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

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علي هذه الأقراص المدمجة قد أعدت دون أية تغيرات

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MONA MAGHRABY

BIOCHEMICAL STUDIES ON *Moringa oleifera* AND *Azadirachta indica* EXTRACTS, AND THEIR GREEN-CHEMICALLY SYNTHESIZED NANOPARTICLES

By

MOSTAFA AHMED ABDULMAGEED

B.Sc. Agric. Sci. (Biotechnology), Fac. Agric. Cairo Univ., 2016

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Title of Thesis: Biochemical studies on *Moringa oleifera* and *Azadirachta indica* extracts, and their green-chemically synthesized nanoparticles

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ABSTRACT

The present study was carried out to evaluate the different biochemical activities of *Moringa oleifera* and *Azadirachta indica* extracts, and their green-chemically synthesized nanoparticles. Chemical composition of dried Moringa and Neem leaves was determined on dry matter which amounted good values of protein, nitrogen free extracts, lipids, ash and minerals. Also, HPLC analysis of Moringa and Neem leaves for the phenols content showed the presence of about 14 compounds in Moringa leaves and 10 compounds in Neem leaves, varying in amount between them. Ag-NPs were prepared in a new developed green-chemically method, and they were characterized by different analytical devices. The antioxidant activity of successive extracts from Moringa and Neem leaves, crude aqueous extracts and synthesized Ag-NPs was determined by DPPH, ABTS and FRAP assays. The antimicrobial activity of successive extracts from Moringa and Neem leaves, crude aqueous extracts and synthesized Ag-NPs was assessed against three Gram-positive species and four Gram-negative species of foodborne pathogenic bacteria; *Bacillus cereus, Staphylococcus aureus, Staphylococcus sciuri, Salmonella typhi, Salmonella enterica, Escherichia coli and Pseudomonas aeruginosa*, and eight phytopathogenic fungal species; *Aspergillus flavus, Aspergillus ochraceus, Aspergillus niger, Aspergillus westerdijikia, Aspergillus carbonarius, Aspergillus parasiticus, Penicillium verrucosum* and *Fusarium proliferatum*. Cytotoxicity of Ag-NPs and crude aqueous extracts was determined on macrophage cell line; RAW 264.7, and after lipopolysaccharide treatment, the anti-inflammatory activity was determined by nitric oxide assay. The previous determinations aimed to investigate the ability of Moringa and Neem crude aqueous extracts and green-chemically synthesized Ag-NPs to act as promising nutritional, microbiological and cell reinforcement agents.

Keywords: Moringa, Neem, Ag-NPs, Antioxidant, Anti-inflammatory, Antimicrobial, Nitric oxide, Macrophages cell line

DEDICATION

To whom, if I asked them for a star, they would carry the sky.
To the light I see through.
To whom I bring mountains for their sake unconstrained.
To my family.

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All thanks and praise are to God the all-wise, the all-knowing and the creator of this wonderful world.

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Special deep appreciation is given to my father, my mother, my brothers and sister.

LIST OF ABBREVIATIONS

No.	Abbreviation	
1.	ABTS	2,2′-azinobis (3-ethylebenzothiozoline-6-sulphonic acid
2.	Ag-NPs	Silver nanoparticles
3.	AIDS	Acquired immunodeficiency syndrome
4.	BHA	Butylated hydroxyl anisole
5.	BHT	Butylated hydroxyl toluene
6.	CF	Crude fiber
7.	CFU	Colony forming unit
8.	COX	Cyclooxygenase
9.	CRP	C-reactive protein
10.	CTCE	Carbon tetrachloride extract
11.	DEN-2	Dengue virus type 2
12.	DM	Dry matter
13.	DMBA-induced HBP	7,12-dimethylbenz[a]anthracene-induced hamster buccal pouch
14.	DMSO	Dimethyl sulfoxide
15.	DNA	Deoxyribonucleic acid
16.	DPPH	2, 2̀- diphenyl -1- picrylhydrazyl
17.	EPV	Epstein-Barr virus
18.	FRAP	Ferric reducing antioxidant power
19.	FTIR	Fourier-transform infrared spectroscopy
20.	GAE	Gallic acid equivalents
21.	GSH	Glutathione reductase
22.	HBV	Hepatitis B virus
23.	HepG2	Hepatocellular Carcinoma Cell Line
24.	HIV	Human immunodeficiency virus
25.	HPIV-3	Human parainfluenza virus type 3
26.	HPLC	High performance liquid chromatography
27.	HSV-1	Herpes simplex virus type 1
28.	IFN-γ	Interferon gamma
29.	IL-6	Interleukin-6
30.	i-NOS	inducible-Nitric Oxide Synthase
31.	LPS	Lipopolysaccharide
32.	LSD	Least significant difference

Cont.

LIST OF ABBREVIATIONS (continued)

No.	Abbreviation	
33.	MAPK	Mitogen-activated protein kinases
34.	MBC	Minimum bacterial concentration
35.	MIC	Minimum inhibitory concentration
36.	Mo-CBP	Moringa chitin-binding protein
37.	MTT	3-(4,5-Dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide
38.	NFE	Nitrogen free extract
39.	NFκB	Nuclear Factor kappa Light Chain Enhancer of Activated B Cells
40.	NO	Nitric oxide
41.	NPs	Nanoparticles
42.	OM	Organic matter
43.	PDA	Potato dextrose agar
44.	PGE2	Prostaglandin E2
45.	PU	Polyurethane foams
46.	QE	Quercetin equivalents
47.	ROS	Reactive oxygen species
48.	RPMI	Roswell Park Memorial Institute (Culturing medium)
49.	RSE	Rasberry extract
50.	RT	Radiotherapy or Room temperature
51.	SDGs	Sustainable development goals
52.	SPR	Surface plasmon resonance
53.	SE	Standard error
54.	TEM	Transmission Electron Microscopy
55.	TFC	Total flavonoid content
56.	Th	T cell- helper
57.	TNF	Tumor Necrosis Factor
58.	TP	Total protein
59.	TPC	Total phenolics content
60.	TPTZ	2,4,6-tripyridyl-s-triazine
61.	TSB	Tryptic soy broth
62.	UTI	Urinary tract infection
63.	YES	Yeast Extract with Supplements (Medium)

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