STUDY NO.: 09

NAME OF THE STUDY: STUDY ON ANATOMY OF MAIZE STEM

A thin transverse section (T.S.) of supplied specimen (maize 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: Two or three layers of sclerenchymatous cells below the epidermis represent hypodermis.

Ground tissue: It consists of a mass of thin walled, round or polygonal shaped parenchymatous cell 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 due to the presence of scattered vascular bundles in the ground tissue.

Vascular bundle: Vascular bundle region is composed of numerous conjoint, collateral and closed vascular bundles scattered only in the ground tissue. The vascular bundles increase in size but decrease in number towards the centre. Each vascular bundle is more or less surrounded by a sclerenchymatous sheath, called bundle sheath, which is more conspicuous towards upper and lower sides of the bundle. The 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.
   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 **maize stem** because
   i) Vascular bundles are present only in the ground tissues not in the hypodermis.

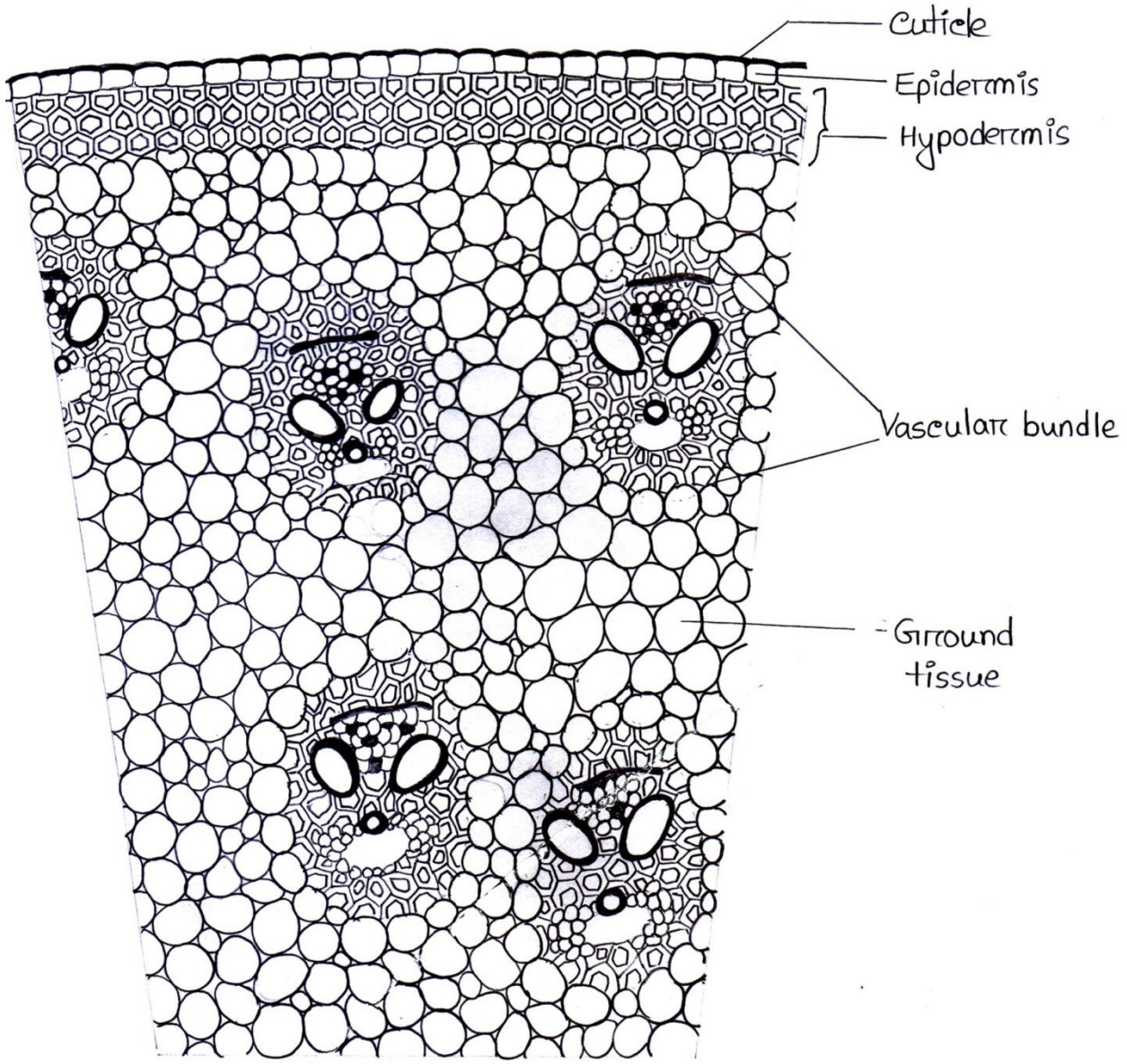

Fig : T.S. of Maize Stem

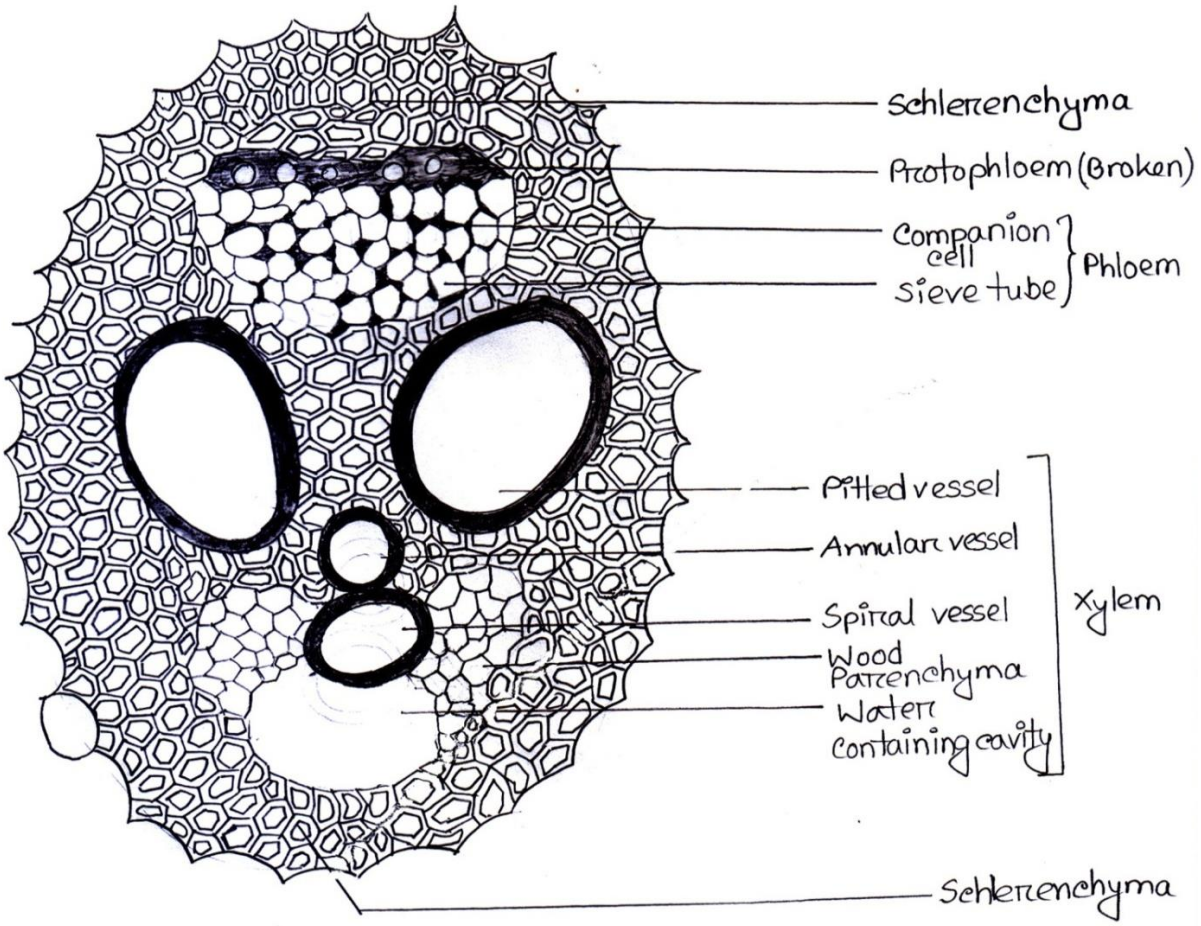

Fig-2: A vascular bundle of maize stem (magnified)