

LIST OF FIGURES

Chapter No.	Figure No.	Title of Figure	Page No.
Chapter – 1: Introduction			
1	1.1(A)	The inflammatory cascade	8
	1.1(B)	The inflammatory cascade	9
Chapter – 2: Literature review			
2	2.1 (A, B)	Morphology of <i>Calotropis procera</i>	21
	2.2	Morphology of <i>Rosa indica</i>	25
	2.3	Morphology of <i>Adhatoda vasaka</i> plant	28
Chapter – 3: Aim and Objectives			
Chapter – 4: Preparation of extracts, Qualitative and Quantitative Analysis			
4	4.1	Steps of HPTLC working	58
	4.2	CAMAG instruments and tools (Basic kit)	60
	4.3	Sample application (Semi-automatic)	60
	4.4	Sample application (Automatic)	60
	4.5	Plate development -Automatic developing chamber ADC2	61
	4.6	Derivatizer	61
	4.7	Detection- TLC Scanner 4	63
	4.8	Documentation (TLC Visualizer 2)	63
	4.9 (A)	Authentication of leaves of <i>Calotropis procera</i>	68
	4.9 (B)	Authentication of flowers of <i>Rosa indica</i>	68
	4.9 (C)	Authentication of leaves of <i>Adhatoda vasica</i>	68
	4.10	Soxhlet apparatus	70
	4.11	Aqueous and Methanolic extract of <i>Rosa indica</i>	71
	4.12	2D Chromatogram of Standard Gallic acid	82
	4.13	Chromatogram of <i>Calotropis procera</i> Extract	83
	4.14	HPTLC 3D Graph for Linearity of Gallic acid	84
4.15	Calibration curve for Linearity of Gallic acid	84	
4.16	2D graph of Standard Gallic acid for Specificity	87	

	4.17	2D Chromatogram of Rutin Standard	87
	4.18	2D Chromatogram of <i>Rosa indica</i> extract	88
	4.19	HPTLC 3D Graph for Linearity of Rutin	89
	4.20	Calibration curve for the Linearity of Rutin	89
	4.21	2D graph of Standard Rutin for Specificity	92
	4.22	2D Chromatogram of Vasicine Standard	92
	4.23	2D Chromatogram of Vasicine in <i>Adhatoda vasica</i> extract	93
	4.24	HPTLC 3D Graph for Linearity of Vasicine	94
	4.25	Calibration curve for the Linearity of Vasicine	94
	4.26	2D graph of Standard Vasicine for Specificity	96
Chapter 5 - <i>In-silico</i> studies of extracts			
5	5.1	The 2D and 3D interaction of the α -amyrin with COX-2	119
	5.2	The 2D and 3D interaction of the Anisotine with COX-2	119
	5.3	The 2D and 3D interaction of the Isosteviol with COX-2	120
	5.4	The 2D and 3D interaction of the β -amyrin with IL-6	122
	5.5	The 2D and 3D interaction of the Anisotine with IL-6	123
	5.6	The 2D and 3D interaction of the Isosteviol with IL-6	123
	5.7	The 2D and 3D interaction of the β -amyrin with COX-1	126
	5.8	The 2D and 3D interaction of the Isosteviol with COX-1	126
	5.9	The 2D and 3D interaction of the Vasicinol with COX-1	127
	5.10	The 2D and 3D interaction of the β -amyrin with TNF- α	129
	5.11	The 2D and 3D interaction of the Isosteviol with TNF- α	130

	5.12	The 2D and 3D interaction of the Anisotone with TNF- α	130
Chapter 6 - <i>In-vitro</i> studies of extracts			
6	6.1	Various cells that produce cytokines.	136
	6.2	The process by which cytokines work	137
	6.3	Sandwich ELISA	138
	6.4(a)	Graph of cell viability of aqueous extract of <i>Adhatoda vasica</i>	144
	6.4(b)	Graph of cell viability of methanolic extract of <i>Adhatoda vasica</i>	144
	6.4(c)	Graph of cell viability of aqueous extract of <i>Rosa</i> <i>indica</i>	144
	6.4(d)	Graph of cell viability of methanolic extract of <i>Rosa</i> <i>indica</i>	144
	6.4(e)	Graph of cell viability of aqueous extract of <i>Calotropis procera</i>	145
	6.4(f)	Graph of cell viability of methanolic extract of <i>Calotropis procera</i>	145
	6.4(g)	Graph of cell viability of aqueous mixture of extracts of <i>Calotropis procera</i> , <i>Rosa indica</i> and <i>Adhatoda</i> <i>vasica</i>	145
	6.4(h)	Graph of cell viability of methanolic mixture of extracts of <i>Calotropis procera</i> , <i>Rosa indica</i> and <i>Adhatoda vasica</i>	145
	6.5 (a, b, c, d, e, f)	Effects of extracts on IL-4 production of THP-1 cells	147-148
	6.6 (a, b, c, d, e, f)	Effects of extracts on IL-10 production of THP-1 cells	149-150
	6.7 (a, b, c, d, e, f)	Effects of extracts on TNF- α production of THP-1 cells	151-152
6.8 (a, b, c, d, e, f)	Effects of extracts on IL-6 cytokine production of THP-1 cells.	153-154	

Chapter 7 - Formulation development and evaluation			
7	7.1	Components of drug development	159
	7.2	Cross section of skin	160
	7.3	A Box-Behnken Design for Three Factors	169
	7.4	Contour plot (2D) showing the combined effect of TEA and Carbopol on Viscosity	182
	7.5	Contour plot (2D) showing the combined effect of Extract and TEA on Viscosity	182
	7.6	Contour plot (2D) showing the combined effect of Extract and Carbopol on Viscosity	183
	7.7	Response surface (3D) showing the combined effect of Extract and TEA on Viscosity	183
	7.8	Response surface (3D) showing the combined effect of Extract and Carbopol on Viscosity	184
	7.9	Response surface (3D) showing the combined effect of TEA and Carbopol on Viscosity	184
	7.10	Contour plot (2D) showing the combined effect of TEA and Carbopol on Spreadability	188
	7.11	Contour plot (2D) showing the combined effect of Carbopol and Extract on Spreadability	188
	7.12	Contour plot (2D) showing the combined effect of TEA and Extract on Spreadability	189
	7.13	Response surface (3D) showing the combined effect of Extract and TEA on Spreadability	189
	7.14	Response surface (3D) showing the combined effect of Extract and Carbopol on Spreadability	190
	7.15	Response surface (3D) showing the combined effect of TEA and Carbopol on Spreadability	190
	7.16	Contour plot (2D) showing the combined effect of TEA and Extract on pH	194
	7.17	Contour plot (2D) showing the combined effect of Carbopol and Extract on pH	194

	7.18	Contour plot (2D) showing the combined effect of Carbopol and TEA on pH	195
	7.19	Response surface (3D) showing the combined effect of Extract and TEA on pH	195
	7.20	Response surface (3D) showing the combined effect of Extract and Carbopol on pH	196
	7.21	Response surface (3D) showing the combined effect of TEA and Carbopol on pH	196
	7.22	Desirability plot	197
	7.23	Overlay plot	198
	7.24	Appearance of developed Polyherbal Gel	199
	7.25	3D Chromatogram of Vasicine	202
	7.26	R _f values and HPTLC Plate of Vasicine	202
	7.27	2D Chromatogram of Vasicine in Polyherbal Gel	203
	7.28	2D Chromatogram of Vasicine in Polyherbal Spray	203
	7.29	3D Chromatogram of Rutin	204
	7.30	R _f values and HPTLC Plate of Rutin	204
	7.31	2D Chromatogram of Rutin in Polyherbal Gel	205
	7.32	2D Chromatogram of Rutin in Polyherbal Spray	205
	7.33	3D Chromatogram of Gallic acid	206
	7.34	R _f values and HPTLC Plate of Gallic acid	206
	7.35	2D Chromatogram of Gallic acid in Polyherbal Gel	207
	7.36	2D Chromatogram of Gallic acid in Polyherbal Spray	207
Chapter 8 - <i>In-vivo</i> studies			
8	8.1	Photograph of Digital Plethysmometer	217
	8.2(a)	Photograph of skin of rat after application of Polyherbal Gel	218
	8.2(b)	Photograph of skin of rat after application of Polyherbal Spray	218