

Topic: Taxus; Internal Structure

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Dr. Sanjeev Kumar Vidyarthi

Department of Botany

Dr. L.K.V.D. College, Tajpur, Samastipur

L.N. Mithila University, Darbhanga

Internal Structures of *Taxus*

Stem:

- In transverse section the stem is irregular in outline and resembles *Pinus* in structure.
- It is surrounded by a thickly cuticularised single-layered epidermis. Inner to the epidermis is parenchymatous cortex having some tannin-filled cells. It is followed by endodermis and sclerenchymatous pericycle.
- The young stem shows a ring of conjoint, collateral, open and endarch vascular bundles enclosing a distinct pith in the centre.
- The protoxylem consists of spiral tracheids, and the phloem contains sieve cells with sieve plates and phloem parenchyma. Companion cells are absent.
- The cambium is persistent and develops a thick vascular cylinder due to secondary growth.

- The cambium cuts secondary phloem towards outer side and secondary xylem towards inner side.
- The secondary wood is devoid of resin canals and wood parenchyma.
- Its tracheids show uniseriate bordered pits only on their radial walls.
- The tracheids also show spiral thickenings.
- The medullary rays are uniseriate and homogeneous but in *Taxus baccata* they are sometimes bi-senate.
- The wood is strong and dense. Due to the presence of tertiary spirals the wood is elastic in nature.
- Phellogen may develop in the older stems showing extrastelar secondary' growth.

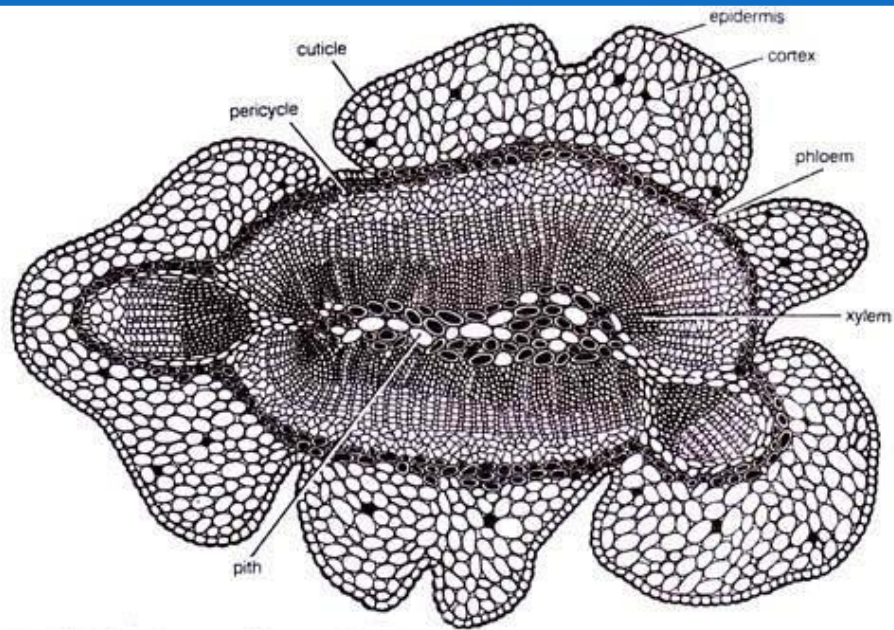


Fig. *Taxus baccata*. T.S. stem (Young).

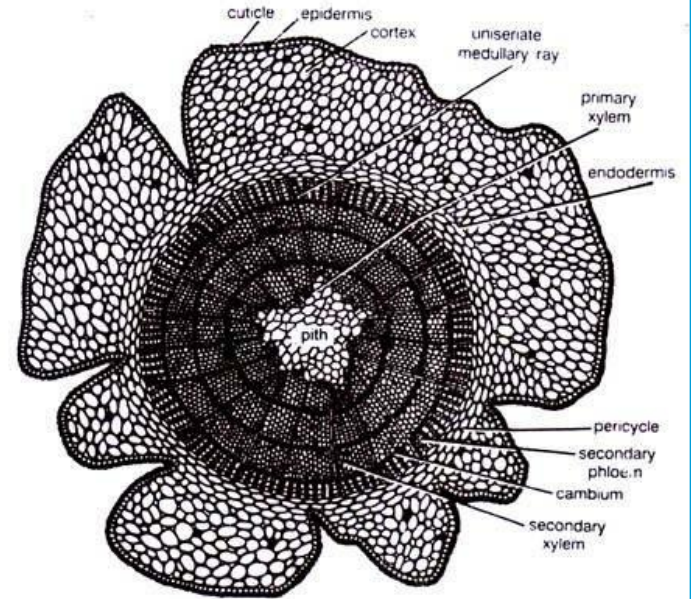


Fig. *Taxus baccata*. T.S. stem (old) showing secondary growth.

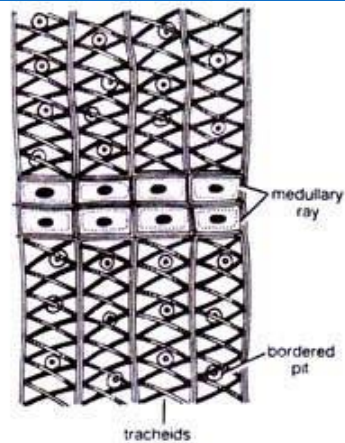


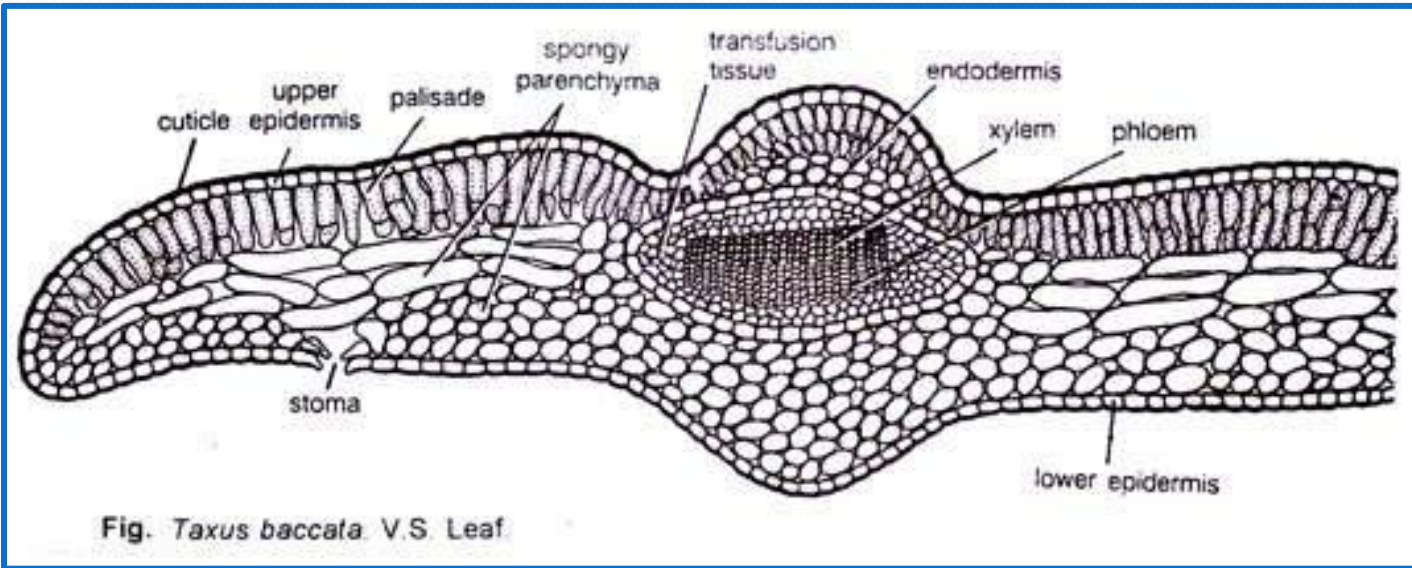
Fig. *Taxus baccata*. R.L.S wood showing biseriate medullary rays and spiral thickenings on the tracheids.

Root:

- Except that of the absence of resin canals, the root anatomy of *Taxus* resembles very much with that of *Pinus*.
- The root is diarch.

Leaf:

- The leaf is dorsiventral. It shows xerophytic characters.
- The upper and lower epidermal cells are rectangular in shape and thickly circularized.
- The cuticle is comparatively thin on the lower surface.
- The stomata are of sunken type and restricted only to the lower epidermis.
- They are haplocheilic in development.
- The mesophyll is differentiated into palisade and spongy-parenchyma.



- The palisade is generally two-layered.
- Only one vascular bundle is present in the mid-rib region. Enclosed by a distinct endodermal layer or bundle sheath the collateral vascular bundle contains phloem towards the lower side and xylem towards the upper side.
- Transfusion tissue is present on both the sides of the vascular bundle.
- Resin canals are generally absent.
- The xerophytic characters of the leaf include the presence of thick cuticle, sunken stomata, transfusion tissue and differentiation of mesophyll into palisade and spongy parenchyma.