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Archaeometric study of artefacts from firing places of Longola-Poggiomarino protohystoric settlement site (Naples, Italy)

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The Longola-Poggiomarino protohistoric village was discovered at west of Naples (southern Italy) in the year 2000, during the construction of a purification plant. It is located nearby the harbour of the Roman town of Pompeii and its age spans from the late Middle Bronze Age to the 6th century B.C., when the site was definitely abandoned (Cicirelli et al., 2006). This is a noteworthy discovery in southern Italy and in Europe, due to the peculiarity of its riverine location and the way in which it was constructed. In fact the village was built on many artificial small islands surrounded by a navigable canal network; hence it is surnamed “The prehistoric Venice”. It is characterized by numerous evidences of human activities, like houses, pirogues, numerous objects and some handicraft working areas, where artefacts for domestic artisan and ornamental use were made (Salari et al., 2006). A great abundance of ceramics and metallic objects (made of diversified materials like lead, bronze, iron and gold) has been found, pointing to several distinct working/smelting sites throughout the village (Balassone et al., 2009). In these working sites, fair evidences of heating have been detected on several materials. In this work we characterized the compositional features of fifteen samples coming from firing places found at Longola, by means of a multi-analytical approach. Likely use of these findings could be coverings of burnt pavements, bricks or heat resistant vessel. The research aim is to contribute to the scenario reconstruction of this archaeological site by the knowledge of some production techniques, firing temperatures and provenance of raw materials. The microstructural features and modal mineralogy of the findings were determined by optical microscopy. X-ray diffraction, SEM-EDS and FTIR spectroscopy were used to determine and characterize overall mineral constituents and their quantitative composition. Representative findings were also analyzed for their whole-rock major and trace element contents by LA-ICP-MS (Elan DRCe, Perkin Elmer/SCIEX, connected to a New Wave UP213 solid-state Nd-YAG laser probe); particularly, being this method almost non-destructive, it is very useful for “in situ” determination of minor to trace elements of selected areas of archaeological artefacts with a high degree of accuracy and precision and very low detection limits. The investigated artefacts mainly belong to a type of fired mixture, called concotto by Italian archaeologists (Bertelle et al., 2001). They are mostly red-orange, but also grey and whitish in colour; their textures are heterogeneous, with numerous inclusions of waste pottery, lithics (leucitic lava) and loose crystals (leucite, clinopyroxene, feldspar, mica, quartz) into a matrix mainly made of iron-rich amorphous material, with variable amounts of hematite, magnetite, kaolinite and smectite. Locally, vivianite (hydrate iron phosphate), calcite and gypsum were detected. The concotti resulted in sturdy materials, particularly suitable for humid environments. Suggestions on possible temperature production are also given.

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