

The compatibility between some the materials used in cleaning to improve their effectiveness in cleaning oil paintings

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Abstract:

The study showed that some cleaning materials do not give the effectiveness of its patients in the cleaning efficiency of the spots on the painting when they are applied alone compared to the cleaning compounds that contain a mixture of more than one material and which has higher effectiveness in cleaning and removing stains significantly. This study examined the compatibility of some cleaning materials to reach compounds that are more effective and help to raise the efficiency rates of cleaning stains from the surface of oil paintings. The researcher has identified some types of cleaning materials that will be used in the study (Gel Voo – Crotex S230 – Vanis). He also performed the necessary examination on the painting in study before starting the cleaning and restoration operations, and the spread of dust stains, soot, fatty stains, acidity, and fungi stains was noted. The previous materials were applied alone without adding them to other materials or preparing a mixture between two types of them in cleaning treatments and stain removal. The treatment was repeated three times, which confirmed this method to obtain a better result in cleaning and stains removal. When applying cleaning compounds that were mixed with more than one cleaning substances in varying proportions, it gave a result of cleaning and removing stains more effectively and with higher quality than its counterparts. The ratios and rates of cleaning for these compounds were from the following (Voor Gel + Lipase Enzyme + Zinc 95% - Crotex S230 85% -Vanis + Gel + Lipase 85%). From here it is clear that the study solves a basic **problem** which is the weakness of the effectiveness of some materials in the efficiency of the processes of cleaning oil paintings when used alone. The **aim** of the study is to achieve compatibility among some cleaning materials to improve the effectiveness and efficiency of oil painting cleaning operations. The **importance** of the research returns to achieving the quality and effectiveness of cleaning operations to maintain oil paintings by maximizing the optimum use of mixing a number of materials by arriving at more effective compounds that are being more efficient. From here we can define the **limits** of the research in achieving the quality and effectiveness of cleaning operations to maintain oil paintings by maximizing the optimal use of mixing a number of materials by arriving at more effective and efficient compounds. The **study methodology** has followed the experimental approach through studying the effectiveness of the application of some modified compounds in cleaning stains and the dirty appearance, by mixing with some cleaning materials and applying them to the painting of the study.

Key Words:

Oil Paintings, Cleaning Components, Lipase, Amylase, Sodium Hydroxide, Polyvinyl Alcohol.

The research Methodology

The research is following the experimental approach through studying the effectiveness of applying some of the modified components in cleaning stains and dirty appearance by mixing some cleaning materials and apply them on the study painting.

In order to achieve the research goal, the following is studied: -

1- Deterioration Aspects

It is necessary to study the most important types of stains which cause distortion of many oil paintings, which are classified to surface stains that are found on the surface of the painting, and other internal stains that cause distortion of the painting ground layers, whether the varnish layer, colors or even the painting ground layer. If we want to know its types, we must make some analysis as below:

By the external examination for deterioration aspects for stains and dirt appearance, it was found that many of them are spread (dust, greasy stains, biological damage, caramel, dirt stains, greasy stains, soot, acidity stains). The researcher used some analysis techniques, Including:

2- Methods and Materials

2-1-Alaysis Methods

2.1.1. Optical Microscope

The researcher examined the painting by using the optical microscope to obtain an enlarged image of components of painting, the color layer, and stains on the painting canvas through microscope lenses.

2.1.2. Scanning Electron Microscope (S.E.M)

Scanning electronic microscope SEM, was used to analyze the painting layers, to identify the fine details of a color layer and painting ground layer, identify the damaged processes, and to give a three-dimensional image.

2.1.3. Microbiological Examination

Based on the foregoing, the researcher took samples from the places of the appearance of fungal spots, and performed isolation and laboratory separation for it to identify their types. The fungus was isolated from the painting under study as follows: cotton swabs were placed and then transferred to the laboratory in sterile tubes.

2.2. Experimental Process

2.2.1. Types of stains on painting OP-02

Examination was observed by the spread of many stains types on the surface of the painting under study and canvas panel, these stains varied among (PH, Fungi, Dust, Mineral, Dirty appearance).

After observing most important aspects of the stains in the painting, we will provide now restoration steps, as follows:

2.2.2. Restoration steps

The study restoration plan was prepared as follows:

- Specify the materials and tools that will be used.

- Implementation of the consolidation process and fix the color layer parts which separated the painting surface.
- Make a cleaning test for the materials used in the study, on the canvas painting.
- Cleaning painting canvas by using some modern components and record the result.
- Restoration of cuttings and rips areas in the canvas painting.
- Use of fungi-and insect-resistant components to protect the painting of exposure to biological damage.
- Straighten canvas paintings by using the thermal iron, and then put the weight of the top of the painting canvas to straightening the fibers.
- Start consolidation of the canvas painting and applying it by spraying it towards horizontally.
- Inject and consolidate cracks in the color layer are found on the surface.
- Cleaning and stains removal.
- Filling the gaps in the painting ground layer.
- Completion and retouching of the color layer were lost.
- The final consolidation process for the painting surface by spraying it horizontally towards the painting fibers.
- Tightening and installing painting on prepared frame.

2.2.3. Cleaning Process

The researcher performed cleaning operations using some Compounds, such as (Vains – Crotexs230 – Gel Vool- Lipase Enzyme – Zinc).

The Result

The appearance of spots varied and overlapped, especially on the histological carrier of the plaque as a result of poor environment and storage conditions, which were represented by acidic spots, dust, soot, fatty and fungal spots. It was also revealed by the scanning electron microscope that the imaging floor is very thin and has almost no thickness and is intertwined with the fibers of the tissue holders of the painting, where the average thickness of the layers of the painting is about 700 microns at a magnification force of 50X. The used cleaning materials gave the best result when the treatments were repeated 3 times in the cleaning process. Where a better result appeared in the ratio of removal and cleaning compared to applying one-time treatment to some types of stains. It also proved the effectiveness of the compounds used in cleaning when mixing them and adding them to other types compared to the application of treatments through a single substance, the rates of cleanliness for those compounds were as follows (the enzyme lipase + zinc 95% - Crotex S230 by 85% - Vanis + Voor Gel + Lipase 85%).

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