DEDICATION

This thesis is dedicated to the people I love and respect for their untiring support and encouragement

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ABBREVIATIONS

µg	microgram
µl	microliter
1-DE	one-dimensional electrophoresis
2-DE	two-dimensional electrophoresis
APS	ammonium persulphate
BCA	bichinchoninic acid
CHAPS	3-(3-cholamidopropyl)-dimethylammonio-propane-sulfonate
cm	centimetre
DTT	dithiothreitol
et al.	Et alia (and others)
IEF	isoelectric focusing
IPG	immobilize pH gradient
kDa	kilo Dalton
l	litre
M	molar
mg	milligram
ml	millilitre
mM	millimolar
nm	nanometre
PAGE	polyacrylamide gel electrophoresis
pI	isoelectric point
RT	room temperature
SDS	sodium dodecyl sulphate
SDS-PAGE	sodium dodecyl sulphate-polyacrylamide gel electrophoresis
TEMED	N,N,N',N'-tetramethylethylenediamine

V	voltage
Vhr	volt-hour

ABSTRACT

Proteomics has been applied in various fields such as in medicine and pharmaceutical. Although proteomics has been introduced for almost a decade, the application of proteomics to protein expression in plants can still be considered as new. This present study is aimed at proteins that are involved in leaves senescence. Proteins were extracted from the leaves of the kesum plants at different age. The extracted protein samples were then subjected to separation on one-dimensional electrophoresis (1-DE) and 2-DE. Separation was performed on broad range pH (pH 3-10) gels of 7 cm and narrow range pH (pH 4-7) gels of 7 cm and 18 cm. The gels were silver stained and results showed that the narrow range gels offered a better resolution of spots. The established 2-DE protein profiles were then analysed using PDQUEST^{TM}. A total of 223 protein spots were detected in the four weeks old kesum protein sample. In the six weeks old and eight weeks old sample, 200 and 100 protein spots were detected respectively. From quantitative analysis, at least nine protein spots were up-regulated in the six weeks old sample in comparison with the four weeks old sample and four protein spots were up-regulated in the eight weeks old sample in comparison with the six weeks old sample. On the other hand, eight proteins spots were down-regulated in the six weeks old sample in comparison with the four weeks old and another six protein spots were down-regulated in the eight weeks old sample in comparison with the six weeks old sample. These differentially expressed proteins may play a role in plant growth and maturation, or plant senescence. These proteins should be further identified and characterized as it will help to better understand the function and role of these proteins in leave senescence or its possible involvement in metabolic pathways of secondary metabolites.