

Research Study in Two Unpublished Artworks of the Important Greek Artist, Theofilos Hatzimichael (1870-1934)

Stella Mouzakiotou^{1,*}, Nikolaos Laskaris², Theodore Ganetsos²

¹Hellenic Open University & University of West Attica, Athens, Greece

²Department of Industrial Design and Production Engineering, University of West Attica, Athens, Greece

Abstract The purpose of this research is to highlight, study and publish two very important signed works of the Greek folk painter - hagiographer of modern Greek art, Theofilos Hatzimichael (1870-1934), which belong to a private collection. These are the works: 1. "New type of rural Mytilene with its coexistence that weaves in rocket", wood painting, time: 1931. 2. "The young Hercules Panais Koutalianos in England", wood painting, time: 1932. The dominant element in Theofilos' work is Greekness and the illustration of the Greek folk tradition and history. He spent most of his life in Pelion, while in 1927 he returned to Mytilene. In Mytilene, despite the mockery and teasing of the people, he continues to paint, making several murals in villages, for a fee, usually for a plate of food and a little wine. Many of the works of this period have been lost, either due to physical damage or destruction by their owners. In Mytilene, he was met by the renowned art critic and publisher Stratis Eleftheriadis (Tériade), who lived in Paris. Eleftheriadis owes much to the recognition of the value of Theophilos' work and its international promotion, which, however, took place after his death. Through the present study of the aforementioned works, we will highlight unknown aspects of the last phase of Theophilos' artistic creation, a period particularly important for the thorough and kaleidoscopic knowledge of his work, since it is the period that is visible through his color palette and His stylistic choices are the optimism and security conveyed to him by the acquaintance and support he receives from Eleftheriadis. Finally, the present work for the study of Theophilos' two unpublished works will be scientifically strengthened by utilizing the achievements of technology. Specifically, in the context of current study, the portable non-destructive techniques of the Non-Destructive Techniques Laboratory of the University of West Attica will be used. In particular, the techniques will be used: 1) portable Raman spectroscopy, for the authenticity test of the paintings 2) portable XRF spectroscopy, for the qualitative analysis of the data concerning the colour palette of the creator, compared to other identified paintings by NTUA.

Keywords Theofilos Hatzimichael, Colour pallet, XRF spectroscopy, Raman Spectroscopy

1. Introduction

The purpose of current work is to highlight, study and publish two very important signed works of the Greek folk painter - hagiographer of modern Greek art, Theofilos Hatzimichael (1870-1934), which belong to a private collection. These are the works: 1. "New type of rural Mytilene with its coexistence that weaves in rocket", wood painting, time: 1931. 2. "The young Hercules Panais Koutalianos in England", wood painting, time: 1932. The dominant element in Theofilos' work is Greekness and the

illustration of the Greek folk tradition and history. Born between 1867 and 1870 in Varia, Lesvos, his father, Gabriel Kefalas (or Kefalas), was a shoemaker and his mother, Penelope Hatzimichael, was the daughter of a hagiographer. At a young age he showed moderate school performance, but also a special interest in painting, on which he acquired basic knowledge next to his grandfather. His life was very difficult because of the people who mocked him, because he was circulating wearing the traditional fustanela. At the age of about eighteen, he left his family environment and worked as a gatekeeper ("Kavasis") at the Greek Consulate in Smyrna. He stayed there for a few years, before settling in the city of Volos, around 1897, looking for occasional jobs and painting houses and shops in the area, so that today the frescoes he made there survive. He spent most of his life in Pelion, while in 1927 he returned to Mytilene. It is alleged that the reason for his departure from Volos was an

* Corresponding author:

stellamouzak@yahoo.gr (Stella Mouzakiotou)

Published online at <http://journal.sapub.org/arts>

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incident in a cafe, when some children, in order to have fun, threw Theofilos from a staircase where he was up and painting.

In Mytilene, despite the mockery and teasing of the people, he continues to paint, making several murals in villages, for a fee, usually for a plate of food and a little wine. Many of the works of this period have been lost, either due to physical damage or destruction by their owners. In Mytilene, he was met by the renowned art critic and publisher Stratis Eleftheriadis (Tériade), who lived in Paris. Eleftheriadis owes much to the recognition of the value of Theofilos' work and its international promotion, which, however, took place after his death. The conceptual clarification of this work is carried out through the complex process in which all the parameters (theoretical, stylistic study and technological support of new non-destructive means) are involved that will reveal new aspects in the field of visual research and study of these unpublished works. The research covers on the one hand a broader historical (Asia Minor Catastrophe, etc.) and a socio-economic context that defined Theofilos' artistic creation, and on the other hand it unfolds the artistic context that interprets and clarifies the specific artistic choices and influences accepted by the author.

In the promotion, stylistic study and analysis of the two unpublished works of the important Greek folk painter, Theofilos - works of global interest that contribute to the kaleidoscopic approach to the art of this period, since the works are unknown, research, to date - in the scientific community according to Panofsky, the three-way process: 1. Listing the project's identity and description (converting the image into speech, without analysis). 2. Iconographic analysis. 3. Stylistic analysis and interpretation. The research conclusions that emerge through the research study of the aforementioned works shed light on unknown aspects of the last phase of Theofilos' artistic creation, a period particularly important for the thorough and kaleidoscopic knowledge of his work, as it is the period that emerges his color palette and his stylistic choices, the optimism and security that the acquaintance and the support he receives from Strati Eleftheriadis (Tériade) convey to him.

The innovative nature of this work initially lies in highlighting the cohesive elements of Theofilos' art with popular culture, filtered by the socio-political data of his time on the one hand, but also its comparative and interactive relationship with Naïve art in Europe by the other. This research approach is necessary, as the material to date is particularly poor, with no reliance on sources of information derived from the comparative study of specific works of art by representatives of art in Europe [1].

• In addition, the collaboration in the field of art history with the use of new technologies, is a practice that is not widely used for documentation purposes in Greece and for conclusions concerning works by specific artists (as opposed to individual cases that focus purely on issues maintenance).

In particular, the techniques will be used:

- 1) portable Raman spectroscopy, for the test - authenticity of the table.
- 2) portable XRF spectroscopy, for the qualitative and quantitative analysis of the data concerning the colour palette of the creator and comparative presentation of the paints of the painter's palette in relation to other well-known identified works by the NTUA.

• Also, the above collaboration of the two scientific fields (theoretical study and applied scientific knowledge), at this level, can function as a "platform" for creating a network of similar actions in other galleries or collections, as most Greek galleries and collections have in their possession works by the important painter Theofilos, whose value is bibliographically proven. Thus, the future interaction of the art spaces that host his works is a constant goal.

2. Materials and Methods

Materials

The first artwork (figure 1) has title "*New type of rural Mytilene with its coexistence that weaves in rocket*" and it is signed as "*artwork of Theofilos G.X. Michael 1931*" (in Greek: "*Νέος τύπος χωρικού Μυτιληνιού με την συμβίαν του στην ρόκα - Έργον Θεόφιλου Γ.Χ. Μιχαήλ 1931*").

The second artwork (figure 2) has title "*The young Hercules Panais Koutalianos in England*" and it is signed as "*1932 artwork of Theofilos G.X. Michael from Mytilene*" (in Greek: "*Ο Νέος Ηρακλής Παναις Κουταλιανός εν Αγγλία, 1932, έργο Θεόφιλου Γ.Χ' Μιχαήλ εκ Μυτιλήνης*").

Methods

In this work two non-destructive analyses were conducted in order to identify the pigments and colorants used by Theofilos in the above-mentioned panel paintings.

For the qualitative determination of chemical elements of the examined colours a Thermo Scientific Niton XLp XRF analyzer was used with an Am-241 source and a solid-state detector. For the data acquisition a built-in software was used and measurements were saved as Unicode ASCII file format being compatible for further analysis with specialized software. Due to the nature of investigation (only qualitative analysis), a cross-check calibration was applied with pigments of known XRF spectrum supplementary to the built-in shutter calibration.

As for the Raman analysis, measurements were performed with the Rock Hound DeltaNu Raman Spectrometer, which has a near-infrared 785nm laser source, adjusted to 8 cm⁻¹ resolution and spectrum range of 200cm⁻¹ to 2000cm⁻¹. Before measurements, calibration tests were conducted in ideal pigment samples made for this purpose [2], to ensure the correct Raman shift measurement and operation.

For further analysis, process and evaluation of

measurements for both XRF and Raman techniques the scientific software SpectraGryph was used (F. Menges, SpectraGryph-Optical Spectroscopy Software, Version 1.2.14, 2020).

All measured Raman spectra, before the main process of pigment identification were subjected to a pre-processing procedure such as baseline correction, Savitzky - Golay smoothing and normalization [3].

3. Review of Previous Works

Historical Evidences

The only work citing the pigments of Theofilos, is that of G. Tsimploulis in 2010 [4]. The author reports that

- “Theofilos made the colour by himself from natural materials, but he never revealed exactly how he made them
- “For the colours he was pounding grass, flowers and pomegranate peels and then mixing them with common dyes.
- “He used to put fig milk or egg white in the paints to as colour stabilizer. The colors that Theofilos worked on were cheap powders and he used linseed oil, glues, milk for binders.”



Figure 1. New type of rural Mytilene with its coexistence that weaves in rocket, artwork of Theofilos G.X. Michael 1931



Figure 2. The young Hercules Panais Koutalianos in England, 1932 artwork of Theofilos G.X. Michael from Mytilene

Analytical Results

Until this publication, the only previous published works about Theofilos colour pallet are those of Saint et al (2018) and Saint et al (2019) [5,6].

In these works, authors mention that after a detailed investigation of several artworks of Theofilos their research findings are:

- In all XRF analysis the elements Zinc (Zn), Barium (Ba), Calcium (Ca) and Lead (Pb) are present. This leads to the hypothesis of the use of Lithopone (mixture of ZnS and BaSO_4) and/or Zinc White (ZnO) and/or Barium White (BaSO_4) and/or Lead White ($2\text{PbCO}_3 \cdot \text{Pb(OH)}_2$) and of Calcite (CaCO_3) or Gypsum ($\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$) as white for colour mixture or preparation layer of canvas.
- From the XRF analysis of blue colour hues, Cu was missing which leads to the hypothesis of use of Cu-free pigment (organic or inorganic) such as Ultramarine ($(\text{Na,Ca})_8(\text{AlSiO}_4)_6(\text{SO}_4, \text{S}, \text{Cl})_2$) or indigo ($\text{C}_6\text{H}_{10}\text{N}_2\text{O}_2$) or even Prussian Blue ($\text{Fe}_4(\text{Fe(CN)}_6)_3 \cdot n\text{H}_2\text{O}$). As Indigo was quite expensive colorant is relatively unlikely to be used by Theofilos while the very low percentages of Iron (Fe) do not guarantee the use of Prussian Blue.
- For the green color hues, the yellow ochre (Iron Oxide, Fe-O) is probably used in a mix with ultramarine blue color, while the XRF spectra have a high content of Ba, Ca, Zn, Fe, Pb. Also possible is the mixture of ultramarine with green earth with the form of celadonite $[\text{K}[(\text{Al}, \text{Fe}^{3+}), (\text{Fe}^{2+}, \text{Mg}) (\text{AlSi}_3, \text{Si}_4) \text{O}_{10}(\text{OH})_2]$ and glauconite $[\text{K}, \text{Na}) \text{Fe}^{3+}, \text{Al}, \text{Mg})_2 (\text{Si}, \text{Al})_4 \text{O}_{10}(\text{OH})_2]$ for the production of the blue-green and green color impressions.
- For the yellow and brown color hues, the painter used earthy pigments rich in Hematite (Fe_2O_3) and/or Goethite (FeOOH), such as caput mortuum or some ochre or a combination of these.
- For the dark red and red-violet shades, earthy pigments were used with Hematite as the main ingredient, as evidenced by the high Fe content. In contrast, bright red as well as pink shades come from the use of minion (Pb_3O_4) diluted with white pigments.

4. Results and Discussion

XRF analyses

In figure 3 and 4 the results of XRF analysis for both artworks are presented, while in tables 1 and 2 the summarized elements found.

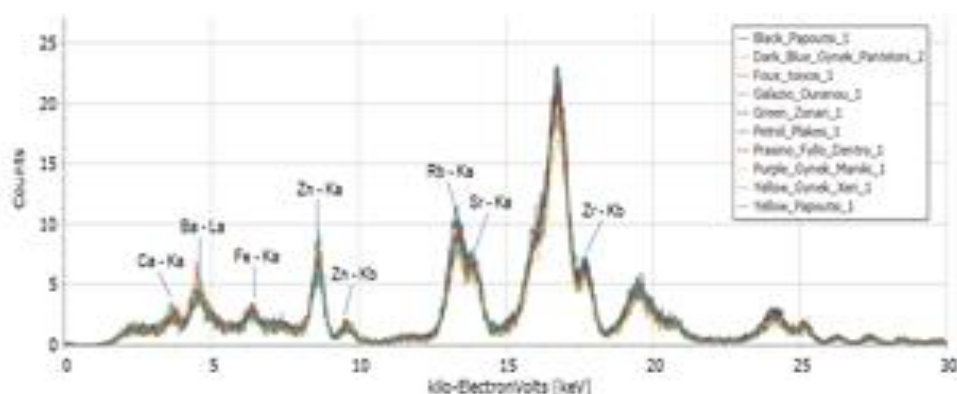


Figure 3. XRF results for the 1st work of Theofilos (see figure 1)

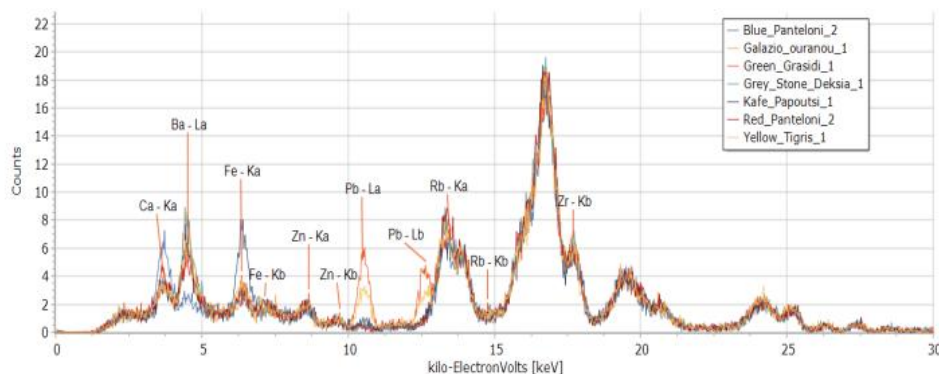


Figure 4. XRF results for the 2nd work of Theofilos (see figure 2)

Table 1. Summarized XRF results for the 1st work of Theofilos (see figures 1 and 3)

Spot of Analysis	Elements	Potential Pigment
Black on shoes	Ca, Ba, Zn, (Fe traces)	Carbon (C) based Black
Blue (trouser)		Ultramarine or indigo
Blue (Sky)		
pink on the walls		Organic red
Green (belt)		Organic green
Deep green (terrain)		Organic green with carbon black
Purple (Sleeve)		White mixed with organic red
Yellow (arm) Yellow (shoes)		White mixed with organic yellow dye

Table 2. Summarized XRF results for the 2nd work of Theofilos (see figures 2 and 4)

Spot of Analysis	Elements	Potential Pigment
Blue (trouser)	Ca	Ultramarine or indigo
Blue (sky)	Ca, Ba, Zn	
Brown (shoes)	Ca, Ba, Zn, high - Fe	Iron Ochres (Fe-O)
Grey (stones)	Ca, Ba, Zn,	White + Carbon black
Green (grass)	Ca, Ba, Zn, Pb Fe traces	Green earths (terra verte) with lead white
Red (trouser)	Ca, Ba, Zn, Fe traces	Organic Red
Yellow (tiger)	Ca, Ba, Zn, Pb λίγο Fe	Yellow ochres with lead white

Raman analyses

In figures 5 to 8 representative Raman spectra are shown along with reference spectrum.

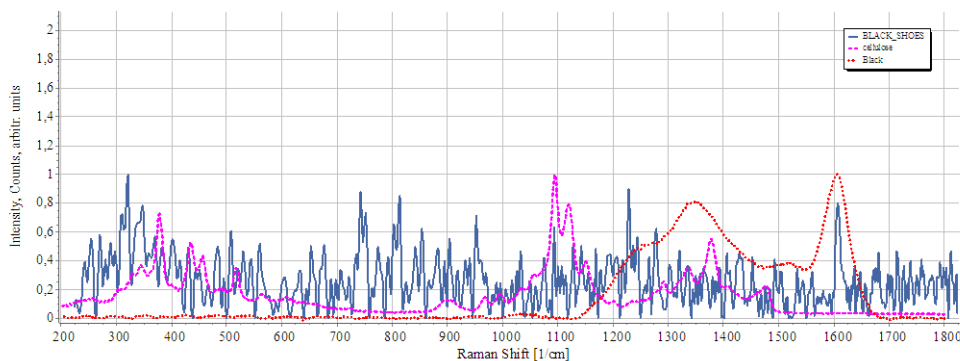


Figure 5. Raman spectra for black of table 1 (blue line) and reference spectrum of carbon black (red dashed line) and cellulose (magenta dotted line)

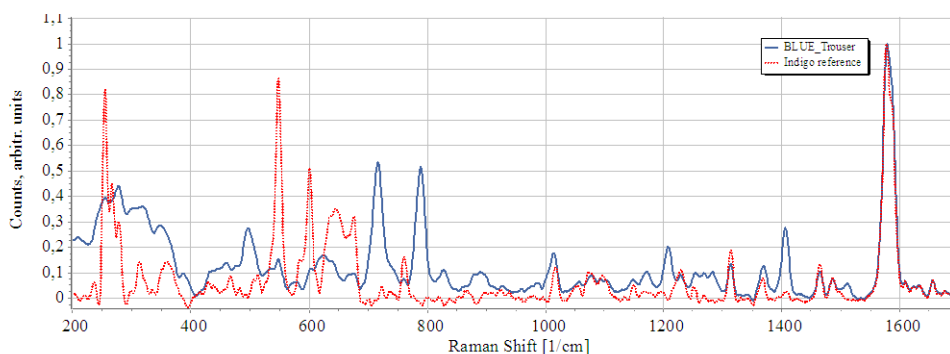


Figure 6. Raman spectra for blue of table 2 (blue line) and reference spectrum of Indigo (red line)

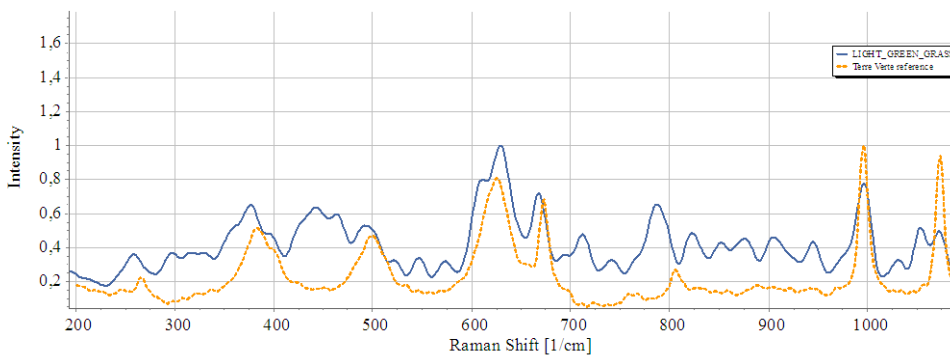


Figure 7. Raman spectra for green of table 2 (blue line) and reference spectrum of Terre Verte (orange line)

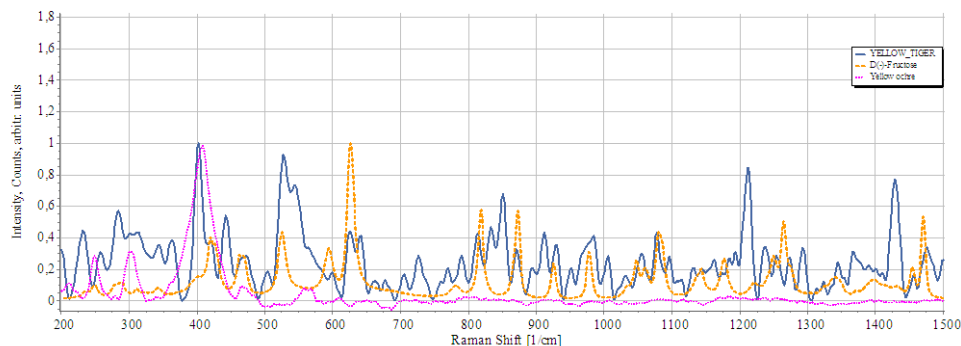


Figure 8. Raman spectra for yellow of table 2 (blue line) and reference spectrum of fructose (orange dashed line) and yellow ochre (magenta dotted line)

5. Conclusions

Summarizing the results of the XRF and Raman analyses, we find that the hypothesis that the painter Theofilos makes

the dyes himself from organic raw materials is valid as in addition to white, which is probably Lithopone or Baryte's white mixed with calcite, the analytical techniques did not reveal inorganic minerals for the pigments.

Also, the results of the present study follow the results of previous works regarding a) the white base of paintings containing Calcite (Ca), Barite (Ba) and Zinc (Zn) is therefore a white of Barite with Calcite, b) in its absence copper (Cu) for blue, together with the absence of a substantial amount of Iron (Fe) and cobalt (Co) by exclusion lead to the conclusion of the use of Ultramarine or Indigo, c) for the brown dye where high Iron (Fe) content was found earth pigment has been used.

Especially for the blue colorants, this study reveals the use of indigo relevant type of dyes. As these are artworks dated in the last phase of Theophilos' artistic creation, a period that his colour palette and his stylistic choices are strongly influenced by the support he receives from Strati Eleftheriadis (Tériade) it is quite possible to use colorants of better quality than of earlier periods of creation.

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