## CONTENTS

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Particulars</th>
<th>Page No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>INTRODUCTION AND REVIEW OF LITERATURE</td>
<td>1</td>
</tr>
<tr>
<td>1.</td>
<td>Medicinal Plants</td>
<td>1</td>
</tr>
<tr>
<td>1.</td>
<td>Antioxidant activity of plants</td>
<td>2</td>
</tr>
<tr>
<td>2.</td>
<td>Anti-inflammatory activity of plants</td>
<td>4</td>
</tr>
<tr>
<td>3.</td>
<td>Antiulcer activity of plants</td>
<td>5</td>
</tr>
<tr>
<td>a.</td>
<td>Colon ulcer</td>
<td>5</td>
</tr>
<tr>
<td>b.</td>
<td>Gastric ulcer</td>
<td>7</td>
</tr>
<tr>
<td>c.</td>
<td>Oral ulcer</td>
<td>10</td>
</tr>
<tr>
<td>2.</td>
<td><em>Aloe vera</em> – a multipurpose folklore medicinal plant</td>
<td>12</td>
</tr>
<tr>
<td>1.</td>
<td>Geographical distribution</td>
<td>14</td>
</tr>
<tr>
<td>2.</td>
<td>Taxonomy and morphology</td>
<td>15</td>
</tr>
<tr>
<td>3.</td>
<td>Folklore uses</td>
<td>15</td>
</tr>
<tr>
<td>4.</td>
<td>Standard operation procedures for good agriculture practices of <em>Aloe vera</em></td>
<td>16</td>
</tr>
<tr>
<td>5.</td>
<td>Climatic conditions, soil required and preparation</td>
<td>17</td>
</tr>
<tr>
<td>6.</td>
<td>Propagation and Irrigation</td>
<td>18</td>
</tr>
<tr>
<td>7.</td>
<td>Crop protection and maintenance</td>
<td>19</td>
</tr>
<tr>
<td>8.</td>
<td>Chopping, drying, grinding and storage</td>
<td>20</td>
</tr>
<tr>
<td>9.</td>
<td>Extraction of aloin from <em>Aloe vera</em></td>
<td>21</td>
</tr>
<tr>
<td>10.</td>
<td>Processing and preservation of pulp</td>
<td>21</td>
</tr>
<tr>
<td>3.</td>
<td>Active components with its properties</td>
<td>22</td>
</tr>
<tr>
<td>4.</td>
<td>Medicinal properties of <em>Aloe vera</em></td>
<td>32</td>
</tr>
<tr>
<td>1.</td>
<td>Anti-inflammatory activity</td>
<td>32</td>
</tr>
<tr>
<td>2.</td>
<td>Antioxidant activity</td>
<td>34</td>
</tr>
<tr>
<td>3.</td>
<td>Wound healing effects</td>
<td>34</td>
</tr>
<tr>
<td>4.</td>
<td>Anti-cancer effects</td>
<td>35</td>
</tr>
<tr>
<td>5.</td>
<td>Effect on gastric acid secretion and ulcers</td>
<td>35</td>
</tr>
<tr>
<td>6.</td>
<td>Skin hydration effects</td>
<td>36</td>
</tr>
<tr>
<td>7.</td>
<td>Hepatoprotective properties</td>
<td>37</td>
</tr>
<tr>
<td>8.</td>
<td>Antimicrobial properties</td>
<td>38</td>
</tr>
</tbody>
</table>
2. STUDIES ON THE IN VITRO ANTIOXIDANT AND ANTIBACTERIAL ACTIVITIES OF ALOE VERA

1. INTRODUCTION

2. MATERIALS AND METHODS
   a. MATERIALS
      1. Chemicals
      2. Plant material
   b. METHODS
      1. Moisture content
      2. Total ash
      3. Total fat
      4. Total protein
      5. Mineral contents
      6. Ascorbic acid
      7. Preparation of Aloe vera extract
      8. Antioxidant activity
         a. Radical scavenging method
         b. Superoxide anion (O$_2^-$) radical scavenging method
         c. Metal chelation method
         d. Reducing power method
         e. Hydroxyl (OH) radical scavenging method
         f. Linoleic acid method
      9. Antibacterial activity

3. RESULTS AND DISCUSSION
   1. Antioxidant activity
      a. Radical scavenging method
      b. Superoxide anion (O$_2^-$) radical scavenging method
      c. Metal chelation method
      d. Reducing power method
      e. Hydroxyl (OH) radical scavenging method
      f. Linoleic acid method
   2. Antibacterial activity
3. TOXICOLOGICAL STUDIES OF ALOE VERA EXTRACT

1. INTRODUCTION

1. Aim of acute toxicity test

2. MATERIALS AND METHODS

a. MATERIALS

b. METHODS

1. Treatment of experimental rats

2. Acute toxicity study

3. Sub-acute toxicity study

4. Liver and Kidney functional tests

a. Creatinine

b. Urea - B

c. Albumin

d. Total protein

e. Bilirubin (total and direct)

f. Alkaline phosphatase (ALP)

g. Glutamic oxaloacetic transaminase (SGOT)

h. Glutamic pyruvic transaminase (SGPT)

5. Histopathological studies

3. RESULTS AND DISCUSSION

a. Acute toxicity study

b. Sub-acute toxicity study

4. EFFECT OF METHANOL EXTRACT OF ALOE VERA ON ACETIC ACID INDUCED COLON ULCER

1. INTRODUCTION

2. MATERIALS AND METHODS

a. MATERIALS

b. METHODS

1. Treatment of experimental rats

2. Chemical, biochemical and enzymatic assays

3. Experimental protocol

4. Chemical analysis

a. Hydroperoxides

b. Conjugated dienes
c. Thiobarbituric acid reactive substance (TBARS) measured as malondialdehyde (MDA)

d. Myeloperoxidase (EC 1.11.1.7)

e. Catalase (EC 1.11.1.6)

f. Glutathione peroxidase (EC 1.11.1.9)

g. Superoxide dismutase (EC 1.15.1.1)

h. Glucose–6–phosphate dehydrogenase (EC 1.1.1.49)
i. Glutathione S-transferase (EC 2.5.1.18)

5. Histopathological studies

6. Statistical analysis

3. a. RESULTS AND DISCUSSION

b. Histopathological studies

5. EFFECT OF PARTIALLY PURIFIED FRACTIONS FROM ALOE VERA ON CHEMICALLY –INDUCED ULCERS IN COLON, STOMACH AND MOUTH

1. INTRODUCTION

2. MATERIALS AND METHODS

a. MATERIALS

b. METHODS

1. Preparation of partially purified fraction of Aloe vera

2. Antioxidant activity by radical scavenging method

3. Preparation of glucomannan an Aloe vera polysaccharide

4. Effect of Aloe vera fractions on cyclooxygenase -2 inhibitory activity

5. Effect of Aloe vera fractions on carrageenan -induced paw edema in rats

6. COLON ULCER

a. Treatment of experimental rats

b. Chemical, biochemical and enzymatic assays

c. Experimental protocol

d. Chemical analysis

e. Histopathological studies

7. GASTRIC ULCER

a. Treatment of experimental rats
b. Chemical, biochemical and enzymatic assays 121

c. Experimental protocol 121
   Pylorus ligation in rats 121

d. Chemical analysis 122

1. Gastric volume 122
2. pH 123
3. Free acidity and total acidity 123
4. Total proteins 123
5. Total carbohydrates 124
6. Fucose 124
7. Hexosamine 125
8. Total hexoses 125

e. Histopathological studies 125

8. ORAL ULCER 125
   a. Treatment of experimental rats 125
   b. Chemical, biochemical and enzymatic assays 126
   c. Experimental protocol 126
   d. Chemical analysis 126

3. RESULTS AND DISCUSSION 126
   a. Antioxidant activity of partially purified fraction of Aloe vera 126
   b. Glucomannans in Aloe vera fractions 127
   c. Effect of Aloe vera fractions on cyclooxygenase-2 inhibitory activity 127
   d. Effect of Aloe vera fractions on carrageenan-induced paw edema in rats 130
   e. Colon ulcer 132
   f. Gastric ulcer 144
   g. Oral ulcer 153

6. DEVELOPMENT OF FUNCTIONAL FOODS / NUTRACEUTICAL RICH FOODS USING ALOE VERA 157
   1. INTRODUCTION 157
   2. ALOE VERA BASED CHOCOLATE 158
      1. INTRODUCTION 158
      2. MATERIALS AND METHODS 159
a. Response Surface Methodology 159
b. Experimental Design 159
c. Raw materials 159
d. Preparation of Aloe vera chocolate 160
e. Sensory evaluation 160
f. Analytical evaluation 160
  1. Proximate composition 160
  2. Peroxide value (PV) 160
  3. Free fatty acid (FFA) 161
  4. Thiobarbutric acid (TBA) 161
  5. Total sugars 162
  6. Reducing sugars 162
  7. Acidity (as % anhydrous citric acid) 163
  8. Radical Scavenging method 163
  9. Total phenols 163
  10. Flavonoids 164
  11. Total antioxidant activity 164
  
g. Texture analysis 165
h. Statistical analysis 165

3. RESULTS AND DISCUSSION 165
a. Optimization of Aloe vera chocolate 165
b. Storage stability of Aloe vera chocolate 172
c. Changes in sensory attributes of Aloe vera chocolate 173

3. ALOE VERA BASED COMPRESSED BAR 178
1. INTRODUCTION 178

2. MATERIALS AND METHODS 178
a. Raw materials 178
b. Preparation of Aloe vera based compressed bar 178
c. Sensory evaluation 179
d. Analytical evaluation 179
e. Statistical analysis 179

3. RESULTS AND DISCUSSION 180
a. Storage stability of Aloe vera based compressed bar 180
b. Changes in sensory attributes of *Aloe vera* based compressed bar

4. *ALOE VERA BASED LEHYA AND CAPSULES*  
   1. INTRODUCTION  
   2. MATERIALS AND METHODS  
      a. Preparation of *Aloe vera* based capsules  
      b. Preparation of *Aloe vera* based lehya  
      c. Analytical evaluation  
   3. RESULTS AND DISCUSSION  
      a. Storage stability of *Aloe vera* based lehya

5. *ALOE VERA BASED FRUIT SPREAD*  
   1. INTRODUCTION  
   2. MATERIALS AND METHODS  
      a. Preparation of *Aloe vera* based fruit spread containing partially purified fraction  
      b. Effect of *Aloe vera* based fruit spread on experimental rats  
      c. Chemical analysis  
   3. RESULTS AND DISCUSSION  
   7. REFERENCES