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THESIS

ENTITLED

CHEMICAL STUDIES ON SOME EGYPTIAN PLANTS BELONGING TO FAMILIES COMPOSITAE AND LEGUMINOSAE

Submitted by

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(M. Sc. Cairo University)

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For

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Faculty of Science

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APPROVAL SHEET FOR SUBMISSION

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SUMMARY

ABSTRACT

Name: Ahmed Hamed Mohamed Gaara

Title of Thesis: "Chemical Studies On Some Egyptian Plants Belonging To Families *Compositae* and *Leguminosae*"

Dgree (Ph. D.): Thesis, Faculty of Science, Cairo University, 2001

This work has been carried out to investigate the chemical constituents of four Egyptian plants namely, *Iphiona scabra, Senecio desfontainei* (Fam. Compositae), *Erythrina indica* (Fam. Leguminosae), and *Jasonia montana* (Fam. Compositae).

Key Words: *Iphiona scabra, Senecio desfontainei, Erythrina indica,* Sterols, Terpenes, Coumarins, and Flavonoids.

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ARABIC SUMMARY

SUMMARY

SUMMARY

CHEMICAL STUDIES ON SOME EGYPTIAN PLANTS BELONGING TO FAMILIES COMPOSITAE AND LEGUMINOSAE

The work described in this thesis has been undertaken with the objective of searching for naturally occurring substances of potential biological activities in Egyptian flora. Through this investigation a useful information were derived from the application of the modern techniques of chromatography (column, paper and thin layer chromatography) and spectral measurments including UV, IR, MS, ^{1}H and ^{13}C-NMR, and also ^{1}H, ^{13}C- and $^{1}H,^{1}H$-COSY.

The introductory part of this thesis comprises a brief account of the coumarins, their commoner structural types encountered in nature and some biological properties. Also, the introductory part comprises a brief account of the flavonoids, their commoner structures, methods of isolation and identification. The theoretical part of the thesis described the original work carried out and is summarized under the following titles:

CHAPTER I

The chemical constituents of the aerial parts of *Iphiona scabra*

This work deals with the chemical constituents of the aerial parts of *Iphiona scabra* (Fam. Compositae) with the object of searching for some

naturally occurring substances with expected biological properties which have been previously found in related compositae plants.

The aerial parts of *Iphiona scabra* were exhaustively extracted with ethanol and the ethanolic extract was fractionated into an unsaponifiable fraction and coumarin fraction.

Investigation and identification of the unsaponifiable fraction

By chromatographic fractionation on silica gel column, the unsaponifiable fraction was eluted with petroleum ether (40-60 °C) and petroleum ether-benzene in ratio (1:1) which afforded waxy hydrocarbons.

Elution of the column with pet. ether (40-60 °C) and benzene in ratio (1:4) and benzene alone afforded colourless crystalline identified to be α-amyrin (**XCLVIII**, Chart 3).

Elution of the column with benzene alone and mixtures of benzene and methanol in different ratios gave two products: the first product was identified as stigmasterol (**CXLIX**, Chart 3) and the second was identified as β-sitosterol (**CL**, Chart 3).

Investigation and identification of the coumarin fraction

The coumarin fraction was also fractionated on a silica gel column. The early fraction eluted from the column with pet. ether (40-60 °C) and pet. ether:benzene in ratio (1:1) gave waxy hydrocarbons.

Further elution in ratios (0.5 %, 1 % and 2%) revealed the presence of three distinct spots with different R_f values and using preparative paper chromatography led to the isolation of three products. The first might be