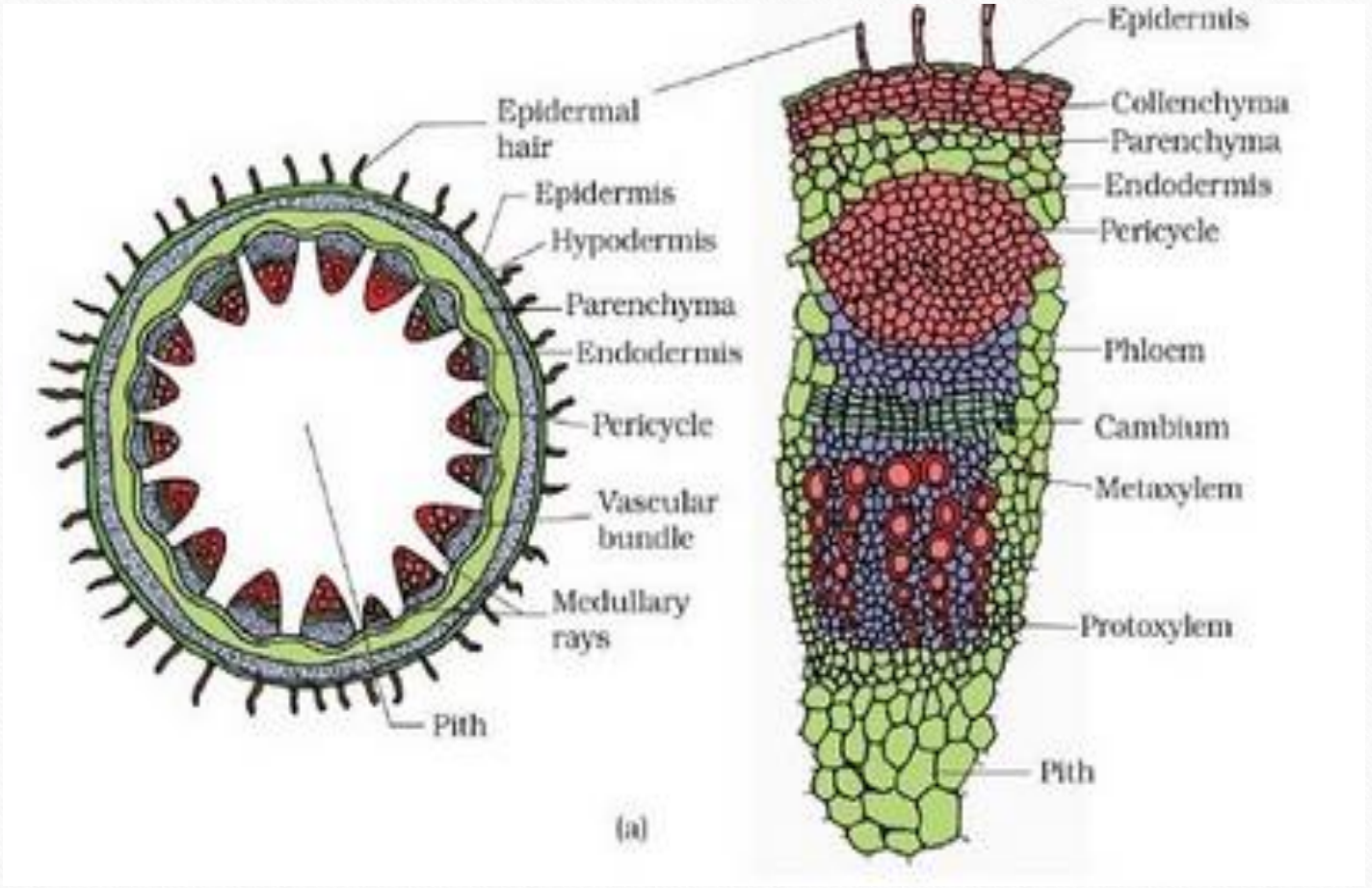
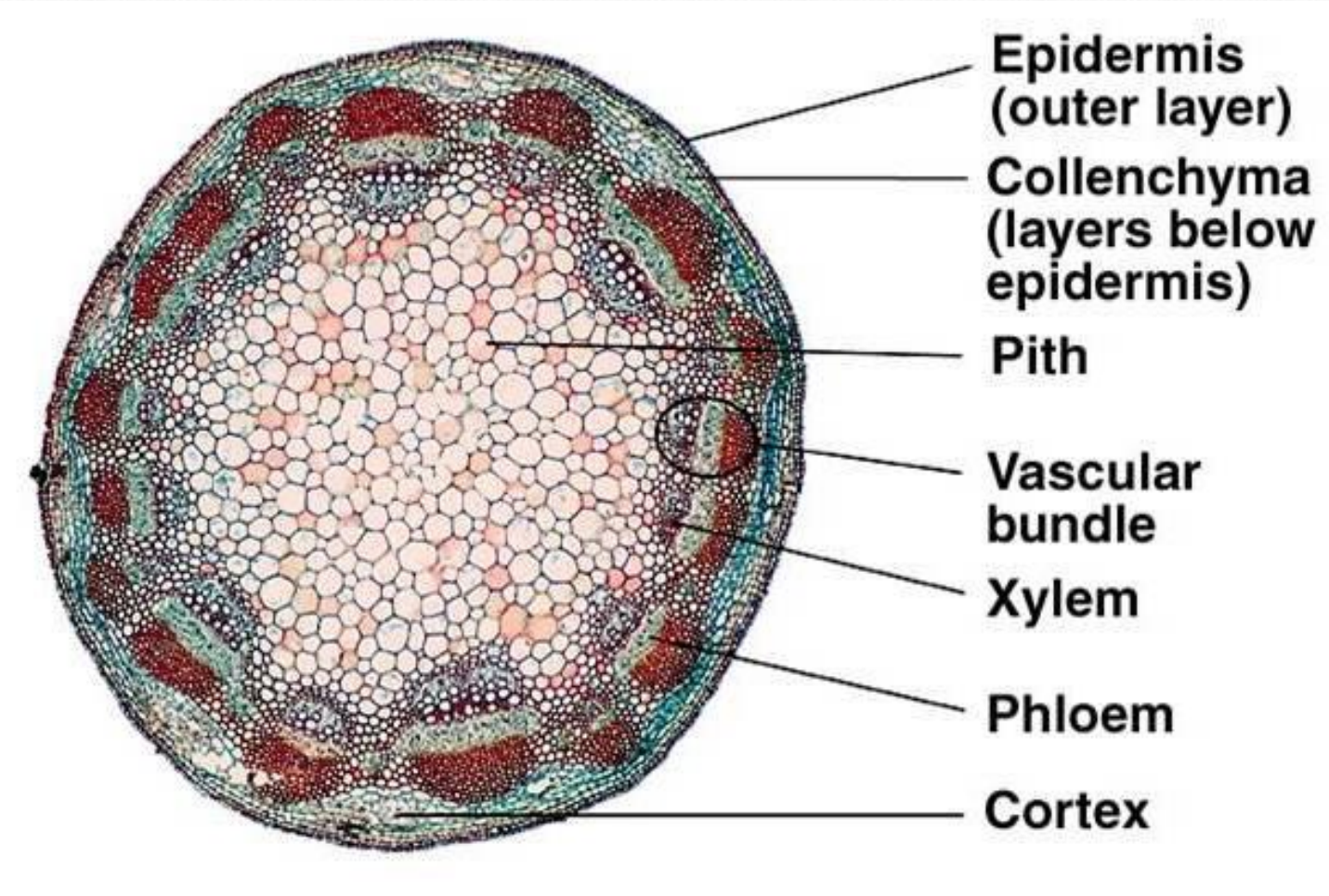
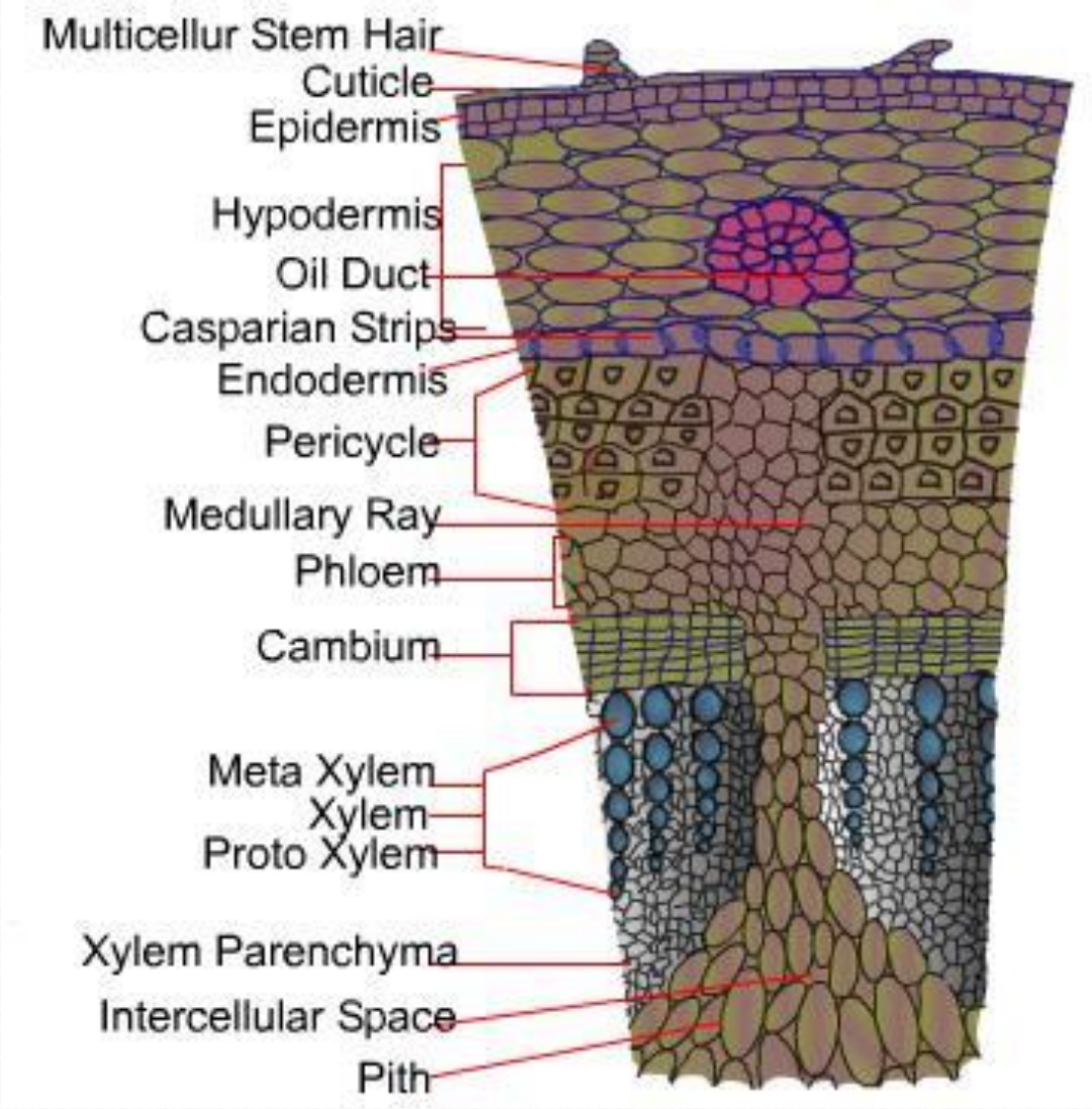
Anatomy of Stem

Characteristics of Stem

- Generally green in colour
- Cuticle present in epidermis
- Presence of trichome
- Hypodermis is well marked
- Casperian strip is absent in
- Vascular bundle is conjoint and collateral
- Xylem is endarch in nature
- Lateral branches arise exogenously

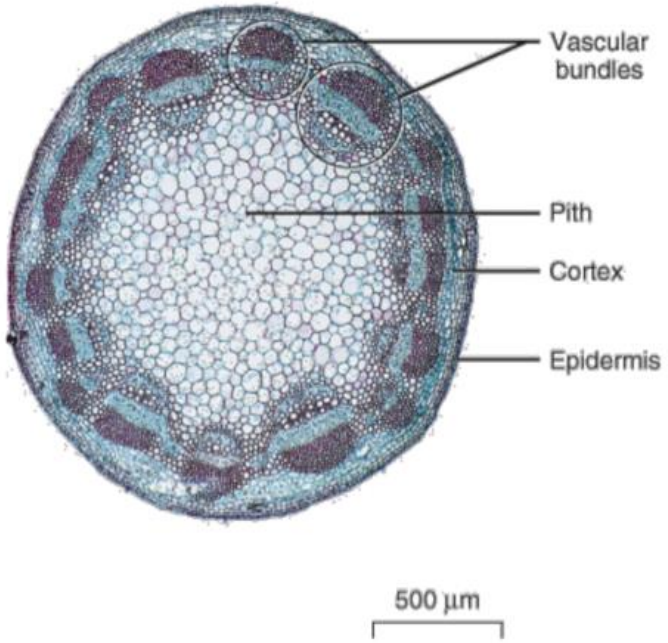

Epidermal hair
Epidermis
Hypodermis
Parenchyma
Endodermis
Pericycle
Vascular bundle
Medullary rays
Pith
(a)
Epidermis
Collenchyma
Parenchyma
Endodermis
Pericycle
Phloem
Cambium
Metaxylem
Protoxylem
Pith


Epidermis
(outer layer)
Collenchyma
(layers below
epidermis)
Pith
Vascular
bundle
Xylem
Phloem
Cortex

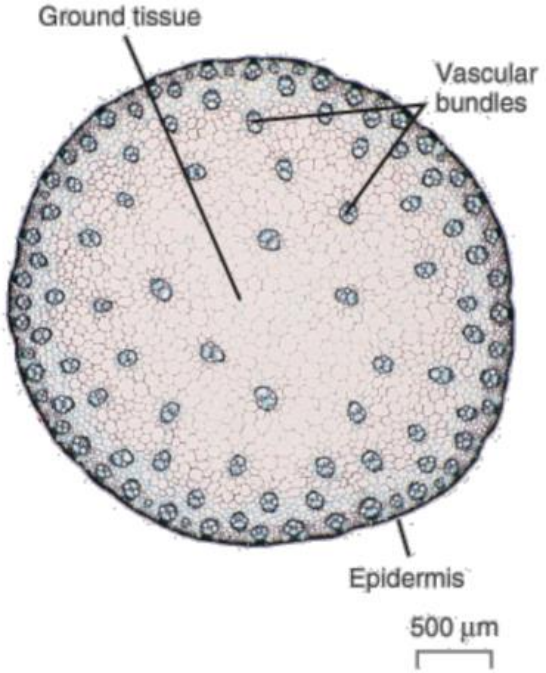

Multicellur Stem Hair
Cuticle
Epidermis
Hypodermis
Oil Duct
Casparian Strips
Endodermis
Pericycle
Medullary Ray
Phloem
Cambium
Meta Xylem
Xylem
Proto Xylem
Xylem Parenchyma
Intercellular Space
Pith

Stem Anatomy

Herbaceous Eudicot Stems



Monocot Stems



Root	Stem
1. Unicellular hair present in epidermis	1. Hairs, if present are multicellular
2. Cuticle layer and stomata are absent	2. Cuticle layer is present and stomata may also be present
3. Hypodermis is not differentiated	3. Hypodermis is well marked
4. Cortex is broad and well developed	4. Cortex is relatively less developed
5. Endodermis is distinct	5. Endodermis is indistinct
6. Pericycle is single layerded and composed of parenchymatous cell	6. Pericycle is multi layerded and composed of sclerenchymatous cell
7. Vascular bundles are of radial type	7. Vascular bundles are of conjoint type
8. Xylem is exarch in nature	8. Xylem is endarch in nature
9. Lateral branches arise endogenously, from pericycle.	9. Lateral branches arise exogenously

Differences Between Dicot and Monocot Stem

Dicot Stem	Monocot Stem
1. Several multicellular hairs are found in epidermis	1. Epidermal hairs are usually not found
2. Hypodermis consists of collenchymatous cells	2. Hypodermis consists of sclerenchymatous cells
3. Cortex is distinct	3. Cortes and hypodermis are not well distinguishable
4. Endodermis and pericycle are distinctly present	4. Endodermis and pericycle are not present
5. Vascular bundles are arranged in a ring	5. Vascular bundles are scattered
6. Vascular bundles are conjoint, collateral and open type.	6. Vascular bundles are conjoint, collateral and close type
7. In vascular bundle, several vessels are present and linearly arranged.	7. Vessels in vascular bundle are arranged in V-shape and are fewer in number.