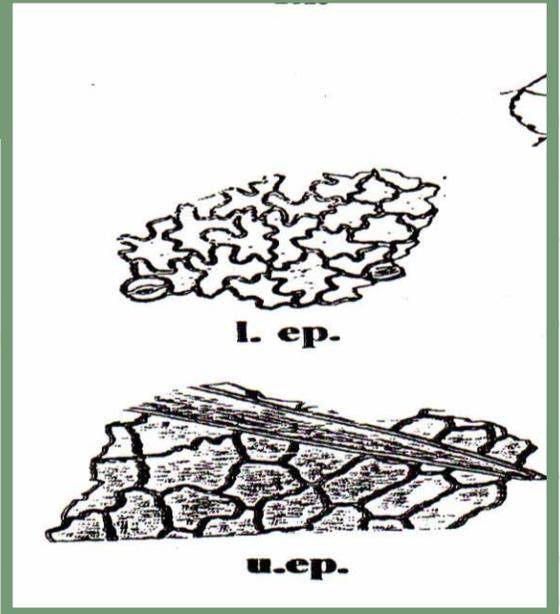
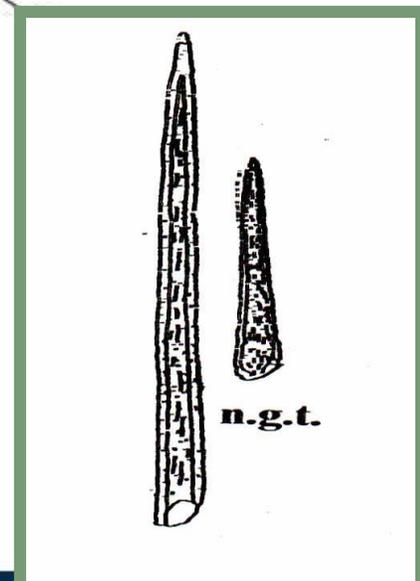
Seeds: 0.5 mm long and 0.3 mm wide, reddish-brown with reticulate surface.

# Powder:

1- Non glandular hairs (conical, unicellular with lignified inner walls).



2- Fragments of leaves showing beaded papillose epidermal cells, anomocytic stomata and hairs.

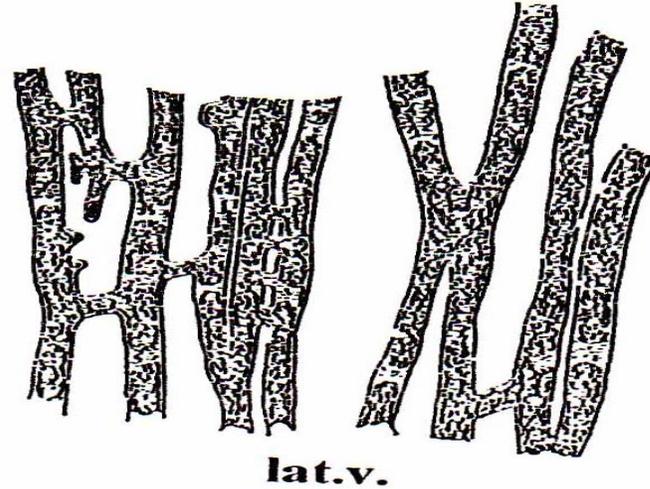


# Powder:

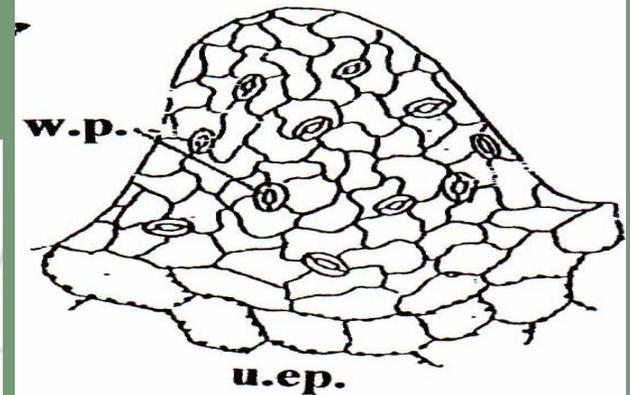
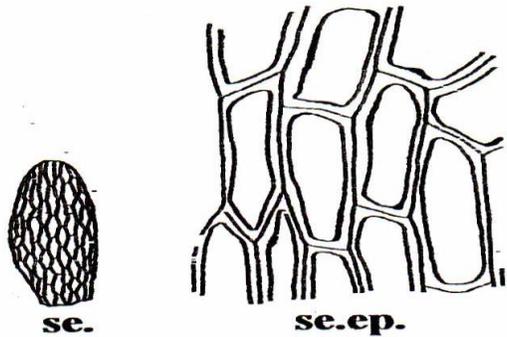
3- Fragments of seed coat showing the characteristic thick-walled, lignified cells.

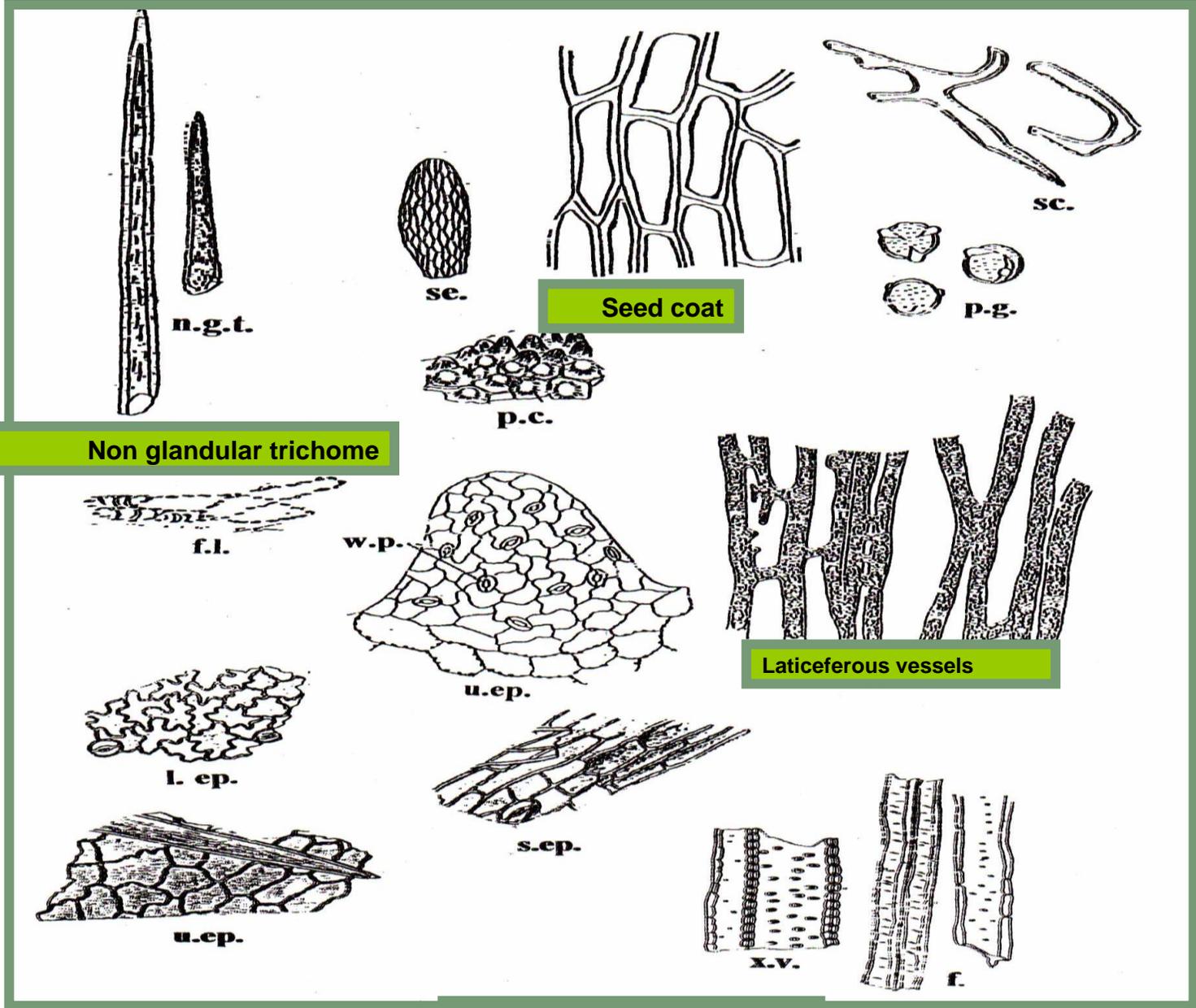


4-Laticiferous vessels



5- Fragments of upper epidermis of leaves showing water pores.





# Lobelia powder

**ACTIVE  
CONSTITUENTS**

**1-Alkaloids (0.25-0.4%) Lobeline, lobelidine, lobelanine and isolobelanine.**

↙  
**3-Lobelic acid**

**2-Neutral principle inflatin**



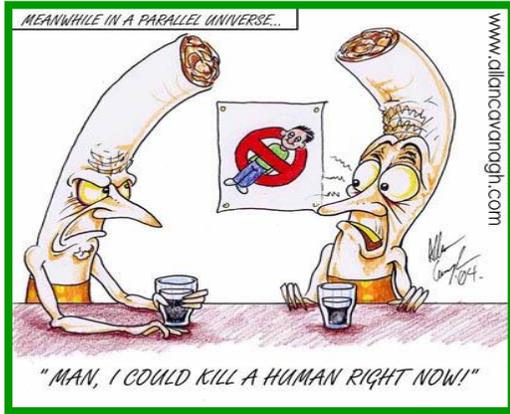
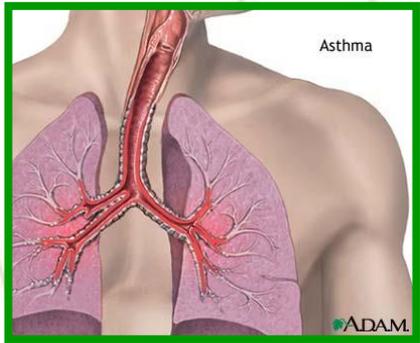
# USES:

**1-Expectorant**

**2-An injection of lobeline HCl is used for resuscitation in newborn babies.**

**3-In treatment of bronchitis & bronchial asthma as it dilates the bronchioles.**

**4-Breaking of smoking habit**



# ERGOT

## Ergot of Rye

Ergot is the sclerotium of *Claviceps purpurea* Family Hypocreaceae, developed in the ovary of rye plant, *Secale cereale* family Graminae.

**What is ergotism?**



## ACTIVE CONSTITUENTS

```
graph TD; A["ACTIVE CONSTITUENTS"] --- B["A- Alkaloids (Ergometrine and ergotamine)"]; A --- C["B - LSD (lysergic acid diethylamide) a hallucinogenic illegal drug"]; A --- D["C- Ergosterol used in synthesis of Vit. D"]
```

**A- Alkaloids  
(Ergometrine and  
ergotamine)**

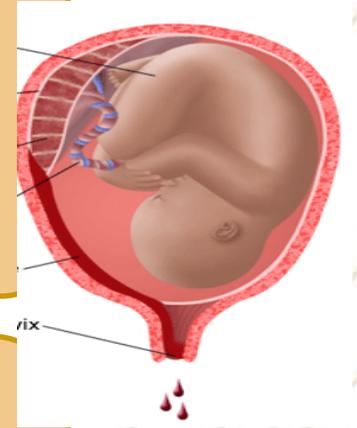
**B - LSD (lysergic acid  
diethylamide)  
a hallucinogenic illegal  
drug**

**C- Ergosterol used  
in synthesis of Vit.  
D**

# USES

## 1- Ergometrine alkaloid:

- **Oxytocic:** It stimulates the uterus → initiate delivery (labor)
- It reduces postpartum hemorrhage



## 2- Ergotamine alkaloid:

- **Vasoconstrictor,** used for the treatment of migraine.
- Used in combination with caffeine to treat headaches.

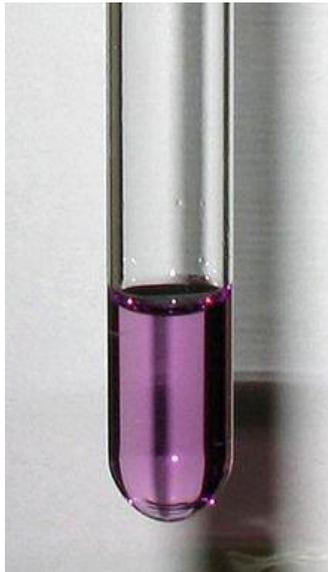


# Pharmaceutical Preparations Containing Ergot Alkaloids



# CHEMICAL TESTS

## 1- Test for Chitin



Digest the sclerotium with NaOH to give chitosan, acetic acid and ammonia.  
Chitosan + Iodine +  $H_2SO_4$  gives violet colour.

## 2-Test for coloring substance

Shake the ergot with ether & 5 drops of  $H_2SO_4$ , add  $NaHCO_3$  and shake well where a reddish violet colour is given in the aqueous layer (used to detect ergot in flour).

## 3- Test for ergotoxin (Van Urk)

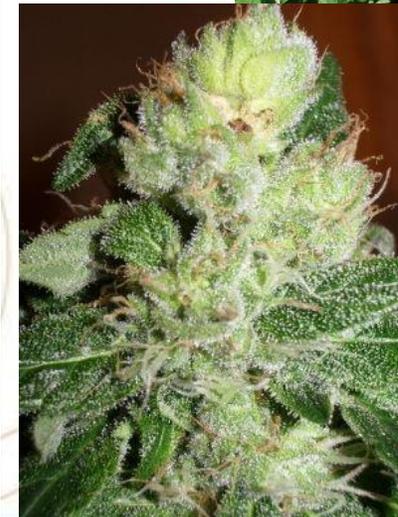
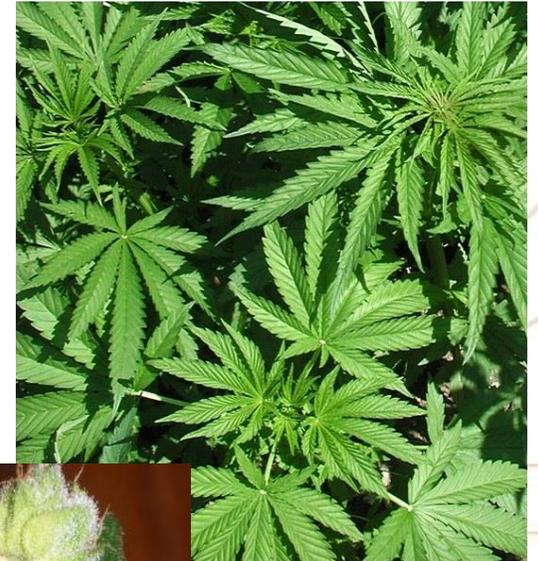
Shake the ergot with  $Na_2CO_3$  and  $CHCl_3$   
Separate the chloroform layer and shake it with Van Urk reagent ( $PDMAB$  and  $FeCl_3$  in  $H_2SO_4$ ) where a blue colour is developed in the acid layer.

# CANNABIS HERB

(Indian Hemp, Hashish, Marihuana)

**Origin:** Is the dried pistillate plants (leaves and flowering tops) of *Cannabis sativa* Family Cannabinaceae.

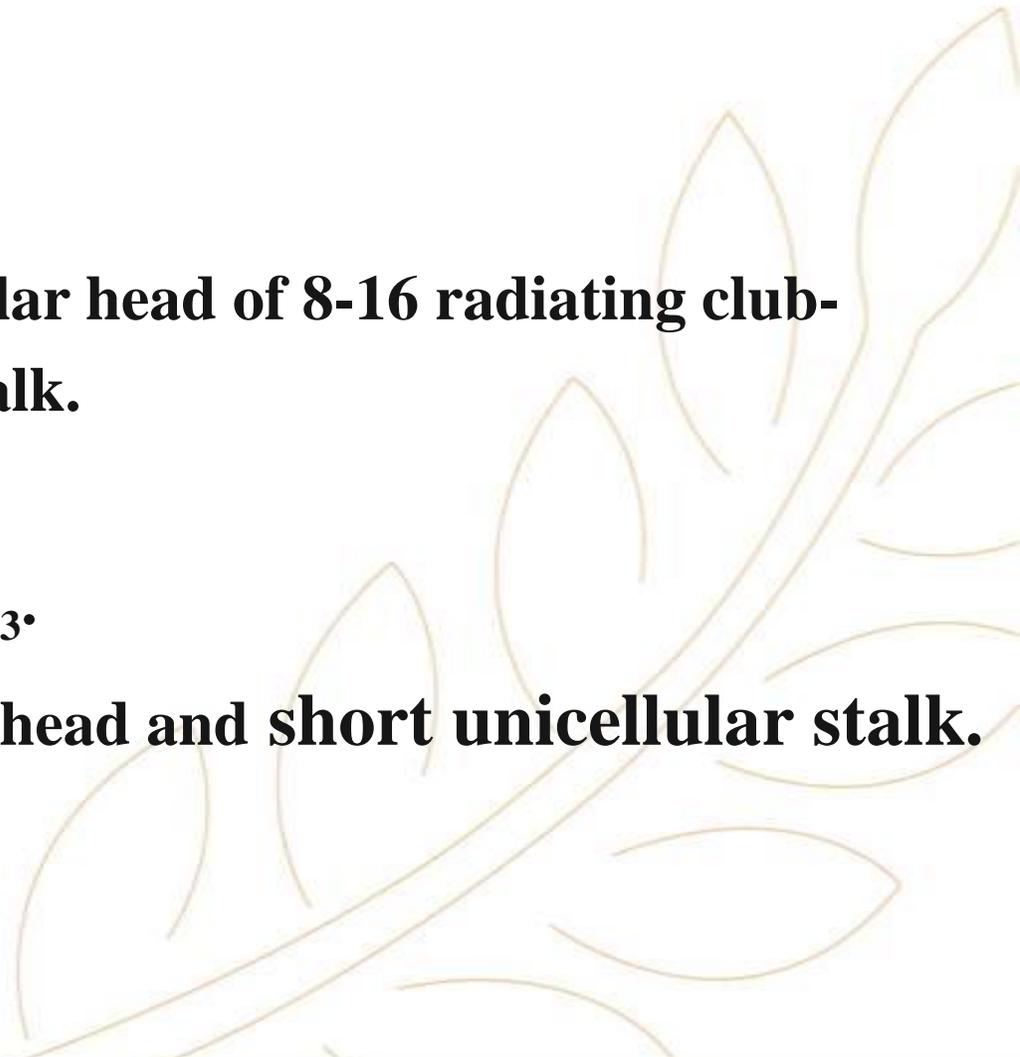
- The plant is cultivated in tropical countries for resin production.
- In temperate region it produces less or no resin but more fibers.



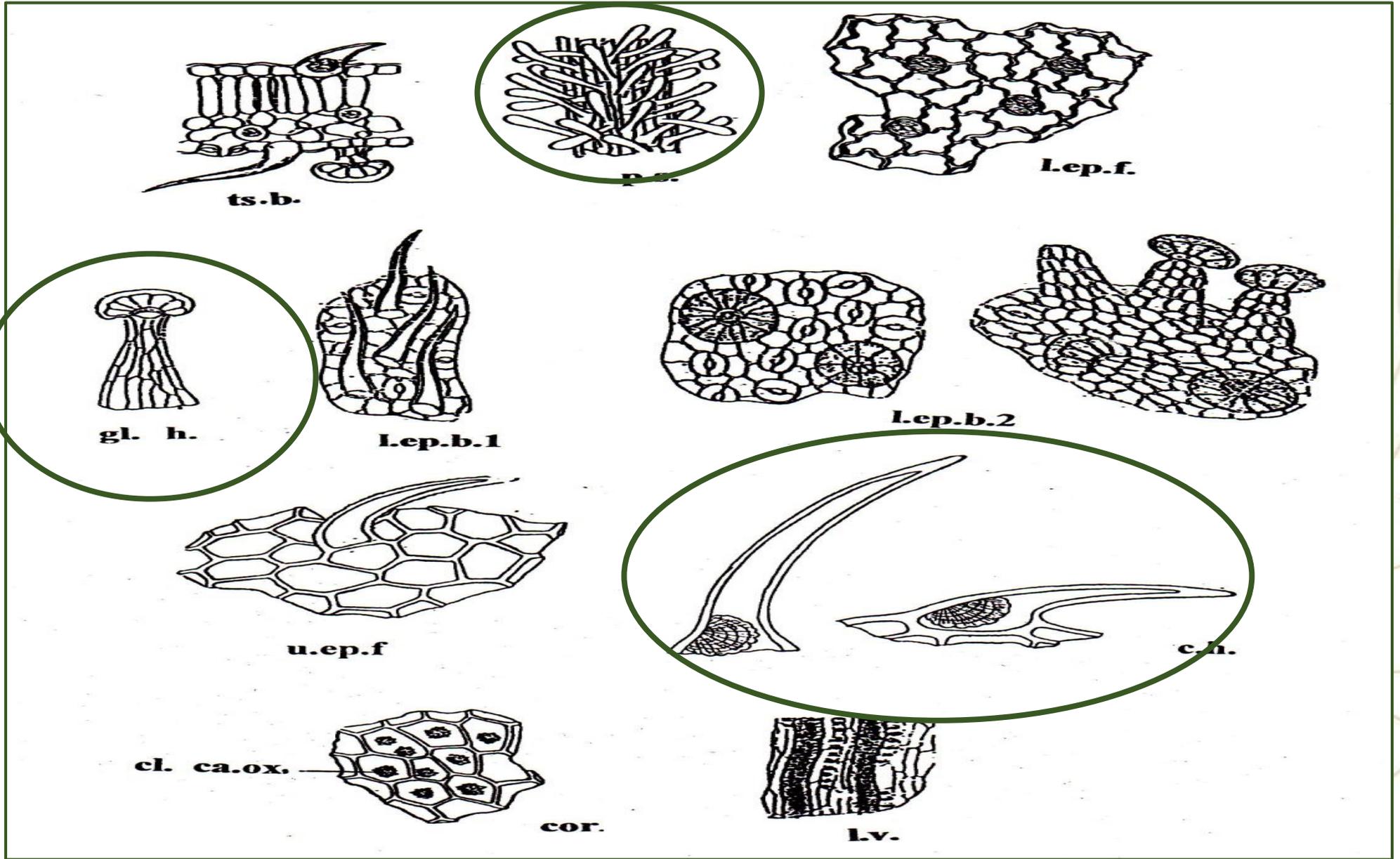
# Powdered cannabis

- **Color:** Dark green
- **Odor:** Narcotic characteristic
- **Taste:** No taste.

## Microscopical characters of the powder:

- **1-Glandular trichomes showing globular multicellular head of 8-16 radiating club-shaped cells and a long multicellular pluriseriate stalk.**
  - **2- leaf tissue with cluster crystal of Ca Ox.**
  - **3- Curved hairs with or without cystolith of CaCO<sub>3</sub>.**
  - **4- Glandular trichomes with labiate glandular head and short unicellular stalk.**
  - **5- Papillosed stigma.**
  - **6- Laticiferous vessels and pericyclic fibers.**
- 

# Powdered cannabis



**1-Resin materials :**

**Tetrahydro cannabinol (THC)  
and cannabinoids e.g.  
Cannabinol & cannabinal**

**2-Nitrogen bases e.g. choline,  
trigonelline**

**ACTIVE CONSTITUENTS**

**3-Volatile oil, oxidase enzyme**

**4-Sterols**

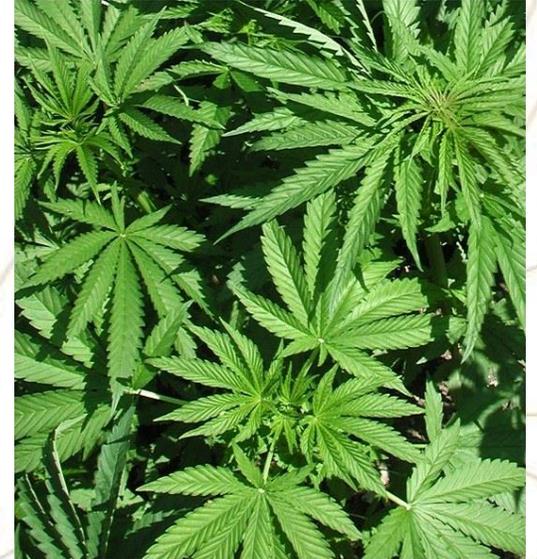
# USES & ACTIONS

**1- CNS stimulant, it produces mental excitement , delirium with hallucination followed by sleep interrupted by bad dreams & marked weakness & mental depression, high sensitivity to sound and less to time & space.**

**2- Analgesic**

**3- Anti anxiety & sedative in mania & hysteria**

**4- THC is a potent anti-emetic used in cancer patients**



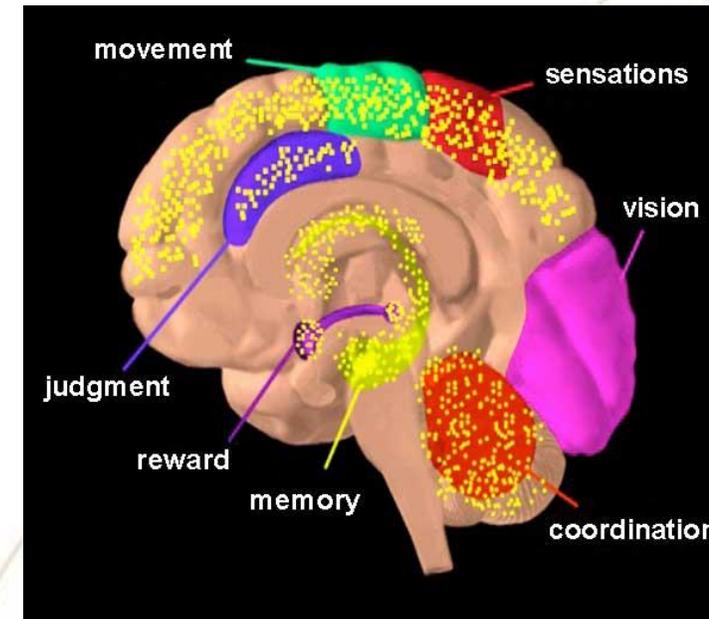
# Side Effects

## ❑ Short term side effects:

Decrease in short-term memory, dry mouth, impaired motor skills, red eyes and feelings of paranoia or anxiety

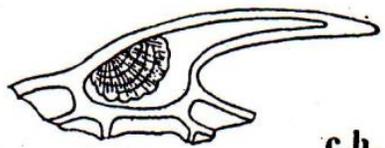
## ❑ Long term side effects:

Addiction, decreased mental ability in those who started as teenagers, and behavioral problems in children whose mothers' used cannabis during pregnancy.



# CHEMICAL TESTS

**1- Powder+ HCl produces eff. due to calcium carbonate in cystolith.**



c.h.

**2- Beam's test:**  
**Cannabis shaken**  
**with light petrol**  
**and alc. KOH and**  
**amyl alcohol give**  
**violet pink colour.**

**3- Fast blue test:**  
**(di-O-anisidine**  
**tetrazolium**  
**chloride)**

**Biological samples +**  
**Fast Blue reagent**

**Different sequences**  
**of colors with**  
**different**  
**cannabinoids**



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