

ANATOMY OF FLOWERING PLANTS

Study of internal structure of plants/animals is called anatomy.

Plants have cells as the basic unit, cells are organized into tissues and in turn the tissues are organized into organs.

There are three types of tissue systems on the basis of their structure and location.

1. The epidermal tissue system
2. The ground or fundamental tissue system
3. The vascular or conducting tissue system.

Epidermal Tissue System

Consists of Epidermal cells (The outermost single layer of cells)

Parenchymatous elongated and compact cells with a small amount of cytoplasm lining the cell wall and a large vacuole.

Presence of waxy thick layer called the cuticle it prevents the loss of water. Cuticle is absent in roots

Stomata (present in the epidermis of leaves)

Stomatal apparatus composed of two bean shaped cells known as guard cells which enclose stomatal pore.

Specialized cells known as subsidiary cells around guard cells. The outer walls of guard cells (away from the stomatal pore) are thin and the inner walls (towards the stomatal pore) are highly thickened

In grasses, the guard cells are dumb-bell shaped.

- Stomata regulate the process of transpiration and gaseous exchange.
- The guard cells possess chloroplasts and regulate the opening and closing of stomata.

Epidermal appendages

Trichomes

Multicellular epidermal hairs on the stem they are called trichomes.

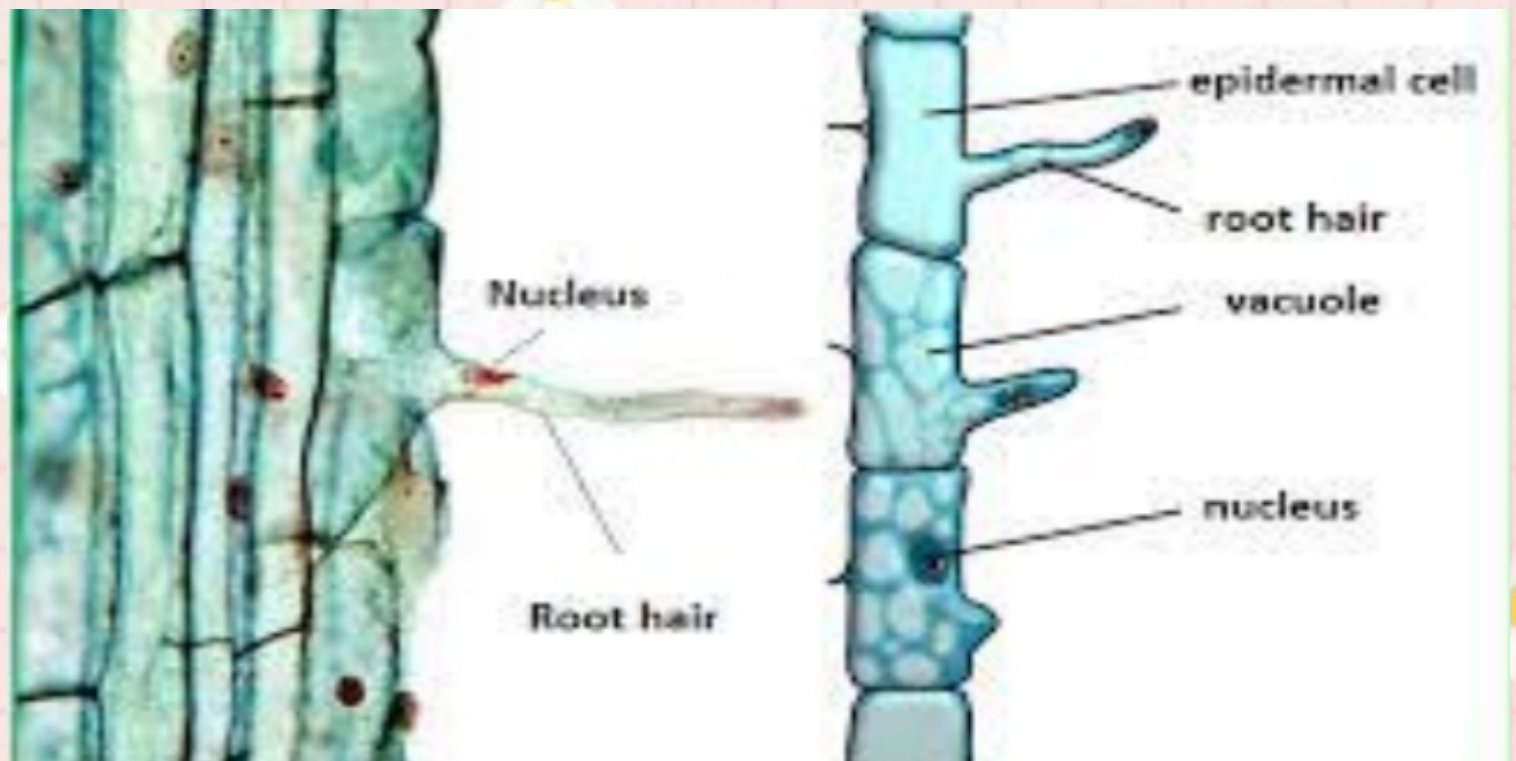
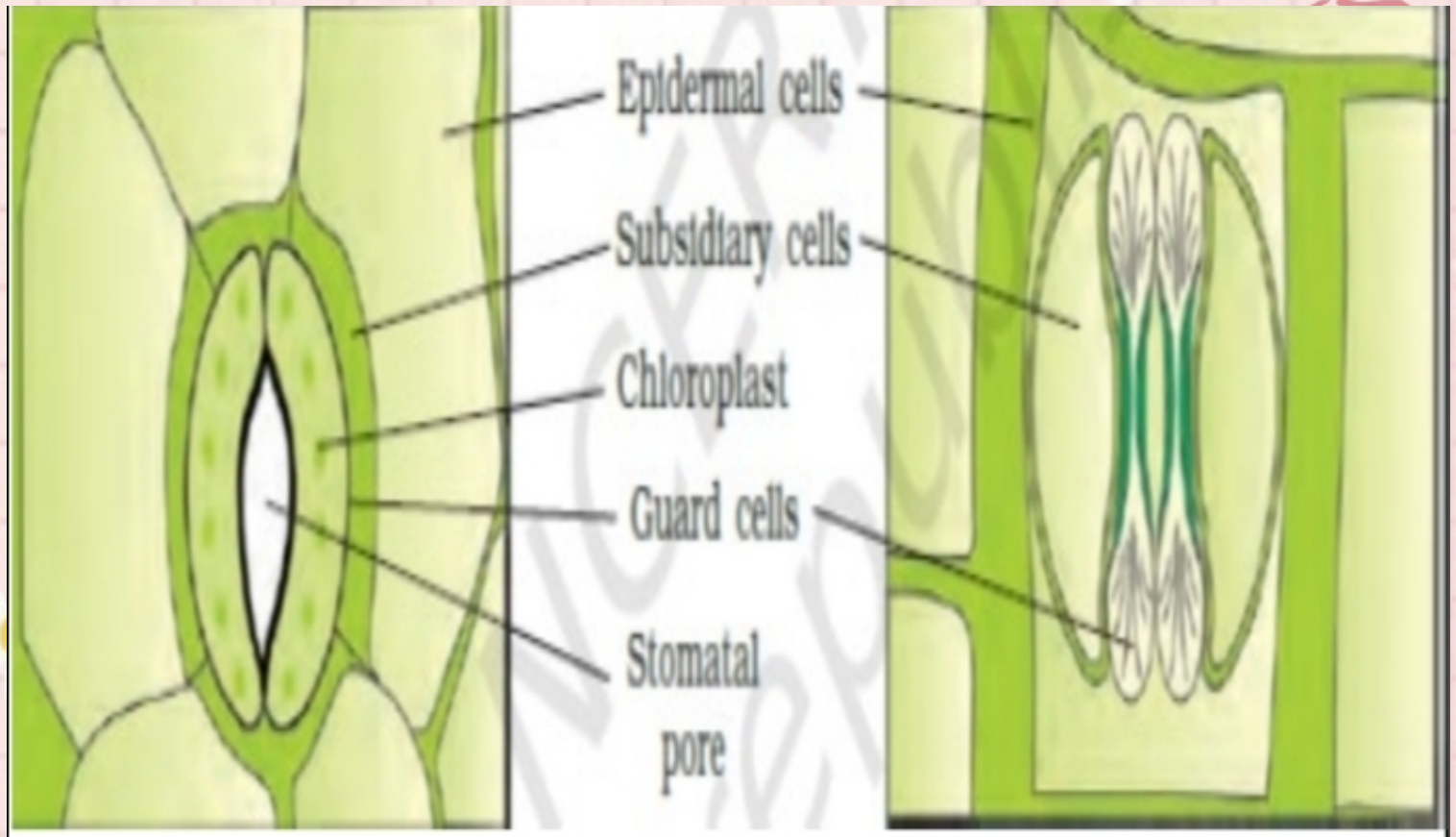
They may be branched / unbranched, soft/stiff and may even be secretory.

The trichomes help in preventing water loss.

Root hairs : The root hairs are unicellular elongations of the epidermal cells. They help

RIZZ

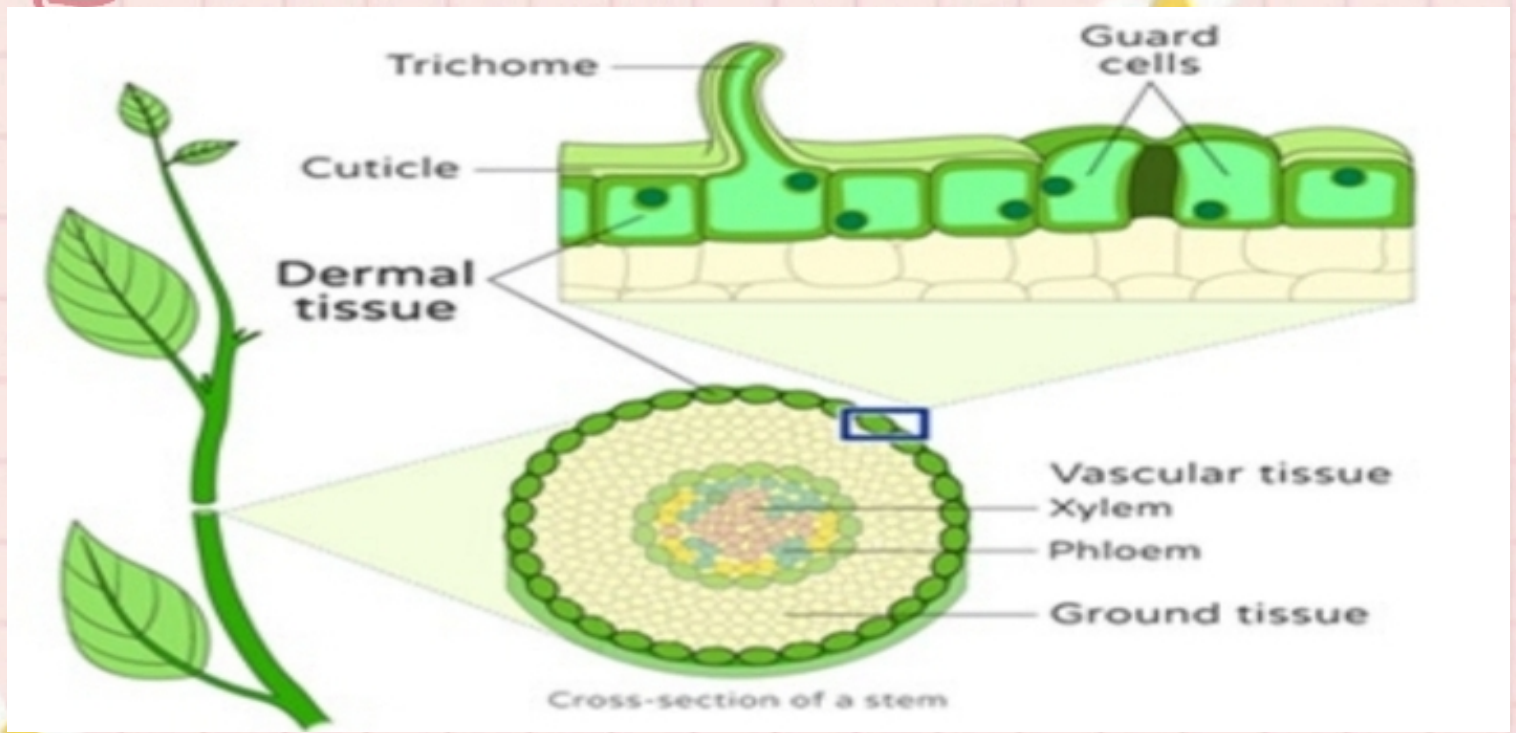
absorb water and minerals from the soil due to transpiration.



The ground or fundamental tissue system

All tissues except epidermis and vascular bundles . It consists of simple tissues such as parenchyma, collenchymas and sclerenchyma.

LES



The vascular or conducting tissue system

The vascular system consists of complex tissues, the phloem and the xylem. The xylem and phloem together constitute vascular bundles.

Types of vascular bundles:

1. Radial- Xylem and Phloem tissues are arranged alternately along different radii (In Roots)
2. Conjoint- Xylem and Phloem are jointly situated along the same radius

2 types--i) Conjoint open ii) Conjoint closed

- Vascular bundles having cambium, possess the ability to form secondary xylem and phloem tissues, and hence are called open vascular bundles. (In Dicots)
- When the vascular bundles have no cambium present in them, they do not form secondary tissues and are referred to are closed. (In Monocots)