

II

Complex System $\Rightarrow$ Vascular tissue.

These are made up from one or more cells. Also
Klas vascular tissue because these are to transport
water & food material. These are not in Tracheo-
phytes: - Pteridophytes, Gymnosperm & Angiosperm.

- Two types: - ① Xylem (Harden) ② Phloem (Food vascular tissue) (Lepton).

① Xylem / Hardome: - These are not in all Tracheophytes
(Pteridophytes, gymnosperm & Angiosperm)

- In all vascular tissues are not.

Component of xylem: -

(i) Tracheids (ii) Vessels (iii) Xylem fiber (iv) Xylem parenchyma.
nonliving living

[i] Tracheids: -

Tracheids In all Tracheophytes these
tracheids are not.

$\rightarrow$ Structural Character: - Unicellular, thick walled
with lignified, dead str.

- Last walls are not pored

Function :- Water Conduction.

(2) Vessels :- Distribution :- These are mainly in Angiosperm

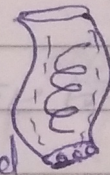
Absent in Trochodendraceae, Tetacentraceae, Winteraceae.

- In some Gymnosperm vessels are +nt :- Gnetum, Ephedra, Welwitschia → Gnetales order

- In some Pteridophytes these are +nt :- Pteridium Bolleanella.

Structural Symptoms :-

Tubular, thickwalled, lignified dead str.



- Walls are deposited और इनमें 2-3 गुना पतली होती है।
- Last walls are pored.

Function :- Water Conduction.

(3) Fibers :- Lignified, thickwalled, dead closed cavity and होती है

Function :- Mechanical Support

(4) Parenchyma: - Present as a simple parenchyma. These are only living component of xylem.

Function :- Water & food storage.

Types of Xylem

(A) On the basis of origin:-

- | | |
|---|---|
| <p>① <u>Primary xylem</u>
Origin - By Prochambium</p> <ul style="list-style-type: none">- Made firstly- less lignified- less Hard- आहारण रेशुसन प्रतिक्रिया करते हैं | <p>② <u>Secondary xylem</u>
Chambium</p> <ul style="list-style-type: none">- Made after- More lignified- More Hard- जटिल रेशुसन प्रतिक्रिया करते हैं |
|---|---|

(B) On the basis of Structure:-

- | | |
|---|--|
| <p><u>Protoxylem</u></p> <ul style="list-style-type: none">- Closed cavity- Beg firstly made- less lignified- less Hard- आहारण रेशुसन प्रतिक्रिया | <p><u>Metaxylem</u></p> <ul style="list-style-type: none">- आहारण चोटी गुंदा करी- After made- More lignified- More Hard- जटिल रेशुसन प्रतिक्रिया |
|---|--|

③ On the basis of Position of Protoxylem:-

Exarch

Endarch

Mesarch

- Present in roots
- Protoxylem outside & metaxylem inner side
- These are unique character of roots
- On the basis of development

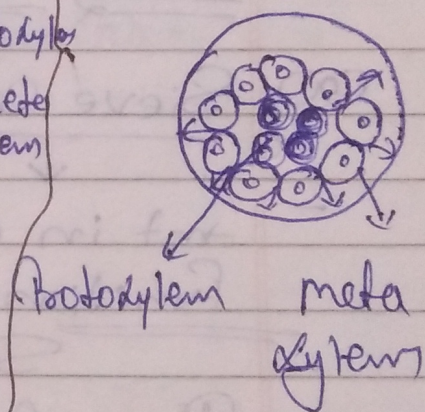
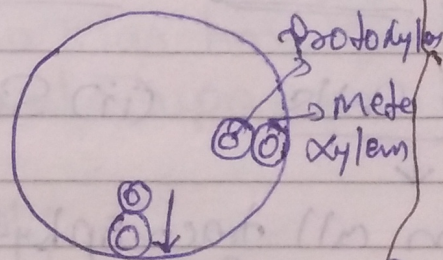
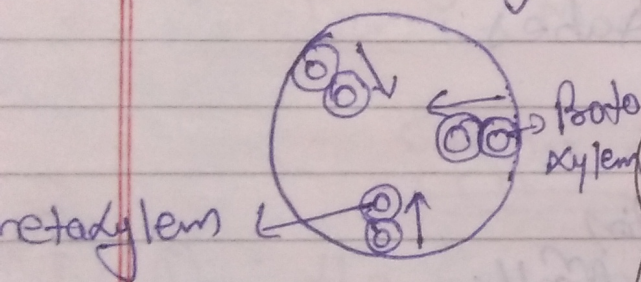
not in Stem

Metaxylem outside & Protoxylem inner side

On the basis of development
Klas Centrifugal Xylem

Protoxylem not in middle side & metaxylem are not around the Protoxylems.
eg: Pteridium, moss
→ Rachis
→ Centrifugal

Klas Centripetal Xylem



On the basis of development two types of Xylem are -

① Centripetal :- ~~वर्तनीय~~ वर्तनीय विकास

② Centrifugal :- ~~वर्तनीय~~ वर्तनीय विकास

Function :- Water Conduction

Note :- In aquatic plants xylems are less developed