

## LIST OF FIGURES

FIGURE NO.	TITLE	PAGE NO.
Figure 3.1	Hallmarks of cancer	12
Figure 3.2	Steps in Carcinogenesis	13
Figure 3.3	Role of reactive oxygen species in three stages of carcinogenesis	21
Figure 3.4	Cellular events of Apoptosis	23
Figure 3.5	Overview of the intrinsic and extrinsic pathways of apoptosis	23
Figure 3.6	Clinical appearance of oral squamous cell carcinoma of tongue	26
Figure 3.7	Well-differentiated squamous cell carcinoma.	27
Figure 3.8	Moderately differentiated squamous cell carcinoma.	27
Figure 3.9	Poorly differentiated squamous cell carcinoma.	28
Figure 3.10	Research focus on anticancer effects of herbs	33
Figure 3.11	The Role of Herbs and Spices in Cancer	33
Figure 3.12	Fenugreek plant	36
Figure 3.13	Fenugreek seeds	36
Figure 3.14	Trigonelline	37
Figure 3.15	Cinnamon leaves and flowers	48
Figure 3.16	Cinnamon trunk	48
Figure 3.17	Cinnamon quills	48
Figure 3.18	Chemical structure of active compounds of Cinnamon	49
Figure 3.19	Papaya tree with unripe fruits	68
Figure 3.20	Papaya leaf	68
Figure 3.21	Papaya ripe fruit with seeds	75
Figure 3.22	Papaya seeds (dried)	75
Figure 3.23	Benzyl isothiocyanate	76

<b>FIGURE NO.</b>	<b>TITLE</b>	<b>PAGE NO.</b>
Figure 5.1	<i>Trigonella foenum- graecum</i> L. (seeds)	145
Figure 5.2	<i>Cinnamomum verum</i> J. Presl (bark)	147
Figure 5.3	<i>Carica papaya</i> L. (leaf of male plant)	149
Figure 5.4	<i>Carica papaya</i> L. (leaf of female plant)	151
Figure 5.5	<i>Carica papaya</i> L. (seeds)	153
Figure 5.6	Physical characteristics of collected plant material and prepared extract of <i>Trigonella foenum-graecum</i> L. (seeds) and <i>Cinnamomum verum</i> J. Presl (bark).	156
Figure 5.7	Physical characteristics of collected plant material and prepared extract of <i>Carica papaya</i> L. (leaves of male and female plant) and <i>Carica papaya</i> L. (seeds).	158
Figure 5.8	Total Antioxidant Activity (TAO) of Standard – Quercetin, <i>Trigonella foenum-graecum</i> L. (seeds), <i>Cinnamomum verum</i> J. Presl (bark) and <i>Carica papaya</i> L. (leaves of male plant, leaves of female plant and seed) extracts	163
Figure 5.9	Reducing Power Activity of Standard – Quercetin <i>Trigonella foenum-graecum</i> L. (seeds), <i>Cinnamomum verum</i> J. Presl (bark) and <i>Carica papaya</i> L. (leaves of male plant, leaves of female plant and seed) extracts	164
Figure 5.10	Nitric Oxide Scavenging Activity of Standard – Ascorbic acid <i>Trigonella foenum-graecum</i> L. (seeds), <i>Cinnamomum verum</i> J. Presl (bark) and <i>Carica papaya</i> L. (leaves of male plant, leaves of female plant and seed) extracts	165
Figure 5.11	Di Phenyl Picryl Hydrazyl (DPPH) Scavenging Activity of Standard – Ascorbic acid <i>Trigonella foenum-graecum</i> L. (seeds), <i>Cinnamomum verum</i> J. Presl (bark) and <i>Carica papaya</i> L. (leaves of male plant, leaves of female plant and seed) extracts.	166
Figure 5.12	Superoxide Scavenging Activity of Standard – Quercetin ( <i>Trigonella foenum-graecum</i> L. (seeds), <i>Cinnamomum verum</i> J. Presl (bark) and <i>Carica papaya</i> L. (leaves of male plant, leaves of female plant and seed) extracts.	167
Figure 5.13	Agar plates of fluconazole resistant <i>Candia albicans</i> with	169

FIGURE NO.	TITLE	PAGE NO.
	and without treatment.	
Figure 5.14	Bar diagram representing the zone of inhibition of the hydroalcoholic extracts of <i>Trigonella foenum-graecum</i> L. (seeds), <i>Cinnamomum verum</i> J. Presl (bark) and <i>Carica papaya</i> L. (leaves and seeds) against fluconazole resistant <i>Candida albicans</i> .	171
Figure 5.15	Agar plates of <i>Streptococcus mutans</i> with and without treatment.	172
Figure 5.16	Bar diagram representing the zone of inhibition of the hydroalcoholic extracts of <i>Trigonella foenum-graecum</i> L. (seeds), <i>Cinnamomum verum</i> J. Presl (bark) and <i>Carica papaya</i> L. (leaves and seeds) <i>Streptococcus mutans</i>	174
Figure 5.17 (a)	HPTLC plate of <i>Trigonella foenum graecum</i> L. (seed) extracts scanned at 254nm.	176
Figure 5.17 (b)	Densitogram at 254nm obtained from HPTLC analysis of <i>Trigonella foenum graecum</i> L. (seed) extracts	176
Figure 5.18 (a)	HPTLC plate of <i>Cinnamomum verum</i> J. Presl (bark) extracts scanned at 254nm	177
Figure 5.18 (b)	Densitogram at 254nm obtained from HPTLC analysis of <i>Cinnamomum verum</i> J. Presl (bark) extracts	177
Figure 5.19 (a)	HPTLC plate of <i>Carica papaya</i> L. (seed) extracts scanned at 254nm	178
Figure 5.19 (b)	Densitogram at 254nm obtained from HPTLC analysis of <i>Carica papaya</i> L. (seed) extracts	178
Figure 5.20	Calibration curve of Bismuth nitrate pentahydrate	180
Figure 5.21	Nitric Oxide Scavenging Activity of Standard (Ascorbic acid), ethanol water extract of <i>Carica papaya</i> L. [leaves of male plant and female plant) and alkaloid fraction <i>Carica papaya</i> L. leaves of male plant and female plant PFL alkaloid)	181
Figure 5.22	Representative photographs of SCC25 ATCC CRL 1628.	182

<b>FIGURE NO.</b>	<b>TITLE</b>	<b>PAGE NO.</b>
Figure 5.23(a)	Percentage viability of cells on treatment with the plant extracts	184
Figure 5.23(b)	Log dose -response relationship of the plant extracts	185
Figure 5.24(a)	Percentage viability of cells on treatment with the active compounds	186
Figure 5.24(b)	Log dose- response relationship of the active compounds	186
Figure 5.25	Acridine Orange and Ethidium Bromide Staining to Assess Apoptosis on Treatment of SCC25 Cell Line with the Extracts of <i>Trigonella foenum-graecum</i> L. (seeds) and <i>Cinnamomum verum</i> J. Presl (bark).	188
Figure 5.26	Acridine Orange and Ethidium Bromide Staining to Assess Apoptosis on Treatment of SCC25 Cell Line with the Extracts of <i>Carica papaya</i> L. CO.2 strain (leaves of male plant, female plant and seeds).	190
Figure 5.27	Acridine Orange and Ethidium Bromide Staining to Assess Apoptosis on Treatment of SCC25 Cell Line with the Active Compound Trigonelline hydrochloride and standard Cisplatin.	193
Figure 5.28	Acridine Orange and Ethidium Bromide Staining to Assess Apoptosis on Treatment of SCC 25 Cell Line with the Active Compounds cinnamaldehyde, 4 hydroxy cinnamic acid, eugenol and benzyl isothiocyanate.	195
Figure 5.29	Agarose gel image depicting internucleosomal DNA fragmentation in cancer cells on treatment with extracts	197
Figure 5.30	Agarose gel image depicting internucleosomal DNA fragmentation in cancer cells on treatment with respective active compounds and standard cisplatin	199
Figure 5.31	Histogram representing control (untreated cells) and effect of <i>Trigonella foenum-graecum</i> L. (seeds) on oral squamous cell carcinoma cell line.	203
Figure 5.32	Histogram representing the effect of <i>Cinnamomum verum</i> J. Presl (bark) on cell cycle of oral squamous cell carcinoma cell line.	205

<b>FIGURE NO.</b>	<b>TITLE</b>	<b>PAGE NO.</b>
Figure 5.33	Histogram representing effect of <i>Carica papaya</i> L. (leaf of male plant) on cell cycle of oral squamous cell carcinoma cell line	207
Figure 5.34	Histogram representing effect of <i>Carica papaya</i> L. (leaf of female plant) on cell cycle of oral squamous cell carcinoma cell line	209
Figure 5.35	Histogram representing the effect of <i>Carica papaya</i> L. (seed) on cell cycle of oral squamous cell carcinoma cell line	211
Figure 5.36	Histogram representing control (untreated cells) and effect of standard cisplatin on oral squamous cell carcinoma cell line	214
Figure 5.37	Histogram representing control (untreated cells) and effect of trigonelline hydrochloride on oral squamous cell carcinoma cell line	216
Figure 5.38	Histogram representing control (untreated cells) and effect of cinnamaldehyde on oral squamous cell carcinoma cell line	218
Figure 5.39	Histogram representing control (untreated cells) and effect of 4 hydroxy cinnamic acid on oral squamous cell carcinoma cell line	220
Figure 5.40	Histogram representing control (untreated cells) and effect of eugenol on oral squamous cell carcinoma cell line	222
Figure 5.41	Histogram representing control (untreated cells) and effect of benzyl isothiocyanate on oral squamous cell carcinoma cell line.	224
Figure 5.42	Determination of mitochondrial membrane potential by confocal microscopy on Treatment of SCC25 Cell Line with ionomycin, standard cisplatin, benzyl isothiocyanate and untreated control.	227

<b>FIGURE NO.</b>	<b>TITLE</b>	<b>PAGE NO.</b>
Figure 5.43	Determination of mitochondrial membrane potential by confocal microscopy on Treatment of SCC25 Cell Line with extracts of <i>Cinnamomum verum</i> J. Presl (bark) and <i>Carica papaya</i> L. (leaves of male plant, female plant and seeds).	229
Figure 5.44(a)	HPLC chromatogram of Digoxin	233
Figure 5.44(b)	HPLC Chromatogram of <i>Cinnamomum verum</i> J. Presl (bark) extract	233
Figure 5.45	Calibration curve of Gallic acid	234
Figure 5.46	Calibration curve of Tannic acid	234
Figure 5.47	Schematic representation of the summary of results	261