

Sudan University of Science and Technology
College of Graduate Studies

**Phytochemical Studies and Antimicrobial
Activities of *Balanites aegyptiaca* Del**

Phytochemical Studies and Antimicrobial
Activities of *Balanites aegyptiaca* Del

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

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قال:
(هُوَ الَّذِي أَنْزَلَ مِنَ السَّمَاءِ مَاءً لَكُمْ مِنْهُ شَرَابٌ وَمِنْهُ شَجَرٌ فِيهِ تُسِيمُونَ * يُنْبِتُ لَكُمْ بِهِ الزَّرْعَ وَالزَّيْتُونَ وَالنَّخِيلَ وَالْأَعْنَابَ وَمِنْ كُلِّ الثَّمَرَاتِ إِنَّ فِي ذَلِكَ لَآيَةً لِقَوْمٍ يَتَفَكَّرُونَ)

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.

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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 subtilis* and *Staphylococcus aureus* at concentration of 10%.

في هذه الدراسة التي 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 تندقته بواسطة

كروماتوغرافيا الطبقة الرقيقة 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 والتحليل

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 المائى 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 تأثير ضعيف على نشاط نوعين من انواع البكتيريا (

Bacillus subtilis & Staphylococcus aureus) وذلك عند تركيز 10%.

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