DECLARATION

I declare that the thesis entitled “Ameliorative effect of Hederagenin from Sapindus trifoliatus L. in in vitro and in vivo model for Type 2 diabetes mellitus and NAFLD” submitted by me for the Degree of Doctor of Philosophy is the record of work carried out by me during the period from January, 2010 to February, 2014 under the guidance and supervision of Dr. R. Dhamotharan, Associate Professor in Botany, PG and Research Department of Plant Biology and Plant Biotechnology, Presidency College (Autonomous), Chennai- 5 and has not formed the basis for the award of any degree, diploma, associateship, fellowship, titles in this University or any other University or other similar institution of Higher Learning.

Chennai 600 005

(P.VINITHA LAKSHMI)
This thesis is dedicated to Dr. G. K. Kumar, who taught me the value of Ph.D., and without whom (Life) science would be a Greek and Latin. I am deeply indebted to him for continued support and unwavering faith in me.
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<tbody>
<tr>
<td>ATCC</td>
<td>American Type Culture Collection</td>
</tr>
<tr>
<td>AUC</td>
<td>Area under Curve</td>
</tr>
<tr>
<td>BSA</td>
<td>Bovine Serum Albumin</td>
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<tr>
<td>CHO</td>
<td>Chinese Hamster Ovary cells</td>
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<tr>
<td>CO$_2$</td>
<td>Carbon Di Oxide</td>
</tr>
<tr>
<td>DM</td>
<td>Diabetes mellitus</td>
</tr>
<tr>
<td>DMEM</td>
<td>Dulbecco's Modified Eagles Medium</td>
</tr>
<tr>
<td>DMSO</td>
<td>Dimethyl Sulfoxide</td>
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<tr>
<td>DNA</td>
<td>Deoxyribo Nucleic Acid</td>
</tr>
<tr>
<td>DPP IV</td>
<td>Dipeptidyl peptidase IV</td>
</tr>
<tr>
<td>ED$_{50}$</td>
<td>Effective Dose</td>
</tr>
<tr>
<td>EDTA</td>
<td>Ethylene Diamine Tetra Acetic Acid</td>
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<tr>
<td>ELISA</td>
<td>Enzyme Linked Immunosorbent Assay</td>
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<tr>
<td>ESR</td>
<td>Eosinophilic Sedimentation Rate</td>
</tr>
<tr>
<td>FBS</td>
<td>Foetal Bovine Serum</td>
</tr>
<tr>
<td>H$_2$SO$_4$</td>
<td>Sulphuric Acid</td>
</tr>
<tr>
<td>H$_3$PO$_4$</td>
<td>Phosphoric Acid</td>
</tr>
<tr>
<td>Hb</td>
<td>Haemoglobin</td>
</tr>
<tr>
<td>His</td>
<td>Histidine</td>
</tr>
<tr>
<td>HPLC</td>
<td>High Performance Liquid Chromatography</td>
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<tr>
<td>HPTLC</td>
<td>High Performance Liquid Chromatography</td>
</tr>
<tr>
<td>HQC</td>
<td>High Quality Control Sample</td>
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<tr>
<td>HRP</td>
<td>Horse Raddish Peroxidase</td>
</tr>
<tr>
<td>IP</td>
<td>Intra Peritoneal</td>
</tr>
<tr>
<td>IU</td>
<td>International Units</td>
</tr>
<tr>
<td>IAEC</td>
<td>Institute of Animal Ethics Committee</td>
</tr>
<tr>
<td>IC$_{50}$</td>
<td>Inhibitory Concentration</td>
</tr>
<tr>
<td>IFN</td>
<td>Interferon</td>
</tr>
<tr>
<td>IL</td>
<td>Interleukin</td>
</tr>
<tr>
<td>IR</td>
<td>Infra red</td>
</tr>
<tr>
<td>KBr</td>
<td>Potassium Bromide</td>
</tr>
<tr>
<td>KCl</td>
<td>Potassium Chloride</td>
</tr>
<tr>
<td>KCL</td>
<td>Potassium Chloride</td>
</tr>
<tr>
<td>KH$_2$PO$_4$</td>
<td>Potassium Di Hydrogen Phosphate</td>
</tr>
<tr>
<td>LC MS/MS</td>
<td>Liquid Chromatography Mass Spectroscopy</td>
</tr>
<tr>
<td>LN$_2$</td>
<td>Liquid Nitrogen</td>
</tr>
<tr>
<td>LPS</td>
<td>Lipopolysaccharide</td>
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<tr>
<td>MgCl$_2$</td>
<td>Magnesium Chloride</td>
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<tr>
<td>MTT</td>
<td>5-diphenyltetrazolium bromide (MTT)</td>
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<td>Na$_2$CO$_3$</td>
<td>Sodium Bicarbonate</td>
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<td>Na$_2$HPO$_4$</td>
<td>Di Sodium Hydrogen Phosphate</td>
</tr>
<tr>
<td>NaCl</td>
<td>Sodium Chloride</td>
</tr>
<tr>
<td>NADPH</td>
<td>Nicotinamide Adenine Diphosphate</td>
</tr>
<tr>
<td>NAFLD</td>
<td>Non alcoholic Fatty Liver Disease</td>
</tr>
<tr>
<td>NaHCO$_3$</td>
<td>Sodium Carbonate</td>
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<tr>
<td>NaN$_3$</td>
<td>Sodium Azide</td>
</tr>
</tbody>
</table>
NaOH - Sodium Hydroxide
NMR - Nuclear magnetic resonance
NOAELs - No Observed Adverse Effect Levels
O.D - Optical Density
PBS - Phosphate Buffered Saline
PO - Per Oral
RBC - Red Blood corpuscles
R<sub>f</sub> - Relative factor
RLM - Rat Liver Microsomes
RPMI - Roswell Park Memorial Institute
RT - Room Temperature
S.E.M - Standard Error Mean
SAv-HRP - Streptavidin Horse Radish Peroxidase
SDS - Sodium doedecyl sulphate
TANUVAS - Tamil Nadu University of Veterinary animal science
TLC - Thin Layer chromatography
TNF-Î± - Tumour Necrosis Factor alpha
TPA - 12-O-Tetra Decanoyl Phorbolacetate
UV - Ultra Violet
WBC - White Blood Cells

**UNITS OF MEASURE**

% - Percentage
δ - Delta
µg - Microgram
µl - Microlitre
°C - Degree Celsius
cm - Centimetre
cm<sup>-1</sup> - Per Centimeter
IC<sub>50</sub> - Inhibition Concentration
L - Litre
mg - Milligram
MHz - Mega Hertz
ml - Millilitre
mm - Millimeter
Mm - Milli Molar
mV - milli Volts
ng - Nanogram
nm - Nanometer
NM - Nano Molar
Pg - Picogram
ppm - Parts Per
rpm - Revolutions Per Minute
w/w - Weight by weight