NATIONAL INSTITUTE OF SIDDHA
Tambaran Sanatorium, Chennai-47.
(Affiliated to the Tamil Nadu Dr. M.G.R Medical University, Chennai-32)

Part I
A study on

ATTIVER PATTAI CHOORNAM

and

Part II
A study on

GANDAGA PARPA MATHIRAI
(Dissertation subject)

for the partial fulfillment of the requirements to the degree of

DOCTOR OF MEDICINE (SIDDHA)
Branch-II – GUNAPADAM

September-2008
ACKNOWLEDGEMENT

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# CONTENTS

## PART – I

A STUDY ON ATTIVER PATTAI (*Ficus racemosa*)

<table>
<thead>
<tr>
<th>S.NO</th>
<th>CONTENTS</th>
<th>PAGE NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>INTRODUCTION</td>
<td>1</td>
</tr>
<tr>
<td>2.</td>
<td>AIM AND OBJECTIVES</td>
<td>3</td>
</tr>
<tr>
<td>3.</td>
<td>REVIEW OF LITERATURE</td>
<td></td>
</tr>
<tr>
<td></td>
<td>BOTANICAL ASPECT</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>GUNAPADAM ASPECT</td>
<td>13</td>
</tr>
<tr>
<td>4.</td>
<td>MATERIALS AND METHODS WITH RESULTS</td>
<td></td>
</tr>
<tr>
<td></td>
<td>AND OBSERVATIONS</td>
<td></td>
</tr>
<tr>
<td></td>
<td>PHARMACOGNOSTIC STUDY</td>
<td>21</td>
</tr>
<tr>
<td></td>
<td>PREPARATION OF CHOORNAM</td>
<td>24</td>
</tr>
<tr>
<td></td>
<td>PHYTOCHEMICAL ANALYSIS</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>THIN LAYER CHROMATOGRAPHY</td>
<td>29</td>
</tr>
<tr>
<td></td>
<td>ANTIMICROBIAL STUDY</td>
<td>31</td>
</tr>
<tr>
<td></td>
<td>BIO CHEMICAL ANALYSIS</td>
<td>33</td>
</tr>
<tr>
<td></td>
<td>ACUTE ORAL TOXICITY STUDY</td>
<td>36</td>
</tr>
<tr>
<td></td>
<td>PHARMACOLOGICAL ANTI DIABETIC STUDY</td>
<td>39</td>
</tr>
<tr>
<td>5.</td>
<td>CLINICAL ASSESSMENT</td>
<td>41</td>
</tr>
<tr>
<td>6.</td>
<td>STATISTICAL ANALYSIS</td>
<td>52</td>
</tr>
<tr>
<td>7.</td>
<td>DISCUSSION</td>
<td>55</td>
</tr>
<tr>
<td>8.</td>
<td>SUMMARY</td>
<td>60</td>
</tr>
<tr>
<td>9.</td>
<td>CONCLUSION</td>
<td>62</td>
</tr>
</tbody>
</table>
## CONTENTS

**PART – II**

**A STUDY ON GANDAGA PARPA MATHIRAI**

<table>
<thead>
<tr>
<th>S.NO</th>
<th>CONTENTS</th>
<th>PAGE NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>INTRODUCTION</td>
<td>63</td>
</tr>
<tr>
<td>2.</td>
<td>AIM AND OBJECTIVES</td>
<td>65</td>
</tr>
<tr>
<td>3.</td>
<td>REVIEW OF LITERATURE</td>
<td>66</td>
</tr>
<tr>
<td></td>
<td>BOTANICAL ASPECT</td>
<td></td>
</tr>
<tr>
<td></td>
<td>GUNAPADAM ASPECT</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>MATERIALS AND METHODS WITH RESULTS AND OBSERVATIONS</td>
<td></td>
</tr>
<tr>
<td></td>
<td>PREPARATION OF THE DRUG</td>
<td>93</td>
</tr>
<tr>
<td></td>
<td>PHYTOCHEMICAL ANALYSIS</td>
<td>95</td>
</tr>
<tr>
<td></td>
<td>ANTIMICROBIAL STUDY</td>
<td>99</td>
</tr>
<tr>
<td></td>
<td>BIO CHEMICAL ANALYSIS</td>
<td>101</td>
</tr>
<tr>
<td></td>
<td>ACUTE ORAL TOXICITY STUDY</td>
<td>104</td>
</tr>
<tr>
<td></td>
<td>PHARMACOLOGICAL ANALGESIC AND ANTI INFLAMMATORY STUDY</td>
<td>108</td>
</tr>
<tr>
<td>5.</td>
<td>CLINICAL ASSESSMENT</td>
<td>112</td>
</tr>
<tr>
<td>6.</td>
<td>STATISTICAL ANALYSIS</td>
<td>118</td>
</tr>
<tr>
<td>7.</td>
<td>DISCUSSION</td>
<td>120</td>
</tr>
<tr>
<td>8.</td>
<td>SUMMARY</td>
<td>123</td>
</tr>
<tr>
<td>9.</td>
<td>CONCLUSION</td>
<td>125</td>
</tr>
<tr>
<td>10.</td>
<td>BIBLIOGRAPHY</td>
<td></td>
</tr>
</tbody>
</table>
INTRODUCTION

Siddha medicine is the ancient system of medicine practiced in southern India. The origin of Tamil language is attributed to the sage Agasthiar and the origin of Siddha medicine is also attributed to him. Before the aryan, there existed an organized civilization in the southern India. This civilization has a medicine to deal with problems of sanitation and treatment of diseases. This is the Siddha system of medicine. The therapeutics of Siddha medicines consists of the use of metals and minerals.

The Tridosha theory, Sapta Dhatu physiology and nomenclature of the diseases are unique in the Siddha medicines. Traditionally it is said that there were 18 Siddhars. They left their imprint not only in medicines but also in yoga and philosophy. The Siddhars were essentially yogis and secondarily physicians.

The fundamental principles of Siddha medicines consists of two essential entities, matter and energy. The Siddhars call them Siva (Male) and Sakthi (Female, creation) matter cannot exist without energy inherent in it and vice versa. They are the primordial elements Bhutas. They are Mann (Solid), Neer(fluid), Thee (radiant) Vayu(gas) and Aakasam(ether). These 5 elements are present in every substance, but in different proportions.

The human anatomy and physiology, causative factor of diseases, the materials for the treatment and cure of diseases, the foods for sustenance of the body, all fall within the 5 elemental categories. The human being is made up of these 5 elements, in different combinations. When their equilibrium is upset disease sets in.
**Madhumegam (Diabetes Mellitus)** is the most common of the serious metabolic diseases of humans. It is characterized by hyperglycemia with or without glycosuria resulting from absolute or relative deficiency of insulin. Lack of insulin affects the metabolism of carbohydrate, protein and fat and causes a significant disturbance of water and electrolyte homeostasis.

**Madhumegam (Diabetes)** is world wide in distribution and the incidence of both Type I (Insulin dependent) and Type II (Non Insulin dependent) diabetes is rising. It is estimated that in the year 2000, 150 million people worldwide had diabetes and this is expected to double by 2010. This global pandemic principally involves Type II diabetes, and is associated with several contributory factors including obesity, unsatisfactory diet, sedentary lifestyle and increasing urbanisation. However the prevalence of both types of diabetes varies considerably around the world and is related to differences in genetic and environmental factors.

The disease is characterized by a series of hormone-induced metabolic abnormalities, by long term complications involving the eyes, kidneys, nerves and blood vessels.

Hence an effort is made to bring effective medicine from the herbal kingdom for treating this global disease.

The present study of **Attiverpattai choornam** is tried for **Madhumegam** and its therapeutic efficacy is found out by pharmacological studies and clinical trial supporting the study had been made out.
AIM AND OBJECTIVES

AIM

To evaluate the efficacy of Attiver Pattai Chooranam (*Ficus racemosa*) in the management of Madhumegam.

OBJECTIVES:

- To Identify the Crude drug
- To study the Antimicrobial activity of the drug
- Bio Chemical analysis of the drug
- To study the Acute oral toxicity of the drug
- To study the Pharmacological activity of the drug (Anti-diabetic)
- To evaluate the efficacy of the drug clinically
BOTANICAL ASPECT

BOTANICAL NAME:

*Ficus racemosa linn*

*Ficus glomerata roxb*

SYNONYMS

<table>
<thead>
<tr>
<th>Language</th>
<th>Translation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tamil</td>
<td>Atti</td>
</tr>
<tr>
<td>English</td>
<td>Gular Fig, Cluster fig, Country fig.</td>
</tr>
<tr>
<td>Hindi</td>
<td>Gular, Umar</td>
</tr>
<tr>
<td>Beng</td>
<td>Dumur, Jagyadumtar</td>
</tr>
<tr>
<td>Guj</td>
<td>Umar, Gular, Umbar</td>
</tr>
<tr>
<td>Mal</td>
<td>Atti</td>
</tr>
<tr>
<td>Tel</td>
<td>Udambaaramu</td>
</tr>
<tr>
<td>Sanskrit</td>
<td>Udambara</td>
</tr>
<tr>
<td>Urdu</td>
<td>Gular</td>
</tr>
</tbody>
</table>

BENTHAM & HOOKERS CLASSIFICATION

<table>
<thead>
<tr>
<th>Classification</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kingdom</td>
<td>Plant Kingdom</td>
</tr>
<tr>
<td>Division</td>
<td>Phenarogams</td>
</tr>
<tr>
<td>Class</td>
<td>Dicotyledons</td>
</tr>
<tr>
<td>Subclass</td>
<td>Monochlamydae</td>
</tr>
<tr>
<td>Series</td>
<td>Unisexuals</td>
</tr>
<tr>
<td>Family</td>
<td>Moraceae</td>
</tr>
<tr>
<td>Genus</td>
<td>Ficus</td>
</tr>
<tr>
<td>Species</td>
<td>racemosa</td>
</tr>
</tbody>
</table>
BOTANICAL DESCRIPTION:

An evergreen tree 15-18m high. Young shoots glabrous, pubercent or scaberulous.

Leaves:
7.5-15 by 3.2 – 6.3 cm
Ovate – oblong or elliptical – Lanceolate, tapering to a bluntish point at the apex.
Glabrous on both surface when mature. Base acute or rounded, 3-neverd petioles 1.3 – 3.8 cm long, glabrous
Stipules 2 cm long ovate, scarious

Flowers:
Male, females and gall flowers together in one receptacle.
Male flowers sessile sepals 3-4 membranous, inflated enveloping the 2 elongate ovate anther
Gall flowers pedicellate.

Perianth:
❖ Gamophyllous, Irregularly toothed.
❖ Covering only the base of rough ovoid ovary.
❖ Style lateral, elongate.
❖ Stigma Clavate

FRUITS:
Fruits red when ripe.
Figs sub globose or piriform borne in large clusters on short, leafless branches emerging from the trunk and the main branches.

DISTRIBUTION:
Throughout greater part of India from outer Himalayan range, Punjab, Bihar, Orissa and common in south India from sea level to about 1800m in evergreen forests and near streams in deciduous forests.

**Parts used.**

Stem bark, root, leaf, fruit, latex, root bark

**Constituents**

Tannin, wax and caoutehous and ash containing silica and phosphoric acid.

**Physical Constant:**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Foreign matter</td>
<td>not more than 2%</td>
</tr>
<tr>
<td>Total Ash</td>
<td>not more than 4%</td>
</tr>
<tr>
<td>Acid Soluble Extractive</td>
<td>not more than 1%</td>
</tr>
<tr>
<td>Alcohol soluble Extractive</td>
<td>not less than 7%</td>
</tr>
<tr>
<td>Water soluble extractive</td>
<td>not less than 9%</td>
</tr>
</tbody>
</table>

**Analysis of the fruit gave the following values:**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Moisture</td>
<td>13.6</td>
</tr>
<tr>
<td>Albuminoids</td>
<td>7.4</td>
</tr>
<tr>
<td>Fat</td>
<td>5.6</td>
</tr>
<tr>
<td>Carbohydrates</td>
<td>49.0</td>
</tr>
<tr>
<td>Colouring Matter</td>
<td>8.5</td>
</tr>
<tr>
<td>Fibre</td>
<td>17.9</td>
</tr>
<tr>
<td>Ash</td>
<td>6.5</td>
</tr>
<tr>
<td>Silica</td>
<td>0.25</td>
</tr>
<tr>
<td>Phosphorus</td>
<td>0.91%</td>
</tr>
</tbody>
</table>

**Analysis of Leaves (air- dry basis)**
Nitrogen - 0.915  
Phosphorus - 0.163  
Lime (Cao) - 5.57

Analysis of Leaves (dry matter basis)

- Crude Protein - 12.36
- Ether extract - 2.75
- Crude fiber - 13.03
- N – Free extr - 58.88
- Total Carbohydrates – 71.91
- Total Ash - 12.98

BARK

Bark Contains 14% tannin

CHEMICAL CONSTITUENTS:

Leaves, Bark and Heartwood


Stem bark:

- Two Leucoanthocyanins, Leucoyandin 3-0-β-D-Glucopyranoside  
  Leucopelargonidin – 3-0- α – 2 L rhamnopyranoside.
- Ceryl behenate
- Lupeol – its acetate.
- Stigma sterol
- \(\alpha\) Amyrin Acetate
- 3 Un identified compound.

**BARK**
- Sitosterol
- Unidentified long chain ketone.

**LEAVES**
- Glucoside

**FRUITS**
- Gluauanol, Lentralcontane
- \(\beta\) - sitosterol
- Gluauarol acetate
- Tiglic Acid ester of taraxasterol
- Lupeol acetate
- Higher Hydrocarbons and other phytosterol.
- Glucose, Triedelin.

**ACTION:**
- Bark, Leaves and unripe fruit

- Hypoglycemic
- Astringent
- Carminative
- Stomachic
- Vermicide
- Hypotensive
- Cardiac- Depressant
Antiprotozoal
Anti-inflammatory
Hepato protective
Anti diarrhoea

Infusion of bark and leaves is astringent – Chopras I.D. of I PP.579.
Bark is Cooling, Sweet and astringent Ayur Nighantum.

USES : $^{30}$

Bark, Leaves and Unripe fruit are used externally and internally in dysentery.
Fruit is edible it is given on aphthous complains, menorrhagia, hemoptysis etc with sugar and honey.
Fruit and the sap extracted from trunk of the tree are efficacious in diabetes.
Powder of the seed mixed with honey 1/3 regarded specific in diabetes, reducing sugar in the urine, thirst and polyuria of diabetes.
In excessive of appetite it is advised by Sushruta to take the pulversied bark with milk.
The bark is used in the form of fine powder in dysentry, diabetes and menorrhagia. And in combination with gingelly oil it is applied to cancerous affections.
Infusion of the bark and the leaves is also employed as mouth wash in spongy gum and internally in dysentry menorrhagia and hemoptysis.
Young leaves crushed or reduced to powder or ripe figs mixed with honey are administered in bilious affections.
Juice of figs or cooled decoction is advised in cases of thirst.

Fresh juice of the ripe fruit is given as adjunct or vehicle to a metallic medicine for diabetes and other urinary complaints.
Fluid which yields on incision of the root is given alone or better mixed with cumin and sugar-candy in gonorrhea.

The sap of root gives relief in diabetes. And is usefully applied in cases of mumps and root juice is applied externally to other inflammatory glandular enlargements.

Root is used in pectoral complaints and dysentery.

A decoction of roots is recommended in menorrhagia.
EXPERIMENTAL STUDIES ON *Ficus racemosa* Linn

MAPA, AUG 2007

- Hypoglycemic properties of *Ficus glomerata* fruits in alloxan - induced diabetic rats - Journal of Natural Remedies.

Petroleum ether, benzene, chloroform, ethanol and aqueous extract of *Ficus glomerata* fruits was screened for hypoglycemic properties in alloxan – induced diabetic rats. The effect was assessed by blood glucose, serum cholesterol, serum urea and serum triglyceride levels. Oral dose of petroleum, ether extracts of 250mg/g body weight produced significant lowering of blood sugar, serum cholesterol, serum urea and serum triglyceride levels in alloxan induced diabetic treated rats.

MAPA, JUNE 2002 VOL 24

- Pancreas tonic an ideal herbal food supplement for diabetes mellitus.

Pancreas tonic is a dietary supplement composed of extracts of herbs namely gymnema Sylvestre (major component) Syzygium cumini, Trigonella foenum – graecum, Azadirachta indica, Ficus racemosa, Tinospora cordifolia Minerals and Vitamins at was given to group of animals for 12 weeks

A significant improvement was found in pancreatic serum glucose levels by regenerating beta cells in pancreas islets. Similar response was identified in humans
A new anti inflammatory glycoside from *Ficus racemosa Linn*.

Bioassay guided fractionation of the ethanol extract of *Ficus racemosa* resulted in the identification of a new compound Racemosic acid. Racemosic acid showed potent inhibitory activity against cox-1 and 5- cox in vitro. Racemosic acid also demonstrated a strong anti oxidant to scavenge ABTs free radical cations.

**MAPIS, JUNE 1986**

- The bark of *Ficus spp* – its beta sitosterol –D- glycoside is hypoglycemic.


- Extract of bark reduce blood sugar by 62% due to presence of some carbohydrates and amino acids which are anti diabetic in nature.

**MAPA, FEBRUARY 1992. NOVEMBER 16**

- *Ficus racemosa* bark reduces blood sugar in rats within a fortnight; effect in permanent.


  Anti diabetic effects of Gular-Alcoholic extract of it lowered blood sugar and cholesterol levels
REVIEW OF LITERATURE
(GUNAPADAM ASPECT)

13
கலவெ:  

dுவாக்கப்படும் அறிகுறிப்பிட்டு பெரும் புரட்சியை, பொருளில் கூட்டு அதிக குறைவை கொண்டது

காப்பான்:

காப்பான் - அசைப்பு, காப்பான் - காப்பு, போர் - காப்பு

குறிப்பிட்டு:  அசைப்பு - Astringent

குறிப்பிட்டு:

குறிப்பிட்டு, எந்தசோட்டல், காப்பான், புண்டை (சிலிசில்) குறிப்பிட்டு குறைவை

"நுணையகம் குறைந்த நவீனகால அறிகுறிப்பிட்டு நேரடைச்சலில் குறைந்தகுதி தேவை எப்படி? - குறிப்பிட்டு

என்ன ஆராய்ச்சி பொருள் குறைவை குறைவை

பிந்துறை பண்டை வழிபாடு விளையாடிய CHECKS"

பின்னு:  

பின்னு - நிலை, பின்னு - காப்பு, பின்னு - காப்பு

பின்னு:  

குறிப்பிட்டு - Improves blood

குறிப்பிட்டு - Laxative

குறிப்பிட்டு:

பின்னு பொருள், பின்னு பொருள், காப்பு பின்னு பொருள் குறைவை குறைவை

பின்னு பொருள் பின்னு பொருள், காப்பு பொருள், காப்பு பின்னு பொருள் குறைவை

பின்னு பொருள் பின்னு பொருள், காப்பு பொருள், காப்பு பின்னு பொருள் குறைவை குறைவை.
பலகை:

தோண - தென்மொழி, மௌலை - பொன்னை, பொன்னை - கிலோபொன்னை

பற்றியது:

தோணப்படி - Astringent

நோக்கம்

நீளம் கைப்பற்றும் நோய்கள் பற்றியே

தோணப்படி பல்கைகளை பற்றியே - வடிவமைந்த

அதிகம் டிற்பு பொன்னை அவின் வெளியே பெரும் நோய்களையும் அதிகமாக பலகை நிர்ப்பிய

நோக்ககர், பசு, நெய்யானப்படி, குண்டுப்படி, குக்குதலைகளும்,

நோக்ககர் பலகைக் குளிரசென்ற நோய்களைப் பற்றியே.

உறுதிகள்: 17

அதிருப்பந்த ஒரு பிப்பு. அதிகருதிகுறிகள் 1 பிப்பு, பல்கைப்படியும் 4 நோய்களுக்கு கடிநில்லாக

அதிருப்பந்த அசுரந்தக்கல்லாலும், ஜோவர்னான்கல் ஜோவர்னான்கல் ஆடைத்தொழிலாகும் குடியாறை

நோக்ககரங்களுக்கு நோக்ககர் குளிர்சென்ற நோய்களையும் அதிகமாக பல்கை நிர்ப்பியது.

அதிருப்பந்த முதல் நோய்கள் கைத்தல் தோண வெளியே தோணப்படி குளிர்சென்ற நோய்களை

அதிருப்பந்த முதல் நோய்கள் கைத்தல் தோண வெளியே தோணப்படி குளிர்சென்ற நோய்களை
1. செய்தியறிக்கும் சாதனைப்படுத்தும் காப்பாடு

<table>
<thead>
<tr>
<th>ஆண்டுபேச்சு</th>
<th>குழுவார்த்தி</th>
<th>பாதிப்புப் பதற்படுத்தும்</th>
<th>தமிழ்</th>
<th>பக்தருப்படுத்தும்</th>
<th>வெளிப்பகுதியார்த்தி</th>
<th>பொறுப்புப் பதற்படுத்தும்</th>
<th>விழா விளையாட்டுகளும்</th>
<th>சுட்டுற்பதிவுப்பதற்படுத்தும்</th>
</tr>
</thead>
<tbody>
<tr>
<td>16 வண்ணம்</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2. நூற்றாண்டு விளையாட்டு 16

<table>
<thead>
<tr>
<th>ஆண்டு</th>
<th>கலைச்சின்னம்</th>
<th>புராணம்</th>
<th>மாணவர்</th>
<th>வினை</th>
<th>குறிப்பிட்டும்</th>
<th>விழா விளையாட்டுகளும்</th>
<th>கூர்ந்து விளையாட்டுகளும்</th>
<th>விழா விளையாட்டுகளும்</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
<td>ம</td>
<td></td>
<td>குறிப்பிட்டும்</td>
<td></td>
<td>விழா விளையாட்டுகளும்</td>
<td>கூர்ந்து விளையாட்டுகளும்</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
நிறைவு பெற்றிருந்தால் - 10 மற்றும் 8 ரோமான் செயற்கையுடன் 1 புனர்பிள்ளை யோகத்துறை

அகழ்வு

அம்பிக விளக்கம்

தினம்

அரிப்பூட்டு

உணர்த்தல் மிக்க

காலத்தொழி

சிற்ற்புத்தொழி

நேரகம்

துணை

1. நூற்றோர் பொழுது பெரும், செம்பபரீட்டு மொழிவாக்கம் கொண்டு செயர் நிலை செய்யும் குழுப்

நூற்றோர் 10 ரோமான் செயற்கையுடன் 2 கொலமான்கள் முடிவு காண்க.

2.நூற்றோர் பொழுது

3. மூன்றாம் பகுதி 18

அகழ்வு, பார்வை மொழிவாக்கம் பெரும் பொழுது கொண்டு செயற்கையுடன் 10 ரோமான் செயற்கை

பெரும் விளக்கம், குழுவின் புகழ் தெளிப்பாயும் பொழுது, விளக்கங்கள், குழுவின் புகழ் மூலத்துறை 1 புனர் புனர்

நூற்றோர் பொழுது விளக்கம், குழுவின் புகழ் தெளிப்பாயும் பொழுது, விளக்கங்கள், குழுவின்

குழுவு விளக்க முடிவை காண்க.

4. நூற்றோர் பொழுது

5. மூன்றாம் பகுதி 18

சிற்று விளக்கம்: மூலம் மூலம்.
4. செலவாய்ந்த கிளையும்:

அர்த்தமாக புராணங்கள், திவுப்பந்தகல், வண்ணத்தில் 1/4 நிலை காணும் கிளையும் 6 புச்சை விளை 3/4 புறப்பக் காய்ப்பக் கிளையும்.

கற்பொருள்

ஒலிக்குறிக்கு ஊறு

குள் விவசாயத்துடன் சேர்ந்து

பச்சை நௌடு - 1/2 புச்சை

கற்பொருள்கள், கொட்டு, கொட்டுரை, கருத்திருப்பான், குறிப்பிட்டுக்கொள்ள, கணிதமையும், பொருளாயில் குறிப்பிட்டு வகுந்த வலுவுகள் விளைப்படும் பாராளியாக குறிப்பிட்டு, குறிப்பிட்டு காண்க. காண்க.

புள்ளிவரிசை: காண்க, பார்க்க

1 குறுகை

9 நூற்றாண்டு

சிலை கோணமு: மாற்றக் குறுகை, மாற்றக் குறுகை, மாற்றமுறை, மாற்றமுறை, பாராளியாக கூற்றும்.

5. ஆமைக் காரணம்

ஆமைக்குறைவு வழங்கும் அறாயாளாக குறிப்பிட்டுக்கொள்ள ஆவெனும், ஆவெனும், ஆவெனும் வழங்கும் குறிப்பிட்டு குறிப்பிட்டு ஆவெனும், ஆவெனும் வழங்கும் குறிப்பிட்டு குறிப்பிட்டு. 21 வருடம் புதுவைக்கூற்றும்.

அறாயா: பச்சை நௌடு

சூழ்ந்த முற்பகுதி: வாலா

சூழ்ந்த வெளிப்பகுதி: குறிப்பிட்டு, குறிப்பிட்டு, குறிப்பிட்டு
பிம்மையல்:
1. பிரச்சினைகள்/சொற்கள் ஒவ்வொரு வகுப்புக்கும் ஒரு பெப்பர் பெட்டியம்

பிரிவாகம் - 2 வகுப்புகள்.

நிதி விளக்கம் - பிரச்சினைகள்/சொற்கள் ஒவ்வொரு வகுப்புக்கும்

பிரச்சினைகளிற்குச் செய்து வருகை தொடர்பு.

2. வெளிப்பாடு விளக்கத்துக்கு பெட்டியானது

பிரிவாகம் - 2 வகுப்புகள் குறிப்பிட்டாலே.

நிதி விளக்கம் - 21, வாரம், கீழ்வணி

3. அறநால் பொருள்

அளவு: 1 காலம். நிதி 1(2) 2 வகுப்புகள், 1 வெளிப்பாடு

நிதி விளக்கம்: பிரச்சினைகள், தன்மை சுற்றுச்சூழல்கள், நிரம்பு, புரிந்துகொள்ளல்

4. முதலாமவருட வளிமயம்

ராணைகள்: 1 வெளிப்பாடு

நிதி விளக்கம்: மகர்பிள்ளை, சிவப்புருங்கள், காம்பி வளிமய, 20 முகமும், 
நிதி ளட்பு. மோற நிதி.

5. தருமைக் குழுவானை

பிரிவாகம்: 2 வகுப்புகள் - 3 நேரங்கள்

நிதி விளக்கம்: அறிவுகள், கல்லறை

6. முதலாமவருட விளக்கம்

பிரிவாகம்: நிதி 2 வகுப்பு

நிதி விளக்கம்: பிரச்சினைகள் பெட்டியானது, 20 நேரங்கள்

நிதி விளக்கம்: வளிம, செவ்வரிகைகள், 2 நிலைகளாக.
7. கைவாலியை பார்க்கவும் வைக்குந்தே

அலுவல்: தொங்கவாழக்கானது, 1 மூலைக்குத்

குறைவு காரணி: கார்போன், என்னைக்குறை, வெள்ளக்கூட, மேற்கரம் குறிப்பிட்டு.

**PHYSIO CHEMICAL STANDARDISATION OF *Ficus racemosa***

**Physical Constants**

- **Foreign Matter** - Not More than 2%
- **Total Ash** - Not more than 4%
- **Acid Soluble Extractive** - Not more than 1%
- **Alcohol Soluble Extractive** - Not less than 7%
- **Water soluble Extractive** - Not less than 9%
METHODOLOGY FOR PHARMACOGNOSY STUDY
ATTI (ROOT BARK)

MATERIALS AND METHODS

The root bark of Ficus racemosa Linn. (Fam. Moraceae) was collected from Pollachi, Coimbatore District. They were fixed in FAA (Formalin 5ml and Acetic acid 5ml and 70% ethyl alcohol 90 ml) in the field itself. Hand sections were taken, stained with safranin. Glycerine mounted temporary preparations were prepared. Microtome sections were taken, stained and mounted according to standard procedure. For paraffin embedded sectioning the usual procedure of hydration and clearing was followed by employing ethyl alcohol (Johansen, 1940). Photomicrographs of different magnifications were taken with Nikon Eclipse E200 microscopic unit.
RESULT FOR PHARMACOGNOSY STUDY OF ATTIVER PATTAI

(Ficus racemosa)

MACROSCOPIC:

The outer surface is fairly smooth and not deeply cracked or fissured, pale brown in colour; inner surface brown red; no characteristic odour and taste.

MICROSCOPE:

The cork tissue or phloem is composed of 7 or lesser number of rows of slightly thick walled rectangular cells. (Fig II A). A distinct phelloge of one or two rows of narrow rectangular cells are present and beneath this is a phelloderm composed of 6 to 10 or more rows of regularly arranged thin – walled rectangular cells, which contain starch grain and rhomboidal crystals. The cortex is a fairly wide zone, the cortical parenchyma cells are spherical –oblong, thin – walled and most of the cells contain tannin. Some cells are packed with starch grains and others contain rhomboidal crystals of Calcium oxalate. Sparsely scattered in the cortex are irregular groups of stone cells (Fig. II B, D & E).

The medullary rays are 2 to 5 seriate and their distal ends are very wide, with large and tangentially elongated cells (fig. II C F). These distal ends almost extend to the periphery of the cortex. The inner bark or bast forms the widest part of the bark. It is composed of alternating radial segments of phloem and medullary rays.

The bast is somewhat densely scattered, with small groups of sclerenchyma.. These cells are large, thick walled and occurs as single or few celled groups. Some of the phloem parenchyma cells contain rhomboidal crystals of Calcium oxalate. Phloem consist of sieve tubes, companion cells and phloem parenchyma. Most of the cortical parenchyma and phloem parenchyma cells contain tannin (fig II D, E).
POWDER:

Reddish Brown; shows cork cells, tanniniferous cells, stone cells and parenchyma cells.
PREPARATION OF THE DRUG
ATTIVERPATTAI CHOORNAM

COLLECTION OF THE DRUG

The root bark of Atti was collected at a forest area near Pollachi.

PURIFICATION AND STORAGE

The root bark was washed in fresh water and cleaned thoroughly and was allowed to dry in shade and stored in moisture proof containers and powdered.

PREPARATION OF CHOORNAM

The drug Attiverpattai Choornam was taken from the literature “Vaidhiya Perungural”.

The dried root bark was made into fine powder and sieved through a white cloth (Vasthira kayam). Then it was purified by steam-cooking in milk (pittavial method). The same was later powdered and sieved again and preserved.

STORAGE OF CHOORNAM

The choornam was stored in clean air tight container

ADMINISTRATION OF THE DRUG

<table>
<thead>
<tr>
<th>Form of Administration</th>
<th>Route</th>
<th>Dose</th>
<th>Time of Administration</th>
<th>Vehicle</th>
</tr>
</thead>
<tbody>
<tr>
<td>Choornam</td>
<td>Enteral</td>
<td>1gm, 2 times a day</td>
<td>Before Food</td>
<td>Water about 30ml</td>
</tr>
</tbody>
</table>
METHODOLOGY FOR IDENTIFICATION OF PLANT
ATTIVERPATTAI CONSTITUENTS BY
PHYTO CHEMICAL TESTS

The drug powder and various extracts of Atti Verpattai Choornam were subjected to chemical tests for identification of its active constituents.

TEST FOR ALKALOIDS:

A small portion of the solvent, free chloroform, alcoholic and aqueous extracts were treated separately with few drops of dilute HCL and filtered. The filter may be tested carefully with alkaloidal reagents such as,

a. Mayer’s reagent  – yellow precipitate
b. Dragendroff’s reagent  – Orange brown precipitate
c. Wager’s reagent   - Reddish brown precipitate

TEST FOR CARBOHYDRATES
Molisch’s test:

Filterate was treated with 2-3 drops of 1% alcoholic alpha – napthol solution and 2 ml of concentrated $\text{H}_2\text{SO}_4$ was added along the sides of the test tube. Appearance of brown ring at the junction of 2 liquids show the presence of carbohydrates.

TEST FOR GLYCOSIDES.

Another portion of Attiver Pattai Choornam was hydrolysed with HCL for few hours on a water bath and the hydrolysate was subjected to Legal’s Bentrager’s test to detect the presence of glycosides.
A. LEGAL’S TEST

To the hydrosylate, 1 ml of pyridine and few drops of sodium nitro prusside solution were added and then it was made alkaline with sodium hydroxide solution. Appearance of pink to red colour shows the presence of glycosides and aglycones.

B. TEST FOR PHYTOSTEROL
LIEBERMAN BURCHARD TEST.

1 gm of the extract of Attiver Pattai Choornam was dissolved in few drops of dry acetic acid 3 ml of acetic anhydride was added followed by few drops of concentrated sulphuric acid. Appearance of bluish green colour shows the presence of phytosterol.

TEST FOR SAPONINS.

The extracts of Attiver Pattai Choornam was diluted with 20 ml of distilled water and it was agitated on a graduated cylinder for 15 minutes. The formation of 1 cm layer of foam shows the presence of saponins.

TEST FOR TANNINS AND PHENOLIC COMPOUNDS.

Small quantities of various extracts were taken separately in water and tested for the presence of phenolic compounds and tannins by adding dilute ferric chloride solution (5%). The formation of violet colour shows the presence.
TEST FOR PROTEINS AND FREE AMINO ACIDS

Small quantities of various extracts of ATTHIVER PATTAI were dissolved in a few ml of water and treated with ninhydrin reagent. Appearance of purple colour shows the presence of proteins and free amino acids.

TEST FOR FLAVANOIDS.

With aqueous sodium hydroxide solution the extract gives blue to violet colour if anthocyanins are present, yellow colour if flavones are present yellow, to orange if flavones are present.
RESULTS OF PHYTOCHEMICAL TESTS OF ATTIVERPATTAI
CHOORNAM(*Ficus racemosa*)

<table>
<thead>
<tr>
<th>Sl.No</th>
<th>Constituents</th>
<th>Attiverpattai Choornam</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Alkaloids</td>
<td>-</td>
</tr>
<tr>
<td>2.</td>
<td>Carbohydrates</td>
<td>-</td>
</tr>
<tr>
<td>3.</td>
<td>Glycosides</td>
<td>+</td>
</tr>
<tr>
<td>4.</td>
<td>Saponins</td>
<td>+</td>
</tr>
<tr>
<td>5.</td>
<td>Tannins</td>
<td>+</td>
</tr>
<tr>
<td>6.</td>
<td>Amino acids</td>
<td>+</td>
</tr>
<tr>
<td>7.</td>
<td>Flavanoids</td>
<td>+</td>
</tr>
<tr>
<td>8.</td>
<td>Phenol</td>
<td>+</td>
</tr>
<tr>
<td>9.</td>
<td>Phytosterol</td>
<td>+</td>
</tr>
<tr>
<td>10.</td>
<td>Protein</td>
<td>+</td>
</tr>
<tr>
<td>11.</td>
<td>Tannic Acid</td>
<td>+</td>
</tr>
</tbody>
</table>

**INFERENC**E:

The Phytochemical tests of *Attiverpattai Choornam* showed the presence of Glycosides, Saponins, Tannins, Amino acids, Flavonoids, Phenol, Phytosterol, Protein and Tannic acid.
METHODOLOGY FOR THIN LAYER CHROMATOGRAPHY OF ATTIVER PATTAI (*Ficus racemosa*)

METHOD:

2g of the sample was soaked in 20ml of rectified spirit (90%) for 18 hrs and boiled for 10 minutes and filtered. The filtrate was concentrated and made upto 10ml. 5µl of alcoholic extract was applied on Merck Aluminium plate pre-coated with Silica gel 60F\textsubscript{254} of 0.2 mm thickness along with the ingredients using Linomat IV applicator. The plate was developed in Toluene; ethyl acetate; formic acid 5:2.5:0.5 v/v. The plate was visualized in UV 254 and 366nm. In 366nm no visible spots are found The plate was then dipped in Vanillin –Sulphuric acid and heated in air oven at 105°C till the spots appeared.
RESULT FOR THIN LAYER CHROMATOGRAPHY OF ATTIVER PATTAI (*Ficus racemosa*)

<table>
<thead>
<tr>
<th>S.No</th>
<th>UV 254 nm</th>
<th>With Spray reagent</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Colour</td>
<td>Rf</td>
</tr>
<tr>
<td>1.</td>
<td>Pale Green</td>
<td>0.11</td>
</tr>
<tr>
<td>2.</td>
<td>Green</td>
<td>0.24</td>
</tr>
<tr>
<td>3.</td>
<td>Pale Green</td>
<td>0.38</td>
</tr>
<tr>
<td>4.</td>
<td>Pale Green</td>
<td>0.51</td>
</tr>
<tr>
<td>5.</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>6.</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>7.</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**INHERENCE:**

The alcoholic extract of *Attiverpattai Choornam* under UV 254nm showed the Rf values 0.11, 0.24, 0.38, 0.51 and with spray reagent it showed the Rf values 0.81, 0.92, 0.97.
METHODOLOGY FOR ANTI-MICROBIAL STUDY

METHOD:

The anti-bacterial activities of different extracts of *Atthiver Pattai choornam* were studied by disc diffusion method against the following organisms.

1. Streptococcus mutans
2. Staphylococcus aurens
3. Escherichia coli
4. Klebsiella pneumoniae
5. Pseudomonas aeruginosa
6. Candida albicans

Extracts of *Atthiver Pattai* were used in the concentration of 100, 50 and 25 ml using their respective solvents. Ciprofloxacin (50 mcg / disc) was used as standard. The disc diffusion method was employed for the screening of anti-bacterial activity.

DISC DIFFUSION METHOD.

A suspension of organism was added to sterile soya bean casein digest agar media at 45°C, the mixture was transferred to sterile petridishes and were allowed to solidity. Sterile discs, 5 mm in diameter, dipped in solutions of different extracts, standard and a blank was placed on the surface of agar plates. The plates were left standing for one hour at room temperature as a period of pre incubation diffusion to minimize the effects of variation in time between the application of the different solutions. Then the plates were incubated at 37°C for 18 hours and observed for anti-bacterial activity. The diameter of zones of inhibition were observed and measured. The average area of zones of inhibition were calculated and compared with that of standard’s.
RESULT FOR ANTI MICROBIAL STUDY OF ATTIVERPATTAI
CHoorANAM

<table>
<thead>
<tr>
<th>Organism</th>
<th>Standard drug Ciprofloxacin 50 mcg/disc</th>
<th>Test drug (APC µl/disc )</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Zone of Inhibition in mm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>100µl</td>
</tr>
<tr>
<td>Ster. mutans</td>
<td>31</td>
<td>18</td>
</tr>
<tr>
<td>Stap. Aureus</td>
<td>30</td>
<td>16</td>
</tr>
<tr>
<td>E. Coli</td>
<td>29</td>
<td>15</td>
</tr>
<tr>
<td>Klebsiella pneumoniae</td>
<td>30</td>
<td>19</td>
</tr>
<tr>
<td>Pseudomonas Aeruginosa</td>
<td>31</td>
<td>15</td>
</tr>
</tbody>
</table>

14 mm – Low sensitive, 15mm – Moderate, above 16mm – highly sensitive

NOTE:

SAMPLE CONCENTRATION : -

4gm – 400 ml of solvent in 25µl, 50µl, and 100µl/disc

Standard for Bacteria :
Ciprofloxacin HCL, 50 mcg/ disc

Standard used for fungus :
4.0 gm – 400 ml of solvent, 10µl, 25µl, 50µl/disc

INFERRENCE:

The Antimicrobial study of Attiverpattai Choornam shows that it is highly sensitive against Strp. mutans, Stap. aureus, E.coli, Klebsiella and Pseudomonas.
METHODOLOGY FOR BIO – CHEMICAL ANALYSIS.

PREPARATIONS OF EXTRACT

5gm of *Attiver Pattai Choornam* was weighed accurately and placed in a 250 ml clean baker and added with 50ml of distilled water. Then it was boiled well for about 10 mins. Then it was cooled and filtered in a 100ml volumetric flask and made upto 100ml with distilled water.

TEST FOR CALCIUM.

2ml of extract was taken in a clean test tube. To this 2ml of 4% ammonium hydroxide solution was added. Presence of calcium is denoted by formation of a white precipitate.

TEST OF IRON (FERRIC)

The extract was treated with glacial acetic acid and potassium Ferro cyanide. Presence of ferric Iron is denoted by a blue colour

TEST FOR IRON (FERROUS)

The extract was treated with conc. HNO₃ and ammonium thiocyanate. (presence of ferrous iron is denoted by formation of blood red colour)

TEST FOR SULPHATE:

2ml of the extract was added to 5% barium chloride solution. Presence of sulphate is denoted by formation of a white precipitate.
TEST FOR CHLORIDE:

The extract was treated with silver nitrate solution. The presence of chloride is denoted by formation of a white precipitate.

TEST FOR CARBONATE:

The extract was treated with concentrated HCL. If carbonate is present, it is denoted by effervescence.

TEST FOR PHOSPHATE:

The extract was treated with ammonium molybdate and conc. HNO₃ if phosphate is present, it is denoted by the formation of a yellow precipitate.

TEST FOR UNSATURATION:

1ml of potassium permanganate solution is added to the extract. The presence of unsaturation is denoted by decolourisation.
RESULTS OF BIO – CHEMICAL ANALYSIS

<table>
<thead>
<tr>
<th>Sl.No</th>
<th>Constituents</th>
<th>Attiverpattai Choornam</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Calcium</td>
<td>+</td>
</tr>
<tr>
<td>2.</td>
<td>Iron (Ferric)</td>
<td>-</td>
</tr>
<tr>
<td>3.</td>
<td>Iron (Ferrous)</td>
<td>+</td>
</tr>
<tr>
<td>4.</td>
<td>Sulphate</td>
<td>-</td>
</tr>
<tr>
<td>5.</td>
<td>Chloride</td>
<td>+</td>
</tr>
<tr>
<td>6.</td>
<td>Carbonate</td>
<td>-</td>
</tr>
<tr>
<td>7.</td>
<td>Phosphate</td>
<td>+</td>
</tr>
<tr>
<td>8.</td>
<td>Unsaturated</td>
<td>-</td>
</tr>
</tbody>
</table>

The acid radicals present were Chloride and Phosphate
The Basic radicals Present were Calcium and Iron (ferrous)

RESULT OF QUANTITATIVE ANALYSIS

<table>
<thead>
<tr>
<th>Sl.No</th>
<th>Test Parameters</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Zinc as Zn</td>
<td>37.8mg/kg</td>
</tr>
</tbody>
</table>
PHARMACOLOGICAL STUDY OF
ATTIVER PATTAI CHOORNAM (*Ficus racemosa*)

MATERIALS AND METHODS

Test Drugs

The following medicinal plants were used in the study were collected and processed by the methods prescribed in standard text books of siddha medicines.

*Attiverpattai Choornam* was prepared by the method described in (Vaithiya Perungural, pg.no 49)

Preparation of drug for dosing

*Attiverpattai Choornam* used for the study was suspended each time with 1% (w/v) solution of sodium carboxy methyl cellulose before administration.

Drugs and chemicals

Alloxan monohydrate and fine chemicals used in these experiments were obtained from Sigma Chemicals company, U.S.A. Other analytical grade chemicals were obtained from S.d. Fine Chemicals Ltd., Mumbai.

Experimental animals

Colony inbred animals strains of wistar rats of either sex weighing 200 - 250 g were used for the pharmacological and swiss albino mice of single sex were used for toxicological studies. The animals were kept under standard conditions 12:12 (day/night
cycles) at 22°C room temperature, in polypropylene cages. The animals were fed on standard pelleted diet (Hindustan Lever Pvt Ltd., Bangalore) and tap water *ad libitum*. The animals were housed for one week in polypropylene cages prior to the experiments to acclimatize to laboratory conditions. The experimental protocol was approved by the Institutional Animal Ethical Committee (IAEC).

**METHODOLOGY FOR ACUTE ORAL TOXICITY STUDY**

Acute oral toxicity was conducted as per the OECD guidelines (Organization of Economic Cooperation and Development) 423 (Acute Toxic Class Method). The acute toxic class method is a stepwise procedure with 3 animals of a single sex per step. Depending on the mortality and/or moribund status of the animals, on the average 2-4 steps may be necessary to allow judgment on the acute toxicity of the test substance. This procedure results in the use of a minimal number of animals while allowing for acceptable data based scientific conclusion.

The method uses defined doses (5, 50, 300, 2000 mg/kg body weight) and the results allow a substance to be ranked and classified according to the Globally Harmonized System (GHS) for the classification of chemicals which cause acute toxicity.

**EXPERIMENTAL PROCEDURE**

Swiss albino mice of either sex weighing 20-25g were used for the study. The starting dose level of *Attiverpattai choornam* was 2000 mg/kg body weight (per oral). As most of the crude extracts posses LD 50 Value more than 2000 mg/kg P.O, the starting dose used was 2000 mg/kg P.O. Dose volume was administered 0.1ml/10 gm body weight to the mice which were fasted over night. With water *ad libitum* Food was withheld for a further 3 to 4 hours after administration and observed for signs of toxicity. Body weight of the mice before and after administration, were noted and any changes in skin and fur, eyes and mucous membranes and also respiratory, circulatory, autonomic,
central nervous systems, somatomotor activity and behavior pattern were observed, and also signs of tremors, convulsion, salivation, diarrhoea, lethargy, sleep and coma were noted. The onset of toxicity and signs of toxicity were also noted.

RESULTS FOR ACUTE ORAL TOXICITY STUDY

**Attiverpattai Choornam** at the dose of 2000mg/kg/po did not exhibit any mortality in mice. As per OECD 423 guidelines the dose is said to be “Unclassified” under the toxicity scale. Hence further study with higher doses was not executed.
METHODOLOGY FOR ANTI DIABETIC ACTIVITY OF
ATTIVERPATTAI CHOORNAM

1. Alloxan induced diabetes in wistar rats

   Test Drug : Attiverpattai Choornam

   Animals : Male wistar albino rats (300-350 g)

   Drugs : Alloxan monohydrate (150 mg/kg/s.c) Sigma USA, Glibenclimide (5 mg/kg, i.p) US Vitamins, India

Induction protocol

1. Animals (n=18) were randomly selected, numbered and weighed.

2. Alloxan monohydrate (150 mg/kg/s.c) was injected to all animals and observed for 48 hours. To avoid hypoglycemic convulsions and death rats were injected with 5% glucose i.p and maintained on drinking water contains 5% glucose for 48 hrs.

3. After 48 hours the blood glucose level was determined using glucometer.

4. Animals showing blood glucose level \( \leq 300 \) mg/dl were taken for the study.

5. Animals showing hyperglycemic \( \leq 300 \) mg/dl were distributed to various groups.

6. Test drug/standard drugs were given for 6 days.

7. At the end of 6 days, animals were fasted to 10 hrs and the fasting blood sugar was estimated by glucometer and reported as mg/dl.
RESULTS FOR ANTI DIABETIC STUDIES

Attiverpattai Choornam exhibited significant antidiabetic activity in alloxan induced diabetes in rats. The results obtained from the study establish its efficacy with good correlation with clinical study findings reported in the thesis.

Effect of Attiverpattai Choornam on Blood Glucose level in rats

<table>
<thead>
<tr>
<th>Groups</th>
<th>Blood Glucose concentration (mg/dl)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>139.667 ± 15.187</td>
</tr>
<tr>
<td>Standard</td>
<td>80.166 ± 5.606***</td>
</tr>
<tr>
<td>Attiverpattai Choornam (500mg/kg, p.o..)</td>
<td>68.32 ± 6.88***</td>
</tr>
</tbody>
</table>

N=6; Values are expressed as mean ±S.D followed by Students Paired ‘t’ Test ***P<0.001 as compared with that of control is considered as significant.
CLINICAL ASSESSMENT

MADHUMEGAM

SIDDHA ASPECT

In Siddha system of medicine the ‘Neer noikal’ have been classified broadly under 2 main categories as Neer perukkal noi, Neer arukkal noi.

Among the Neernoikal, Madhumegam is described under neer perukkal noi.

VERUPEYARGAL (synonyms)

Neerhizhivu, Inippu neer.

Iyal (Definition)\(^{22}\)

Madhumegam is defined as a disease in which there is large quantity and high frequency of micturition, derangement of 7 udal thathukkal and loss of weight.

Noi varum vazhi (aetiology):
According to yugi vaidhya chindamani, the etiology of madhumegam is explained as follows:

Excessive intake of fat and high caloric foods such as milk, ghee and meat, increased intake of alcoholic beverages, excessive carbohydrate intake, eating indigestible and cold food, disturbance in sleeping, excessive involvement in sexual activities, obesity stress and fear are mentioned as the etiological factors for Madhumegam.
KURIGUNAM (CLINICAL FEATURES):

Poly dipsia, dryness of tongue, fatigue, giddiness, general weakness, polyuria are some of the clinical features.
திறந்துசெய்த பயிற்சிகளுக்கு.

நூற்றாண்டைக்கு பின்னர் உருவான துறையிலே திறந்துசெய்த பயிற்சிகளுக்கு நேர்க்காண்டு செய்யப்பட்டது. அந்த துறையிலே திறந்துசெய்துள்ள பயிற்சிகள் நேர்க்காண்டு முடிக்கிறது. அந்தந்தத்தில் என்பது நேர்ப்படு பண்டையாகும்.

“பண்டைய செயலுக்குச் சேர்ந்து அரங்கம்”

என்று செய்யும் பல்வேறு வகைகளால் முன்னெடுத்துப் பயிற்சிகளுக்கு என்பது என்பது என்ன இடைவெளியில் (அறிவு) குறிப்பிட்டுபடற்று என்பது என்று – செயல், புரியும் – செயல் என்பது என்று பயிற்சிகளுக்கு முன்னெடுத்துஅரங்கம்.
MODERN ASPECT

DIABETES MELLITUS

Definition:

Diabetes mellitus comprises a group of common metabolic disorders that share the phenotype of hyperglycemia. Several distinct types of diabetes mellitus exist and are caused by a complex interaction of genetics, environmental factors and lifestyle choices. Depending on the etiology of Diabetes mellitus, factors contributing to hyperglycemia may include reduced insulin secretion, decreased glucose usage and increased glucose production.

Classification

Two broad categories of Diabetes mellitus are

1. Type – I diabetes (IDDM) – β cell destruction usually leading to absolute insulin deficiency.
2. Type – II diabetes (NIDDM) – may range from predominantly insulin resistance with relative insulin deficiency to insulin secretory defect with insulin resistance.

CLINICAL FEATURES:

Polyuria
Nocturia
Poly dypsia, dryness of mouth
Poly phagia
Rapid weight loss
Chronic fatigue
Giddiness
Peripheral neuritis


Diagnostic criteria for Diabetes:

<table>
<thead>
<tr>
<th>Blood glucose</th>
<th>Normal</th>
<th>Border line</th>
<th>Diabetes mellitus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fasting</td>
<td>&lt;0-110mg/dl</td>
<td>&gt;110 but less than 125 mg%</td>
<td>&gt;126 mg%</td>
</tr>
<tr>
<td>Post prandial</td>
<td>&lt;140mg/dl</td>
<td>&gt;140 But less then 200 mg%</td>
<td>&gt;200 mg%</td>
</tr>
</tbody>
</table>

MEDICAL ADVICE:

1. The diet should include complex carbohydrate protein, decreased fat and low calories

2. Advised to take small frequent meals.

3. Advised to avoid sweety, excessive salty, sour tastes in food.

4. Advised to take food rich in fiber content (app 20 – 30 gm/day)

5. Advised to monitor blood glucose levels regularly.

CLINICAL STUDY PATTERN:

The study was carried out at the Madhumegam sirappu sigichai pura noiyalar pirivu (outpatient department), Government Arignar Anna Hospital for Indian medicine and Homeopathy, Chennai.

Sample size: 40 Patients
SELECTION OF PATIENTS

Patients with the following criteria were enrolled for the study.

INCLUSION CRITERIA

- Patients of age group: 30-70 years
- Patients of either sex
- Non Insulin Dependent Diabetes Mellitus (NIDDM) – Type – II
- Non – obese
- Clinical Parameters – Polyuria, Polydipsia, Polyphagia, fatigue, giddiness, Peripheral neuritis

INVESTIGATIVE PARAMETERS

- Fasting blood sugar of 110/dl and above
- Post prandial Blood Sugar 140 mg/dl and above

EXCLUSION CRITERIA

- Patients with type I Diabetes mellitus.
- Pregnancy induced Diabetes mellitus.
- Patients with renal impairment.
- Patients with hypertension.
- Patients with other cardio vascular problems, pancreatic pathology and liver affections.
- Patients with Diabetic nephropathy and retinopathy.
WITHDRAWAL CRITERIA:

Irregular medication.
Patients who followed dual treatment.

STUDY DESIGN:

Open clinical trial

DRUG SCHEDULE:

Attiverpattai choornam, 1gm was administered with water (30ml) before food, twice daily for a period of 48 days.

Enrollment and method of study.

Patients with us the above inclusion criteria were enrolled in the study after recording the baseline data. 1g of Attiverpattai choornam with water was given twice a day after food for a period of 48 days. The patients were advised to visit follow-up once in 7 days for a general observation related to dose adaptation and parallel clinical parameters were recorded.

The efficacy follow up was taken up at the end of 48 days of therapy for recording clinical and investigative parameters, and they were subjected to statistical analysis at the end of the study.

During the course of treatment patients were advised to report immediately when they get signs of hypoglycemia (giddiness, sweating, palpitation etc.)
Parameters of evaluation.

CLINICAL PARAMETERS.

- Polyuria (Athi moothiram)
- Polyphagia (Athi Pasi)
- Polydipsia (Athithagam)
- Fatigue (sorvu)
- Giddiness
- Peripheral neuritis

Investigative parameter included is estimation of blood sugar (Fasting and Post Prandial)
<table>
<thead>
<tr>
<th>S.No</th>
<th>Op.No</th>
<th>Patient Name</th>
<th>Age/Sex</th>
<th>Duration of Treatment</th>
<th>Before Treatment</th>
<th>After Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Blood Sugar (mg%)</td>
<td>Blood Sugar (mg%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>F</td>
<td>PP</td>
</tr>
<tr>
<td>1.</td>
<td>3343</td>
<td>Sivagami</td>
<td>56/F</td>
<td>29.10.07-11.12.07</td>
<td>136</td>
<td>96</td>
</tr>
<tr>
<td>2.</td>
<td>2982</td>
<td>Gayathiridevi</td>
<td>32/F</td>
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<td>136</td>
</tr>
<tr>
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<td>Ganesh</td>
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<td>3836</td>
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<td>Kaveri</td>
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<td>122</td>
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<td>6.</td>
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<td>Thangappan</td>
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<td>5987</td>
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<td>Gowri</td>
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<td>Desigan</td>
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<td>23.11.07-15.01.08</td>
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<td>1596</td>
<td>Adhikesavan</td>
<td>65/M</td>
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<td>9220</td>
<td>Mary</td>
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<tr>
<td></td>
<td>Name</td>
<td>Gender</td>
<td>Start Date</td>
<td>End Date</td>
<td>Age</td>
<td>Height</td>
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<tr>
<td>---</td>
<td>-----------</td>
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<td>Dhananchezhiyan</td>
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<td>Esakiyal</td>
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<td>108</td>
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<tr>
<td>26</td>
<td>Sampooranam</td>
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<td>24.01.08-11.03.08</td>
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<td>124</td>
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<tr>
<td>27</td>
<td>Kanagamani</td>
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<td></td>
<td>138</td>
<td>112</td>
</tr>
<tr>
<td>28</td>
<td>Johny</td>
<td>M 58</td>
<td>29.01.08-15.03.08</td>
<td></td>
<td>160</td>
<td>134</td>
</tr>
<tr>
<td>29</td>
<td>Jamal</td>
<td>M 55</td>
<td>29.01.08-11.03.08</td>
<td></td>
<td>140</td>
<td>112</td>
</tr>
<tr>
<td>30</td>
<td>Maniambu</td>
<td>F 62</td>
<td>29.01.08-11.03.08</td>
<td></td>
<td>135</td>
<td>128</td>
</tr>
<tr>
<td>31</td>
<td>Pachaiammal</td>
<td>F 65</td>
<td>31.01.08-15.03.08</td>
<td></td>
<td>125</td>
<td>106</td>
</tr>
<tr>
<td>32</td>
<td>Venkatesan</td>
<td>M 55</td>
<td>05.02.08-20.03.08</td>
<td></td>
<td>94</td>
<td>92</td>
</tr>
<tr>
<td>33</td>
<td>Nageswararao</td>
<td>M 42</td>
<td>05.02.08-05.04.08</td>
<td></td>
<td>120</td>
<td>107</td>
</tr>
<tr>
<td>34</td>
<td>Durai</td>
<td>M 42</td>
<td>05.02.08-20.03.08</td>
<td></td>
<td>198</td>
<td>121</td>
</tr>
<tr>
<td>35</td>
<td>Palani</td>
<td>M 43</td>
<td>26.02.08-04.04.08</td>
<td></td>
<td>220</td>
<td>127</td>
</tr>
<tr>
<td>36</td>
<td>Shanthi</td>
<td>F 56</td>
<td>03.03.08-15.04.08</td>
<td></td>
<td>110</td>
<td>102</td>
</tr>
<tr>
<td>37</td>
<td>Muthuswamy</td>
<td>M 50</td>
<td>04.03.08-20.04.08</td>
<td></td>
<td>98</td>
<td>94</td>
</tr>
<tr>
<td>38</td>
<td>Parameshwari</td>
<td>F 40</td>
<td>05.03.08-20.04.08</td>
<td></td>
<td>125</td>
<td>105</td>
</tr>
<tr>
<td>39</td>
<td>Lakshmi</td>
<td>F 58</td>
<td>05.03.08-15.04.08</td>
<td></td>
<td>110</td>
<td>102</td>
</tr>
<tr>
<td>40</td>
<td>Durairaj</td>
<td>M 70</td>
<td>06.03.08-19.04.08</td>
<td></td>
<td>121</td>
<td>106</td>
</tr>
</tbody>
</table>
SEX DISTRIBUTION:

<table>
<thead>
<tr>
<th>S.No</th>
<th>Sex</th>
<th>No.of.Cases</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Male</td>
<td>12</td>
<td>30</td>
</tr>
<tr>
<td>2.</td>
<td>Female</td>
<td>28</td>
<td>70</td>
</tr>
</tbody>
</table>

INFERRENCE

Out of 20 Patients 12 cases (60%) were male and 8 cases (40%, were female)
AGE DISTRIBUTION:

<table>
<thead>
<tr>
<th>S.No</th>
<th>Age Group</th>
<th>No.of.Cases</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>30-40</td>
<td>2</td>
<td>17</td>
</tr>
<tr>
<td>2.</td>
<td>41-50</td>
<td>10</td>
<td>25</td>
</tr>
<tr>
<td>3.</td>
<td>51-60</td>
<td>16</td>
<td>40</td>
</tr>
<tr>
<td>4.</td>
<td>61-70</td>
<td>6</td>
<td>15</td>
</tr>
</tbody>
</table>

INFERENCES:

Among 40 Patients, 7 belong to age group 30-40 and 10 patients belong to age group 41-50, 16 pts belong to age group 51-60 and 6 patients belong to 61-70 maximum pts found to be between 40-60
OCCUPATION WISE DISTRIBUTION

<table>
<thead>
<tr>
<th>S.No</th>
<th>Occupation</th>
<th>No.of.Cases</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>House wife</td>
<td>24</td>
<td>60</td>
</tr>
<tr>
<td>2.</td>
<td>Teacher</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>3.</td>
<td>Farmer</td>
<td>5</td>
<td>12</td>
</tr>
<tr>
<td>4.</td>
<td>Daily Labour</td>
<td>8</td>
<td>20</td>
</tr>
<tr>
<td>5.</td>
<td>Retired Person</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>6.</td>
<td>Office Work</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

Among 40 patients 24(60%) patients were housewife, 1 (2%) patient was teacher, 5(12%) patients were farmer and 8 (20%) were Daily Labour. From the above data, it is noted that age and occupation donot show any influence on the management of Diabetes.
HABIT WISE DISTRIBUTION

<table>
<thead>
<tr>
<th>S.No</th>
<th>Habit</th>
<th>No.of.Cases</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Veg</td>
<td>6</td>
<td>15</td>
</tr>
<tr>
<td>2.</td>
<td>Mixed</td>
<td>18</td>
<td>45</td>
</tr>
<tr>
<td>3.</td>
<td>Alcohol</td>
<td>8</td>
<td>22</td>
</tr>
<tr>
<td>4.</td>
<td>Smoker</td>
<td>8</td>
<td>22</td>
</tr>
</tbody>
</table>

INFERENCES:

This table shows that food habit do not show any influence in case of Diabetes. Among 40 patients. 6(15%) were, Vegetarian, 18%(45%) were non-veg, 8(22%) were smoker 8(22%) were alcoholic 8 (22%) were smokers.
SOCIO- ECONOMIC STATUS:

<table>
<thead>
<tr>
<th>S.No</th>
<th>Socio – Economic Status</th>
<th>No.of.Cases</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Poor</td>
<td>28</td>
<td>71</td>
</tr>
<tr>
<td>2.</td>
<td>Middle</td>
<td>9</td>
<td>22</td>
</tr>
<tr>
<td>3.</td>
<td>Rich</td>
<td>3</td>
<td>7</td>
</tr>
</tbody>
</table>

**INFERENCE:**

Among 40 pts 28(71%) were poor, 9(22%) were middle class and 3 (7%) were rich.
SYMPTOM WISE DISTRIBUTION

<table>
<thead>
<tr>
<th>Symptoms</th>
<th>Before Treatment</th>
<th>After Treatment</th>
<th>Improvement</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polyuria</td>
<td>40</td>
<td>4</td>
<td>36</td>
<td>90</td>
</tr>
<tr>
<td>Polydipsia</td>
<td>40</td>
<td>3</td>
<td>37</td>
<td>92</td>
</tr>
<tr>
<td>Polyphagia</td>
<td>39</td>
<td>4</td>
<td>35</td>
<td>89</td>
</tr>
<tr>
<td>Giddiness</td>
<td>34</td>
<td>6</td>
<td>28</td>
<td>82</td>
</tr>
<tr>
<td>Fatigue</td>
<td>40</td>
<td>10</td>
<td>30</td>
<td>75</td>
</tr>
<tr>
<td>Peripheral Neuritis</td>
<td>23</td>
<td>14</td>
<td>9</td>
<td>39</td>
</tr>
</tbody>
</table>

INFERENCE:

Patients with the parameters that is polyuria, Polydipsia, Polyphagia, Giddiness, Fatigue, Peripheral Neuritis were taken for the study.

Among 40 Patients 36 pts improved from polyuria.
Among 39 Pts with polyphagia 35 got relief from the symptom.
Among 40 Pts with polydipsia 37 improved.
Among 34 Patients with giddiness 28 got relief.
Among 40 Pts with Fatigue 30 got improvement.
Among 23 Pts with peripheral neuritis only 9 got improvement.
MEAN VALUES OF REDUCTION IN BLOOD GLUCOSE LEVELS:
Before and After Treatment

<table>
<thead>
<tr>
<th>S.No</th>
<th>Blood Sugar</th>
<th>Before Treatment</th>
<th>After Treatment</th>
<th>Reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Fasting</td>
<td>133</td>
<td>107</td>
<td>26</td>
</tr>
<tr>
<td>2.</td>
<td>Post Prandial</td>
<td>195</td>
<td>155</td>
<td>40</td>
</tr>
</tbody>
</table>

**INFERENC**E:

The mean Value of reduction in fasting blood sugar level before treatment 26. The mean value of reduction in post prandial sugar level after treatment 40.
METHODOLOGY FOR STATISTICAL ANALYSIS

PHARMACOLOGICAL STUDY:

The statistical analysis was carried out by using one-way ANOVA (Analysis of variance) followed by Dunnett’s ‘t’ test. P values <0.05 were considered as significant.

STATISTICAL ANALYSIS FOR CLINICAL STUDY:

To find the statistical significance paired t-test was used to assess the effect of treatment based on symptoms. Two tailed P value was considered for statistical significant. Analysis was performed by using SPSS 10 (Statistical Package for social science) Version package. For comparison of proportion among male and female less than 45 years and greater than or equal to 45 years. Chi square test was applied to find the statistical significance. P values less than 0.05 were considered significant.

\[ t = \frac{\overline{d} \sqrt{n}}{S} \]

\[ \overline{d} = \text{Mean} \]
\[ n = \text{No. of Samples} \]

To study variation in one or more attributes the data are expressed mostly as proportions. If a sample is divided into only two classes such as successes and failures it is said to have a binomial

\[ P = \frac{\text{Number of individuals having a Specific Character}}{\text{Total Number}} \]

\[ P = \frac{\text{Character in a binomial distribution is expressed}}{\text{Total Number}} \]

q = probability of non – occurrence of the same.

STANDARD ERROR OF PROPORTION (S.E.P)

59
The probability or Proportional changes of positive or negative occurrence of an attribute or a character in a population or universe follows.

**Binomial Frequency Distribution**

\[
S.E.P = \sqrt{\frac{Pq}{N}}
\]

Probability of difference occurring by chance can be found by applying Z test as done in the case of means,

\[
Z = \frac{p - P}{S.E.P}
\]

**STATISTICAL ANALYSIS**

**DESCRIPTIVE STATISTICS :**

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>40</td>
<td>31</td>
<td>70</td>
<td>50.5</td>
<td>12.36</td>
</tr>
</tbody>
</table>

The mean value of Affected group was observed to be 50.

**PAIRED SAMPLES STATISTICS:**

<table>
<thead>
<tr>
<th>Pair I</th>
<th></th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fasting Blood Sugar</td>
<td>B.T</td>
<td>40</td>
<td>94</td>
<td>220</td>
<td>131.95</td>
<td>25.85</td>
</tr>
<tr>
<td>A.T</td>
<td>40</td>
<td></td>
<td>96</td>
<td>200</td>
<td>110.35</td>
<td>13.5</td>
</tr>
</tbody>
</table>

The mean Fasting Blood Sugar (131.95) before treatment was reduced to mean value 110.35 after treatment.
PAIRED SAMPLES STATISTICS:

<table>
<thead>
<tr>
<th>Pair</th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>B.T</td>
<td>40</td>
<td>149</td>
<td>294</td>
<td>195.72</td>
<td>30.01</td>
</tr>
<tr>
<td>A.T</td>
<td>40</td>
<td>123</td>
<td>207</td>
<td>155.52</td>
<td>20.82</td>
</tr>
</tbody>
</table>

The mean Post prandial Blood Sugar (195.72) before Treatment was reduced to mean 155.53 after treatment.

<table>
<thead>
<tr>
<th>Pair</th>
<th>B.T vs A.T</th>
<th>Paired Mean</th>
<th>t</th>
<th>df</th>
<th>Significance (2 tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Fasting Blood Sugar</td>
<td>18.9</td>
<td>6.250</td>
<td>39</td>
<td>0.000</td>
</tr>
<tr>
<td>2.</td>
<td>Post Prandial Blood Sugar</td>
<td>41.125</td>
<td>10.582</td>
<td>39</td>
<td>0.000</td>
</tr>
</tbody>
</table>

Paired t-test showed significant (P<0.001) in both fasting and Post prandial blood sugar levels after treatment at 39 degrees of freedom. The Attiverpattai choornam has produced significant reduction in both Fasting and Post prandial Blood Sugar level.

STATISTICAL ANALYSIS OF SUBJECTIVE PARAMETERS OBSERVED BEFORE AND AFTER TREATMENT OF PATIENTS.

<table>
<thead>
<tr>
<th>S.No</th>
<th>Parameters</th>
<th>Percentage improved</th>
<th>Statistical Criteria</th>
<th>Probability</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Study</td>
<td>Effect</td>
<td>Difference</td>
<td>Z</td>
</tr>
<tr>
<td>1.</td>
<td>Polyuria</td>
<td>100</td>
<td>90</td>
<td>10</td>
<td>0.645</td>
</tr>
<tr>
<td>2.</td>
<td>Polydipsia</td>
<td>100</td>
<td>93</td>
<td>7</td>
<td>0.3225</td>
</tr>
<tr>
<td>3.</td>
<td>Polypagia</td>
<td>97</td>
<td>88</td>
<td>9</td>
<td>0.000</td>
</tr>
<tr>
<td>4.</td>
<td>Giddiness</td>
<td>85</td>
<td>70</td>
<td>15</td>
<td>1.225</td>
</tr>
</tbody>
</table>

P <0.001 hence the improvement in the subjective parameters produced by Attiver pattai choornam is statistically significant.
DISSCUSSION

Madhumegam (Diabetes mellitus) represents a heterogeneous group of disorders. It is characterized by hyperglycemia and disturbances of carbohydrate, fat and protein metabolism associated with absolute or relative deficiencies in insulin action or insulin secretion.

From the literature survey the drug Attiverpattai choornam was found to be more effective in the treatment of Madhumegam.

The drug was selected as per the literature evidence given in the siddha text “Vaidhiya perungural” and clinical trial, pharmacological shady were carried out in order to prove its efficacy in treatment of Madhumegam.

The various experiments studies on Attiverpattai (The root bark of Ficus racemosa linn shows its potent hypoglycemic activity.

\[ \text{Attiverpattai} \]
The physiochemical standardization viz. Total acid soluble ash, water soluble ash, alcohol and water soluble extractive values were determined.
In Diabetes mellitus due to the insufficiency of insulin the normal protein synthesis of the body is affected. Hence there is loss of weight which should be treated with dietary protein supplement. Hence the presence of protein is a significant evidence for the treatment of the disease.

Flavonoids are potent anti-oxidant when body’s cells burn oxygen they form free radicals. Increased formation of reactive oxygen species (ROS) related to increase of glucose concentration in plasma and tissues. The inhibitory effect may be due to flavonoids.

Bio markers for oxidative damage to DNA, lipids and proteins are also supporting the concept of increased oxidative stress in diabetes. Antioxidant treatment can reverse oxidative stress, suggesting the therapeutic procedure beneficial effect of antioxidant treatment.

The β–sitosterol-D glucoside of *Ficus racemosa* is hypoglycemic. (MAPIS June 1986, No. 1474).

Extract of the bark *Ficus racemosa linn* reduces blood sugar by 62% due to presence of same carbohydrates and amino acids which are ant diabetic. (The Doctor News, Jan 1991)

The biochemical analysis of the drug showed the presence of Zinc. The quantity of Zinc per kg was 37.8mg. Zinc is essential constituent of many enzymes such as Carbonic anhydrate, Alkaline phosphates, pancreatic carboxy peptidase and cystolic super oxide dismutase.

Zinc is required for the preparation of insulin and increases the duration of insulin action, when given by injection. Zinc is used in the β cells of the pancreas to store and
release insulin when required. Hence the presence of Zinc supports its efficacy in the management of Madhumegam.

Chloride is necessary for glandular hormone secretion. It also prevents the building of excessive fat and acute intoxication. It may be helpful in preventing the athreselerotic changes due to diabetes.

Antimicrobial study reveals that the drug is a highly sensitive antibacterial agent against Staphylococcus aureus, Mutans, Pseudomonas, Klebsiella and E.coli.

Acute and repeated oral toxicity study reveals that the drug was proved safe for administration as it did not exhibit any significant toxicity at 600mq/kg body weight.

Attiverpattai choornam produced hypoglycemic activity against alloxan induced diabetic rats. The findings of the experimental anti diabetic study show that Attiverpattai possess anti diabetic property and thus lead pharmacological support to the traditional Siddha medical use of Attiverpattai choornam in treatment of Madhumegam.

Open clinical trial with a sample size of 40 Patients, a period of 48 days revealed the following features.

Max. No. of patients affected belong to the age group 40-60 (65%) and the greater being female (70%). Patients taking mixed diet (45%) were more prone to the incidence of Madhumegam. It was found that sedentary life style and habits influences the occurrence of Madhumegam.

Administration of Attiverpattai choornam, 1gm twice a day with water (30ml), before food for a period of 48 days, showed gradual relief from the subjected parameters such as Polyuria (Athimoothiram), Polydipsia (Adhidhagam), Polyphagia (Adhipasi) and fatigue (Sorvu), Improvement in the subjected parameters were clinically significant,
statistical analysis showed significant reduction in both fasting and post prandial blood sugar after treatment with *Attiverpattai choornam*. No adverse effects were observed during the entire course of this study.
SUMMARY

The study on **Attiver Pattai Choornam** to evaluate its efficacy in the management of **Madhumegam** was carried out based on the evidences collected from Siddha literatures.

After obtaining guidance from the HOD & permission from principal, Govt Siddha medical college, pharmacognostical study was carried out in Central Research Institute for Siddha, Chennai – 106.

Pharmacological study was carried out in C.L. Baid Metha College of pharmacy, Thoraipakkam, Chennai.

The single drug Attiverpattrai was purified, powdered and purified, prepared as choornam and was stored. RF values were determined by TLC.

Phytochemical tests were done which showed the presence of Tannins, Steroids, Flavanoids, Saponins, Proteins, Amino acids and Glycosides.

The antimicrobial study proved, it to be effective against various bacteria.

Biochemical analysis showed presence of calcium, Iron (ferrous), phosphate, and chloride.

Pharmacological study was done for its ant diabetic activity in C.L Baid Mehta College of pharmacy, Chennai, Thoraipakkam. The results showed significant hypoglycemic activity on alloxan induced diabetic rats.
The clinical assessment was done as an open clinical trial in special op department for Madhumegam at Arignar Anna Hospital for Indian medicine Chennai – 106. The patients were selected according to selection criteria.

Patients were carefully observed in regular visit and prognosis was sincerely documented.

The drug Attiver Pattai Chooranam was administered 1gm twice a day with water (30ml) before food for a period of 48 days.

In the clinical trial improvement of signs and symptoms like polyuria, polydipsia, polyphagia, fatigue were clinically significant.

No adverse drug effect was observed during the entire course of study.

The drug Attiverpattai choornam showed significant reduction in blood sugar.
CONCLUSION

The evaluation of efficacy of a single drug, **Attiverpattai choornam** in the management of **Madhumegam** gave significant results.

Presence of Tannins, Flavanoids Saponins, Zinc, Chloride play a vital role in management of **Madhumegam**.

Pharmacological anti-diabetic activity strengthen the study.

Clinically the drug relieved the symptoms polyuria, polydipsia, polypnagia very well.

**Attiver pattai choornam** regularized the 3 humors by stabilizing the azhal thathu by its thuvarpu suvai

No adverse effects were observed during the period of study.

In total **Attiver pattai choornam** play a potential therapeutic role the in management of **Madhumegam**.

**Attiver pattai choornam** needs further study with regard to mechanism of action to develop as a potent anti diabetic agent.
SEX DISTRIBUTION:

<table>
<thead>
<tr>
<th>S.No</th>
<th>Sex</th>
<th>No.of.Cases</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Male</td>
<td>12</td>
<td>30</td>
</tr>
<tr>
<td>2.</td>
<td>Female</td>
<td>28</td>
<td>70</td>
</tr>
</tbody>
</table>

INFEERENCE

Out of 20 Patients 12 cases (60%) were male and 8 cases (40%, were female)
AGE DISTRIBUTION:

<table>
<thead>
<tr>
<th>S.No</th>
<th>Age Group</th>
<th>No.of.Cases</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>30-40</td>
<td>2</td>
<td>17</td>
</tr>
<tr>
<td>2.</td>
<td>41-50</td>
<td>10</td>
<td>25</td>
</tr>
<tr>
<td>3.</td>
<td>51-60</td>
<td>16</td>
<td>40</td>
</tr>
<tr>
<td>4.</td>
<td>61-70</td>
<td>6</td>
<td>15</td>
</tr>
</tbody>
</table>

INFERENCE:

Among 40 Patients, 7 belong to age group 30-40 and 10 patients belong to age group 41-50, 16 pts belong to age group 51-60 and 6 patients belong to 61-70 maximum pts found to be between 40-60
patients 24(60%) patients were housewife, 1 (2%) patient was teacher, 5(12%) patients were farmer and 8 (20%) were Daily Labour. From the above data, it is noted that age and occupation donot show any influence on the management of Diabetes.

**HABIT WISE DISTRIBUTION**

| S.No | Habit            | No.of.Cases | Percentage (%) |
|------|------------------|-------------|----------------|----------------|
|      |                  |             |                |                |
1. Veg | 6 | 15
2. Mixed | 18 | 45
3. Alcohol | 8 | 22
4. Smoker | 8 | 22

**Inference:**

This table shows that food habit do not show any influence in case of Diabetes. Among 40 patients. 6(15%) were Vegetarian, 18%(45%) were non-veg, 8(22%) were smoker 8(22%) were alcoholic 8 (22%) were smokers.

**Socio-Economic Status:**
<table>
<thead>
<tr>
<th>S.No</th>
<th>Socio – Economic Status</th>
<th>No.of.Cases</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Poor</td>
<td>28</td>
<td>71</td>
</tr>
<tr>
<td>2.</td>
<td>Middle</td>
<td>9</td>
<td>22</td>
</tr>
<tr>
<td>3.</td>
<td>Rich</td>
<td>3</td>
<td>7</td>
</tr>
</tbody>
</table>

**INFERENC E:**

Among 40 pts 28(71%) were poor, 9(22%) were middle class and 3 (7%) were rich.

**SYMPTOM WISE DISTRIBUTION**
<table>
<thead>
<tr>
<th>Symptoms</th>
<th>Before Treatment</th>
<th>After Treatment</th>
<th>Improvement</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polyuria</td>
<td>40</td>
<td>4</td>
<td>36</td>
<td>90</td>
</tr>
<tr>
<td>Polydipsia</td>
<td>40</td>
<td>3</td>
<td>37</td>
<td>92</td>
</tr>
<tr>
<td>Polyphagia</td>
<td>39</td>
<td>4</td>
<td>35</td>
<td>89</td>
</tr>
<tr>
<td>Giddiness</td>
<td>34</td>
<td>6</td>
<td>28</td>
<td>82</td>
</tr>
<tr>
<td>Fatigue</td>
<td>40</td>
<td>10</td>
<td>30</td>
<td>75</td>
</tr>
<tr>
<td>Peripheral Neuritis</td>
<td>23</td>
<td>14</td>
<td>9</td>
<td>39</td>
</tr>
</tbody>
</table>

**INFERRENCE:**

Patients with the parameters that is polyuria, Polydipsia, Polyphagia, Giddiness, Fatigue, Peripheral Neuritis were taken for the study.

Among 40 Patients 36 pts improved from polyuria.

Among 39 Pts with polyphagia 35 got relief from the symptom.

Among 40 Pts with polydipsia 37 improved.

Among 34 Patients with giddiness 28 got relief, Among 40 Pts with Fatigue 30 got improvement, Among 23 Pts with peripheral neuritis only 9 got improvement.

**MEAN VALUES OF REDUCTION IN BLOOD GLUCOSE LEVELS:**
Before and After Treatment
**INFERENCES:**

The mean value of reduction in fasting blood sugar level before treatment is 26. The mean value of reduction in post prandial sugar level after treatment is 40.
INTRODUCTION

Use of traditional Medicines for human ailments, especially herbal medicines, could be traced back to 4500 BC in ancient China at the time of Xia dynasty and in India during the vedic period. With increasing life expectancy, incurable chronic diseases toxicity associated with modern systems of medicines, traditional systems of medicine have become significantly popular all over the world today.

The World Health Organization (WHO) estimates that 80% of the Population of developing countries relies on traditional medicines for their primary health care. The world market for herbal products is estimated at $ 80 billion dollars and is growing at the rate of 7 % per annum.

Life is not mere living but living in good health. The health of an individual and of nations is of primary concern to one and all. From his first awakening man has sought to fight and control diseases and turned to nature for inspiration and guidance.

During thousand of years of early existence many natural materials by instinct or intuition or trial and error, got in use for combating human ailments. Thus the Traditional systems of Medicines Siddha, Ayurveda lean heavily on natural products in health management.

In spite of great and spectacular advances in modern medical sciences in the fight against disease, a considerable portion of world’s population, especially in developing countries like India is still without proper medical care.

About one third of India’s population have never visited a doctor and another 24 % doesnot get proper medical treatment. Hence practicing siddha system of medicine and usage of medicinal plants for curing ailments such as inflammation, jaundice,
diabetes mellitus are gaining momentum throughout the world. Siddha system of medicine claim to offer a number of herbal medicines that are effective in curing such diseases permanently without or with minima side effects. But scientific and experimental evidences to support these claims are meager.

There has been resurgence of Siddha System of medicine the world over. There is growing realization in the world that the holistic approach of Siddha System of medicine complimenting the modern systems holds the key for realising the goal for health and well being for all.

The Siddha System of medicine have an impressive record of treating many chronic and incurable diseases. “Vellainoi” (Leucorrhoea) is one such ailment of womanhood. The treatment of Vellainoi has become a great problem since many women refuse to present themselves with such complaints.

“Gandagam” (Sulphur) is widely used in Siddha System for treating various diseases especially skin diseases. Hence an attempt was made to find out the efficacy of “Gandaga Parpa Matirai” in treating Vellainoi. Systematic pharmacological studies in evidence to the study have been made out.
AIM AND OBJECTIVES

AIM:
To evaluate the efficacy of *Gandhaga Parpa Mathirai* in the management of *Vellai Noi*.

OBJECTIVES:

- To Identify the Crude drug
- To study the Antimicrobial activity of the drug
- Bio Chemical analysis of the drug
- To study the Acute oral toxicity of the drug
- To study the Pharmacological activity of the drug (Anti-Inflammatory, Analgesic)
- To evaluate the efficacy of the drug clinically
REVIEW OF LITERATURE
GUNAPADAM ASPECT

“ஆனே நமது மாநிலம் கானே இயற்கையை”
அதிலும் தலைமுறை வல்லாணலைத்
குறிப்பிட்டுச் சங்கிலிப் பிரபலாசனம்
பற்றிய நூற்றையும் பனித்தக்கோட்டையை 46
– சடைல கங்கசா

காநிலொப்புப் பல்லவ பெண்ண மாநிலம், வாச, கிருஷ்ணம், அருசை புகாரின், பேராஜீ, ஸ்ரீபீர்஫ுகேரி, 
சிங்கி, சாப்பிட்டு சாயமாரகக்குடி, உடைன், வெளிப்புறம், ராஜீவு, பாரியா பலைசுழற்சி, 
காரணமாறும், இது குற்றோப்பில் தொடங்க வைக்கும் கொண்டுவிடும் ከ2.
சால், கல்வியை, குழந்தைகள், எழுத்துகள் குறிப்பிட்டு, சிற்றலை, புகழ்மலர், 
முன்னைச் செய்ய நிகழ்வு பட்டியலில் முதல் முறையிலும் இருந்த 
செயல்படி தரும செய்யல் பட்டியல் குறிப்பிட்டு

குறிப்பிட்டு

ஜார்வின் கல்வியை அடையாளம், போர்க் கட்டுளவி, பந்தலையின், வேளிக்குறிகளின் 
குறுக்கு தொடர்புபடுத்தப்பட்டுள்ளன. அதன் பட்டியல்களைக் குறிப்பிட்டு, உள்முழு 
செயல்படி தரும செய்யல் பட்டியல் குறிப்பிட்டு

ஜார்வின் கல்வியை அடையாளம் அடையாளம் முன்னையொலிகளில் தொடர்பு பட்டியல் குறிப்பிட்டு

புற்று போர்க் கட்டுளவி வந்தவர் தொடர்பு பட்டியல் குறிப்பிட்டு

ஜார்வின் கல்வியை அடையாளம் முன்னையொலிகளில் தொடர்பு பட்டியல் குறிப்பிட்டு

தனியுரிகளை வந்தவர் தொடர்பு பட்டியல் குறிப்பிட்டு

ஜார்வின் கல்வியை அடையாளம் முன்னையொலிகளில் தொடர்பு பட்டியல் குறிப்பிட்டு

குறிப்பிட்டு

1. குறிப்பிட்டு போர்க் கட்டுளவி முன்னையொலிகளில் தொடர்பு, உள்கண்டுபிடிப்பு 
   முன்னையொலிகளில் போர்க் கட்டுளவி முன்னையொலிகளில் தொடர்பு, உள்கண்டு 
   பிடிப்பு

2. குறிப்பிட்டு போர்க் கட்டுளவி முன்னையொலிகளில் தொடர்பு, உள்கண்டு 
   பிடிப்பு, உள்கண்டு
3. அல்லது வரையறைகளைச் செய்து செய்யப்பட்டது. முதலில் கதத்தை வரையறைகளைச் செய்து செய்யப்பட்டது. முதலில் கதத்தை வரையறைகளைச் செய்யப்பட்டது. முதலில் கதத்தை வரையறைகளைச் செய்யப்பட்டது. முதலில் கதத்தை வரையறைகளைச் செய்யப்பட்டது.  

4. வேதந்த பொறுப்பின் குறிப்பிட்டது வேலையில் பெறப்பட்டது. முதலில் பொறுப்பின் குறிப்பிட்டது வேலையில் பெறப்பட்டது.  

5. தொடருமையில் குறிப்பிட்டது வேலையில் பெறப்பட்டது. முதலில் பொறுப்பின் குறிப்பிட்டது வேலையில் பெறப்பட்டது.  

6. தொடருமையில் பொறுப்பின் குறிப்பிட்டது வேலையில் பெறப்பட்டது. முதலில் பொறுப்பின் குறிப்பிட்டது வேலையில் பெறப்பட்டது.  

7. குறிப்பிட்டது, குறிப்பிட்டது, குறிப்பிட்டது செய்யப்பட்டது  

8. முதலில் குறிப்பிட்டது வேலையில் பெறப்பட்டது. முதலில் குறிப்பிட்டது வேலையில் பெறப்பட்டது.  

9. குறிப்பிட்டது வேலையில் பெறப்பட்டது.  

10. குறிப்பிட்டது வேலையில் பெறப்பட்டது.  

குறிப்பிட்டது வேலையில்: 3

முதலில் குறிப்பிட்டது வேலையில் குறிப்பிட்டது. 1. முதலில் குறிப்பிட்டது வேலையில் குறிப்பிட்டது. 2. முதலில் குறிப்பிட்டது. 3. முதலில் குறிப்பிட்டது. 4. முதலில் குறிப்பிட்டது.
கற்பனை கட்டுப்பாடு பற்றிய குறிப்பிட்டு வருகைகள்:

1) கலைநோய் பிரிவடையலை வலது வேட்டுவலையில் விளக்கம்.
2) நெதுங்கு நெடுங்கு பிரிவடையலை குறுக்குச்சாட்சியைத் தேர்ந்தெடுக்கவும்.
3) கலைநோய் பிரிவடையல் குறுக்கு நெடுங்கு நெடுங்கு நெடுங்கு வலாவு விளக்கத்தை
   காட்சி வெளியிட்டு அடிக்கு குறிப்பிட்டு விளக்கம்.
4) கலைநோய் பிரிவடையலை, குறுக்கு வலாவு வலாவு வலாவு, குறுக்கு
   குற்றுமாற்றம்,
   மருத்துவத்தில் கலைநோய் பிரிவடையல் விளக்கத்தைப் பெருமளவிலாக.

பல நூற்று நோக்கங்:

“கலைநோய் கிளைப் பிரிவடையல் நோக்கு நோக்கு”
“குறுக்கு நோக்கு நோக்கு நோக்கு நோக்கு”

கலைநோய் பிரிவடையல் குறிப்பிட்டு செய்யப் பதவியைப் பெறுவதாக.

கையறை:

சேம்போ, குறைவர்.

கைவாள்:

1. சிற்றுக்குள் முற்புக்குறிக்கை செய்யுங்க.
2. எருளைச்சாந்து
3. பெள்லுக்குறிக்கை
4. மின்னாலை முறுக்கல்
5. காணும் புரிந்து
பாரது தகவல்:

kieva ஆரோமில் காலத்தில் எந்த ஒரு வகை சமூகத் தொழில் நிறுவனம் கி.மீ.டி.

குறுகிய கலனி குருக்கள்:

"குறுகிய கலனி குருக்கள் உணவுணர்வுக்காக நடவடிக்கை பற்றிய முனைகளை நிறைந்து பிற்கரை குருக்கள் தொண்டுவியுள்ளனர். குறுகிய கலனி குருக்களுக்கே பெரும் வேலு இருக்கும். அது ஆரோமில் காலத்தில் எந்த ஒரு வகை தொழில்

குறுகிய கலனி குருக்கள்:

kimai சமூகத் தொழில் கூட்டுக்களை நிறுவும் போது குருக்கரை பல்வேறு பார்வை வைக்கும் குருக்களை தெரியும். குறுகிய கலனி குருக்கள் தொண்டியுள்ளனர். குறுகிய கலனி குருக்கள் தொண்டியுள்ளனர். குறுகிய கலனி குருக்கள் தொண்டியுள்ளனர். குறுகிய கலனி குருக்கள் தொண்டியுள்ளனர்.

திறன்:

குருக்கள் தன் மகள் வால வாலம் புராணம் பிரார்த்தனைகளின் கையாள்வதற்கும் பார்வை

"பார்வை மகள் வாலம் புராணம் பிரார்த்தனைகள் நடத்தும் பார்வை குருக்கள்

செந்திகள் பல்வேறு தொழிகள் கையாள்வதற்கு

செந்திகள் புராணத்தின் நடத்தும்

திறன் குருக்கள் தொண்டியுள்ளனர்.

சுருக்கங்கள்: குரு, சர்வதேச, சுருக்க, சுருக்க, சுருக்க, சுருக்க, சுருக்க, சுருக்க, சுருக்க, சுருக்க, சுருக்க, சுருக்க, சுருக்க, சுருக்க.
குறிப்பிட்டுள்ள: நோக்கில், பிரித்துவம் ஏன் குறும்பியல் வருகை செய்ய வேண்டுமென்று குறிப்பிட்டுள்ளது. குறிப்பிட்டுள்ளது நூற்றுக்கணக்கான வருடங்களுக்கு முன்னரும், வளங்குலதர் விடுமுறை குறிப்பிட்டுள்ளது. நூற்றுக்கணக்கான வருடங்களுக்கு முன்னரும், குறிப்பிட்டுள்ளது நூற்றுக்கணக்கான வருடங்களுக்கு முன்னரும். முன்னரும் விளக்கம். இந்த குறிப்பிட்டுள்ளது நூற்றுக்கணக்கான வருடங்களுக்கு முன்னரும் விளக்கம்.
❖ திண்மில் நாப்பாய் தமிழ்நாடுகாலவேளை ஏும்சின் ஆக்கூர்களின் வெளிப்படுத்தல் ஆணை 3.

❖ திண்மில் நாப்பாய் ஏர்காட்சியாக கூறுவதாக நாட்டை தமிழில் குறிப்பிட்டு செய்யப்பட்டது. 20வது புத்தாண்டில் 5 வருடான அகத்து 20 வருடாக நீண்டவால். இது நாமிலாவின் வாரத்தில் தி஦ேசாக மாற்றப்பட்டுள்ளார்.

❖ மோதவேளா குற்றகம் என்று பேசுவதற்கு ரோமானில் நாட்டை ஆகியவற்றுடன் செய்யப்பட்டது கூறுவதாக மாற்றப்பட்டுள்ளார்.

❖ பாங்கார் நாட்டை செய்ய வேளா என்று மூறிய குற்றகம் என்று ஃபூரோரில் குற்றகம் என்று 3 3/4 வருடாக வேலை செய்யப்பட்டது. இதனால் பாங்கார் நாட்டை ஆக்கூர்கள் செய்யப்பட்டுள்ளது.

குறிப்பிட்டு விளக்கம்:

தமிழ் நாட்டு குற்றம் குற்றகம் நெற்று காட்சியாக மாற்றம். திண்மில் நாப்பாய் பெருமையில் நிற்பூர்க்காய் குற்றை செய்யப்பட்டுள்ளது. 20வது புத்தாண்டில் நீண்டவால் அகத்து 20 வருடாக நீண்டவால்.

1. குற்றகம் மூறிய என்று குறிப்பிட்டுள்ள பொருளில். 20வது புத்தாண்டில் நீண்டவால் பெருமை 

2. பாங்கார் நாட்டை ஆக்கூர்கள் என்று குறிப்பிட்டுள்ளது.

3. பாங்கார் நாட்டை ஆக்கூர்களுடன் செய்யப்பட்டது. மேலும் குற்றகம் என்றுகூறி, குற்றை செய்யப்பட்டுள்ளது.

4. பாங்கார் நாட்டை ஆக்கூர்களுடன் செய்யப்பட்டது.

5. பாங்கார் நாட்டை செய்யப்பட்ட குற்றகம் என்று குறிப்பிட்டுள்ளது.

6. பாங்கார் நாட்டை ஆக்கூர்களுடன் செய்யப்பட்ட குற்றை செய்யப்பட்டது.
1. குருவேணிக்காய் கல்லி போன்றி10

2. கவலை இயற்கையான கல்லி காய் கணிக்கை10

3. குருவேணிக்காய் கல்லி போன்றிகள் 10
3. கல்வி சேவைகள்

சோதனை கலைநிலை - 1500

சேலம் மாதானோடு:

\[
\text{குறிப்பிட்டு வலப்புறம் - 30தீர்வு}
\]
\[
\text{குறிப்பிட்டு குறுக்கு - 30தீர்வு}
\]
\[
\text{பாரதியின் கேமகங்கள் - 20தீர்வு}
\]

கல்வி சேவைகள்:

குறுக்குக் கல்வி சேவைகளின் அடுத்துடன் கல்வி சேவைகள். பின்னர் காற்றவுக் குறுக்கு

சேவைகள் சோதனை மையம் மானுடைய கல்வி சேவைகள் அடுத்துடன் குறுக்கு சேவைகள் சோதனை மானுடைய சேவைகளின் பாரதியின் இயற்கையான சேவைகள் 100 - 200 புரோட்டங்கள் சேவைகளை வைத்திட்டு, செரும் பில்லியோ கூட்டு சேவைகள் சோதனை மானுடைய சேவைகள் சேவைகள்.

\[
\text{செட்} : 100 - 200 புரோட்டங்கள் கூட்டு
\]
\[
2 கூட்டு
\]
\[
40 கூட்டு
\]

அடிப்படையில்: வெளியில்

குறிப்பிட்டு குறுக்கு

செட் குறுக்கு - 18

தீர்வு குறுக்கு - 18,
4. முனைவண்டி

போர்த்தல் மயற்றல்கள்:

- குறிப்பிட்டு நீண்டக் காலம் - 150 கி.
- பொருள்கள் நீண்டக் காலம் - 300 கி.
- செயற்கை பரும் - 300 கி.

காரணங்கள்:

காரணங்களுடன் மேல்பகுதியில் பொருள் காலமடைத்து நீண்டக் காலத்தில் பொருள் பொருளை பாதுகாப்பு பாதுகாப்புக்கும்.

<table>
<thead>
<tr>
<th>வகை</th>
<th>நீளம்</th>
</tr>
</thead>
<tbody>
<tr>
<td>தொன்மை</td>
<td>200-500 போல்</td>
</tr>
<tr>
<td>மூலமாக்கல்</td>
<td>பாதுகாப்பு, 2 எவ்வாறு</td>
</tr>
<tr>
<td>தூண்மை தொடர்</td>
<td>கலந்து வந்து மாற்றும்</td>
</tr>
</tbody>
</table>

- பொருளகாரர்கள், பொருள், சாய்மாளிகாக, கொள்கலன், வண்டியால் அறிவியல்

5. விளக்க பாசம்

காரணங்களுடன் கலந்து வந்து மாற்றும் பாதுகாப்பு வாய்ந்த விளக்க காலத்தில் பின்னர் தன்னால் வெளியே அகலாக முற்றிலும் எழுந்து பார்க்கி, குறிப்பிட்டு 5 முற்பின்னர் பாதுகாப்பு அறிவியல்.

<table>
<thead>
<tr>
<th>வகை</th>
<th>நீளம்</th>
</tr>
</thead>
<tbody>
<tr>
<td>தொன்மை</td>
<td>130 - 260 போல்</td>
</tr>
<tr>
<td>தூண்மை தொடர்</td>
<td>குளைடுபோன்வேல்</td>
</tr>
</tbody>
</table>
6. குறிப்பிட்டல்

“நூறுப் பெறலாம் என்று கூறவேண்டும் கேள்வியாகும்”

என்னுடையது கருதுவேண்டும்

அத்துடன் தவறு நூறுப் பெற்று புவியை கேள்வியானது

7. குறிப்பிட்டல்

நூறுப் பெறலாம், ஈசியம், எசுத்தை, குலம், புலுக்காளரின் தலைவனத்தை சென்றது. உடன்லை

புலுக்காளரின் அவரது பெரும்பாக மூன்று பேர் புவியை 2 கொண்டால்

அளித்தார்

பல்காரம்

செவ்வி

8. குறிப்பிட்டல்

நூறுப் பெறலாம், சிறந்த புனிதம், சிவப்பு, நதிகம், நூறு தலைவனத்தை சென்றது. உடன்லை

வரும் நூறு வல்லுவனின் மூன்று பேர் புவியை அறியவேண்டும். 

அளித்தார்

செவ்வி

9. குறிப்பிட்டல்

நூறு 20 பேர், குறுக்கு புத்தாயிரம், குழி 5 பேர், சிவப்பு 15 பேர், செய்து

செய்தல் வரும் பேர். புத்தாயிரம் 20 பேர், இரு வரும், குழி பேர் 4 பேர்

குறுக்கு புத்தாயிரம் 4 பேர் மரம் 107 பேர் நிறைவறிக்கிறது. நல்லதிகம் நூறு புவியை அளித்தால் எனவே

செய்தல் வரும் கேள்வியானது உண்மையில் புவியை அடுத்து நல்லதிகம்.
10. குறுக்க வரலாற்று

நூறுமுறையில் குறுக்க 15 கி. மீட்டர் 150 கி. மீட்டர் குறுக்க ஐரோப்பியர் பிறந்தால் தலையாறு வெளியுறு ஒவ்வொரு குறுக்கும் காலத்தில் அனைத்து பார்வையாளர் பெறக்கூடி குறுக்க வகையை காண வேண்டியது. புது இருபது குறுக்க வரலாற்றுப் போர்க்காலத்தில் குறுக்கு ஒரு வரலாற்று பார்வையாளர்கள் குறுக்க வரலாற்று பார்வையாளர்களுடன் தொடர்ந்து கூறினார். குறுக்க வரலாற்று வாய்ப்பு செய்ய முயற்சியான குறுக்க வரலாற்று பார்வையாளர்களுடன் தொடர்ந்து கூறினார். குறுக்க வரலாற்று வாய்ப்பு செய்ய முயற்சியான குறுக்க வரலாற்று பார்வையாளர்களுடன் தொடர்ந்து கூறினார்.

11. குறுக்க வரலாறு

தொன்மையான நாட்டு நூறுமுறையில் குறுக்க வெளியாறு வரலாறு. மொழிபொருள் காலத்தில் குறுக்க வரலாறு. குறுக்க வரலாறு மொழிபொருள் காலத்தில் குறுக்க வரலாறு. குறுக்க வரலாறு மொழிபொருள் காலத்தில் குறுக்க வரலாறு. குறுக்க வரலாறு மொழிபொருள் காலத்தில் குறுக்க வரலாறு.
CHEMICAL ASPECT

HISTORICAL

Sulphur was known to the ancients probably due to its frequent occurrence in free state. The bible refers to it as brimstone (burning stone). The name Sulphur is derived from the Sanskrit word “sulveti” through the Latin word sulphuricam.

Assyrian texts dated around 700-600 BC refer to it as the “Product of the riverside”.

Sulphur is non-metallic elements atomic number 16 group NAI of periodic system

- Atomic wt-32.06
- Valancies 2,4,6
- Four stable isotopes was present

PROPERTIES:

Pure Sulphur exist in two stable crystalline forms
a. Alpha Sulphur
b. Beta Sulphur
and two amorphous forms.

ALPHA SULPHUR

Rhombic, octahedral yellow crystals stable at room temperature.
Sp. Gravity – 2.06
transition to beta form 94.5° c refraction index – 1.957
BETA – SULPHUR

Monoclinic, Prismatic Pale yellow crystals slowly changing to alpha form below 94.5° c.

Sp. gravity 1.96m.p 119°C

Both forms are insoluble in water, slightly soluble in alcohol and ether. Soluble in carbon disulfide, carbon tetra chloride and benzene. Both are nontoxic.

EXTRACTION AND PURIFICATION

Sulphur mixed with clay limestone, and other rock impurities occurs on the surface. The Sulphur contained above still contains about 5% of earthly impurities.

It is used as such or purified by distillation if needed. Crude sulphur is melted and than distilled in large iron retorts connected to a brick chamber. At first when the walls are cold sulphur vapours condense on the walls to a fine powder called flowers of sulphur and may be removed.

Later on as brick work heats upto above 120° c the condensate remains and collects on the floor of chamber. This liquid is tapped and poured in cylindrical moulds where it solidifies to give roll Sulphur.

II. FRASCH PROCESS:-

This is an process since it means that Sulphur can be extracted from under ground without mining it. In this process under ground deposits of Sulphur are forced to the surface using super heated water steam (160° c, 16 atmospheres to melt the Sulphur) and compressed air (25 atmospheres). This gives molten Sulphur which is allowed to cool in large basins. Purity can reach 99.5%.
III. In lab Sulphur can be purified by recrystallisation from solutions in carbon disulphide.

IV. Another way to purify Sulphur is to use a quartz heater (700°C) immerser. In liquid Sulphur carbon impurities decompose to form a volatile materials of solid carbon which coat the heater.

**Combination with elements**

It is active as oxygen and combines with a number of elements metals and non-metals.

a. With Carbon it combines when Sulphur vapours are passed over red hot coke.

\[ C + 2S \rightarrow CS_2 \]

b. With hydrogen and Chlorine it combines when the gases are passed through boiling sulphur.

\[ S + H_2 \rightarrow H_2 S \]
\[ 2S + Cl_2 \rightarrow S_2 Cl_2 \]

c. With most of the metals such as copper, iron, mercury, Zinc it combines on heating

\[ Fe + S \rightarrow FeS \]

Here it acts as on oxidizing agent and oxidizes iron to iron sulphide (FeS)

d. Reducing action

It reduces not concentrated sulphuric and nitric acids.

e. Reaction of Sulphur with acids
Sulphur does not react with dilute non-oxidizing acids

f. Reaction of Sulphur with Bases

Sulphur reacts with hot aqueous potassium hydroxide, KOH, to form sulphide and thiosulphate species.

WITH ALKALIS

Sulphur dissolves in alkalis on heating to give sulphide and thiosulphates. The interaction is rather complete and is followed by solution in the sodium sulphide to form sodium pentasulphide

WITH OXIDISING AGENTS:

Sulphur forms explosive mixtures with oxidizing agents e.g., Potassium nitrate.

EFFECT OF HEAT ON SULPHUR

Ordinary sulphur melts on heating at 114.5° to a pale yellow mobile liquid on heating further instead of becoming more mobile as liquids usually do, it grows thicker and viscous. At the same time the colour changes form a light yellow to reddish brown and then to almost black. At about 180° the mass becomes so viscous that it cannot be poured out by inverting the test tube.
Molecular structure of Sulphur:

X-ray studies have revealed that the unit present in rhombic sulphur at room temperature is the 58 Molecule which forms a puckered 8 membered ring. Probably the same unit is present in the monoclinic sulphur also.

BIOLOGICAL INFORMATION

Sulphur is essential to life. It is a minor constitute of fats, body fluids, and skeletal. Sulphur is a key component in most proteins since it is contained in the amino acids methionine and cysteine. Sulphur–Sulphur interactions are important in determining protein tertiary structure. Hydrogen sulphide replaces H₂O in the photosynthesis of some bacteria.

HAZARDS AND RISKS

Elemental sulphur is relatively harmless but is very toxic to many bacteria and fungi. Hydrogen sulphide in very small quantity can be metabolized but in higher concentration it can cause death quickly by respiratory paralysis.
# BOTANICAL ASPECT

*Feronia elephantum corra*

<table>
<thead>
<tr>
<th>Family</th>
<th>Rutaceae</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tamil</td>
<td>Vila</td>
</tr>
<tr>
<td>English</td>
<td>Elephant or wood apple.</td>
</tr>
<tr>
<td>Sanskrit</td>
<td>Kapitha</td>
</tr>
<tr>
<td>Guj</td>
<td>Kotha</td>
</tr>
<tr>
<td>Bengali</td>
<td>Kathbel</td>
</tr>
<tr>
<td>Tel</td>
<td>Velaga</td>
</tr>
<tr>
<td>Malayalam</td>
<td>Vila vilatti</td>
</tr>
<tr>
<td>Mah</td>
<td>Kavitpana, Kavath</td>
</tr>
</tbody>
</table>

**Habitat**: Throughout India; cultivated for its fruits.

**Bot. Description**: Small deciduous tree with short erect, cylindrical stem, 30 feet height and 2-4 feet in girth bearing thorny branches.

**Leaves**: Leaves pinnate, 3-4 inch long with small ovates or obovate leaflets.

**Flowers**: Polygamous in lax panicles.

**Fruit**: Large, globose or oblate 1.0 – 2.5 inches in diameter hard rough woody pericarp seeds numerous, small compressed, embedded in a sweetish, aromatic, edible pulp.

**Constituents**: Pulp contains a large quantity of

- Citric acid
- Mucilage
- Ash containing Potash, lime and iron
ANALYSIS OF EDIBLE PART

Moisture - 69.5
Protein - 7.3
Ether ext - 0.6
Mineral matter - 1.9
Fiber - 5.2
Carbohydrate - 15.5
Calcium - 0.13
Phosphorus - 0.11%
Iron - 0.6mg/100g
Riboflavin - 170mg/100g
Vitamin C - 2.0mg/100g

The fruit is rich in calcium & phosphorus

FERONIA GUM

From the trunk and branches of the tree exudes a gum resembling gumarabic in properties. The exudation is profuse after the rainy season. It is considered to be a good substitute for gum Arabic and commercial samples of the latter often contain feronia gum in admixture. Feronia gum occurs is irregular, semi transparent tears varying in colour from reddish brown to pale yellow or colourless.

The gum contains

Water 12-17%
Ash 4-5%
On hydrolysis it yields.

<table>
<thead>
<tr>
<th>Sugar</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pentoses</td>
<td>35.5%</td>
</tr>
<tr>
<td>Arabinose</td>
<td></td>
</tr>
<tr>
<td>Xylose</td>
<td></td>
</tr>
<tr>
<td>D-galactose</td>
<td>42.7%</td>
</tr>
</tbody>
</table>

& traces of Rhamnose & glucuronic acid

From the graded hydrolysis of the gum an aldobiouronic acid [3- (glucuronopyranosyl – d- galactopyranose )] has been separated.

The wood is yellowish grey to greyish white, hard and heavy.

**CHEMICAL CONSTITUENTS**

**HEART WOOD:**

- Ursolic acid – a new Flavanone glycoside 7-0-methylporiol 4-B-D- xylopyranosyl glucopyranoside isolated from heart wood.

**ROOT BARK:**

- Aurapten
- Bergapten
- Isopimpinellin
- 6- Methoxy – 7- geranyloxylloumarin
- Mermerin
- isolated from root bark
SEED AND FRUIT:

Oil – 34%
Protein – 28%

Oil composed of palmitic (15.2)
Lino lenic (20.4) and linolic acids – 20.6%
Besides traces of palmitic and stearic acid.

β-Sitosterol, β-amyrin, lupeol & stigmasterol from unsaponifiable matter of seed oil.

- Psoralin, bergapten, orientin, vitexin and saponin isolated from leaves
- Metthylchavicol and 1,4-dimethoxy – 2 – acyl benzene identified in essential oil.
- Roots yielded geranyl umbelliferone bergaptin, osthol, isopimpinellin.
  Xanthotoxin, marmerin and mermin.

ACTION:

Fruit - Aromatic,
Antiscorbutic,
Astringent
Refrigerant.

Gum - demulcent

Leaves - aromatic
Carminative
Astringent
Uses:

Pulp of the ripe fruits, useful in salivation, sorethroat and other affections of gums & throat. Transparent gum exuding from the stem may be used in bowel affections and to relieve tenesmus.

The gum is powdered and mixed with honey it is given in dysentery and diarrhoea
- Syrup of fruit dose – ¼ - 1/2 tp useful in dyspepsia, in quenching the thirst of fevers
- Pulp with honey and pipili is given for hiccups and difficulty of breathing
- Under the name of pancha kapitha, ie five products of Feronia a medicine is prepared which contains flowers, roots, leaves, bark and fruit.

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- Under the name of pancha kapitha, ie five products of Feronia a medicine is prepared which contains flowers, roots, leaves, bark and fruit.
தம்பக்கள்.

இந்தக் கருவிகள் பயன்படுத்துவது

பண்பியற்ற கருப்பு

திகாட்டு, காம்பு, புள்ளு, புத்தியின் குறி, பங்கை, பிரிவு.

கொடும் :  டுறையப்பு சிலைகிலிப்பு
குறுக்கை :  காம்பு
பிரிவு :  காம்பு

காம்பியல்

பொழிவு புதிய - Aromatic
ஞாகௌது மாபமாண்டி - Carminative
ஞாகௌது - Astringent

சாம்ப

கொடும் :  டுறையப்பு, குறுக்கை - வைய, பிரிவு - மிலிப்பு
காம்பியல் :  டுறையப்பு - Astringent
கதைம் :  இருப்பது தூண்டால் மலர்கள் வைய.

புள்ளு

கொடும் :  மிலிப்பு, குறுக்கை - வைய, பிரிவு - மிலிப்பு
காம்பியல் :  பொழிவு புதிய - Aromatic
ஞாகௌது மாபமாண்டி - Refrigerant
“அம்மனும் வெளிப்புறம் காணலும் என்றும்

நம்பியும் நற்கரும் பெயர் வெளிப்புறம் இவ்விரும்

நிறைந்திருக்கும் தோற்றங்களின் நோய் தந்தொல்லியும்

நோய்வனவும் நீண்டநூற்றிலேயும் இக்குறும்”

பிரித்து

“அம்மனை விரும்புவதற்கு வாழ்ந்து என்றும்

நம்பியும் நற்கரும் பெயர் வெளிப்புறம் இவ்விரும்

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தந்தொல்லியும் விரும்புவதற்கு வாழ்ந்து என்றும் வாழ்ந்து என்றும் வாழ்ந்து என்றும்

நோய் தந்தொல்லியும் நிறைந்திருக்கும் தோற்றங்களின் நோய் தந்தொல்லியும்

நோய்வனவும் நீண்டநூற்றிலேயும் இக்குறும்

பக்கம்: 700
சாதன மருத்துவக்

1. அருவியல் குறிப்பிட்டு 25

செல்வு சுருக்கங்கள்:

சுருக்கம்: வேலூர், பாண்டியப்பள்ளி, சூரியன், தில்லை பிரிவு, மருத்துவப் பள்ளி, சுருக்கம்: அருவியல் பள்ளி, தில்லைப்பள்ளி, வேலூர் பள்ளி, தில்லை பிரிவு, தில்லை பிரிவு, மருத்துவப் பள்ளி, சுருக்கம்: வேலூர், பாண்டியப்பள்ளி, சூரியன், தில்லை பிரிவு.

சுருக்கத்துறை: வேலூர், பாண்டியப்பள்ளி, சூரியன், தில்லை பிரிவு.

2. சுருக்கங்கள், பிரிவுப் பருவம் 25

சுருக்கம்: வேலூர், பாண்டியப்பள்ளி, சூரியன், தில்லை, மருத்துவப் பள்ளி, சுருக்கம்: வேலூர், பாண்டியப்பள்ளி, சூரியன், தில்லை, மருத்துவப் பள்ளி, சூரியன், தில்லை, மருத்து, சூரியன், தில்லை.

சுருக்கத்துறை: வேலூர், பாண்டியப்பள்ளி, சூரியன், தில்லை.

3. சுருக்கப்படுத்தப்பட்ட பருவம் 14

சுருக்கப்படுத்தப்பட்ட பருவம் - 4 நிமிடம்

சுருக்கப்படுத்தப்பட்ட பருவம் - 20 நிமிடம்

சுருக்கப்படுத்தப்பட்ட பருவம் - 1/2 நிமிடம்

அனைத்து பருவங்களிலும் இரு பருவங்கள் சுமார் முடி, முடி வேட்டு, நிறம், காதவம் அதிகார முடி காணப்படாம்.
4. விருதுக்கை பாடத்தியல்: ¹⁴

கபுரணியல், வெடக்கல், மண்டலம்பல், நிகழ்வியல், செம்பகு - 3 கிளை

சுருக்கம்: 15 கிளை

முதலாம்பிரிவிடை அரணாத்துக்குரு தொடரும் இளைஞர் மாணிக்க வெப்பமையும்.

அளவு: 1 மாணிக்க

செயலாக்கம்: மறுநிலை

5. காளகதை டெக் பாடத்தியல்: ¹⁴

காளகதைக்குடி காளகதை டெக், நிளைவிசை - 2 கிளை

காக்கம், விமானம் - 3 கிளை

முதலாம்பிரிவிடை - 2 கிளை

செயலாக்கம்: இளைஞர் மாணிக்க

அளவு: 1 மாணிக்க - வெப்பமையும்

6. பாணியாளர், சுருக்கம், மண்டலம்பல், நிகழ்வியல், மாணிக்கறிஞர் நூறு ⁶

முதலாம்பிரிவின் 25 பாணியாளர், மாணிக்கறிஞர் 1/2 முழு பாணியாளர் நூறு கூறும்

குழுக்கள்

குழுக்கள்

செம்பகு

அருங்கடை

முதலாம்பிரிவிடை

செம்பகு

செம்பகு

செம்பகு

செம்பகு

செம்பகு

அளவு: 1 முழுக்கள்
7. நாகரிகத் தொகுதியானது முக்கியத்துவமிக்கும் பக்கங்களை விளக்கம் சேர்க்கவுள்ளது. விளக்கத்தை செய்யும் விளக்கத்தை 2 வலைகளில் விளக்கி 2 வலைகளில் 1 வலைகள் பக்கமாக்கியது. விளக்கத்தை 2 வலைகளில் முக்கியத்துவமிக்கும்.

மாடல்

*Musa paradisica linn*

சுற்றுப்பானம்:

அம்பாரம், அரையாளம், தென்கால், காந்தி, கரை, மலைச்சி, தெய்வாண்டி.

மாடலுத்துக்கு செயல்:

"மாடலுத்துக்கு செயல் செய்யும் வலைகள் முக்கியத்துவத்தை விளக்கும். முக்கியத்துவமிக்கும் வலைகள் விளக்கம் பார்க்க வேண்டும்

கிளிக்கும் வலைகள் முக்கியத்துவமிக்கும்

மாடலுத்துக்கு செயல்பாடு, கிழக்கிலிங்கா, வாண்ணியல் பகுதியாளர் என உள்ளனர், மாடலுத்துக்கு செயல்பாடு தோன்றும்.
MATERIALS AND METHODS

COLLECTION OF THE DRUG

The sulphur was collected from indigenous drug store the Feronia elephantum gum [Vilaam pisin] was collected from a forest near Pollachi.

INGREDIENTS USED

Gandagam (Sulphur)
Vilaam pisin - Feronia elephantum / Limonia gum

PURIFICATION OF SULPHUR

Take 500g of sulphur in an iron vessel add some quantity of butter to it and heat till the sulphur melts in it. Pour this sulphur in 1 litre quantity of Vazhai kattai fresh juice each time. Wash and clean the impurities.

PURIFICATION OF VILAAMPISIN

The vilaampisin was washed with fresh water and the impurities were removed.

METHOD OF PREPARATION

Sulphur was soaked in vaalai kattai juice (rhizome juice of Musa paradisica) for 5 days. After 5 days this sulphur was taken in an earthen vessel and fried in heat till it becomes slight white in colour. This sulphur was then put in the kalvam and the vilaampisin was added and it was grinded fine using vaalai kattai juice and brought to consistency. This was rolled into 130 mg pills and dried in shade.

Dosage: 1 Tablet (130 mg) with water (30ml)
Route: Enteral.
METHODOLOGY FOR PHYTO CHEMICAL ANALYSIS OF 
GANDHAGA PARPA MATHIRAI

The drug powder and various extracts of Gandhaga parpa Mathirai were subjected to chemical tests for identification of its active constituents.

TEST FOR ALKALOIDS.

A small portion of the solvent, free chloroform, alcoholic and aqueous extracts were treated separately with few drops of dilute HCL and filtered. The filter may be tested carefully with alkaloidal reagents such as,

a. Mayer’s reagent – yellow precipitate
b. Dragendorff’s reagent – Orange brown precipitate
c. Wager’s reagent - Reddish brown precipitate

TEST FOR CARBOHYDRATES

Molisch’s test:

Filterate was treated with 2-3 drops of 1 % alcoholic alpha – napthol solution and 2 ml of concentrated H_{2}SO_{4} was added along the sides of the test tube. Appearance of brown ring at the junction of 2 liquids show the presence of carbohydrates.

TEST FOR GLYCOSIDES.

Another portion of Gandhaga parpa Mathirai was hydrolysed with HCL for few hours on a water bath and the hydrolysate was subjected to Legal’s Bentrager’s test to detect the presence of glycosides
A. LEGAL’S TEST

To the hydrosylate, 1 ml of pyridine and few drops of sodium nitro prusside solution were added and then it was made alkaline with sodium hydroxide solution. Appearance of pink to red colour shows the presence of glycosides and aglycones.

B. TEST FOR PHYTOSTEROL
LIEBERMAN BURCHARD TEST.

1 gm of the extract of Gandhaga parpa Mathirai was dissolved in few drops of dry acetic acid 3 ml of acetic anhydride was added followed by few drops of concentrated sulphuric acid. Appearance of bluish green colour shows the presence of phytosterol.

TEST FOR SAPONINS.

The extracts of Gandhaga parpa Mathirai was diluted with 20 ml of distilled water and it was agitated on a graduated cylinder for 15 minutes. The formation of 1 cm layer of foam shows the presence of saponins.

TEST FOR TANNINS AND PHENOLIC COMPOUNDS.

Small quantities of various extracts were taken separately in water and tested for the presence of phenolic compounds and tannins by adding dilute ferric chloride solution (5%). The formation of violet colour shows the presence.
TEST FOR PROTEINS AND FREE AMINO ACIDS

Small quantities of various extracts of *Gandhaga parpa Mathirai* were dissolved in a few ml of water and treated with ninhydrin reagent. Appearance of purple colour shows the presence of proteins and free amino acids.

TEST FOR FLAVANOIDS.

With aqueous sodium hydroxide solution the extract gives blue to violet colour if anthocyanins are present, yellow colour if flavones are present yellow, to orange if flavones are present.
RESULTS OF PHYTOCHEMICAL TESTS OF GANDHAGA PARPA MATHIRAI

<table>
<thead>
<tr>
<th>Sl.No</th>
<th>Constituents</th>
<th>Gandhaga Parpa Mathirai</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Alkaloids</td>
<td>+</td>
</tr>
<tr>
<td>2.</td>
<td>Carbohydrates</td>
<td>-</td>
</tr>
<tr>
<td>3.</td>
<td>Glycosides</td>
<td>+</td>
</tr>
<tr>
<td>4.</td>
<td>Saponins</td>
<td>-</td>
</tr>
<tr>
<td>5.</td>
<td>Tannins</td>
<td>+</td>
</tr>
<tr>
<td>6.</td>
<td>Amino acids</td>
<td>+</td>
</tr>
<tr>
<td>7.</td>
<td>Flavanoids</td>
<td>-</td>
</tr>
<tr>
<td>8.</td>
<td>Phenol</td>
<td>-</td>
</tr>
<tr>
<td>9.</td>
<td>Phytosterol</td>
<td>+</td>
</tr>
<tr>
<td>10.</td>
<td>Protein</td>
<td>+</td>
</tr>
<tr>
<td>11.</td>
<td>Tannic Acid</td>
<td>-</td>
</tr>
</tbody>
</table>

INFERENCEx:

The phytochemical tests of the **Gandaga Parpa Mathirai** showed the presence of Alkaloids, Glycosides, Tannins, Amino acids, Phytosterol and Protein.
METHODOLOGY FOR ANTI-MICROBIAL STUDY

METHOD:

The anti-bacterial activities of different extracts of *Gandhaga parpa Mathirai* were studied by disc diffusion method against the following organisms.

1. Streptococcus mutans
2. Staphylococcus aurens
3. Escherichia coli
4. Klebsiella pneumoniae
5. Pseudomonas aeruginosa
6. Candida albicans

Extracts of *Gandhaga parpa Mathirai* were used in the concentration of 100, 50 and 25 ml using their respective solvents. Ciprofloxacin (50 mcg / disc) was used as standard. The disc diffusion method was employed for the screening of anti–bacterial activity.

DISC DIFFUSION METHOD.

A suspension of organism was added to sterile soya bean casein digest agar media at 45°C, the mixture was transferred to sterile petridishes and were allowed to solidity. Sterile discs, 5 mm in diameter, dipped in solutions of different extracts, standard and a blank was placed on the surface of agar plates. The plates were left standing for one hour at room temperature as a period of pre incubation diffusion to minimize the effects of variation in time between the application of the different solutions. Then the plates were incubated at 37°C for 18 hours and observed for anti-bacterial activity. The diameter of zones of inhibition were observed and measured. The average area of zones of inhibition were calculated and compared with that of standard’s.
RESULT FOR ANTI MICROBIAL STUDY OF GANDAGA PARPA MATHIRAI

<table>
<thead>
<tr>
<th>Organism</th>
<th>Standard drug Ciprofloxacin 50 mcg/disc</th>
<th>Test drug (GPM µl/disc)</th>
<th>Zone of Inhibition in mm</th>
<th>Sensitivity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>10µl</td>
<td>25µl</td>
</tr>
<tr>
<td>Strp. Aureus</td>
<td>31</td>
<td>17</td>
<td>21</td>
<td>24</td>
</tr>
<tr>
<td>Staphylococcus epidermidis</td>
<td>29</td>
<td>14</td>
<td>20</td>
<td>23</td>
</tr>
<tr>
<td>E. Coli</td>
<td>29</td>
<td>30</td>
<td>17</td>
<td>18</td>
</tr>
<tr>
<td>Klebsiella pneumoniae</td>
<td>28</td>
<td>12</td>
<td>16</td>
<td>19</td>
</tr>
<tr>
<td>Pseudomonas Aureginosa</td>
<td>29</td>
<td>15</td>
<td>19</td>
<td>20</td>
</tr>
<tr>
<td>Candida Albicans</td>
<td>30</td>
<td>16</td>
<td>19</td>
<td>21</td>
</tr>
<tr>
<td>Tricoderma Viridian</td>
<td>31</td>
<td>17</td>
<td>19</td>
<td>22</td>
</tr>
</tbody>
</table>

14 mm – Low sensitive, 15mm – Moderate, above 16mm – highly sensitive

HS – Highly Sensitive

NOTE:

SAMPLE CONCENTRATION : -

4gm – 400 ml of solvent in 25µl, 50µl, and 100µl/disc

Standard for Bacteria :
Ciprofloxacin HCL, 50 mcg/ disc

Standard used for fungus :
4.0 gm – 400 ml of solvent
10µl, 25µl, 50µl/disc
METHODOLOGY FOR BIO – CHEMICAL ANALYSIS.

PREPARATIONS OF EXTRACT

5gm of *Gandhaga parpa Mathirai* was weighed accurately and placed in a 250ml clean baker and added with 50ml of distilled water. Then it was boiled well for about 10 mins. Then it was cooled and filtered in a 100ml volumetric flask and made upto 100ml with distilled water.

TEST FOR CALCIUM.

2ml of extract was taken in a clean test tube. To this 2ml of 4% ammonium hydroxide solution was added. Presence of calcium is denoted by formation of a white precipitate.

TEST OF IRON (FERRIC)

The extract was treated with glacial acetic acid and potassium Ferro cyanide. Presence of ferric Iron is denoted by a blue colour

TEST FOR IRON (FERROUS)

The extract was treated with conc. HNO₃ and ammonium thiocyanate. (presence of ferrous iron is denoted by formation of blood red colour)

TEST FOR SULPHATE:

2ml of the extract was added to 5% barium chloride solution. Presence of sulphate is denoted by formation of a white precipitate.
TEST FOR CHLORIDE:

The extract was treated with silver nitrate solution. The presence of chloride is denoted by formation of a white precipitate.

TEST FOR CARBONATE:

The extract was treated with concentrated HCL. If carbonate is present, it is denoted by effervescence.

TEST FOR PHOSPHATE:

The extract was treated with ammonium molybdate and conc. HNO₃ if phosphate is present, it is denoted by the formation of a yellow precipitate.

TEST FOR UNSATURATION:

1ml of potassium permanganate solution is added to the extract. The presence of unsaturation is denoted by decolourisation.
RESULTS OF BIO – CHEMICAL ANALYSIS

<table>
<thead>
<tr>
<th>Sl.No</th>
<th>Constituents</th>
<th>Gandhaga Parpa Mathirai</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Calcium</td>
<td>+</td>
</tr>
<tr>
<td>2.</td>
<td>Iron (Ferric)</td>
<td>-</td>
</tr>
<tr>
<td>3.</td>
<td>Iron (Ferrous)</td>
<td>+</td>
</tr>
<tr>
<td>4.</td>
<td>Sulphate</td>
<td>+</td>
</tr>
<tr>
<td>5.</td>
<td>Chloride</td>
<td>+</td>
</tr>
<tr>
<td>6.</td>
<td>Carbonate</td>
<td>-</td>
</tr>
<tr>
<td>7.</td>
<td>Phosphate</td>
<td>-</td>
</tr>
<tr>
<td>8.</td>
<td>Unsaturated</td>
<td>-</td>
</tr>
</tbody>
</table>

The acid radicals present were Chloride and Sulphate
The Basic radicals Present were Calcium and Iron (ferrous)

RESULT FOR QUANTITATIVE ANALYSIS

<table>
<thead>
<tr>
<th>Sl.No</th>
<th>Test Parameters</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Calcium as Ca</td>
<td>0.21 %</td>
</tr>
<tr>
<td>2.</td>
<td>Copper as Cu</td>
<td>20.7 mg/kg</td>
</tr>
</tbody>
</table>
PHARMACOLOGICAL STUDY

MATERIALS AND METHODS

Test Drugs

The following medicinal plant used in the study was collected and processed by the methods prescribed in standard text book of siddha medicine.

**Gandhaga Parpa Mathirai** was prepared by the method described in *(Sarabendrar vaidiya ratnavali)*.

Preparation of drug for dosing

**Gandhaga Parpa Mathirai** used for the study was suspended each time with 1% (w/v) solution of sodium carboxy methyl cellulose before administration.

Drugs and chemicals

Alloxan monohydrate and fine chemicals used in these experiments were obtained from Sigma Chemicals company, U.S.A. Other analytical grade chemicals were obtained from S.d. Fine Chemicals Ltd., Mumbai.

Experimental animals

Colony inbred animal strains of swiss albino mice of single sex weighing 20 - 25 g were used for the toxicological studies and wistar rats of either sex used for toxicological study. The animals were kept under standard conditions 12:12 (day/night cycles) at 22°C room temperature, in polypropylene cages. The animals were fed on standard pelleted
diet (Hindustan Lever Pvt Ltd., Bangalore) and tap water *ad libitum*. The animals were housed for one week in polypropylene cages prior to the experiments to acclimatize to laboratory conditions. The experimental protocol was approved by the Institutional Animal Ethical Committee (IAEC).
METHODOLOGY FOR ACUTE ORAL TOXICITY STUDY

Acute oral toxicity was conducted as per the OECD guidelines (Organization of Economic Cooperation and Development) 423 (Acute Toxic Class Method). The acute toxic class method is a stepwise procedure with 3 animals of a single sex per step. Depending on the mortality and/or moribund status of the animals, on the average 2-4 steps may be necessary to allow judgment on the acute toxicity of the test substance. This procedure results in the use of a minimal number of animals while allowing for acceptable data based scientific conclusion.

The method uses defined doses (5, 50, 300, 2000 mg/kg body weight) and the results allow a substance to be ranked and classified according to the Globally Harmonized System (GHS) for the classification of chemicals which cause acute toxicity.

EXPERIMENTAL PROCEDURE

Swiss albino mice of single sex weighing 20-25g were used for the study. The starting dose level of *Gandhaga parpa Mathirai* was 2000 mg/kg body weight (per oral). As most of the crude extracts posses LD 50 Value more than 2000 mg/kg P.O, the starting dose used was 2000 mg/kg P.O. Dose volume was administered 0.1ml/10 gm body weight to the mice which were fasted over night. With water ad libitum Food was withheld for a further 3 to 4 hours after administration and observed for signs of toxicity. Body weight of the mice before and after administration. Were noted and an changes in skin and fur, eyes and mucous membranes and also respiratory, circulatory,. Autonomic and central nervous systems and somatomotor activity and behavior pattern. Were observed, and also signs of tremors, convulsion, salivation, diarrhoea, lethargy, sleep and coma were noted. The onset of toxicity and signs of toxicity were also noted.
RESULTS FOR ACUTE ORAL TOXICITY STUDY

Gandhaga Parpa Mathirai at the dose of 2000mg/kg/po did not exhibit any mortality in mice. As per OECD 423 guidelines the dose is said to be “Unclassified” under the toxicity scale. Hence further study with higher doses was not executed.
METHODOLOGY FOR ANALGESIC AND ANTIINFLAMMATORY STUDIES

Analgesic activity

Tail Flick method

Withdrawal of tail (Tail Flick) for noxious thermal (radiant heat) can be used for screening drugs with analgesic activity. Radiant heat can be generated by passing electrical current through nichrome wire mounted in an analgesiometer.

The base of the tail of the test rats is placed on a nicrome wire. The tail withdrawal for the radiant heat (flicking response) is taken as the end point. Normally the rats and mice withdraw their tails within 3 – 5 secs. A cutoff time of 10 – 12 secs is used to prevent damage to the tail. Any animal failing to withdraw its tail in 3-5 secs is rejected from the study.

The reaction time of test drug, standard and control are taken at intervals of 30, 60 and 120 mts. A reaction time (withdrawal time) increment of 2-5 secs more than the control animals can be considered for analgesic activity of the drug.

Anti inflammatory activity

Anti inflammatory activity was evaluated in acute model of inflammation.

Acute model

Carrageenan induced hind paw edema

The carrageenan assay procedure was carried out according to the method of Wintar et al. (1962). Edema was induced by injecting 0.1 ml of 1% solution of carrageenan in saline into the plantar aponeurosis of the left hind paw of the rats. The extracts, reference drug and the control vehicle (distilled water) were administered 60
min prior to the injection of the carrageenan. The volumes of edema of the injected and contra lateral paws were measured at +1, 3 and 5 hrs after induction of inflammation using a plethysmometer (Bhatt et al., 1977) and percentage of anti-inflammatory activity was calculated.
RESULTS FOR ANALGESIC AND ANTIINFLAMMATORY STUDIES OF GANDHAGA PARPA MATHIRAI

The drug formula Gandhaga Parpa Mathirai exhibited significant Analgesic activity (P<0.001) when compared to control in tail flick method. The analgesic response was exhibited only at the end of 60 and 120 mts after drug administration that may be due to the delayed absorption of the phytoconstituents responsible for the analgesic activity.

In the acute phase inflammation model (carrageenan induced hind paw edema) Gandhaga Parpa Mathirai showed significant (P<0.001) anti-inflammatory activity. In this study also the anti-inflammatory response was noticed at the end of 120 mts of administration whereas standard drug diclofenac sodium exhibited immediate response. This again may be due to the delayed absorption of the phyto constituents present in the drug from the intestine.

The analgesic and antiinflammatory activity exhibited by Gandhaga Parpa Mathirai have significant correlation with the clinical study reported in the thesis.
### Analgesic activity of (Gandhaga Parpa Mathirai) using Tail Flick Method

<table>
<thead>
<tr>
<th>Groups</th>
<th>Paw licking response (Sec)</th>
<th>0 min (Sec)</th>
<th>30 min (Sec)</th>
<th>60 min (Sec)</th>
<th>120 min (Sec)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td></td>
<td>2.386 ± 0.396</td>
<td>2.293 ± 0.96</td>
<td>2.36 ± 0.367</td>
<td>2.482 ± 0.653</td>
</tr>
<tr>
<td>GPM (500mg/kg, p.o.,)</td>
<td></td>
<td>2.386 ± 0.116 ns</td>
<td>2.63 ± 0.328 ns</td>
<td>3.38 ± 1.033 **</td>
<td>4.16 ± 0.719 **</td>
</tr>
<tr>
<td>Standard (Diclofenac Sodium) (5mg/kg/po)</td>
<td></td>
<td>2.266 ± 0.391</td>
<td>3.53 ± 0.450 ***</td>
<td>4.533 ± 0.388 ***</td>
<td>5.803 ± 0.7995 ***</td>
</tr>
</tbody>
</table>

n=6; Values are expressed as mean ± S.D using followed by paired T – test

**P<0.001 as compared with control.
ns - Non significant as compared with control

### Anti inflammatory activity of Gandhaga Parpa Mathirai induced hind paw edema in rats

<table>
<thead>
<tr>
<th>Groups</th>
<th>Paw volume (ml) by mercury Displacement at regular interval of time</th>
<th>0min</th>
<th>30min</th>
<th>60min</th>
<th>120min</th>
<th>240min</th>
<th>15 hrs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td></td>
<td>1.633 ± 5.164</td>
<td>1.883 ± 4.472</td>
<td>2.10 ± 8.944</td>
<td>2.23 ± 0.103</td>
<td>2.33 ± 7.528</td>
<td>2.36 ± 8.944</td>
</tr>
<tr>
<td>GPM (500mg/kg, p.o.,)</td>
<td></td>
<td>1.683 ± 0.1472 ns</td>
<td>1.808 ± 0.1497 ns</td>
<td>2.0 ± 0.303 ns</td>
<td>2.13 ± 8.944 ***</td>
<td>1.92 ± 8.197 ***</td>
<td>1.306 ± 8.944 ***</td>
</tr>
<tr>
<td>Standard (Dic.Sodium 5 mg/kg/po)</td>
<td></td>
<td>0.835 ± 0.065 ***</td>
<td>1.315 ± 0.069 ***</td>
<td>1.128 ± 0.049 ***</td>
<td>1.011 ± 0.056 ***</td>
<td>0.896 ± 0.048 ***</td>
<td>0.85 ± 0.054 ***</td>
</tr>
</tbody>
</table>

n=6; Values are expressed as mean ± S.D followed by paired T – test.

ns - Non significant as compared with control;
P< 0.000 (***) as compared with control.
CLINICAL ASSESSMENT
ABOUT DISEASE AS PER SIDDHA ASPECT

• ேவாற்றுடன் விளையாடு
• வேய்ச்சல் விளையாடு
• மருத்துவம
• இசையமைப்பை

தினம்

சிற்றில்லாத விளையாட்டுத் தொடர்பு (அ) பில்லாசே தொடர்ச்சியாகும் குறிப்பிட்டு தினம் செய்யும், சிற்றில்லாத எச்சலங்கள் விளைப்பட்ட இவ்விளையாட்டுகள் உள்ளவை தீர்மானம்.

தினம் உச்சகிரிய காரணமாக

“பாதாக மேளிய விளக்கம் மீது விளக்கம் பாதாக புறப்பிட்டு

மீது விளக்கம்

காலத் தூக்கிய விளக்கம் விளக்கம் காலத்துக்கு

மீது பிரைட்டு

சேலாய் விளக்கம் விளக்கம் விளக்கம் விளக்கம்

பொன்னாசத் விளக்கம் விளக்கம்

காலத் பெருக்கிசேலாக பபாபாசத் விளக்கம் விளக்கம்

சட்டமானத்தொண்டை”.

1. மீது விளக்கம்
2. பிரைட்டு பிரைட்டு
3. சேலாய் விளக்கம் விளக்கம் விளக்கம்
4. பொன்னாசத் விளக்கம்
5. கலப்பாளர் நம்பிக்கைகளில் - லேப் 2 செயல்,
துவம்படி செயல் - லேப்பாளர் நம்பிக்கைகள் அடைய போக்கு.
6. முன்னோரிட்டு கூறும் கோவில்
7. பொறுப்புகள் கவரறி வேறு கலவை நம்பிக்கையான இச்செயல் பின்புறக்

சிற்று வரலாற்:

“2 கோந்து பொயின் பால் பால் பால் பால்
2 படிப்பில் பிணைங்காலவிளச்சம் கூட்டம்”

செலுத்தி பின்புறம் 21 விளக்கப்படுத.

சுருக்காப்புகள்

காலாண்டி சரசுக்குப் பார்த்தோம் கூறிட குறிப்பிட்டு

குறிப்பிட்டு குறிப்பிட்டு
சென்று விளக்கம் வேளைக் குறிப்பிட்டு

பிறங்கு விளக்கம்

குறிப்பிட்டு குறிப்பிட்டு குறிப்பிட்டு

சென்று விளக்கம் வேளைக் குறிப்பிட்டு

பிறங்கு விளக்கம் காண்டல்

1. முக்குழா, திருப்பு திருக்கணவல்கள் மையா
2. அசுராதிகள் மையா
3. கருவையா திருக்கா, ஸ்ரீமா திருக்கணவல்கள் மையா.
AS PER MODERN CONCEPT

The word Leucorrhoea is described as any white or yellowish white discharge from the vagina strictly excluding the presence of blood. The pH of the vaginal secretion averages about 4.5 during reproductive period the acidity which is undoubtedly oestrogen dependent. This acidic PH inhibits the growth of pathogenic organism the lactic acid of the healthy vagina and the vaginal portion of the cervix. Any vaginal discharge which is frankly purulent and contains pus cells and from which the causative organisms can be isolated and cultured should be considered as due to a specific vaginal infection.

TRICHOMONIASIS

I. One of the most commonly occurring
II. Itching in vulva
III. Disease almost entirely in child bearing era
IV. By inadequate hygiene & sexually transmitted
V. By use of an infected persons towels, clothes.

CANDIDIASIS:

Vulvo vaginitis, monilial
Abnormal vaginal discharge associated with vulval irritation

SIGNS & SYMPTOMS

I. Intense vulval itching
II. Thing curd like vaginal discharge
III. Dyspareunia at times
IV. Erythema of Vulva
V. Inflammed, vulval skin
VI. Thick white patches appear attached to vaginal mucosa.

CAUSATIVE ORGANISM

Trichomonas vaginalis, a protozoan

SYMPTOMS

I. Vaginal discharge is profuse thin creamy or slightly green
II. Irritant and frothy
III. Pruritis & inflammation of vulva
IV. Dysuria, frequency of urination and low grade urethritis

NON SPECIFIC VAGINITIS

Mixed pathogens are recovered.

CAUSATIVE ORGANISM

Staphylococci
Streptococci
Ecoli

SYMPTOMS & SIGNS.

1. Irritation, Tender vagina
2. Burning micturition & dysuria
CLASSIFICATION

1. Non Infective
   I. Physiological excess
   II. Cervical cause
   III. Vaginal cause

2. Infective
   I. Specific
   II. Non – Specific

3. Neoplastic
4. Foreign body

INCLUDING CRITERIA

1. White / yellowish discharge per vagina
2. Vulval irritation
3. Itching in vulva
4. Low back pain
5. Lower abdominal pain
6. Dysuria

EXCLUDING CRITERIA

1. Blood Stained
2. Pregnancy and lactating mother
3. Irregular follow up cases

INVESTIGATION PROCEDURES

Routine examination were done, diagnosis were made on the basis of signs  and symptoms
Medical Advice

I. Advice regarding personal hygiene

II. Avoidance of synthetic garments

III. Fingernails should be clipped short

IV. Avoidance of contamination of vulva
   with ablution of water after bowel action.

V. Improving general health.

VI. The partners were also enquired for infection and advised
    for treatment.

Number of cases taken were 45 in that 40 were subjected for the clinical study and
the following were observed during the course of treatment.

Age, socioeconomic status personal habits & diets, occupational status, signs &
symptoms during admission were recorded. Improvement showing signs and symptoms
and statistical analysis after treatment is recorded and tabulated as follows.
AGE DISTRIBUTION:

<table>
<thead>
<tr>
<th>S.No</th>
<th>AGE</th>
<th>No.of.Cases</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>11-20</td>
<td>7</td>
<td>17</td>
</tr>
<tr>
<td>2.</td>
<td>21-30</td>
<td>22</td>
<td>55</td>
</tr>
<tr>
<td>3.</td>
<td>31-40</td>
<td>11</td>
<td>27</td>
</tr>
</tbody>
</table>

**INFERENCES**

Among 40 Patients 7 (17%) were between 11-20, 22 (55%) were in the age group 21-30 and 11 (27%) were in the age group 31-40.
OCCUPATION WISE DISTRIBUTION:

<table>
<thead>
<tr>
<th>S.No</th>
<th>Occupation</th>
<th>No.of.Cases</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>House Wife</td>
<td>28</td>
<td>70</td>
</tr>
<tr>
<td>2.</td>
<td>Students</td>
<td>8</td>
<td>20</td>
</tr>
<tr>
<td>3.</td>
<td>Tailor</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>4.</td>
<td>Daily Labour</td>
<td>3</td>
<td>7</td>
</tr>
</tbody>
</table>

**INFEERENCE:**

Among 40 Patients 28 (70%) patients were House wife, 8 (20%) patients were students 1(2%) was tailor and 3(7%) patients were Daily Labour.
SOCIO- ECONOMIC STATUS:

<table>
<thead>
<tr>
<th>S.No</th>
<th>Socio – Economic Status</th>
<th>No.of.Cases</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Poor</td>
<td>26</td>
<td>65</td>
</tr>
<tr>
<td>2.</td>
<td>Moderate</td>
<td>10</td>
<td>25</td>
</tr>
<tr>
<td>3.</td>
<td>High</td>
<td>4</td>
<td>10</td>
</tr>
</tbody>
</table>

Inference:

Among 40 patients 26(65%) were poor, 10(25%) were moderate class and 4 (10%) were high people. This data shows that Leucorrhoea is most prevalent in poor people due to poor hygienic conditions.
SYMPTOM WISE DISTRIBUTION

<table>
<thead>
<tr>
<th>Symptoms</th>
<th>Before Treatment</th>
<th>After Treatment</th>
<th>Improvement</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yellowish/white discharge</td>
<td>40</td>
<td>8</td>
<td>32</td>
<td>80</td>
</tr>
<tr>
<td>Vulval irritation</td>
<td>30</td>
<td>2</td>
<td>28</td>
<td>73</td>
</tr>
<tr>
<td>Itching in Vulva</td>
<td>33</td>
<td>3</td>
<td>30</td>
<td>90</td>
</tr>
<tr>
<td>Lower Abdominal Pain</td>
<td>35</td>
<td>10</td>
<td>25</td>
<td>71</td>
</tr>
<tr>
<td>Low Back Pain</td>
<td>25</td>
<td>10</td>
<td>15</td>
<td>60</td>
</tr>
<tr>
<td>Dysuria</td>
<td>25</td>
<td>4</td>
<td>21</td>
<td>84</td>
</tr>
</tbody>
</table>

**INFEERENCE:**

Patients with the parameters that is Yellowish/white discharge, Vulval Irritation, Itching in vulva, Lower abdominal pain, Low back pain, Dysuria were taken for the study.

Among 40 patients 32 pts improved from Yellowish/white discharge
Among 30 patients with Vulval Irritation 28 got relief from the symptom.
Among 33 patients with Itching in vulva 30 improved. Among 35 patients with Lower abdominal pain 25 got relief, Among 25 Patients with Low back pain 15 got improvement, Among 25 Patients with Dysuria only 21 got improvement.
MARITAL STATUS

<table>
<thead>
<tr>
<th>S.No</th>
<th>Marital Status</th>
<th>No.of Patients</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Married</td>
<td>30</td>
<td>75</td>
</tr>
<tr>
<td>2.</td>
<td>Un Married</td>
<td>10</td>
<td>25</td>
</tr>
</tbody>
</table>

INFERENCES:

Among 40 patients 30 (75%) patients were married and 10 (25%) patients were unmarried. This shows that the disease is more prevalent in the married women.
VAGINAL SMEAR

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Vaginal Smear</th>
<th>No. of Patients</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Trichomonas Vaginalis (TV)</td>
<td>5</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Candida albicans</td>
<td>4</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Non – Specific infections</td>
<td>36</td>
<td>30</td>
<td></td>
</tr>
</tbody>
</table>

**INFERENCE:**

Among 40 patients 5 patients were found positive for Trichomonas, 4 were found positive Candida albicans and 36 were of Non-specific infections.
METHODOLOGY FOR STATISTICAL ANALYSIS

To study variation in one or more attributes the data are expressed mostly as proportions. If a sample is divided into only two classes such as successes and failures it is said to have a binomial

\[
P = \frac{\text{Number of individuals having a Specific Character}}{\text{Total Number}}
\]

Character in a binomial distribution is expressed

\[
P = \frac{\text{Character in a binomial distribution is expressed}}{\text{Total Number}}
\]

\[q = \text{probability of non – occurrence of the same}.
\]

STANDARD ERROR OF PROPORTION (S.E.P)

The probability or Proportional changes of positive or negative occurrence of an attribute or a character in a population or universe follows.

Binomial Frequency Distribution

\[\text{S.E.P} = \sqrt{\frac{pq}{N}}\]

Probability of difference occurring by chance can be found by applying Z test as done in the case of means,

\[Z = \frac{p - P}{\text{S.E.P}}\]
## STATISTICAL ANALYSIS OF SUBJECTIVE PARAMETERS OBSERVED BEFORE AND AFTER TREATMENT OF PATIENTS.

<table>
<thead>
<tr>
<th>S.No</th>
<th>Parameters</th>
<th>Percentage improved</th>
<th>Statistical Criteria</th>
<th>Probability</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Study</td>
<td>Effect</td>
<td>Difference</td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>Yellowish Discharge</td>
<td>100</td>
<td>80</td>
<td>20</td>
<td>Z=1.870</td>
</tr>
<tr>
<td>2.</td>
<td>Vulval Itching</td>
<td>83</td>
<td>75</td>
<td>8</td>
<td>Z=0.6451</td>
</tr>
<tr>
<td>3.</td>
<td>Vulval Irritation</td>
<td>75</td>
<td>70</td>
<td>5</td>
<td>Z=0.3225</td>
</tr>
<tr>
<td>4.</td>
<td>Dysuria</td>
<td>62</td>
<td>52</td>
<td>10</td>
<td>Z=1.903</td>
</tr>
</tbody>
</table>

P <0.001 hence the improvement in the subjective parameters produced by **Gandaga Parpa Mathirai** is statistically significant.
DISCUSSION

Vellai Noi is the term used to describe any white or yellowish – white discharge from the vagina. Vellai noi is characterized by itching in vulva, dysuria and yellowish discharge. This treatment has become great problem since many women refuse to present themselves with such complaints. Hence the disease Vellai Noi was chosen and the drug Gandaga Parpa Mathirai was selected for treating Vellai Noi.

From the literature survey the drug Gandaga Parpa Mathirai was found to be more effective in the treatment of Vellai noi. The drug was selected as per the literature evidence given in the siddha text “ Sarabendar Vaidhya Ratnavali”. And clinical trial, Pharmacological study were carried out in order to prove its efficacy in the treatment of Vellai noi.

The biochemical Analysis of the drug showed the presence of copper and calcium.

Copper plays vital role in hemopoiesis. If helps in the synthesis of hemoglobin and maturation of red blood cells.
Calcium ions are necessary for muscle contraction. Muscle contraction is impaired when there is a deficiency of calcium ions. Calcium ions are necessary for the normal transmission of nerve impulses.

Phytochemical tests were done which showed the presence of Phytosterol, Protein, Tannins, Amino acid, Glycosides.

Antimicrobial study reveals that the drug is a highly sensitive anti–bacterial agent against klebsiella, E.Coli, Pseudomonas, proteus, Staphylococcus aureus and fungi, Candida albicans.

Acute oral toxicity study reveals that the drug was proved safe for administration as it did not exhibit any significant toxicity at 2000 mg/kg body weight.

Gandaga Parpa Mathirai showed significant analgesic and anti-inflammatory activity. The findings of experimental Anti–inflammatory activity was significant and this leads pharmacological support to the use of the drug in Vellai not.

Open clinical trial with the sample size of 40 patient, for a period of 48 days revealed the following features.

Maximum No.of Patients affected belong to age group 21-30 (55%) and married women (75%) were more compared to unmarried. It was found that improper hygiene was the main reason for the disease, so the patients were advised for proper hygiene.

Administration of Gandaga Parpa Mathirai, in the dose of 1 tablet (130mg), twice daily after food for a period of 48 days showed gradual relief for the subjected parameters such as yellowish discharge, itching in vulva, vulva irritation, Dysuria and lower abdominal pain.

No adverse effects were observed during the course of this study.
SUMMARY

The study on *Gandaga parpa mathirai* to evaluate its efficacy in the management of Vellai noi was carried out based on the evidences collected from Siddha literature.

After obtaining guidance from the HOD and permission from principle, Govt Siddha Medical College, pharmacology study was carried out in C.L.Baid Mehta college of pharmacy, Thoraipakkam Chennai.

The compound drug *Gandaga Parpa Mathirai* was prepared as per the siddha literature.

Phytochemical tests were done which showed the presence of Alkaloids, Phytosterol, Protein, Tannins, Amino acid and Glycosides.

The antimicrobial study proved it to be effective against various bacteria and fungi. Biochemical analysis showed presence of Calcium, Iron (ferrous), Sulphate and Chloride.

Pharmacological study was done for its anti-inflammatory, analgesic activity in C.L.Baid Metha college of pharmacy, Chennai, Thoraippakkam. The results showed significant Anti inflammatory and analgesic activity.

The Clinical assessment was done as an open clinical trial in the Gunapadam Department op, at Arignar Anna Hospital for Indian Medicine, Chennai – 106, The patients were selected according to selection criteria.
Patients were carefully observed in regular visit and prognosis was sincerely documented.

The drug *Gandaga parpa mathirai* was administered 1 tablet (130mg) twice a day with water (30ml) after food for a period of 48 days.

In the clinical trial improvement in signs and symptoms like Yellowish discharge, Dysuria, Vulval itching, Vulval irritation, lower abdominal pain were clinically significant.

No adverse drug effect was observed during the course of study.

The drug *Gandaga Parpa Mathirai* showed significant improvement in the treatment of Vellai Noi.
CONCLUSION

The evaluation of efficacy of the compound drug *Gandaga parpa mathirai* in the management of *Vellai Noi* gave significant results.

Presence of Alkaloids, Phytosterol, Tannins, Amino acid, Glycosides play vital role in the management of Vellai Noi.

Pharmacological anti inflammatory and analgesic activity strengthen the study.

Clinically the drug relieved the symptoms yellowish discharge dysuria, Vulval irritation, Vulval itching very well.

*Gandaga parpa mathirai* regularized the 3 humors by stabilizing the Azhal thathu by its kaipu, thuvarppu suvai.

No adverse effects were observed during the period of study.

In total *Gandaga parpa mathirai* play a potential therapeutic role in treating Vellai Noi.
AGE DISTRIBUTION:

<table>
<thead>
<tr>
<th>S.No</th>
<th>AGE</th>
<th>No.of.Cases</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>11-20</td>
<td>7</td>
<td>17</td>
</tr>
<tr>
<td>2.</td>
<td>21-30</td>
<td>22</td>
<td>55</td>
</tr>
<tr>
<td>3.</td>
<td>31-40</td>
<td>11</td>
<td>27</td>
</tr>
</tbody>
</table>

**INFERENCE**

Among 40 Patients 7 (17%) were Between 11-20, 22 (55%) were in the age group 21-30 and 11 (27%) were in the age group 31-40.
OCCUPATION WISE DISTRIBUTION:

<table>
<thead>
<tr>
<th>S.No</th>
<th>Occupation</th>
<th>No.of.Cases</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>House Wife</td>
<td>28</td>
<td>70</td>
</tr>
<tr>
<td>2.</td>
<td>Students</td>
<td>8</td>
<td>20</td>
</tr>
<tr>
<td>3.</td>
<td>Tailor</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>4.</td>
<td>Daily Labour</td>
<td>3</td>
<td>7</td>
</tr>
</tbody>
</table>

INERENCE :

Among 40 Patients 28 (70%) patients were House wife, 8 (20%) patients were students 1(2%) was tailor and 3(7%) patients were Daily Labour.
SOCIO- ECONOMIC STATUS:

<table>
<thead>
<tr>
<th>S.No</th>
<th>Socio – Economic Status</th>
<th>No.of.Cases</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Poor</td>
<td>26</td>
<td>65</td>
</tr>
<tr>
<td>2.</td>
<td>Moderate</td>
<td>10</td>
<td>25</td>
</tr>
<tr>
<td>3.</td>
<td>High</td>
<td>4</td>
<td>10</td>
</tr>
</tbody>
</table>

INFERENCES:

Among 40 patients 26(65%) were poor, 10(25%) were moderate class and 4 (10%) were high people. This data shows that Leucorrhoea is most prevalent in poor people due to poor hygienic conditions.

SYMPTOM WISE DISTRIBUTION

<table>
<thead>
<tr>
<th>Symptoms</th>
<th>Before Treatment</th>
<th>After Treatment</th>
<th>Improvement</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yellowish/white</td>
<td>40</td>
<td>8</td>
<td>32</td>
<td>80</td>
</tr>
</tbody>
</table>
SYMPTOM WISE DISTRIBUTION

<table>
<thead>
<tr>
<th>Symptom</th>
<th>No. of Patients</th>
<th>Improvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yellowish/white discharge</td>
<td>30</td>
<td>2</td>
</tr>
<tr>
<td>Vulval irritation</td>
<td>33</td>
<td>3</td>
</tr>
<tr>
<td>Itching in Vulva</td>
<td>35</td>
<td>10</td>
</tr>
<tr>
<td>Lower Abdominal Pain</td>
<td>25</td>
<td>10</td>
</tr>
<tr>
<td>Low Back Pain</td>
<td>25</td>
<td>4</td>
</tr>
<tr>
<td>Dysuria</td>
<td>25</td>
<td>4</td>
</tr>
</tbody>
</table>

INFERENCE:

Patients with the parameters that is Yellowish/white discharge, Vulval Irritation, Itching in vulva, Lower abdominal pain, Low back pain, Dysuria were taken for the study.

Among 40 patients 32 pts improved from Yellowish/white discharge.
Among 30 patients with Vulval Irritation 28 got relief from the symptom.
Among 33 patients with Itching in vulva 30 improved.
Among 35 patients with Lower abdominal pain 25 got relief.
Among 25 Patients with Low back pain 15 got improvement.
Among 25 Patients with Dysuria only 21 got improvement.

MARITAL STATUS

<table>
<thead>
<tr>
<th>S.No</th>
<th>Marital Status</th>
<th>No.of Patients</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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<tr>
<th>Symptoms</th>
<th>No. of Patients</th>
<th>Improvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yellowish/white discharge</td>
<td>30</td>
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</tr>
<tr>
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</tr>
<tr>
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MARITAL STATUS

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<tr>
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<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Among 40 patients 30 (75%) patients were married and 10 (25%) patients were unmarried. This shows that the disease is more prevalent in the married women.
**VAGINAL SMEAR**

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Vaginal Smear</th>
<th>No. of Patients</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>BT</td>
<td>AT</td>
</tr>
<tr>
<td>1.</td>
<td>Trichomonas Vaginalis (TV)</td>
<td>5</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Candida albicans</td>
<td>4</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Non – Specific infections</td>
<td>36</td>
<td>30</td>
<td></td>
</tr>
</tbody>
</table>

**INFERENCEx:**

Among 40 patients 5 patients were found positive for Trichomonas, 4 were found positive Candida albicans and 36 were of Non-specific infections.
1. கார்கிள தோற்றம், கல்லால் கச்சித்திய மக்கள். கார்கில் முதல்கற்று, மக்கள் முதல்கற்று. Pg. 825, 810, 18,
2. துரு தினார்த்தல் கால் மக்கள். கார்கில் முதல்கற்று, மக்கள் முதல்கற்று. Pg. 107, 224, 236, 237
3. மாதா, வீரராஜ மத்திய. வீரராஜ வீராஜ்புரி, கால்போ குறிப்பிட்டு. Pg. 7, 10, 55, 17, 12.
4. கோவில் மற்றும் பார்வார் தொன்மை குறிப்பிட்டு. கார்கில் முதல்கற்று, மக்கள் முதல்கற்று. Pg. 644, 18, 659.
5. மாதா, கால்போ சீனித் தொன்மை. பார்வார் கால்போ முசுகூலா. Pg. 9.
6. கார்கிள்சு தோற்றம் முதல்கற்று, மக்கள் முதல்கற்று. கார்கிள்சு. Pg. 4, 6, 124, 162, 135, 501, 194, 100.
7. கால்போ பார்வார் தொன்மை. கால்போ பார்வார். Pg. 126, 469.
8. கார்கில் மற்றும் பார்வார் தொன்மை. கால்போ பார்வார். Pg. 342.
9. கார்கில் மற்றும் பார்வார் தொன்மை. கார்கில் முதல்கற்று. Pg. 89, 146.
10. பார்வார் முதல்கற்று 1000, கால்போ பார்வார். Pg. 315, 248, 269.
11. பார்வார் தொன்மை. கால்போ பார்வார். Pg. 32.
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   மாநில விளையாட்டில் கேட்ட Pg. 21, 36.
45. பொன் காலிசன் விளையாட்டி, கருணையிரமுனி. கோட்டாரியார்.
46. கர்மசங்கார் விளையாட்டி, கருமண் துருகம், நன்குருகம்
47. காட்டமலையார் பூமியாழ் காரணியாள், கருமண் துருகம், நன்குருகம்.