

STUDY NO.: 08

NAME OF THE STUDY: STUDY ON ANATOMY OF WHEAT STEM

A thin transverse section (T.S.) of supplied specimen (wheat stem) under compound microscope shows the following structures from the periphery to the centre.

Epidermis: The epidermis consists of a single layer of compact and rectangular shaped cells having no intercellular spaces among them. A protective layer, composed mainly of cutin substances, called cuticle present on the outer surface of epidermis.

Hypodermis: It is composed of 3-5 layers of sclerenchymatous cells with several patches of chlorenchymatous or parenchymatous cells. It lies just below the epidermis and contains one series of smaller sized vascular bundles.

Ground tissue: It consists of a mass of thin walled, round or polygonal shaped parenchymatous cells having well defined intercellular spaces among them. This tissue extends from below the hypodermis to the centre. It is not differentiated into cortex, pericycle and pith. One series of vascular bundles (large size) is embedded in ground tissue.

Vascular bundle: Vascular bundles are conjoint, collateral and close type. They remain both in the ground tissue and in the hypodermal tissue. The vascular bundles in ground tissue are more or less same in size. Each vascular bundle is more or less surrounded by a sclerenchymatous sheath, called bundle sheath. The vascular bundle consists of xylem and phloem. The xylem is 'Y' or 'V' shaped comprising bigger metaxylem vessels, smaller protoxylem vessels, xylem fibre and xylem parenchyma. Protoxylem lacuna may be formed by breaking down the protoxylem vessel and some neighboring wood parenchyma. Phloem consists only of seive tube and companion cell.

Identification:

1. It is a **stem** because

- i) Vascular bundles are conjoint i.e., xylem and phloem lie in the same radius side by side.
- ii) Xylem is endarch i.e., metaxylem towards the periphery and protoxylem towards the centre.

2. It is a **monocot stem** because

- i) Vascular bundles are close type i.e., cambium is absent in between xylem and phloem.
- ii) Hypodermis composed of sclerenchymatous cells.

3. It is a **wheat stem** because

- i) Vascular bundles are present both in ground tissue and in hypodermis.
- ii) Sclerenchymatous hypodermis is interrupted by a few patches of chlorenchyma or parenchyma tissue.

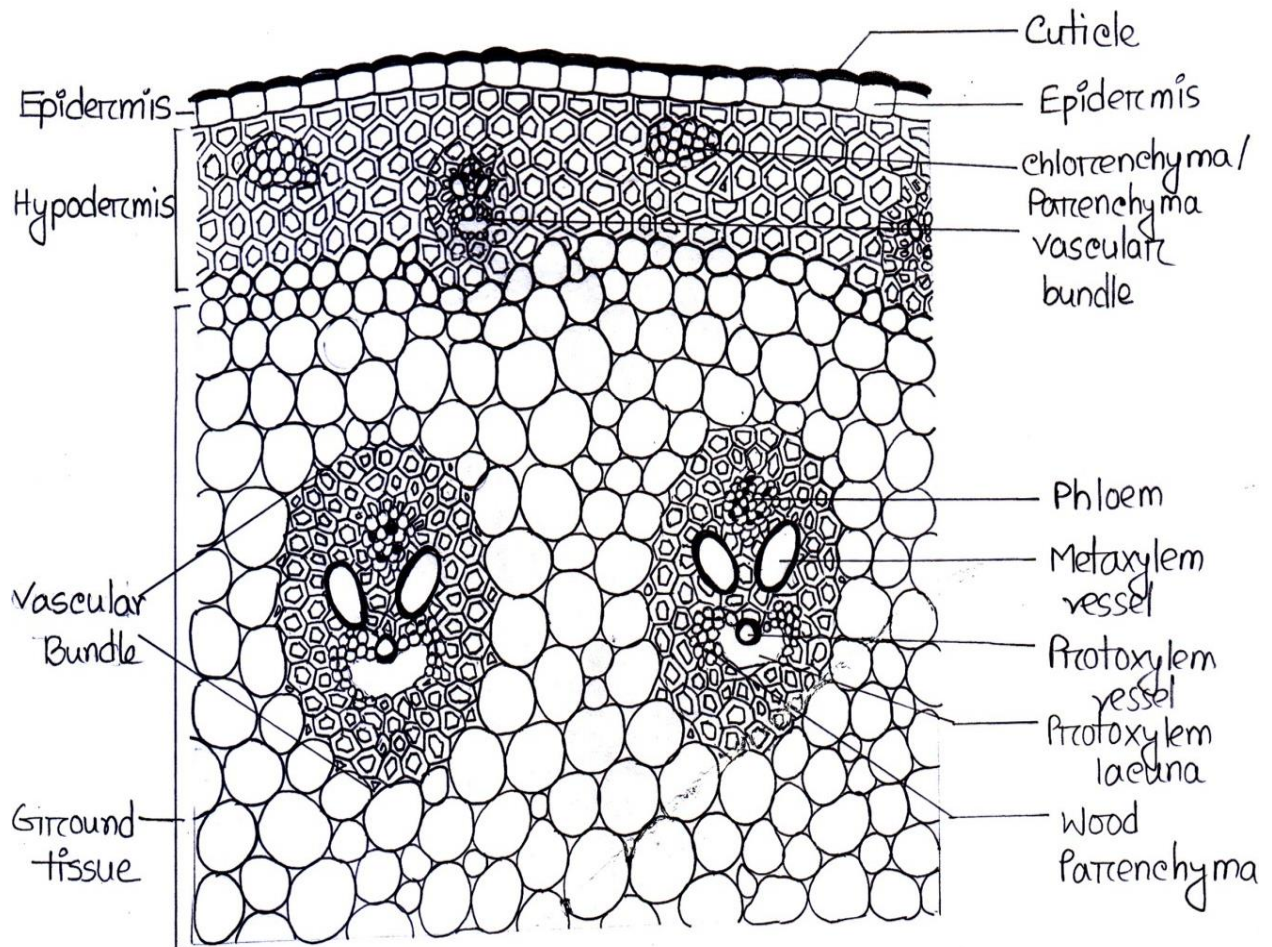


Fig: T.S. of wheat stem