

CHALLENGES IN THE CONSERVATION OF AN EARLY 19th CENTURY HOLY DOOR - THE FIRST STEPS

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Abstract:

Holy doors, also named royal doors or beautiful gates, are the central doors of the iconostases in the Eastern Orthodox churches. An iconostasis is a complex wooden screen structure which separates the sanctuary (altar) from the nave of the church. Holy doors, as the whole iconostases, are most often very complex polychrome wood artefacts, with sculptured elements, gilded and painted surfaces. Their high value, residing from liturgical, spiritual, artistic, historic and documentary valences, makes their conservation imperious and challenging at the same time. Understanding of the object and scientific investigations are starting key points for an approach in accordance to the code of good practice and ethics. The paper presents the first steps undertaken in the conservation of a 19th Century Holy door, originated from the old orthodox church in Codlea (Brasov county), presently belonging to the local Museum of Traditions. Active conservation methods to preserve the very frail painting layer, the gilding and the wood substrate, with massive insects attack, were applied. Microscopy, FTIR spectroscopy and XRF were employed to investigate the original technique and materials, to highlight the initial conservation state and also assist the cleaning interventions.

Key words: scientific conservation; cultural heritage; holy doors; microscopy; FTIR; XRF.

INTRODUCTION

The Church is the heart and the most important cohesive element for a community brought together by the faith in God. The church is the holy place which makes possible the communion of Divinity with the mankind, the place where spiritually the Heaven meets the Earth. From birth to death the Christians life is connected to the Church, where the most important events are celebrated: the Christening, the wedding and, finally, the funeral service.

The architecture and specific painting or decoration of the churches serve the purpose of feeling the presence of God, getting closer to Heaven and making the Bible alive. The cross shape and division of the interior in three distinct areas: altar, nave and narthex are architectural characteristics of most Orthodox churches. The altar or sanctuary, always orientated to the East, is a sacred area where is located the Holy Table. The altar is separated from the nave by the iconostasis, most often a wooden screen with a complex structure of frames. Icons with themes, symbolism, clothing, colours and gestures according to iconographical cannons (Harrison et al. 2006), are incorporated in this structure so that its liturgical function,

to isolate the celebration of the sacraments from the laity, is associated to a narrative one, to show the history of the Church in images (Labo 2016, Yudin 2017). Three openings with doors allow the connection between the altar and the nave. Holy doors, also named royal doors or beautiful gates, are the central doors of the iconostases. The other two side doors are known as deacon's doors or angels' doors.

Most often the whole structure of iconostases is made of wood (e.g. lime, oak), which is decorated by carving and usually finished by gilding (application of gold leaf on a white preparation layer called gesso, usually after the application of red bolus), though silver or copper alloys leaf, as well as polychromies were employed. The same materials and techniques were used for the holy doors. Painted icons with religious significance are often inserted in the design of holy doors. Often the Virgin Mary and Saint Gabriel are included, though there is no general rule.

Besides the usual degradation factors, such as variation of environmental humidity and temperature, risk of biological degradation in certain conditions, some specific factors related to the religious ritual have to be considered for wood artefacts in churches. These include exposure to incense and candles smoke, as well as acts of veneration, e.g. by kissing for icons. Moreover, repeated cleaning and repainting for continued use in the church and preservation of a new and shiny aspect, as well as inadequate structural repairs are part of the history of religious artefacts. This "care" and "conservation" measures, taken as gestures of faith and love, usually result in more damage (Harrison 2006, Labo 2016).

OBJECTIVE

The main objective of the research work presented in this paper was the investigation and active conservation of a valuable Holy door, dated from the first part of 19th century. In accordance to the principles and code of good practice, adequate documentation and employment of diverse analytical techniques were necessary to understand the object, evaluate the conservation state and select the appropriate methods for interventions. The paper presents the first steps in a complex approach: scientific investigation and active conservation of the painting layer, gilding and wood substrate, all in a precarious conservation state due to severe specific degradation processes. These were essential for the salvage of the valuable artefact, while preserving its authenticity.



Fig. 1.

The Holy door- general aspect and structure: a) face view; b) back view; c) dimensions.

PRESENTATION OF THE OBJECT

The Holy door (Fig. 1) presented as case study in this paper belongs to the Codlea Museum of Traditions, being part of its collection based on donations from the local community and intended to be presented by the museum in terms of culture, spirituality and traditions in historic evolution. Future is strongly related to knowledge and understanding of the past and history, of cultural values and the role of local

community and recognised personalities in the evolution of a locality/ town. These all represent reasons to appreciate the initiative and effort of the Council of Codlea to open this local museum.

The Holy door originates from the *Înălțarea Domnului* (Lord Ascension) Orthodox Church, the oldest one in Codlea, dating from 1783. There is no exact dating of the holy doors, but there is information on the fact that initially separation between the altar and the nave was made by a brick wall and about donations of different religious artefacts for liturgical purposes or funds for church improvement from rich merchants from Brasov and parishioners in the first decades of the 19th Century (Lehni 2009, Plaiasu and Marin 2011). It is reasonable to believe that the holy doors are dating from the same period – around 1800-1830, which is in accordance to the Baroque style influences in the decoration (Labo 2016). A new wooden screen iconostasis was mounted in 1935 in the church. The object presented in this paper is, very likely, the left door leaf from the first holy doors of the church. This is the only one remained, being discovered in the attic of an old house, once headquarter of Romanian Cașina, a cultural and political association of Romanians in Transylvania, founded in 1835 in Brașov (https://ro.wikipedia.org/wiki/Casina_rom%C3%A2n%C4%83_din_Bra%C8%99ov).

This was made of a 30 mm thick panel constituted from two boards of lime wood joint together on their longitudinal edges with the aid of two transversal rails (made of resinous species), visible on the back of the door panel. Though no adhesive was used, the stability of the panel is remarkable due to a fine processing of the edges and the dovetail joint solution employed for the rails, so that only a fine shrinkage gap is visible between the two boards. The whole object has a rectangular trapezoidal shape, the dimensions being detailed in Fig.1c.

The whole assembly was processed by carving and divided in two registers, each of them processed to give the impression of a panelled frame structure. Actually, two arched panels, on which saints icons were painted, are present on both the inferior and superior registers. The icons are codified in this paper as I1, I2 (upper register, from left to right) and I3, I4 (bottom register, from left to right). Architectural elements, namely column capitals and moulded arches are framing the icon panels. On the upper part of both registers there are areas highly decorated with phytomorphic motifs, such as leafs, stalks, flowers. The whole framing of the four icons appears to have been gilded, though obviously several layers of bronze varnish were applied on top of the original gilding. The concept of the whole door leaf is a multiple representation of the symbol of the *tree of life*. Moreover, if one is imagining the complete assembly of the two Holy doors, then the same important symbol will result, with a central vertical axis and branches on both sides.

The back side and the edges of the door are painted in grey with a simulated marble effect obtained by white and black lines. This might not be the original finish, but a late intervention, as suggested also by the similar coating of the two metallic hinges.

Initial state of conservation

Due to the ageing of materials and totally inappropriate conditions the object was deposited and totally neglected for a very long period of time (at least 80 years), the initial conservation state of the holy door (Fig.1a, Fig.2), was very unstable and precarious for both the wood substrate and the painting layer, imposing urgent conservation actions. Severe insects attack, still active in some areas, caused advanced wood frailness, so that ruptures with loss of material occurred (Fig. 2 a,b,c,e).

The painting layer for the four icons was extremely dark, fragile, crackled, non-adherent, with extensive flaking, explaining the significant losses as lacunar or more compact areas (Fig.1a, Fig. 2 d,e). An approximation of losses of the original painting layer conducted to the following values: 15% for I1, 40-45% for I2 (with almost total loss of the background painting layer in the upper part), 20% for I3 and 25% for I4. The risk of detachment and further losses were maximum, with irremediable bad consequences on the value and authenticity of the object. Accordingly, consolidation of the still existing but very aged and fragile painting layer, to ensure its preservation without any further loss, was a major challenge and the first step in the conservation process, as described later in this paper.

The "gilded" area, very dirty and darkened, of brownish colour, was also affected in terms of integrity and adherence to the substrate (Fig. 2 d,e,f). Areas of total exfoliation up to the bare wood (Fig. 2 g) alternated with areas of delamination between the top layer and the white preparation layer, while in some areas the red bolus was still visible (Fig. 2 i). Maximum losses occurred on the "frame" (the rectangular side and bottom parts) of the assembly, being approximated at about 50% on the left stile, 70% on the right stile and almost 50% on the bottom rail. Some trends of exfoliation of the "gilding" were also present in the sculptured upper part of the door leaf, as well as evidence of previous "consolidation" by overpainting with a bronze varnish, with contrary results. Frailness of wood and the lacy sculptured structure of this highly decorated area caused unfortunately rupture with loss of material, approximated to about 20% from this area. Unfortunately, completion of this sculptured missing part will not be possible due to the lack of relevant information (similar elements).

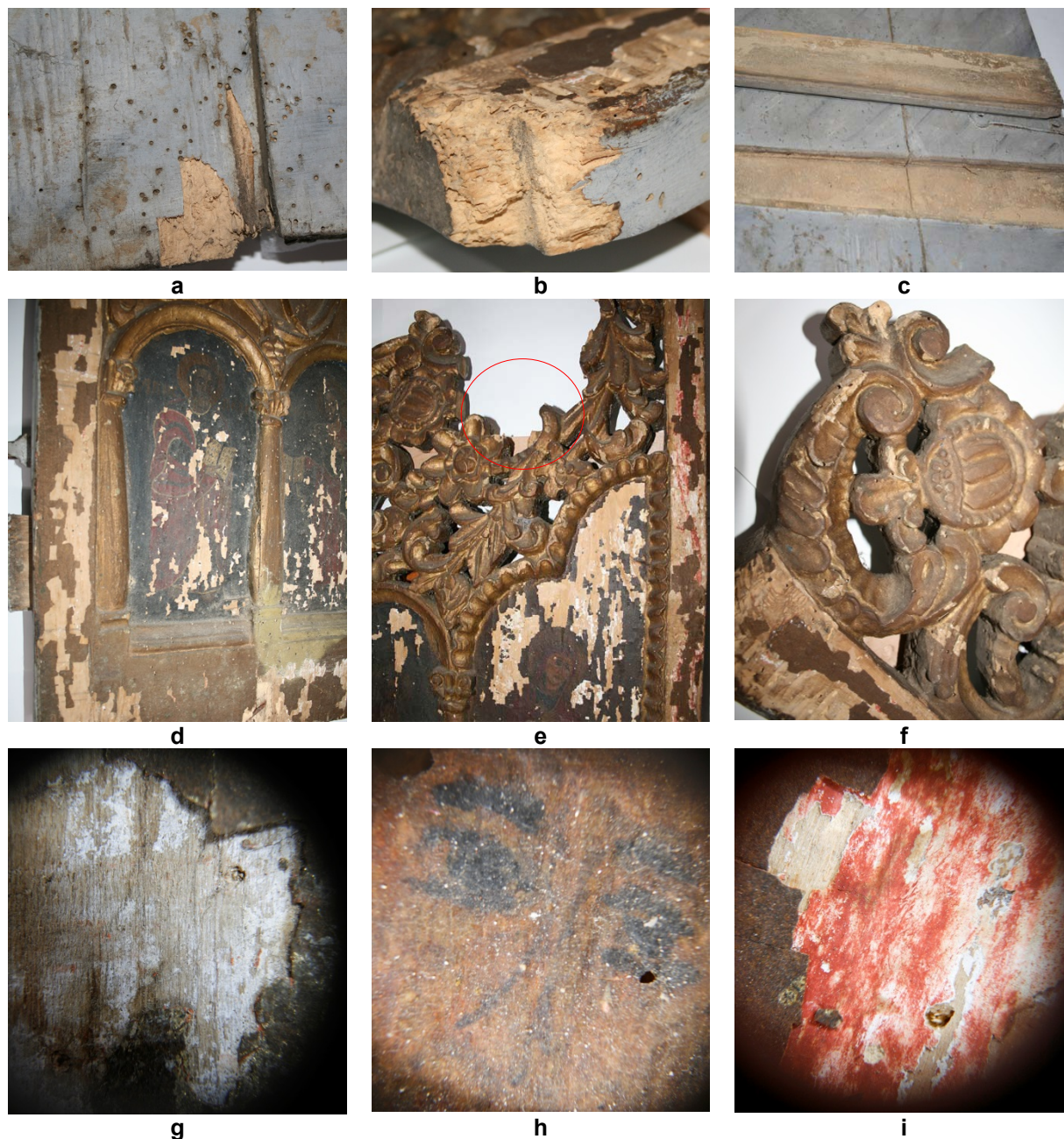


Fig. 2.

Details of the initial state of conservation: a) insects attack; b) fragile wood and rupture; c) massive active insects attack; d,e,f) details of degradation of “gilding” and painting layer with significant losses; g) magnified view of lacunar loss of gilding layer up to the wood substrate; h) detail of aged painting layer through magnifying glass; i) magnified view of lacunar loss of gilding – white gesso and red bolus still present.

SCIENTIFIC INVESTIGATIONS

Before any direct intervention relevant photos were taken to document the initial state of conservation and the whole object was meticulously examined by naked eyes and through magnifying glasses. At this stage, small samples of painting layer (P1, P2, P3, P12/ icon I1: P4/ icon I4, P7/ icon I3), “gilding” and wood substrate (P11) were collected from damaged areas (Fig. 3) for investigations. Supplementary, samples of less degraded wood were collected from the back of the panels (L1) and rails (L2) for wood species investigation.

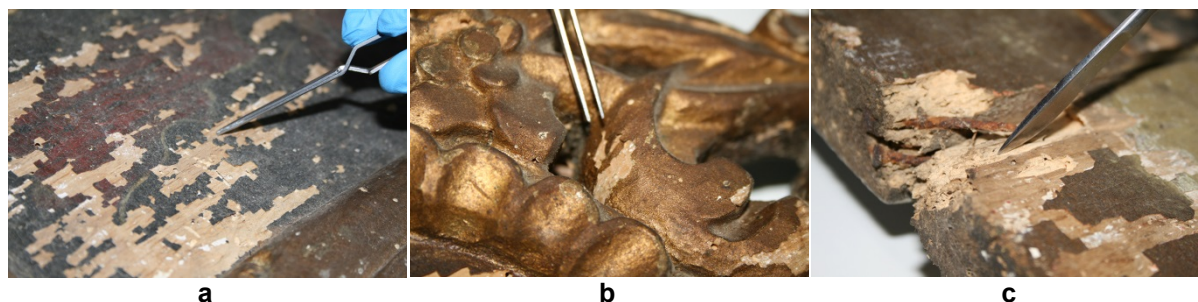


Fig. 3.

Collection of samples for investigations: a) painting layer; b) gilding; c) frail wood.

Optical microscopy (stereomicroscope OPTIKA SZM with video camera) and FTIR-ATR spectroscopy (ALPHA BRUKER spectrometer) were employed to reveal the structure of the painting/ "gilding" layers and possibly identify the materials. Moreover, X ray fluorescence (XRF) was employed to identify the main chemical elements present in the "gilded" areas, after cleaning. Only some examples are given in this paper.

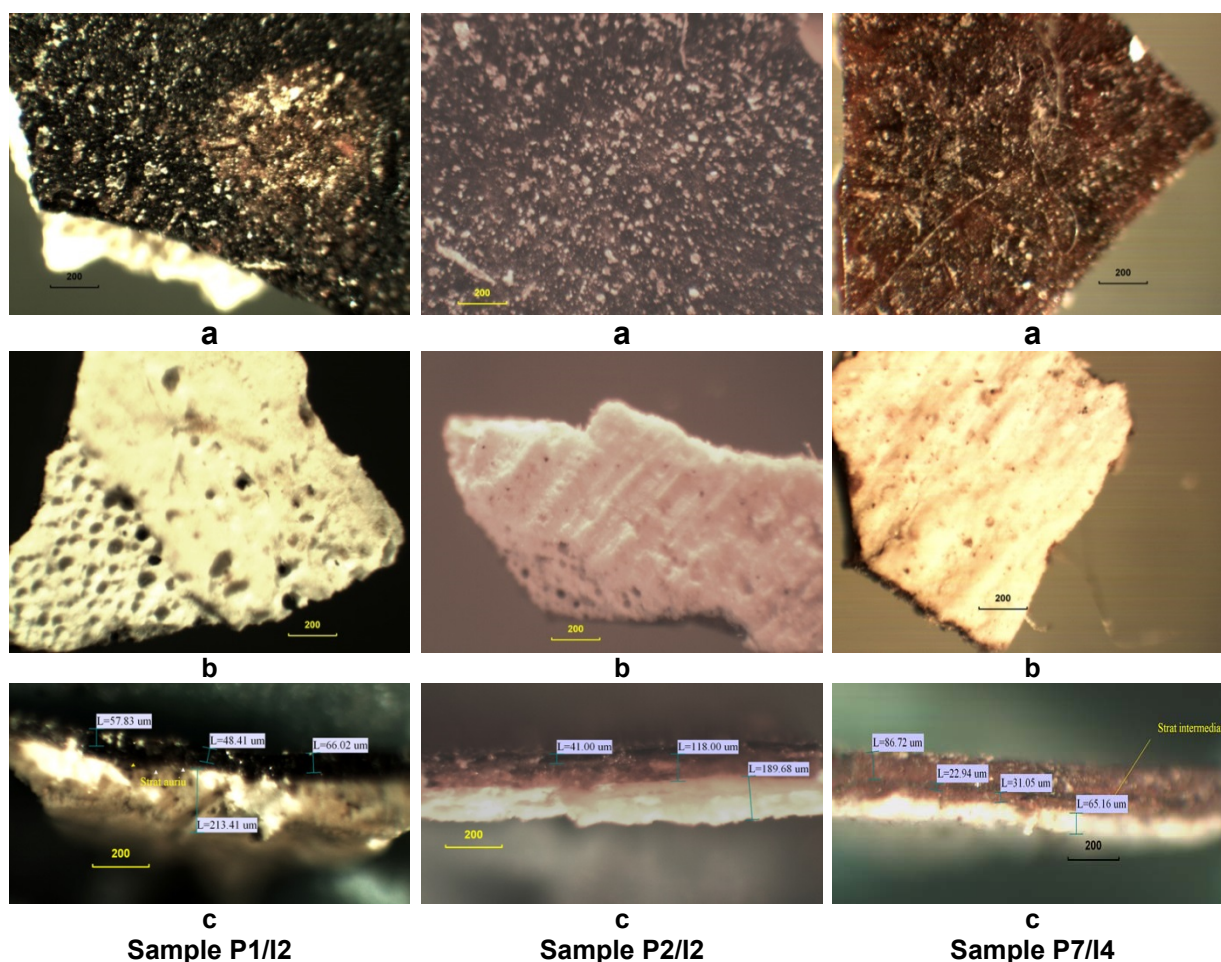


Fig. 4.

Microscopic structure of the painting layer - exemplification for samples P1, P2 from icon I2 and P7 from icon I4, observed under stereomicroscope at 60x magnification: a) face - top layer, b) back-preparation layer, c) cross-section.

The microscopic investigation of the paint layer samples (Fig. 4) clearly revealed that the wood substrate was prepared by application of a white base coat of "gesso" type. The total thickness of this layer varied from about 100 μ m to about 200 μ m and appears to have resulted from successive application of materials with different porosity. Also the topography of the layer in direct contact with the wood substrate seems to indicate processing of wood to ensure a better adhesion of the ground layer, a usual technique for

traditional icons (Socolova 2001). FTIR investigation of the preparation layer (not presented in this paper) indicated that this was prepared from animal glue (possibly rabbit skin glue) and chalk.

For all the samples, a dark top layer, with granular structure and different inclusions (e.g. fibrous filaments) was observed. This might be a top varnish which entrapped smoke, charcoal particles and dust. Several other layers, of different colours depending on the sample origin, were observed in the cross-section. For some samples, a very thin and discontinuous, yellow, highly reflective layer was observed, which might indicate application of a gold/metal leaf prior painting in order to endure a special luminosity and colour effects. (Gettens and Stout 2012).

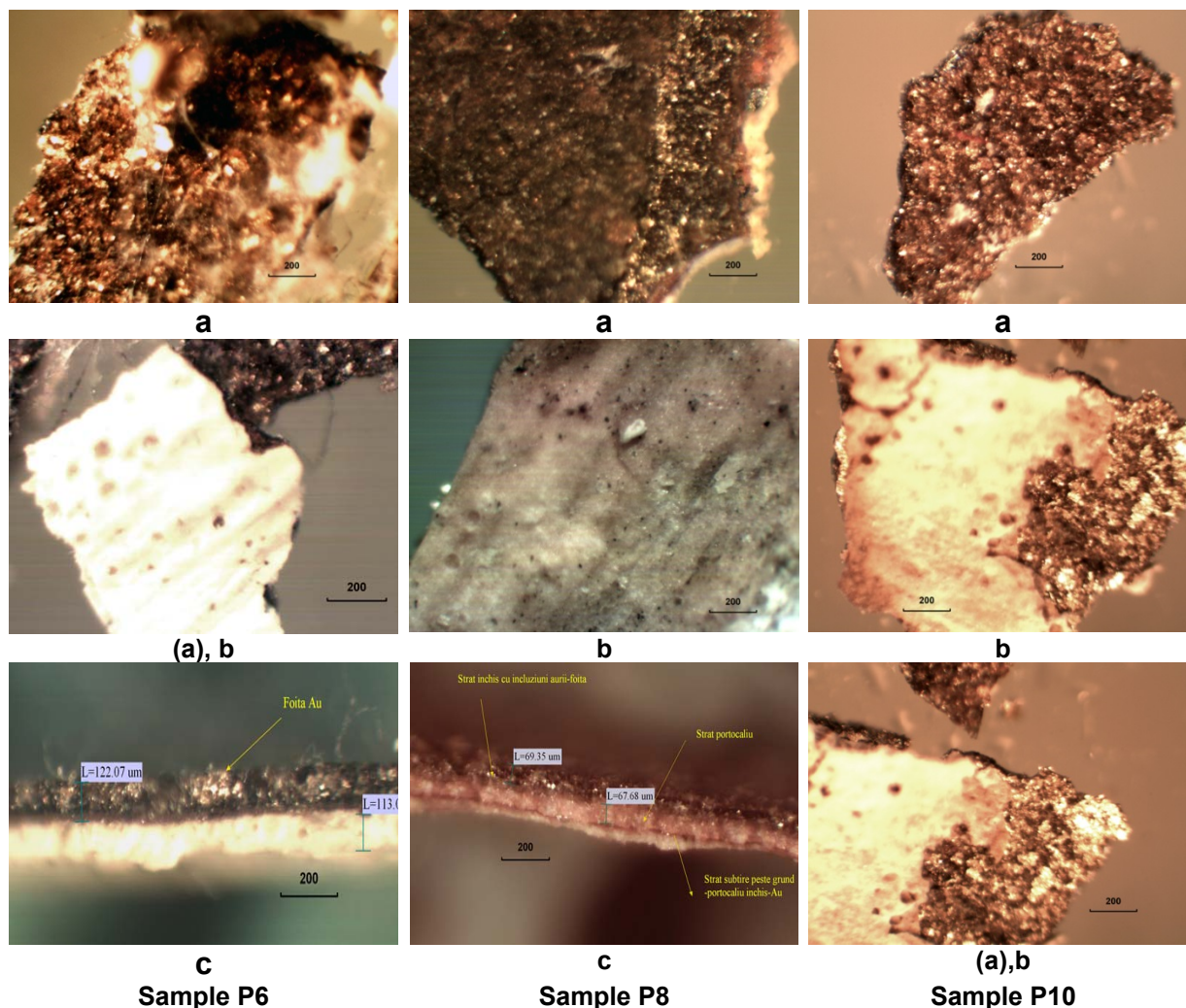


Fig. 5.

Microscopic structure of the "gilding" layer - exemplification for samples P6 (moulded arch I4), P8 (bottom part of the "frame"), P10 (floral ornaments from the top), observed under stereomicroscope at 60x magnification: a) face - top layer, b) back-preparation layer, c) cross-section.

The microscopic investigation of the "gilding" samples (Fig. 5) revealed that the wood substrate was prepared by application of a white base coat of "gesso" type, similarly to the painted areas. FTIR investigation of the preparation layer (not presented in this paper) indicated that this was prepared from animal glue (possibly rabbit skin glue) and chalk, though XRF analysis revealed also presence of lead (Pb) alongside calcium (Ca) in the gesso. For some gilded areas the application of a red "bolus" on top of the white gesso was evident microscopically. As the actual "gilding" material is concerned, two main aspects were revealed: 1) the non-uniform, granular aspect of the surface, with yellowish shiny areas alternating with darker spots; 2) discontinuity of the gilding material in the cross-section, with only isolated areas indicating the potential presence of a metallic/gold leaf. These support the assumption of an advanced degradation of the original gilding with metallic leaf and re-painting with a varnish containing metallic powders.

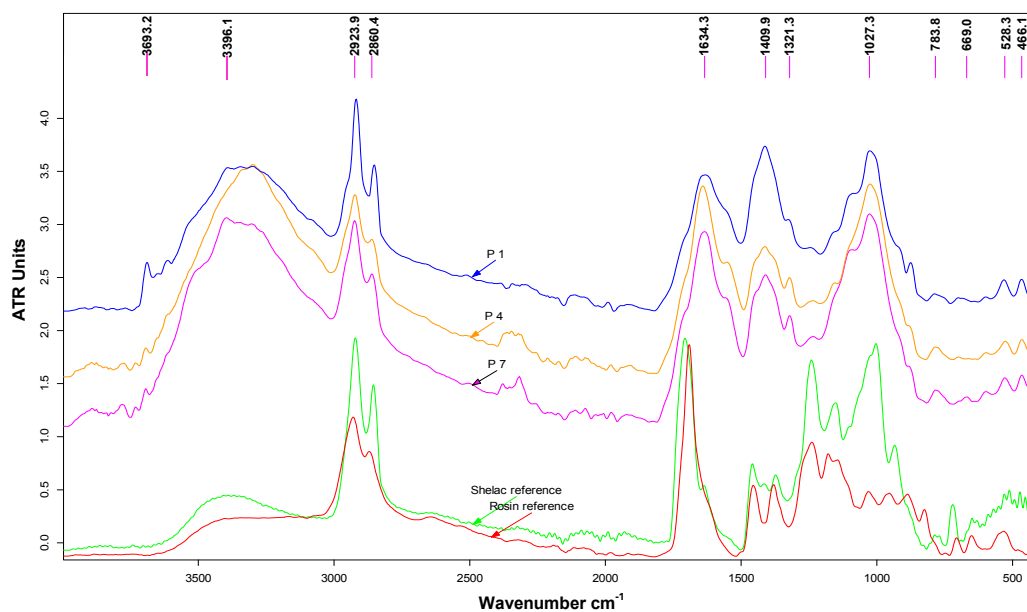


Fig. 6.
FTIR spectra of the surface of painting samples – top layer.

The FTIR investigation of the surface of the samples of painting layer (Fig.6) indicates that very likely a varnish containing shellac and rosin, alongside other components, has been applied to protect the tempera painting.

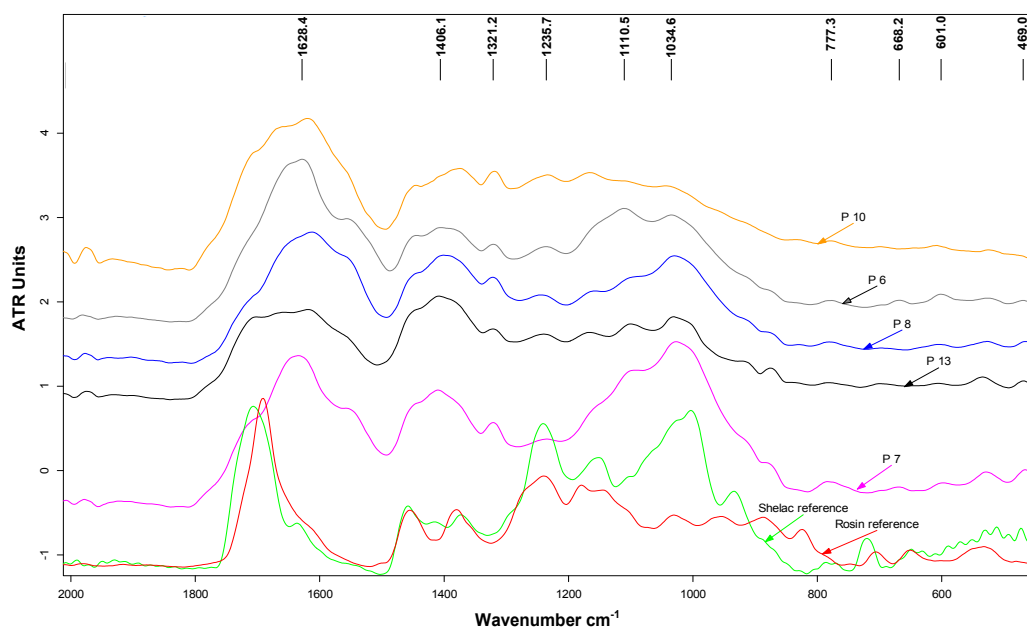


Fig. 7.
FTIR spectra of the surface of gilding samples – top layer (P6, P8, P10, P13) compared to.

The FTIR spectra registered for the surfaces of the “gilding” samples (Fig.7) indicate a slightly different type of varnish than that applied on painted areas, though it is possible that the same varnish was applied on top of a “gilding” varnish (containing metallic powder) employed to “restore” the original gilding. More tests and complementary methods are needed to clarify these aspects.

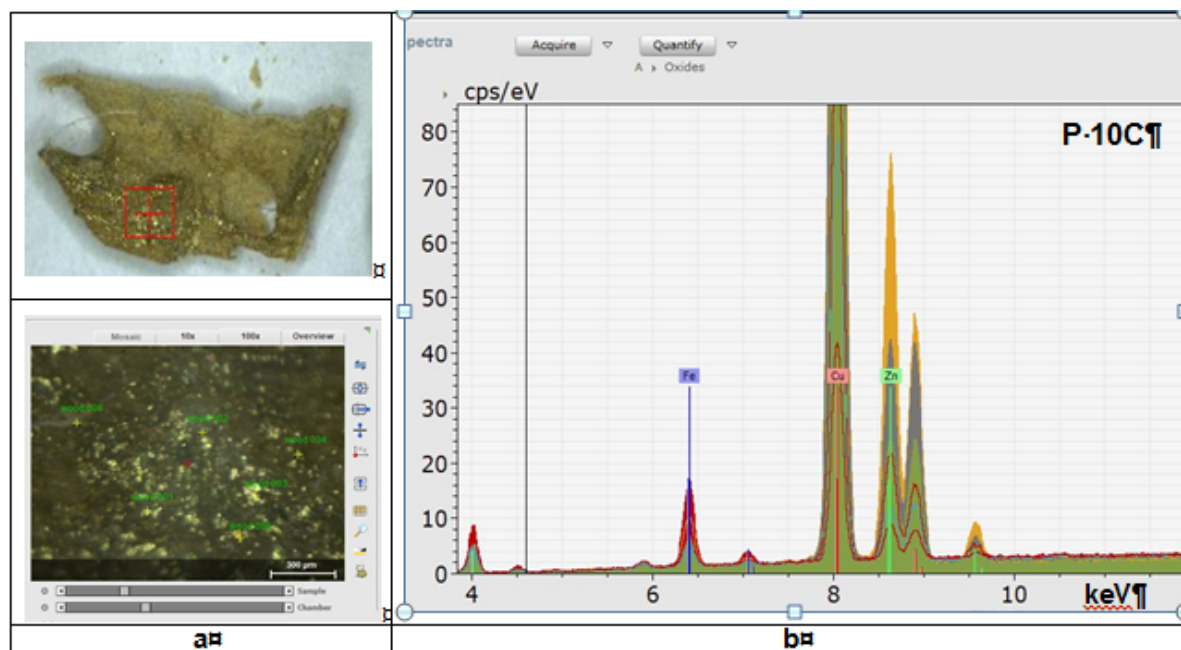


Fig. 8.
Micro-XRF analysis of sample P10-gilding- floral area.

XRF and micro-XRF (Fig.8) analyses were employed in an attempt to elucidate the nature of the “gilding” material. These tests were performed on samples collected after cleaning, actually controlled partial stripping the gilded surfaces with a solvent based diluted stripping solution. The main metallic elements found were copper (Cu) and zinc (Zn), no gold (Au), which indicates a brass alloy. The same metals were identified on the cotton swabs employed for cleaning, which indicates that cleaning should go deeper in order to get to the original gilding. However, this might be risky, as very likely the original gilding layer might have been lost in high proportion, explaining massive repainting. Therefore, any further steps will be agreed with the legal owner of the artefact (the museum’s curator). It has to be mentioned that not only gold leaf, but also brass, bronze and silver leaves were employed in 18th and early 19th century for such artefacts (Angold 2014)

CONSERVATION CONCEPT

The concept of conservation considered with priority active conservation methods with a view of ensuring preservation of the object authenticity, meaning no further loss of painting and “gilding. Accordingly, the first step was consolidation of the very frail original painting layer and flaking “gilding” areas employing Japanese paper and diluted fish glue solution (Fig.9), the application of the protective material being followed by hot pressing (at 60°C) with electric spatula, or alternation of hot and cold pressing, by case. Once this goal was reached, it followed the active conservation of the wood substrate in order to stop the active insects attack and consolidate the frail wood. For this purpose an insecticide solution (Perxil 10) and then Paraloid B72 (solutions 5%, 7% in ethyl acetate) were applied by injecting into the insects galleries in several reprises. At this stage, structural repairs as completion of small missing parts and consolidation of the panel structure were possible. The steps to follow are those of thorough cleaning of the surfaces, based on previous testing of different solutions for the different types of surfaces (icons painting, gilding, marble-like paint on the back of the door). A standard solution (based on water, alcohol and non-ionic detergent) was adequate for the back of the door, whilst totally un-effective for the “gilded” parts, for which a diluted stripping solution (Chromofag / Ethyl alcohol in ratio of 2:1) was employed. The cleaning of gilding is still in progress. Preliminary tests indicated that the painted areas (icons) can be adequately cleaned with ethyl alcohol 97%.

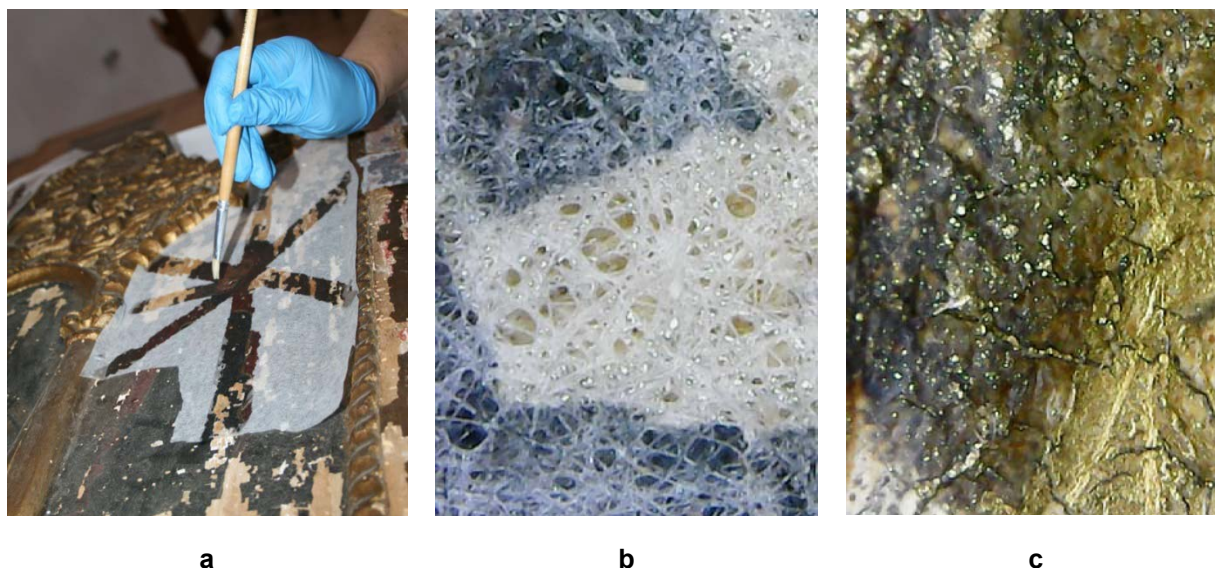


Fig. 9.

Aspects of conservation and consolidation of the original painting layer and gilding: a) application of the Japanese paper; b) macroscopic aspect of a consolidated area of painting layer- fibres of consolidating paper c) final aspect of a gilded consolidated area after removing the Japanese paper – edges of a gold/metallic leaf evident on the right side.

CONCLUSIONS

Following a complex approach, based on scientific investigations, the main challenges in the active conservation of the valuable early 19th century Holy Door originated from the oldest orthodox church in Codlea have been successfully addressed:

- the original painting layer and gilding have been consolidated to prevent any further losses;
- the very degraded and frail wooden support has been stabilised by adequate treatments including preservation against insects attack and consolidation with polymers;
- important steps were achieved in understanding the manufacturing techniques employed and identification of the original and later interventions materials;
- adequate methods of cleaning / controlled partial stripping were identified and applied, but this process is still in progress.

All these are important steps in the conservation of the artefact, while maintaining its authenticity and historic value.

Last but not least, this research proves once again that cooperation between specialists, laboratories and institutions serve successfully the ultimate common goal of conservation of cultural heritage.

ACKNOWLEDGEMENTS

The authors acknowledge the cooperation with the *Codlea Museum of Traditions*, the present paper being the result of a research project funded by the Codlea City Council. The authors express their gratitude to the Total Spectrum SRL for the XRF investigations. The authors also acknowledge the structural funds project PRO-DD (POS-CCE, O.2.2.1., ID 123, SMIS 2637, ctr. No 11/2009) for providing the infrastructure used in part of the investigations presented in this work at the CDI Institute of Transilvania University of Braşov, as well as the beneficial cooperation between the CNM ASTRA Sibiu and the Transilvania University of Braşov.

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***Evaluarea multi-disciplinară a șilor âmpărătești din bisericile de secol XV-XIX în vederea conservării și restaurării prin metode clasice și digitale pentru asigurarea vizibilității comunitare, PROIECT PN-II-PT-PCCA-2013-4-1882- PARTENERIATE ÎN DOMENII PRIORITARE, 2013-2016, available at: http://usiimparatesti.granturi.ubbcluj.ro/Raport_Etapa_1.pdf