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Olena Andrianova*

PhD in Chemical Sciences, Associate Professor
National Academy of Culture and Arts Management
01015, 9 Lavrska Str., Kyiv, Ukraine
Bureau of Scientific and Technical Expertise "ART-LAB"
04053, 3-7 Kyianivskiy Ln., Kyiv, Ukraine
<https://orcid.org/0000-0003-3835-6312>

Svitlana Biskulova

PhD in Chemical Sciences, Associate Professor
National Academy of Culture and Arts Management
01015, 9 Lavrska Str., Kyiv, Ukraine
Bureau of Scientific and Technical Expertise "ART-LAB"
04053, 3-7 Kyianivskiy Ln., Kyiv, Ukraine
<https://orcid.org/0000-0003-3437-6113>

Technological research of Adalbert Erdelyi's still life of the post-Budapest period

Abstract. The study's relevance lies in obtaining valuable information about Adalbert Erdelyi's painting, which enhances the understanding of his artwork, supports efforts at accurate attribution, and enriches the study of art history. The purpose of this study was to characterise artist's painting materials and technique of the post-Budapest period and introduce obtained results into scientific circulation. The research methodology was based on an integrated general scientific approach that combines theoretical and empirical methods, including art-critic and comparative analyses as well as optical and physicochemical methods. X-ray fluorescence analysis and Fourier-transform infrared spectroscopy were used to determine the artist's pigment palette. Until now, only a few works of Adalbert Erdelyi's early creative stage have been known and introduced into scientific circulation. A comprehensive study of Adalbert Erdelyi's still life was carried out. The stylistic and technological features of the painting that were inherent in the post-Budapest period were established. It has been shown that cardboard made from a mixture of rag fibers and wood pulp was used as the painting support. The type of cardboard gluing and fillers were determined. The still life was painted wet-on-wet on the unprimed support without applying underdrawings. The analysis of the organic binder has shown that the painting was executed in the oil painting technique. Pure lead white was identified in white paints. Lead white with an admixture of zinc white, a mixture of lead white and zinc white, chrome yellow (lead chromate), vermilion, alizarin crimson, ocher, Emerald green (copper acetoarsenite), and Prussian blue were found in the paint layer. The identified pigments and a comparative analysis of oil polymerisation in lead white paint allowed us to confirm that the painting was created in 1918. It is shown that the artistic and style characteristics of the painting correspond to Adalbert Erdelyi's post-Budapest period. Thus, "Still Life with Glasses on a Tray" can be considered the first known image of glasses with water in the artist's creative heritage. The results of carried out research are an important informative source in the analysis of the artist's early works and can be useful for art historians and curators of museum collections

Keywords: painting; artist palette; pigments; optical microscopy; UV fluorescence; X-ray fluorescence analysis; Fourier-transform infrared spectroscopy

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*Corresponding author



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Introduction

Comprehensive studies that include analysis by optical and physicochemical methods for establishing the technological features of the painting support, ground, and paint layer as well as the pigment palette of Adalbert Erdelyi's artworks of the post-Budapest period have not been carried out yet. This research represents the first scientific milestone in studying Adalbert Erdelyi's artwork materials which makes the presented work relevant.

Adalbert Erdelyi (1891-1955) is an outstanding Ukrainian artist and founder of the Transcarpathian School of Painting, who played a significant role in the professional formation of a whole generation of Ukrainian masters. His unique style was developed in several stages that are inextricably linked to the leading European art schools of Hungary, Germany, and France. Each of the stages is characterised by certain artistic and style characteristics that are inherent in the artist's work and are highlighted in scientific publications.

Since the beginning of the 21st century, scholars have paid considerable attention to the life and creative work of Adalbert Erdelyi as the founder and most prominent representative of the Transcarpathian School of Painting. There is a significant number of scientific publications devoted to the reconstruction of the artist's life and creative path, the evolution of his individual painting style, and the artistic and style characteristics of different creative periods. The formation of the creative personality of Adalbert Erdelyi in the context of the Hungarian cultural and artistic process of the first half of the 20th century was highlighted in the article by A. Strii (2020). The study of A. Seytasanova (2023a) is devoted to the German period of Adalbert Erdelyi's creativity and artistic and stylistic analysis of the artist's individual manner acquired after the experience of working in Munich. An art-critic analysis of Erdelyi's paintings executed during his stay in France in 1929-1931 performed by A. Seytasanova (2023b) revealed stylistic features in the artistic language and singled out the aspects that influenced the further development of his creative method. The paper I.A. Pavelchuk (2019) explored the trends of Cezannism in Adalbert Erdelyi's artwork and performed a comparison of the iconography of Cezanne's scenes and the artistic interpretations of Adalbert Erdelyi's landscapes, still-lives, and thematic compositions. O. Lagutenko & A. Seytasanova (2024) studied the last period of Erdelyi's activity when Ukrainian art was heavily influenced by Soviet ideology, identified specific features of his painting, and revealed new artist's method that combined the decorative expressive realism of previous years with the requirements of socialist.

The features of Erdelyi's artwork of the early periods are highlighted only in a few articles. The study A. Strii (2020) found that Adalbert Erdelyi's paintings of the Budapest (1911-1915) and post-Budapest (1915-1922) periods were influenced by the realist trend in Hungarian art, in particular by such prominent masters as Imre

Revesz and Bela Ivanyi-Grunwald. A limited number of artist's works created in the second half of the 1910s and early 1920s have been brought into scientific circulation. The collection of the East Slovak Gallery (2024) includes the still-life *Glasses of Water* (1921). A comprehensive research of Erdelyi's paintings of the 1910s by optical and physicochemical methods has not been carried out yet.

The purpose of the study is to provide a technological examination and introduce into scientific circulation Adalbert Erdelyi's painting "Still Life with Glasses on a Tray" of the post-Budapest period.

The results of a technological examination of Adalbert Erdelyi's paintings of the post-Budapest period are presented for the first time, which determines the scientific novelty of the article.

Materials and Methods

The focus of this study is Adalbert Erdelyi's (1891-1955) painting "Still Life with Glasses on a Tray" (Fig. 1) from a private collection. Its authorship was confirmed by an expert opinion of the Transcarpathian Regional Art Museum named after Yosyp Bokshai (Prykhodko & Ryzhova, 2007b).

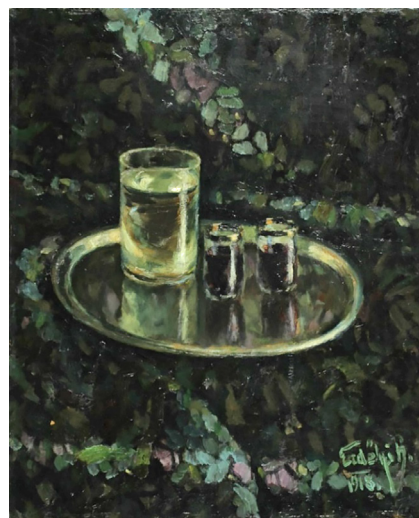


Figure 1. Adalbert Erdelyi (1891-1955). Still Life with Glasses on a Tray. 1918. Oil on cardboard. 47.3×40.0 cm

Source: developed by the authors

A comprehensive multi-analytical approach proposed P.O. Tanasa *et al.* (2020) and A. Macchia *et al.* (2022) for studying painting materials and the artist's technique was applied. It included formal, artistic and stylistic, and comparative analyses, as well as technological research using optical and physicochemical methods.

The technological features of the painting were established by visual examination and microscopic analysis using a stereoscopic microscope MBS-10 and a

digital USB microscope Sigeta Expert (Sigeta Optics Ltd., Ukraine). Imaging in the visible, ultraviolet (UV), and infrared (IR) ranges was performed according to the workflow proposed by A. Cosentino (2015, 2016) which utilises a multispectral imaging system consisting of a digital CCD camera associated with appropriate lamps and a set of filters to reveal retouches and under-drawings and to map and identify pigments. There was employed modified Canon Rebel XSi (Canon Inc., USA) multispectral camera (12.2 Mpx) covering the range 360-1000 nm and equipped with Fotga UV-IR Cut filter (UV-induced fluorescence) and Zomei IR 760 filter (near IR photography). Kodak colour separation guides and grayscale patches were used to adjust the white balance and exposure of the images.

The elemental composition of pigments in the paint layer was determined by X-ray fluorescence analysis (XRF) using an ElvaX-ART spectrometer ("Elvatech", Ukraine) with an SSD detector and a W anode X-ray tube with 35.0 kV voltage and 50 μ A current. The spectra were processed automatically with ElvaX 2.9 software.

Organic binder and pigment identification was performed by Fourier transform infrared spectroscopy using a Vertex 70 spectrometer (Bruker Optics, Germany) equipped with a diamond attenuated total reflectance accessory (ATR-FTIR) spectrometer. The spectra were acquired in the spectral range of 400-4500 cm^{-1} with a resolution of 0.5 cm^{-1} . A total of 64 scans were recorded for each sample. Spectra collection and processing were carried out using Bruker Opus 6.5 software. The interpretation of data was performed using the reference spectra in the material collection of the Bureau of Scientific and Technical Expertise "ART-LAB". The aging degree of linseed oil binder in paint was conducted according to the method described in (Biskulova & Andrianova, 2019). The method was based on the determination of the ratio between integral intensities of the curve absorption bands of carbonyl groups C = O (1738-1743 cm^{-1}) and methylene/methyl groups CH_2/CH_3 (2850-2930 cm^{-1}) as an internal standard of oil binder in FTIR spectra.

The applied analytical methods were engaged to obtain information about the artist's technique, characteristics of the painting materials, and the time of still-life execution.

Results and Discussion

The study Adalbert Erdelyi's painting "Still Life with Glasses on a Tray" involves formal, artistic and stylistic, and comparative analyses of the still-life painting, as well as the characterisation of the painting support and paint layers.

The still life depicts a glass of water and glasses filled with a dark cherry liquid, placed on an oval tray with a mirror surface. This motif is one of the most favorite in the artist's work. The authors of the article O. Prykhodko & H. Ryzhova (2007a; 2007b) emphasise that water

becomes a mythical and poetic symbol in Erdelyi's art as the embodiment of beauty, perfection, and harmony. The idea of water connects Erdelyi's painting and is enriched by new ideas and plastic images during his artistic search. One of the earliest known works in which Adalbert Erdelyi depicts glasses of water is a painting from the East Slovak Gallery collection (Fig. 2).



Figure 2. Adalbert Erdelyi (1891-1955).

Glasses of Water. 1921. Oil on canvas. 45×43 cm.
East Slovak Gallery, Inv. Number 0-2861

Source: Official website of East Slovak Gallery collection (2024)

Characteristic author's techniques and stylistic features of the artist's early creative periods were described in the introductory articles to the album "Adalbert Erdeli" (Pryimych, 2007; Prykhodko & Ryzhova, 2007a; Prykhodko & Ryzhova 2007b) and the exhibition catalog "Adalbert Erdelyi. Works from private collections" (Tsytovyich, 2006). It is noted O. Prykhodko & H. Ryzhova (2007a; 2007b) that Erdelyi's paintings of the 1910s and early 1920s are characterised by dark "museum" colour and unnecessary detailed elaboration and descriptiveness. The "Still Life with Glasses on a Tray" (1918) is executed in a dark green and brown colour scheme with bright accents that create reflexes on the objects. The scene of the painting and its artistic and stylistic features correspond to Adalbert Erdelyi's post-Budapest period.

The still life is signed at the bottom right corner in two lines. The signature consists of the artist's surname, the first letter of the name, and the date "Erdelyi B//1918". It is known that the signature "Erdelyi Béla" (or "Erdelyi B") is present on the artist's drawings that were created while studying at the II-VI courses of the Hungarian Royal College of Fine Arts (Budapest) (Bilousov & Vakulenko, 2006), several drawings of 1910-1914 from private collections (Kovach, 2007) and early paintings, in particular, *Still Life* dated 1915 (Nebesnyk, 2007). The

artist's works of later periods that were created during the 1920s and the first half of the 1940s are signed "Erdelyi" with a stroke in the form of the letter "A" (Bilousov & Vakulenko, 2006; Kovach, 2007; Nebesnyk, 2007). The "Still Life with Glasses on a Tray" was signed with greenish-blue paint over black and brown painting and cardboard surface. Microscopic examination shows that the signature was applied before the paint layer was completely dry. The signature and a lower paint layer are permeated by the network of age-related cracks. The grain size of the signature paint and its composition (a mixture of lead white with small amounts of chrome yellow and Prussian blue) correspond to the greenish-blue colours of the paint layer. All of the above indicates that the signature was applied immediately after the completion of the painting. There were no detected retouchings and overpaints in the signature area in UV radiation.

The still life is painted on a 2 mm thick multi-layered cardboard of medium density. The cardboard has acquired a yellow-brown tint due to the natural aging and deterioration with time. The support was cut on all sides as a result of the author's alteration of the cardboard size as indicated by the paint leakage at the edges. On verso, the cardboard has an irregular, rather rough grainy texture, indicating that it was produced without using a calender. Microscopic examination and infrared

spectroscopy analysis showed that the cardboard was made of a mixture of rag fibers and wood pulp as evidenced by the presence of a small amount of lignin. The cardboard is glued with plant gum and contains calcium carbonate and kaolin as fillers. There is fragility and brittleness of the cardboard due to the destruction of fiber and binder, the cardboard layers have come apart along the edges in a few places at the corners. On the verso of the cardboard, there are restoration patches in the upper center and left. No visible producer's or dealer's marks on the cardboard verso were found. The painting was stamped on the verso at the top right by the Transcarpathian Regional Art Gallery in Uzhhorod, where the art historical examination of the work was carried out.

The still life is painted on unprimed support. The glued surface of the cardboard can be observed under microscopic examination in some areas left unpainted (Fig. 3). The paint was applied wet-in-wet throughout in a single session. The paint layer is of average thickness, varying between smooth to relief-like impasto with brushstrokes recognizable throughout (Fig. 4). The paints are homogeneous, microscopic examination revealed small factory-ground particles of brown, cherry-purple, and black pigment as well as white filler grains in paints. Microscopic examination and analysis in the infrared radiation haven't detected any underdrawings.

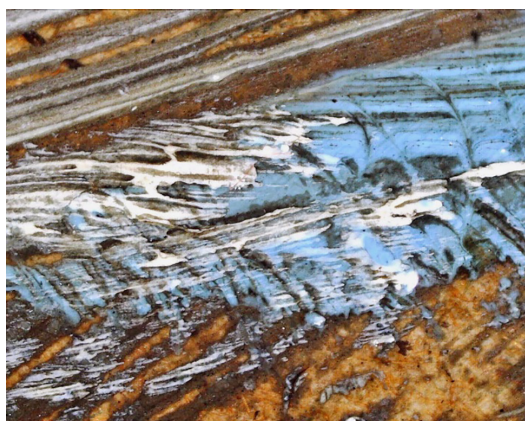


Figure 3. Adalbert Erdelyi (1891-1955).

Still Life with Glasses on a Tray.

Optical microscopy image of unprimed support (magnification ×50)

Source: developed by the authors

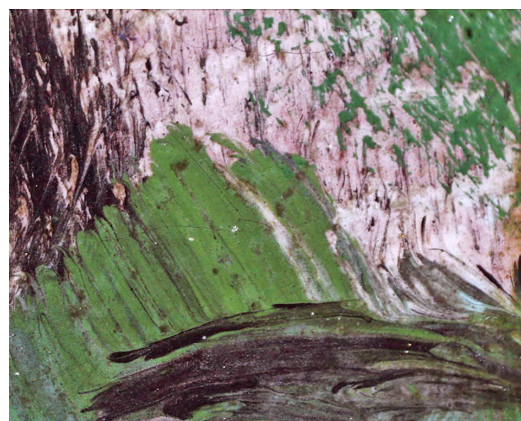


Figure 4. Adalbert Erdelyi (1891-1955).

Still Life with Glasses on a Tray.

Optical microscopy image of the paint layer

brushstrokes applied wet-in-wet (magnification ×50)

Source: developed by the authors

The study of the painting in the ultraviolet (Fig. 5) and infrared ranges (Fig. 6) was preceded by the determination of the pigments of the paint layer by physico-chemical methods. It was established that the painting is covered with a thin layer of transparent colourless varnish that was applied during the restoration of the work and exhibits a lilac-blue fluorescence in UV radiation. Such a characteristic of fluorescence is typical for modern synthetic varnishes. A few retouching spots of the painting were found. The features of the visible

fluorescence induced by ultraviolet UV radiation indicate the use of lead white as a white pigment. Paints of brown shades in UV rays look dark purple (do not fluorescence), which is typical for iron-containing pigments (ocher, umber). The brushstrokes applied with light blue paint have a blue fluorescence, which may indicate the presence of Prussian blue. The strong absorbance of cherry, dark green, and blue paints in the infrared range permits the detection of Prussian blue in their composition.



Figure 5. Adalbert Erdelyi (1891-1955). Still Life with Glasses on a Tray. UV-induced fluorescence image
Source: developed by the authors



Figure 6. Adalbert Erdelyi (1891-1955). Still Life with Glasses on a Tray. Infrared (760 nm) image
Source: developed by the authors

Identification of pigments and fillers in the paint layer was carried out by the XRF method and ATR-FTIR analysis. It was established the presence of lead white in white paint. In paint mixtures were identified lead white with small amounts of zinc white and a mixture of lead white and zinc white. Large-scale production of the zinc white pigment for oil colours started in the 1850s, shortly after developing the indirect process of zinc oxide manufacture (Palladino *et al.*, 2024). The pure lead white pigment was widespread in the paint material's market until the 1940s (van Driel *et al.*, 2018). Chrome yellow (lead chromate) was found in the paints of lightyellow shades. Bright red brushstrokes were applied with vermilion pigment that was produced industrially until the mid-20th century (Andrianova, 2020). The dark cherry shades are a mixture of alizarin crimson and Prussian blue. Ochre was identified in the orange-brown and dark brown paints. Bright green paints contain Emerald green pigment (copper acetoarsenite). Emerald green was industrially produced in 1814 (Herm, 2020) and was commonly used in oil painting until the 1960s despite its toxicity (Fiedler & Bayard, 1977). Paints of yellow-green and dark green shades are composed of chrome yellow and Prussian blue mixture. Prussian blue has also been identified in light blue, dark blue, and pink-purple paint, mixed with alizarin crimson in the latter one. Blanc fixe (barium sulfate), chalk, and gypsum admixtures were found as paint fillers. Aluminum hydroxide is present in cherry and pink-purple alizarin-based paints (Schweppe & Winter, 1977).

The still life was executed in the oil painting technique (oil was identified as a binder in all paints by ATR-FTIR analysis). The pigments detected in the paint layer and a comparative analysis of oil polymerisation in the white paints (Biskulova & Andrianova, 2019) with reference-dated works indicate that the painting was

created in the first quarter of the 20th century and confirm that it was painted in 1918.

The applied methods allowed for the reconstruction of the work's creation process and the identification of the materials used by Adalbert Erdelyi in the post-Budapest period.

Conclusions

Adalbert Erdelyi is one of the most prominent Ukrainian painters. Since the beginning of the 21st century, much attention has been paid to the study of his life and the stylistic features of his artistic heritage. Only a limited number of Erdelyi's works executed during his early creation period have been introduced into scientific circulation. The article presents the results of a comprehensive study of Adalbert Erdelyi's still life of the post-Budapest period which includes both artistic and stylistic, and technological analysis by optical and physicochemical methods. It was demonstrated that the scene of the painting and its artistic, and stylistic features correspond to Erdelyi's artwork of the 1910s and early 1920s. The peculiarities of the signature application, the characteristics of the painting support, and the pigment palette were determined. Microscopic examination revealed that the signature was applied immediately after the still-life completion. Comparative analysis of artwork by Erdelyi had shown that signature characteristics are typical for artists' paintings and drawings executed before the 1920s. The support for the painting was identified as cardboard made from a mixture of rag fibers and wood pulp. The sizing of cardboard was determined as plant gum, calcium carbonate and kaolin were identified as fillers. The painting technique was characterised as wet-on-wet applied directly to the unprimed support without underdrawings. The use of oil paint was confirmed through organic binder

analysis. X-ray fluorescence and Fourier-transform infrared spectroscopy revealed the artist's pigment palette, including pure lead white, lead white mixed with zinc white, chrome yellow, vermillion, alizarin crimson, ochre, Emerald green, and Prussian blue. These findings, alongside the oil polymerisation analysis in lead white paint, verified that the painting was created in 1918. The artistic and stylistic characteristics aligned with Erdelyi's post-Budapest period, establishing "Still Life with Glasses on a Tray" as the first known depiction of glasses with water in his oeuvre.

Prospects for further research are related to the comprehensive study of the artist's paintings created

during the post-Munich, post-Paris, and Soviet periods applying modern analytical techniques for identifying the painting materials and features of Erdelyi's technique and their evolution across his artistic career.

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Conflict of Interest

None.

References

- [1] Andrianova, O. (2020). [Technological research in the structure of art examination](#). In *Ukrainian art history discourse* (pp. 20-70). Riga: Izdevniecība "Baltija Publishing".
- [2] Bilousov, M.P., & Vakulenko, Ye.Yu. (2006). *Adalbert Erdelyi. Works from private collections: Exhibition catalog*. Kyiv: Kyiv Museum of Russian Art.
- [3] Biskulova, S.O., & Andrianova, O.B. (2019). Investigation of the degree of the binder's aging in oil painting and PVA tempera by infrared spectroscopy (ATR-FTIR). In *Museums and restoration in the context of cultural heritage preservation: Current challenges* (pp. 39-46). Kyiv: Kod.
- [4] Cosentino, A. (2015). Practical notes on ultraviolet technical photography for art examination. *Conservar Património*, 21, 53-62. doi: 10.14568/cp2015006.
- [5] Cosentino, A. (2016). [Infrared technical photography for art examination](#). *e-Preservation Science*, 13, 1-6.
- [6] Fiedler, I., & Bayard, M. (1977). [Emerald green and Scheele's green](#). In *A handbook of their history, characteristics and use* (Vol. 3). Washington, DC: National Gallery of Art; USA; London, UK: Archetype Publications.
- [7] Herm, C. (2020). [Emerald green versus Scheele's Green: Evidence and occurrence](#). In *7th Interdisciplinary ALMA conference "The Colour Theme"* (pp. 189-202). Bratislava: Academy of Fine Arts in Prague.
- [8] Kovach, A.M. (Ed.). (2007). *Adalbert Erdelyi: Album*. Uzhhorod: Oleksandra Harkusha Publishing House.
- [9] Lagutenko, O., & Seytasanova, A. (2024). Problems and features of A. Erdelyi's handwriting in the late period (1945-1955). *Current Issues of Humanitarian Sciences*, 72(2), 108-113. doi: 10.24919/2308-4863/72-2-15.
- [10] Macchia, A., Biribicchi, A., Carnazza, P., Montorsi, S., Sangiorgi, N., Demasi, G., Prestileo, F., Cerafogli, E., Colasanti, I.A., Aureli, H., Zappelli, M., Ricca, M., & La Russa, M.F. (2022). Multi-analytical investigation of the oil painting "Il Venditore di Cerini" by Antonio Mancini and definition of the best green cleaning treatment. *Sustainability*, 14(7), article number 3972. doi: 10.3390/su14073972.
- [11] Nebesnyk, I.I. (2007). *Adalbert Erdelyi*. Lviv: Publishing House "Ms".
- [12] Official website of East Slovak Gallery collection. (2024). Retrieved from https://www.webumenia.sk/en/dielo/SVK:VSG.O_2861.
- [13] Palladino, N., Occelli, M., Wallez, G., Coquinot, Y., Lemasson, Q., Pichon, L., Stankic, S., Etagens, V., & Salvant, J. (2024). An analytical survey of zinc white historical and modern artists' materials. *Heritage Science*, 12(1), article number 47. doi: 10.1186/s40494-023-01082-4.
- [14] Pavelchuk, I.A. (2019). The search for Cezanne in the practice of Adalbert Erdelyi in the 1930s and 1940s. *Bulletin of the Kharkiv State Academy of Design and Arts*, 2, 82-88. doi: 10.33625/1993-6400-2019-2-82-88.
- [15] Prymych, M. (2007). The space of painting of Adalbert Erdelyi. In *Adalbert Erdelyi: Album* (pp. 7-26). Uzhhorod: Oleksandra Harkusha Publishing House.
- [16] Prykhodko, O., & Ryzhova, H. (2007a). The monogram of master's soul. In *Adalbert Erdelyi: Album* (pp. 27-42). Uzhhorod: Oleksandra Harkusha Publishing House.
- [17] Prykhodko, O., & Ryzhova, H. (2007b). Expert opinion (Report No. 958). *Transcarpathian Art Museum named after Y. Bokshai*.
- [18] Schweppe, H., & Winter, J. (1977). [Madder and Alizarin](#). In *A handbook of their history, characteristics and use* (Vol. 3). Washington, DC: National Gallery of Art; USA; London, UK: Archetype Publications.
- [19] Seytasanova, A. (2023a). Artistic and stylistic features of Adalbert Erdelyi's painting in 1922-1926. *Fine Art and Culture Studies*, 4, 147-153. doi: 10.32782/facs-2023-4-20.
- [20] Seytasanova, A. (2023b). The French period in the work of A. Erdelyi (1929-1930): Creative studies and stylistic features. *Collection of Scholarly Works "Ukrainian Academy of Arts"*, 34, 168-175. doi: 10.32782/2411-3034-2023-34-22.

- [21] Strii, A. (2020). The formation of the creative personality of Adalbert Erdelyi in the context of the Hungarian cultural and artistic process of the first half of the 20th century. *Current Issues in the Humanities*, 32(2), 27–33. doi: [10.24919/2308-4863.2/32.214661](https://doi.org/10.24919/2308-4863.2/32.214661).
- [22] Tanasa, P.O., Sandu, I., Vasilache, V., Sandu, I.G., Negru, I.C., & Sandu, A.V. (2020). Authentication of a painting by Nicolae Grigorescu using modern multi-analytical methods. *Applied Sciences*, 10(10), article number 3558. doi: [10.3390/app10103558](https://doi.org/10.3390/app10103558).
- [23] Tsytovych, V. (2006). *Adalbert Erdelyi. Works from private collections: Exhibition catalog*. Kyiv: Kyiv Museum of Russian Art.
- [24] van Driel, B.A., van den Berg, K.J., Gerretzen, J., & Dik, J. (2018). The white of the 20th century: An explorative survey into Dutch modern art collections. *Heritage Science*, 6, article number 16. doi: [10.1186/s40494-018-0183-4](https://doi.org/10.1186/s40494-018-0183-4).

Олена Андріанова

Кандидат хімічних наук, доцент
 Національна академія керівних кадрів культури і мистецтв
 01015, вул. Лаврська, 9, м. Київ, Україна
 Бюро науково-технічної експертизи «АРТ-ЛАБ»
 04053, пров. Киянівський, 3-7, м. Київ, Україна
<https://orcid.org/0000-0003-3835-6312>

Світлана Біскулова

Кандидат хімічних наук, доцент
 Національна академія керівних кадрів культури і мистецтв
 01015, вул. Лаврська, 9, м. Київ, Україна
 Бюро науково-технічної експертизи «АРТ-ЛАБ»
 04053, пров. Киянівський, 3-7, м. Київ, Україна
<https://orcid.org/0000-0003-3437-6113>

Технологічні дослідження натюрморту Адальберта Ерделі постбудапештського періоду

■ **Анотація.** Актуальність дослідження полягає в отриманні цінної інформації про живопис Адальберта Ерделі, що поглиблює розуміння його творчості, підтримує зусилля з точної атрибуції та збагачує мистецтвознавчу науку. Метою цього дослідження було охарактеризувати матеріали та техніку живопису художника постбудапештського періоду та ввести отримані результати в науковий обіг. Методологія дослідження ґрунтується на комплексному загальнонауковому підході, що поєднує теоретичні та емпіричні методи, зокрема мистецтвознавчий та порівняльний аналізи, а також оптичні та фізико-хімічні методи. Для визначення пігментної палітри художника використано рентгенофлуоресцентний аналіз та інфрачервону спектроскопію з Фур'є-перетворенням. До цього часу були відомі та введені в науковий обіг лише кілька творів раннього періоду творчості Адальберта Ерделі. Проведено комплексне дослідження натюрморту Адальберта Ерделі. Встановлено стилістичні та технологічні особливості живопису, притаманні для постбудапештського періоду. Показано, що в ролі основи для картини використовувався картон, виготовлений із суміші ганчіркових волокон і деревної целюлози. Було визначено тип склеювання картону та наповнювачі. Натюрморт написаний мокрим по мокрому на неґрунтованій основі без нанесення підмальовок. Аналіз органічного зв'язуючого показав, що картина виконана в техніці олійного живопису. У фарбах білого кольору виявлено чисті свинцеві білила. У фарбовому шарі виявлено білила свинцеві з домішками білил цинкових, суміш білил свинцевих з білилами цинковими, хром жовтий (хромат свинцю), кіновар, алізарин малиновий, охра, смарагдово-зелений (ацетоарсеніт міді), берлінська лазур. Ідентифіковані пігменти та порівняльний аналіз полімеризації олії у свинцевій білій фарбі дозволили підтвердити, що картина була створена у 1918 році. Показано, що художньо-стильові характеристики картини відповідають постбудапештському періоду творчості Адальберта Ерделі. Таким чином, «Натюрморт з келихами на таці» можна вважати першим відомим зображенням келихів з водою у творчій спадщині художника. Результати проведеного дослідження є важливим інформативним джерелом в аналізі ранньої творчості художника та можуть бути корисними для мистецтвознавців і зберігачів музейних колекцій

■ **Ключові слова:** живопис; палітра художника; пігменти; оптична мікроскопія; ультрафіолетова флуоресценція; рентгенофлуоресцентний аналіз; інфрачервона спектроскопія з Фур'є-перетворенням