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# RESEARCH ON THE MURAL PAINTINGS FROM THE CHURCH SAINTS ARCHANGELS, FROM THE VILLAGE OF AȘCHILEU MIC, COUNTY OF CLUJ

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## Abstract

One of the oldest wooden churches from the county of Cluj, is situated in the village of Așchileu Mic. The church, which is a historical monument, was constructed sometimes between 1762 and 1767, and was dedicated to the Holy Archangels Gabriel and Michael. At the very beginning of the 19<sup>th</sup> century, the church was decorated with mural paintings. This paper presents not only the iconographical and architectural features of the monument, but also the research and the experiment results obtained by applying FTIR method on some samples of mural painting. These analyses were meant to certify the origin of the materials used in the primer and colour layers of the painting inside this very old wooden church.

*Keywords:* mural painting, wooden church, FTIR

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## 1. Introduction

Așchileu Mic is located on the northern region of the county of Cluj, 38 kilometres from the municipality of Cluj-Napoca. The village lay in a predominantly hilly area and at the foot of the highest hill rests an old timber church.

Due not only to its age and architecture, but also to the icons and mural paintings that it shelters, the timber church from Așchileu is a historical monument that has been included on the National Cultural Heritage list (Figure 1).

The church was dedicated to the Holy Archangels Michael and Gabriel, and is assumed to be erected shortly after the half of the 18<sup>th</sup> century. It was built in oak wood, in the style of the timber churches from Maramureș [1], as were all the other similar buildings from the north western Transylvania. It is a nave

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shaped church, measuring 13.5 meters long and 7 meters high. On top of the narthex rises a 20 meters high belfry guarded by 4 small towers. The church is surrounded on the western, northern and southern sides by a porch, while a beautiful roof covers the stairs.

Researchers have not yet reached consensus about the exact date when the church was built. Most probably, the church was erected between 1762 and 1767, as inferred from the Documents concerning the past of the Romanian Orthodox Church from Transylvania [2]. Yet, there is evidence that suggests another dating. Above the entrance door into the church is inscribed the year 1801, which made the Academician Marius Porumb to state that „the church, a valuable architectural monument, was built in 1801, replacing an older worship place” [3]. Despite this interpretation, according to oral traditions, the year inscribed above the door seems to be referring only to the date of the porch’s building, and not of the entire church [4].

There are also different opinions concerning the date when the mural painting was done. There is a Cyrillic inscription on the eastern wall of the sanctuary which states that „The angels were named as patrons of the church built through the faith and efforts of the ancestors, (...) and was painted by me the humble painter Ioan Pop from Unguraş 1806”. Also, on the back of the wooden shrine from the Holy Altar there is another date written, 1843, as well as the name of another painter, Simeon Mărţişan. Based on these latter writings, Marius Porumb considers the entire painting of the church to belong to Simeon Mărţişan and, as a consequence, to have been made in the mentioned year, 1843 [3]. Nicolae Sabău also subscribes to this opinion [5].

However, the two inscriptions concerning the date of the painting are only apparently in contradiction, if one admits that the first year is that of the painting of the church, and the second one, the year of the painting of the wooden shrine only.

The dating of the building and of the mural painting are not the only unknown facts of this church. Throughout the very few studies concerning the wooden church from Aşchileu, one is told nothing on the nature of the materials employed in painting the church, though their knowledge appears as necessary for the future interventions of restoration. The present study wants to bring its contribution to the knowledge of this old monument of Cluj county, especially by using the FTIR analysis on the pigments and binders used in painting the church.

## **2. The mural painting**

### ***2.1. The iconographical program***

The interior of the church from Aşchileu is entirely painted. As it was done in all the other timber churches of the time, some stripes of cloth were glued above the site of contact between two beams. Then, a layer of gesso was applied on the entire inner surface, the painting being done on the gesso.



**Figure 1.** The wooden church from Așchileu.



**Figure 2.** Holy Hierarchs, sanctuary.



**Figure 3.** The mad virgins, narthex.



**Figure 4.** Saint Archangel Michael, nave, eastern wall.



**Figure 5.** Sanctuary, ceiling.

Up on the semicircular vault of the sanctuary is not painted the Mother of God with the Child, as expected, but the All Seeing Eye of the Lord, a western type representation. Six medallions with the prophets Jonah, Jeremiah, Isaiah, Ezekiel, Zechariah and Daniel may be seen on each side. On the northern part of the vault the scenes of The Raising of Lazarus and the Entry into Jerusalem are painted, while on the southern part lie The Presentation at the Temple and another small unidentified scene.

In the lower register of the Sanctuary, next to the prothesis, one can see the Descent of Christ from the Cross, while on the rest of the register Holy Fathers and Hierarchs are painted (Figure 2).

On the vault above the nave the Virgin Mary is painted, and at the western and eastern corners, the Holy Evangelists Matthew and John, respectively Luke and Mark. The northern part of the vault is divided by frames into eight scenes that describe moments from the life and Passions of our Saviour.

In many of the scenes the characters are represented wearing the specific clothes of the time. Thus, one may see Jewish high priests in the costumes of the time, wearing the turban on their heads, the specific garment of the Moslems. This way, the painter was referring to those who, for hundreds of years, represented the evil for the Romanian people [4, p. 75].

On the southern wall of the narthex, as well as on one side of the western wall, the myrrh-bearing women are painted as they are encountered by the angel sitting on the overturned stone and telling them that Christ has risen. In the remaining space, to the frame of the door, the Holy Emperors Constantine and Helen are represented, while the scene of Abraham's sacrifice is painted above the entrance. In the northern part of the western wall lies the scene of the five mad virgins (Figure 3), which continues on the northern wall of the narthex with the representation of the five wise virgins.

Above and beneath these paintings one may admire vegetal motifs that cover the wall to the ceiling. Both the vegetal motifs and the floral ornaments (tulips, bunches of grapes, etc) that decorate the base of the separating wall between the nave and the narthex, are painted in vivid colours of red, blue and green.

The dominant colours of the scenes are red, blue and green, on a grey background. The painting of the church has a folk and naive character. It has a flat rendering, and the clothing are made by applying the drawing on the ground colour.

## ***2.2. The conservation state of the mural painting***

The conservation state of the mural painting of the church is a rather precarious one. During the last 20 years, the infiltrations of rainwater due to the aging and the damage of the shingle coating system of the church, as well as other factors lead to the degradation of the mural painting.

The walls of the church are made of oak ledgers of different widths, approximately 20 cm thick. The vaulted ceiling is made of wooden boards. Some of these are curved, due to the aging and subjecting to excessive moisture and heat, and have caused the appearance of level difference between them. The boards that form the flat ceiling of the narthex were joined together by wooden slats. Due to the aging and the local action of the water, some of these slats were separated.

As I have already mentioned, strips of cloths were glued over the places where the ledgers were joined together (Figure 4). Few of them have been preserved in a good state of conservation, most of them being seriously damaged. Some pieces of cloth are detached from the wood, because of the loss of the binder's quality due to aging and exposure to microclimate factors, while others are completely missing. These cloths detached from the support, some of which are kept in their places only by nails, need fast fixing intervention, because there is a risk of losing the existing painting coat.

The gesso layer, made of plaster and animal glue in low concentration, was applied over the entire inner surface of the church in uneven thickness. In many places, the gesso lost its adhesion to the substrate creating numerous separations, exfoliations and gaps. Cracks of the gesso may be noticed, due especially to the loss of the physical properties of the binder, under the influence of the microclimate factors of the church – extremely great differences of humidity and temperature.

As far as the painting coat is concerned, it presents all types of degradation, especially in the joining areas between the ledgers and the cloths. The painting coat has numerous blind separations, exfoliations, erosions, scratches and gaps. The painting coat of the upper and middle register has numerous traces of washing to the gesso or even to the wood, and white opaque haloes from the solubilisation of the gesso layer. Deposits of minerals may also be noticed in the areas where there were infiltrations of rainwater. In the lower part of the walls there are great losses of painting coat mainly due to the human action (frictions, hand touching, scratching, kicking etc). The entire surface of the walls is covered with a coat of dirt made of dust, candle smoke, excrements, different organic deposits, as well as with a glossy layer of fat, mainly on the lower part. Inside the sanctuary there is a very thick layer of dirt, the candle smoke being predominant, highly blurring the painted scenes (Figure 5). There are many metallic nails all over the surface of the walls and in the places left after their extraction separations of the painting coat to the gesso may be noticed.

In the upper part of the southern wall is a totally improperly installed electric panel next to a fuses one, still having cables, doses, switches and outlets attached, for which reason rather large surfaces from the original painting are being blocked.

### 3. Experimental data

In the analysis that we done on the types of pigments used, as well as on the binder, we have used the FTIR spectrometry method. This is an analytical technique of a molecular type which provides us qualitative and semi quantitative information on the different layers of polychromy, or the preparation of a work of art. The FTIR method is one of the few techniques able to provide useful information on the presence of both the organic substances (oils, animal glues, waxes, binders, resins, fats etc) and the numerous inorganic compounds (carbonates, sulphates, nitrates, phosphates) [6]. FTIR spectrometry is very useful for conducting the preliminary assessments of the samples, and is able to provide sufficient and conclusive data for a diagnosis.

The method used is specific for the spectrometry – measuring the remaining energy after the crossing of a ray through the sample. The difference of energy differs according to the sample's absorption capacity. According to the part of the spectrum that is absorbed, the type of group present there may be identified [7].

One of the main associated analytical techniques is the infrared microscopy. It involves using a certain microscope that is connected directly to the spectrometer. This technique allows performing the analysis on very small samples, without damaging them [8].

For the present analysis many samples were taken from different damaged areas of the mural painting, samples that should provide us the information on the pigments used and the binder (Figures 2, 3, 5). The samples were analysed through FTIR spectroscopy and spectroscopy of atomic absorption.

Aldrich standard solutions (Cu, Cd, Pb, Ni, Zn, Co, Cr, Fe, Ca) and reagents p.a. Merck (HNO<sub>3</sub>, HCl, H<sub>2</sub>O<sub>2</sub>, H<sub>2</sub>SO<sub>4</sub>) were used. The pigments were put under spectral analysis in the IR field (4000-400 cm<sup>-1</sup>), using the FT-IR 6100 JASCO, Japan device. The technique in direct transmission through the process of tablet forming in KBr with a resolution of 2 cm<sup>-1</sup> has been used. Identification of the metals was made by means of an atomic absorption spectrophotometer - type Varian Tehnoton.

### 4. Results and discussions

For the qualitative analysis of the pigments and the binder, the spectral procedures in IR were used. For comparison and identification the FTIR spectres of the samples were also compared with the literature data. The obtained data are rendered in Figures 6-10.

The chemical analyses made on the samples extracted from the fragments of painting have revealed the following aspects:

- The presence of a 150-260 μm thick layer of gesso, based on calcium sulphate (that can also be noticed in the FTIR spectrums the specific bands: 3700-3200, 1140-1080, 671, 602 cm<sup>-1</sup>);

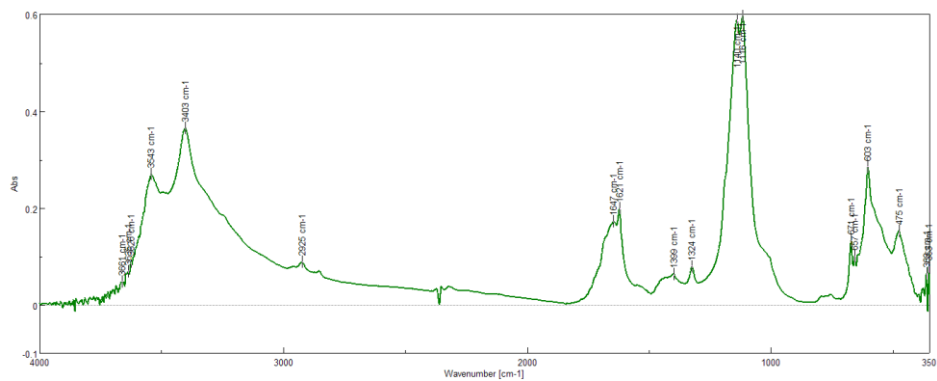


Figure 6. The FTIR spectre of the red colour sample.

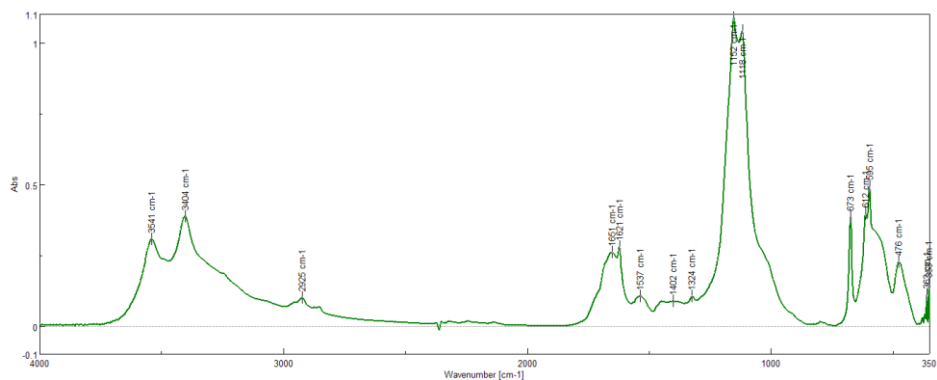


Figure 7. The FTIR spectre of the brown colour sample.

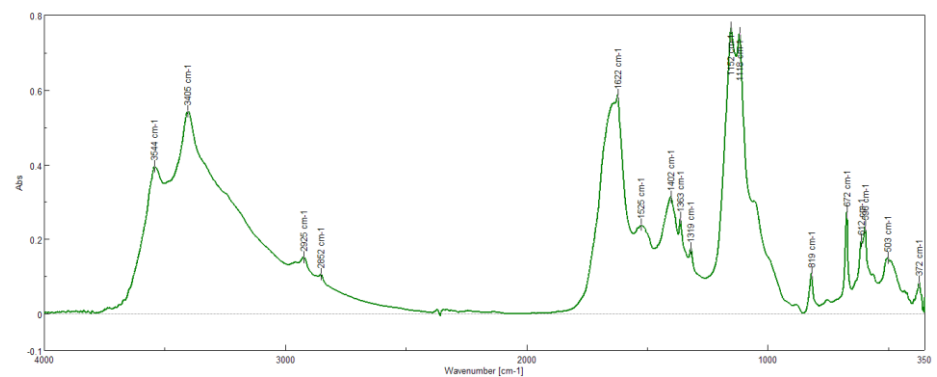
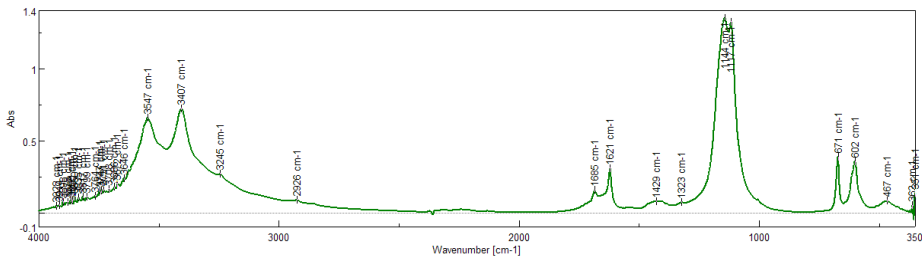
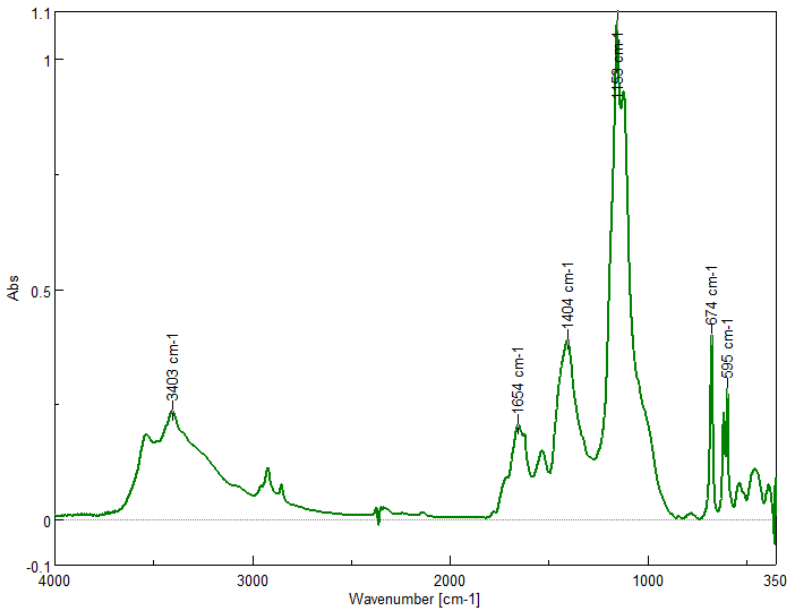


Figure 8. The FTIR spectre of the green colour sample.

- The painting binder used is milk casein (the specific bands 1660-1600, 1565-1500, 1480-1300, 666  $\text{cm}^{-1}$ );
- The red used is, as was assumed, iron oxide (Figure 6, the specific bands 680-450  $\text{cm}^{-1}$ );
- The brown used is also iron oxide, used in mixture with carbon black (Figure 7);
- The green used is malachite (Figure 8, the specific bands 3700-3100, 1530-1350, 1100-1000, 900-650  $\text{cm}^{-1}$ );
- The white used is calcium sulphate (Figure 9, the specific bands 3700-3200, 1140-1080, 671, 602  $\text{cm}^{-1}$ );
- The yellow used is iron ochre (Figure 10, specific bands 3550-3450, 1600-1500, 1100-1000, 600-500  $\text{cm}^{-1}$ )



**Figure 9.** The FTIR spectre of the white colour sample.



**Figure 10.** The FTIR spectre of the yellow colour sample.



Atomic absorption revealed the metals present in the pigments: iron and copper, respectively calcium in the binder.

## **5. Conclusions**

The analysis done on the samples taken from the church have revealed the nature of the materials used in the mural painting, especially the nature of the pigments and of the binders. Knowing them is absolutely necessary for the future to make restoration interventions, choosing the solvents and the adequate materials, and also to determine the possible incompatibilities [9, 10].

On the other hand, considering that certain painting materials were specific to each period, knowing the pigments and binders from the mural painting from Așchileu, might contribute, after future comparative studies, to the establish the precise date of the mural painting from this old wooden church.

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