

Ministry of Higher Education  
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# **Effect of different modified heat cure acrylic denture base material on adherence of *Candida albicans* and on some of mechanical properties**

A thesis

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## **Abstract**

**Statement of problem:** Acrylic resin proved to be convenience for yeast colonization, giving acceptable conditions for adhesion and growth of yeast, and the same problem for resilient tissue conditioner because of its high porosity. Since *Candida Albicans* (*C. Albicans*) owns negative charge so can create electrostatic repulsion forces with negatively charged polymers, the previous studies showed negatively charged PMMA had less *C. Albicans* adherence, which lead to reduce occurrence of denture stomatitis.

**Purpose:** The aim of this study was to evaluate the Effect of phosphate containing polymethylmethacrylate (PMMA) and the effect of varnish coating on the denture base on the growth of *C. Albicans* and porosity, also testing the effect of phosphate containing group in comparison to PMMA group on the following properties: Transverse strength and Hardness test.

**Material and Methods:** Three groups were prepared in this study, they were divided into group A commercially available acrylic resin , B phosphoric acid 2- hydroxyethyl methacrylate ester containing group (PA2HEME) and C varnish coated acrylic resin group. For group B subdivided into four groups (10 samples for each test), while for group C subdivided into three groups (10 samples for each test) according to type of test and time of measuring adherence of candida. Ten disc shape acrylic resin samples were prepared for *C. Albicans* adherence test with dimensions 10mm x3mm (diameter x thickness). Ten rectangular shape samples were prepared for transverse and hardness test with dimension 65 mm length x 10 mm width x 2.5 mm thickness. The samples kept in distilled water at 37C° for 48 hours before testing to remove residual

monomer. Ten disc shape samples for porosity test with dimension 30 mm diameter x 3 mm thickness.

**Results:** this study showed that there was physical change and chemical change between 15% phosphoric acid 2-hydroxyethyl methacrylate ester and 85% methyl methacrylate (MMA). There were a highly significant reduction in the *Candida* adherence and porosity test for both of experimental groups (PA2HEME group, varnish-coated group), however the PA2HEME group had the lowest *Candida* adherence, while for transverse strength and hardness test for the PA2HEME group result showed high significant reduction comparing to the control group.

**Conclusion:** mixing 15% of PA2HEME with 85% MMA can highly reduce the *C. Albicans* adhesion and the porosity of new modified acrylic resin with reduction in the mechanical properties, also for varnish-coated group there was high significant reduction in the *Candida* adhesion and porosity.