



Determination of the activities of lipase collected from plant sources

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**A thesis submitted in the partial fulfillment of the requirements for the degree of
Master of Science in Applied Human Nutrition & Dietetics**

Department of Applied Food Science and Nutrition

Faculty of Food Science and Technology

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June 2019

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This is to certify that we have examined the above Master's thesis and have found that is complete and satisfactory in all respects, and that all revisions required by the thesis examination committee have been made.

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Dedication

*I dedicate this small piece of work to my
beloved parents and husband*

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CONTENTS

Authorization-----	ii
Dedication -----	iv
Acknowledgements-----	v
Table of contents -----	vi-viii
List of Tables-----	ix
List of Figure-----	x
List of abbreviation-----	xi
Abstract-----	xii
Chapter 1: Introduction-----	01-03
Chapter 2: Review of Literature-----	04-10
2.1 Seed lipases-----	05
2.2 Oil seed lipases-----	06
2.3 Bean lipases-----	06
2.4 Coconut lipases (<i>cocosnuciferalinn</i>)-----	06
2.5 Rice bran lipase-----	07
2.6 Lipase applications-----	09
Chapter 3: Materials and Methods-----	11-44
3.1 Site selection for sample-----	11
3.2 Study place-----	11
3.3 Detection of the presence of residual lipase enzyme-----	11
3.3.1 List of chemical ingredients-----	11
3.3.2 Preparation of samples-----	11-13
3.3.3 Working principle of chemical ingredients-----	13
3.3.4 Process details-----	14
3.3.5 Flow diagram of the detection of the presence of residual lipase enzyme-----	15
3.4 Determination of the activities of lipase-----	16
3.4.1 Preparation of lipase acetone powder-----	16

3.4.1.1	List of chemical ingredients-----	16
3.4.1.2	Working principle of chemical ingredients-----	16
3.4.1.3	Process details of coconut lipase acetone powder preparation-----	17
3.4.1.3.1	Flow diagram of lipase acetone powder preparation (coconut)-----	18
3.4.1.3.2	Figures of lipase acetone powder preparation (coconut)-----	19
3.4.1.4	Process details of soya meat lipase acetone powder preparation-----	20
3.4.1.4.1	Flow diagram of lipase acetone powder preparation (soya meat)-----	21
3.4.1.4.2	Figures of soya meat lipase acetone powder preparation-----	22
3.4.1.5	Process details of bean seed lipase acetone powder preparation-----	23
3.4.1.5.1	Flow diagram of lipase acetone powder preparation (bean seed)-----	24
3.4.1.5.2	Figures of bean seed lipase acetone powder preparation-----	25
3.4.1.6	Process details pumpkin seed lipase acetone powder preparation-----	26
3.4.1.6.1	Flow diagram of lipase acetone powder preparation (pumpkin seed)-----	27
3.4.1.6.2	Figures of pumpkin seed lipase acetone powder preparation-----	28
3.4.2	Preparation of enzyme solution-----	29
3.4.2.1	List of chemical ingredients-----	29
3.4.2.2	Process details of enzyme solution preparation-----	29
3.4.2.3	Flow diagram of the preparation of lipase enzyme solution-----	30
3.4.3	Assay of enzyme activity-----	31
3.4.3.1	List of chemical ingredients-----	31
3.4.3.2	Primary preparations of chemical ingredients-----	31
3.4.3.3	Procedure for the assay of enzyme activity-----	32
3.4.3.3.1.1	Preparation of control and incubated solution of coconut enzyme-----	32
3.4.3.3.1.2	Flow diagram of the assay of enzyme activity of coconut enzyme-----	33
3.4.3.3.2	Enzyme activity of soya meat enzyme solution-----	34

3.4.3.3.2.1 Preparation of control and incubated solution of soya meat enzyme-----	34
3.4.3.3.2.2 Flow diagram of the assay of enzyme activity of soya meat enzyme-----	35
3.4.3.3.3 Enzyme activity of bean seed enzyme solution-----	36
3.4.3.3.3.1 Preparation of control and incubated solution of bean seed enzyme-----	36
3.4.3.3.3.2 Flow diagram of the assay of enzyme activity of bean seed enzyme-----	37
3.4.3.3.4 Enzyme activity of pumpkin seed enzyme solution-----	38
3.4.3.3.4.1 Preparation of control and incubated solution of pumpkin seed enzyme-----	38
3.4.3.3.4.2 Flow diagram of the assay of enzyme activity of pumpkin seed enzyme-----	39
3.4.4 Determination of the pH stability-----	40
3.4.5 Determination of the temperature stability-----	40
Chapter 4: Result-----	41-55
4.1 Detection of the presence of residual lipase enzyme in the samples-----	41-44
4.2 Activities of lipases-----	45-55
Chapter 5: Discussion-----	56-57
Chapter 6: Conclusion -----	58
Chapter 7: Recommendations and future perspectives-----	59
References-----	60-66
Appendix A: Figures of Sample-----	67
Brief Biography-----	68

List of Table

Table No	Title	Page No
2.1	The most studied seed lipases and their main features and biochemical properties	08
4.1	Results of the residual lipase detection test	41
4.2	Effect of heat treatment on the activities of coconut lipases at pH 8.0 (ppm/ml/hr)	46
4.3	Effect of heat treatment on the activities of coconut lipases at pH 7.0 (ppm/ml/hr)	46
4.4	Effect of heat treatment on the activities of Soya meat lipases at pH 7.0 (ppm/ml/hr)	47
4.5	Effect of heat treatment on the activities of Soya meat lipases at pH 8.0 (ppm/ml/hr)	47
4.6	Effect of heat treatment on the activities of Bean seed lipases at pH 8.0 (ppm/ml/hr)	48
4.7	Effect of heat treatment on the activities of Pumpkin seed lipases at pH 8.0 (ppm/ml/hr)	48
4.8	Activities of lipases at pH 8.0 (ppm/ml/hr)	49
4.9	Activities of lipases at pH 7.0 (ppm/ml/hr)	49
4.10	Activities of lipase at pH 6.0 (ppm/ml/hr)	50
4.11	Activities of lipase at pH 5.0 (ppm/ml/hr)	50
4.12	Activities of lipases at different pH on average (ppm/ml/hr)	51
4.13	Activities of lipases as heat treatment vs non-heat treatment at different pH (ppm/ml/hr)	53

List of Figure

Figure No	Title	Page No
3.1	Banana peel sample	12
3.2	Lentil sample	12
3.3	Mustard seed sample	12
3.4	Pumpkin seed sample	12
3.5	Soya meat sample	12
3.6	Winter melon seed sample	12
3.7	Orange peel sample	13
3.8	Eggplant sample	13
3.9	Bean seed sample	13
4.1	Detection of lipase enzyme in Banana peel	41
4.2	Detection of lipase enzyme in Lentil	42
4.3	Detection of lipase enzyme in Mustard seed	42
4.4	Detection of lipase enzyme in Pumpkin seed	42
4.5	Detection of lipase enzyme in Soya meat	43
4.6	Detection of lipase enzyme in Winter melon seed	43
4.7	Detection of lipase enzyme in Orange peel	43
4.8	Detection of lipase enzyme in Eggplant	44
4.9	Detection of lipase enzyme in Bean seed	44
4.10	Effect of heat treatment on the activities of coconut lipases at pH 9.0 (ppm/ml/hr)	45
4.11	Effect of pH on activity of lipases isolated from coconut, soya meat, bean seed and pumpkin seed	52
4.12	Activities of lipases in heat treatment at different pH	54
4.13	Activities of lipases in non-heat treatment at different pH	55

List of Abbreviation

Words	Abbreviation
FFA	Free Fatty Acid
CF	Cystic Fibrosis
UV-probe	Ultraviolet-probe
PPM	Parts Per Million
VIS	Visible
LMW	Low Molecular Weight
EDTA	Ethylene-Diamine-Tetra-Acetic Acid

ABSTRACT

Lipases are ubiquitous in nature and are produced by several plants which are available in Bangladesh. These enzymes exhibit several important features, such as low cost and easy purification, which make their commercial exploitation as industrial enzymes as a potentially attractive alternative. In this study, nine samples of plant origin (banana peel, orange peel, pumpkin seed, winter melon seed, mustard seed, eggplant, lentil, bean seed and soya meat) were screened to identify the presence of lipase enzyme in them. The result showed that except banana peel all the other plant sources were containing lipase. The study also conducted the assay of colorimetric micro-determination of fatty acids released to copper salt enabled the activity of crude enzyme extract on olive oil as substrate under different environment condition providing range of pH from pH 5.0- pH 8.0 and temperature range was from 25°C to 40°C. Four lipase containing plant samples (coconut, soya meat, bean seed and pumpkin seed) were experimented to determine their lipase activities to specify their acid and heat stability. The result showed, the coconut lipase was heat stable and suitable for alkaline environment; only the bean seed lipase was active in both acidic and alkaline environment, but it was highly heat sensitive. The soya meat lipase was only active at pH 8.0, was suitable in alkaline medium and highly heat sensitive, and the pumpkin seed lipase was heat sensitive and suitable for alkaline medium. The coconut enzyme acted maximally at 38°C and had optimum pH of 8.0. So, the coconut enzyme can be used at alkaline environment at this temperature in different food industry such as dairy industry, baking industry, tea industry, oil and fat industry and so on for flavor enhancement, emulsification, cheese ripening and many other purposes. The bean seed lipase acted in both the acidic and alkaline medium, so this enzyme can be used in both the high and low acidic pH medium. This study should be further experimented for identifying the purification and isolation of coconut and bean seed lipase enzymes (at least) in future for using these enzymes in the industrial fields in a great amount.

Key words: Lipase, lipolytic activities, colorimetric micro-determination, crude enzyme extract, acid stability, heat stability.