

**AN ASSESSMENT OF THE  
CYTOTOXICITY AND SURFACE  
TOPOGRAPHIC CHANGES OF ROOT  
CANAL DENTIN WALLS FOLLOWING  
THE USE OF MORINDA CITRIFOLIA  
(A COMPARATIVE IN VITRO STUDY)**

**Thesis**

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بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

قَالُوا سُبْحَانَكَ لَا عِلْمَ لَنَا إِلَّا  
مَا عَلَّمْتَنَا إِنَّكَ أَنْتَ الْعَلِيمُ  
الْحَكِيمُ

صدق الله العظيم  
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# DEDICATION

❖ To my sweetest heart **FATHER NAZIH,**

*The greatest gift I ever had Came from God; I call him Dad!  
Everyday with you, I learn something new. I feel so comfortable  
around you daddy, you are the best friend I have ever had. I love  
you so much.*

❖ To my beloved, inspiring, and supportive **MOTHER  
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*Mom, nothing I say will ever be enough for you. You are one  
person in this world whom I can completely trust and I know you  
will never let me down. I love you mama.*

❖ To my adorable **BROTHERS ABDUALLAH AND  
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*You are my support, my strength, my friend and my guide.  
There's no other love like the love for a brother. There's no other  
love like the love from a brother. Love you.*

❖ To my **SISTER SAMAR,**

*Children come and eventually they go. Friends grow up and  
move away. But the one thing that's never lost is my sister!  
Om Qais, you are gift to the heart, a friend to the spirit, a golden  
thread to the meaning of life.*

❖ To who's shared my difficult times, to all my  
friends...Great thank.

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## **INTRODUCTION**

Cleaning is one of the main objectives of root canal treatment. Thorough cleaning removes microorganisms, permits better adaptation of filling materials, and enhances the action of intracanal medicaments. The choice of an irrigant is of great importance because they might vary in their effectiveness to act as lubricants during instrumentation and flush debris, smear layer, and bacteria out of the canal.

Because root canal irrigants and medications can come in contact with periradicular tissues, they should be bio-compatible, systemically non toxic, non caustic to periodontal tissues and have little potential to cause an anaphylactic reaction when accidentally extruded beyond the apical foramen.

Sodium hypochlorite (NaOCl) remains the most widely used irrigating solution in endodontics through its high power of disinfection and tissue dissolving properties, but it is incapable of removing the smear layer by itself and is cytotoxic to periradicular and vital tissues.

*Morinda citrifolia* is a plant growing in almost all tropical areas of the world. The plant grows as a shrub or tree depending on conditions of soil and climate. On Polynesian islands and Hawaii, noni plants grow wild as well as in plantations, on beach areas and inland up to height of 600 m. Flowers and fruits at all phases of ripeness can be observed on the plant all year. Noni plants proliferate very rapidly and bear fruits already in the first year after seeding.

Morinda citrifolia juice has a broad range of therapeutic effects, including antibacterial, antiviral, antifungal, antitumor, analgesic, hypotensive, anti-inflammatory, and immune-enhancing effects . Morinda citrifolia juice contains the antibacterial compounds L-asperuloside and alizarin. Acetone extracts from Morinda citrifolia juice also demonstrated some antimicrobial activity.

There are currently few studies describing the potential use of the natural irrigating solution Morinda citrifolia juice (MCJ) as endodontic irrigant therefore this study will be conducted.

## **REVIEW OF LITERATURE**

In recent years, there has been an increasing interest in the use of natural substances as endodontic irrigants, and some questions concerning the safety of synthetic compounds have encouraged more detailed studies of plant resources.

Several medicinal plant preparation such as Chamomile extract *Tubaro et al (1984)*, Morinda citrifolia Juice (MCJ) *Murray et al (2008)*, and tea tree oil *Hammer et al (2003)* have been studied to be used as natural endodontic irrigant.

Because root canal irrigants and medications can come in contact with periradicular tissues, in addition to having good antibacterial ability, they also should be biocompatible. In selecting root canal irrigants, one must weigh their therapeutic benefits against their potential cytotoxicity effects.

Polynesians have used the fruit juice from Morinda citrifolia or noni plant in folk remedies for more than 2000 years. All parts of the plants, including the fruits, the leaves, and the roots have been shown to contain active compounds that have high medicinal values *Punjanon et al (2006)*. It is primarily used to stimulate the immune system and prevent the formation of tumors including malignant one and cure several diseases *Chan-Blanco et al (2006.)*