# Evaluation of crude drug

Pharmacognosay
Lecture(5)

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Drugs
Of
Evaluation

**To evaluate a drug means to identify it &to determine its quality & purity**

**Identify – identification of biological source of the drug.**

**Quality – the quality of the active constituents present.**

**Purity – range of foreign organic material present in a crude drug.**

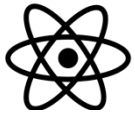
# To evaluate a drug this involves a number of methods:

Organoleptic

Microscopic

Biological

Chemical



Physical

Spectral analysis

# 1) Organoleptic evaluation of a drug:

This refers to drug evaluation by means sense organs and includes :

**A) Shape & size**

**B) Color**

**C) Texture**

**D) Odor & taste**

# 2) Microscopic evaluation of a drug:

**the microscope used in the examination of drug. The microscope is not only used to study the**

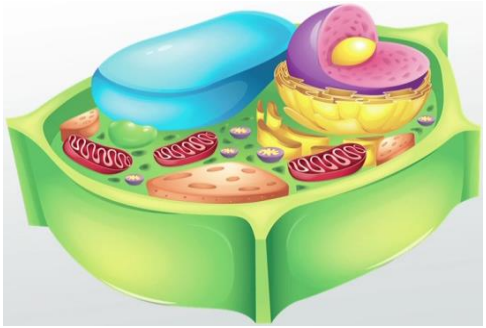
**1) adulteration in the powdered plant or animal drugs.**

**but it is so important in the**

**2) identification of pure powdered compounds.**

# Why we use Microscope??

- Powdered drugs possess very few macroscopic characteristic that are very important in the identification.
- The cells of powered drugs of being mostly broken that the content(like starch, lignin calcium oxalate crystals, fibers, .. ect)



# Each cell has:

1) Fibers, vessels, epidermal cells, stomata.

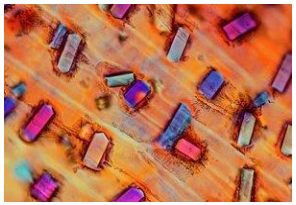
2) Cell contents & secondary metabolites.

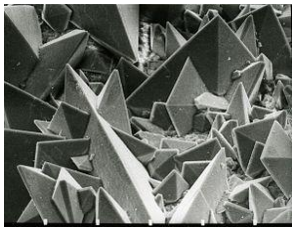
1 & 2 called tissue elements

The presence or absence of these tissue elements which is seen under the microscope are used to determine the type of powdered drug.

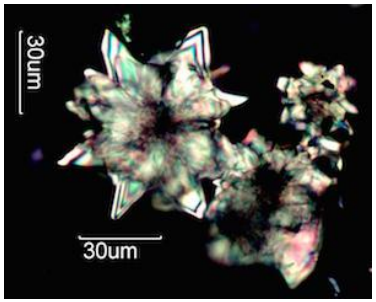
# Calcium oxalate crystals appear as :

## A) Package of needles in onions.

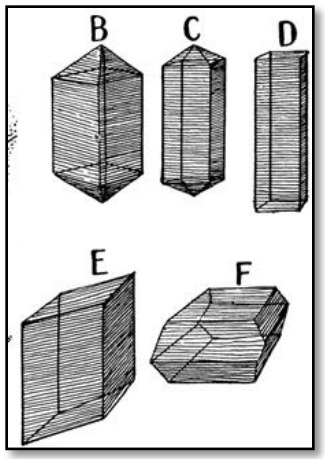




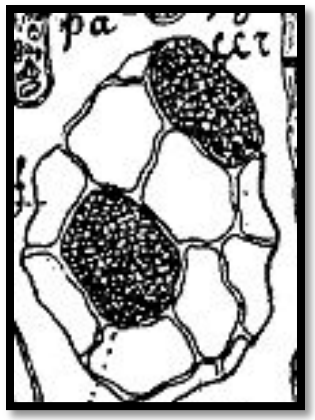
## B) Star or flower shape (clusters) in Rhubarb



## C) Crystal sheath (Prisms) in Liquorice & Senna.

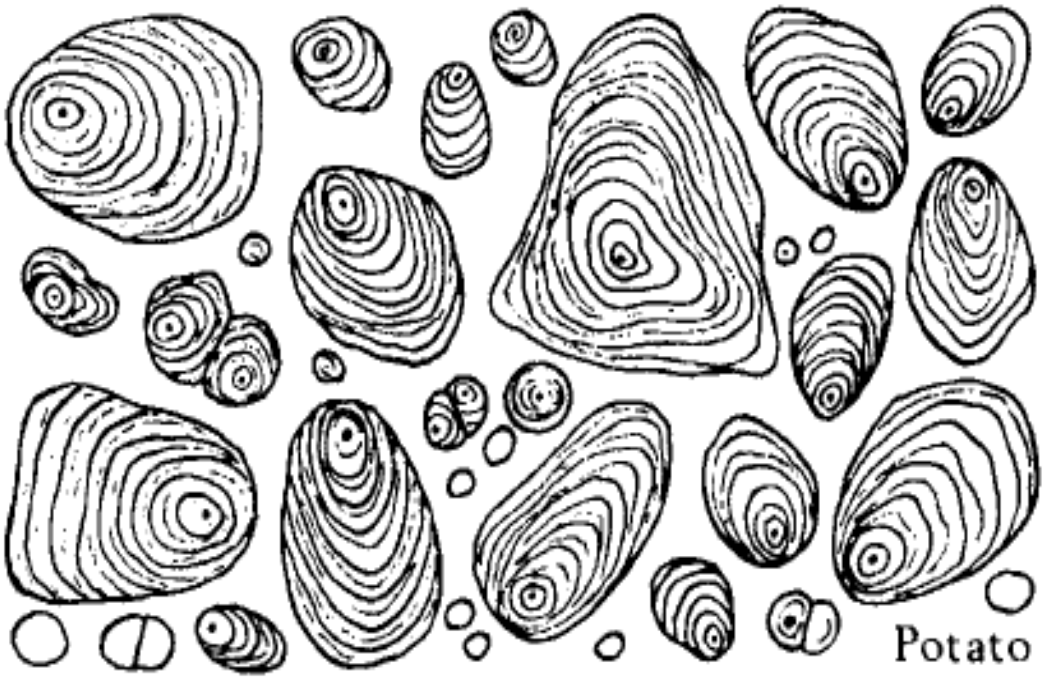


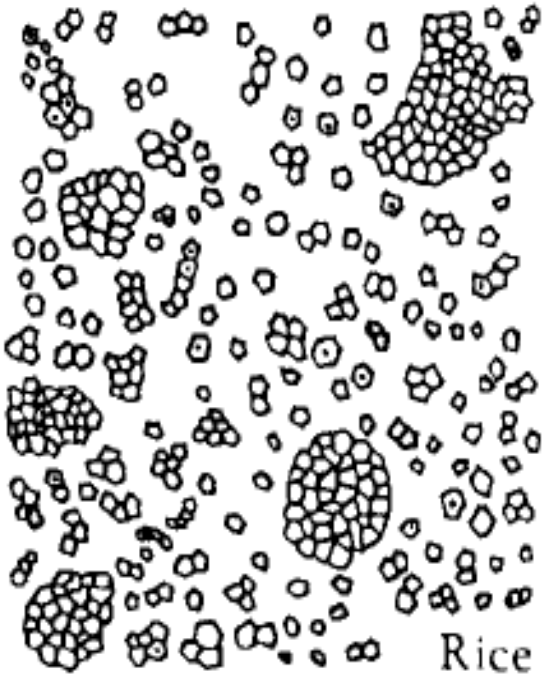

## D) Microcrystals as in belladonna.

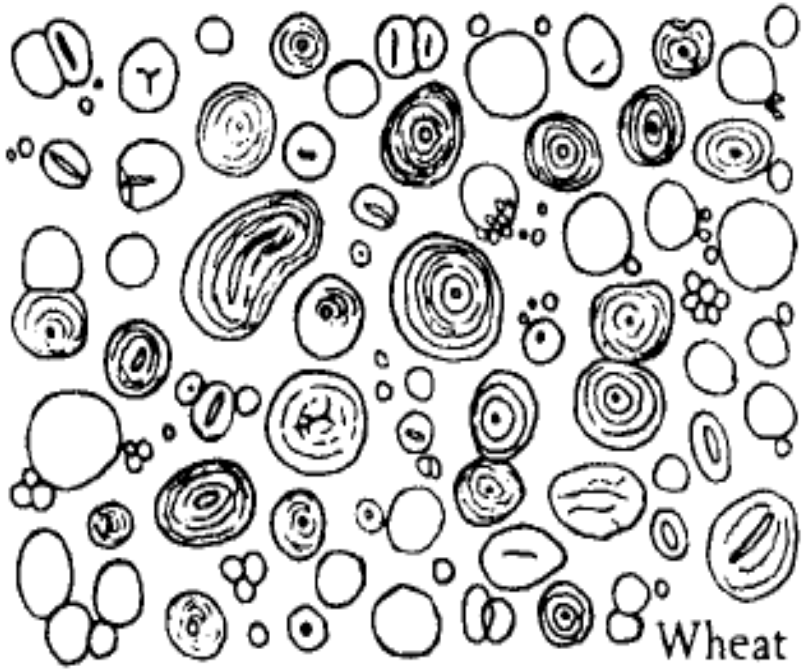


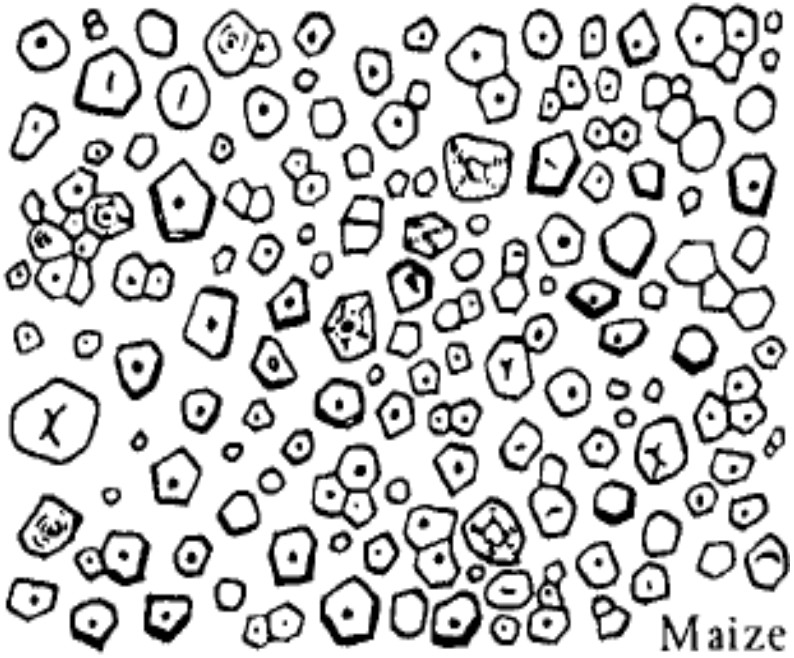
# Other example is Starch

Starch have the same color but under the microscope we can differentiate between the different types of starch grains.


Potato


Rice

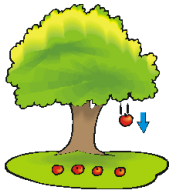

Wheat


Maize

# 3) Physical methods of evaluation

**The physical properties that are used for identification are:**

**Solubility**



**Specific gravity**

**Refractive index**

**Melting point**

**Water content**

# 4) Chemical methods of evaluation of a drug:

**By using chemical tests to evaluate crude drug (to determine the active constituents of the drug) by using chemical reagents in a colored reaction, such as:**

1) Drug contain alkaloid → Dragendroff's → Orange to red color

2) Drug contain glycoside → KOH sol. 5% → Red color

3) Drug contain Tannins → $FeCl_3$ sol. → Green to brown color

# 5) Biological evaluation of a drug:

- **This evaluation include biological assay or bioassay.**
- **examples : determination of antimicrobial activity of some drugs, antitumor activity, antioxidant activity, antifertility activity, hypoglycemic activity and neuro pharmacological activity .**

# 6) Spectroscopic or spectrometric method of evaluation:

**This method can be used for evaluation of pure drugs or compounds from crude drugs.**

**spectrometric method**
**requires the isolation of the active constituent & then evaluate it by these methods (UV, IR, FT-IR, etc…..)**


good luck on
midterms!