

Microscopy as a tool for wood identification of national heritage historical buildings

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The achievement of an accurate diagnosis to define between the replacement or restoration of wood requires a preliminary study of this wood. This study is especially relevant when it happens to be the restoration of historical buildings or monuments listed as national patrimony. The identification of wood can be made from their macroscopic and microscopic characteristics. Considering the importance of accuracy in restoration decisions, this paper presents a microscopic analysis of wood from the historical building at the Historical Center of Pelotas, RS, Brazil. The characterization was performed in an optical microscope (OM), model Opton TA-0124-XL equipped with a digital camera, and a scanning electron microscope (SEM), model Shimadzu-SSX550. In order to characterize this material wood was cut in cubes that were boiled in water, stained with safranin and astra-blue, dehydrated in increasing alcohol series and diaphanized with xilol. For the analysis at the OM the cubes were cut on a sliding microtome and resulted in slides containing three anatomical planes. For analysis at the SEM the cubes with a volume of 0.5 cm³ were coated with gold and analyzed in the three anatomical planes. In both microscopes was observed the absence of channels resiniferous and longitudinal parenchyma and the presence of longitudinal tracheids with square, hexagonal or rounded sections, without helical thickening; bordered pits; homogeneous wood rays; pits type cupresoid (1-6 per field); and smooth axial parenchyma walls, characterizing the description of wood *Araucaria Angustifolia*. Comparatively, the analysis at the OM was effective concerning the perception of the characteristics of wood and the analysis at the SEM was important for image quality and accuracy of measurements. This work confirmed the importance of the use of microscopy and the technical-scientific knowledge for greater precision in the definition and selection of woods.

Keywords: optical microscopy, scanning electron microscopy, characterization, wood

[1] L.M. Burger, H.G. Richter, Anatomia da madeira, São Paulo: Nobel, 1991.

[2] B. A. Dedavid, C. I. Gomes, G. Machado, Microscopia Eletrônica de Varredura: Aplicação e Preparação de Amostras, EDIPUCRS, Porto Alegre, 2007

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