***Rhysocaryoxylon fryxelli* (walnut, Chinese walnut)**

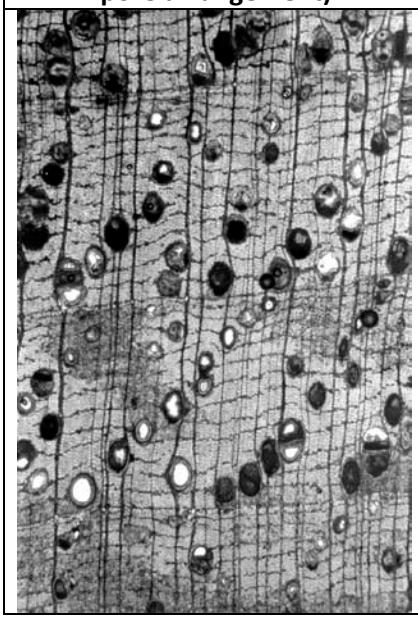
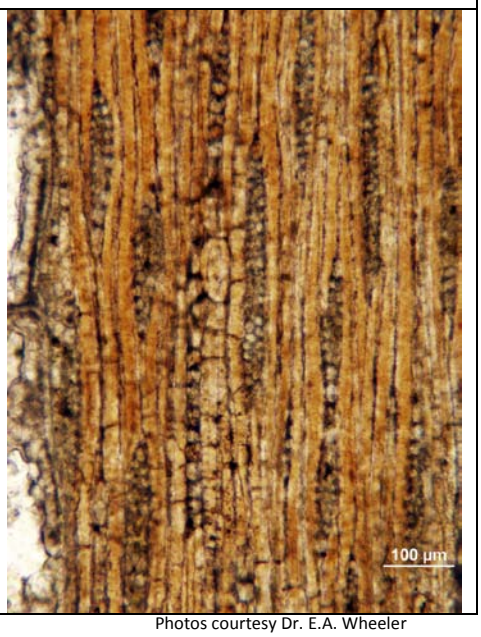
Family: Juglandaceae

Synonyms: *Juglans fryxelli* Prakash & Barghoorn 1961; *Caryojuglandoxylon* (Prakash & Barghoorn)Müller-Stoll & Mädel-Angeliewa 1983

Naming reference: Dupéron, J., 1988. Les bois fossiles de Juglandaceae: inventaire et revision. Review of Palaeobotany and Palynology 53, 251-282.

Other references: Prakash, U. & E.S. Barghoorn. 1961. Miocene fossil woods from the Columbia basalts of central Washington, I. Journal of the Arnold Arboretum XLII, 165-199

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

Transverse section (showing specimen with strong diagonal pore arrangement)	**Transverse section (second example with a more random pore arrangement)**	**Tangential section**
		

Photos courtesy Dr. E.A. Wheeler

Diagnostic features: Growth rings distinct with semi-ring porous vessel arrangement, often aligned in a diagonal pattern. Vessels solitary or in short radial multiples. Perforation plates simple. Rays 1-3(4) seriate, homocellular. Axial parenchyma scanty paratracheal to vasicentric, or in slightly wavy, narrow, regularly spaced tangential lines visible throughout the growth ring. Some parenchyma strands have inflated cells that likely contained crystals.

Discussion: When originally described by Prakash and Barghoorn, this wood was described as a walnut and placed in the modern walnut genus, *Juglans*. Subsequent studies noted the difficulty in distinguishing certain genera of the walnut family based on wood anatomy, and the form genus *Rhysocaryoxylon* was erected for woods that contained features common to modern walnuts and hickories. The walnut group and the hickory group can be separated if the central pith is present, because the walnuts have chambered pith and the hickories have solid pith. Unfortunately, fossil specimens with preserved pith are rare in the Columbia River Basalts. Additionally, some specimens labeled as walnut could actually be members of the closely related genus *Pterocarya* (wingnut) which also has chambered pith and diagonal pore arrangement. Fossil pollen from the region shows that walnuts, hickories, and wingnuts were all present in the Pacific Northwest during the time of the Columbia River Basalt eruptions.

Walnut type wood with diagonal pore arrangement is rare in the Vantage deposit. It is more common in the wood from Yakima Canyon, where it is typically labeled as *Pterocarya*.