

BIOCHEMICAL STUDIES ON THE DIFFERENT EFFECTS OF SOME EGGPLANT EXTRACTS

By

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B.Sc. Agric. Sci. (Agricultural Biochemistry), Fac. Agric., Ain Shams Univ., 2001

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APPROVAL SHEET

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ABSTRACT

The effect of solvent polarity on the total phenols extracted from eggplant peel varieties as well as its antioxidant, antimicrobial and anticancer activity were studied. As the solvent polarity increases, the total of yield extract, total phenolic (TP) and total flavonoid (TF) increased. Phen-1,3-diol, 4,5,6-trimethoxy-2-propionyl (1.43-15.16%) and 1-Naphthalenol (1.58-14.73%) were the major compounds identified by GC/MS/MS in propan-2-ol and methanol extracts, respectively. Both methanol and propan-2-ol extracts exhibited higher antioxidant activities, DPPH radical scavenging activity and ferric reducing power (FRP), than n-hexane extract. Among eggplant varieties, TP and TF compounds obtained from peel of round black were higher than those obtained from long black and long purple varieties in all three solvents. All EPP successive extracts showed anticancer effects against both breast (MCF-7) and liver (HepG2) cancer cells, and it had the strongest inhibition against HepG2 cells, while it had moderate inhibition against MCF-7 cells. The methanol and propanol extracts showed high antibacterial activity, especially gram positive bacteria, while the hexane extract showed very low anti-bacterial activity, while all extracts showed an activity against fungus. Round black eggplant peel extract was the most active against both breast and liver cancer compared to other species. Methanol direct MD extract, which had lowest TP and TF content compared with methanol successive (MS0) extract, exhibited the highest DPPH radical scavenging activity and the highest FRP in all three EPP varieties. MD extracts had the strongest inhibition against breast cancer cell line (MCF-7 cells) with IC_{50} values ranging from 17.0-21.6 $\mu\text{g/ml}$, whereas MS extracts had the strongest inhibition against liver cancer cell line (HepG2 cells) with IC_{50} values ranging from 19.7-25.2 $\mu\text{g/ml}$. MD extract had higher antibacterial activity than MS extract against most Gram negative bacteria. The *F. solani* was more resistant to both MD and MS extracts than *A. niger*. However, MS extract exhibited antifungal activity against *F. solani* more than MD extract. Round black exhibited strong inhibition against HepG2 and MCF-7 cells in MS and MD extracts, respectively. The results of biological study show that eggplant peel extract can be used as a natural source to reduce weight and triglycerides, and thus protect against diabetes, heart disease and arteriosclerosis. Eggplant peel extract can also be used to reduce blood glucose level for diabetics, and in protecting the body from the symptoms resulting from diabetes, such as high levels of liver enzymes, urea and high oxidation rate in serum.

Key words: Solvent polarity, eggplant varieties, phenolic compounds, antioxidant activity, anticancer activity, antimicrobial activity, antidiabetic activity,

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LIST OF ABBREVIATIONS

µg	microgram
µmol	micromole
ALP	alkaline phosphatase
ALT	alanine aminotransferase
AST	aspartate aminotransferase
°C	degree centigrade
CE	catechin equivalents
dL	deciliter
EPP	eggplant peel
GAE	gallic acid equivalents
FRP	ferric reducing power
h	hour
Hb	hemoglobin
kg	kilogram
HDL	high density lipoproteins
LDL	low density lipoproteins
M	molar
MCF-7	breast cancer cell line
MCV	mean corpuscular volume
MD	methanol direct
MDA	malondialdehyde
HepG2	liver cancer cell line
MIC	minimum inhibition concentration
mg	milligram
mm	millimeter
mmol	millimole
MS	methanol successive
PDA	potato dextrose agar
RBCs	red blood cells
SD	standard deviation
STZ	streptozotocin
TPC	total phenolic content
TFC	total flavonoid content
WBCs	white blood cell

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