

NOTE

Wood selection for Chinese wood statues preserved in the several museums in the USA

Suyako Tazuru-Mizuno^{1*}

Abstract

The author's approach is focusing on wood selection for Chinese statues preserved in several museums, especially in the USA, where many East Asian sculptures are preserved, to get a deeper understanding of the historical background of Buddhist sculptures in East Asia. In general, *Torreya nucifera*, *Chamaecyparis obtusa*, *Cerasus* sp., *Zelkova serrata* were often used for Japanese wooden statues. Our research showed however, that the species selected for wood statues in China were completely different from those in Japan. Of the 62 Chinese wooden statues preserved in several US museums, the following wood species were identified by microscope: *Paulownia* sp. (17 statues), *Tilia* sp. (16 statues), *Salix* sp. (15 statues), *Populus* sp. (3 statues), *Juniperus* sp. (3 statues), *Santalum album* (3 statues), others (5 statues). Continued research will be necessary to understand the cultural exchange and logistics in East Asia.

1. Introduction

Wood species for East Asian wooden statues is now in the spotlight. In Japan, wood anatomist, Jirô Kohara, and art historian, Takeshi Kuno, performed wood identifications on over 600 Japanese Buddhist sculptures in the 1950s [1]. Further scientific wood identification of wooden statues from the 8th century in Japan has been systematically conducted by several researchers [2-4]. A hypothesis was proposed that the selection of *Torreya nucifera* for the 8th century statues, is referring to the commentary of a Sutra, that recommends the use of the so-called hakuboku, as a substitute for *Santalum album*, or sandalwood. Compared to that Japanese situation, wood identification of Chinese and Korean wood statues has not been done systematically so far.

The author's approach is focusing on wood selection for Chinese and Korean statues preserved in several museums, especially in the USA, where many East Asian sculptures are preserved, to get a deeper understanding of the historical background of Buddhist sculptures in East Asia. For the wood identification, the conventional microscopic method, and synchrotron X-ray micro-tomography (SRX-ray μ CT) [5] were applied. As an interim report, this paper summarizes the wood identification results of Chinese wooden statues in the USA, conducted in cooperation with Drs. Mechthild Mertz (CRCAO-CNRS, France), Takao Itoh (Nara National Research Institute for Cultural Properties), and Junji Sugiyama (Kyoto University).

2. Materials and Methods

For wood identification, either optical microscopy, and synchrotron X-ray micro-tomography (SRX-ray μ CT) was applied. Small samples were collected by curators or conservators of the museums. The samples were taken

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¹Laboratory of Biomass Morphogenesis and Information, RISH, Kyoto University.
Gokasho, Uji, Kyoto 611-0011 Japan

* E-mail: tazurusuyako@rish.kyoto-u.ac.jp

from the underside of the sculptures and from cracks, without harming the integrity of the sculptures. For the preparation of the microscopic slides, the samples were first soaked in water for softening, and then, thin sections were taken by hand, in cross, radial and tangential directions (20µm to 30µm thick). The sections were heated on a hot plate for removing the air-bubbles inside, and enclosed by the slide-mounting medium Gum-chloral. The slides were studied under the optical microscope (Olympus BX51). Some samples were too fragile and tiny for making preparations, so that SRX-ray µCT at BeamLine20XU in SPring-8 located in Hyogo Prefecture, Japan, was applied. This method provides high resolution (0.472 µm/pixel) 3-D image of the anatomical micro-structure enough to identify the wood species.

3. Results

Of the 62 Chinese wooden statues preserved in several US museums, the following wood species were identified by microscope: *Paulownia* sp. (17 statues), *Tilia* sp. (16 statues), *Salix* sp. (15 statues), *Populus* sp. (3 statues), *Juniperus* sp. (3 statues), *Santalum album* (3 statues), others (5 statues).

The results of the wood identifications of 28 statues were extracted from published data [6].

Figure 1 shows the results of the wood selection trend in the 62 Chinese wooden statues studied so far.

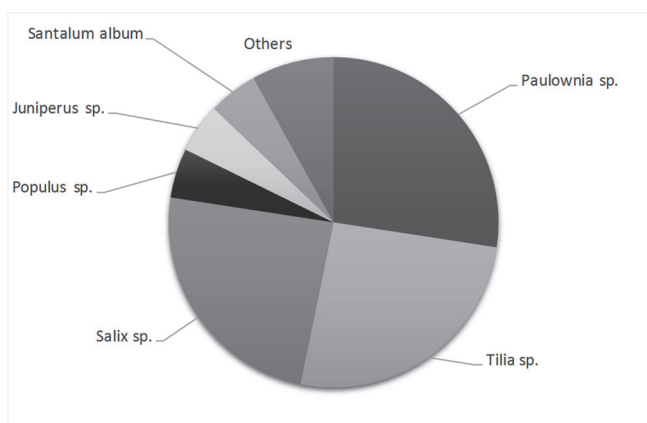


Figure 1. Wood species used for 62 Chinese wooden statues.

4. Discussion

In Japan, the following wood species, *Torreya nucifera*, *Chamaecyparis obtusa*, *Cerasus* sp., *Zelkova serrata* were traditionally used for wooden statues. Our research showed however, that the species selected for wood statues in China were completely different from those in Japan. Since this paper only summarizes the results of a limited cases for identifications conducted at several museums in the USA so far, it does not lead to any general trends or conclusions, it is an interesting result because it may show geographic differences on wood usage and also to understand the cultural exchange and logistics in East Asia. Continued research will be carried out.

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Profile



Suyako Tazuru-Mizuno

<Biography> Graduated from the Graduate school of Agriculture, Kyoto University in 2007 / Completed the doctoral course at the Graduate School of Agriculture, Kyoto University (Ph.D. in Agriculture) in 2011 / Postdoctoral at RISH in the same year / Assistant Professor at the RISH in the same year (to present) <Research theme> Interdisciplinary research aimed at understanding the diversity of East Asian wood cultures, based on scientific investigations of cultural heritage materials employing both traditional and novel techniques <Hobbies> handicraft.