

## **Petroarchaeometric investigation of building stones and mensiochronological analysis of masonry structures of the St. Maria Veterana archaeological site in Triggiano (Apulia, southern Italy), as multidisciplinary tool for the chronological dating and traditional production technology studies**

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*Keywords:* building stone, mensiochronology, petroarchaeometry.

The paper introduces a multidisciplinary method based on the correlation between the petroarchaeometric characterisation of building stone and the mensiochronology investigation of blocks, which represents an efficient tool for the chronological dating and the production technologies study in stone masonry.

The multidisciplinary approach was applied on the St. Maria Veterana archaeological site in Triggiano (Bari, southern Italy), a hypogeum including a medieval church (XI-XVI) and successive several environments (crypts, gates, hallways, tomb chambers) and presenting various archaeological stratifications and renovation of some settings, which hinder the correct dating of building phases.

The research aim was both to provide an original contribution to the poor information of this archaeological site, especially in terms of chronological data on different settings, and to enrich the knowledge about the reconstruction of production technology in Apulian contexts.

For this purpose, representative samples were collected from each wall stratigraphic units and their thin sections were observed by means of optical microscope to highlight the petrographic and textural features and to recognise rocks used for production of building blocks.

Moreover, a direct inspection and measurement of stone blocks was carried out following the mensiochronology method, a non-destructive method providing a dating of stratigraphic units, by means of brick measurement. Mensiochronology data were processed by statistical analysis and analogies of blocks, from different settings, were pointed out to create correlation classes.

Petrographical results revealed the carbonate composition of used rocks, namely calcarenites extracted from the surrounding area and local limestones probably from the near production and supply sites. Furthermore, the mensiochronology analysis displayed recurrent block measures and frequent masonry textures also in different settings. The matching of all results obtained by the petrographic and mensiochronological analysis allowed to discover the analogies among employed rock materials and size features of blocks in wall stratigraphic units and then, to provide the relative chronological correlation of the archaeological site settings.

In addition, starting from historical information and since the use of a specific rock variety and recurring of block sizes are indexes of the same building phase, the presented method supported the historical reconstruction of the St. Maria Veterana site, reason why it represents a valuable multidisciplinary tool for the chronological dating and traditional production technology studies.

*This research belongs to TRIVIANUM project, designed by “PUGLIA MIA Association for research, promotion and protection of Apulia cultural heritage” in collaboration with “METROPOLIS Association” and financed by the “Pasquale Battista Foundation”.*