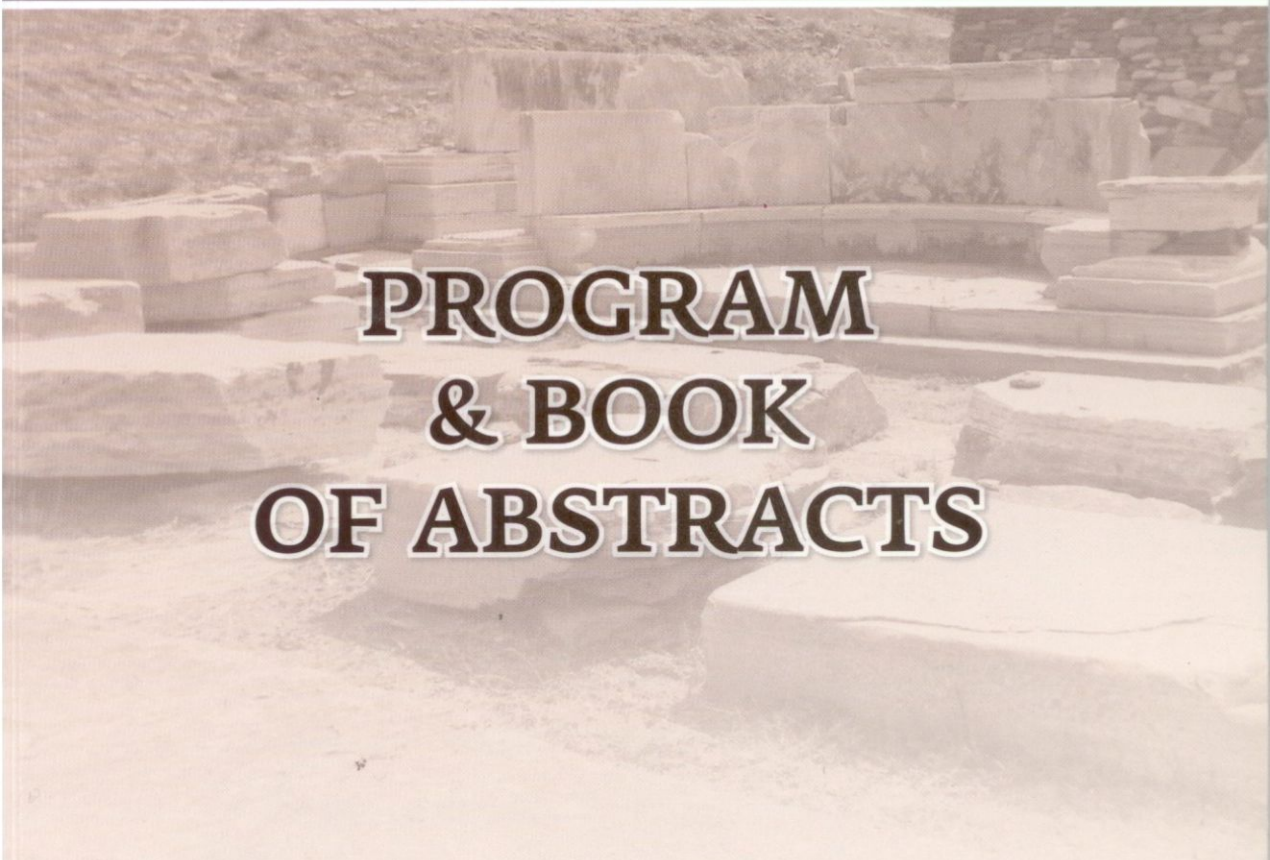


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IDENTIFICATION OF PIGMENTS IN MEDIEVAL ICONS AND ORIENTAL ILLUMINATED MANUSCRIPTS USING MICRO-RAMAN SPECTROSCOPY

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Micro-Raman spectroscopy is a rapid and unambiguous technique for identification of pigments used in the wall paintings, icons and manuscripts. This technique was applied in order to obtain information on the pigments used in (A) the two valuable icons appointed for conservation, from the Gallery of Icons in Ohrid and (B) the two 16th century Oriental illuminated manuscripts, from the collection of the National and University Library "St. Kliment Ohridski" in Skopje.

The pigments sampling from the icons was done by gently touching the paint with the cotton bud (the varnish had to be removed first), while the manuscripts were placed directly under the microscope, without damaging them. All obtained Raman spectra were compared to the reference database of pigments.

The pigments palette identified from the two icons, "SS. Basil the Great and Nicholas" (dated around 1045/50) and "Mother of God Episkepsis" (early 14th century) was rather limited. Hematite and cinnabar were used for the reds and lazurite for the blue colour, while greens were mixtures of two pigments, either azurite and lead tin yellow type II or carbon black and lead tin yellow type I. Some traces from the previous conservation treatments were also detected.

A rich palette of pigments was revealed in the two illuminated manuscripts, showing an extensive use of extremely valuable and costly pigments, characteristic for Oriental manuscripts of the 16th century.

- The main text was written in black ink (carbon black). The coloured inks of cinnabar, indigo, vergaut (a mixture of indigo and orpiment), realgar were used to highlight given elements of the text.
- The pigments identified in the illuminations are lapis lazuli, red lead, cinnabar (the lighter hues were obtained with addition of lead white and the outlines with carbon black), gold (confirmed by XRF analyses), malachite, atacamite and brochantite, the latter two are probably result of some degradation processes.