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

# Histological and Immunohistochemical study of the Effect of Local Application of Moringa Oliefera /Marine Collagen on Bone Healing in Rats

The Thesis

Submitted to the Council of the College of Dentistry, Baghdad University, In Partial Fulfillment of Requirements for the Degree of Master in Oral Histology.

Submitted by:

**Areej Salim Dawood**

B.D.S.

Supervised by:

**Prof Dr. Nada M. H. Al-Ghaban**

B.D.S., M.Sc., Ph.D. (Oral Histology and Biology)

Baghdad- Iraq

2021 A.D 1441 A.H

# Abstract

**Background**: Bone healing is a greatly complex reformative process. Moringa Oliefera seeds are one of the most helpful nutritious herbal product. Because it has antimicrobial properties and have buffering limit also, it has been used in industrial and agricultural field. Marine collagen extract from marine organisms such as fish and sponges which have easy extraction process and considered as safe product. The procollagen type I propeptides are derived from collagen type1 , the most abundant form of collagen found in bone.

**Aim of the study**: Evaluation of the effect of Moringa Oliefera flavonoids , Marine collagen and their combination on bone healing by means of histological , histomorphomerical and immunohistochemical studies.

**Materials and methods:** Twenty Albino male rats , weighting (350-450 g) have been used in this study. Standardized bone defect of about 3mm in depth and 2mm in width created in the distal side of right and left femurs for each rats. These bony defects were divided into four groups

1. Control group (10 bony defects): these bony defect were left to heal normally
2. Moringa Olifeira group (10 bony defects): these bony defects were treated with (0.5ml) Moringa Olifeira
3. Marine collagen group (10 bony defects): these bony defects were treated with (1mg) Marine collagen
4. Combination group (10 bony defects): these bony defects were treated with both (0.25mg) Marine collagen and (0.25ml) Moringa Olifeira.

Then ten rats were sacrificed at 2 and 4 weeks interval post operatively. Histological examination was performed under light microscope for all bone

sections stained with Haematoxylin and Eosin with assessment of histomorphometric analysis include counting of bone cells (osteoblasts, osteocytes and osteoclasts), trabecular width, trabecular number and bone marrow space area were done using Image J. software. Also Immunohistochemical localization of procollagen type I propeptides were done by using mouse monoclonal antibody against procollagen type I propeptides secreted type for all groups in both healing intervals.

**Results**: Histological finding of the present study illustrated that treatment with Moringa Oliefera and Marine collagen induced earlier bone formation, mineralization and maturation of intrabony defects in comparison to control.
Histomorphometric analysis for almost all bone parameters used in present study showed highly significant difference in all studied groups in both intervals.
Immunohistochemical result of this study showed strong positive expression for procollagen type I N-terminal propeptides in osteoblasts especially at 2 weeks duration and in osteocytes at 4 weeks durations in combination of Moringo Oliefera and Marine collagen group than that in others.

**Conclusions:** This study revealed that local application of combined Moringa Oliefera extract and Marine collagen in intra bony defects may accelerate bone matrix formation and maturation and increased the expression of pro collagen type I N- terminal pro peptide.

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

# تقييم تأثير التطبيق الموضعي لمستخلص نبات البان / كولاجين الحيوانات البحرية على عملية شفاء العظام في الجرذان عن طريق الدراسة النسيجية والكيميائية النسيجية المناعية

**الرسالة**

مقدمة الى مجلس كلية طب الاسنان جامعة بغداد كجزء من متطلبات نيل درجة الماجستير في انسجة الفم

من قبل

**أريج سالم داود**

بكالوريوس طب وجراحة الفم والاسنان

بأشراف

**الاستاذ الدكتور ندى محمد حسن الغبان**

ماجستير أنسجة وعلوم الحياة

دكتوراه أنسجة وعلوم الحياة

٢٠٢١ م ١٤٤١هـ