



Epidermal tissue system – Part 2

Anto Joseph

Session outcome

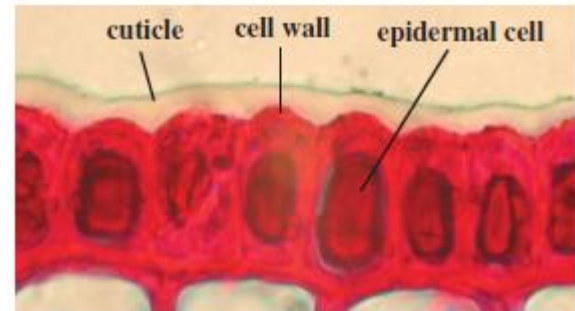
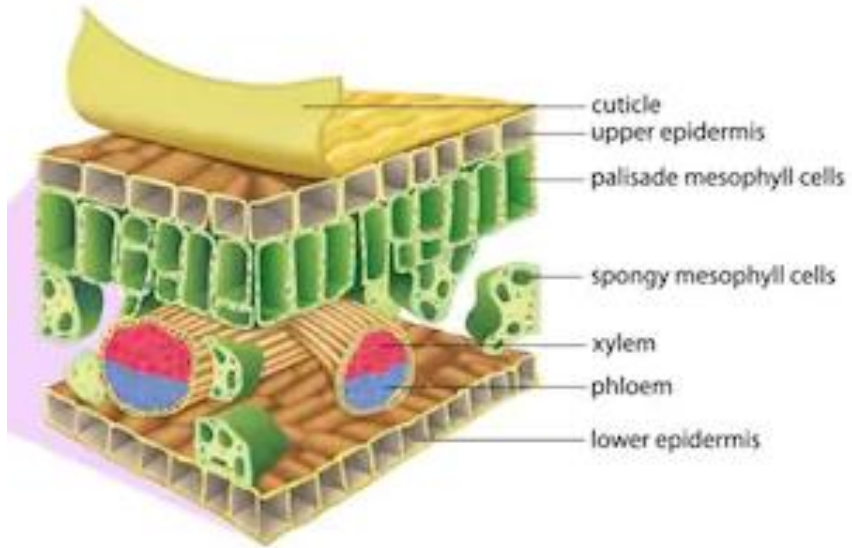


- Cuticle
- Stomata
- Types of stomata
- Trichomes
- Bulliform cells

Cuticle

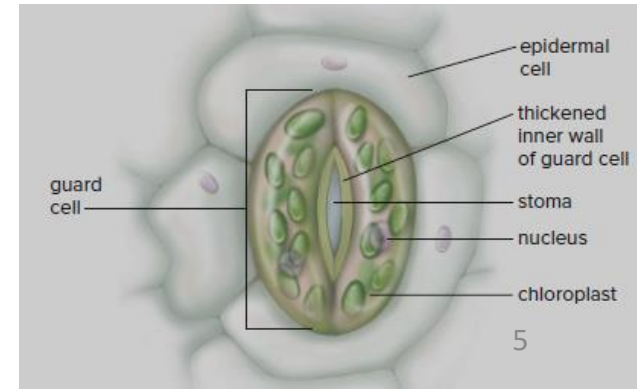


- The plant cuticle is an extracellular hydrophobic layer that covers the aerial epidermis of all land plants.
- Made up of cutin – a water impermeable waxy material
- Cutin is formed from fatty acids.
- It provide protection against desiccation and external environmental stresses.



Stomata

- The stomata are **minute pores** which occur in the epidermis of plants.
- Each Stomata is surrounded by two bean shaped epidermal cells - the **guard cells**.
- The epidermal cells bordering the guard cells are called accessory cells or **subsidiary cells**.

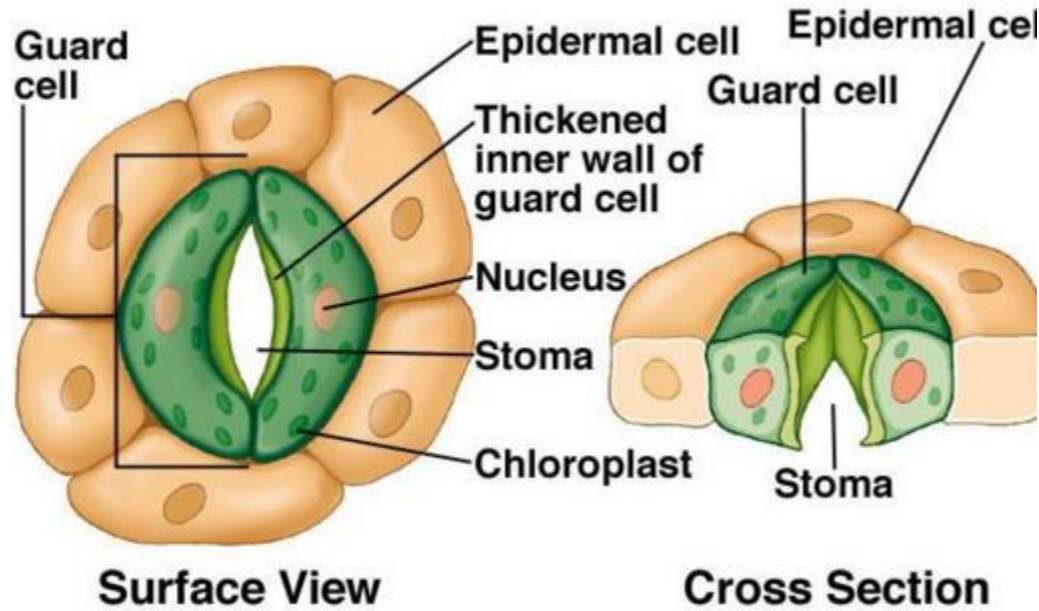




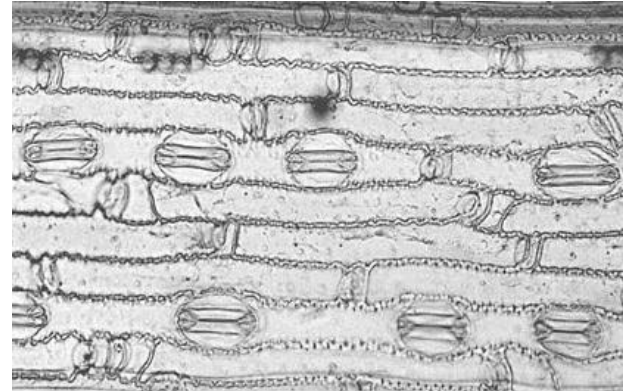
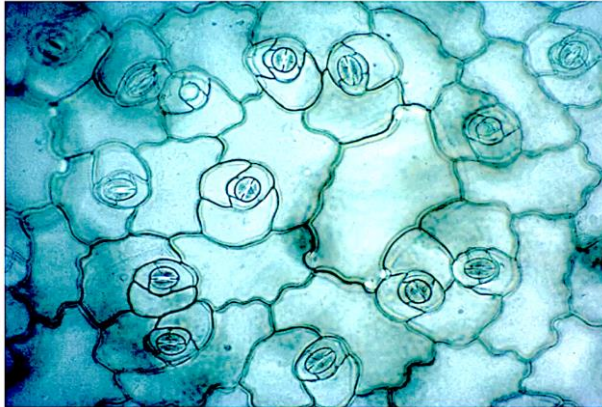
- The guard cells are specialized epidermal cells which are kidney shaped in surface view.
- They contain chloroplast and starch grains.
- The walls of guard cells have Peculiar Thickening.
- The walls that face the stomata are thickened and the outer walls are thin.



Stoma



- Usually in the leaves of dicotyledonous the stomata remain scattered whereas in the leaves of monocotyledons they are arranged in parallel rows.



Stomatal Distribution in Monocot Leaf (Parallel)



- In floating leaves stomata are confined only on the upper surface of the leaves.





- At normal conditions stomata remain closed in the absence of light and remain open in the presence of light.

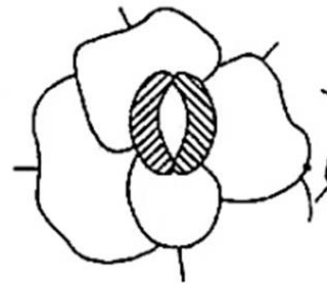
Types of stomata



- In dicots
 - Anomocytic stomata
 - Anisocytic stomata
 - Paracytic type
 - Diacytic type
- In Monocots
 - Gramineous type

Anomocytic stomata

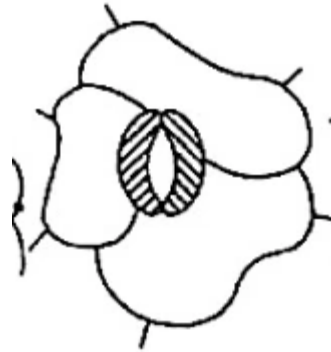
- It is also known as Ranunculaceous type
- The stomata remains surrounded by a limited number of subsidiary cells **which are quite alike the remaining epidermal cell.**



Anomocytic

Anisocytic stomata

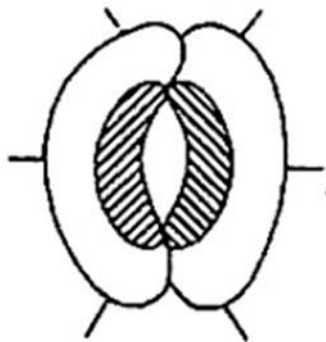
- Also known as cruciferous type
- In this type, the stoma remain surrounded by three subsidiary cells of which **one is distinctly smaller than the other two.**



Anisocytic

Paracytic type

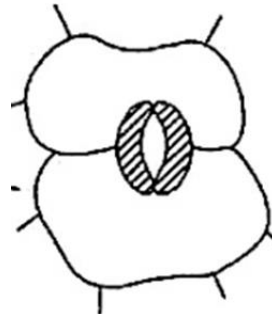
- Also known as Rubiaceous type
- In this type, the stoma remains surrounded by two **subsidiary cells** which are **parallel to the long axis of the pore and guard cells**.



Paracytic
And Joseph

Diacytic type

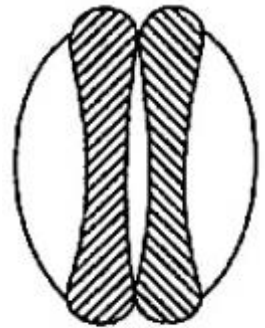
- Caryophyllaceous type
- In this type, the stoma remains surrounded by a pair of subsidiary cells , whose **common wall is at right angles to the guard cells.**



Diacytic
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Gramineous type

- The gramineous stoma possesses guard cells of which the middle portions are much narrower than the ends so that the cells appear like dumb – bells like in surface view.



Gramineous

Trichomes



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Trichomes or hairs

- Epidermal outgrowths
- Found singly or less frequently in groups
- They may be unicellular or multicellular
- Dead or living cells

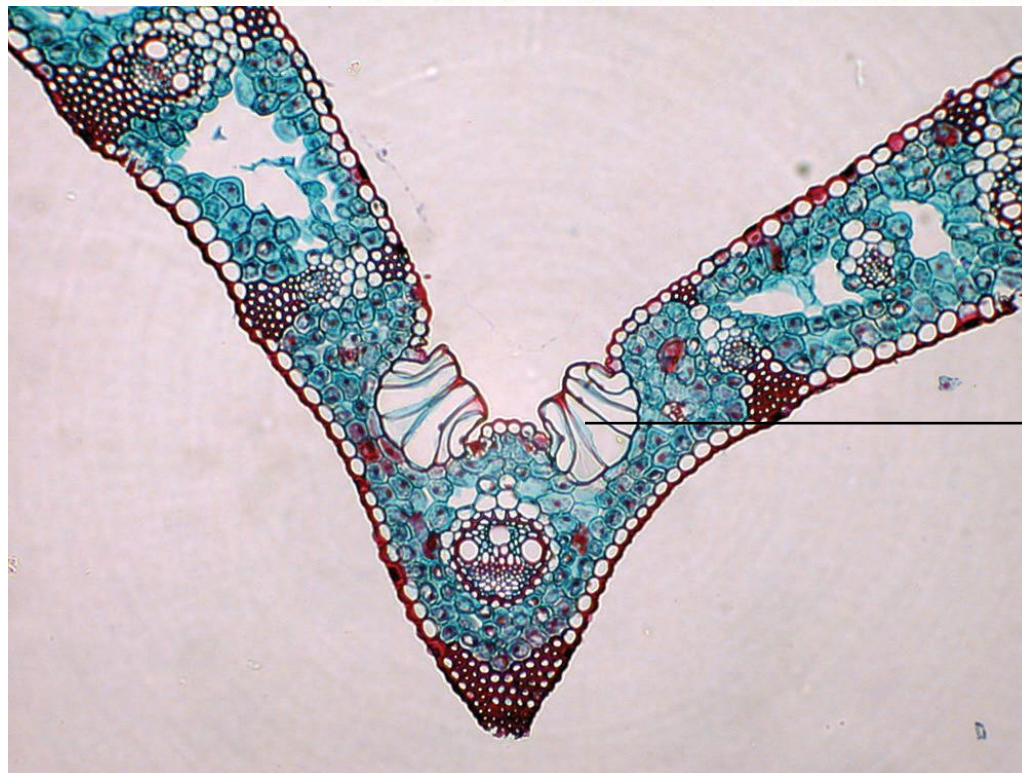
Types

- Stinging hairs
- Glandular hairs
- Scale or peltate hairs

Bulliform cells



- Bulliform cells or motor cells are large, bubble-shaped epidermal cells that occur in groups on the upper surface of the leaves of many monocots.
- These cells are present on the upper surface of the leaf. They are generally present near the mid-vein portion of the leaf and are large, empty and colourless.
- They are involved in folding and unfolding of leaf tissue in order to control light intensity and reduce overall water loss.



→ Bulliform cells

Thank
you!!!