

Non destructive imaging of Japanese Buddha statues

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In Japan and in Korea separately, there is two statues: one was made from wood and the other was made of bronze. The first registered national treasure, Hōkōmōroku at Koryū-ji temple is unique as it is made from Akamatsu wood (*Pinus densiflora*). In Asuka era, Kusunoki, *Cinnamomum camphora* and Kaya, *Torreya nucifera* have been mainly used for such statues. Later, Hinoki (*Chamaecyparis obtusa*) has been used for the same purpose. Who made and where it was made have been long debated.

In an old document, there is a record of a statue brought from Silla in 623, and the statue was handed down in Koryū-ji temple. This statue is supposed to be the present Hōkōmōroku. Its appearance is also nearly identical to the bronze statue handed down in Korea (Korean National Treasure #83). Therefore it seems likely that the statue was brought from Silla.

Generally, in order to prevent crack formation on the face, body of the Buddha statue, hidden skills are there. The sculptor's invention is to carve inside for releasing internal stress of wood. This advanced technique was introduced from Silla. It was so well done but the cover is made of *Cinnamomum camphora*, which grows only in the limited area of Korean peninsular, southern most coast and Jeju island, but grows mainly in Japan.

Thus, who, where, and when it was made is still uncovered. As such, knowing wood species of important cultural artifacts is of great importance as an evidence for correct understanding of our history.

In the case of samples from national treasure or cultural assets, however, only non-destructive analysis is allowed. Even during restoration, sampling on purposely is strictly regulated. This is in such a situation that the samples are often too small to apply conventional microscopic technique even when samples became available unexpectedly.

SR-microCT technique provides resolution enough to resolve species-specific anatomical feature from such a precious sample and thus allowed us to identify wood species[1]. Some examples will be given in the presentation.

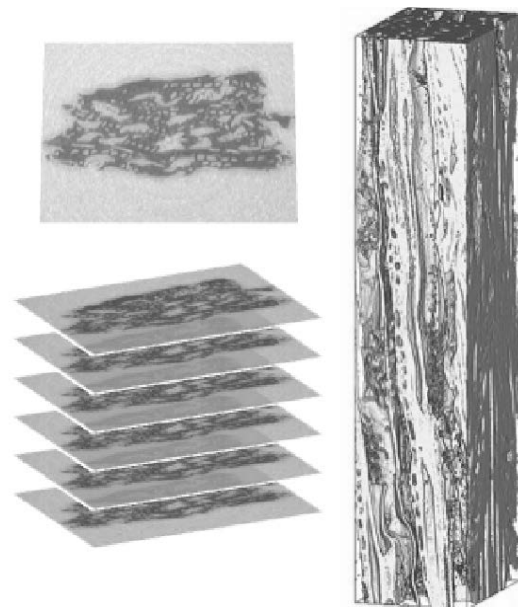


Fig.1 An example of wood fragment observed by SR-microCT technique.

[1] S. Mizuno, R. Torizu, J. Sugiyama, J. Archeol. Sci **37**, 2842 (2010).