

## ICONS CONSERVATION AND PIGMENTS IDENTIFICATION OF THE SACRED ICONS PAINTER ANTONIOS AGORASTOS

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### ABSTRACT

The sacred icon painter Antonios Agorastos became known after the recording of his inscribed icons in Skopelos by Pavlos Lazaridis, covering a period of 30 years 1667-1703. The signed icons that we studied in Tyrnavos are the two icons of the Virgin Mary and Christ in the iconostasis of the church of Saint Anargyros on either side of the Beautiful Gate. The aim of the research is the study of the pigments of the hagiographer and the evaluation of other non-signed icons. In a golden background, the Virgin Mary is depicted enthroned in the form of the Infant. She is depicted sitting frontally holding Christ in front of her. At the bottom right is an inscription with the painter's name, by the hand of Antonios sub deacon Agorastos Kritos (1668). Also, in a golden background, Jesus Christ is depicted enthroned in the type of Pantocrator. With his right hand he blesses and with his left he holds an open evangelist painting of holy icons.

For the measurements of the pigments in the icons, the following techniques were used: a) Raman spectroscopy Thunder Optics - Gem Raman System with 532nm laser excitation, while before identification, the spectra were subjected to a procedure such as baseline correction, Savitzky - Golay smoothing - normalization and b) the XRF spectrometer Niton XLp 818 technique with an excitation source of 241 Am. Analysis of Raman and XRF spectra was performed with the help of Spectragryph software. The identification of pigments using the two complementary techniques revealed the use of a variety of inorganic pigments such as lead white, copper green (verdigris), copper blue (azurite), for yellow (realgar), iron ochres (red and yellow) and cinnabar for the red colour.

**Keywords:** Icons, Agorastos, pigments identification, paintings conservation

### 1.0 INTRODUCTION

The icon painter Antonios Agorastos became known in 1964 after the recording of his inscribed images in Skopelos by Pavlos Lazaridis. His inscribed icons cover a period of 30 years 1667-1703. We don't know any details about his life to this day. Portable despotic icons painted by him adorn the temple panels of churches and monasteries in Skopelos - the church of Agios Ioannis Mylos, the monastery of Panagia Papameletiou, Livadiotissa, the monastery of the Transfiguration of the Savior (1667), the monastery of Flamouri in Pelion, holy temple of Agioi Anargyroi in Tyrnavos (1668). The signed icons in Tyrnavos are the two icons of the Virgin Mary and Christ in the iconostasis of the church of Agioi Anargyroi on either side of the Beautiful Gate.

In a golden background, the Virgin Mary is depicted enthroned in the form of the Infant. She is depicted sitting frontally holding Christ in front of her. Christ is depicted full body with his legs crossed to the right, while his torso is represented frontally. With his right hand he blesses. The Virgin wears a dull dark red maforium adorned with gold studs and leaves her dark blue dress uncovered. Christ wears a white tunic with a red "sign" and a red robe wrapped around his left shoulder. The halo of the Virgin Mary is decorated with incised winding stems ending in flowers. The throne is rendered in gold, light brown and red. Does the backrest form a cavity? likewise the arms. The ends of the arms and backrest are crowned with the figures of the four Evangelists who are represented to the waist, emerging from acanthus leaves supporting unrolled scrolls. In front of the lower part of the throne, two saints are projected, on either side of the Virgin's feet. At the bottom right is an inscription with the name of the painter and the date the icon was created, by the hand of Antonios sub deacon Agorastos of Kritos AXXI (1668).

Also, in a golden background, Jesus Christ is depicted enthroned in the type of Pantocrator. With his right hand he blesses and with his left he holds an open gospel. Christ wears a tunic rendered in a dull dark red, with a light red "sign", and a dark robe that forms a rich pleat. The outlines of the robe are rendered in gold. The robe is wrapped around his left shoulder. The halo has an incised decoration with meandering shoots, on which the antennae of the cross are inscribed. A cherub can be seen on the upper antenna. Christ sits on a red cylindrical cushion, the ends of which are decorated with a band of winding shoots. Similarly, the feet rest on a red cylindrical cushion with the same decoration. The throne is rendered in gold, light brown and faint mercury. It has a rectangular backrest with a semicircular end and the arms are formed by a row of pesos. The ends of the arms and the backrest are crowned with the symbols of the four Evangelists. At the bottom right is an inscription with the name of the painter and the date the image was created, by the hand of Antonios sub deacon Agorastos. The rest of the icons of the iconostasis should probably be attributed to the same iconographer, although they are unsigned since it was the custom of Agorastos not to sign all the icons.

In recent years, there has been a growing interest in historical painting techniques. The study of painting techniques and materials used throughout history and across cultures is inherently an interdisciplinary exercise. In the past such studies were sometimes carried out with little interaction between art historians, conservators, material scientists and archaeologists, because each discipline tends to present the results of their studies in different forums (Hermens, 2012).

Information about painting techniques can be obtained in a number of ways, including chemical or physical analyzes of the materials found in the paintings. Analyzes of a large number of paintings attributed to specific regions, schools, workshops or individual masters can contribute to the history of painting techniques. Analytical results can also help art historians evaluate attributions and can support or refute their hypotheses. Analysts, however, need art historians to inform them of the stylistic idiosyncrasies and significance of these schools, workshops or teachers (Owen, 2023).

The aim of the research is the study and identification of the pigments of the hagiographer and the evaluation of other non-signed images. The images were studied and preserved in accordance with international standards, modern methods and protocols followed by the conservation laboratory of the Chronological Museum of Larissa. The maintenance was done

with the funding of the Holy Metropolis of Larissa. All stages of image conservation were covered, fixing wood, fixing preparation and paint layers, removing oxidized varnish, cleaning the painted surface, aesthetic restoration and protective varnish.

## 2.0 MATERIALS AND METHODOLOGY

### 2.1 Methodology

For the measurements of the pigments in the icons, the following techniques were used: a) Raman spectroscopy Thunder Optics - Gem Raman System with 532nm laser excitation, while before identification, the spectra were subjected to a process such as baseline correction, Savitzky - Golay smoothing - normalization (Lycke et al ., 2023) and b) the XRF spectrometer Niton XLp 818 technique with an excitation source of 241 Am. The analysis of Raman and XRF spectra was performed with the help of Spectragryph software (Menges, 2020).



**Figure 1: XRF spectrometer (on the left) and Thudner Optics – Gem Raman SYSTEM (on the right)**

### 2.2 Materials

The state of preservation of each icon was recorded in detail and documented by photographing it. After the first tests, it was found that the two icons presented problems in common. The signs of the suffering of the previous years were strong. Damage from moisture, holes from wood-eating insects, loss of paint layers are evident in the pictures. The varnishes of the painted surface were oxidized, darkened by the soot of the candles. The icons also had interventions in their structure such as local overpainting and color additions, stuccoing and material additions (Milanou, 2010).

With the specialized technological equipment of the conservation laboratory, some non-destructive diagnostic techniques were applied such as: a) Their study under ultraviolet and infrared radiation with the Mu.S.I.S multispectral camera b) Microscopic observation with a Leica CLC150 X microscope.3. Camera NIKON D 700. Revealed during the above examinations' layers of painting, presence of varnish.

The utilization of the results of the analyzes contributed to the understanding of the problems and the appropriate choice of the method of removing the varnishes and the paintings. Efficacy, reversibility and safety of interventions and maintenance materials were the main concern.

Fixations were made to the wood as the carrier of the icons to ensure the stability and strength required. The detachments of preparation and painting were done with fixations. The oxidized varnishes that altered the aesthetics of the painting compositions were removed. During the cleaning process, all kinds of dirt, color additions and over paintings were removed from the painted surfaces. Aesthetic restoration brought aesthetic homogeneity to painting. The conservation work was completed with the final coating of varnish, to protect the painted surface (Doumas, 2010).

The preservation conditions of the inner space of the temple change according to the external changes in the relative humidity and temperature of the environment. For this reason, they also affect the works of art existing inside the temple, such as the icons in this particular study. Wood-eating insects attack and destroy the wooden support of the images. The relative humidity limit for their action is around 70% and the appropriate temperature above 16°C. The wood also contracts and expands resulting in its decay. This is followed by cracking and peeling off the paint layer. Then the painted surface can suffer cracking, peeling and losses. The natural aging of the materials, i.e. the wood, the substrate and the binder of the painted surface, have a share of responsibility for the current state of the images. The factors that cause the aging and destruction of the varnishes that cover the painted surface are ultraviolet radiation and high temperature. When the works are in similar conditions, the varnishes change their physical properties, they become dark, dull, brittle with the result that they do not protect the works of art and reduce their artistic value (Lazidou and Drosaki, 2008).

The burning of candles and oils from the candlesticks noticeably affect the surface of the painted parts, altering the consistency and protectiveness of the varnish. Human interventions with a lack of knowledge to protect works of art can slow down their durability and aesthetics. After measuring the relative humidity and temperature, inside the temple it was found that the values fluctuate over time at normal levels, 18°C- 28°C and the relative humidity at 50-70%.

After the maintenance and restoration work, it is always deemed necessary for every object of historical importance to be kept in a place with regulated conditions, for its further survival in time, whether it is a museum or a storage space or a temple.

The icons we are studying, after their conservation, will be exhibited in the church where they belong. The despotic icons of Saints Anargyroi, also, the icons of Saint Nicholas of the Vlachs in the iconostasis where they were placed.

The average room temperature for the whole year must be maintained at 22°C and the relative humidity at 65%. The temperature and indirectly the relative humidity are controlled with central heating or air conditioning facilities/air conditioning unit. A relative humidity and temperature measuring instrument such as a thermohydrometer also helps us to control them. Also, dehumidifiers can maintain proper conditions. Images should not come into contact with direct and local lighting. Do not place near sources of heat (radiator, gas) and moisture (wet walls).

Despotic icons painted by him adorn the icons of churches and monasteries in Skopelos, the holy church of Agios Ioannis of Mylos, the monastery of Panagia Papameletiou, Livadiotissa, the monastery of the Transfiguration of the Savior (1667), the monastery of Flamouri in Pelion, the holy church of Agioi Anargyro in Tyrnavos (1668). The signed icons that we studied in Tyrnavos are the two icons of the Virgin Mary and Christ in the iconostasis of the church of Agioi Anargyri on either side of the Beautiful Gate (Sdrolia, 1991).

### 3.0 RESULTS AND DISCUSSION

#### 3.1 Icons conservation

##### “Virgin” (1668) Mobile icon

In a golden background, the Virgin Mary is depicted enthroned in the form of the Infant. She is depicted sitting frontally holding Christ in front of her. Christ is depicted full body with his legs crossed to the right, while his torso is represented frontally. With his right hand he blesses. The Virgin wears a dull dark red maphorion adorned with gold studs and leaves her dark blue dress uncovered. Christ wears a white tunic with a red "sign" and a red robe wrapped around his left shoulder. The halo of the Virgin Mary is decorated with incised winding stems ending in flowers. The throne is rendered in gold, light brown and red. Does the backrest form a cavity? likewise the arms. The ends of the arms and backrest are crowned with the figures of the four Evangelists who are represented to the waist, emerging from acanthus leaves supporting unrolled scrolls. In front of the lower part of the throne, two saints are projected, on either side of the Virgin's feet. On the lower right, there is an inscription with the name of the painter and the date the icon was painted, by the hand of Antonios subdeacon Agorastos of Kritos AHXI (1668).

- Manufacturing technology

The support consists of three pieces of wood that are snapped together with gamma and thick nails. It shows the wild surface of the wood prepared to receive the preparation. The substrate is smooth, regular in thickness, beige in color. On top of the preparation is the painting layer created with hagiography paints, powders.

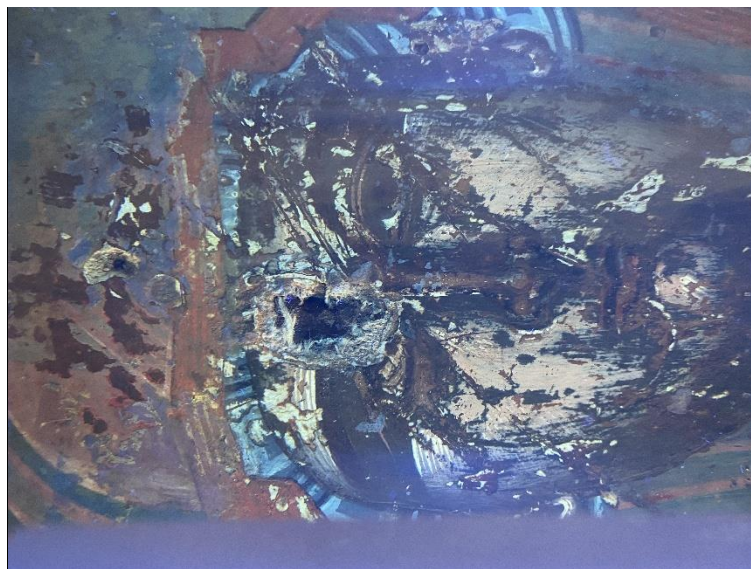
- Damage description

Holes of wood-eating insects and color deposits loss of colors on the throne. There are holes from the pegs. Loss of painting and addition of new preparation in various places with color interventions. Varnish shrinkage is visible. Halo with floral decoration, possibly silver is painted with silver paint.

Because of the three woods in the union of these the fabric preparation is gone perhaps. loss of preparation due to the non-cohesion of the woods with each other. Oxidation of nails loss of wood left about where in the middle appears to be from an accident. In the background there is a later gilt-bronze color glaze.



**Figure 2: Photographic material before (left), during (center) and after restoration (right)**



**Figure 3: Fluorescence photograph - Blue color shows epigraphs**



**Figure 4: During restoration. Removal of subsequent stucco-dissolution of oxidized varnish**

**“Jesus Christ” in the type of Pantocrator.**

Also, in a golden background, Jesus Christ is depicted enthroned in the type of Pantocrator. With his right hand he blesses and with his left he holds an open gospel. Christ wears a tunic rendered in a dull dark red, with a light red "sign", and a dark robe that forms a rich pleat. The outlines of the robe are rendered in gold. The robe is wrapped around his left shoulder. The halo has an incised decoration with meandering shoots, on which the antennae of the cross are inscribed. A cherub can be seen on the upper antenna. Christ sits on a red cylindrical cushion, the ends of which are decorated with a band of winding shoots. Similarly, the feet rest on a red cylindrical cushion with the same decoration. The throne is rendered in gold, light brown and faint mercury. It has a rectangular backrest with a semicircular end and the arms are formed by a row of pesos. The ends of the arms and the backrest are crowned with the symbols of the four Evangelists. At the bottom right is an inscription with the name of the painter and the date the image was created, by the hand of Antonios sub deacon Agorastos.

- Manufacturing technology

The support consists of a single piece of wood. The substrate is smooth, regular in thickness, beige in color. On top of the preparation is the painting layer created with hagiography paints, powders. The preparation has fabric. The varnish layer is of normal thickness.

- Damage description

In the face of Christ, at the point of the nose, preparation and painted surface are missing due to human intervention. The same is present at the bottom left of the image.'

Christ carries a silver halo fixed with nails painted with silver paint (the image has also been painted by mistake). Painted on is the background and the burgundy letters on either side of Christ's face.

Wood-eating insect holes are present on the back of the image and on the narrow sides of the wood around the perimeter. The tresses have been removed showing signs of their absence and the studs have been cut, while the remaining parts of the studs have slightly shaken the preparation and painted surface.

Through vertical crack starts from above. Dust under the halo was found when we removed it and three coins in the 1960 issue with King Constantine the Eagle and Owl as tamas were also found.



**Figure 5: Photographic material before (left), during (center) and after restoration (right)**

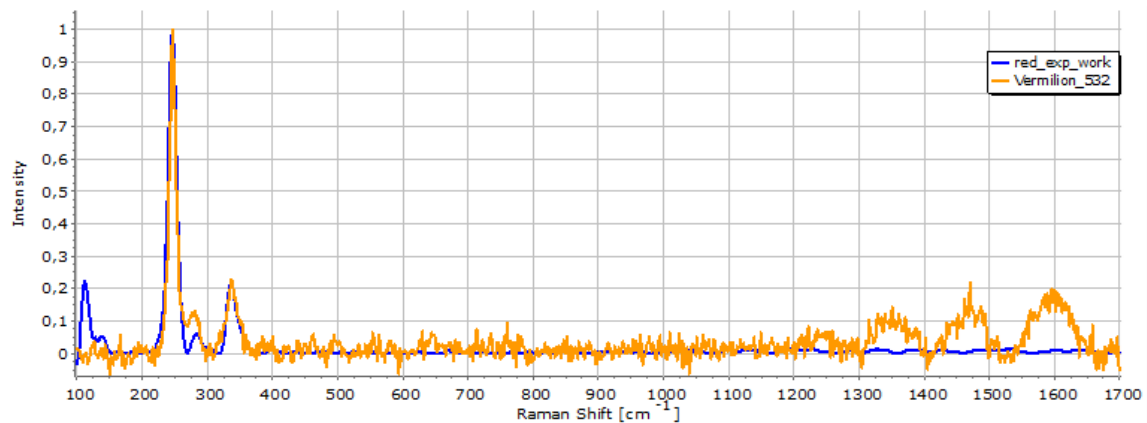




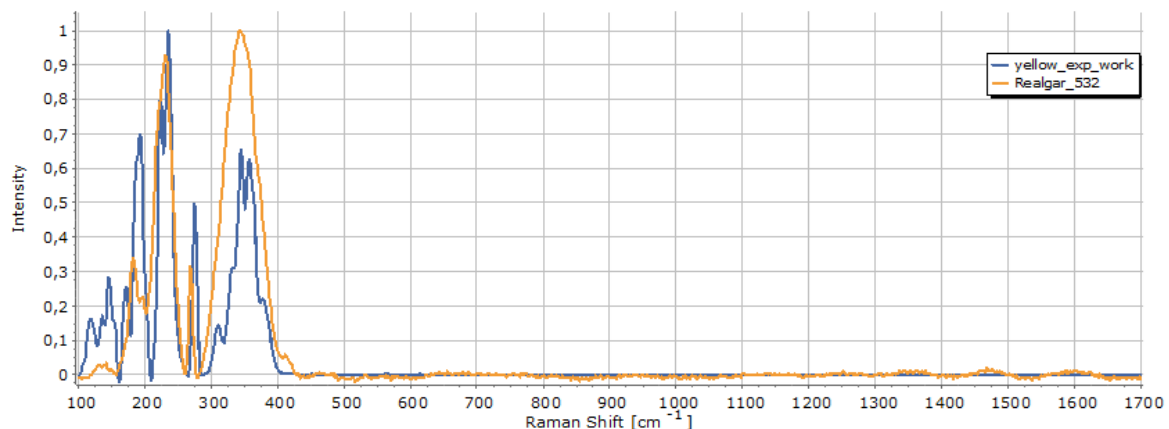
**Figure 6: During restoration. Removal of oxidized varnish**

### 3.2 Results of Non-destructive analysis

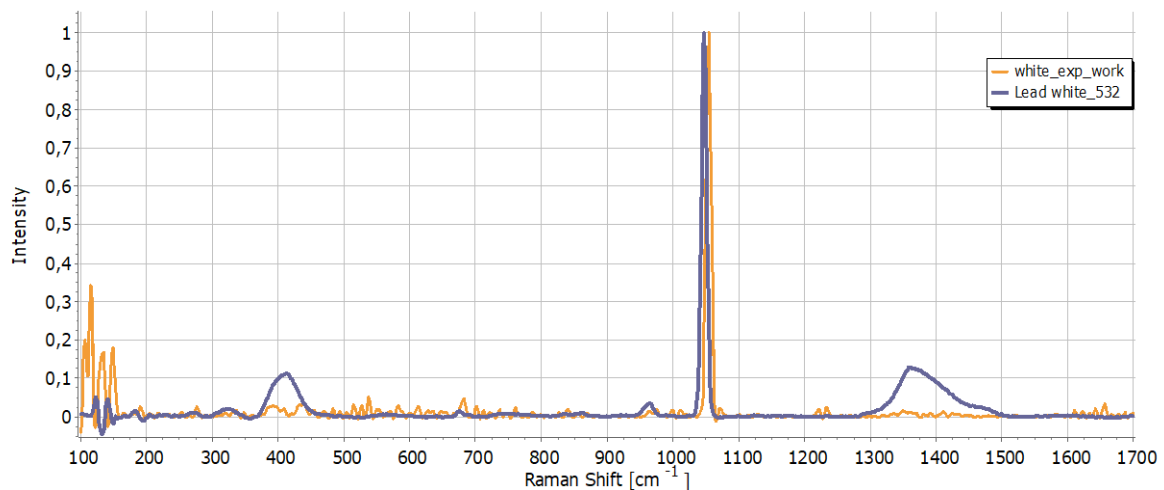
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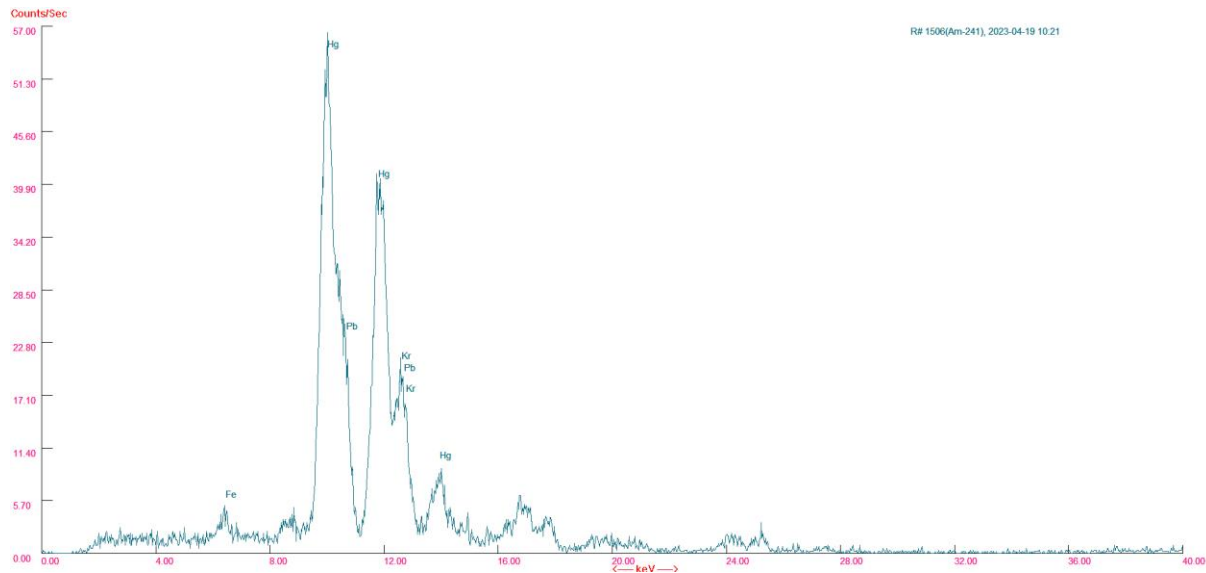
**Figure 7. Raman spectrum. Identification of the pigment Vermilion as a comparison of the experimental results (blue) with the reference from Bibliography (Pigments checker data base 2016 [10])**



**Figure 8. Raman spectrum. Identification of the pigment Realgar as a comparison of the experimental results (blue) with the reference from Bibliography (Pigments checker data base 2016 [10])**



**Figure 9. Raman spectrum. Identification of the pigments Lead White as a comparison of the experimental results (blue) with the reference from Bibliography (Pigments checker data base 2016 [10])**



**Figure 10. XRF spectrum – Identification of pigment Vermillion, peaks related to the element of Hg**

#### 4.0 ACKNOWLEDGEMENTS

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