

TOCOWO (TOmography of COngolese Wooden Objects)

In support of the international travel of ethnographic collections: Identification of wood on Congolese objects using micro- and sub micron Tomography

B2/191/P2/TOCOWO

SUMMARY

Context

The Royal Museum for Central Africa (RMCA) hosts a large collection of Congolese heritage objects. Of this vast collection, more than 55.000 sculptures, musical instruments, equipment, furniture, and alike are made of wood or contain wooden elements. For less than 7% of these wooden objects has the tropical species ever been determined. Yet a wood identification of the collection objects enable the museum to share its unique collection more widely, sending objects abroad on traveling exhibitions or loans conform to the international laws of endangered species. Discovering more about the wood species represented in the collection can also provide insight into their construction or their region of origin. In addition, knowledge of the wood species of an object can also aid the conservators of the museum in determining the best treatment course, considering the specific characteristics of the wood species and its ageing properties.

Objectives

To date, the practice for identifying African wood species requires a sample of wood from the object. By processing the sample and studying it microscopically, the anatomical features of the wood species can be described and matched to a possible wood species. Such an invasive method permanently removes a part of the object, ranging from 2 mm³ to 2 cm³. The TOCOWO project, which started in September 2020, aimed to explore the possibility of micron and sub-micron X-ray computed tomography (μ CT) as a non-invasive alternative for the identification of wood species. At the time, the technique had already shown much promise in the field of wood biology, as it can capture high-resolution information of its internal wood structure. A second objective of the project was to formulate a protocol for the μ CT scanning of heritage objects, specifically fragile African objects such as held by the museum. Lastly, the project aimed to set up a reference database from the scanned tropical wood species present in the collection.

Conclusions

At the conclusion of the two-year project, 109 objects from the collection of the RMCA have been scanned, creating a unique dataset. The TOCOWO project was able to confirm the technique can lead to positive wood identifications and has also documented the technique's limits regarding the analysis of African heritage objects. The high-resolution scans of the wood structure inside the

object show many anatomical features, allowing a description of the wood to be made. The acquired resolution - and chance of a successful identification – depended on the object’s dimensions, shape, included materials and wood species. A protocol was drafted to provide a guide through the intricacies of scanning museum objects, and specifically the specific delicacies of analysing African heritage objects. CONteXT, a follow-up project to TOCOWO, will further explore the vast dataset of scanned objects, focusing on the material evidence inside the objects pertaining to their construction, history, and original context. All results will be disclosed by the end of the project in an exhaustive image database and an exhibition in the RMCA.

Keywords

Wood anatomy, African heritage, Conservation, Travelling exhibitions, Micro-CT and sub-micron CT, CITES