

PENTOXYLALES

Occurrence

The Order Pentoxylales was proposed by Birbal Sahni in 1948. The first specimen were found from Rajmahal Hills of northeastern India. Remains have been reported from New Zealand, Australia & Antarctica. This is an extinct order.

→ The habit of plant is unknown. It is a very small tree or shrub.

STEM  
→ The stem shows dimorphism in having -g long and dwarf shoots. In the long shoot the leaf bases are elliptical, spirally arranged & sparsely placed. In the dwarf shoot, the leaf bases are rhomboidal & closely placed.

→ The cross section of a young stem of Pentoxylon shows five curved primary bundles with pith & cortex.

→ The tracheids of primary bundle have annular, spiral or scalariform thickening.

→ The stem diameter is between 5-20mm. covered with leaf bases.

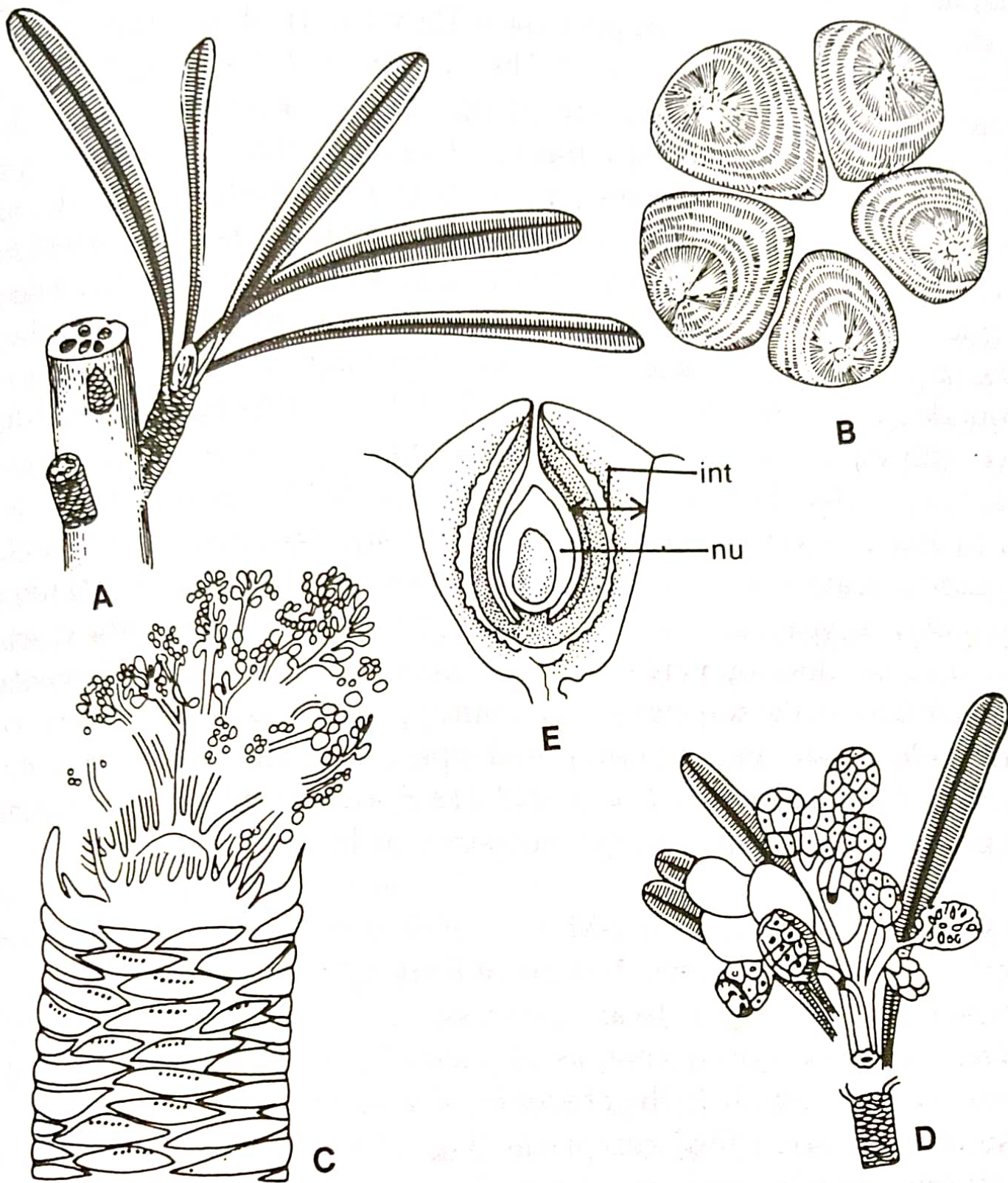


Fig. 8: A,B,D, *Pentoxylon sahnii*; C, *Sahnia nipaniensis*; E, *Carnoconites* (int, integument; nu, nucellus). A. Reconstruction of foliage-bearing branch showing long and short shoots. The leaves are borne on short shoots. B. The stelar system in long shoot consisting of five distinct vascular segments. C. Short shoot bearing male 'flower'. Note rhomboidal leaf bases. D. Short shoot bearing ovulate cones which are mulberry-like. E. LS ovule. (A,B,D,E, after Sahni, 1948; C, after Vishnu-Mittre, 1953).

(2)

In an older stem five large vascular bundles arranged in a ring.

Pith, medullary rays & pith found crushed.

→ Distinct growth rings were also found.

### LEAVES -

The leaves are found in clusters. These are strap shaped in *Taenopteris* morphotype shared with other groups of seed plants. The leaves are up to 20 centimeters long and have a prominent midrib. The midrib is about 2 mm broad and consist of several parallel veins.

→ 5 to 9 diploxylic vascular bundles traverse in an arc through the petiole and midrib. The bundles in the middle of an arc always the largest.

(3)

## Male fructification or Pollen bearing Organ

- The male flower consists of about 24 filiform microsporophylls arranged in a whorl.
- Their bases are fused to form a disc around the receptacle. which is a broad conical structure.
- The sporangia are stalked, unilocular & pyriform.
- Sporangia born singly or in a group of 2 to 4 at the end of the microsporophyll.
- The pollen are small, monosulcate and prolate. without any marked orientation.

Seed bearing Organs have a central axis. called peduncle. which branches into numerous structures that end with an ovule.

- The seeds are sessile.
- A fully developed & differentiated sclerotesta is present in all seeds. with micropylar end expanded in a beak like structure. as they are secretory in nature like other gymnosperms.