# بسم الله الرحمن الرحيم


MONA MAGHRABY

# شبكة المعلومات الجامعية

# التوثيق الالكتروني والميكروفيلم

MONA MAGHRABY

شبكة المعلومات الجامعية

التوثيق الإلكتروني والميكروفيلم

# جامعة عين شمس

# التوثيق الإلكتروني والميكروفيلم

# قسم

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***MONA MAGHRABY***

# Phytochemical and Biological Studies on Certain Plants Belonging to Family Fabaceae

A Thesis Submitted

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By

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## Abstract

# Phytochemical and Biological Studies on Certain Plants Belonging to Family Fabaceae

The gastroprotective activity of the dichloromethane soluble fraction of *Adenanthera pavonina* leaves methanol extract (APD) was investigated against ethanol-induced gastric ulceration in rats. APD markedly increased the mucin content, PGE2 production compared with the ulcer control group. APD (50 and 100 mg/kg) pretreatment markedly increased GSH and catalase levels when compared with the ulcer group. Furthermore, APD significantly decreased the elevated MDA tissue levels, which was induced by ethanol administration. The results demonstrated that APD exhibited potent anti-inflammatory activity as the level of TNF-α returned to its normal value in the group pretreated with 100 mg/kg of APD and this effect was higher than omeprazol. The gastoprotective activity was further confirmed by markedly reduction of NFκB, COX-2 and iNOS immunoexpression in groups pretreated with APD.

Phytochemical investigation of dichloromethane fraction of *Adenanthera pavonina* leaf resulted in isolation of coumesterol dimethyl ether (1), formononetin (2), biochanin A (3), genistein (4), kaempferol (5), apigenin (6) and daidzein (7). Our results suggested that the dichloromethane soluble fraction of *Adenanthera pavonina* leaves methanol extract could be developed as a gastroprotective dietary supplement or functional food due to different isoflavone compounds.

GC–MS analysis revealed the presence of 21 components representing 97.9% of the oil content of *A. pavonina* leaves and 14 components representing 98.7% of the oil content of fruits. This result summarized the chemical profiles of *A. pavonina* leaves and fruits essential oils growing in Egypt for the first time. The leaves essential oils of *A. pavonina* demonstrated different composition compared with the oils from the fruits.

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# LIST OF ABBREVIATIONS

| | |
|---|---|
| **α** | alpha |
| ***δ* value** | chemical shift (ppm) |
| **µg** | microgram |
| **µM** | micromole |
| **ANOVA** | analysis of variance |
| **APB** | Butanol soluble fraction of *Adenanthera pavonina* leaves methanol extract. |
| **APD** | Dichloromethane soluble fraction of *Adenanthera pavonina* leaves methanol extract |
| **APH** | Hexane soluble fraction of *Adenanthera pavonina* leaves methanol extract |
| **APLT** | *Adenanthera pavonina* leaves total methanol extract |
| **APT** | Attached proton test |
| **ATCC** | American Type Culture Collection |
| **bw** | body weight |
| **CC** | column chromatography |
| **$CD_3OD$** | deuterated methanol-$d_4$ |
| **$CH_2Cl_2$** | dichloromethane |
| **$CHCl_3$** | chloroform |
| **cm** | centimeter |
| **CNS** | central nervous system |
| **COX-2** | cyclooxygenase enzyme -2 |
| ***d*** | doublet |
| **DCM** | dichloromethane |
| **Dil** | dilute |
| **DMSO-$d_6$** | deuterated dimethylsulfoxide-$d_6$ |
| **DPPH** | 2,2-diphenyl-1-picrylhydrazyl radical |
| **ELISA** | enzyme linked immunosorbent assay |
| **ESI** | electrospray ionization |
| **EtOAc** | ethyl acetate |
| **EtOH** | ethanol |
| **g** | Gram |
| **GSH** | glutathione |
| **h** | hour |
| **HCT116** | human colorectal carcinoma cell lines |
| **HEPES** | N-2-hydroxyethylpiperazine-N-2′-ethanesulfonic acid |
| **HNE** | Human neutrophil elastase |
| **HPLC** | high performance liquid chromatography |
| **HSP** | heat shock protein |
| **Hz** | Hertz |

| | |
|---|---|
| **i.p** | intraperitoneal |
| **$IC_{50}$** | inhibitory concentration by 50% |
| **ID** | internal diameter |
| **INF** | interferon |
| **iNOS** | inducible nitric oxide synthase |
| ***J* value** | coupling constant |
| **kg** | kilogram |
| **l** | liter |
| **LPS** | lipopolysaccharide |
| **m** | meter |
| ***m/z*** | mass to charge ratio |
| **MDA** | malondialdehyde |
| **MeOH** | methanol |
| **mg** | milligram |
| **MHz** | mega Hertz |
| **MIC** | minimum inhibitory concentration |
| **min** | minute |
| **ml** | milliliter |
| **mM** | millimole |
| **mm** | millimeter |
| **MS** | mass spectrometry |
| **MTT** | microculture tetrazolium assay |
| **NF-κB** | nuclear factor kappa B |
| **nm** | nanometer |
| **NMR** | nuclear magnetic resonance |
| **NO** | nitric oxide |
| **PC** | paper chromatography |
| **PDA** | photodiode array |
| **Pet. ether** | petroleum ether |
| **$PGE_2$** | prostaglandin $E_2$ |
| **PNPG5** | P-Nitrophenyl-α-D-maltopentaoside |
| **ppm** | part per million |
| **ROS** | reactive oxygen species |
| **rpm** | rotation per minute |
| ***s*** | singlet |
| **TLC** | thin layer chromatography |
| **TMS** | tetramethylsilane |
| **TNF-α** | tumor necrosis factor alpha |
| **$t_R$** | retention time |
| **UV** | ultraviolet |
| **VLC** | vacuum liquid chromatography |