

QUALITY CONTROL OF CRUDE DRUGS

Microscopical Evaluation



By

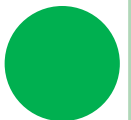
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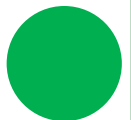
Rama University, Kanpur.

EVALUATION



MICROSCOPICAL EVALUATION

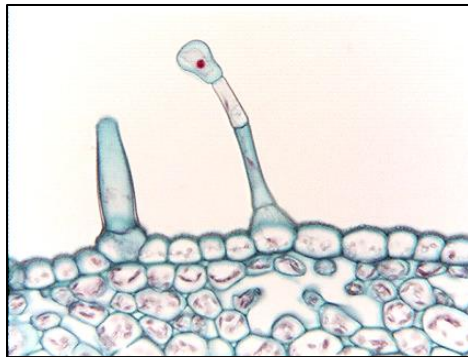
- Refers to the character and arrangement of these tissues as they are present in the herb.
 - Transverse section (T.S.)
 - Longitudinal sections (L.S.)
- The sections are cut by razor or microtome, treated with **choral hydrate and HCl** solution with gentle heating to remove chlorophyll and treated with **phloroglucinol** to give coloured section.
- Powdered herbs possess very few macroscopic features of identification outside of colour, odour and taste.



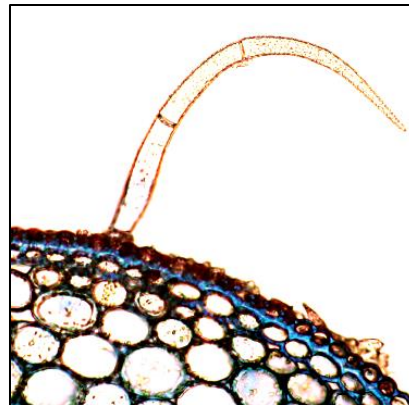
POWDER MICROSCOPY

○ Leaves:

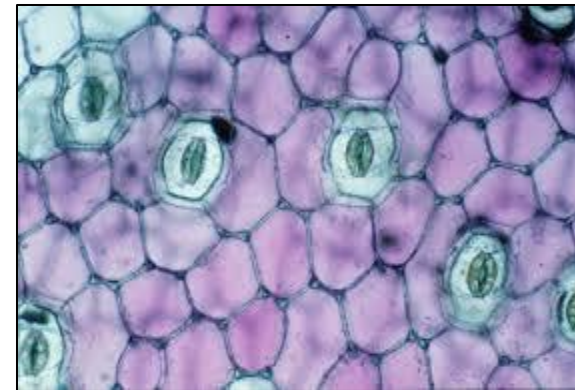
- Trichomes (Glandular and Covering)
- Crystals of calcium oxalate (Rosette, needle shaped)
- Stomata (paracytic, diacytic, anisocytic, anomocytic)
- Epidermis cells, palisade,
- Vessels



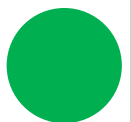
Glandular
Trichomes
A. belladonna



Covering
Trichomes
D. stromonium



Paracytic Stomata
Senna leaves



○ Flower:

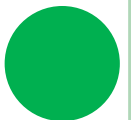
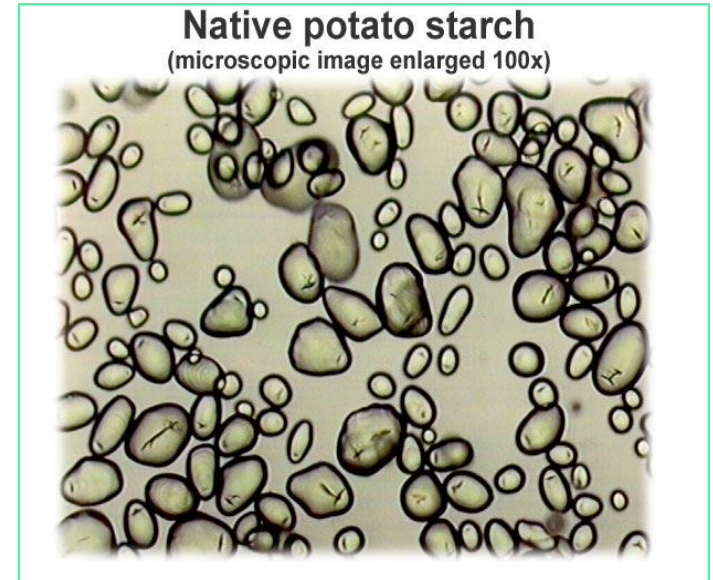
- Trichomes (glandular and covering)
- Epidermis, stigma, anther.
- Pollen grain
- Volatile oil

○ Fruits and seeds:

- Starch grains (Polyhedral, oval)
- Aleurone grain
- Sclerenchyma
- Vittae
- Endocarp

○ Bark & wood:

- Phloem, xylem
- Trachides, Parenchyma, wood Parenchyma
- Fibers, medullary rays, cork, cambium.



QUANTITATIVE MICROSCOPY

- **Palisade ratio:** Number of palisade cells under one epidermal cell using four continuous epidermal cells for the count.
- **Stomata index:** It is the percentage of the number of stomata to the total number of epidermal cells, each stomata being counted as one cell.

$$\text{Stomatal index} = (S/E+S) * 100$$

(S) Number of stomata per unit area

(E) Number of epidermal cells in the same unit area.

- *Cassia angustifolia* (Indian)(both surface) 17.1-18.7-20
- *C. acutifolia* (Alexandrian) (both surface) 11.4- 12.2-13



○ Stomatal numbers:

It is an average number of stomata per mm² of epidermis.

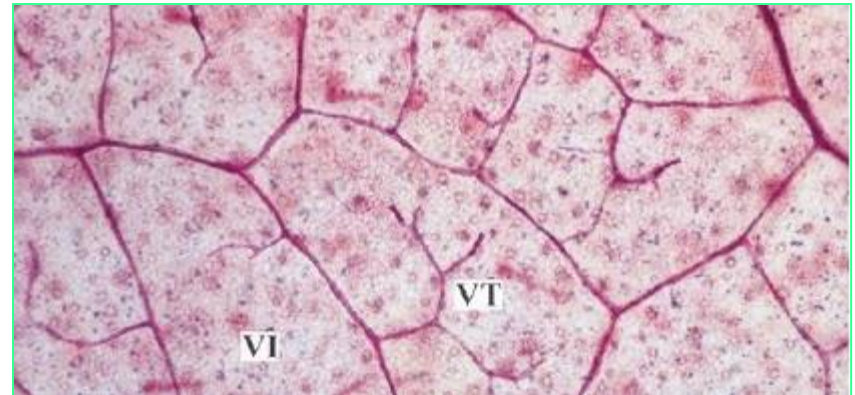
Plant	Stomatal number	
	Upper surface	Lower surface
<i>Atropa belladonna</i> , European	7.5-10-17.5	77.5-113-176.5
<i>Atropa acuminata</i> Indian	6-14-37.5	62.5-93-174

○ Vein-islet number

Average number of vein islet per mm² of the leaf surface midway between the midrib and the margin.

Cassia angustifolia 25-30

Cassia acutifolia 19-23



VI= Vein Islet

VT= Vein Termination



- **Vein-termination number :**

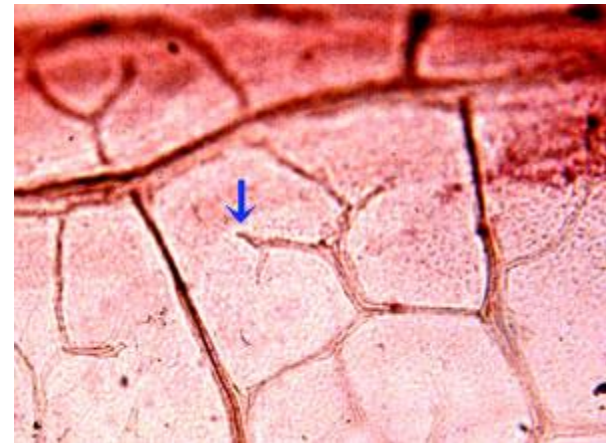
Average number of **vein termination** per mm² of the leaf surface midway between the midrib and the margin.

- It can be used to distinguish between leaves of closely related species.

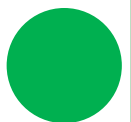
- *Atropa belladonna* **6.3-10.3**

- *Digitalis purpurea* **2.5-4.2**

- *Hyoscyamus niger* **12.4-19.0**



Vein Termination



THANK YOU

