

# WOOD IDENTIFICATION IN THE ICONS OF BERAT MIDDLE-AGE MUSEUM: FIRST STEPS OF THEIR RESTORATION AND CONSERVATION

## (IDENTIFIKIMI I DRURIT TË IKONAVE TË BERATIT NË MUZEUN E MESJETËS: HAPAT E PARË TË RESTAURIMIT DHE RUAJTJES)

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### ABSTRACT

At the deposit of the Middle Age Museum of Berat there are about 350 icons, among of 4500 items all over Albania. The first scientific step in their restoration is wood identification. This is important because different species have different physical (density, ability to shrink and swell) and mechanical (modulus of elasticity, static bending, compression, tension and shear) properties and different reaction to temperature and relative humidity of environment (swelling and shrinkage and as result, different deformation), so it needs an accurate study before other restoratory interventions. Actually it is carried out the identification of six icons.

The technique used for the anatomic study is the resin inclusion. After chemical treating of small samples in resin (butyl based) and their thermal treating in thermostat (temperature 60°C for 12 hours), were prepared anatomic sections by microtome. The microscope observations showed that three icons belong to *Juglans regia* L., two icons belongs to *Populus* sp. (probably *Populus alba* L.), and the last one belongs to *Abies alba* Mill. Such a process is under way for other icons in the restoration process.

**Key words:** icon, restoration, anatomic study, microscope observations, wood identification.

### INTRODUCTION

Medieval picture in Albania is represented by a considerable number of works. Many of them have an artistic quality which passes the border of the national interest. These pictures are of Byzantine icons, conserved in churches and monasteries of southern and central Albania, where the Orthodox Christianity is diffused. There are more than 4500 icons. A considerable part of them are conserved in the National Museum of Tirana (about 700) and in two Middle Age Museums of Berat (about 350) and Korça.

The structure of icons is composed by some layers; wooden support, ground layer, canvas and in the end the painting. In some rare cases, the painting is applied directly on wooden supports.

According to the dimensions of wooden support, Albanian icons can be classified in three categories, small, medium and large.

The small ones are mainly placed in the upper part of iconostases and are composed by a single board. This type of icon was commonly used in Albania. The medium ones are composed by two boards and in large icons (over 100x70 cm), the wood support has three boards.

The joining of boards was made using animal glue. Most of supports of Albanian icons of

the 14<sup>th</sup>-16<sup>th</sup> centuries are realised by this kind of joint. In the 17<sup>th</sup>-19<sup>th</sup> centuries, where icons started to be painted in larger supports, glued jointing were reinforced with butterfly keys.

Crossbeams are elements which maintain the support continuity and insure the planarity of the surface. Until the 16<sup>th</sup> century the connection between crossbeams and boards was made using wrought-iron nails. In the later centuries the dovetailed crossbeams were used.

Icons of our study were all of medium dimensions and in two of them the painting is applied directly on wooden support.

The actual situation related to the study, conservation and restoration of icons in Albania isn't satisfactory. The elements leading to such conclusions include:

- documentation; is partial. Icons are described only by an artistic viewpoint. There is a lack of accurate information about wood species, structure and supports, the biodegradation and paints used. On the same time the chronological information about the restorations is completely lacking.

- conditions of conservation; problematic ones, especially in museum of Berat. The storage room of icons in Berat is exposed to inappropriate environment hygrometric parameters.

- performed restoration interventions; until now the interventions have consisted only on cleaning and restoration of the painting layer

The aim of this paper is to present the work in progress in the framework of the cooperation between the Department of Wood Technology, Faculty of Forestry Sciences, Agricultural University of Tirana and the Institute of Monuments.

#### MATERIAL AND METHODS

For wood identification of icons small samples were taken very carefully using a sharp cutter. The location where the samples were extracted was the back corner edge of the panel, in a manner that the art object would not be damaged. The size of fragment ranged 1-3 mm in width and several millimeters up to 1 cm in length according to recommendations of Romagnoli [1].

The first step was the verification by stereomi-

croscope for choosing the good parts of samples which will be treated later.

The technique used for anatomic study was the resin inclusion. After the based butyl resin was prepared, the samples were put in glass containers filled with mixture of resin and ethanol in equal amounts. The samples were left in these containers for one hour. Then the samples were put in pure resin and left in it for 1.5 hour. In the end, the samples were placed in capsules filled with resin, which were placed in thermostat in a temperature of 60 °C for 12 hours (Fig. 1 and 2).



Figure 1. Inclusion of samples in resin

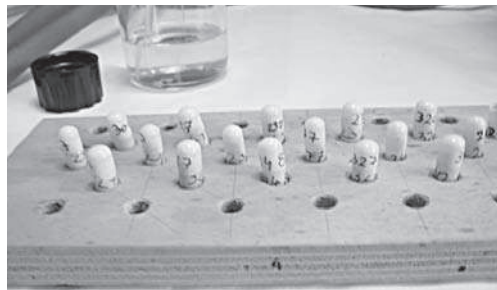


Figure 2. Samples in capsules after thermal treatment

After the resin polymerization in thermostat and the equilibration in the environmental temperature for two days, the capsules were open and the resin together with the samples were cut by microtome and fixed in microscopic slides using glycerol, ready for anatomical observation. Nardi's key identification was used to identify the wood species [2].

#### RESULTS AND DISCUSSIONS

The identification for six panel paintings

showed that three of them (*Christ Pantocrator*, *Deesis*, *Christ Crucifixion*) belong to walnut (*Juglans regia* L.), two others (*Source of Life Given*, *Christ entering in Jerusalem*) belong to poplar *Populus* spp. and the last one (*Over grave crying*) belongs to white fir (*Abies alba* Mill.) (Table 1).

The result of anatomical description also is confirmed by the abundance of *Juglans regia* L. in forests of Osumi's valley [3], to Southern Albania, where are located the churches of icons. This wood is determined as semi heavy (density oven dried 520 kg/m<sup>3</sup>) and can be dried well. The natural durability is classified in the middle rank (third class). It is not resistant against the insect attack, especially from common furniture beetle (*Anobium punctatum*). *Juglans regia* L. was appreciated by the local craftsmen to carry out their works due to its structure (fine texture) which is suitable for painting and gluing.

In the case of poplar, it is more likely to be white poplar *Populus alba* L. [4] since it is the only popular specie grown naturally in the region of Myzeqe, Southwestern Albania near Berat [5], where many Byzantine churches were also located. It is homogeneous wood with fine texture and low density. It is not resistant against biological and anobium attacks (fifth class), but is worked and painted very well. This result is novel for Albanian icons, because this wood was never appreciated for artifacts in Albania.

The information about the use of softwoods (*Abies alba*) [4] in Albanian icons is not new, but the detailed information about specific species did not exist. This species has been rightly chosen by the author because of its adequate characteristics of structure and properties. It's not heavy wood ( $d_{12}=441$  kg/m<sup>3</sup>) and can be dried well. The natural durability is not good (fourth class) but with a good resistance against the acid and basic solutions. It is well-known by craftsmen traditionally for its good ability to be worked on. It seems that this wood is imported from Përmet region, adjacent to Berat, where it is naturally widely grown.

#### CONCLUSIONS

The identification of wood species carried out

before the restoration process of icons in Berati's Museum showed that the native wood was used. *Juglans regia* L. was used in three icons, and it is still nowadays highly appreciated by local craftsmen to carry out their works. Unexpected is *Populus alba* L. which was identified in two icons. This wood is spread in the region but traditionally not appreciated by the woodworkers. Also the last one is identified as *Abies alba* Mill., a very spread species conifer our forests all over the country. This wood was appreciated by artists because of its homogeneity, fine texture and resin canal absence. The work presented in this paper is novel to Albania. At the same time, part of the information resulting out of this work was unknown till now. The significance of interdisciplinary collaboration has reformed the restoration process of icons in Albania and based it on scientific methods. Since the restoration of icons is a complex process dealing not only with painting, future developments are foreseen with regard to wood species identification of icons in Tirana and Berat Museums.

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Table 1

	<i>Transversal section</i>	<i>Radial section</i>	<i>Tangential section</i>	<i>Anatomic description</i> <sup>27</sup>
<i>Christ Pantocrator</i>				<ul style="list-style-type: none"> <li>- Transversal section; Diffuse porous. Isolated large pores. Apotracheal parenchyma in layers and diffuse. Tyloses present.</li> <li>- Radial section; Heterogeneous and homogenous rays.</li> <li>- Tangential section; Simple perforation plate. Rays most often 2-4 cells wide, occasionally uniseriate. Average ray height 15-30 cells.</li> <li>Key characteristic: Solitary pores sparsely scattered. Rays 2-4 cells wide. (<i>Abies regie</i> L.).</li> </ul>
<i>Source of Life Givens</i>				<ul style="list-style-type: none"> <li>- Transversal section; Diffuse porous. Pores are solitary or in radial files of 2-3. Diffuse and terminal apotracheal parenchyma.</li> <li>- Radial section; Homogenous rays. Large ray-vessel pits.</li> <li>- Tangential section; Simple perforation plate.</li> <li>- Uniseriate, homogenous rays with height 5-30 cells.</li> <li>Key characteristic: Diffuse porous. Uniseriate homogenous rays. Large ray-vessel pits; <i>Populus</i> spp. (Schweingruber, 1990)</li> </ul>
<i>Over grave crying</i>				<ul style="list-style-type: none"> <li>- Transversal section; In general heartwood absent. No resin canal. E general a sharp transition from earlywood to latewood.</li> <li>- Radial section; Rays without tracheids. Taxodioid pits in rays. Ray walls are thick and tooth shaped. Usually one, often two rows of pitting in radial tracheid walls.</li> <li>- Tangential section; Average ray height 9-25 cells.</li> </ul>
<i>Christ entering in Jerusalem</i>				<ul style="list-style-type: none"> <li>- Transversal section; Diffuse porous. Isolated large pores. Apotracheal parenchyma in layers and diffuse. Tyloses present.</li> <li>- Radial section; Heterogeneous and homogenous rays.</li> <li>- Tangential section; Simple perforation plate. Rays most often 2-4 cells wide, occasionally uniseriate. Average ray height 15-30 cells.</li> <li>Key characteristic: Solitary pores sparsely scattered. Rays 2-4 cells wide. (<i>Abies regie</i> L.).</li> </ul>
<i>Diesses</i>				<ul style="list-style-type: none"> <li>- Transversal section; Diffuse porous. Pores are solitary or in radial files of 2-3. Diffuse and terminal apotracheal parenchyma.</li> <li>- Radial section; Homogenous rays. Large ray-vessel pits.</li> <li>- Tangential section; Simple perforation plate. Uniseriate, homogenous rays. Ray height: 5-30 cells.</li> <li>Key characteristic: Diffuse porous. Uniseriate homogenous rays. Large ray-vessel pits; <i>Populus</i> spp. (Schweingruber, 1990)</li> </ul>