BIOCHEMICAL STUDIES ON SOME FRUIT WASTES AND THEIR USES IN NUTRITION

By

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B.Sc. Agric. Sci. (Biotechnology), Fac. Agric., Cairo Univ., 2003
M.Sc. Agric. Sci. (Agric. Biochemistry), Fac. Agric., Cairo Univ., 2011

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APPROVAL SHEET

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ABSTRACT

The chemical composition of banana peel (*Musa sapientum* and *Musa cavendish.*) was studied. The general analysis was found to be moisture 89.62 and 86.43, crude protein 12.48, and 7.65, total lipid 3.86 and 14.05, ash 18.5 and 12.26, crude fiber 14.61 and 16.36, total carbohydrate 65.16 and 66.04% of *Musa sapientum* and *Musa cavendish*, respectively.

The ash contained (mg/100g) Mg 95.25 and 66.68, Na 134.69and 81.71 Zn 0.8 and 1.63, Fe 3.87 and 2.11, Ca 106.9 and 45.12 and the major content was K 3804.73 and 2883.78 of *Musa sapientum* and *Musa cavendish*., respectively.

The phenolic compound contents (mg/100g) were found to be pyrogallol (31.98 and 63.98) catechein (21.55 and 16.33),gallic (.58 and 3.22),vanillic (2.94 and 4.46)ellagic (5.57 and 1.48), protocatchoic (1.22 and 3.09) and catechein (21.55 and 16.32) , E- vanilic(19.6 and 7.23) salycilic(25.53 and 1.13) of *Musa sapientum* and *Musa cavendish* peel., respectively.

The major flavonoid compound in *Musa sapientum* was quercetine (6.29 mg/100g). On the other hand, the major flavonoid compound in *Musa cavendish* was hespirdin (13.68mg/100g).

The fatty acid contents of fruit were found to be linolenic acid represent the major component (34.16 and 29.7 %) followed by linoleic (23.7 and 26.1%) and Palmitic (24.49 and 23.5%) in *Musa sapientum* and *Musa cavendish* peel., respectively.

Biological evaluation of (*Musa sapientum* and *Musa cavendish.*) the methanolic peel extracts had a significant effect as anti-hepatic injury on male albino rats and had antimicrobial effect against G+, G- bacteria and fungi. On the other hand, had no effect as anticancer. The hexanoic and ethyl acetate extracts have anticancer effect.

Key words: Banana peel, *Musa sapientum*, *Musa cavendish* , chemical analysis, fatty acid, phenolic compounds ,flavonoid compounds, antioxidants, anticancer, antimicrobial, anti hepatic injury.

DEDICATION

I dedicate this work to whom my heart felt thanks; my father, my mother , My husband , my Sister and my sons for their patience and help, as well as to my brothers for all the support they lovely offered along the period of my post graduation.

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LIST OF ABBREVIATIONS

A.O.A.C	Association of official analysis chemists
ALT	Alanine amino transeferase
AST	Aspartate amino transeferase
B. wt	Body weight
CAN	Acetonitrile
CCl_4	Carbon tetra chloride
CRD	Completely Randomized Designed
DGLA	dihomo-γ-linolenic acid
DMSO	Di methyl sulphoxide
DPPH	Di Phenyl Picryl Hydrazyl
DRI	Dietary Referance Intake
D.W	Dry wight
ESR	Electron Spin Resonance
Eth Aco Ex	Ethyl acetate extract
GAE	Gallic Acid Equivalents
GC/MS	Gas chromatography-mass spectrometry
GLA	γ-linolenic acid
GOT	Glutamic- oxaloacetic transaminase
GPT	Glutamic- pyruvic transaminase
HCT-116	Colonic cancer cell line
HDL-cholesterol	High density lipoproteins-cholesterol
Hep-G_2	Hepatic cancer cell line
HEx	Hexanoic extract
HPLC	High performance liquid chromatography
IC_{50}	The half maximal inhibitory concentration
LA	Linoleic acid
LDL-cholesterol	Low density lipoproteins-cholesterol
MBC	Minimum Bactericidal Concentration
MC	*Musa cavendish*
MeOH Ex	Methanol extracts
MIC	Minimum Inhibitory Concentration
MS	*Musa sapientum*
Musa sp.	*Musa species*
PGE_1	Prostaglandin E_1
RAE	Retinol activity equivalents
TFC	Total Flavonoid Content
TPC	Total Phenol Content
W Ex	Water extracts

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