

**CELLULAR ANALYSIS OF WOOD MATERIAL FROM
THE LITTLE JOHN SITE (KdVo-6)**



Photo Credit: N. A. Easton

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Introduction. Pacific Northwest Archaeological Services (PNWAS) received wood samples for identification by cellular analysis from Norman Alexander Easton. The archaeological samples consisted of four wood fragments collected from the Little John Site (KdVo-6); located 12 kilometers north of the village of Beaver Creek, Yukon, Canada near the border of Canada and Alaska.

This analysis and report was prepared for Norman Alexander Easton. Cellular analysis and microscopic identification was conducted by Kathleen Hawes, Assistant Director for PNWAS. Equipment for identification included an Optixcam 3.0 MP microscope camera mounted on an Omano OMM88T compound microscope.

Cellular analysis of wood samples. Four fragments of wood were examined, and were identified to genus (see Table 1, below). Three of the samples were received in one container (numbered #1, #2, #3), and the fourth (#4) was in a container intermingled with small wood fragments and dry soil. All the wood samples were very dry and fragile; however samples #1-3 were able to be sampled with a sharp razor blade for microscopic examination after a few minutes of soaking in water. Sample #4 was actually the largest of several small fragments, all of which were very fragile. An attempt was made to soak #4 but the sample was unable to be sectioned either wet or dry. Finally, a small piece of the sample was crushed and mixed with a few drops of water, with the resulting mixture placed onto a slide with a fine paintbrush and then examined microscopically. Enough segments of the cell structures were visible to allow for a partial identification.

Table 1. Results of cellular analysis

Field Site #	Material	Weight	Identification
<i>KdVo-6</i>	<i>Wood</i>	<i>0.985g</i>	<i>Betula sp. (birch)</i>
<i>KdVo-6</i>	<i>Wood</i>	<i>5.910g</i>	<i>Betula sp. (birch)</i>
<i>KdVo-6</i>	<i>Wood</i>	<i>43.665g</i>	<i>Betula sp. (birch)</i>
<i>KdVo-6</i>	<i>Wood</i>	<i>0.560g</i>	<i>Betula sp. (birch)</i>

Summary. The identification of these samples is to the genus level. All four samples were deciduous hardwoods, with vessel elements and perforation plates visible. Vessels are few in number, with scalariform perforation plates and alternate intervessel pits; homocellular uniseriate ray structures were observed. These features indicate a plant of the Betulaceae family, which include the genera *Alnus* (alder) and *Betula* (birch). Both have similar cellular structure; however the *Alnus* genus generally has aggregate rays, which were not observed in the wood samples examined.

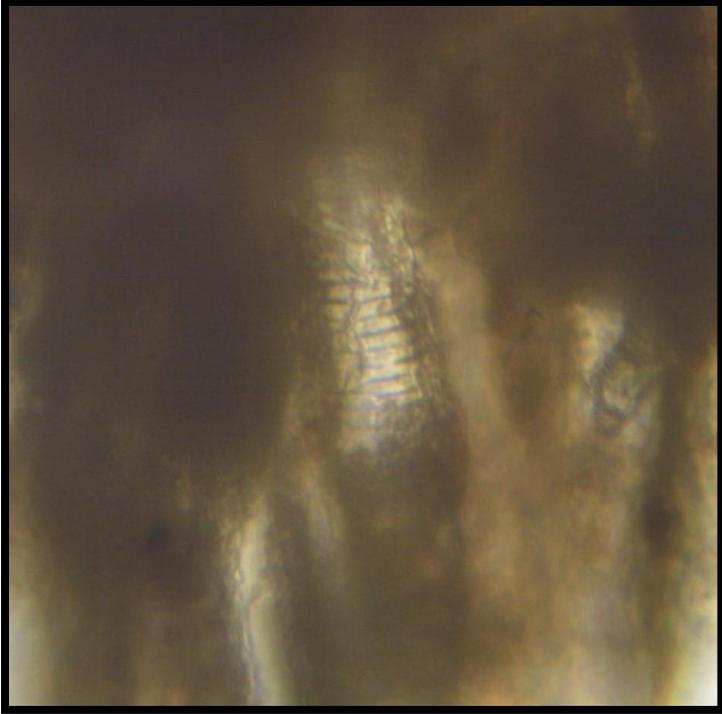


Figure 1. Example of scalariform perforation plate from Sample 2.

Several birch (*Betula*) species are currently represented in the project area, including *B. kenaica*, *B. neoalaskana*, *B. occidentalis*, and *B. glandulosa*. It is difficult to distinguish between these species based on cellular characteristics. Therefore identification of these wood samples is to genus, as indicated in Table 1.

The Betulaceae family has an ancient history in Alaska and the western Yukon (including the Little John Site project area); fossil ancestors date back to at least the late Cretaceous period, 89 to 65 million years ago. Alaska birch leaf fossils and petrified wood can be found in coal and associated rocks that date back to at least the Middle to Late Miocene (14 to 5 million years ago). Remnants were found of a spruce-birch forest in the sediments under a 5.7-million-year-old lava flow south of Cape Deceit, Alaska. Thus, birch species have been in Alaska for millions of years and evolved with the changing environment from warmer and moister to much colder and drier than present and warmer again at present (Packee 2004).

References

Hoadley, R. Bruce

1990 *Identifying Wood: Accurate Results with Simple Tools*. The Taunton Press.

Packee, Edmund C.

2004 Taxonomy and Evolution of Alaska's Birches. In *Agroborealis* 36(1):20-26.

Panshin, A.J. and Carl de Zeeuw

1980 *Textbook of Wood Technology*. McGraw Hill, Inc.

[http://dl1.yukoncollege.yk.ca/anth225/Excavations at the Little John Site Yukon Territory Canada](http://dl1.yukoncollege.yk.ca/anth225/Excavations_at_the_Little_John_Site_Yukon_Territory_Canada) (accessed May 10, 2013)