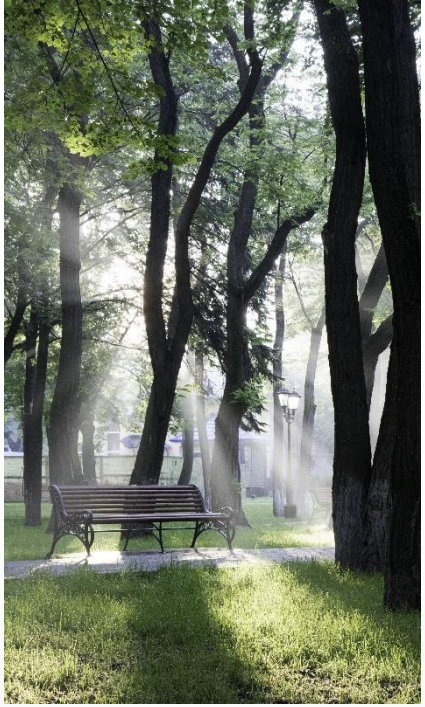

Anomalous secondary growth in Boerhaavia stem

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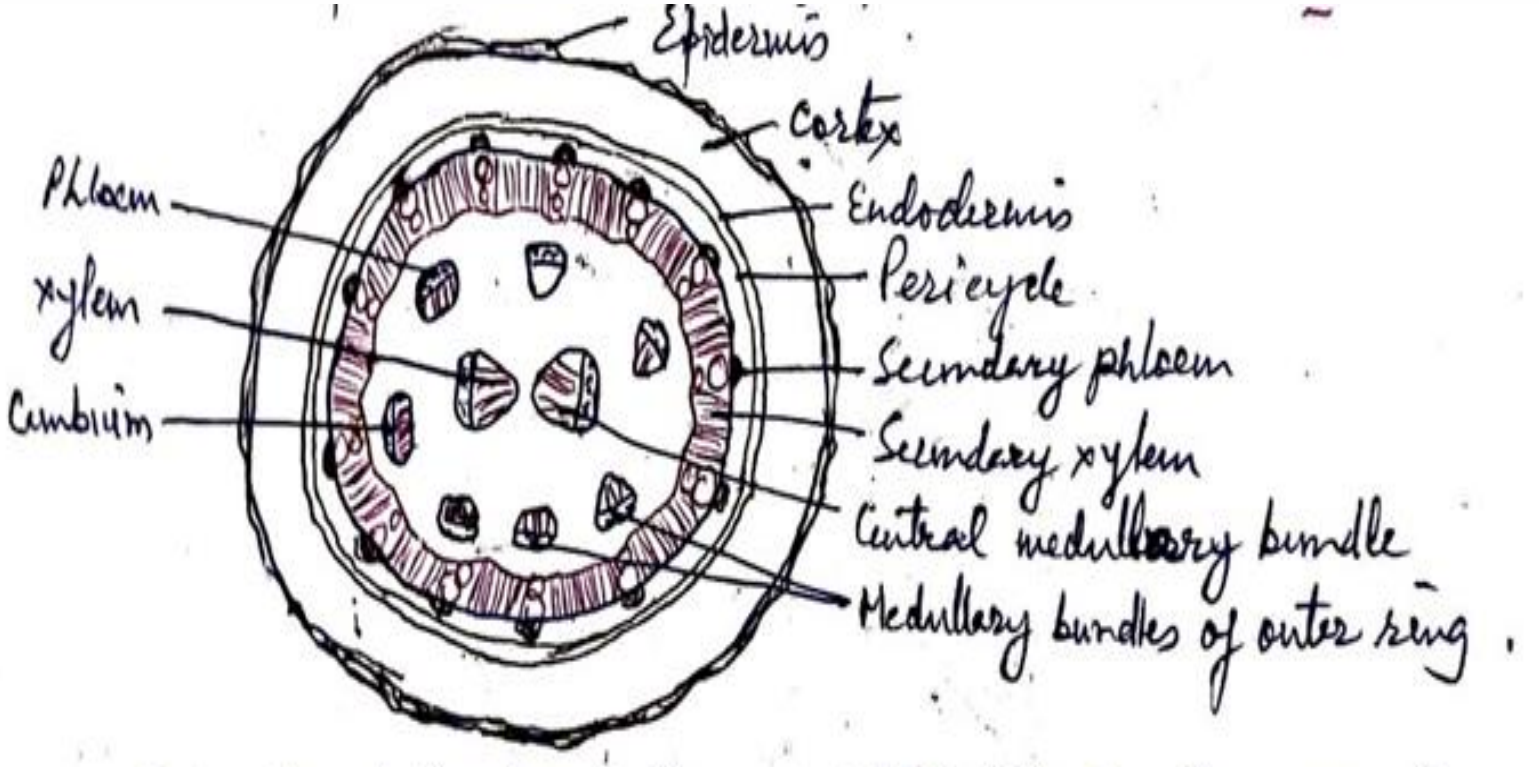
Anomalous Secondary growth in Boerhaavia

Primary structure

1. Epidermis – It is single layered, parenchymatous, compact with cuticle over it. Stomata may be found in grooves.
2. Cortex – It contains collenchymatous 3-4 layered hypodermis and below that 4-5 layered chlorenchymatous layer. The innermost cortex is simple parenchymatous.
3. Endodermis – It is single layer, the cells of which are typical endodermal type.
4. Pericle – It is 1-2 layered parenchymatous structure with isolated patches of sclerenchyma. This patch is generally outside the vascular bundles of outer normal ring of vasculature.



T.S. Stem of Boerhaavia (diagrammatic) after Secondary growth.

5: Vascular zone (before secondary growth)

a/ There are three layers of vascular bundles. The inner two layer are made of medullary bundles embedded in the ground tissue (pith zone).

b/ All the vascular bundles are conjoint, collateral, open and endarch.

c/ The central 2 medullary bundles are largest.

d/ Outer layer of medullary bundles are 6-14 in numbers and bundles are smaller than the central bundles.

e/ Intermost layer of vascular bundles are not medullary. This layer has more than 14 bundles and smaller that the other layers.

f/ The primary xylems have only annular and spiral thickenings, whereas secondary xylem has pitted or sometimes reticulate thickenings.

g/ Phloem fibre or xylem fibre are absent from the vascular tissue.

h/ Medullary bundles have very less secondary growth and by that activity only the size of the medullary bundles increase somewhat.

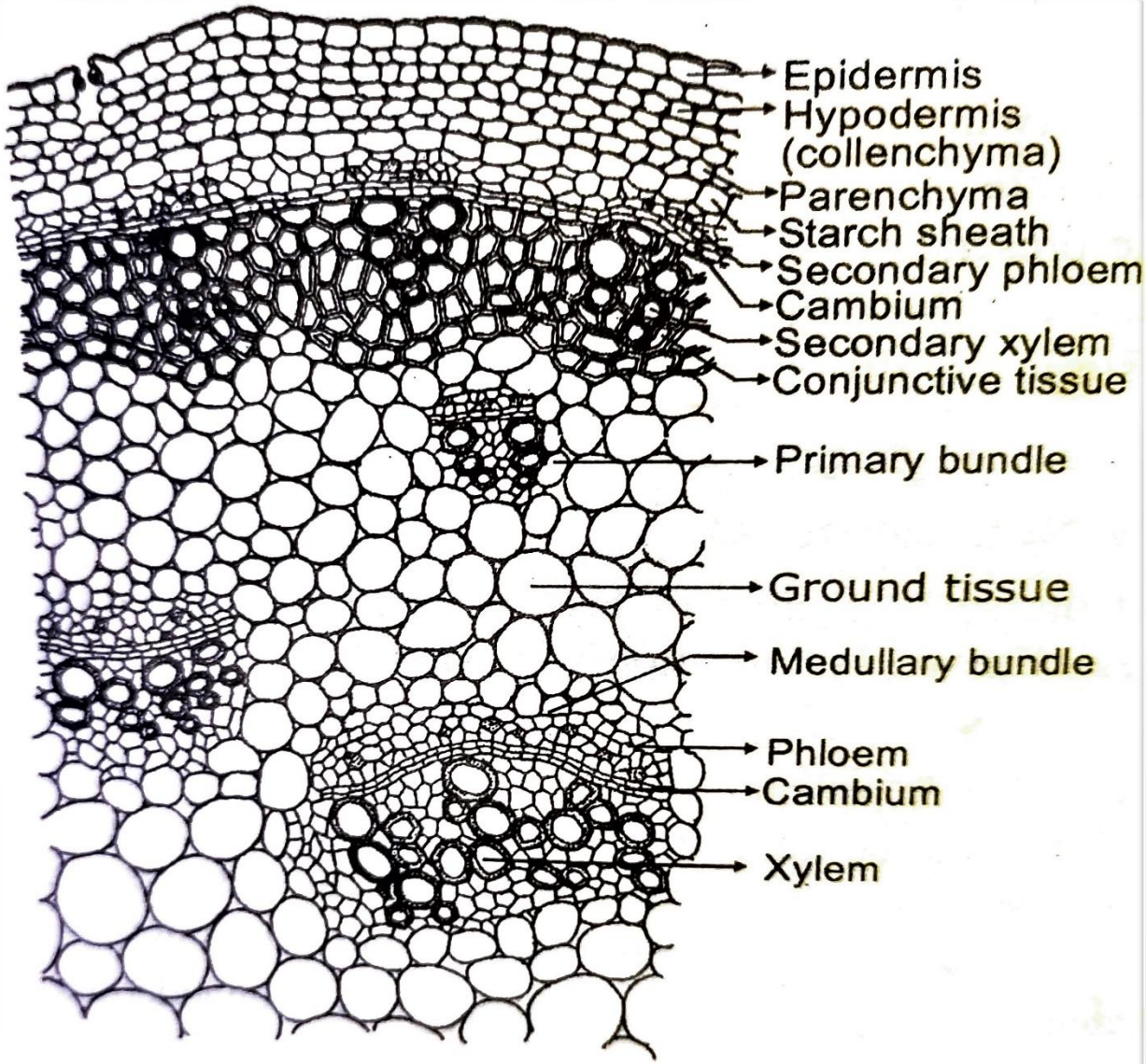


Fig. 25.18A : A portion of *Boerhaavia* stem in transverse section.

Vascular zone (after secondary growth)

a/ After secondary growth, secondary medullary bundles are formed in large number in large number.

b/ In between secondary medullary bundles there are secondary conjunctive tissue which are formed by the activity of cambium.

c/ Conjunctive tissues are initially parenchymatous but in due course the cells are transformed into sclerenchymatous types.

d/ Outside the conjuctive tissue, the cambium forms parenchymatous secondary parenchyma.

Conclusion

Chief peculiarities

1. There are almost 38 angiospermic families with anomalous structures.
2. Medullary bundles are one of them. They are found both in primary and secondary structures.
3. Boerhaavia of the family Nyctaginaceae is known for medullary bundles.
4. It has two rings of primary medullary bundles in primary origin. The inner central ring has only two medullary bundles.
5. Outside this ring, the another ring of medullary bundle may have 6-14 bundles.
6. Both the rings are almost in the pith zone. In the stellar zone, after secondary growth, many secondary medullary bundles are formed.
7. It is all due to the creeping nature of the plant, where there is no need of central compact zone of secondary xylem.
8. So, there is the development of broken secondary xylem due to separate secondary bundles.