

Traditional building materials and modern restoration products identified at the painted Matia-fresco Loggia, Corvins' Castle, Romania

Rodica-Mariana Ion (1,2), Lorena Iancu (1), Daniela Turcanu Carutiu (3), Verginica Schroder (4), Sorin Tincu (5), Cristian Roman (6), Nelu Ion (1), Ioan Alin Bucurica (7), Sofia Teodorescu (7), Ioana Daniela Dulama (7), Raluca Maria Stirbescu (7), and Anca Gheboianu (7)

(1) ICECHIM, Evaluation and Conservation of Cultural Heritage, Romania (rodica_ion2000@yahoo.co.uk), (2) Valahia University, Materials Engineering Dept., Targoviste, Romania, (3) OVIDIUS University Constanta, Expertise Center for the Art of Science, Culture and Spirituality, Institute Of Science, Culture And Spirituality, Constanta, (4) OVIDIUS University Constanta, Faculty of Pharmacy, Constanta, Romania, (5) Corvins' Castle, Hunedoara, Romania, (6) Museum of Archeology, History and Ethnography, Hunedoara, Romania, (7) Valahia University of Targoviste, Institute of Multidisciplinary Research for Science and Technology, Targoviste, Romania

Corvins' or Hunyadi Castle is located in Hunedoara, region Transylvania, Romania. It was built in the 15th century on the site of an older medieval fortification, on a cliff above the Zlasti River. In the castle loggia called Matia, there is a fresco related to the legend of the royal descence of John Hunyadi (Corvin). The legend says that John Hunyadi was, in fact, the illegitimate son of Sigismund of Luxembourg, king of Hungary, with Elizabeth Margineanu, a beautiful woman from Hateg area. The king gives to Elizabeth Margineanu, a golden ring, as a gift for her unborn child, to be later recognized in the royal court by his true father. In one day, the ring was stolen by a raven and John, puts his hand on the bow and recovers his ring. Years later, when John arrives at the royal court, the Hunyadi's blazon became the raven with a gold ring in his beak. The name Corvin comes from the Latin "Corvus" = raven. After the devastating fire from 1854, which provoked an extensively damaged of the castle, it was subsequently restored, but the restoration was carried out in several stages and some of these were not entirely successful. The painted Matia-fresco Loggia is a high-value artistic component and is in an advanced degree of deterioration, and its study is absolutely necessary.

The diagnosis of the degradation stage of different materials such as natural stone, crushed stone, sands and gravels, clay, inorganic binders (lime, dolomite, natural cements, hydraulic lime, and gypsum), mortars, artistic components (painted surfaces, Matia-fresco Loggia, stone) from the Corvins' Castle have been investigated by using advanced investigative techniques proper for recommendations on restoration and preservation operations. Modern high-fidelity portable and laboratory equipments have been used for analyzes: Scanning Electronic Microscopy (SEM-EDS), Optical Microscopy (OM), X-ray Diffraction (XRD), Fourier Transformed Infrared (FT-IR) and Raman spectroscopy, polychromy analysis (by chromatic parameters). Also, the study of interactions and compatibility between traditional building materials and modern restoration products, the influence of local materials as a part of cultural and technological heritage and the monitoring and characterization of weathering/decay features, environmental interactions, including the biological and microbiological experiments by optical microscopy, stereomicroscopy, culture media, UV analyzes, bacterial and fungal tests, PCR analysis (detection of infections, species, genre), are the other main points of this paper. As a preliminary conclusion, the Corvins' Castle was constructed from dolomite-limestone blocks from the natural local resources, crenellated to the upper part. XRD indicates mostly the presence of dolomite, calcite and quartz, with small amount of illite, muscovite, paragonite, montmorillonite, wonesite, feldspars, chlorite and some clayey raw material: whitmoreite, kornelite, micas and other heavy minerals. Also, iron silicide is present in mostly of the samples, recognized by the used analytical techniques. Incompatibilities between traditional materials and the new ones (wood-mortars, mortars-cements) observed after restorations over time are discussed, too, focusing on their effects on the walls and painted surfaces.

Acknowledgements: This study was supported by the grants 120 BG/2016 and PN-III-P1-1.2-PCCDI-2017-0476 from UEFISCDI-MEN.