Journal of Cultural Heritage xxx (2016) xxx–xxx

Available online at
ScienceDirect
www.sciencedirect.com

Elsevier Masson France
EM|consulte
www.em-consulte.com/en

Original article

The *Pietà di Ragusa* panel: A science-based contribution to its dating by dendrochronology, wood anatomy and pigment analysis

Manuela Romagnoli[a,*], Lorenza D'Alessandro[b], Claudio Seccaroni[c], Pietro Moioli[c], Domenico Poggi[d], Michael Grabner[e]

[a] *DIBAF, University of Tuscia, Via San Camillo De Lellis s.n.c, 01100 Viterbo, Italy*
[b] *Private restorer, Campagnano di Roma, Roma, Italy*
[c] *ENEA, Italian National Agency for New Technologies, Energy and Sustainable Economic Development, Roma, Italy*
[d] *Artelab, Roma, Italy*
[e] *Institute of Wood Technology and Renewable Resources, University of Natural Resources and Life science, Wien, Austria*

ARTICLE INFO

Article history:
Received 3 November 2014
Accepted 5 April 2016
Available online xxx

Keywords:
Dendrochronology
Pigments
Art history
Paint techniques
Dating
XRF analysis

ABSTRACT

This paper discusses the results of scientific investigations on a panel painting whose past attribution to Michelangelo has been recently taken again into account. The panel was investigated by means of dendrochronology, wood anatomy and pigment analysis. The wooden support is made of spruce and its last tree ring was dendrochronologically dated to 1497. Taking the time for wood working and seasoning into account, the *terminus post quem* for the creation of the painting is between 1525 and 1535. According to chemical analysis, the paint's binder is mainly egg tempera with some parts in fat tempera and finishings on the sky with azurite in glue tempera over a layer of smalt bound in fat tempera. These pigments are coherent with the expected period and help to date this panel. Obviously, we cannot confirm that Michelangelo himself painted the panel, but our results are coherent with his lifetime (1475–1564) and executive career. Our study contributes new science-based data to an on-going art historical debate.
Aim. – The aim is to locate the chronological and geographical contexts by scientific analyses of the painted panel "Ragusa Pietà" under debate because of a possible attribution to Michelangelo who is believed to have painted it for Vittoria Colonna.

1. Introduction

The attribution of an artefact to its author is often subject of art-historical debates but scientific investigations can provide evidence supporting or confuting a proposed attribution. In this paper, we discuss the results of scientific investigations on the painted panel "Pietà di Ragusa" whose earlier attribution to Michelangelo has recently been re-assessed [1]. During its recent restoration [2], investigations focused on the wood and the paints, with the hope of contributing to the discussion of the painting's authorship.

Panel paintings by Michelangelo are extremely rare. The "Doni Tondo", sometimes called "The Holy Family", in the Uffizi in Florence, is commonly accepted as the only artist's original work, and two other paintings in the National Gallery in London, the "Manchester Madonna" and "The Entombment", are ascribed to him, but not universally accepted. In this paper, we discuss the analytical data in view of dating of the materials and to technical features without taking the art-historical subject itself into account.

2. The painting

The painting *Pietà di Ragusa* (Fig. 1) belongs to the family of the current owner since several generations. Based on numerous documents from the 16th century and onwards, the restorer Antonio Forcellino attributed the *Pietà* to Michelangelo, with Vittoria Colonna as its patro, to 1545 [3]. It then belonged to cardinal Reginald Pole and, after this, to the archbishop of Ragusa (now Dubrovnik, Croatia). The painting is documented in the USA since the 19th century, and its provenance from Ragusa is also documented. The discussion about the attribution of the painted panel made its restoration essential, in order to allow a correct reading of the picture and of its technical features [2]. The painting has recently been shown in the exhibition "The Renaissance in Rome. In the name of Michelangelo and Raphael" (Rome, Palazzo Sciarra, October 21, 2011 – April 18, 2012), and there, it was attributed to Michelangelo.

* Corresponding author. Tel.: +39 0 761/357399; fax: +39 0 761/357554.
E-mail address: mroma@unitus.it (M. Romagnoli).

http://dx.doi.org/10.1016/j.culher.2016.04.005
1296-2074/

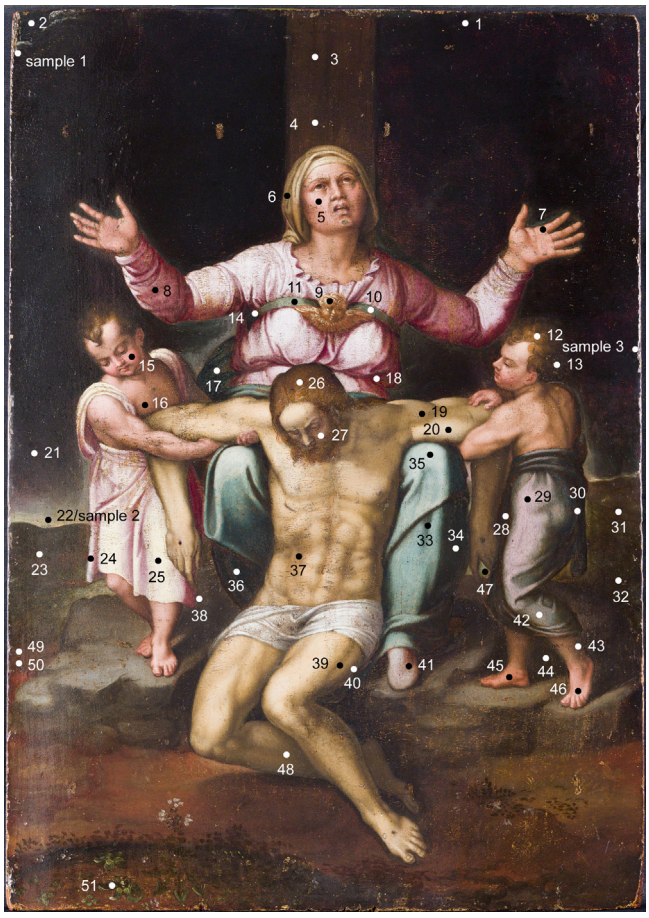

Fig. 1. The front side of the painted panel "Pietà". XRF measurement points and location of samples (sample 1, sample 2 and sample 3) (private collection).

Fig. 2. Back side of the painted panel. On the top, drawing of the top-edge and the axe of the tree pith, named pith axe.

The work was painted on a single rectangular wooden panel (Fig. 2), with the grain in vertical direction. Its dimensions are 64.5 cm × 45 cm, the thickness is about 1.5 cm. The panel was cut from the tree trunk in radial direction.

Apparently, we can say that the board has never been thinned or narrowed at the edges during the centuries. Some knots were filled with sawdust. On the radiograph, it was possible to observe rectangular cloth strips with fringed edges, which were located immediately below the preparatory layer. Smaller knots were simply grouted. Originally, there were two battens placed 6–7 cm apart from the upper and the lower edge, each of them was fixed with four nails felled on the front side of the panel. The upper batten was taken off in the past and now only the felled tips can be observed in place (Fig. 3).

3. Methods

3.1. Wood identification

Valuable information can be obtained by identifying the wood species of a painted panel. This can provide hints on the geographical area in which the supposed author lived and worked. Wood identification was carried out by using the microscopic characters for softwoods compiled by Richter et al. [4]. Two small fragments were taken from the bottom edge of the panel. Cross-cut and radial thin sections were made by hand using a razor blade. The wood species was identified according to the identification-key of Schweingruber [5].

Moreover, timber trade practices in certain parts of Europe and in certain periods [6], as well as the customs of some painters like Rembrandt and Lucas Cranach the Elder [7] have to be taken into account.

Further observations regarding the wood processing, including wood quality, lining material, thickness of the panel together with the radial and tangential cut, may contribute to an overall picture of the work examined.

We are, however, aware that wood identification and the observations alone will never provide a proof for the attribution of an artifact to a particular artist.

3.2. Dendrochronological dating

The application of dendrochronology to a single artefact has quite a few limits especially in Italy [8], but the discipline also has a big advantage compared to other scientific analyses, namely the accuracy of dating because it gives an approximate indication of the calendar year or even the season in which the last tree ring formed. This last ring represents the closest date to the moment in which the artefact was realized, i.e. the date of the tree's death. The tree's death is calculated when the last measured ring in an artefact is just below the bark, meaning that the bark is present or that the outer part of the artefact has a round shape ("waldkante", "waney edge"). When this occurs, wood dating provides a *terminus post quem* [9] and the creation of the artefact postdates that moment depending on the length of the seasoning and on the habits of the author who sometimes preferred to use aged wood from storage. Such wood was often preferred because it was more stable a hygroscopic point

Please cite this article in press as: M. Romagnoli, et al., The *Pietà di Ragusa* panel: A science-based contribution to its dating by dendrochronology, wood anatomy and pigment analysis, Journal of Cultural Heritage (2016), http://dx.doi.org/10.1016/j.culher.2016.04.005