

# **New results on the polychromy of stone monuments in the Roman provinces**

## **The PolychroMon project**

### **Introduction**

One of the main aims of the PolychroMon project (“Colours revealed – Polychromy of Roman monuments of the Danube provinces”) – funded by the Heritage Science Austria programme of the Austrian Academy of Sciences (Heritage\_2020-028\_PolychroMon) – is to determine and analyse the presence of polychromy on Roman stone monuments in order to get information on the original appearance of the monuments and on the nature of the materials used as a basis for (art) historical interpretations, preservation and visualisation measures. For this purpose, an interdisciplinary cooperation between the Austrian Archaeological Institute (OeAI) / Austrian Academy of Sciences (OeAW), the States Collections of Lower Austria, the Kunsthistorisches Museum Vienna (KHM) and the Federal Monuments Authority Austria (BDA) has been established. The use of state-of-the-art technologies enables to identify and analyse the traces of original colouring and it further allows systematic documentation and a comprehensive scientific evaluation of the examined monuments (e.g. Kremer et al., 2023, pp. 5213–5214).

### **Material**

The objects under investigation are primarily cult, votive, funeral and architectural artefacts from the Vienna Basin and the Leitha area (with a special focus on Carnuntum) and reference material from other regions. Special attention is given to the monuments of the Mithras cult, which allow exemplary investigations into the cultural and symbolic significance of colour applications. The project is the first to systematically apply research methods already tried and tested on ancient objects in the Mediterranean region to stone monuments in the Roman provinces.

### **Methodology**

The presentation will provide an overview on the analytical approach and selected results in material investigations. In the first step of analyses, non-invasive methods are applied – including macro photography and digital microscopy, spectral imaging, light spectroscopic techniques like Raman- and fiber optic reflectance spectroscopy, X-ray fluorescence and X-ray diffraction – in order to get distributional, chemical and phase information of antique pigments. Furthermore, the results are cross checked with and extended via traditional micro-invasive methods, like cross section analyses with light optical and electron microscopy or gas chromatography – mass spectrometry, inter alia providing insights into stratigraphy and identification of binding materials, respectively. In order to establish the impact of the artefact`s history on its polychromy, museum documentation is being investigated and important information is recorded and digitised when available.

## Results & Conclusions

Preliminary results show the extensive presence of colours on stone monuments in the Danubian provinces of Noricum and Pannonia, as evidenced elsewhere in the Empire. The palette includes white, yellow, orange, red, green, blue and black colour manufactured from the most widespread pigments produced from limestone, ochres, minium, green earth, Egyptian blue and carbon black. There are also indications for pigment mixtures, for example to achieve purple tones. Analytical investigation on binders revealed that lime technique was primarily applied, however, in some areas of red colour application egg-containing binding media were observed. Numerous detailed results allow conclusions to be drawn about the painting techniques and the work processes.

## Discussion

One of the major challenges in detecting colour remains so far lies in the conservation status of the artefacts themselves. The majority of the monuments have been subjected to thorough cleaning, which resulted in the erasure of pigment traces. Besides cleaning, various other factors contributed to the scarce preservation of pigments: previous conservation and restoration undertakings, excavation and storage circumstances, etc. The challenge lies in documenting, analysing and conserving the preserved remains and in developing suitable methods for interpreting and communicating the results.

## References

Kremer, G., Linke, R., Plattner, G., Pollhammer, E., Brzakovic, M., Krickl, R., Silnovic, N. and Pitthard, V. (2023). 'Minerva in Colours: First Results on a Polychrome Roman Sculpture from Carnuntum (Pannonia)', *Heritage* 2023, 6(7), pp. 5213–5241. DOI: 10.3390/heritage6070277