Sudan University of Science and Technology
College of Graduate Studies

Phytochemical Studies and Antimicrobial Activities of *Balanites aegyptiaca* Del

[illegible]

Thesis Submitted in Partial Fulfillment of the Requirement of M. Sc. Degree in Chemistry

By:
Nejood AbuBaker Haroon Sulayman

Supervisor:
Dr. Dafaalla Mohamed Hag Ali

April 2007

j

قال □□□□□:

(**هُوَ** ا لَّذِي أُ نزَلَ منَ السَّمَاءِ مَاءً لَّكُم مِّنْهُ **شَرَابٌ** ومنْهُ **شَجَرٌ** فِيه تُسِيمُونَ * **يُنبِتُ** لَكُم به ا لزَّرْعَ وَالزَّيْتُونَ وَالنَّخِيلَ وَالأَعْنَابَ وَمِن كُلِّ الثَّمرَاتِ إِنَّ فِي ذَلِكَ لآيَةً لِّ قَوْمٍ يَتَفَكَّرُون)

صدق □□□□ □□□□□□

– النحل

آية (10-11)

Dedication

To my father and mother…
With their big hearts.

To my dear uncle …
Who taught me the meaning of patience.

To my sister and brother…
Who taught me the meaning of brotherhood.

Acknowledgments

I would like to express my deep gratitude and sincere appreciation to my supervisor **Dr. Dafaalla Mohamed Hag Ali,** for his patient supervision, encouragement and help during this study.

My thanks are extended to the academic staff, technicians and other members of the Department of Chemistry, Sudan University of Science and Technology for help and encouragement.

I would like to thank the staff of the Medicinal and Aromatic Plants Research Institute for their valuable assistance.

Special thanks are also due to **Dr. Asma Ali** for her help and support.

My greater thank is to my father for financial support to complete this work.

My thanks are also extended to my family, my friends and my colleagues for their encouragement and support during this study.

Abstract

In this study the leaves of *Balanites aegyptiaca* Del., which is widely used in the traditional medicine of Sudan, were phytochemically screened and found to contain flavonoids, alkaloids, sterols, tannins and saponins. One of the flavonoids (compound1) was isolated and purified from the ethanolic extract by thin layer chromatography (TLC) on silica gel using the solvent system butan-2-ol: acetic acid: water (5:1:4).

A tentative structure of this flavonoid was deduced on the basis of its IR, UV and MS spectra and acid hydrolysis and it was found to be 8-(1-propenyl)-3'-ethoxyl-4'-hydroxyflavone-7-*O*-glycoside.

The antimicrobial activity of the ethanolic extract of the leaves, the water extract and the isolated pure compound was evaluated against seven gram-positive and gram-negative microorganisms. The water extract was found to be the most active against *Escherichia coli*. Compound 1 exhibited weak antimicrobial activity on *Bacillus subtillis* and *Staphylococcus aureus* at concentration of 10%.

□□□□□□□

في هذه الدراسة التى اجريت على اوراق نبات الهجليج المستخدم بشكل كبير فى العلاج التقليدى فى السودان، تم اجراء مسح على المكونات الطبيعية فى النبات و وجد انه يحتوى على فلافونويدات، قلويدات، ستيرويدات، تانين و مركبات صابونية.

احد الفلافونويدات (compound 1) تم عزله و تنقيته بواسطه كروماتوغرافيا الطبقه الرقيقه من المستخلص الايثانولى وذلك باستخدام المذيب بيوتان-2-ول : حامض الخليك : ماء (4:1:5).

تم تحديد تركيب كيميائي مؤقت للفلافونويد باستخدام مطيافيه الاشعة تحت الحمراء، الاشعة فوق البنفسجية المرئية، طيف الكتلة والتحلل المائى بواسطة الحامض وهو:
8-(1-propenyl)-3'-ethoxyl-4'-hydroxyflavone-7-*O*-glycoside.

تمت دراسة فعالية المستخلص الكحولي والفلافونويد المستخلص من اوراق نبات الهجليج و المستخلص المائي للاوراق على خمسة انواع من البكتيريا و نوعين من الفطريات و وجد انها جميعها لها تأثير ضعيف على نشاط البكتيريا و الفطريات عند تراكيز ضعيفة، فيما وجد ان للمستخلص المائى تأثير ملحوظ على نشاط أحد أنواع البكتيريا (*Escherichia Coli*). و قد وجد ان للفلافونويد المستخلص تاثير ضعيف على نشاط نوعين من انواع البكتيريا (*Bacillus subtillis* & *Staphylococcus aureus*) وذلك عند تركيز 10%.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

[illegible]
كلية الدراسات العليا

[illegible]

[illegible]

اعداد:
نجود [illegible]

اشراف:
د. [illegible]

2007 - [illegible]