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New data on pigments and techniques of Apulian tomb painting

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Scientific framework and aims

Tomb painting in **Apulia** is particularly widespread since the second half of the **4th century BC.** Within Apulia, figurative painting seems to be particularly attested in **Daunia**. Considering the rather sudden explosion of the phenomenon, the question arises as to where the **techniques** and **models** came from. While comparisons for the iconographic and decorative motifs can be found in a very wide area, the transmission paths of the **technical know-how** are less clear. Can it be assumed that **local craftsmen** specialized in painted wall decoration already existed, or should we suppose the involvement of painters from **other areas**? Is it more likely that the earliest examples of figurative tomb decoration are to be related to local **workshops of potters** or other artists? Were the same techniques and material used for the different supports – graves, houses and vases – or can **medium-specific differences** be traced?

Analysed Monuments

Painted narrative friezes or scenes are known in 11 Daunian graves. **Five** of them were analysed within the framework of this study:

- Tomba dei Cavalieri (second half of the 4th c.) and Tomba della Nike (late 4th to early 3rd c.) in **Arpi**
- Ipogeo del Cerbero (second half of the 4th c. with paintings dating to the early 3rd), Ipogeo Scocchera B (built in the first half of the 3rd c.) and Ipogeo Sant'Aloia (3rd c.) in **Canosa**

Canosa, Ipogeo del Cerbero (Image: C. Colombi, DAI)

Discussion and conclusion

Four of the five tombs analysed (Tomba dei Cavalieri, Ipogeo del Cerbero, Ipogeo Scocchera B, and Ipogeo Sant'Aloia) have yielded **similar results**.

The pictorial layer was applied directly on a coarse preparatory layer. A **fresco** painting technique – occasionally supplemented by secco details – could be postulated, with the pigments mixed with pure lime. The **palette** was composed of lime for white, charcoal for black, hematite for red, goethite for yellow, and Egyptian blue for blue – the **typical "basic stock"** for Hellenistic tomb painting in Apulia and more generally in Southern Italy, Etruria, and Macedonia.

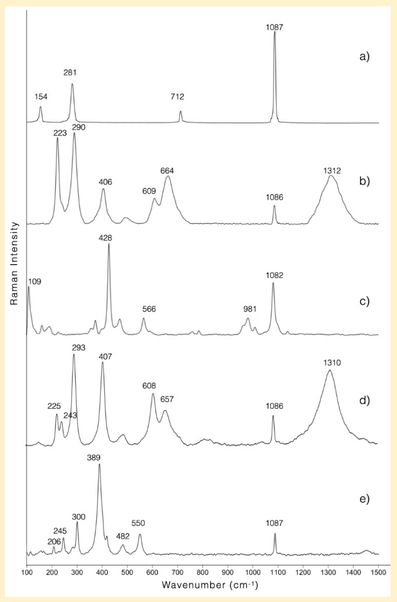
Arpi, Tomba della Nike (Image: C. Colombi, DAI)

In the **Tomba della Nike** two particularly **refined preparatory layers** were observed, with slaked lime consisting of well-selected (fine and homogenous grain size) and well worked material (absence of calcination residues, parallel alignment of pores to the surface). The analyses revealed the presence of **madder lake** (pink background) and **cinnabar** (blood of the wounded warrior). The colouring components extracted from the madder root were adsorbed with clays to generate an insoluble substance suitable for painting. A Ca-based layer (lime) separates the pigmented layer from the plaster.

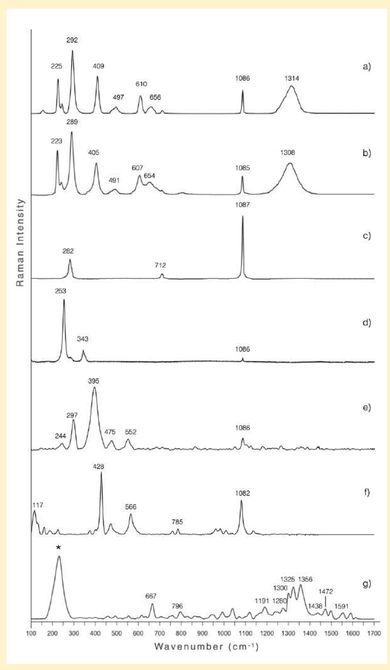
The pink background, the use of madder lake, the iconography and style of the figurative scene link the Tomba della Nike to the **polychrome vases** produced in local workshops in Arpi and Canosa. At least for the Tomba della Nike we can therefore postulate that a **specialized Arpanian workshop** produced both painted vases and wall paintings using the same techniques and materials.

Methods and results

Samples were analysed by a **multi-technique** approach. **Raman** and **Infrared spectroscopies** were employed to identify pigments and colourants and to check for the presence/absence of binders; **light and electron microscopy** to define the structural characteristics of the paint layers and to recognize the manufacturing technique.



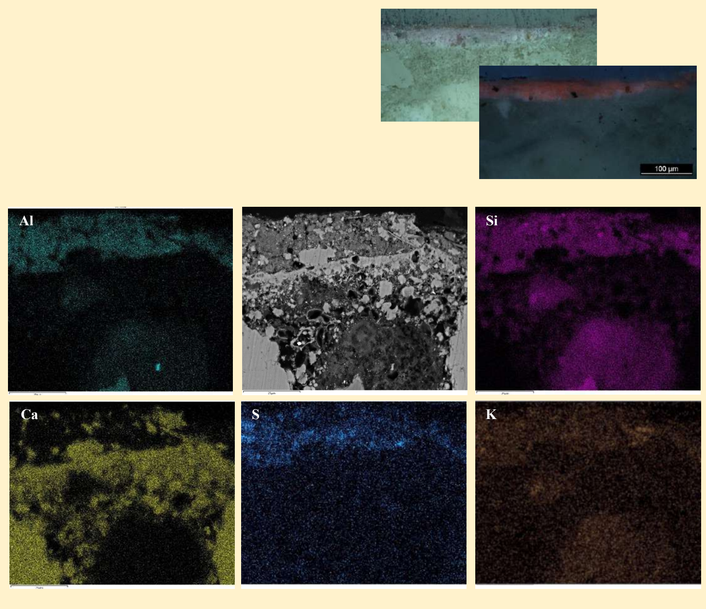
Raman spectra of the samples from the Tomba dei Cavalieri: a) white, b) red, c) blue, d) red, e) yellow (Image: A. Mangone)



Raman spectra of the samples from the Tomba della Nike: a) red (spirals), b) brown, c) white, d) red (pediment), e) yellow, f) blue, g) pink (Image: A. Mangone)

Grave	Sample/colour	Pigment identified
Tomba della Nike	1. Pink (background)	Madder lake
	2. Light blue (shield)	Egyptian blue
	3. Yellow (background)	Goethite
	4. Deep red (blood)	Cinnabar
	5. White (horse)	Calcite
	6. Reddish brown (horse)	Hematite
	7. Dark red (spirals)	Hematite
Tomba dei Cavalieri	9. Yellow (horse)	Goethite
	10. Red (horse)	Hematite
	14. Light blue (harness)	Egyptian blue
	15. Deep red (reins)	Hematite
	16. White (dress)	Calcite
Ipogeo Scocchera B	18. Red (plaster fragments)	Hematite
	19. Red (tympanum)	Hematite
	20. Reddish brown (horse)	Hematite
	21. Yellow (background)	Goethite
	22. Blue/light blue (traces)	Egyptian blue
	23. White (frame)	Calcite
	24. Black (frame)	Charcoal
	24-B. Red (plaster fragment)	Hematite
Ipogeo del Cerbero	25. Red (door frame)	Hematite
	26. Black (frame)	Charcoal
	27. Yellow (dress)	Goethite
	28. White (background)	Calcite
	29. Black (cerberus, outline)	Charcoal
Ipogeo S. Aloia	30. Black (pillar/side frame)	Charcoal
	31. Black (inside door frame)	Charcoal
	32. Red/dark Red (tympanum)	Hematite
	33. Red (door frame)	Hematite
	34. Black (acroterion)	Charcoal
	35. White (architrave)	Calcite
	36. White (architrave)	Calcite
	37. Brown (pillar)	Hematite

Results of sample analyses from Arpi and Canosa



OM photomicrographs of cross sections under white (left) and UV-light (right) illumination; SEM-BSE photomicrographs (from upper to lower: madder lake pigment, Ca-based layer and plaster) and X-ray maps (Al, Si, K, S, Ca) of cross sections (Images: A. Mangone)

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