بسم الله الرحمن الرحيم

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

شبكة المعلومات الجامعية

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التوثيق الالكتروني والميكروفيلم

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A THESIS
ENTITLED

CHEMICAL STUDIES ON THE CONSTITUENTS OF SOME LOCAL PLANTS

Submitted to
Faculty of Science
Cairo University

For
The Degree of
MASTER OF SCIENCE

By
NABILA HELMY SHAFIK
(B.Sc., Cairo University)

National Research Centre
Cairo
2001

Approval sheet

Title of the M.Sc. Thesis:

"CHEMICAL STUDIES ON THE CONSTITUENTS OF SOME LOCAL PLANTS"

Name of the candidate: **Nabila Helmy Shafik**
Submitted to the Faculty of Science, Cairo University

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Besides the work carried out in this thesis, the candidate: **Nabila Helmy Shafik** has attended post-graduate courses for partial fulfilment of the requirements of M.Sc. degree in the following topics.

1- Heterocyclic Chemistry.

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5- Organic Photochemistry.

6- Pericyclic Reactions.

7- Natural Products.

8- Biochemistry.

9- Polymer Chemistry.

10- Functional Group Analysis.

11- Quantum Chemistry.

12- Instrumental Analysis.

13- New Trends in Analytical Chemistry.

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ABSTRACT

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Title of the M.Sc. Thesis:

"CHEMICAL STUDIES ON THE CONSTITUENTS OF SOME LOCAL PLANTS"

Degree: M.Sc., Faculty of Science, Cairo University, 2001.

This work has been carried out to investigate the chemical constituents especially the phenolic and flavonoid components extracted from *Acalypha Wilkasiana* (family Euphorbiaceae) using different physical and chemical methods of investigation.

Key words:

Acalypha Wilkasiana, Euphorbiaceae, phenolic , flavonoid, tannins, physical investigations, chemical investigations.

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ABBREVIATIONS

b.	Blue
br.	Brown
Co-PC	Comparative paper Chromatography
d.	Dark
EAC	Ehrlich ascites carcinoma
f.	Faint
Fig.	Figure
gr.	Green
MS	Mass Spectroscopy
NMR	Nuclear magnetic resonance
Sh	Shoulder
TDPC	Two- dimensional paperchromatography
TLC	Thin –layer chromatography
UV	Ultra Violet
v.	Violet
y.	Yellow

CONTENTS

SUMMARY AND CONCLUSION

Summary and Conclusion

The aim of this thesis deals with the study of the chemical structure of polyphenolic constituents and their glycosides isolated from the leaves of *Acalypha wilkasiana* (Euphorbiaceae). This plant has been selected to be the subject of this thesis due to its economic importance in folk medicine or in pharmacological uses and its scarce reports in the current literature.

The leaves of *Acalypha wilkasiana* were air- dried, ground and extracted with hot acetone then further with hot water.

The acetone extract (A_h) was applied onto a Sephadex LH-20 column, whereby four fractions were obtained.

The first fraction showed to contain complex pattern of polyphenolic constituents in minute amounts which could not be easily identified.

Investigation of the second fraction led to the identification of two tannins, one of them is new and identified as 1-O-galloyl-2,4-DHHDP-3,6-valonyl-α-L-glucopyranose (A_1) and the second as 1-O-galloyl-2,4-DHHDP-3,6-HHDP-α-L-glucopyranose (A_2) [geraniin].

From the third fraction, 1-O-galloyl-2,3-HHDP-β-D- glucopyranose (A_3) was isolated and identified.

The fourth fraction desorbed from the column proved to contain mainly phenolic acids and esters which were identified as ellagic acid (A_4), gallic acid (A_5), methyl gallate (A_6) and ethyl gallate (A_7).

The dried hot water extract was further extracted with ethyl acetate. The concentrated ethyl acetate extract (A_e) was applied onto a polyamide column and eluted with water and water/ethanol mixtures with gradual increase in concentration, whereby 9 fractions were obtained.

The first fraction showed to contain mainly free sugars which were identified as: glucose, galactose, rhamnose and arabinose.

Investigation of the second fraction led to the identification of a new flavonoid glycoside: kaempferol-3-O-α-L-rhamnosyl-(1→2)-β-D-galactosyl-(1→6)-α-L rhamnoside (A_8).

From the third fraction, another new flavonoid glycoside, kaempferol-3-O-α-L-rhamnosyl(1→6)-β-D-glucosyl(1→6)-β-D-glucoside (A_9), was purely isolated and identified.

Detailed studies of the fourth fraction led to the isolation and identification of two glycosidic flavonoids namely: kaempferol-3-O-β-D-glucosyl (1→ 2)-β-D-galactoside (A_{10}) and the new one kaempferol-3-O-β-D-arabinopyranoside -4`-O-α-L- rhamnoside (A_{11}).

From fraction five two kaempferol diglycosides were isolated and identified as kaempferol-3-O-α-L-rhamnosyl-(1→ 6)-β-D-galactoside (A_{12}) and kaempferol-3-O-β-D-glucosyl-(1→ 6)-β-D-glucoside (A_{13}).

Four kaempferol monoglycoside namely kaempferol-3-O-α-L-rhamnoside (A_{14}) and kaempferol-3-O-α-L-arabinoside (A_{15}) were isolated and identified from