

University of Ahlulbait  
College of pharmacy  
SECOND CLASS

# **Microscopical identification of crude drugs and cell contents**

Lab:3

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## Cork Tissue

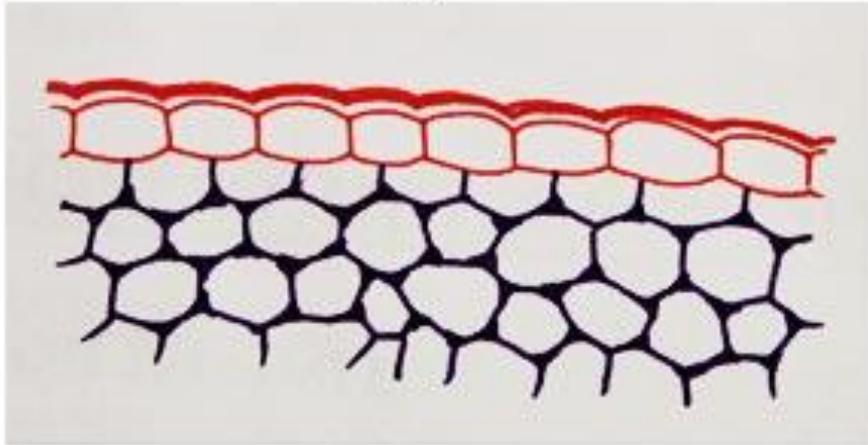
- \* Outer protective tissue of older Stems and roots formed by secondary lateral meristem called cork cambium.
- \* Rectangular in outline.
- \* Compactly arranged in several layers.
- \* Intercellular space – absent .
- \* Older cells – dead and filled with tannins , resins and air .

## Collenchyma Tissue

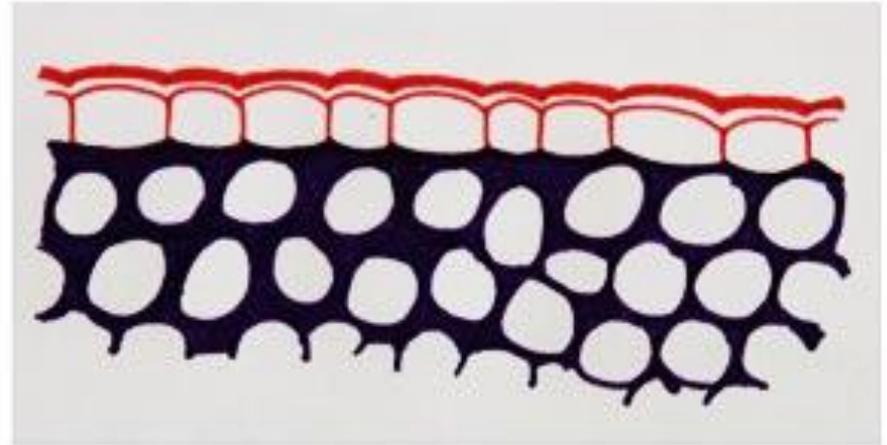
- \* the cells are elongated and are circular , oval or polygonal in cross - section .
- \* Cell wall is unevenly thickened with cellulose at the corners against the intercellular spaces .
- \* Intercellular spaces are generally absent .
- \* Collenchyma cells have a support function in plants , particularly in young plants . These cells help to support plants while not restraining growth due to their lack of secondary walls and the absence of a hardening agent in their primary walls.

# Types of Collenchyma in Plants

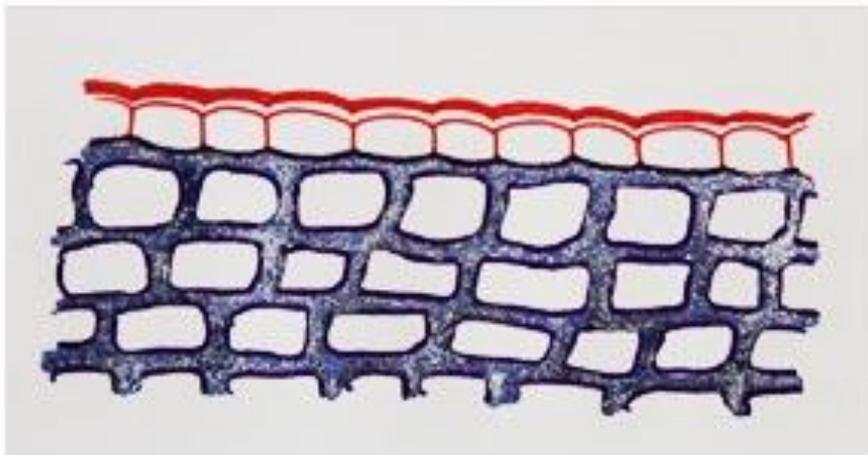
Angular



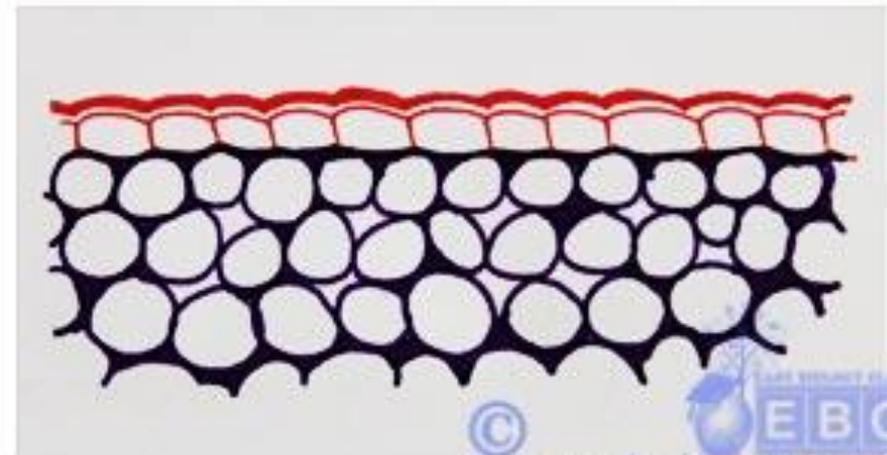
Annular



Lamellar



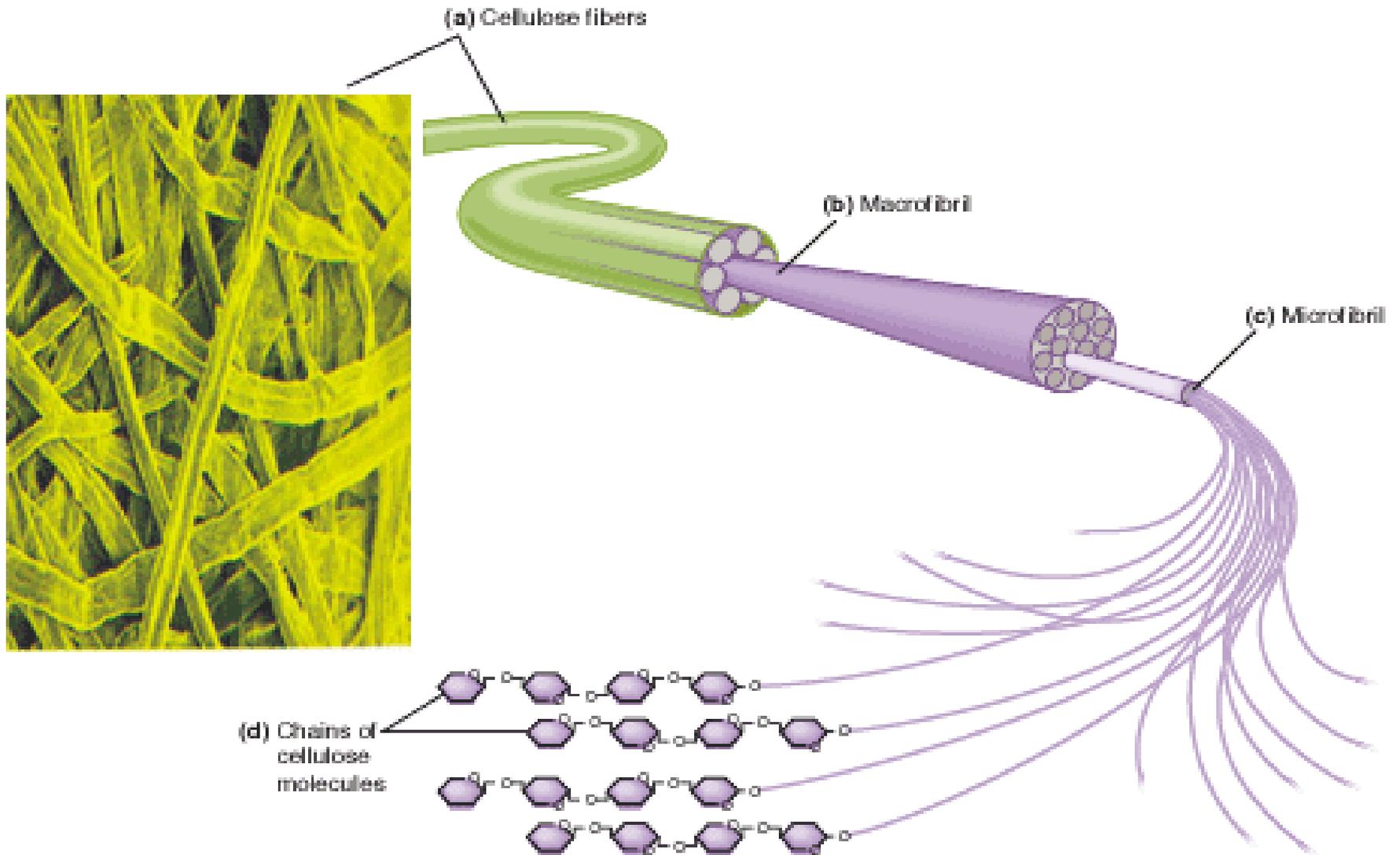
Lacunar



# Fibers

The cell wall of the fiber cells – which is what gives them their properties of strength and elasticity – are mostly cellulose, although there may also be lignin, tannins, gums, pectins and other polysaccharides present .

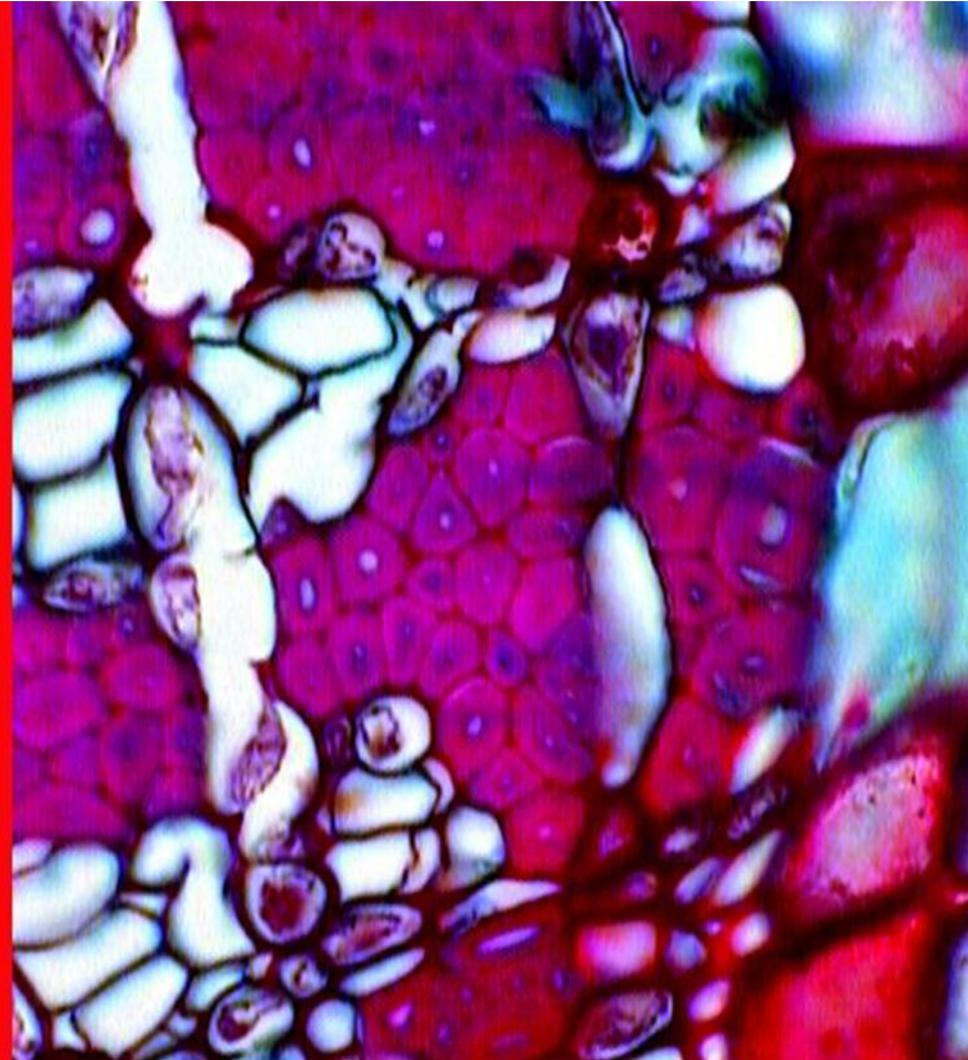
# Cellulose Fibers (للإطلاع)



# للإطلاع



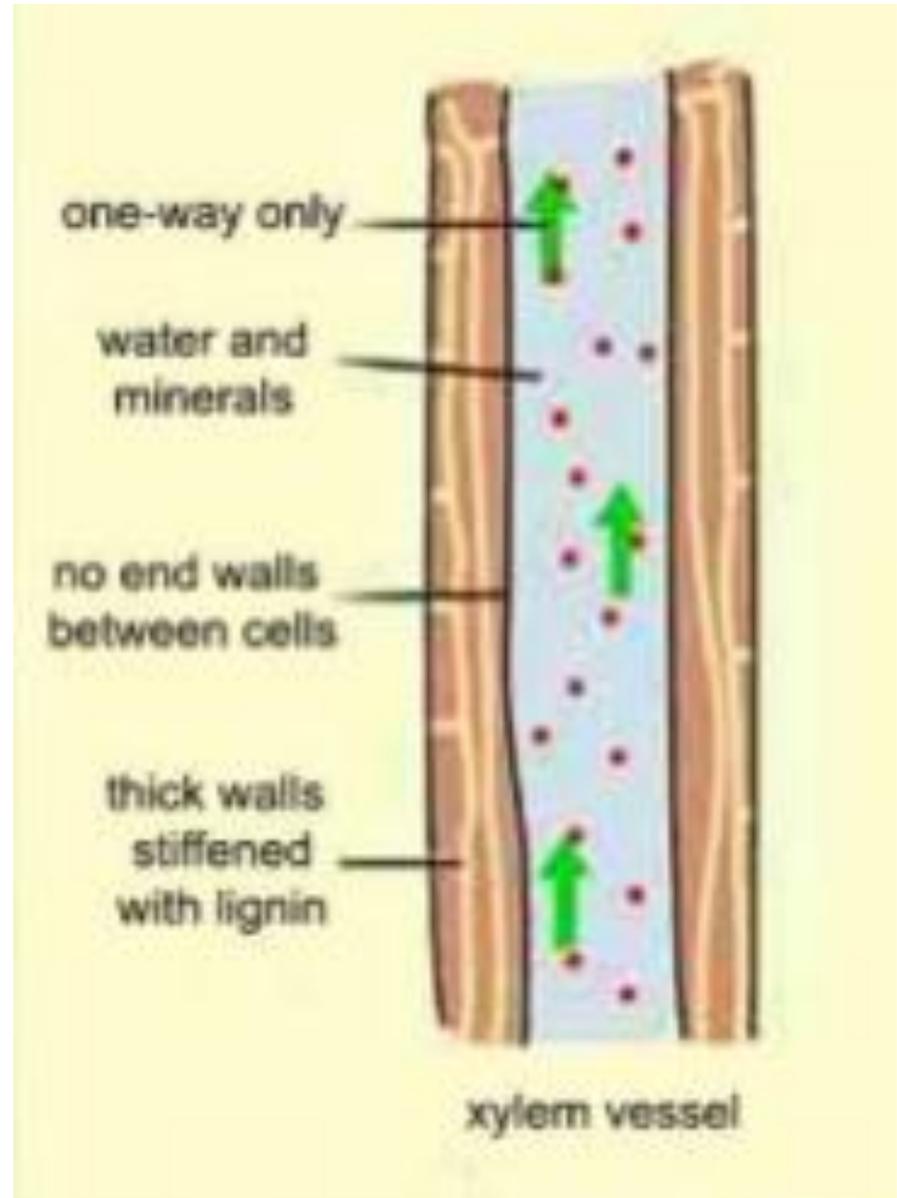
**longitudinal View 40x**



**cross section 1000x**

# Xylem

Carries water and nutrients that enter the plant in the root up through the stem and out to parts of the leaf .



# Secretory tissue

Divided in to two groups :

1. Laticiferous tissue .
2. Glandular tissue .

Function : includes the secretion of gums , resins , volatile oils , nectar , Latex , and other substances in plants .

## Cell contents

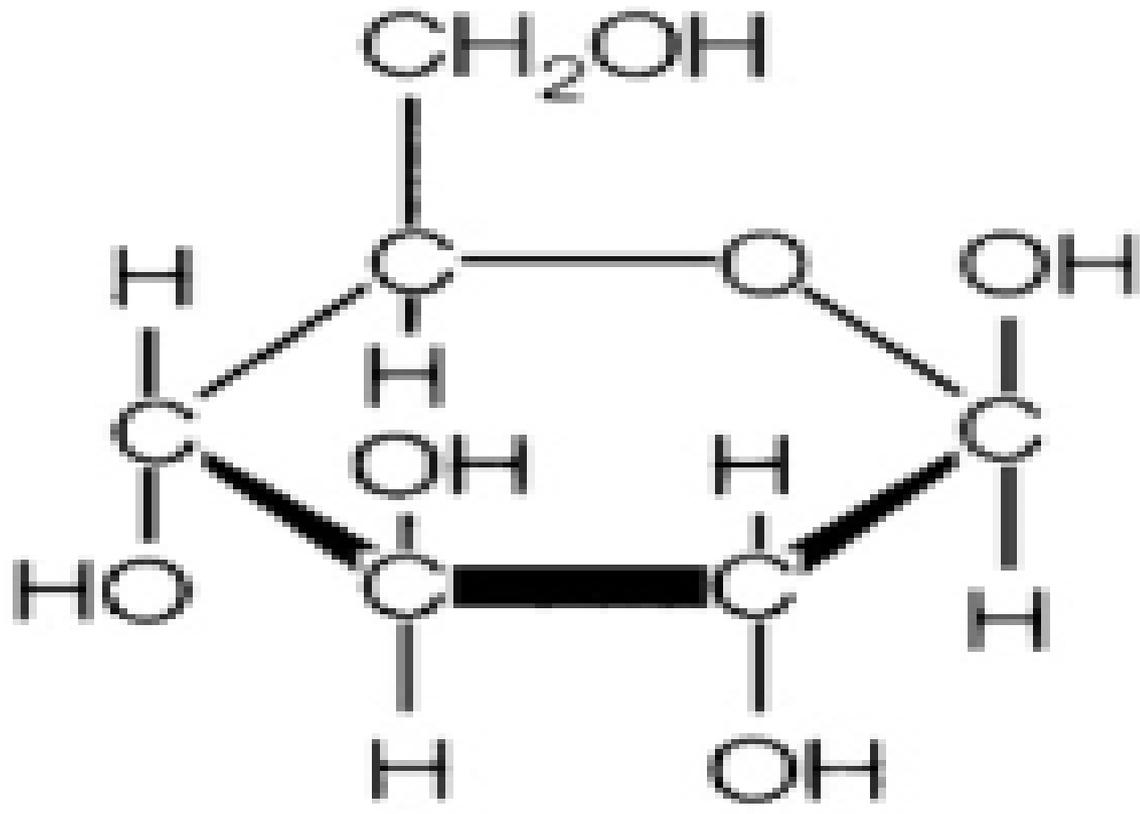
Cell contents which we are concerned in Pharmacognosy are those which can be identified in vegetable drugs by microscopic examination or by chemical and physical tests. These cell contents represent either food storage products. e.g. starch or by products of metabolism and these include carbohydrates, proteins, fixed oils, fats, alkaloids, purines, glycosides, volatile oils, gum, mucilage resins, tannins, calcium oxalate, calcium carbonate, and silica.

# Starch

This is a polysaccharide that is found in plants the form of small grains . Larger amounts are found in the seeds and another storage organs such as potato tubers .

Starch forms an important component of food and is major energy source in most diets .

Starch is made of along chain of  $\alpha$ - glucose mono saccharides linked by glycosidic bond . These bonds are formed by condensation reactions .



**Hilum is the starting point of formation of starch granules , the position of the hilum either central or eccentric . There are different shapes of hilum ( dot , curved , multiple cleft ).**

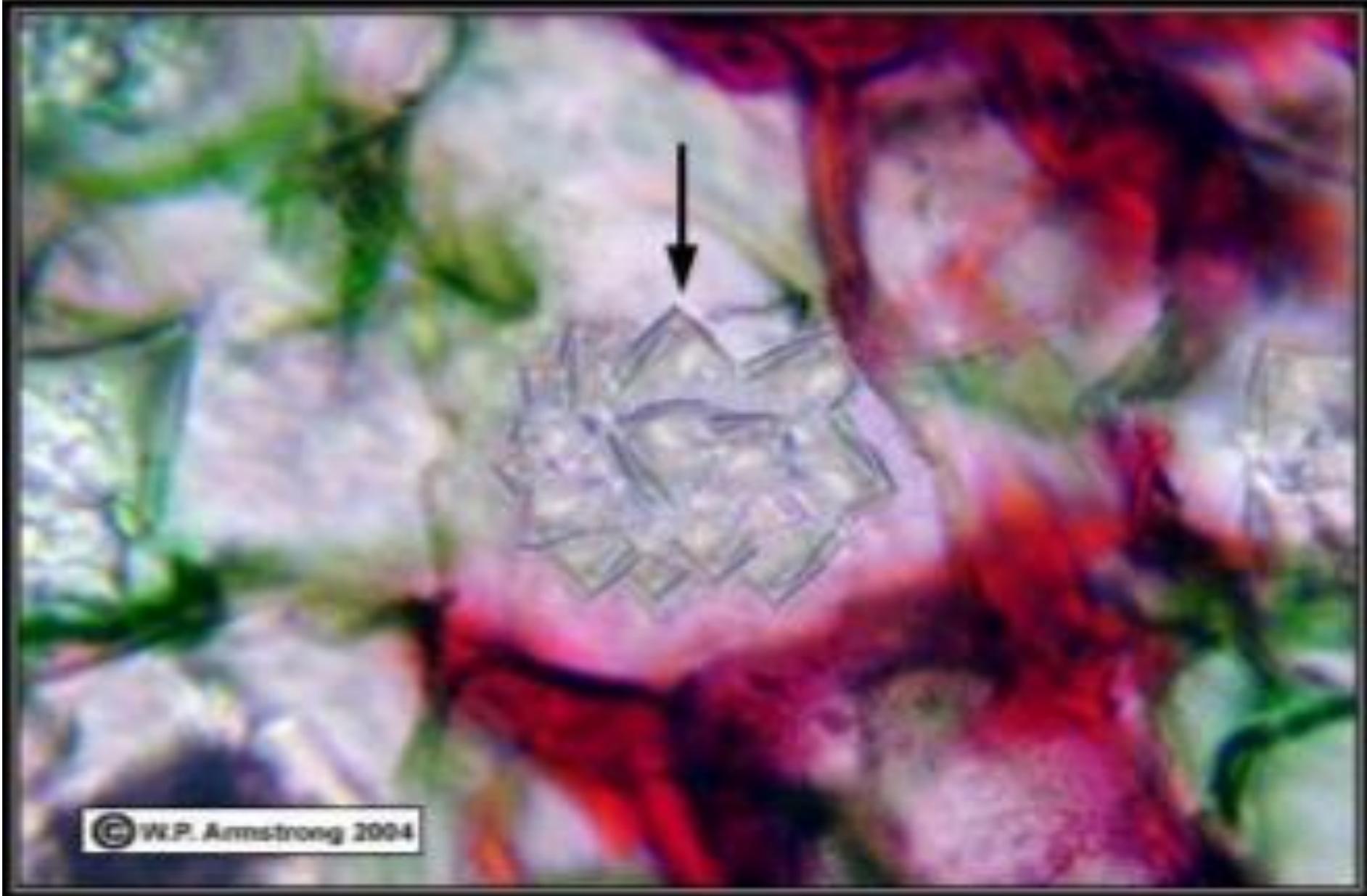
## Calcium oxalate crystals

Generally found in the vacuoles and are as follows :

1. Raphides : needle like crystals which occur singly .
2. Prismatic - prism-like or pyramid - like crystals found

In leaves of begonia

3. Rosette - aggregate of crystals which has flower - like apperance in stem of Kutsarita plant .



Calcium oxalate crystal in *Tilia* sp.