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"Experimental study for the evaluation of new pastes for treatment of some deterioration aspects of archaeological bone with application on selected object"

By

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SUPERVISION COMMITTEE

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Summary:

Significant quantities of archaeological bones have been discovered in Egypt and are preserved in Egyptian museums and storage facilities. Almost all of these bones suffer from many aspects of deterioration. Fracturing, cracking, surface marks, abrasion, missing fragments, pitting and breakage are considered the most serious aspects affecting archaeological bones. Various factors have caused deterioration such as weathering, salts, human impacts (excavation, transportation, and handling), termites, pressure and microbial attack.

Researchers and specialist scientists in the field of conservation have found that the traditional techniques in completion (conservation) processes to rectify bone defects were ineffective to the point of being useless. The author has made an evaluation of the traditional pastes used to repair damaged archaeological bone and modified them to create a paste that has a better result. Nanotechnology, by using nanomaterial, showed improving polymer properties (due to its small particle size) compared with other modified materials significantly improved compatibility with other materials to create nanocomposites. Most of the results are positive, which enables the researchers to study polymer behavior at nano scale level. Scientists and researchers have found this method is much better than the other traditional completion methods as it provides protection and better aesthetic appearance to archaeological bone.

This study will focus on the restoration of archaeological bone, through evaluation of the pastes which are in common use, and using some new pastes which have not been used before. The pastes that are used in completion of bones can be controlled by natural and synthetic materials. It should be mentioned that different natural and synthetic materials are used without any evaluation; the evaluation of pastes composed of natural and synthetic materials with specific criteria will be useful for the conservation of bones.

This research has developed new pastes for the conservation of archaeological bone, which will improve the physical properties of new paste from short term to longer term, giving lower change of color, chemical stability proved by using FTIR. This is explained by a greater depth of penetration of the nanoparticles providing a higher resistance to the effects of weathering agents.

Key Words

Filling

Fractures

Missing

Cracking

Deterioration

Fungi

Conservation

Investigation

Spectrophotometer

FTIR

Mechanical Properties

SEM

XRD

TEM

Nanotechnology

Visual assessment

AutoCAD

Photoshop

DEDICATION

I praise almighty Allah for giving me the strength, passion, courage and guidance to achieve this work, despite all difficulties.

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