



**Republic of Iraq
Ministry of Higher Education
and Scientific Research
University of Baghdad
College of Dentistry**



**Effect of Tellurium Oxide Micro Particles Incorporation into
Poly (Methyl Methacrylate) on *Candida Albicans* Adherence
and Some Physico-Mechanical Properties**

A Thesis

submitted to the Council of the College of Dentistry / University
of Baghdad in partial fulfillment of the requirement for the degree
of master of science in prosthodontics

By

Riyam Hasan Hazim

B.D.S.

Supervised by

Professor Dr. Abdalbasit Ahmad Fatihallah

B.D.S., M.Sc , Ph.D

2022 A.D

1443 A.H

ABSTRACT

Introduction: Poly (methyl methacrylate) has served as a primary model for the development of other dental materials; the mechanical properties of PMMA appliances and products are less than ideal . To address this issue, various fillers and oxides of silver, titanium, zinc, and zirconia have been incorporated. Therefore, the focus of the current study on incorporating tellurium oxide into heat cure PMMA denture base and studying its effect on PMMA properties. To determine and evaluate the effect of optimum percentages of tellurium oxide microparticles incorporation into PMMA on *Candida albicans* adherence and some other properties (Transverse strength, Impact strength, Surface roughness and Surface hardness).

Materials and methods: Tellurium oxide micro-particles powder with concentration of 3%, 5% by weight was firstly added and mixed with the PMMA monomer by probe sonication apparatus, then this suspension was mixed with the measured amount of powder of PMMA, a control group (0% by wt. Tellurium oxide micro-powder) was fabricated to facilitate groups comparison. A total of 160 specimens was prepared, and divided into 5 groups, where 30 specimens for each test group assigned, and each test group subdivided into 3 subgroups (n=10) and for nystatin antifungal effect test 10 specimens incorporated by 1.4% by wt. of nystatin.

Results: There is a significant decrease in the number of *Candida albicans* cells adhered to PMMA also there is improvement in transverse strength, impact strength and surface hardness and non-significant

increase in surface roughness after adding 3% and 5% Tellurium oxide compared to samples from the control group.

Conclusion: Incorporating the Tellurium oxide powder into heat cure acrylic material can succeed in producing a heat cure acrylic material with improved antimicrobial, mechanical and physical properties.



جمهورية العراق
وزارة التعليم العالي والبحث العلمي
جامعة بغداد
كلية طب الأسنان



تأثير اضافة اوكسيد التيليريوم على التصاق المبيضات البيض و بعض الخصائص الفيزيائية و الميكانيكية لمادة الراتنج الأكريلي الحراري

رسالة مقدمة الى مجلس كلية طب الأسنان- جامعة بغداد كجزء من
متطلبات نيل درجة الماجستير في صناعة الأسنان

قدمت من قبل

ريام حسن حازم

بكلوريوس طب وجراحة الفم والأسنان

بإشراف

أ.د عبد الباسط احمد فتح الله

دكتوراه في التعويضات الصناعية

العراق - بغداد