

NOTE

Wood selection for Japanese wooden Komainu**(Laboratory of Biomass Morphogenesis and Information, RISH, Kyoto University)****Suyako Tazuru-Mizuno****Introduction**

Wood identification of wooden cultural assets provides significant information of wood selection and a new interpretation of the role that these wood species played in ancient periods [1]. In Japan, wood anatomist Jiro Kohara and art historian Takeshi Kuno, performed wood identifications in the 682 Buddhist sculptures from all over Japan in the 1950s [2]. Further scientific wood identification of wooden statues from the 8th century in Japan has been systematically conducted by several researchers [3-5], a hypothesis was proposed that the selection of *Torreya nucifera* for the 8th century statues is referring to an ancient sacred text that mentions the use of the so-called Hakuboku, as a substitute for *Santalum album*, that sacred wood indigenous in India. Compared to the Buddhist statues, wood identification of wooden Komainu statues which were often placed closed to Buddhist statues and Deity statues has not been done on a large scale. Our approach is focusing on wood selection of Komainu statues preserved in Kyoto and Shiga prefectures, where many religious sculptures are preserved. For the wood identification, conventional microscopic method and synchrotron Xray micro-tomography (SRX-ray μ CT) [6] was applied.

Materials and methods

In this study, wood identification was performed on wooden Komainu, 14 samples from Shiga prefecture and 4 samples from Kyoto prefecture. These statues were all assumed to be made from the Kamakura period to Muromachi period (Table 1). Small samples were collected by curators or taken from the underside of the sculpture and cracks without harming the integrity of the sculptures. For wood identification, the samples were brought to Kyoto University and preparation were made. First, the samples were soaked in water for softening. For the following preparation of the microscopic slides, thin sections were taken, either by hand, in cross, radial and tangential directions (20 μ m to 30 μ m thick). Sections were heated on a hot plate for removing the air-bubbles inside, and enclosed by the Gum-chloral. The slides were studied under the optical microscope (BX51), and photos were taken by a digital camera. Since 4 samples from Shiga prefecture and 1 sample from Kyoto prefecture were too fragile and tiny for making preparation, synchrotron Xray micro-tomography (SRX-ray μ CT) was applied at BeamLine20XU in SPring-8 located in Hyogo Prefecture, Japan. This method allows us to see the high resolution (0.472 μ m/pixel) 3-D image of the wood's anatomical micro-structure and to identify wood species.

Results

Of the 17 wooden komainu statues and one pedestal of Komainu statue located Shiga and Kyoto prefecture, the following wood species were identified:

Chamaecyparis obtusa (14 samples)

Torreya nucifera (4 samples)

Table. 1 show the details of samples and identified results. 阿 indicate the Komainu statue open its mouth and 𠄎 close its mouth. No. 14 is the pedestal of Komainu statue.

Discussion and conclusion

In Japan, a pair of guardian dogs Komainu is put in front of shrines and temples. They have a role to protect holy places because of its dignity. They are made of stone nowadays, however before Meiji period they were mainly made of wood and placed in front of sanctuary or set with Buddha and Deity statues. In fact, the systematic researches for the wooden Komainu have been delayed. The reasons include its difficulty in morphology classification, regional bias and lack of opportunity for investigation. Recently, as mentioned above, wood identification for Buddhist statues in Japan brought significant results concerning about the wood selection in Buddhism to Art historical field. On the other hand, wood selection criteria of other Buddhist art assets and Shintoism art assets has not been revealed.

NOTE

Our study showed that some Komainu in Kyoto and Shiga prefecture were also made from *Torreya nucifera* which hold important meanings in making Buddhist sculpture in 8th century in Japan. Wood species used for Buddhist statues had mainly changed from *Torreya nucifera* to *Chamaecyparis obtusa* with their carving style had changed from “Ichiboku” statues carved out of a single bole to “Yosegi” statues separately carved various part and assembled. In any case, we may ask the question why the Japanese selected *Torreya nucifera* and *Chamaecyparis obtusa* as a material for sacred wooden statues such as Buddha statues and Komainu. This is an initial step that opens the way for

Table. 1 Details of statues and identification results.

Serial Number	Prefecture	Shrine/Temple name	阿/畔	Date	Identified species
1	Shiga	Kasuga shrine	阿	Kamakura	<i>Chamaecyparis obtusa</i>
2		Nonomiya shrine	阿		<i>Chamaecyparis obtusa</i>
3			畔		<i>Chamaecyparis obtusa</i>
4		Tamao shrine	阿		<i>Chamaecyparis obtusa</i>
5			畔	<i>Chamaecyparis obtusa</i>	
6		Shina shrine	畔	Nanboku cho	<i>Chamaecyparis obtusa</i>
7		Mikami shrine	阿	Muromachi (1420)	<i>Torreya nucifera</i>
8			畔		<i>Torreya nucifera</i>
9		Syokakuji temple	畔	Muromachi	<i>Chamaecyparis obtusa</i>
10		Mochihi shrine	阿		<i>Chamaecyparis obtusa</i>
11			畔		<i>Chamaecyparis obtusa</i>
12		Jionji shrine	阿		<i>Chamaecyparis obtusa</i>
13			畔	<i>Chamaecyparis obtusa</i>	
14		Nonomiya shrine	Pedestal	Muromachi (1552)	<i>Torreya nucifera</i>
15	Kyoto	Sudai shrine	畔	Muromachi	<i>Chamaecyparis obtusa</i>
16		Tenman shrine	阿		<i>Chamaecyparis obtusa</i>
17			畔		<i>Chamaecyparis obtusa</i>
18		Yotsutsuji Hachiman shrine	畔	Unknown	<i>Torreya nucifera</i>

further investigation for Komainu statues. For further investigation, identification, dating of many statues and constructing database would be necessary. So far, I found some Komainu statues with Buddha statues and Deity statues are preserved in foreign Museum through my resent study in the USA. I hope my study would be one of a strong call to all museums in all over the world to focus on wood species of Wooden Buddhism assets such as Buddhist statues, Komainu and other heritages.

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