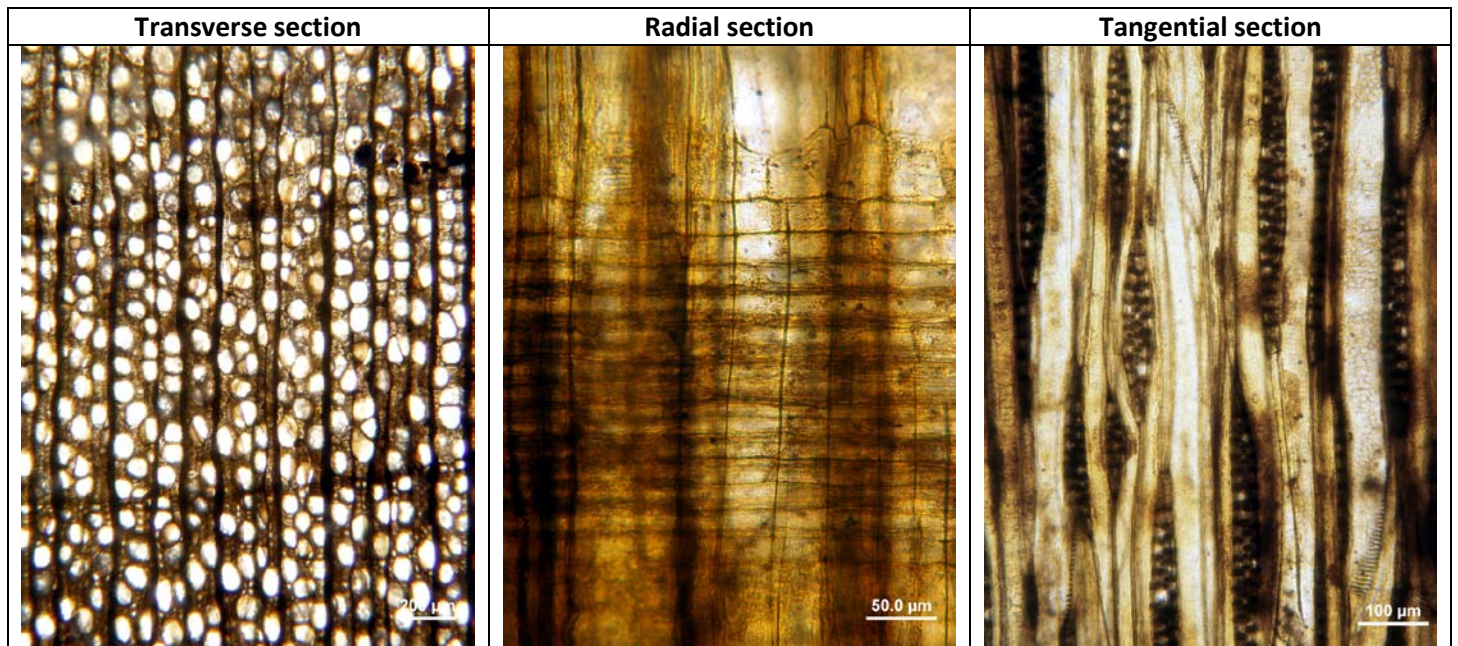


Unknown hardwood 4

Family: Unknown

Reference: Wheeler, E.A. & T.A. Dillhoff. 2009. The Middle Miocene wood flora of Vantage, Washington, USA. IAWA Journal, Supplement 7. 101p.



Photos courtesy Dr. E.A. Wheeler

Diagnostic features: Growth rings present, diffuse porous vessel arrangement. Vessels mostly solitary with some short radial multiples. Perforation plates scalariform with 21-28 bars. Spiral thickenings in the tips of some narrow vessel elements and along the entire length in others. Rays 1-3 seriate, heterocellular, typically with one marginal row of upright to square cells. Axial parenchyma rare.

Discussion: This type is represented by a single specimen from Vantage. It is very similar to the *Liquidambar* type, however, *Liquidambar* doesn't have vessels with spiral thickenings along their entire length whereas this type does. Anatomical features of this wood occur in several families so at this time it is not possible to assign it to any single family.