

Title: **Roman paintings composition determination from several sites in Catalonia**

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The analysis of the archaeological materials is a mode to study the past and to know the customs and way of life of our ancestors. It is also a way to learn how to improve the conservation of this historical heritage. The Romans, who used to decorate their walls with sculptures, mosaics, paintings, etc. are an interesting case of study. Roman paintings are archaeological samples that once analyzed can provide us information about its way of life. The Romans generally used inorganic pigments to decorate their walls. These types of pigments can be effectively analysed with X-ray fluorescence, a non-destructive elemental analysis technique.

Therefore, the objective of this study is to determine the pigments used in the Roman period in Girona.

To do this, different samples from different types of villas in Girona were analysed. These samples are mainly from the Republican and Roman Empire periods and in order to analyse them, an optimised cleaning procedure was necessary. This procedure consisted in shaking the samples in water in an ultrasound bath. Once this step was completed the samples were cleaned with a needle and soft brush.

The different villas provided very similar pigments between them and between the different periods. Most of the red pigments have been identified as an iron oxide, except the cinnabar from the villa of *Pla de l'Horta*. The white pigments were identified as lime white, the yellow ones as golden ochre, the blue ones as Egyptian blue and the greens ones as green earth. On the other hand, purple and black pigments could not be identified because of its organic composition.

Among the villas analysed, the variety of pigments found was slightly different. The villa with the least variety was *Collet de Calonge*, in which no expensive pigments were found. This could show a lower value of richness.

The villa of *Pla de l'Horta* has given more variety than *Collet de Calonge* and it has also been the villa where cinnabar has been found, a quite expensive pigment in antiquity. This would show a pretty high purchasing power.

In the end, the villa of *Can Ring*, which had the highest variety of pigments but without any expensive pigment identified, would be a villa with little purchasing power. However, there is not enough information to know its real wealth.

Finally, it can be concluded that the pigments and techniques used have not varied in the Girona either by area or by period, as indicated by the similarity of the pigments found.

Keywords: Romans, mural paintings, pigments, republican period, Roman Empire period, Girona, frescos, villa, X-ray fluorescence