
Investigation on Neolithic adornments using X-ray spectrometry

Bogdan Constantinescu*¹, Paul Mereuta†², Daniela Stan², and Done Serbanescu³

¹National Institute for Nuclear Physics and Engineering – POB MG-6, Magurele-Ilfov, Romania

²National Institute for Nuclear Physics and Engineering Bucharest – Romania

³Museum of Gumelnitza Civilization – Romania

Abstract

Adornments from some Neolithic sites (Boian and Gumelnitza Kocadermen-Karanovo VI cultures) situated in South of Romania have been investigated to determine their mineralogical composition using X-Ray Fluorescence (XRF) and Scanning Electron Microscope Energy Dispersive X-ray Spectroscopy (SEM-EDS). Pendants and beads were preliminary analyzed with a XMET 3000TXR+ Oxford Instruments XRF portable spectrometer (elements from Potassium to Uranium) and, for light elements (Carbon, Oxygen, Sodium, Magnesium, Aluminum, Silicon) which are essentially for minerals characterization, investigated using a Zeiss EVO MA15 electron microscope. The most spectacular results are the identification of two pendants (ear-rings?) from nephrite, of few beads from native copper embedded in malachite and of a necklace from malachite beads put together with different types of nephrite beads. A comparative analysis with similar artefacts from Serbia (e.g. Antonovic and Stojanovic, 2009, The nephrite amulet from Zmajevac) and Bulgaria (e.g. Kostov, 2010, Gem minerals and materials from the Neolithic and Chalcolithic periods in Bulgaria and their impact on the history of gemology) is presented. Some considerations about geological provenance (deposits) of nephrite, jadeite and native copper are also discussed.

Keywords: adornments, Neolithic, X, ray spectrometry, nephrite, malachite, copper

*Speaker

†Corresponding author: paul.mereuta@nipne.ro