

TOMBA DELLE MELAGRANE IN EGNAZIA (BRINDISI – ITALY): INTEGRATE HISTORICAL-SCIENTIFIC ANALYSES

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ABSTRACT

In this paper, the results of an interdisciplinary study carried out by the National Research Council, Institute of Archeological Heritage - Monuments and Sites (IBAM), on the Tomba delle Melagrane in Egnazia (BR) are presented. The tombs are carved out of rocky reefs and have one chamber with painted walls. The study has been carried out by means of petrographical and chemical analyses of the stone materials which make up the structure, as well as of the facings, like the plaster and painted layers. The analytical results could provide interesting information about the materials and techniques employed and would also be useful for a comparison with other funerary contemporary structures in Apulia. The study has been completed with the representative mapping of the decay.

KEY WORDS

Messapian painted tomb, conservation, mapping of decay, plasters characterisation.

INTRODUCTION

In this paper are presented the results of a multidisciplinary study aiming to enhance knowledge and conservation of the *Tomba delle Melograne*, at Egnatia, an ancient pre-roman town on the Adriatic coast of Apulia. This tomb is one of the most important extant archaeological monuments pertaining to Messapian civilization. It is located outside the fortification walls, in the area of the western necropolis. It was discovered in 1975, during the works for building the Archaeological Museum. The tomb is entirely excavated in the rocky bank (reef?) and consists of a funerary chamber with its vestibule. The walls and the ceiling of the chamber, plastered and painted, present the typical forms of decay of hypogeal monuments.

The building of the tomb can be dated in the second half of IV century B.C.

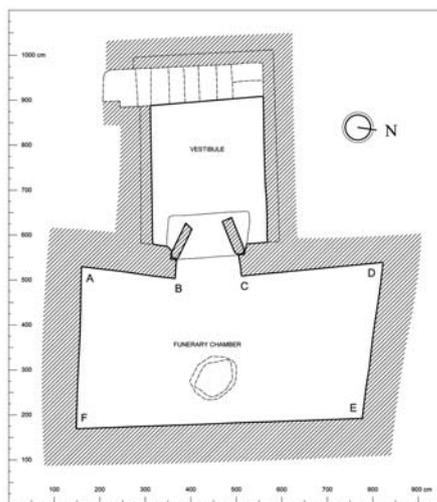


Figure 1

ARCHAEOLOGICAL DATA

The tomb presents an irregular plan, with a trapezoidal hypogeal chamber (ca. m.7x4) and a rectangular vestibule (ca. m. 2.50x3.50), originally *sub divo*, to which a little stair gives access. The stair was created by carving eight steps out of the wall opposed to that of entrance to the chamber. From the vestibule one accedes to the funerary chamber through a stone door consisting of two monolithic wings, revolving on their hinges, which are carved out of the slabs themselves. On the right wing there is a carved handgrip. Probably it was first excavated the deep ditch corresponding to the vestibule, and then was realized *the scavo in galleria* of the chamber.

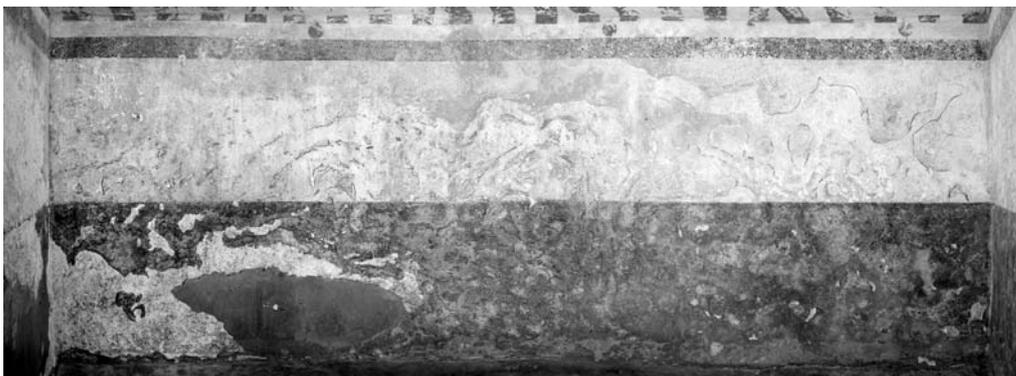


Figure 1

The tomb has been repeatedly plundered, probably in 19th century; of this bear witness two big holes on the chamber ceiling and above the entrance door. Though the building of the tomb can be dated to the second half of the IV century B.C. the scanty and fragmentary remains of ceramic furniture found in it (particularly the fusiform unguentarii) can be dated to the III-II century B.C. and give witness of the use of the tomb till this time. The walls and the ceiling of the funerary chamber present a painted decoration. The paintings on the ceiling seem to reproduce the underside of a gable roof: on the white background, a central and longitudinal strip, painted in black and red, reproduces the *columnen*, while the red strips departing from it reproduce the crossbeams. The paintings on the walls present a zoned decoration with panels and friezes. In the lower parts of them we have: a red wainscot (h 18 cm) and some black-bluish panels (h 79.5 cm) marked by vertical red stripes (w 3.5 cm) and a continuous decorated black band (h 14.5 cm).. The decorative pattern of this band consists of a wavy bough with ivy leaves alternating with palmettes, which are in line with the red vertical stripes or with the middle of panels. In the upper part of the walls, above a large white zone (h 95 cm), it runs another black band (h 14 cm) reproducing a molding. Its decorative pattern consists of a series of irregular dotted patches, painted in red, white and yellow, reproducing a marble *crusta*. Above it, on three sides, there are some fruits painted in red: three pomegranates (which give the tomb its name) on the longer wall opposite to the entrance, and two quinces on each of the shorter walls. Nails, irregularly distanced, but at the height of 178 cm above the floor, are driven into each of the walls.

ANALYSIS OF STATE OF CONSERVATION

In past time the tomb has been interested by a number of conservation actions. The structures, formerly exposed to atmospheric agents, have been incorporated in the Museum structures and protected with a cover. This cover hinders the infiltration of rainwater inside the hypogeum and the exposition of the structures to sun light. Moreover, together with the elimination of incandescent lamps, it prevents the formation of infesting algae. Access to visitors has been forbidden, in view of avoiding risky hygrothermic fluctuations inside the funerary chamber. At present, chamber walls present an advanced state of decay. Macroscopic analyses have highlighted the existence of many more or less extended lacunae and of a diffuse carbonatic patina, due to the precipitation of calcium-carbonate, which was formerly propagated by infiltration water and is still spread by condensation. This last phenomenon represents today one of the main problems for the conservation of paintings (Figg. XYZ). In the present paper, we present, in particular the state of conservation of the stretch AB of the western wall (Fig. XX), which appears to be representative of the general situation of the funerary chamber. Figure XXXXX shows several patent lacunae of different form and size, demarcated with neat

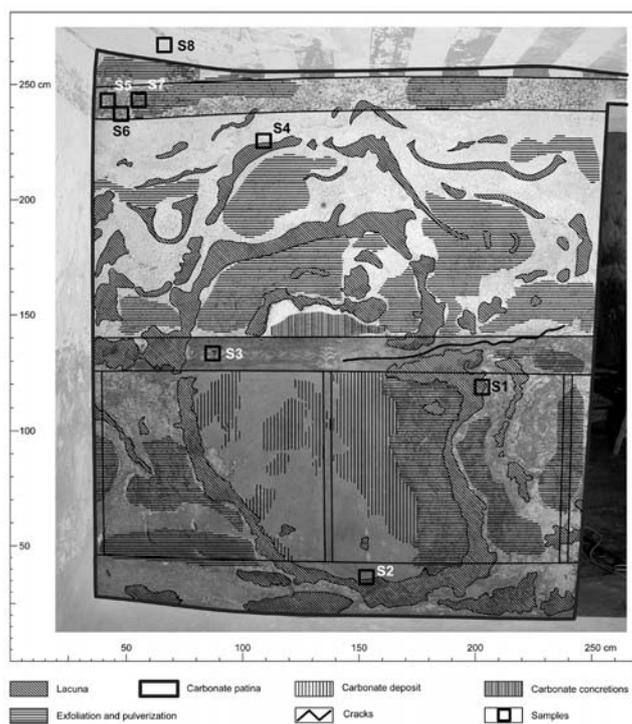


Figure 1

borders. These lacunae presents themselves as broad furrows – from 1 to 3 cm in depth – in the plaster. The origin of this pathology is imputable to a selective alteration of the frame plaster, which presents dyshomogeneous microstructural features (porosity, granulometry, etc.) in different areas. A systematic action of survey and analysis of these features is required to the end of stopping processes of degradation of the paintings and of preventing their emergence in other parts of the walls. Other forms of alteration interest the paintings; among them the existence of thick carbonate concretions, and exfoliation and pulverization processes. Many of the areas that have suffered detachment of the painted film, are interested by pulverization. Finally, some cracks in the plaster have been detected.

MINERALOGICAL-PETROGRAPHICAL AND CHEMICAL ANALYSES

Twelve samples of natural and man-made stone materials have been taken from different points of the tomb. More precisely, natural stone samples have been taken from the rocky bank, man-made samples have been taken from frame and finish plaster and from pictorial layers. On these samples we have conducted mineralogical-petrographical analyses through RX diffractometry, observation of thin sections in transmitted light and of lucid sections in reflected light. The aim was that of characterizing the rocky bank where the tomb was excavated, the plasters and the paintings on chamber walls, and the alteration products widely present on most parts of the same walls. The study has allowed, too, identifying techniques of plaster and painting attachment. The samples, their place of extraction and the analyses conducted on them, are presented in Table 1.

NATURAL STONE MATERIALS

The rocky stone out of which the tomb was carved is a yellow-brown calcarenite often tending to reddish due to inclusions of red earth. It consists of a mixture of fossil fragments (algae, pellets, bivalves), sometimes hard to distinguish, hold together by a predominantly sparitic cement, often pigmented in red due to presence iron oxides. Clasts' average granulometry ranges between 400 and 500 microns, but there are also smaller and bigger grains. Porosity of observed sample is not very high (10-12%) for this type of stone, due to the presence of precipitation calcite, often crystalline, which fills stone porosity, consisting of a grid of

irregular pores varying between a few microns and 200-300 μ . According to current classifications, this stone can be defined as Biosparite (Folk) or Grainstone (Dunham).

The entrance door has been realized from a stone composed from grains of crystalline limestone and sporadic bioclasts cemented mainly by sparite and more rarely by micrite. The size of grains ranges between tens of microns and more than two millimeters. Observable porosity is about 10%; it is generally of the intercrystalline type, with pores of varying form and size. It can be classified as “not much clean intrasparite” (Folk) or as “Wakestone” (Dunham). Its detected composition qualifies the stone as belonging to Cretaceous rocks widely outcropping in the region (Altamura or Bari limestone).

PLASTERS

Stratigraphical analyses conducted on thin and lucid sections have allowed to verify that two layers of plaster were applied on calcarenitic walls. They consist of slime binder and an aggregate of decreasing granulometry from the inner (a) to the surface layer (b). In an area on the shorter wall EF, plaster was applied over a background composed of big ceramic fragments (vases and tiles) cemented by a mortar similar to that of plaster's layer a.

Layer a: coarse frame plaster with carbonate hydrate lime binder of a thickness not less than 0.5 cm; grains composing the aggregate present a size of about 1,5-2,5 mm.; 2/3 of them consist of micritic stone fragments originating from ground local calcarenitic rocks; the remaining 1/3 consists of single crystals of sparry calcite. Rare accessory minerals, like quartz and feldspar, are also present.

Porosity is not very high. It consists mainly of fissures in points of contact between grains and binder. There are also rare fissures that go through the binder. The ratio binder/aggregate varies between 1:2 and 1/3.

Layer b: finish plaster of a thickness varying between 1 and 2 mm. It consists of an aggregate composed almost exclusively by fragments and single crystals of sparry calcite which present very different granulometry: the average size of fragments is about 1 mm, that of the crystals varies from a few microns to 300-500 μ .

Sample	Provenance	Macroscopic shape	Colour*	Type of analyses
ETM 1	wall AB	fragment with painted layer and preparation strata	black	drx, cross section
ETM 2	wall AB	fragment with painted layer and preparation strata	red	drx, cross section, eds
ETM 3	wall AB - ivy leave	flake with painted layer	cream	cross section, eds
ETM 4	wall AB	fragment with painted layer and preparation strata	white	drx, thin and cross section, eds
ETM 5	wall AB - marbled band	flake with painted layer	yellow	cross section, eds
ETM 6	wall AB - marbled band	flake with painted layer	white	cross section, eds
ETM 7	wall AB - marbled band	flake with painted layer	red	cross section, eds
ETM 8	wall AB - from roff	flake with preparation and painted layer	red	thin and cross section, eds
ETM 9	wall DE above ceramic fragments	fragment with painted layer and preparation strata	black	drx, cross section
ETM 10	wall DE among ceramic fragments	fragment of mortar	white	Drx, thin section, eds
ETM 11	ceiling	fragment of rock	yellow-red	Drx, thin section
ETM 12	door	fragment of rock	white-greysh	Drx, thin section

* the colour refers to superficial layer

The binder, whose ratio versus the aggregate is that of 60/70%, consists of carbonate hydrate lime. The finish plaster on the lower band of all the walls presents a black pigmentation, with fragments of coal black of the size of a few microns. The sparry calcite crystals, obtained by grinding vein calcite, are generally parallel to the surface, contributing probably to enhance the color of the upper pictorial layer.

PAINTINGS AND PIGMENTS

The colors prevalently used in the paintings are black, white and red. In the upper zone, which reproduces a kind of polychrome marble, it has been employed also the yellow.

Almost all pictorial layers have been applied on finish plaster (layer b) through the “fresco” technique, though it is sometimes difficult to detect color absorption by underlying plaster, which is typical of this kind of execution. The black pictorial layer, applied “a fresco” over the black pigmented finish plaster, has an average thickness of about 50-60 microns. It is composed of coal black minutely ground and scattered among a carbonate binder. Over all the black samples it is clearly detectable a layer of precipitate calcite present on the outer surface. White paintings, too, has been applied “a fresco” on the finish plaster through a thin layer of pure calcium carbonate (Bianco S. Giovanni). The thickness of the observed layers almost never exceeds 30 μ .

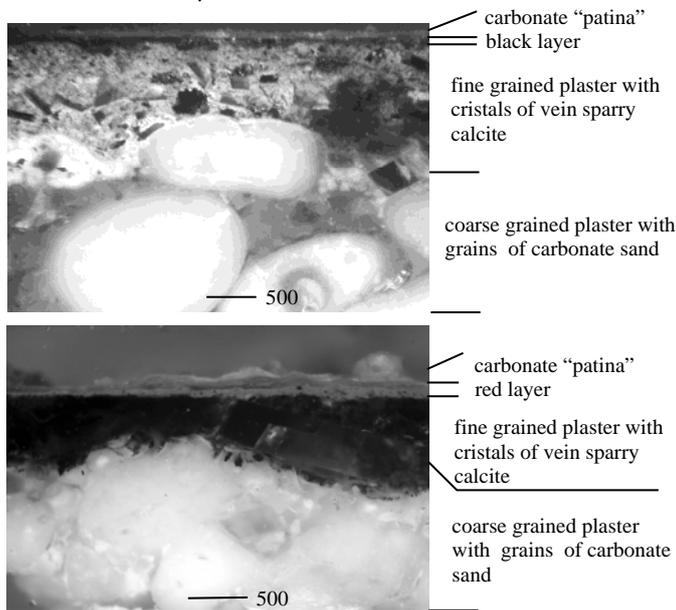


Figure 1

employed since one can see clear traces of color absorption by the underlying finish plaster.

The upper band has been realized applying a black colored background, over which white, red and yellow stokes were given. Indeed, observations on lucid sections have revealed that it is always present the basic black coat over which lay the different colored pictorial layers. Lastly, the pigment used for yellow paint consists of yellow ochre, with tiny particles of red ochre.

FINAL REMARKS

The above described analyses have given interesting new information about ancient Apulian wall painting. A first point concerns the employment of sparry calcite in the finish plaster of

Observations on sections have revealed that red painting employed in the lower zone of the walls has been applied on a black pigmented finish plaster. The pigment consists of very pure ochre, rich in iron oxides, scattered in a carbonate binder. The thickness of the pictorial layer varies between 50 and 100 μ . The surface presents a whitish patina, thick over 100 μ , consisting of precipitate calcite. The red pictorial layer in the ceiling's strips, instead, has been applied on a white finish plaster. The thickness of the pictorial layer varies from 50 to 130 μ . Here it is clear that an “a fresco” technique was

painted tombs, which appears to be widely diffused in Apulia. In fact, it is documented in several other tombs of the same period at Egnatia (Tomba del Pilastro) and Manduria in Messapia, as well as at Monte Sannace in Peucetia and Arpi in Daunia. But here we can observe the employment of sparry calcite not only in the finish plaster (layer b) but also in the coarse frame plaster (layer a). In this last one, it appears associated in an aggregate consisting of selected sand, neatly differing from that employed in the coarse frame plaster at the “Tomba del Pilastro”, which consists of local stone fragments. This makes still more difficult to understand the employment of sparry calcite in plaster aggregate of painting tombs. In fact, even the hypothesis of correlating it with want of giving more brilliance to paintings colors, appears to be weakened, if not excluded, by the observed employment of sparry calcite also in the coarse frame plaster of our tomb. Peculiar, too, it appears to be, in the paintings of this tomb, the employment of a finish plaster with black coal pigmentation in areas which were to be painted in black, whereas in white painted areas of the walls, as well as in the decorated upper band and on the ceiling, the finish plaster employed was the ‘normal’ one (aggregate with sparry calcite). A final point pertains the techniques of application of paintings. All of them were applied “a fresco”, excepting those of the lower band of walls and of the decorated upper band, which were applied, probably, with the technique “a mezzo fresco”(superposed paints).

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