شبكة المعلومات الجامعية

# بسم اللّه الرحمن الرحيم



# شبكة المعلومات الجامعية

# التوثيق الالكتروني والميكروفيلم

شبكة المعلومات الجامعية

# جامعة عين شمس

## التوثيق الإلكتروني والميكروفيلم

# قسم

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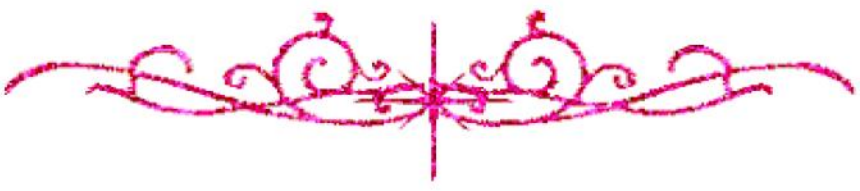

# بالرسالة صفحات
# لم ترد بالأصل

# Remineralizing potential of Grape seed extract on demineralized Enamel and Cementum of Human premolar samples (Scanning electron microscope and polarized light microscopic study)

Thesis Submitted to
Faculty of Dentistry – Ain Shams University
In Partial Fulfillment of the requirementsfor
Doctor Degree in Oral Biology

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"قالوا سبحانك لا علم لنا إلا ما علمتنا

إنك أنت العليم الحكيم"

صدق الله العظيم

سورة البقرة آية "32"

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I dedicate this work to my beloved parents, my children and my brothers those are dearest to my heart

## *Abstract*

**Aim:**

The aim of this study was to investigate the remineralizing potential of grape seed extract on demineralized enamel and cementum of human premolars and to compare with that of NaF using scanning electron microscope (SEM) attached with energy-dispersive x-ray analysis (EDXA) and Polarized light microscope (PLM).

**Materials and Methods:**

Forty recently extracted maxillary first premolars were randomly divided into four groups, (n= 10) according to the following procedure: negative GI (no treatment), positive GI (immersed in demineralizing solution), GII (treated with grape seed extract) and GIII (treated with sodium fluoride). The demineralized specimens were subjected to pH cycling twice daily for two weeks. Then analyzed by scanning electron microscope with EDX and finally polarized light microscopy.

**Results:**

For enamel the SEM of groups GII & GIII revealed apparent decrease in the irregularities of demineralized enamel with presence of globular precipitates causing occlusion of enamel rod ends. EDXA revealed a significant difference between groups, when Ca & P were compared showing a greater potential of remineralization for GSE than NaF. Statistical analysis of PLM showed significant decrease in lesion depth in GII compared with GIII. For cementum the SEM analysis showed regular narrow cracks in some areas with decreaing signs of resorption on the mineralized cementum in both groups II, III. Polarized light microscopic analysis showed mineral precipitation band on the surface of treated cementum lesions without area of demineralization. Wide birefringent zone known as remineralizing zone (RZ) was also observed in GII. While in GIII, thin birefringent zone was also observed.

**Conclusion:**

In this in vitro study, it was found that grape seed extract caused a better improvement in the surface topography of the enamel and cementum better than sodium fluoride solution.

# *Contents*

# *List of Abbreviations*

| Abbreviation | Meaning |
|---|---|
| ANOVA | ANalysis Of Variance |
| Ca | Calcium |
| CaCl2 | Calcium Chloride |
| CaF2 | Calcium Fluoride |
| EDJ | Enamel -Dentin Junction |
| EDXA | Energy Dispersive X-ray microAnalyzer |
| EREs | Enamel Rod Ends |
| ERSH | Epithelial Root Sheath of Hertwig |
| ESEM | Environmental Scanning Electron Microscope |
| F | Fluoride |
| FDA | Food and Drug Administration |
| GSE | Grape Seed Extract |
| HAP | Hydroxyapatite |
| KCL | Potassium Chloride |
| KH2PO4 | Potassium Dihydrogen Phosphate |
| KV | KiloVoltage |

| | |
|---|---|
| LFD | Live Fiber Detection |
| Mm | Millimeters |
| NaF | Sodium Fluoride |
| Na2Po3F | Sodium monoflurophosphate |
| NR | Naringin |
| OH | Hydoxyl group |
| OPC | Oligomeric ProanthoCyanidins |
| P | Phosphorous |
| PA | Proanthocyanidins |
| PDL | Periodontal ligament |
| PH | Measure of acidity & alkalinity |
| PLM | Polarized Light Microscope |
| QC | Querecetin |
| RZ | Remineralizing Zone |
| SD | Standard Deviation |
| S. Mutans | Streptococcus mutans |
| SnF2 | Stannous Fluoride |
| SPSS | Statistical Package for Social Science |
| TCP | Tricalcium Phosphate |

| | |
|---|---|
| wt% | Weight percent |
| X | Magnification power |