

Conference Paper

Technical Study of *Judith with the Head of Holofernes* from Nizhny Tagil Museum of Fine Arts. New Materials for Attribution

Denis Ilichev¹, Nikita Kulesh², and Mikhail Mingaztdinov³¹Junior Researcher, Chair of Art History and Museology, Ural Federal University, Yekaterinburg, Russia²PhD in Physics and Mathematics, Senior Researcher, Department of Solid State Magnetism, Assistant Professor, Department of Magnetism and Magnetic Nanomaterials, Ural Federal University, Yekaterinburg, Russia³Junior Researcher, Laboratory of Artistic Practices and Museum Technologies, Ural Federal University, Senior Researcher, Ekaterinburg Museum of Fine Arts, Yekaterinburg, Russia

Abstract

We performed a technological investigation of *Judith with the Head of Holofernes* (a copy of Cristofano Allori's work) from the Nizhny Tagil Museum of Fine Arts to clarify the painting's attribution. According to the current attribution, the copy was created in the 17th century Italy. Pigment analysis using X-ray fluorescence spectroscopy and scanning electron microscopy with energy dispersive spectroscopy was undertaken in order to provide indicators of the approximate date of the Nizhny Tagil copy. The analysis results – supplemented with evidence from UV-imaging and micro-imaging, radiographic examination and studies of the paintings' support, ground and paint layers – agree with the existing attribution but do not necessarily confirm it. Comparison of the technical characteristics of the Nizhny Tagil *Judith* with the techniques of Western and Russian painting allows us to extend the dating. In addition, certain fragments of the painting were examined to provide insight into specifics of differences between the copy and the original, which turned out to be mainly the results of previous restorations.

Keywords: 17th century Italian painting, painting technique, canvas, pigments, ground, X-ray fluorescence, scanning electron microscopy, x-radiograph, cross-sections.

Corresponding Author:

Denis Ilichev

d.v.ilichev@urfu.ru

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1. Introduction

The collection of Nizhny Tagil Museum of Fine Arts (NTMII) has a painting of *Judith with the Head of Holofernes*, a copy of the work with the same name by an Italian artist Cristofano Allori (1577–1621). Presumably, the copy was made in Italy in 17th century but no comprehensive analysis was carried out before. To cover this gap, the employees of the Ural Federal university set on to complete a technological analysis that would specify the painting's attribution: determine its age and the possibility of it matching the Italian painting school of 17th century technically.

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The question of the painting's provenance remains open. It is impossible to determine when and under what circumstances this canvas ended up in Nizhny Tagil. The Act of Nizhny Tagil Regional Museum dating August 22, 1951 establishes only that this painting had previously been in the museum possession but wasn't registered and accounted for. In addition, we can note that this painting wasn't included in the list of art works that were handed over in 1924 by I.E. Grabar from the State Museum Fund in exchange for *Madonna del Popolo* that was attributed to the workshop of Rafael Santi.

2. Materials and Methods

In 1959 the Regional Museum transferred this painting to the Nizhny Tagil Regional Museum. After the restoration works that were carried out by Sergey Griva in 1980s, the painting was ready for display. Restoration revealed the merits of an earlier ignored work of art that now took its place in the museum collection.

For a long time, *Judith* remained unattributed. Only in 1955 the museum employees established the name of the original painting by Cristofano Allori. As a result, the work was placed in a certain historical and artistic context.

Despite many losses, the remaining parts of the painting bear witness to the fact that this copy was made by a professional artist. The copyist used the "tenebroso" technique and worked on the shapes moving from dark to light in accordance with the original that was done under the influence of Caravaggio. An ability to show the angle, make us feel the space, richness of tones and different modalities in accordance with the original also points to the hand of an experienced artist.

Determining the name of the author of the original painting didn't provide answers to all the questions about the source that was used for copying and so many points remained non-clarified. According to historical documents and reports of contemporaries, Allori reproduced this composition multiple times adding some changes [1, pp. 4–6].

3. Discussion

At present, there are two paintings of Judith that can reasonably claim the authorship of Cristofano Allori: one of them is kept in the Royal Collection in Windsor Castle (London), the other one in Palatine Gallery in Palazzo Pitti (Florence).

Allori's work gained popularity and is still considered to be one the most fascinating paintings of Florentine Seicento [2, p. 156]. So, it is not surprising that the artist's best

painting was copied multiple times over the course of centuries. That said, copyists usually used the version kept in the Palatine Gallery due to its availability. Thus, the painting from the NTMII collection is iconographically closer to the *Judith* from Palazzo Pitti.

Despite this iconographic similarity with Palatine Gallery *Judith*, the painting from Nizhny Tagil has several distinctive features that aren't found in any of the well-known versions of Allori's painting. These differences with the original are insignificant: inclination of Judith's head, the figure is depicted at a different angle that shows the heroine's shoulder, the folds on her cloak to the right fall in different way, the position of her thumb that holds the cut-off head of Holofernes has been changed, there is no servant girl with a bag, which were present in the original. It is worth noting that majority of these alterations are even though insignificant but unique – they have no similarities not just among the author's version of the painting but also in multiple copies and engravings of different time and provenance. In all reproduced compositions of Palatine Gallery *Judith*, the copyists worked hard to follow all details of the original (with different level of mastership) and without making any alterations. Therefore, many questions regarding the work's authenticity, the method that was used by the copyist, the source of copying and the time of creation arise.

The analysis of painting in ultraviolet (UV) light demonstrated that majority of painting parts which differ from the Palatine Gallery picture, bear the traces of restoration alterations. The fragment of the cloak is especially definitive since the differences emerge exactly on the border with the visible in UV light renovations. Not all shot in UV light demonstrate the presence of late restorations. For example, the luminescence on the left-hand thumb of Nizhny Tagil *Judith* in UV light has a very pale tonality which implies no alternations made. Nevertheless, the existence of alternations in this case was proven by the X-ray analysis that demonstrated that initially the thumb was painted according to the original.

The situation is different with the angle that presents *Judith* from Nizhny Tagil. The depiction of her right shoulder seriously altered the position of the figure and diminished the dramatic effect of her pose that we see in the Allori's original. Neither the photos in UV light, nor the X-ray analysis supply a clear answer to the question, who and when made such a serious change. An explanation that *Judith* author from Nizhny Tagil could make a copy from another version of the painting or a cardboard copy that have similar differences seem to be unlikely. If there such cardboard copy or a copy with similar composition features existed, then it would have been known to specialists through copying practice. The chances that a copyist, who had a specific painting to

work from, decided to demonstrate such freedom as to introduce so many local and unwarranted changes also seem doubtful. Taking into consideration the fact that the rest of differences in *Judith* from NTMII have resulted from restoration works, our research demonstrated that the most probable explanation is that the main part of these changes, especially the Judith's right shoulder, appeared after the restoration works that were done without comparing to the original.

Comparative analysis in combination with technological methods allowed us to establish some iconographic features of the painting and explain their causes. At the same time, there is a need for more detailed research into the materials used for this painting and layers in its structure that could verify the dating and provenance of this painting with the current attribution.

Determining the type of textile canvas used in *Judith* from NTMII would be a crucial step in evaluation of this work of art. The painting was copied, which is why it is possible to obtain information about the author's canvas only with the help of an X-ray analysis and the study of the foundation texture. Using the side light, we can observe a diagonal rib, while the X-rays provide a sufficiently detailed view of a twill fabric, definitely hand-made because of the differing thickness of the threads.

After the textile canvases gained popularity in European art, the plain structure canvases were the ones most commonly used, while the use of twill fabric canvases still remains a rather rare and unique phenomenon. In her article [3, p. 272] about the textile canvases in Western European art of 17th century, T.V. Maksimova notes that twill fabric canvases were used in the 17th century Italian paintings. She also mentions that they were especially characteristic of Venetian masters, since Venice was the main center of twill fabric production. However, these canvases were used in other regions as well (twill fabric canvas brought from Venice were sometimes used by the artists in other countries), even by Russian masters in the 18th and 19th centuries [4, p. 20], although this practice was quite rare. Hand-woven threads can be seen as an argument towards an earlier dating of the canvas. Nevertheless, it is important to examine canvas in its integrity with the priming if we want to get a more detailed and precise data.

Photos made in UV-light in combination with textile texture analysis helped to identify parts of the painting that most likely had the author's painting. Microscopic samples for studying the priming and the paint layer were selected precisely from these fragments. Element analysis of the priming and paint layer was carried out using the method of X-ray fluorescent analysis (XFA) on the Rigaku Nanohunter and also with the help of scanning electronic microscope Inspect with energy-dispersive X-ray spectrometer

EDAX (this analysis was done by Eu.I. Patrako, a researcher at the M.N. Mikheev Institute of Metal Physics).

Microscopic analysis of slices showed the use of yellow and brown priming with a dark grey (almost black) imprimatur on top of it. Analysis of the yellow and brown priming helped to establish its main elements: calcium, lead and iron. The obtained data enables to determine the priming layer as a mixture of chalk with white lead paint and ground-based iron-containing pigment. The elements of the dark grey layer of imprimatur include: silicate, iron, carbonium and also traces of lead and calcium. This content enables us to establish that ground-based iron-containing pigment mixed up with sooth and traces of lead paint and chalk was used as a filler for imprimatur.

The obtained results of chemical analysis match the research data for materials of Italian painting in the 17th century [5–7]. Composite stratigraphic tables (including of primings) for Italian masters [5, pp. 8–57; 6, pp. 227–257] demonstrate how typical the use of such primings was in Italy in the 17th and the first half of the 18th century.

Of course, primings similar in texture and colour were used by painters in other European schools of the 16th – first half of 18th centuries [8, pp. 91–116]. For example, such priming is quite characteristic of Spanish and Dutch masters. However, combination of twill fabric and coloured brown priming, elements that are typical of the 17th and the first half of 18th century Italian art, can be considered as an argument for the existing attribution of Nizhny Tagil *Judith*.

Chemical analysis of paint layer fragments, which most likely belong to the hand of the author, helped to determine the presence and relative concentration of marking elements and also demonstrated that there are no controversies regarding the time period that painting was attributed to.

It is worth noting that in his work the author used a lot of lead-containing pigments and chalk that were discovered in all samples. It is most likely that he added lead paint and saturnine red. Elements that are part of other lead pigments were not discovered.

The artist used lead paint when working on Nizhny Tagil *Judith*'s carnation. The analysis of paint sample taken from Judith's forehead showed that lead paint was also used with the addition of small amounts of silicate and iron-containing pigments.

The study of a micro-slice taken from Judith's yellow dress demonstrated the presence of two paint layers. Both layers are of yellow and orange colours but have different subtones and structure: the bottom layer is more intense and homogeneous in colour, while the upper layer is pale ochre colour and has a lot of tiny inclusions (red, orange and black particles). Despite the difference, both layers have a similar chemical content that indicates the use of ground-based iron-containing pigment.

The sample was taken from the red lining of Judith's cloak and also consists of two layers that have similar colours and differ only in the shades which can be explained by the increase of whitewash in the upper layer (the sample was taken from a lighter part of the cloak). The paint also includes iron-containing pigment and possibly an addition of cinnabar because of the small amounts of mercury that was discovered in the sample.

The analysis of the sample taken from the green pillow showed the use of copper and ground-based iron-containing pigments.

4. Conclusions

Detailed technological analysis of the painting from the NTMII, *Judith with the Head of Holofernes* sheds light on earlier unknown details regarding materials and technical features of this artwork. Unfortunately, all the data collected in the process of research cannot decisively confirm or contradict the existing attribution. Nevertheless, it gives opportunity to establish a time frame when the painting was created with more certainty and limit it to the 17th – first half of the 18th centuries. It is also crucial to highlight that no contradictions between technical features of the painting and its similarity with technical methods of Italian art school of the abovementioned period were established.

This kind of research represents a valuable experience of expert work in the Ural region: an interdisciplinary approach to studying the object from the Ural museum using local technical resources on the basis of laboratory equipment of the Ural Federal University and M.N. Mikheev Institute of Metal Physics of the Ural Branch of the Russian Academy of Sciences.

There is no doubt that the attribution of this painting is far from complete. The obtained data about technology used for creating this artwork can be used for further and more profound analysis. Comparing the obtained data with similar data about the Western European easel painting looks especially promising.

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