



**41st INTERNATIONAL
SYMPOSIUM ON
ARCHAEOLOGY**

BOOK OF ABSTRACTS

Editors:
N. Zacharias and E. Palamara

May 15-21, 2016
Kalamata, Greece

P-47. Multi-analytical study on the frescoes of Kurilo Monastery "St. Ivan Rilski", Bulgaria

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This contribution describes the results obtained from the characterisation of paint samples from Kurilo Monastery "St. Ivan Rilski", Bulgaria. The Kurilo Monastery is a part of the Sofia Sveta Gora complex of cloisters, founded in the 10th century. It was destroyed in the 14th century, but it was rebuilt by monks and painted in 1596 by the famous artist and writer Pimen Zograf. The only thing left from the old monastery to this day is the single-nave double-apsed church with two narthexes. Pimen Zografski's frescoes urgently need restoration.

Fourier Transform Infrared Spectroscopy (FTIR), Raman Spectroscopy (RS), Scanning Electron Microscopy coupled with Energy Dispersive X-ray Spectroscopy (SEM-EDS) and X-Ray Powder Diffraction (XRD) were used for the inorganic content determination. Organic materials in the paint samples were analyzed based on Attenuated Total Reflectance (ATR) IR spectra. A spectral database of paint materials was built and used to enable fast and reliable

identification of the pigments and binders used by the local artists.

Via these complementary techniques and by the help of the spectral database, we were able to identify the mineral pigments and organic binders in the paint samples. Green earths containing celadonite and goethite were used as green pigments. Red colored paint samples showed cinnabar and red ochre content. Calcite and gypsum were also present in the paint samples. Extraction by various organic solvents and ATR-IR spectral analysis enabled the identification of resin in the golden colored samples.

The authors are grateful for financial support by the National Science Fund of Bulgaria (Contract K02-15).

P-48. Characterization of wall painting materials from Rila Monastery (Bulgaria) by Raman and ATR-FTIR Spectroscopy

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Rila Monastery is the largest Eastern Orthodox monastery in Bulgaria, founded in the 10th century by the first Bulgarian hermit St. John of Rila. As national historical monument and UNESCO World Heritage Site, it constitutes great cultural, artistic and religious value. The main monastery church "The Nativity of the Virgin" is painted by the best zographs of the Bulgarian Revival - Dimitar Zograph, Zahari Zograph and Ivan Obrazopisov.

Analytical study on the frescoes on different parts of the church, executed in different time periods, would allow characterization of the used materials, defining the possible evolution of techniques over time. With this aim, we carried out Raman and ATR-FTIR investigation on samples from the frescoes, painted by Zahari Zograph in 1844. ATR-FTIR and Raman spectroscopies provide molecular and structural information for the organic as well as for inorganic materials in a fast and non-destructive way without any sample preparation steps. These advantages make them very suitable for the characterization of mineral pigments and organic binders in artworks. Our spectral studies showed that the color palette of the frescoes comprises of pigments such as calcite, minium, azurite, smalt and charcoal black. Organic material used for execution of the glided halo in the frescoes was also analyzed. The obtained results provide a useful basis for comparison with the frescoes in the church "The Nativity of the Virgin", executed in later periods.

The authors are grateful for financial support by the National Science Fund of Bulgaria (Contract K02-15).

P-49. Examination of 14th-15th century Buddhist wall paintings from a cave complex in Saspol, Ladakh

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Located in Northern India, Ladakh valley was part of the old silk route and its cultural heritage belongs to the tradition of Western Tibetan art. The small village of Saspol in this region hosts a cultural site that incorporates a castle from the 8th-9th century, chortens, five temples and seven meditation caves. The latter include an impressive group of wall paintings ascribed to the 15th century or an earlier period; their dating is still under debate.

The Saspol caves are of significant importance to Ladakh, and an invaluable part of the cultural heritage of the area. Their current conservation state is, however, highly delicate, the natural erosion of the conglomerate layer being the main concern [1]. The treatment of the site is being carried out after an exhaustive condition assessment is implemented. To support this, a number of paint samples were extracted from the wall paintings. The materials characterization of the samples aims to unravel the technology used in the preparation of these wall paintings.