

2) Xylem- for H₂O transport

a) Vessel elements- perforated ends

b) Tracheids- not perforated

Tracheary elements- with lignin in their cell walls (the two above)

Types:

1-Annular: Zea mays (annular ring)

2-Helical: Tilia (helical spiral)

3-Reticulate (net-like)

4-Pitted: Cucurbita (many, non-lignified pits)

5-Bordered pits: Pine (bordered pits)

6-Scalariform: Cucurbita (ladder-like)

*Stomata: for cellular respiration

a) guard cells (2) flexible anticlinal walls

b) accessory/subsidiary cells- participate in osmotic changes involved in movements of guard cells (variable #)

c) stoma

-radial and alternating vascular tissue arrangement

-SAME

-has endodermis with Casparian strip

-SAME

-EXARCH(protoxylem on the outside while inwards is the metaxylem)

-SAME

-has pericycle (gives rise to lateral roots)

-SAME

-fibrous

-tap

-with pith

-without pith

Cons regions:

1) Epidermis- outer region (gives rise to root hairs)

2) Cortex- middle (largest area of root)

a) outer- parenchyma cells

b) endodermis- has Casparian strip (made of suberin)

*may also have hypodermis (monocot root) which can be of suberin and lignin component

3) Stele- inner region

a) pericycle- gives rise to lateral roots/branch root (opposite protoxylem pole)

b) vascular tissues

*Patterns for primary xylem: diarch, triarch, tetrarch, polyarch