



**STUDIES ON BIOCHEMICAL CHANGES IN
LIPIDS OF SOME MATURING AND
GERMINATING OIL SEEDS**

THESIS

**Submitted for the Degree of
Doctor of Philosophy**

in

Science (Botany)

BY

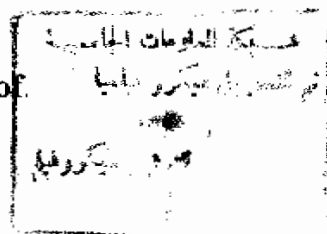
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APPROVAL SHEET
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Abstract

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Studies on biochemical changes in lipids of some
maturing and germinating oil seeds.
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In this study it was able to investigate the compositional changes of the different lipids (fatty acid, sterols, four sterol lipids, tocopherols, vitamin E and triglycerides) in maturing and germinating rape and cottonseeds. The three latter groups are of great importance in plants and have not been hitherto investigated by several investigators. It was found that there were marked changes in the amounts of lipids as well as in their compositional changes during maturation stages of each oil crop. Distinguishable changes in total amounts of lipids as well as their composition in germinating seeds (in cotyledon and axis) were also obtained under different conditions.

It was also found that GA_3 exerted very marked changes in the composition of different lipids in germinating rape and cottonseeds. In addition, salinity played a marked role in the seedling growth as well as the composition of their lipids. Advanced methods of analysis, recently developed, have been applied in the present investigation and accordingly helped too much in determining accurately the different individual lipid components even they were in minute quantities.

The lipid compositional changes in maturing and germinating seeds were interpreted in the frame of the known established metabolic pathways. On the basis of these changes in the different lipids in maturing seeds, the appropriate harvest time can be determined not only according to oil content of seeds but also to their lipid profiles during seed maturation as seed quality criterion. In addition, the compositional changes in the lipids of germinating seeds integrate with those occurring in maturing seeds during the plant life cycle of oilseed crops.



List of Abbreviations :

DAS	Days after sowing
DOG	Days of germination
FA	Fatty acid
TG	Triglyceride
MG	Monoglyceride
DG	Diglyceride
FFA	Free fatty acid
X	Linolenic acid
L	Linoleic acid
O	Oleic acid
P	Palmitic acid
S	Stearic acid
SG	Sterylglycoside
ASG	Acylated sterylglycoside
FSG	Free sterylglycoside
FS	Free sterol
AS	Acylated sterol
T	Tocopherol
GA ₃	Gibberellic acid

Key words:

Gossypium barbadense c.v. Giza75 (cottonseed) - *Brassica napus* c.v.AD201/81Gi(rapeseed)Maturation - Germination - Lipids - Fatty acid, Myristic acid(C_{14:0}), Palmitic acid (C_{16:0})-Palmitoleic acid(C_{16:1})-Stearic acid(C_{18:0}), Oleic acid (C_{18:1})- Linoleic acid (C_{18:2})- Linolenic acid (C_{18:3}) - Eicosanoic acid (C_{20:0}) - Eicosenoic acid (C_{20:1})- Eicosadienoic(C_{20:2})-Docosanoic acid(C_{22:0})-Docosenoic acid (C_{22:1})- Docosadienoic (C_{22:2})-Tetracosanoic(C_{24:0})-Tetracosenoic acid(C_{24:1})- Triglyceride - Monoglyceride - Diglyceride-Free fatty acid-Sterol-Free and acylated sterol-Free and acylated sterylglycoside-Cholesterol-Avenasterol- Isofucosterol- Stigmasterol- Brassicasterol- Campesterol- Beta-sitosterol-7-stigmasterol-Tocopherols-Alpha-tocopherol-Beta-tocopherol-Gamma-tocopherol-Delta-tocopherol-Gibberellic acid-Salinity.

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CONTENTS

	Page
General Introduction and Aim of Work.	1
Review of literature.	2
Materials and Methods.	20
Results and Discussions.	32
Part I Studies on Compositional Changes of Lipids During Seed Maturation of Rape and Cotton.	32
1- Changes of different lipid contents in maturing seeds.	33
i- Rapeseed	33
ii- Cottonseed	34
2- Compositional changes of different lipid profiles in maturing seeds.	35
A- Fatty acid	35
i- Rapeseed	36
ii- Cottonseed	38
B- Triglyceride	40
i- Rapeseed	41
ii- Cottonseed	41
C- Whole sterol and sterol lipids.	42
C-1- Whole sterol	44
i- Rapeseed	44
ii- Cottonseed	45
C-2- Free and acylated sterol	45
i- Rapeseed	45
ii- Cottonseed	46
C-3- Free and acylated steryl glycosides	47
i- Rapeseed	47
ii- Cottonseed	49
D- Tocopherols	50
i- Rapeseed	50
ii- Cottonseed	51
Part II Studies on Compositional Changes of Different Lipids in Germinating Seeds and the Influence of GA ₃ on Such Changes During Germination and Seedlings Growth.	74
A- Rapeseed	77
1- Germination response	77
2- Oil content	77
3- The whole pattern of changes in lipid constituents of rapeseed treated with GA ₃ during germination and seedling growth.	78

80	4- Fatty acid profiles.
81	a- Control seeds
81	i- Cotyledon
81	ii- Axis
82	b- GA ₃ -treated seeds.
82	i- Cotyledon
82	ii- Axis
83	5- Triglyceride profiles
85	a- Control Seeds
85	i- Cotyledon
85	ii- Axis
85	b- GA ₃ -treated Seeds.
85	i- Cotyledon
85	ii- Axis
87	6- Whole sterol and sterol lipid patterns.
89	6-1- Whole sterol patterns.
90	a- Control seeds
90	i- Cotyledon
90	ii- Axis
91	b- GA ₃ -treated seeds
91	i- Cotyledon
91	ii- Axis
93	6-11- Free and acylated sterol patterns.
93	a- Control seeds
93	i- Cotyledon
93	ii- Axis
94	b- GA ₃ -treated seeds
94	i- Cotyledon
94	ii- Axis
97	6-111- Free and acylated sterlglycoside patterns.
97	a- Control seeds
97	i- Cotyledon
97	ii- Axis
98	b- GA ₃ -treated seeds
98	i- Cotyledon
98	ii- Axis
102	7- Tocopherol profiles.
102	a- Control seeds
102	i- Cotyledon
102	ii- Axis
103	b- GA ₃ -treated seeds.
103	i- Cotyledon
103	ii- Axis
104	B- Cottonseeds
104	1- Germination response
105	2- Oil content
105	3-The whole pattern of changes in lipid constituents of cottonseed
	in treated with GA ₃ during germination and seedling growth.

4- Fatty acid profiles.	108
a- Control seeds	108
i- Cotyledon	108
ii- Axis	108
b- GA ₃ -treated seeds	109
i- Cotyledon	109
ii- Axis	109
5- Triglyceride profiles.	112
a- Control seeds	112
i- Cotyledon	112
ii- Axis	112
b- GA ₃ -treated seeds	113
i- Cotyledon	113
ii- Axis	114
6- Whole sterol and sterol lipid patterns.	116
6-i- Whole sterol	116
a- Control seeds	116
i- Cotyledon	117
ii- Axis	117
b- GA ₃ -treated seeds	117
i- Cotyledon	117
ii- Axis	118
6-ii- Free and acylated sterol patterns	119
a- Control seeds	119
i- Cotyledon	119
ii- Axis	119
b- GA ₃ -treated seeds	120
i- Cotyledon	120
ii- Axis	120
6-iii- Free and acylated sterylglycoside patterns.	122
a- Control seeds	122
i- Cotyledon	122
ii- Axis	123
b- GA ₃ -treated seeds	124
i- Cotyledon	124
ii- Axis	124
7- Tocopherol profiles.	127
a- Control seeds	127
i- Cotyledon	127
ii- Axis	127
b- GA ₃ -treated seeds	128
i- Cotyledon	128
ii- Axis	128

Part III	Compositional Changes of Different Lipids in Rape and Cotton	
	Seedlings as Affected by Low Salinity Levels.	152
	A- Compositional changes of lipids in rape seedlings.	155
	i- Fatty acid	155
	ii- Free and acylated sterol	156

156	iii- Free and acylated sterylglycosides
158	B- Compositional changes of lipids in cotton seedlings.
158	i- Fatty acid
158	ii- Free and acylated sterol
160	iii- Free and acylated sterylglycoside.
172	Summary
172	Bibliography
179	Arabic Summary