

radix 3 (27.8%). In terms of rooting media, no significant difference in rooting of cuttings was achieved. For the potting media experiment, increment in height measured at five months after potting was significantly higher in media of soil, mixture of soil:compost and sand:compost compared to mixture of soil:coconut husks and soil:rice hulls. Diameter increment was significantly bigger in mixture of soil:compost and sand:compost compared to mixture of soil:coconut husks and soil:rice hulls. The media with soil:compost had the highest height increment (20.4 cm) and the biggest diameter increment was obtained in media of sand:compost (9.1 cm).

**Keywords:** Plantation species; Vegetative propagation; rooting medium; hormones; potting medium

## PP009

# Identification of ancient charcoal fragments in Central Africa: meeting the challenge of species diversity

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Fossil pollen and charcoal fragments are preserved in lake sediments, in forest soils and in ancient human settlements. As such, vegetation history is remarkably well archived. However, Central African vegetation history has been poorly documented. Central African palaeovegetation reconstructions are based mainly on pollen analysis, while the charcoal archive remains hardly explored. Nevertheless, ancient charcoal analysis has proven worthwhile in temperate regions. One of the main challenges for charcoal identification in tropical regions is species diversity.

Therefore we developed and present a transparent charcoal identification protocol within an umbrella database of species names and metadata, compiled from the on-line database of wood-anatomical descriptions (InsideWood), the database of the world's largest reference collection of Central African wood specimens (RMCA, Tervuren, Belgium) and inventory and indicator species lists. This database covers more than 2900 Central African woody species, which is a large fraction of the total woody species richness of Central Africa. The protocol starts with an anatomical query within this database, focussing on genus rather than species level and proceeds with automatic extension and reduction phases taking into account metadata on (1) availability of thin sections within the reference collection, (2) species distribution and (3) synonymy. The protocol ends with a comparative microscopic study of wood reference thin sections and charcoal anatomy.

The protocol has been optimised for the Mayumbe region (DR Congo). We present first identification results from several radiocarbon dated charcoal collections (8000 - 200 cal yr BP), sampled in systematically excavated profiles in the Mayumbe forest. Identification results are mutually consistent. Also, these identification results are consistent with vegetation history based on palynological research within and around the research area. As such, anthracology complements palynology and a combination of both can lead to stronger palaeobotanical reconstructions.

**Keywords:** charcoal identification; Central Africa; climate change; vegetation reconstruction

## PP010

# Identification of timber species in the largest Italian collection of wooden statues, at the National Museum of the Palazzo di Venezia in Rome

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The Palace of Venice was built in the fifteenth century by the Venetian Cardinal Pietro Barbo, who later became Pope under the name of Paul II, and one century later donated to the “Serenissima”, the Republic of Venice; the name of the palace derives from its destination as Embassy of the Republic in Rome. As for the Republic, also the palace from 1797 became property of the Austrian Empire, as Austrian Embassy; it went to the Italian State in 1916 and was intended to host a National Museum.

The most important and largest (over one hundred and seventy pieces) collection of wooden sculptures present in Italy, having various origin and production, Italian and European, is now kept in this museum.

From one hundred artefacts, partly exhibited in the museum and partly preserved in the deposits, were drawn 137 samples in order to identify the wood species, following the guide-lines for sampling and identification of species contained within the UNI 11118 : 2004 (Cultural heritage - wooden artefacts - criteria for identification of wood species).

The results of the analysis provided the art historian an important set of data in the complex task of identifying the exact origin of the “erratic” artefacts, combining the technological and scientific results obtained with the historical-artistic information; this because the wood species are related to very specific growing habitats, often related to the cultural areas of artistic production.

A total of 13 different timber were identified: 60% of identifications correspond to lime (*Tilia* sp.) and poplar (*Populus* sp.), where out of the total lime alone is 43%. Other timbers appear sporadically, but among them more significant are Swiss pine (*Pinus cembra*), European walnut (*Juglans regia*), sweet chestnut (*Castanea sativa*) and deciduous European oak (*Quercus* sp.).

**Keywords:** Wood culture; paper production; wooden screen molds; Museum of Paper; wood species.

## PP011

# Evaluation of Permeability of Hardwood Using Darcy's Law

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