"Phytochemical Study on Some Local Plant Species Belonging to Genera *Sisymbrium, Suaeda, Caesalpinia and Conocarpus*".

THESIS

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(M.Sc.) Chemistry

For Ph. D. Degree In Chemistry

Supervised

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Title of Ph. D. Thesis: "Phytochemical Study on Some Local Plant Species Belonging to Genera *Sisymbrium, Suaeda, Caesalpinia and Conocarpus"*.

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ABSTRACT

Name: Ali Mohamed Ali El-Hagrasi

Title of the thesis: "Phytochemical Study on Some Local Plant Species Belonging to Genera *Sisymbrium, Suaeda Caesalpinia and Conocarpus".*

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Twenty four phenolic and flavonoid compounds were isolated and their structures were elucidated by chemical methods and physical tools like UV spectrophotometry with shift reagents, MS, ^{1}H , ^{13}C - NMR and 2-D spectroscopy. Also, the fatty acid, sterol and hydrocarbon contents were also studied in addition to the biological activity of the methanolic extracts of the selected plants .

Key words : *Caesalpinia pulcherrima, L. Sisymbrium irio L. Conocarpus erectus L. Suaeda pruinosa* Forssk flavonoids, flavanols, flavanones, GLC analysis, antioxidant activity, antimicrobial activity and cytotoxic activity for each methanolic extract

Supervisors: Signature

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Ali Mohamed El - Hagrasi

List of Abbreviations

PC : Paper chromatography.

CC : Column chromatography.

PPC : Preparative paper chromatography.

GLC : Gas Liquid chromatography.

UV : Ultraviolet Visible spectrophotometry

MS : Mass spectrometry.

EI-MS : Electron ionization-Mass spectrometry.

ESI-MS : Electrospray Ionization Mass spectrometry.

1D-NMR : One-Dimensional Nuclear Magnetic Resonance.

2D-NMR : Two-Dimensional Nuclear Magnetic Resonance.

^{1}H – NMR : Proton Nuclear Magnetic Resonance.

^{13}C-NMR : ^{13}C-Nuclear Magnetic Resonance.

^{1}H, ^{1}H COSY : Homonuclear proton-proton Correlation Spectroscopy.

COSY : Correlation Spectroscopy.

HMBC : Heteronuclear Multiple Bond Connectivity.

HMQC : Heteronuclear Multiple Quantum Coherence.

DEPT : Destrostionless Enchancement Polarization Transfer.

s : singlet

d : doublet

m : multiplet

b : broad.

J : Coupling constant

M HZ : Mega-Hertz

δ : Chemical shift.

R.t. : Retention time .

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Aim of the work

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Egypt is one of the most important countries in the field of exportation of medicinal plants especially to Europe as well as surrounding regions. More two thousand species of medicinal and aromatic plants are growing in the Egyptian deserts which create a base of raw materials exploited for drug production.

The huge number of medicinal plants and their importance in the field folk medicine encourage the chemists to look after the chemical constituents, isolation and identification of their biologically active metabolites. Phenolic and flavonoid compounds form the largest group of natural products and receive increasing interest as they are believed to be biologically active.

The aim of this work is to study the phenolic constituents of *Caesalpinia pulcherrima* L. *(Fabeacae)*, L. *Conocarpus erecatus* L. *(Combreateace), Sisybrium irio* L. *(Cruciferae) Suaeda pruinosa* Forssk. *(Chenopodiaceae)* through:

- Extraction of plant constituents by using suitable organic solvents and concentration of these extracts to be used.
- Isolation of the phenolic compounds by suitable and different methods of the isolation such as column chromatography containing polyamide or silica gel; purification of the isolated compounds by paper chromatography or sephadex LH-20.
- Elucidation of the chemical structure of the pure isolated phenolic compounds following standard methods of identification such as

chemical methods (acid, alkaline, enzymatic hydrolysis, ……etc), physical methods as spectroscopic analysis (IR, UV and NMR spectroscopy) and recent techniques in mass spectrometery.

- Study of the fatty acid, hydrocarbon and sterol constituents of these samples.
- Testing of the biological activity of the methanolic extracts of these samples to evaluate the investigated plants for cultivation and utilization.