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# **Sapwood and Heartwood**

***Facilitator :Dr. Sagarika Parida***

***Dept. of Botany,***

***School of Applied Sciences***

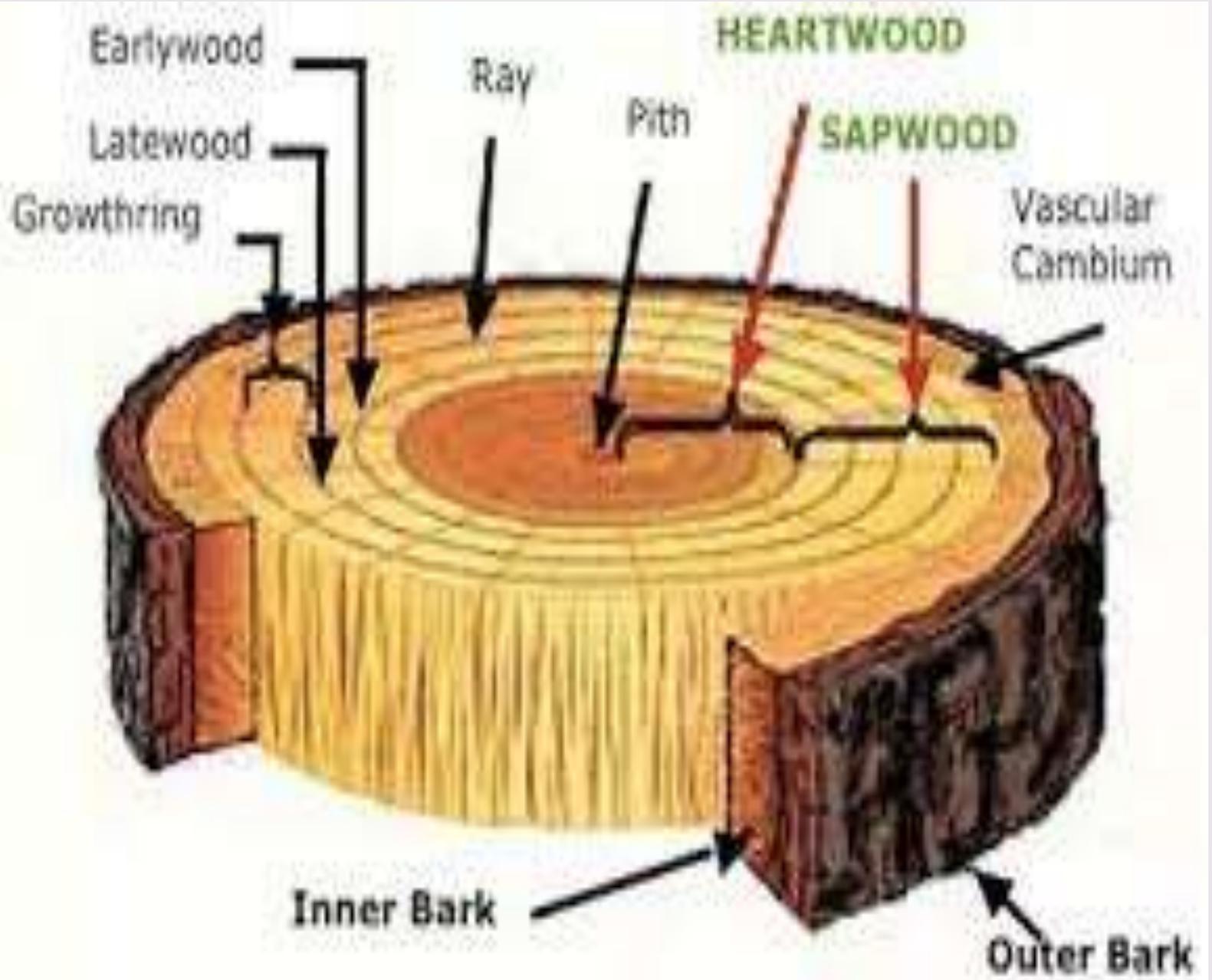
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## Heartwood and Sapwood

- Wood is the secondary xylem of seed plants
- The xylem in the central part is called the heartwood or duramen
- The darker colour of heartwood is the accumulation of many aromatic substances pigments and tannis
- The inner heart wood provides the mechanical support
- The peripheral part of the wood is light coloured and called the sapwood or Alburnum
- Conduction of sap occurs through the sapwood.



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## **Similarities Between Heartwood and Sapwood**

- Both are composed of secondary xylem formed after many years off secondary growth
- Both are derived from the vascular cambium
- Both can provide mechanical support to the plant



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# Difference Between

## Heartwood

1. Heartwood occurs in the central portion of an old stem.
2. Cells are comparatively older.
3. Also called 'DURAMEN'.
4. Sapwood is dark coloured.
5. It is the dead and non-functional part of secondary xylem.
6. The lumens of the vessels are plugged due to tyloses formation.
7. Cells store many ergastic substances such as resins and tannins.
8. Heartwood is heavier.
9. Heartwood is durable wood and suitable for furniture.
10. Wood resistant to insect and fungal attack.

## Sapwood

1. Sapwood occur in the peripheral(outer) portion of an old stem.
2. Cells are comparatively younger.
3. Also called 'ALBURNUM'.
4. Sapwood is light coloured.
5. It is the living and functional secondary xylem.
6. The lumens of the vessels are not plugged. No tyloses formation.
7. Cells don't store any ergastic substances.
8. Sapwood is light in weight.
9. Sapwood is not durable and not suitable for furniture.
10. Wood is not resistant to insect and fungal attack.



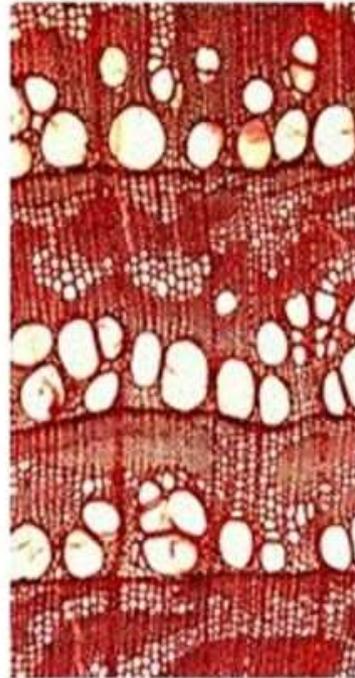
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# Ring and Diffuse Porous Wood

## Ring-porous versus Diffuse-porous Woods

Ring Porous



Rhus sp.

Diffuse Porous



Salix sp.



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## Hardwoods

Hardwoods may be divided into

1. Ring-porous

2. Diffuse-porous trees

- In ring-porous trees the vessels laid down at the beginning of the growing season are much larger than subsequent vessels laid down at the end of the season (or ring).
- Diffuse-porous trees form vessels of roughly the same radial diameter throughout the growing season. Larger vessel size permits more-rapid water conduction.



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## Ring Porous Wood

- For some groups of species (oaks and elms) the earlywood/ latewood transition occurs abruptly and is very distinct.
- Within each growth ring, a band of large early wood vessels (pores) is clearly visible to the naked eye, after which a band of latewood vessels appears much smaller.



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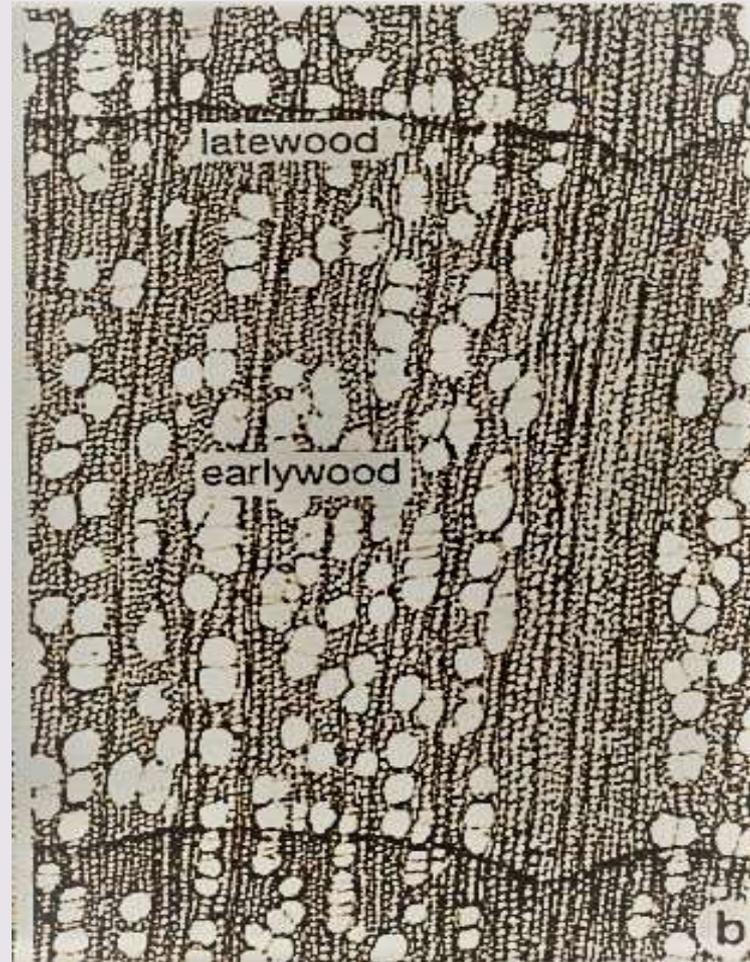
## Diffuse Porous Wood

- The last group of species has vessels (pores) that are uniform in size across the entire growth ring
- These vessels are usually small, uniform in size and are very difficult to see with the naked eye



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**Diffuse porous wood**



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# Difference Between

## Ring Porous Wood

1. In it the vessels are of different diameter.
2. The vessels are not uniformly distributed throughout the wood.
3. Vessels with wide and smaller diameter are formed in the early and the later part of the growth season respectively.
4. Vessels with wide diameter of early wood and vessels of smaller diameter of late, summer or autumn wood are distinguishable.
5. The development of vessel is sudden and rapid.
6. The vessels are longer in length than those of diffuse porous wood.
7. The rate of transport of water in plant with ring porous wood is ten times faster than those with diffuse porous wood.

## Diffuse Porous Wood

1. In it the vessels are more or less equal in diameter.
2. The vessels are uniformly distributed throughout the wood.
3. Vessels with more or less equal diameter are formed throughout the growth ring.
4. Vessels of early wood and late wood are indistinguishable.
5. The development of vessel is slow.
6. The vessels are shorter in length than those of ring porous wood.
7. The rate of transport of water in plants with diffuse porous wood is slower than those with ring porous wood.



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***Thank You***