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A University Forests lecture for HUSTEP (Hokkaido University Short-Term Exchange Program) on the ancient forest culture of Hokkaido University campus

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Introduction

Hokkaido University campus has been designated a National Archeological Site (K39 Site and K435 Site) (Yoshizaki 1986, Kosugi 2003, 2005, 2008). Therefore, there are many excavations related to ancient vegetation, such as seeds, pollen fossil, wooden tools and charred wood. These excavations allow us to estimate ancient forest vegetation and the wood utilization of ancient people who lived in the area of what is now Hokkaido University campus.

Watanabe et al. (2005), the first author, has been identifying the buried ancient woods found at sites on Hokkaido University campus since 2003. The results, including charred wood, have been reported in archeological excavation reports. However, no one has summarized these results in relation to wood identification and pollen fossil analysis, or systematically organized the data concerning the ancient forest culture, i.e., ancient forest vegetation and wood utilization of ancient people who lived in the area of Hokkaido University. To clarify the ancient forest culture is important because it can lead to an understanding of how ancient peoples managed forests and we may learn from them forest management techniques suitable for the current global climate changes.

Hokkaido University Forests has developed a course on “Environmental Science for Biological Resources” as a part of “Hokkaido University Short Term Exchange Program”, HUSTEP (Sasa and Koike 2002, Koike et al. 2006, 2007). To introduce “Ancient Forest Culture” of Hokkaido University campus, we created panels that summarize the results of the wood identification and pollen fossil analysis using the accumulated archeological data from excavations on Hokkaido University campus.

Description of panels

Each panel is B4 paper size (250 x 353 mm) and 7 mm thick. We made a set of ten panels. A set is comprised of a panel for a campus map, two panels of wood identification methods and seven panels of summaries of forest culture (Epi-Jomon, Satsumon and Ainu) (Appendix). These panels include many photos and figures with short explanations written in both Japanese and English (Photo 1).

We made two sets, and one is used for the HUSTEP lecture at the Archeological Research Center of Hokkaido University. The other is displayed at the International Student Center of Hokkaido University (Photo 2).

“Ancient Forest Culture” of Hokkaido University Campus

In these panels, we outlined the “Ancient Forest Culture” of the campus from the current data of wood identification and pollen fossil analysis.

Epi-Jomon culture (about 2000 years ago)

Eleven pit-dwellings, a type of ancient house, were excavated at Jinbun-syakaikagaku-sogokyoiku-kenkyuto-chiten of K39 site. (The “chiten” means surveyed point in Japanese). Of these pit-dwellings, two included the remains of charred wood. The wood had been used for roof structures of the pit dwellings. The wood was identified using scanning electron microscope (SEM). A total of 16 taxa of deciduous broad-leaved trees, including some kinds of monocotyledon, were identified.

Most samples were identified at the genus level, such as ash (*Fraxinus* spp.; example, Yachidamo [*Fraxinus mandschurica* var. *japonica*]), and in turn Mizuki (*Cornus controversa*) and alder (*Alnus* spp.; ex. Ke-yama-han'noki [*Alnus hirsuta*]). The name in [], is the assumed tree species based on the growth traits of living species belonging to the same genus.

Pollen analysis of this site showed that a large number of pollen originated from ash and alder. These species typically grow in swamps or near rivers. Therefore, we concluded that Hokkaido University campus had been covered by deciduous broad-leaved forests near a river or swamp about 2000 years ago, and that ancient people used trees that were easily available in the surrounding forests for building pit-dwellings (Watanabe et al. 2005).

Satsumon culture (about 1000 years ago)

We have two sites of this period, Kyudojo-chiten and Keitekiryo-chiten at K39 Site.

In Kyudojo-chiten, one burned pit-dwelling was excavated and included some charred wood, which had been used for building the pit-dwelling. Wood identification analysis revealed that the charred wood was willow (*Salix* spp.), alder and walnut (Oni-gurumi; *Juglans ailanthifolia*). These species, like ash, are found along riversides or swamps. Therefore, ancient people of this era used the same species as those in the Epi-Jomon period

In Keitekiryo-chiten, many artifacts made of wood were found. One of them was a kind of fish trap, i.e. teshi. Teshi (the word originated from Ainu people) consisted of piles and supplemental crosspieces. Wood identification revealed that ancient people used trees species that had straight branches, i.e. fir and ash as piles, and flexible branches of wood, i.e. willow and alder as supplemental crosspiece. Furthermore, the results of wood identification showed that many artifacts were made of ash, yew (Ichii; *Taxus cuspidata*), *Hydorangea* spp. or maples. These tree species are dense hardwoods. Therefore, it is believed that ancient people chose tree species for making tools and utensils.

Pollen analysis revealed that this area was near a river and surrounded by a riverside forest or swamp forest, but there were other kinds of fields with oak and birch growing on the periphery of them. It is likely that people used trees from the surrounding swamp forest and they selected tree species for a specific purpose.

Ainu culture (about 400 years ago)

Some piles were excavated in the remnants of a buried river channel of the “Sakusyukotoni-gawa” at Fuzokutosyokan-honkan-hokuto-chiten. The wood was identified as ash. This analysis revealed that Ainu people used ash the same way as the people in Epi-Jomon and Satsumon eras.

These sites are located next to the ancient “Sakusyukotoni-gawa” river. It is believed that Hokkaido University campus may be located on two ancient rivers, “Sakusyukotoni-gawa” and “Seronpetsu-gawa”, and has been a swamp or an area often disturbed by floods of the two rivers. People lived on the dry natural levees near the rivers and used wood from the surrounding forests for about 1600 years. The “ancient forest culture” of Hokkaido University campus shows that ancient people used wood from the surrounding forests without destroying them. This seems to be an original form of sustainable forest management.

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