PART - I

A STUDY ON

MUDAKKATRAN

(Cardiospermum halicacabum Linn.)
FOR VALI AZHAL KEELVAYU

PART - II

A STUDY ON

PACHAI KARPOORATHI CHOORANAM

FOR GUNMAM

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CERTIFICATE

Certified that I have gone through the dissertation submitted by Dr.S.PAVANAN, a student of final M.D. (s), Branch - II, Gunapadam, Government Siddha Medical College, Chennai - 106, and the dissertation work has been carried out by the individual only.

Place : Chennai
Date :

Professor and Head of the Dept.
Post Graduate Department,
Branch - II, Gunapadam,
Govt. Siddha Medical College,
Chennai - 106.

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INTRODUCTION

The siddha system of medicine has been practicing in our country since time unknown. The basic emphasis of siddha system is on positive health viz., to prevent disease by careful dieting and proper control of the mind to achieve a good health that assures not only longevity but also immortality.

The siddha system of medicine is a gift to mankind given by the Siddhars. It is the speciality of siddha system and its non-differntiation of food and medicine.

"உணவே மருந்து மருந்தே உணவு"

In siddha system diseases are initially treated with herbal preparations and then by metals, minerals and Jeeva vaguppu etc., to cure diseases.

"வேர்பாரு தழைபாரு மிஞ்சினக்கால் மெல்லமெல்ல
பற்ப செந்தூரம் பாரே"

Siddha system has its own developed chemistry and the siddhars training in the direction of its development had resulted in the genesis of thousands of minerals and metallic preparations, thus the system is well equiped to compact any type of diseases.

The materia medica of the siddha system is the outcome bulk of siddhar's therapeutic wisdom. These medicines in the form of decoction, powders, pills, oils, parpam, chenduram and external medicines will offer cure for any kind of diseases.

The people are needed to have easily available medicines to cure many diseases. Nature has given us a wide variety of medicinal plants to preserve good health and cure diseases. The siddha system is dealing with natural system of medicines with very least adverse effects. So, the siddha system of medicine is living science for ever.

Siddha system of medicine is one of the most important Indian system of medicine. Nowadays the Indian system of medicine is undergoing revolutionary changes.

Nowadays physicians have started prescribing indigenous medicines for liver diseases, gynecological problems, cancer, HIV, Diabetes, Calculus, Haemorrhoids etc., for their known least side effects.

Most of the chronic diseases are caused by the derangement of vatha humour. Among them, vali azhal keelvayu (Rheumatoid Arthritis (RA)) disease classified under the vatha diseases.

Vali Azhal Keelvayu is the most common inflammatory arthritis in women, affecting small and large joints. Before the age group of 45, the female : male incident ratio is 6:1, prevalence increases with age with 5% of women and 2% of men over 55 years being affected. The clinical course is usually life long with intermittent exacerbations and remissions and highly variable severity. So the medicines should be taken for life time, which should be effective, non toxic and safe.

A part of my dissertation work, I have chosen MUDAKKATRAN CHOORANAM obtained from Mudakkatran whole plant (including the root) given for 'VALI AZHAL KEEL VAYU' (Rheumatoid arthritis).

AIM AND OBJECTIVE

The ultimate aim of the disssertation work is to prove the efficacy of Mudakkatran Chooranam to treat Vali Azahal Keelvayu (Rheumatoid Arthritis).

Mudakkatran is a well known drug for vatha diseases. In Siddha literature Mudakkatran is also mentioned for skin diseases and ear ache.

Vali Azhal Keelvayu is an autoimmune disease, which affects the joints of millions of people each year. Patient with auto immune diseases have antiboidies in their blood that target their own body tissues, associated with inflammation. It also affects other organs of the body.

The prevalance of Vali Azhal Keelvayu is approximiately 1% of the population. Women are affected approximately three times more often than men. The onset of the disease is most frequent during the fourth and fifth decades of life with 80% of all patients developing the disease between the ages of 35 and 50. Many chronic diseases including Vali Azhal Keelvayu considered incurable in other systems of medicine can be treated successfully with siddha medicines.

I have slected this herbal drug which may be very suitable to treat Vali Azhal Keelvayu naturally without any side effects.

The main objective of this present study is to create an awareness about the Siddha Science and to highlight the efficiency of siddha drug among the public. With the basic intention in mind following specific objectives have been drawn.

1. My aim is to gather all the information about the trial drug Mudakkatran and its therapeutic use for Vali Azhal Keelvayu.
2. Pharmacognostic study
3. Bio-Chemical analysis
4. Microbiological study
5. Pharmacological study
6. Clinical study
7. Bio - Statistical study.

REVIEW OF LITERATURE

I. GUNAPADAM ASPECT[51]

முடக்கற்றான் (MUDAKKATRAN)

Botanical Name : *Cardiospermum halicacabum* Linn.

வேறுபெயர்கள்:

முடக்கொத்தான் பேர்தனையே மொழியக் கேளு
முனிவான ரத்தபாதி யாவுமாகும்
படக்கொத்தான் பாபீரோத்தா விசுவகெந்தி
பாங்கான கிரிவாத்தியம் அங்கபாதி
மடக்கொத்தான் மண்டலகா ரகமுமாகு
மகத்தான அங்கபதி பூதனாகும்
விடக்கொத்தான் விஷஅந்திர வாதனாசி
விளம்பிய தோர் முடக்கொத்தான் விபரமாமே[50]

பொருள்: முடர்குற்றான், முடக்கறுத்தான், ரத்தபாதி, படக்கொத்தான், விசுவகெந்தி, கிரிவாத்தியம், அங்கபாதி, மடக்கொத்தான், மண்டலுகாரகம், அங்கபதிபூதன், விஷஅந்திரவாதன்.

பயன்படும் உறுப்பு : இலை, வேர்

குணம் : சுவை - துவர்ப்பு
தன்மை - வெப்பம்
பிரிவு - கார்ப்பு

செய்கைகள்:[1, 51]

சிறுநீர் பெருக்கி - Diuretic
மலமிளக்கி - Laxative
பசித்தீதூண்டி - Stomachic
உடல் தேற்றி - Alterative
தடிப்புண்டாக்கி - Rubefacient
வாதமடக்கி - Antivatha
வியர்வை பெருக்கி - Diaphoretic
வாந்தியுண்டாக்கி - Emetic
சூதகமுண்டாக்கி - Emmenagogue

பொதுகுணம் :[51]

சூலை பிடிப்பு சொரி சிரங்கு வன்கரப்பான்
காலைத் தொடுவாய்வுங் கன்மலமுஞ்-சாலக்
கடக்கத்தா னோடிவிடுங் காசினியை விட்டு
முடக்கற்றான் றன்னை மொழி (அகத்தியர் குணவாகடம்)

பொழிப்புரை :

கீல்பிடிப்பு, சினைப்பு, கிரந்தி, கரப்பான், **பாதத்தை அனுசரித்த வாதம்,** மலக்கட்டு முதலிய நோய்கள் முடக்கற்றானால் தீரும்.

வழக்கு முறைகள் :

- இலை, வேர் முதலியவற்றை குடிநீரிட்டு, வளி, மூலம், நாட்பட்ட இருமல் முதலியவைகளுக்கு கொடுக்கலாம்.
- இலைப்பொடியுடன் சித்திரமூல வேர்பட்டை பொடி, கரியபோளம் இவை சேர்த்து மூன்றுநாள் தர சூதக கட்டு நீங்கும்.
- இலைகளை வதக்கி அடிவயிற்றில் கட்ட சூதகத்தை மிகுதிப்படுத்தி சூலக அழுக்குகளை வெளிப்படுத்தும்.
- இலையை எண்ணெயிலிட்டு காய்ச்சி, அவ்வெண்ணையினை வலிகளுக்கு பூசலாம்.
- இலைச்சாற்றைக் காதில் விட காதுவலி, சீழ்வடிதல் நீங்கும்.
- வேர் குடிநீரை மூலநோய்க்குத் தரலாம்.
- முடக்கற்றான் கொடியின் குடிநீருடன் ஆமணக்கெண்ணெய் கூட்டித் தர மலம் கழியும்.

முடக்கற்றான் சேரும் மருந்துகள்

1. வாதநாச தைலம்[17]

- நொச்சி, முடக்கற்றான், வீழி, வெண்சாரணை, உத்தாமணி, பாவட்டை, பொடுதலை - இவைகளின் சாறுகள் தலா 1/4 படி
- தேங்காய் பால், சிற்றாமணக்கு நெய் - வகைக்கு 1/4 படி

- இதில் சுக்கு, வசம்பு, சீரகம், தேவதாரு, கப்பு மஞ்சள், கஸ்தூரி மஞ்சள், வெள்ளைப் பூண்டு, உத்தாமணி வேர், பெருங்காயம், மிளகு, சுட்ட ஆமை ஓடு - வகைக்கு 1 வாரகன்.
- சரக்குகளை தேங்காய் பால் விட்டரைத்து கலக்கி அடுப்பேற்றி சிறு தீயாக எரித்து பதமுற தைலங்காய்ச்சி வடித்துக்கொள்ள வேண்டும்.

அளவு : 1/2 - 1 பலம், காலையில் மட்டும், 3 நாட்கள்

தீரும் நோய்கள் :

வாதநோய்கள், கைகால் பிடிப்பு, குடைச்சல், இடுப்பு வலி, **கீல்வாயு,** ஓடு வாயு.

2. முடகற்றான் எண்ணெய்[17]

முடக்கற்றான் சாறு	-	1/2 படி
கள்ளி சாறு	-	1/2 படி
சிற்றாமணக்கெண்ணெய்	-	1 படி

இவைகளைக் கலந்து ஒரு தைல பாண்டத்திலிட்டு, அதில் சித்திர மூல வேர்பட்டை, வெண்காக்கட்டான் வேர், சிற்றரத்தை, இந்துப்பு, பெருங்காயம், கழற்சி வேர் பட்டை, கழற்சி வித்து வகைக்கு 1/2 பலம், வெள்ளை பூண்டு 1 1/2 பலம், எடுத்து அரைத்து சேர்த்து கலந்து அடுப்பேற்றி சிறுதீயாக எரித்து பதமாக காய்ச்சி வடித்துக் கொள்ளவும்.

அளவு : 1/4 - 1/2 அவுன்ஸ், காலை மட்டும், 2-3 நாட்கள் (கடும்பத்தியம்)

தீரும் பிணிகள் : அண்டவாதம், குடல் வாதம், வாதசூலை

3. **முடக்கற்றான் சாறு** - 1/2 படி

நல்லெண்ணெய் - 1/2 படி

வசம்பு, பூண்டு, பெருங்காயம், திரிகடுகு, இந்துப்பு, சீரகம், சதகுப்பை, பறங்கிபட்டை, தேவதாரம் வகைக்கு 1 கழஞ்சு அரைத்து விளக்கெண்ணெயில் போட்டுப் பதமாய் காய்ச்சி எடுத்துக்கொள்ள வேண்டும்.

அளவு : ஒரு காசளவு

தீரும் பிணி : சூதகவாயு[16]

4. **குழந்தைகளின் செங்கிரந்திக்கு மருந்து**[16]

மூக்கரைச்சாரணை, **முடக்கற்றான்,** செப்பு நெருஞ்சில், முத்தெருக்கஞ்செவி, ஒரிதழ் தாமரை, வெங்காயம், மயிலிறகு, இவையெல்லாம் ஒரே சமமாய் தட்டி எடுத்துக் கொண்டு சிற்றாமணக்கு எண்ணெயில் போட்டு காய்ச்சி குழந்தைகக்கு உள்ளுக்கு கொடுத்து தாய்க்கு மேலே பூச செங்கிரந்தி தீரும்.

5. கழற்சி பருப்பு 1 அவுன்ஸ்

சாரணை வேர் 1 அவுன்ஸ்

சுக்கு 1 அவுன்ஸ்

முடக்கற்றான் வேர் 1 அவுன்ஸ்

சரக்குகளை பொடித்து 13 அவுன்ஸ் நீரில் போட்டு 6 அவுன்ஸ் குடிநீராக குறுக்கி 1 பாலாடை வீதம் தினம் 2 வேளை தர குழந்தைகளின் அண்ட வீக்கம் குணமாகும்.

6. **முடக்கற்றான் இலைச்சாறு**
குப்பைமேனி சாறு
முக்காச்சாரணை சமூலச்சாறு
ஆமணக்கெண்ணெய்
} தலா 1 அவுன்ஸ்

இவற்றை அடுப்பேற்றி காய்ச்சி வடித்து 1 பாலாடை வீதம் கொடுத்து வர மாந்த வலிப்பு தீரும்[15].

7. மகா ஆனந்த வயிரவனெண்ணெய்[20]
8. குமட்டிக்காய் பதங்கம்[20]
9. மேகநாதத் தைலம்[31]
10. தூதுவேளை கிருதம்[17]
11. இளநீர் கிருதம்[17]
12. சஞ்சீவி எண்ணெய்[15]
13. விடமுட்டி தைலம்[15]
14. முக்கூட்டுத் தைலம்[39]
15. மேக கஷாயம்[39]
16. அண்டவாத ஒற்றடம்[56]
17. அண்டவாத எண்ணெய்[36]
18. கொரட்டைத் தைலம்[56]
19. பூவரசங்காயெண்ணெய்[23]

II. REVIEW OF LITERATURE : BOTANICAL ASPECT

MUDAKKATRAN - *Cardiospermum halicacabum* Linn.[12]

Benthem & Hooker Classification :

Kingdom	-	Plant Kingdom
Division	-	Angiosperms
Class	-	Dicotyledonae
Subclass	-	Polypetalae
Series	-	Discifloreae
Order	-	Sapindalis
Family	-	Sapindaceae
Genus	-	Cardiospermum
Species	-	halicacabum

Vernacular Name[2]

Sans	-	Jyotishmati
Eng	-	Winter cherry, heart's pea
Hind	-	Kanphata
Ben	-	Nayaphataki
Mal	-	Ulinja
Tam	-	Mudakkatran
Tel	-	Buddakakana
Pun	-	habul-kalkal
Arab	-	laftaf

Part Used : Whole plant, leaves and root.

Geographical Distribution[12]

Through out India from the North west frontier to ceylon and Mallacca. It is distributed in most tropical and sub tropical countries.

Description of the Plant :[3, 12]

Habit	-	Annual or perennial
Leaves	-	Deltoid or ovate (1 1/2 - 3 inch)
Leaflets	-	Deeply cut; coarsely toothed.

Flowers	-	White (3 - 4 mm)
Fruit	-	Wide, broadly pyriform
Seeds	-	Globose, smooth, black with a small white heart shaped aril.
Inflorescence	-	Axillary, 2 tendriliferous at base, 3 - branched.

Ethnomedical Importance : [2, 3]

1. On the Malabar coast, the leaves are administered in pulmonic complaints.
2. The leaves mixed with castor oil are employed internally in **rheumatism** and **lumbago.**
3. The whole plant rubbed up with water is applied to **rheumatism** and **stiffness of the limbs**.
4. The whole plant, steepped in milk is successfully applied to **reduce swellings** and hardened tumours.
5. In Punjab, the seed is used as a tonic in fever and a diaphoretic in **rheumatism**.
6. The juice of plant promotes the catamenial flow during the menstrual period.
7. It is dropped into ears to cure earache and discharge from the meatus.
8. The root is given in scorpion - sting.
9. An infusion of the leaf and stalk is given as an anema for dysenteries and diarrhoeas.
10. Root and leaves of the herb in decoction are used in **rheumatism** , nervous disease, piles, chronic bronchitis, and phthisis.
11. Leaves fried are applied to the pubes to increase the menstrual flow in amenorrhoea.
12. Leaves boiled in oil such as castor oil are applied over **rheumatic pains, swellings** and tumours of various kinds.
13. The whole plant has also been used both internally and externally in **rheumatism** and **lumbago.**

CHEMICAL CONSTITUENTS : [4,5]

The whole plant contains,

Saponins

Traces of alkaloids

Flavonoids

Apigenin

Phytosteroids

- Cardiospermum halicacabum ethanol as well as n-hexane extracts for their **anti-pyretic** activity against yeast induced pyrexia in rats.
- Alkaloid fraction from seeds showed in vitro antibacterial action against some pathogenic organisms, caused transient hypotension and cardiac inhibition in anaesthetised dogs. It blocked spasmogenic effects of acetyl choline, histamine and 5 - hydroxy tryptamine on guinea pig ileum and dog tracheal chain. It had biphasic effect on frog rectus abdominis muscle.
- Alcoholic extract of leaves produced cholinergic and antihistaminic effects on CVS and showed significant **anti-inflammatory** activity in rats. It also produced CNS depression in near lethal doses and **analgesic** effect in mice and rats.
- Alcoholic and aqueous extracts in vitro prevented cellular and extra cellular injuries by stabilising lysosomal membrane and prevented enzyme leakage.
- Fatty acid content of seed oil 19.5 - 23.5%, (+) pin itol, 7-0-glucuronides of apigenin, chrysoeriol and luteolin isolated from leaves.
- Seeds contain Amino acids, fatty acids, cyanolipids, methyl-4, 4-dimetyoxy - 3 - buty rate, proteins.
- Apigenin and its glycoside, arachidic acid, monomethylether of inositol, proanthocyanidin, saponin, β - sitosterol, its β - D - galactoside and stigmasterol glycoside have been encountered in the plant.

MATERIALS AND METHODS

Mudakkatran Chooranam had selected for Vali Azahal Keellvayu (Rheumatoid Arthritis).

Collection of the Test Drug :

The whole plant of Mudakkatran collected from Athimanjeri pet village, near Tiruttani, Tamil Nadu and they dried well under sun shade.

Purification of the Raw Drug :

The whole plants were well rinsed in water and dried well.

Preparation of the Test Drug :

Chooranam :

The well dried mudakkatran plants were made into fine powder and sieved through white cloth (Vasthira kayam).

Purification of Chooranam :

- The fine powder of mudakkatran was then purified by steam cooking in milk (Chooranathooimai).
- Then the powder was dried and sieved again.

Drug Administration :

Route of Administration	:	Enteral
Dose	:	1 gm.
Vehicle	:	60 ml. warm water.
Time of administration	:	Three times daily after food.

Mudakkatran chooranam was subjected to the following tests.

- Bio-chemical analysis.
- Antimicrobial studies.
- Pharmacological analysis
- Clinical study

Figure 1

முடக்கற்றான் – *Cardiospermum halicacabum*

முடக்கற்றான் சூரணம்

PHARMACOGNOSTIC STUDY

Material and methods

The plant was collected from Anna Hospital campus, Arumbakkam, Chennai – 600 106. Free-hand as well as microtome sections of the root, stem, leaf and petiole were taken and double stained.

Staining

Alcoholic safranin (0.5%) counter stained with 0.25% fast green. This schedule gave good results for studying the histology of different tissues of the plant organs. All slides, after staining in saffranin were dehydrated by employing graded series of ethyl alcohol (30%, 50%, 70%, 90% and absolute alcohol) and stained fast green in clove oil and xylol – alcohol (50-50) and passed through xylol and mounted in DPX mountant. Photomicrographs were taken with the help of Nikon microscope. Clearing of leaves for studying palisade ratio, stomatal number and stomatal index was done by using 5% sodium hydroxide along with chlorinated soda solution supplemented with gentle heat.

Macroscopic:

Root

Tap root, thick, reddish brown, hard, woody, branched rootlets, 2 to 50 mm thick.

Stem

Stems and branches slender, wiry, twisted and ribbed.

Leaf

Leaves alternate, exstipulate, long stalked, biternate, deltoid to broadly ovate. Leaflets, short stalked or sessile, oblong, thin and flaccid, nearly glabrous, palegreen above, deeply and coarsely serrate or dentate, narrowed at base and very acute or acuminate at apex. Petiole longitudinally furrowed.

T.S. of Root

Transverse section of root shows outermost 3 or 4 layers of thin walled tabular cork cells, the outermost one or two layers flattened and crushed. It is followed by a phelloderm madeup of 4 – 8 layers of compactly arranged and tangentially elongated cells. Group of phloem fibers are arranged as a discontinuous ring in the middle of cortical region. Prismatic crystals are seen in some of the cells. Phloem present. Xylem contains vessels of various diameters, medullary rays uniseriate, protoxylem points discernible among collapsed cells of pith (Fig.2A).

The secondary growth starts quite early and takes place in the normal way and soon the primary cortex and epidermis rupture away (Fig.2B).

T.S. of Young stem

Transverse section of young stem shows 6 ridges and 6 grooves (Fig.2C). It is differentiated into epidermis, cortex and stele. Epidermis is madeup of thin walled single layered, parenchyma cells, protected by a thick cuticle (Fig. 2 E). The cortical region shows a zone of 3 to 5 rows of collenchyma below the ribs and a zone of 3 to 5 rows of chlorenchyma below the shallows. Below this region is a one or two layers of thin walled parenchyma cells. Some of these cells contain prismatic calcium oxalate crystals (Fig.2D). Pericycle is represented by a zone of 7-9 rows of sclerenchyma fibres below the ribs and 3 or 4 rows of fibres below the shallows (Fig. 2 E).

The stele shows an irregular ring of bicollateral vascular bundles, some of them being larger and some smaller. Primary phloem is composed of sieve tubes, companion cells, phloem fibres and phloem parenchyma. Primary xylem is composed of xylem vessels, xylem fibres and xylem parenchyma. Inner phloem is present below the primary xylem elements. The pith is composed of large, thin walled parenchyma cells.

T.S. of Mature stem

At regions where the activity of cork cambium is seen, the epidermis is ruptured and it is followed by a few rows of collenchyma cells or chlorenchyma cells which occur as patches alternating with each other. Following this, a few uniform rows of tabular cork cells are found. 2 or 3 rows of parenchyma are found below this, which are supposed to represent the secondary cortex. Secondary phloem forms

a continuous cylinder traversed by thick walled phloem rays. The ring of cambium is represented by 2 or 3 rows of fusiform and ray initials. Secondary xylem is represented by a large number of xylem vessels, tracheids and fibres. Vessels are mostly solitary and occasionally groups of 2 or 3 vessels are seen. The secondary xylem is traversed by xylem rays. The primary xylem is seen towards the centre with little primary inner phloem along with it.

The pith cells are parenchymatous. Normal secondary growth is seen and the secondary vascular tissues are produced by the activity of the cambial ring formed by the union of fascicular and interfascicular cambium.

T.S. of Petiole

Transverse section of petiole is quadrangular in shape with 2 ribs and a groove along the adaxial side (Fig.2F). The epidermis is single layered and covered by a thin cuticle. Unicellular trichomes are seen. Certain glandular hairs with a short stalk and multicellular head are also noticed. The hypodermal region is composed of collenchyma below the ridges and chlorenchyma below the shallows (Fig.2F). It is followed by 4 or 5 rows of parenchyma cells. The pericyclic sclerenchyma fibres completely encircles the 4 collateral vascular bundles present in the centre. A small bundle is also present in between these 4 bundles. 4 to 6 rows of sclerenchyma are seen at the region of the bundles but only 2 or 3 rows of sclerenchyma are seen at other regions.

Pith is composed of thin walled parenchyma cells (Fig.) The 2 adaxial ribs are provided with a hypodermal zone madeup of 4 to 6 rows of collenchyma below the ribs and 3 rows of chlorenchyma at the shallow region. The 2 leaf trace bundles are located in the 2 adaxial ribs, one bundle being present in each rib. The leaf trace bundles are provided with the sclerenchymatous fibres along the outer side.

The leaf

T.S. of Midrib

Transverse section of midrib shows a conical projection on the adaxial surface and a larger semi globose projection on the abaxial side (Fig.3G,H). The midrib is supplied by a single collateral vascular bundle, with xylem above and phloem below.

The rest of the midrib region is filled with parenchymatous cells. Some of these cells contain cluster crystals. (Fig.3H).

T.S. of Lamina

Dorsiventral in nature. The mesophyll of the lamina is differentiated into palisade and spongy tissues. The epidermis is single layered, madeup of large horizontally elongated cells. The palisade layer is composed of a row of vertically elongated, closely arranged single layer of cells packed with chloroplastids (Fig.3I). The spongy tissue is composed of loosely arranged parenchyma with lesser number of chloroplastids. Some cells of the mesophyll tissue contain druses of calcium oxalate crystals (Fig.3I). Veins in the lamina portion are again supplied by a single vascular bundle.

Epidermis in surface view

The adaxial foliar epidermis is madeup of larger cells with wavy outline (Fig.3J). The abaxial foliar epidermial cells are same like that of adaxial epidermal cells but with very wavy contour (Fig.3K). Stomata are more numerous on the abaxial surface and of ranunculaceous or anomocytic type. Stomatal number 70-90-120 /mm^2, and stomatal index 30-32-34/mm^2 for upper epidermis: stomatal number 130-150-170/ mm^2, and stomatal index 36-39-42/mm^2 for lower epidermis. Palisade ratio 10-12.

Trichomes

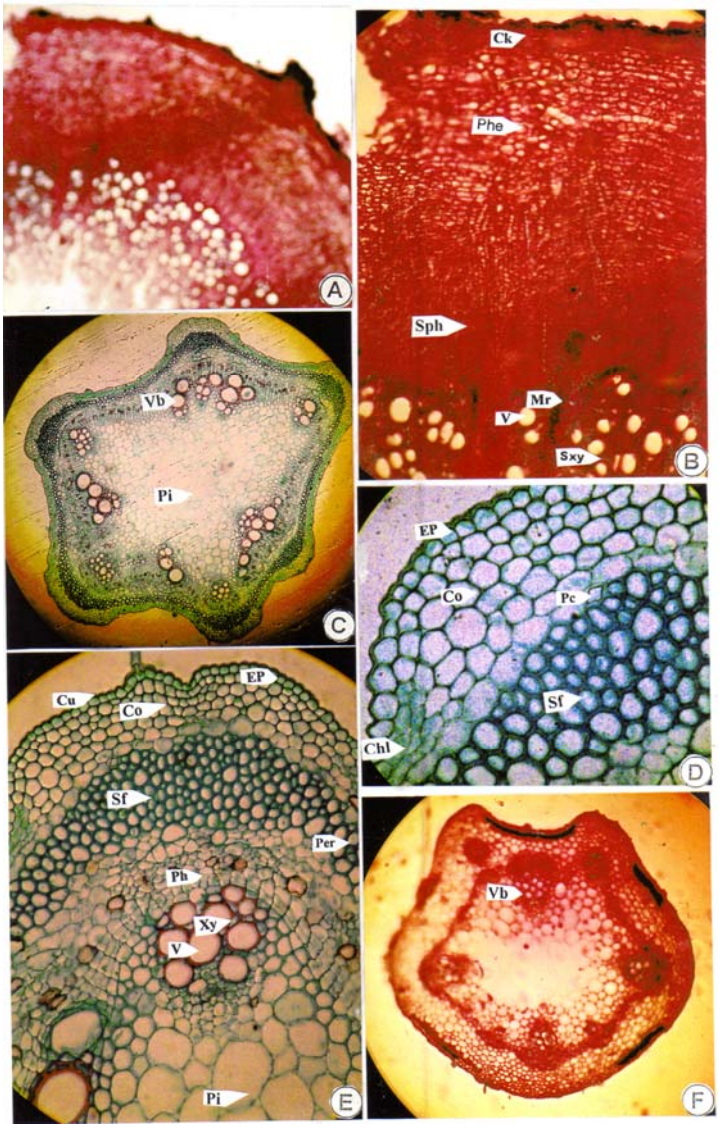
Glandular trichomes are provided with a short stalk and globose multicellular head. At times they are sunk in the epidermis. Certain unicellular trichomes with bulbous base and pointed hairs are also present on the lamina. They are partly sunk in the epidermis (Fig.3L,M).

T.S. of Peduncle

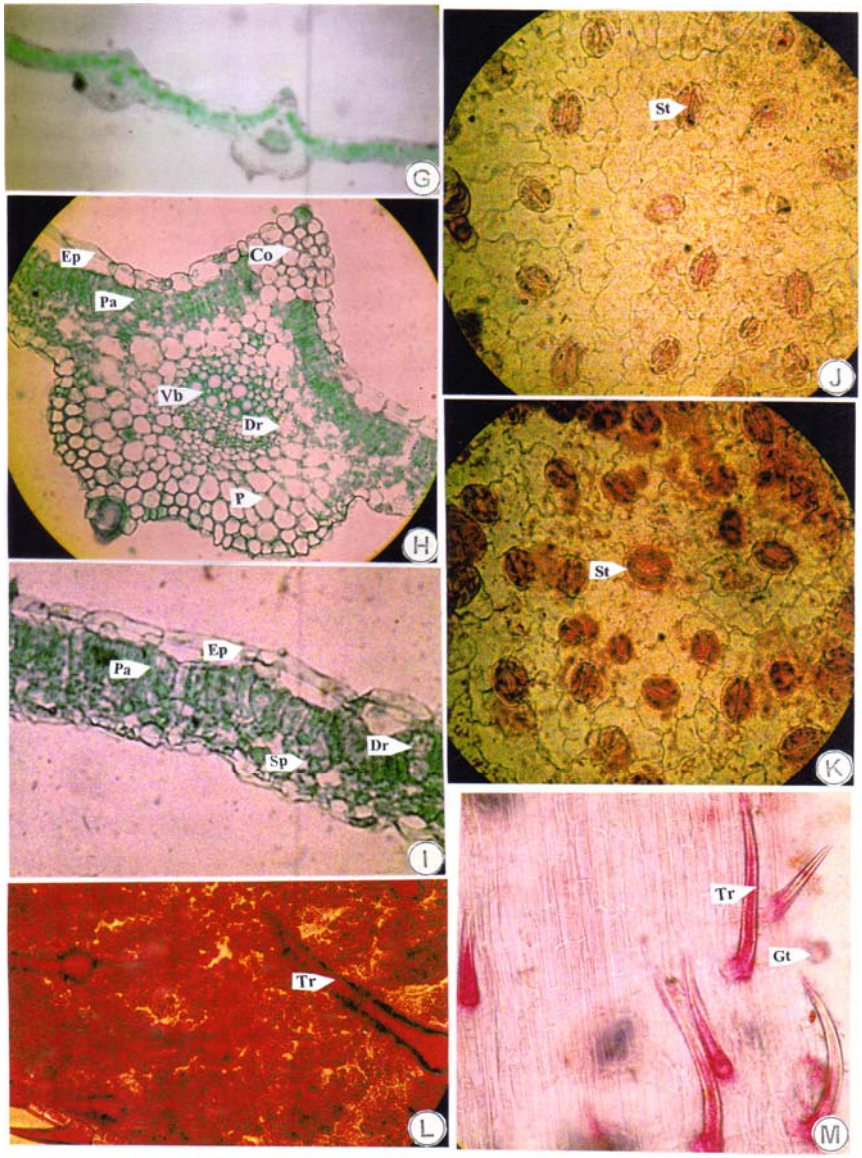
Transverse section of peduncle shows 4 angles, 2 ribs being slightly largely than the other 2. The hypodermal region of the rib is composed of collenchyma cells and shallow region is composed of 3 or 4 layers of chlorenchyma. Below the hypodermis is the continuous ring of sclerenchymatous fibres. About 5 rows of fibres are present below the ribs and about 2 or 3 rows of fibres are present at other regions.

Secondary growth in the vascular tissue is noticed. Due to the cambial activity a continuous ring of phloem tissue is found below the sclerenchyma zone. In the interfascicular regions 1 or 2 rows of xylem fibres are found and this along with the primary xylem forms more or less a continuous cylinder of xylem tissue. Primary xylem is represented by xylem vessels and xylem fibres. Pith is madeup of slightly thick walled parenchymatous cells.

Figure - 2



A	T.S. of root	Chl	Chlorenchyma
B	T.S. of root	Ck	Cork cells
C	T.S. of young stem	Co	Collenchyma
D	T.S. of stem showing prismatic calcium oxalate crystal	Cu	Cuticle
		Ep	Epidermis
E	T.S. of stem - A portion enlarged	Mr	Medullary ray
F	T.S. of petiole	Pc	Prismatic calcium oxalate crystal
		Per	Pericycle
		Ph	Phloem
		Phe	Phelloderm
		Pi	Pith
		Sf	Sclerenchyma fibre
		V	Vessel
		Vb	Vascular bundle
		Xy	Xylem



G	T.S. of leaf	Co	Collen cyhma
H	T.S. of Midrib	Dr	Druses of calcium oxalate crystal
I	T.S. of lamina	Ep	Epidermis
J	Adaxial foliar epidermis	Gt	Glandular trichome
K	Abaxial foliar epidermis	P	Parenchyma cells
L, M	Trichomes	Pa	Palisade tissue
		Sp	Spongy tissue
		St	Stoma
		Tr	Unicellular trichome
		Vb	Vascular bundle

BIO-CHEMICAL ANALYSIS

Preparation of Extract

5 gm. of Mudakkatran Chooranam was weighed accurately and placed in a 250 ml clean beaker and added with 50 ml of distilled water. Then it was boiled well for about 10 minutes. Then it was cooled and filtered in a 100 ml volumetric flask and made upto 100 ml with distilled water.

SI.No	Experiment	Observation	Inference
1.	**I. Test for Acid Radicals** **1. Test for Sulphate :**		
I. a)	2 ml of the above prepared extract was taken in a test tube. To this add 2 ml of 4% Ammonium oxalate solution.	Cloudy appearance white precipitate was obtained	Presence of sulphate
b)	2 ml of Sodium carbonate extract was added with 2 ml of dilute Hydrochloric acid was until the effervescence ceases off. Then 2 ml of Barium chloride solution was added.	White precipitate in soluble in Con. Hcl was obtained	Sulphate was confirmed
II.	5 drops of clear solution was added with 2 ml of dilute Sulphuric acid and slightly warmed. To this, 1 ml of dilute Potassium permanganate solution was added.	$KMnO_4$ solution was decolourised	Presence of Oxalate.
III.	**Test for Zinc:** To the 2 ml of extract sodium hydroxide solution was added in drops to excess.	White precipitate soluble in excess of sodium hydroxide.	Zinc was confirmed.

IV.	**Test for Megnesium :** To 2 ml of extract, Sodium hydroxide solution was added in drops to excess.	White precipitate insoluble in excess of sodium hydroxide solution was obtained.	Magnesium was confirmed.
V.	**Test for Arsenic :** 2 ml of extract was treated with 2 ml of Silver nitrate solution.	Brownish red pricipitate was obtained.	Arsenic was confirmed.
VI.	**Test for Tannic acid :** 2 ml of the extract was treated with 2 ml of Ferric chloride solution.	Black precipitate was obtained	Presence of Tannic acid
VII.	**Test for unsaturated compound :** To 2 ml of the extract 2 ml of Potassium permanganate solution was added.	$KMnO_4$ was decolourised	Presence of unsaturated compound
VIII.	**Test for Albumin :** 2 ml of the extract was added with 2 ml of Esboch's reagent.	Yellow colour Precipitate formed.	presence of Albumin.
IX.	**Test for Type of compound :** 2 ml of the extract was added with 2 ml of Ferric chloride solution.	Light green colour developed	Oxyquinole epinephrine and pyrocatechol

The results of Bio-chemical analysis are shown in observation and results.

ANTI-MICROBIAL STUDY

Preparation of Extract :

To 5 gms of Mudakkatran Chooranam 50 ml. of water was added and kept in a boiling water bath for 20 minutes and then filtered.

The extract of the drug was tested with the following micro organism.

1. Staphylococcus aureus.
2. Escherichia coli
3. Klebsiella
4. Proteus
5. Pseudomonas
6. Candida albicans.

Procedure :

The tube dilution method was used as a homogenous dispersion of the drug was more effective to test the antimicrobial activity of the drug. Dilution method was used in the preliminary screening of the antimicrobial activity.

To the 5 ml of Nutrient Broth culture 0.5 ml. of the extract was added and the tubes were incubated at $37^{o}C$ overnight. The next day the tubes were examined for turbidity and subcultures were made on Nutrient Agar plates. Control tubes without drug were also included. The plates were incubated overnight at $37^{o}C$ and the next day the reading was taken.

The results are shown in observation and results.

PHARMACOLOGICAL STUDIES

ACUTE TOXICITY STUDY OF MUDAKKATRAN CHOORNAM

MATERIALS AND METHODS

Animals:

Randomly bred adult Wistar male and female rats from animal facility were used. They were housed in poly-propylene cages (6 per cage) with dust free rice husk as bedding material, and were provided with food and water *ad libitu*m and rats for various acute toxicity studies. The rats for acute toxicity studies were fasted for 18 h before the experiment.

Formulations:

Mudakkatran Choornam was prepared as a suspension with 2% CMC by mixing all the constituents and used for acute toxicity studies.

Haematological, biochemical and histological studies:

Three male and three female rats (200 to 250 g body weight) of nine group of animals were given upto the maximum of 4.0g.kg-1 of orally at different dose levels from the beginning of 50mg/kg using a 16 gauge oral feeding needle as per the OECD guidelines-420. An equal number served as control, given orally the vehicle only (8ml.kg-1 2% CMC). Twenty-four hours after the oral dosing the animals were lightly anaesthetised with ether and blood was withdrawn from the orbital plexus. They were then killed by cervical dislocation and vital organs were dissected out. Organ to body weight ratio, and various haematological and biochemical variables were studied. Tissues of vital organs *viz.,* lung, liver, kidney, spleen, heart and testes or uterus were fixed in 10% buffered formalin for microscopic examination. Standard procedures were used for the haematological, biochemical and histological parameters.

ANALGESIC ACTIVITY OF MUDAKKATRAN CHOORANAM IN LABORATORY ANIMALS

MATERIALS AND METHODS

Animals

Wistar Albino rats of either sex (180-200g) and mice (15 - 30 g) were housed in groups of 5 -6 animals in standard cages (23 x 38 x 23 cm) at 23-30°C. They were provided with standard pellet diet and water *ad libitum*. The rats were kept for one week for acclimatization before the experimental sessions. The studies were approved by the CPCSEA and the local ethics committee.

Drugs and Chemicals

Aspirin, Pentazocine, Acetic acid were used. The test drugs were suspended in distilled water using 1% CMC and administered in a volume of 1 ml/100 g p.o.

Preparation of stock solution

The test drug was mixed uniformly in 2% CMC and diluted with water to make the concentration as 10mg/ml. from this the appropriate dose was administered to the animals according to their body weight.

Analgesic studies

The acute toxicity study showed the nontoxic effect upto 4g/kg body weight. Therefore one tenth and one fifth of the maximum dose used in the toxicity study were selected for the further study. The test drugs were administered at 400 or 800 mg/kg, p.o., 60 min before exposure to noxious stimuli. The standard drugs aspirin (100 mg/kg p.o.) were given 30 min before the test procedure. The studies involved three types of noxious stimuli.

Chemical:

Acetic acid-induced writhing in mice. The animals were divided into four groups consisting of six animals each. They were group I served as control-received 0.1ml of 2% acetic acid intraperitonially. Group II and III served as test received Mudakkatran Chooranam (400&800mg/kg. p.o.). Group IV served as standard-received Aspirin (100mg/kg.p.o.). After 30 min of drug treatment all the animals were treated with acetic acid to analyze the percentage of protection by the given test drugs.

Thermal:

Two methods were employed for giving thermal stimuli, (i) Eddy's hot plate method: the hot metal surface maintained at 55 ± 1°C, the sensitive animals (Mouse) were selected by subjecting them for basal reaction test. Then they were treated with drugs as described above. Pentazocine 5mg/kg ip, was used as a standard drug.. The paw licking or jumping response was considered as an end point. (ii) Tail flick method: Application of radiant heat to the mouse-tail through a hot nichrome wire (5.5 ± 0.5 amps). The apparatus (Analgesiometer, Techno, India) used has a water jacket to maintain constant temperature around the stimulus area.

Mechanical:

Mouse tail clip method. Mice pre-treated (60 min) with vehicle or test drugs (400&800 mg/kg po) were administered and Significant reduction in the reaction time of tail withdrawal after applying bulldog clip on tail was compared with vehicle treated animals was considered as antinociceptive response delay in tail withdrawal reflex was noted. 6 mice were used in each group. Experiments were conducted at room temperatures ranging between 30 to 32°C. In both tail flick and tail clip methods the tail withdrawal response was considered as an end point. Comparisons was made with pretreatment or Normal control (0 h) values.

Anti-inflammatory activity of the Mudakkatran Chooranam in acute and chronic inflammatory models in rats

Materials and Methods

Animals:

Wistar Albino rats of either sex (180-200g) were housed in standard cages. They were provided with food and water *ad libitum*.

Carrageenan induced rat paw oedema:

Acute inflammation was induced by subplantar injection of 0.1 ml. of 1% freshly prepared suspension of carrageenan (Sigma Chemical Co.) into the right hind paw of each rat. The paw volume was measured at 0 and 2 h after the injection of carrageenan using a plethysmometer. The Mudakkatran Choornam (400 &800mg/kg) was administered orally. The standard drug aspirin 150 mg/kg was administered orally. The control group received 0.9% saline 10ml/kg orally. Drugs were given simultaneously along with the carrageenan injection. Mean increase in the volume of oedema was measured and the percentage of inhibition was calculated.

Cotton pouch-induced granuloma:

Sub-acute inflammation was induced by cotton pellet granuloma. After shaving off the fur the animals were anesthetized; through a single needle incision, sterile preweighed cotton pellets (10 mg) one each were implanted in the axilla and groin region respectively of each rat. Mudakkatran Choornam (400 &800mg/kg), Aspirin (150 mg/kg) and 0.9% saline 10 ml/kg (control) were administered orally to the respective groups of animals for 7 consecutive days from the day of cotton-pellet implantation. On the eighth day the animals were sacrificed and the cotton pellets were removed and incubated at $60^{O}C$ overnight and the dry weights were taken. The increment in the dry weight of the pellet was taken as a measure of granuloma formation.

The results are showed in Observation and Results.

CLINICAL ASSESSMENT

In Siddha system of medicine vali azahal keelvayu is classified under category of vadha disease and one among the type of 'keel vayu"

Sababathy Kaiedu describes the disease valie Azhal keelvayu as follows:

"வாதபித்தக் கீல் வாயுவின் வருங்குறிச் சாற்றக் கேளாய்
ஏதமார் மந்த மேப்பம் இரைச்சலும் வயிற்றிற் காணும்
ஓதருங்குத்தல் வீக்கம் ஓய்தலில் எரிச்சலுண்டாம்
காதறு முறக்கமின்மை காய்ச்சலுங் காணுங்கண்டாய்"[53]

நோய்குறிகுணங்கள் ;

உணவு செரியாமல் முதலில் புளியேப்பமுண்டாதல், அடிக்கடி காற்று பரிதல், மலக்கட்டு, உடல் பெருத்தல் முதலிய குறிகுணங்களை காட்டி மணிக்கட்டு, கணுக்கால், விரல்கள் இவைகளின் கீல்கள் சிவந்து (Swelling of smaller Joints), எரிச்சலையும், மிகுந்த வலியையும் உண்டாக்கும். இந்நோய் மருத்துவத்திற்கு அடங்கினும் மீண்டும் திரும்பத் திரும்ப வருவதுமாயிருக்கும். மேற்கண்ட கீல்கள் கரடு கட்டி நீட்டவும் நன்றாய் மடக்கவும் முடியாமல் (Morning Stiffness & Restriction of Movements) நிலைத்து நிற்கவும் செய்யும். தூக்கமின்மை, படுக்கையில் புரளல், சிறுசுரம் முதலியன ஏற்படும்.

நாடிநடை :

"திருத்தமாம் வாதத்தோடே தீங்கொடு பித்தஞ் சேரிற்
பொருத்துகள் தோறும் நொந்து போதவே பிடிக்கும்"

(நோயின் சாரம்)

"இடமான சேத்துமத்தில் பித்த நாடி
எழுந்தணுகில் விடமுடனே வீக்கமுண்டாம்"

(சதக நாடி)

"காணப்பா வாத மீறில் கால்கைகள் பொருந்தி நோகும்"

(காவிய நாடி)

"வாதத்தில் சேத்தும மாகில் வலியோடு வீக்கமுண்டாம்"

(அகத்தியர் நாடி)

ABOUT THE DISEASE:

- The disease Vali Azhal Keelvayu is closely related with the disease Rheumatoid Arthritis, mentioned in modern medicine.
- Rhematoid Arthritis is the most common form of arthritis.
- Rheumatoid Arthritis was the term introduced by Sir. Alfred Barring Garrod in 1859 to describe a chronic inflammatory disease of peripheral joints.

Definition:

Rheumatoid Arthritis is a symmetrical destructive and deforming polyarthritis affecting small and large synovial joins associated with systemic disturbance, a variety of extra articular features and the presence of circulating anti globuling antibodies (Rhematoid factors)

Aetiology :

Although the cause of Rheumatoid Arthritis remains obscure, there is increasing evidence that the disease is triggered by T. lymphocyte in genitically predisposed individuals with define HLA class II haplotypes. HLA - DR_4 is the major susceptibility haplo type in most ethnic group, but DR_1 is more important in Indians. HLA-DR_4 sub types result from only few amino acid difference in the third hyper variable region of the amino acid sequence through several other HLA allies that have more recently been associated with RA in some populations.

Pathology :

The pathogenic hall mark of RA is synovial membrane proliferation and out growth associated with erosion of articular cartilage and subchondral bone. Often linked to proliferating inflammatory tissue (pannus) may lead

subsequently to destruction of intellectual and periarticular structures and may result in joint deformities and dysfunction seen clinically.

CLINICAL FEATURES :

I. Articular Manifestation :

Most commonly involved joints are small joints of the hands, wrists, knees and feet with time the disease also may affect the elbows, shoulders, sternoclavicular joints, hips and ankles. The temperomandibular and cricoarytenoid joints are less frequently involved. Spinal involvement is generally limited to the upper cervical articulations.

Hand :

Swelling of PIP joints giving a fusiform or spindle shaped appearance to the fingers. Bilateral and symmetrical swelling of the MCP joints is also frequent.

Swan neck deformities develp from hyper extension of the PIP joints in conjunction with flexion of DIP joint.

Boutonniere (Button Hole) deformities results from flexion contract of the PIP joints associated with hyper extension of the DIP joints.

Wrists :

The wrists are almost invariable involved and demonstrate palpable boggy synovium and thenar muscle wasting may be evident.

Knees :

Synovial proliferation and effusion are common. Ballotment on the patella or buldge sign may due to effusion popliteal cysts (Barker's) may form owing to effusion or synovial proliferation in to semimembraneous bursa.

Feet and Ankles :

Subluxation of the metatarsal heads into soles often with valgus deformities of the toes.

Neck :

Neck pain and stiffness are common. Atlanto axial subluxation (C_1 on C_2) can be seen in upto radiographically in 30% of cases. Spinal compression may lead to bladder or bowel incontinence or quadriplegia.

Elbows :

Proliferation synovitis in the elbow.

Hip :

Pain in the groin, lateral buttock, lower back may indicate hip involvement.

II. EXTRA ARTICULAR MANIFESTATIONS :

Skin :

Subcutaneous nodules, palmar erythema and fragility of the Skin, Rheumatoid vasculitis.

Cardiac Manifestations :

Pericarditis, Conduction system block, coronary vasculities, myocarditis, endocarditis, pericardial fluid shows low glucose level, elevated lactate dehydrenase.

Pulmonary Manifestation :

Pleurisy, pleural effusion, nodules in lung parenchyma chronic interstitial fibrosis, irreversible respiratory insufficiency.

Neurologic Manifestation :

Peripheral neuropathy produced by proliferating synovium causing compression of nerves, carpal tunnel syndrome, tarsal tunnel syndrome often associated with wrist and foot drop.

Opthalmic Manifestation :

Sjogren's syndrome cause corneal damage associated with dryness of eyes. Scleritis may result in visual impairment.

Felty's Syndrome :

Triad of chronic Rheumatoid Arthritis, Spleenomegaly and neutropenia is associated with lymphadenopathy.

DIAGNOSTIC CRETERIA FOR RA :

(By the American Rheumatism Association)

1. Morning stiffness of more than 1/2 hour duration.
2. Pain or tenderness in atleast one joint.
3. Joint swelling of atleast one joint observed by physician.
4. Swelling of atleast one other joint has observed by physician, with a three month interval between the appearance of the 2 joint swelling.
5. Symmetrical swelling of indentical joints except distal interphalangeal joint.
6. Subcutaneous nodules.
7. X Ray changes of RA.

Selection of Patients :

To study the efficacy of the drug "Mudakkatran Chooranam" in Vali Azhal Keel Vayu 40 patients were selected between the age group of 30 - 70 years, were treated as out patients in Govt. Arignar Anna Hospital, Chennai.

INCLUDING CRETERIA	EXCLUDING CRETERIA
• Pain • Morning stiffness • Joint swelling • Tenderness • Restricted joint motion • Fever	• Osteo arthritis • Gout • Tubercular arthritis • Psoriatic arthritis • Gonococcal arthritis • Juvenile RA • Rheumatic fever • Subcutaneous nodules. • RA with swan neck deformity, button hole deformity, Ulnar deviation.

Radiological Finding :

- Soft tissue swelling
- Narrrowing of joint space due to cartilage destruction

Line of treatment :

All the selected patients were undergone the blood and urine examination. They were diagnosed as "Vali Azhal Keel Vayu" by the history of symptoms., physical examination and confirmed by radiological findings. Then they were treated with Mudakkatran Chooranam with the dosage of 1 gm. With warm water 3 times a day after meals and the treatment was continued upto the improvement of symptoms.

Diet restriction and Medical Advise :

- The patients were advised to avoid food like root tubers, dhal and others which increase vadha kutram.
- Obese patients were advised to reduce their weight to avoid further stress on joints.
- Advise to perform mild exercises both strengthening and aerobic (In order to strengthen the quadriceps muscles)[13].

BIO-STATISTICAL STUDY

Bio-statistical study was carried out 40 out-patients in Post-graduate's Department of Gunapadam, Govt. Siddha Medical College attached to Arignar Anna Hospital of Indian Medicine, Chennai - 106.

CRETERIA FOR SELECTION OF BIO-STATISTICS

Analysis of Subjective parameters : (Before and After Treatment)

- Pain
- Swelling
- Morning Stiffness

The results of Bio-statistical analysis of subjective parameters are explained at Results and Observation (Table - 3).

OBSERVATION AND RESULTS

Mudakkatran chooranam the trial drug was undergone Bio-chemical analysis, Antimicrobial study, Pharmacological study, clinical study and Bio-statistical study and the results were observed.

Physico - Chemical standards of Mudakkatran Chooranam :

Loss on drying @ 105^{o}C	6.96%
Ash Value	7.01%
Water Solublity	12.58%
Acid insoluble ash	0.84%
Alkalinity as $CaCO_3$ in water soluble ash	0.24%
pH at 10% aqueous solution	5.35

Inorganic analysis - Quantitative :

Zinc as Zn	40 mg/Kg.
Iron as Fe	706 mg/Kg.
Magnesium as Mg	0.28 %

BIO-CHEMICAL ANALYSIS :

Done at Govt. Siddha Medical College, Chennai - 106. The extract of Mudakkatran Chooranam showed the presence of

Acid Radicals :

Sulphate, Oxalate

Basic Radicals :

Zinc, Magnesium, Iron, Arsenic

Miscellaneous :

Tannic acid, Albumin, Unsaturated compound

ANTI MICROBIAL STUDY :

In vitro antimicrobial activity of Mudakkatran Chooranam extract showed that the drug was sensitive to staphylococcus aureus and resistant to E-coli, klebsiella, proteus, pseudomonas and candida albicans.

PHARMACOLOGICAL STUDY :

Acute toxicity studies of Mudakkatran Choornam

Results

Haematological, biochemical and histological studies:

Rats administered with 4.0g/kg orally did not show any toxic signs and symptoms. The studies carried out on various clinical parameters and histology did not reveal any toxicity induced changes. 24 hr after oral administration the male rats showed an increase in WBC counts, increase in urea level and changes in the relative weight of lung and liver. There was no significant change in rats administered 50mg/kg to 4.0 g/kg Mudakkatran Choornam did not show any significant change compared to the control during the 4 h post administration period.

Discussion

A dose of 4.0 g/kg of Mudakkatran Choornam given orally did not alter the haematological, biochemical and histological parameters. A few significant changes observed were also within normal clinical limits. Oral administration of Mudakkatran Choornam did not show any hepatotoxicity or nephrotoxicity in the histological examination, though the urea levels were slightly increased in male rats. Mudakkatran Choornam is a nonirritant and has a better safety.

Good stability and extremely low toxicity of formulation of Mudakkatran Choornam makes it a favourable.

Analgesic activity of Mudakkatran Chooranam

Results

Analgesic activity

Test drug Mudakkatran Chooranam at two dose levels (400&800 mg/kg, p.o.) were studied and they exhibited significant dose dependent antinociceptive effect as measured by tail flicks, Tail clip method, hot plate method, in rats and chemically induced abdominal constrictions in mice.

Chemical stimulus: Acetic acid induced writhing

The test drug MC (400&800 mg/kg, p.o.) significantly reduced ($p < 0.001$) the number of writhing episodes in treated mice. Mudakkatran Chooranam elicited more analgesic activity vs aspirin – treated animals ($p< 0.01$). The analgesic effect shown by MC were not significantly different from that of aspirin group indicating comparable activity at the doses used.

Thermal stimuli: Eddy's hot plate and analgesiometer

Both the standard (Pentazocine: 5mg/kg ip, - 30 min) and the test drugs (Mudakkatran Chooranam 400&800 mg/kg po, -60 min) showed marked analgesic effects when tested on Eddys' hot plate (mice) and Analgesiometer (rats) as evidenced by significant increase ($p< 0.01$) in reaction time to thermal noxious stimuli. The reaction times were significantly lower ($p <0.05$ to < 0.01) in test drug and standard drug treated groups than in control group. But the test drug treated group indicating less analgesic potency than the standard drug.

Mechanical stimuli:

Mudakkatran Chooranam at both the dose levels (400&800 mg/kg, p.o.) Were exhibited significant dose dependent antinociceptive effect as measured

by Tail clip method, Significant increase in the reaction time of tail withdrawal reflux after applying bulldog clip on tail was observed in drug treated animals.

Discussion

All the mice attempted to dislodge the clip within 2-3 seconds. The all-or-none criteria in the tail clip test was used. The test drugs exhibited moderate to marked analgesic effects. Traditionally Mudakkatran Chooranam are claimed to be useful in painful inflammatory conditions and Rheumatoid Arthritis. The results show that the test drugs exhibited analgesic activity against chemical, thermal and mechanical stimuli at the doses used. In the present study, the analgesic activity was observed at 400-800 mg/kg p.o., the maximum tolerated dose of test drugs was found to be >4g/kg p.o. indicating wide margin of safety.

Table- 1. Analgesic effects of Mudakkatran Chooranam in laboratory animals

Groups	Dose Used Mg/Kg body weight	Writhing test (No. of writhings in 10min)	Tail-flick test Reaction time (sec)		Tail-clip test Reaction time (sec)		Eddy's hot plate method Reaction time (Sec)	
			Basal	After drug	Basal	After drug	Basal	After drug
Control	1ml CMC	44.83±1.30	1.87±0.06	1.82±0.01	2.45±0.76	2.44±0.07	1.83±0.04	1.8±0.02
Test1	400	26.66±0.88**	1.81±0.04	2.39±0.04**	2.3±0.19	2.8±0.06*	1.90±0.06	1.95±0.06^{ns}
Test2	800	25.5±1.17**	2.03±0.04	3.88±0.03**	2.28±0.08	2.8±0.1*	1.97±0.06	3.58±0.17**
Standard	Asp-100, Pen-5,	22.83±0.94**	1.88±0.22	4.9±0.02**	2.13±0.1	4.83±0.07**	1.96±0.04	5.85±0.09**

Values are mean ± SEM (n = 6); *P<0.05; **P<0.01 considered as significantly different from control or Pretreatment values

Antiinflammatory activity of The Mudakkatran Choornam

Results

Mudakkatran Choornam in a dose of 400&800mg/kg exhibited significant antiinflammatory activity in both acute and sub-acute models (Table 2). Mudakkatran Choornam 400mg/kg exhibited maximum inhibition of 41.00% and Mudakkatran Choornam 800mg/kg showed an inhibition of 33.08%, while the standard drugs aspirin showed an inhibition of 51.25% respectively ($P<0.001$) in the carrageenan induced rat paw oedema (acute) model.

In the sub-acute model of inflammation (cotton pouch granuloma), Mudakkatran Choornam exhibited significant ($P<0.001$) reduction in the granuloma weight 43.53% and 42.10% respectively. These results were comparable with that of the standard drugs, Aspirin 43.28%.

Discussion

The results of the present investigation suggest that Mudakkatran Choornam produced significant antiinflammatory effect. Carrageenan induced inflammatory process is believed to be biphasic. The initial phase seen at the 1st hour is attributed to the release of histamine and serotonin. The second accelerating phase of swelling is due to the release of prostaglandin, bradykinin and lysozyme. It has been reported that the second phase of edema is sensitive to clinically useful non-steroidal anti-inflammatory agent. The anti inflammatory activity exerted by Mudakkatran Choornam suggest that they could have acted by affecting kinnin, prostaglandin, bradykinin and lysozyme synthesis. In the cotton pouch granuloma test significant antiinflammatory activity ($P<0.001$) were exerted by the Mudakkatran Choornam. Its efficacy to inhibit the inflammation might be due to an increase in the number of fibroblasts and synthesis of collagen and mucopolysaccharides during granuloma tissue formation.

Table 2: Effect of Mudakkatran Choornam on carrageenan induced paw oedema and cotton-pouch granuloma in rats.

Drug	Dose mg/kg, p.o	Carrageenan induced rat paw oedema		Cotton-pouch granuloma	
		Vol. of rat paw oedema (ml) mean±SEM ***	Percent Inhibition	Weight of granuloma (mg) mean±SEM***	Percent Inhibition
Control(2% CMC)	10 ml/kg	1.26±0.071	----------	71.89±2.91	-------
Aspirin	150	0.645±0.006	51.25	40.77±1.713	43.28
MC-1	400	0.708±0.007	41	40.59±2.313	43.53
MC-2	800	0.803±0.008	33.08	41.62±1.963	42.10

Values are mean±SEM. n=6 in each group. ***P< 0.001 when compared to control.

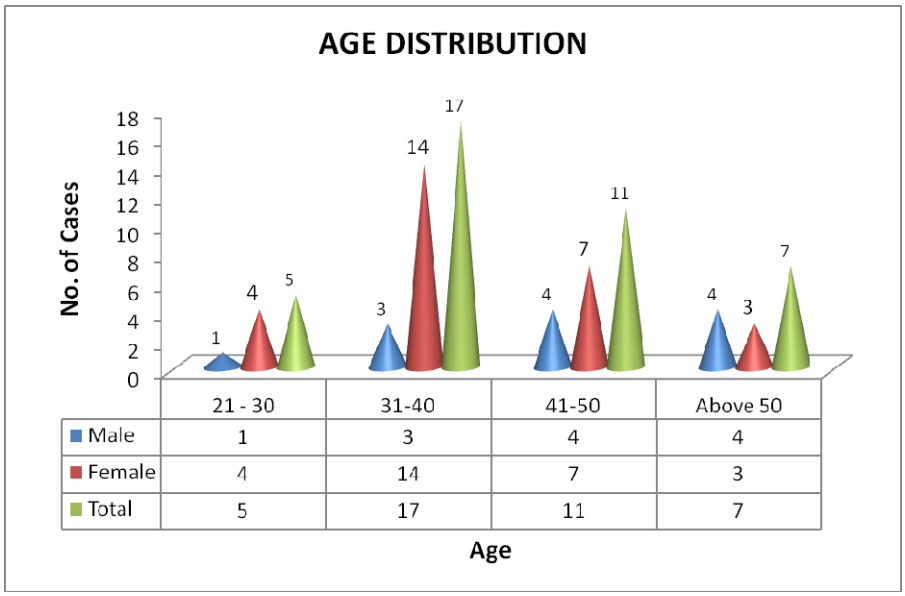
OBSERVATION AND RESULTS OF CLINICAL STUDY

The trial drug was given daily to the patients and they were examined clinically with keen observation.

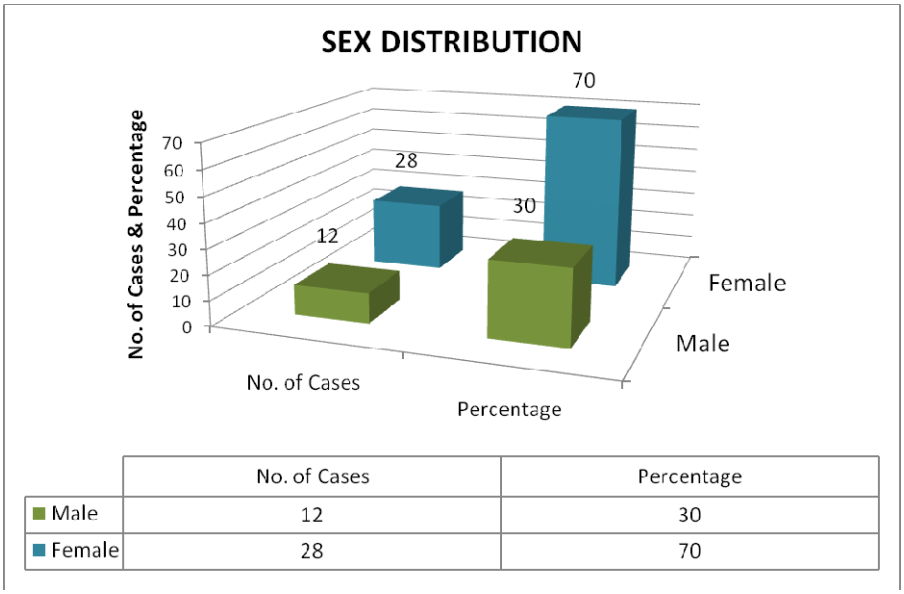
Reduction of pain, morning stiffness and swelling is an important sign or progress. The duration of the treatment ranged between 50 - 70 days according to the severity of the signs and symptoms of the patients.

The observation regarding,

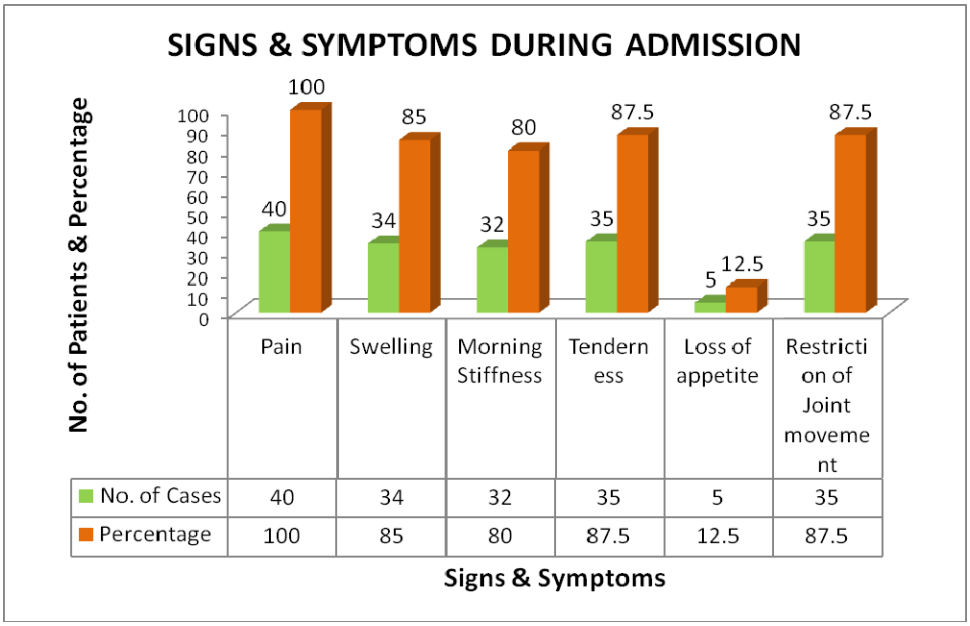
- Age variation
- Sex difference
- Signs and symptoms during admission.
- Results
- Improvement showing sign and symptoms after treatment are recorded and tabulated as follows :



	21 - 30	31-40	41-50	Above 50
Male	1	3	4	4
Female	4	14	7	3
Total	5	17	11	7



	No. of Cases	Percentage
Male	12	30
Female	28	70



	Pain	Swelling	Morning Stiffness	Tenderness	Loss of appetite	Restriction of Joint movement
No. of Cases	40	34	32	35	5	35
Percentage	100	85	80	87.5	12.5	87.5

Results :

The results are based on the clinical improvement on signs and symptoms before and after treatment.

- The total relief from symptoms was considered as **good** relief.
- The relief from pain, swelling, tenderness and morning stiffness were considered as **moderate** relief.
- The relief from less than four symptoms were considered as **mild** relief.

CLINICAL STUDY ON MUDAKKATRAN CHOORANAM IN OUT PATIENT DEPARTMENT IN THE MANAGEMENT OF VALI AZHAL KEELVAYU

S. No	O.P. No.	Name, Age / Sex	Complaints	Duration of Treatment in days	BT & AT	BLOOD													URINE			X - Ray	Results
						TC Cells / Cumm	DC (%)			ESR (mm)		Hb g %	Sug mg%	Ur mg%	Cho mg%	RA Factor	CRP	ASO titre	Alb	Sug	Dep		
							P %	L %	E %	1/2 Hr.	1 Hr.												
1	7939	Kamala 45/F	Pain, swelling, tenderness, restriction of both wrist joints movement	56	BT	10900	68	30	2	27	45	13	132	32	217				N	N	N		Good
					AT	9800	67	30	3	15	29	12.5	124	30	220				N	N	N		
2	8164	Chandiran 47/M	Pain, swelling, tenderness in Lt. MCP, both MTP	70	BT	9100	53	41	6	44	80	10	113	30	214	(-)	(+)	(-)	N	N	OPC		Good
					AT	8700	67	30	3	22	32	10	127	24	220	(-)	(-)	(-)	N	N	N		
3	9129	Gnanasekar 53/M	pain, tenderness in Rt. Elbow, swelling, morning stiffness in both MCP.	63	BT	9600	52	40	8	25	42	10.5	143	27	207				N	N	N		Good
					AT	9100	56	40	4	7	20	10	135	21	198				N	N	N		
4	1530	Lakshmi 40/F	Swelling, morning stiffness, tenderness, in Lt. MCP, fever.	56	BT	8600	59	37	4	20	38	11	101	18	163	(-)	(+)	(-)	N	N	FEC		Moderate
					AT	9800	60	35	5	12	20	11	84	23	180				N	N	FEC		
5	1666	Lalitha 40/F	Swelling, tenderness in right shoulder, both MCP, fever	70	BT	9800	60	36	4	24	40	10.5	108	27	193				N	N	OPC		Mild
					AT	9600	58	35	7	25	48	10.5	138	23	162				N	N	EPC		
6	1685	Pichaiammal 42/F	Swelling, tenderness, morning stiffness, in both MCP, Rt. MTP	56	BT	9300	55	41	4	112	200	9	140	21	182				N	N	N		Good
					AT	10100	70	25	4	80	110	8	127	20	191				N	N	N		
7	1841	Rajalakshmi 55/F	Swelling, tenderness, morning stiffness in Lt. MCP, both knee, Rt. ankle, both MTP, loss of apptite	63	BT	7900	56	36	8	30	54	12	136	27	185				N	N	OPC	Os.Ch.	Good
					AT	8500	60	36	4	20	42	12	140	25	169				N	N	N	Os.Ch.	
8	2027	Anandh 40/M	Swelling, tenderness in Lt. shoulder both MCP, Lt. Knee, both ankle.	56	BT	10100	63	33	4	18	33	11.5	110	17	194				N	N	N		Good
					AT	10000	70	27	3	8	20	12	93	21	180				N	N	N		
9	2096	Jeyachitra 30/F	Swelling, tenderness, morning stiffness in Rt. PIP, Rt. MCP Lt. wrist, Lt. Knee.	63	BT	9300	64	34	2	9	22	10	115	32	210				N	N	OPC	NOJS	Good
					AT	9800	65	30	5	5	13	11	110	30	220				N	N	N	NOJS	
10	3596	Selvaraj 37/M	Swelling, tenderness, morning stiffness in Lt. Elbow, both knees, Rt. MTP	63	BT	9800	57	39	4	14	30	11	150	18	179	(-)	(-)	(-)	N	N	FPC		Good
					AT	10200	61	37	2	10	18	11	146	24	182				N	N	N		
11	4480	Meenakshi 42/F	Tenderness, morning stiffness in both PIP, Lt. MCP, Rt. shoulder joint, loss of appetite	70	BT	8700	54	41	5	52	90	9.8	98	23	177				N	N	N		Good
					AT	9200	63	30	7	30	62	9.5	85	21	182				N	N	OPC		
12	6125	Muthu 50/M	Tenderness, morning stiffness in both MCP, PIP, Knee joint, loss of appetite	56	BT	9800	57	38	5	5	9	11	86	18	175				N	N	FPC	Os. Ch.	Good
					AT	10500	60	36	4	4	8	10	94	21	180				N	N	FEC	Nil	
13	6255	Tamilarasi 38/F	Pain, tenderness, morning stiffness in both MCP, both wrist, Rt. knee	63	BT	9200	54	42	4	20	42	9	138	26	167	(+)	(+)	(-)	N	N	FPC		Good
					AT	9000	60	34	6	10	22	9.5	126	25	184	(-)	(-)	(-)	N	N	N		

S. No	O.P. No.	Name, Age / Sex	Complaints	Duration of Treatment in days	BT & AT	BLOOD														URINE			X - Ray	Results
						TC Cells / Cumm	DC (%)			ESR (mm)		Hb g %	Sug mg%	Ur mg%	Cho mg%	RA Factor	CRP	ASO titre						
							P %	L %	E %	1/2 Hr.	1 Hr.								Alb	Sug	Dep		
14	6947	Rasubee 47/F	Swelling, morning stiffness, tenderness in both PIP and MCP fever	63	BT	9100	53	39	8	12	20	7.5	82	25	156				N	N	OPC		Moderate
					AT	9500	57	35	8	8	15	8	92	28	169				N	N	OPC		
15	7293	Yadodha 36/F	Pain, swelling, tenderness in Lt. shoulder, elbow joints	63	BT	10700	62	33	5	12	25	10.5	83	19	172				N	N	N		Good
					AT	10100	65	33	2	4	9	11	100	23	178				N	N	N		
16	9191	Gragalakshmi 52/F	Tenderness, morning stiffness, in both MCP & PIP	63	BT	7200	65	33	2	5	12	12.2	112	20	170	(-)	(-)	(-)	N	N	N		Good
					AT	8300	60	37	3	5	9	12	96	18	169				N	N	N		
17	160	Sulakshana 35/F	Swelling, tenderness morning stiffness in Rt. hip and knee joint, fever, loss of appetite	56	BT	8600	67	30	3	38	65	14	104	22	215				N	N	FEC		Moderate
					AT	9100	58	40	2	22	40	13	115	20	207				N	N	FEC		
18	1445	Nagammal 48/F	Pain, swelling, morning stiffness in both PIP and MCP, fever	63	BT	6400	52	46	2	12	28	12.2	130	20	144	(+)	(+)		N	N	N		Good
					AT	7200	57	40	3	10	18	13	130	18	154				N	N	N		
19	1743	Jeyalakshmi 50/F	Pain in both knee, swelling, tenderness in both PIP & MCP, fever	63	BT	7700	60	35	3	44	77	13	115	24	187	(-)	(-)	(-)	N	N	N		Mild
					AT	8500	53	39	8	15	25	13	117	31	187				N	N	N		
20	2182	Elumalai 32/M	pain, swelling, tenderness, morning stiffness in both MCP, PIP, Rt. and Lt. ankle joints	56	BT	10700	62	33	5	11	20	11	78	26	174	(-)	(-)	(-)	N	N	FPC		Good
					AT	10200	64	31	5	8	12	10.5	83	25	182				N	N	FPC		
21	3840	Kalaimani 24/F	Swelling, pain, tenderness, morning stiffness in both knee, Lt. PCP, MCP	56	BT	9000	57	36	7	5	9	9	135	23	169				N	N	FEC		Good
					AT	9600	55	36	9	15	22	9	130	24	187				N	N	N		
22	5584	Kulanjiammal 30/F	Pain, swelling, morning stiffness, tenderness in Rt. knee joint, Rt. MCP, loss of appetite	56	BT	9400	57	38	5	5	12	9	138	18	169				N	N	OEC		Good
					AT	9700	59	34	7	5	10	9.5	115	19	170				N	N	N		
23	5891	Selvam 45/M	Pain, swelling, tenderness, morning stiffness in Lt. MCP, PIP, Both shoulder joint	63	BT	9400	64	31	5	18	40	9.6	120	23	195				N	N	N		Moderate
					AT	9700	65	32	3	10	18	9	97	20	204				N	N	N		
24	5906	Shanthi 50/F	Pain, swelling, tenderness, morning stiffness in both knee Rt. ankle joint.	56	BT	8500	68	30	2	30	60	9	113	27	156	(+)	(+)	(+)	Tr.	N	N		Good
					AT	8900	65	32	3	20	32	10	110	22	169	(-)	(-)	(-)	N	N	N		
25	6069	Narayanan 63/M	Pain, swelling, tenderness morning stiffness in Rt. & Lt. PIP	63	BT	7700	56	40	4	20	43	10	100	26	185	(+)	(-)	(-)	N	N	N		Good
					AT	8600	65	25	10	15	32	11	117	24	203				N	N	N		
26	6190	Jeeva 48/M	Pain, swelling, tenderness, morning stiffness in Rt. knee joint, both MCP	63	BT	9800	62	32	6	15	19	11	113	19	213				N	N	N		Moderate
					AT	9200	60	37	3	6	12	11	110	23	220				N	N	N		
S. No	O.P. No.	Name, Age / Sex	Complaints	Duration of Treatment in days	BT & AT	BLOOD														URINE			X - Ray	Results
						TC Cells / Cumm	DC (%)			ESR (mm)		Hb g %	Sug mg%	Ur mg%	Cho mg%	RA Factor	CRP	ASO titre						
							P %	L %	E %	1/2 Hr.	1 Hr.								Alb	Sug	Dep		

27	7438	Girija 40/F	Pain, tenderness, morning stiffness in both MCP, knee joint.	63	BT	10800	67	30	3	58	105	13	107	25	200				N	N	FEC		Good
					AT	9700	61	33	6	35	48	12	110	24	192				N	N			
28	7635	Rani 40/F	Pain, swelling, tenderness, morning stiffness in Rt. PIP	63	BT	9200	62	33	5	10	22	8.5	98	19	172	(-)	(-)	(+)	N	N	FEC		Good
					AT	9800	57	40	3	10	15	9	110	18	192				N	N	FPC		
29	8028	Tamilthara 38/F	Pain, swelling, tenderness, morning stiffness in both ankle, PIP, MCP	56	BT	10500	54	40	6	22	38	11	138	27	230	(+)	(+)		N	N	N		Good
					AT	8700	67	30	3	12	32	11	127	25	170	(-)	(+)	(-)	N	N	FPC		
30	9186	Vasanthi 35/F	Pain, swelling, tenderness, morning stiffness in both knee and wrist joints.	63	BT	9000	59	34	7	30	60	10	93	21	170				N	N	N		Good
					AT	9800	59	34	6	15	32	10	84	23	188				N	N	N		
31	9878	Chitra 32/F	Pain, swelling, morning stiffness in both knee, MCP joints	63	BT	9700	72	26	2	16	42	14.4	105	28	182	(-)	(-)	(+)	N	N	N		Good
					AT	10500	58	38	4	7	16	14	98	24	165				N	N	N		
32	1831	C. Selvi 39/F	Pain, swelling, morning stiffness, tenderness in Rt. knee joint	56	BT	11100	55	41	4	38	78	12	123	30	207				N	N	N		Moderate
					AT	10900	62	36	2	15	38	12	120	31	210				N	N	N		
33	5489	Chitra 35/F	Pain, swelling, morning stiffness tenderness in all PIP, MCP, both knee, elbow, hip and shoulder joints	56	BT	9200	58	30	12	50	104	7	93	27	167	(+)			N	N	FPC	Os.Ch.	Good
					AT	10000	60	32	8	25	44	9	98	24	186	(-)	(-)	(-)	N	N	N	N	
34	6234	Murugan 24 / M	Pain, tenderness,morning stiffness in Rt. MCP, PIP and shoulder joints, fever	63	BT	8800	65	30	5	8	15	11	140	35	196	(-)	(+)	(-)	N	N	N		Good
					AT	9300	63	33	4	15	26	12	132	30	194	(-)	(-)	(-)	N	N	N		
35	8852	Salamen 65/M	Pain, swelling, tenderness, in Rt. PIP, MCP and Lt. hip joint	63	BT	9400	58	36	6	60	124	9	89	24	210				N	N	N		Moderate
					AT	10100	59	38	3	35	68	9	96	18	207				N	N	N		
36	8880	Veeramani 52/M	Pain, swelling morning stiffness in Rt. PIP, MCP	56	BT	10500	60	38	2	15	24	14	81	32	214	(+)	(+)	(-)	N	N	N		Good
					AT	10200	57	42	1	7	12	14	87	30	200	(-)	(-)	(-)	N	N	N		
37	934	Jeyasri 36/F	Pain, swelling, tenderness in both MCP	56	BT	8400	50	46	4	15	36	13	125	22	159	(-)	(-)	(-)	N	N	N		Good
					AT	9100	63	36	1	8	17	12	120	27	163				N	N	N		
38	1346	Vasumathi 24/F	Pain, swelling, morning stiffness in both MCP, loss of appetite	63	BT	9400	52	44	4	10	18	11	99	18	153	(-)			N	N	FEC		Good
					AT	9400	58	36	6	5	12	10.5	83	18	165				N	N	OPC		
39	2708	Bhavani 37/F	Pain, swelling, morning stiffness in both knee joints, Rt. MTP	56	BT	9800	60	32	8	25	52	10.5	268	23	172				N	N	OPC	Os.Ch.	Good
					AT	10200	60	30	10	13	26	10.5	252	24	196				N	N	OPC	N	
40	3816	Rajamani 60/F	Pain, swelling, morning stiffness tenderness in MCP, PIP of both hands	56	BT	7500	55	38	7	24	40	11	140	14	166				N	N	N		Good
					AT	7900	55	39	6	30	48	11	133	18	173				N	N	N		

Abbreviation :

BT - Before Treatment, AT - After Treatment, TC - Total WBC Count, DC - Differential Count, Hb - Haemoglobin,
Sug - Glucose, Ur - Urea, Cho- Cholesterol, Alb - Albumin, Dep. - Deposit, OPC - Occasional Pus Cells,
FPC - Few Pus Cells, N - Nil, P - Neutrophills, L - Lyphocytes, E - Eosinophills, (+) - Postive, (-) - Negative,
Os. Ch. - Osteophytic Changes, NOJS - Narrowing of Joint Space, Tr. - Trace

BEFORE TREATMENT

SHARON DIAGNOSTIC CENTRE

No.6/20, Govindan Street, Ayyavoo Colony, Aminjikarai, Chennai - 600 029. Tel : 2363 2090

Patient's Name : Mrs. TAMIL ARASI Age / Sex : (39/F)

Consultant : Dr. PREMA.BS,MS Date : 26/07/2007

REPORT

SID.No. : **000399**

Report Dt:26/07/2007
Time :12:18:17
Page No :1

Test	Result	Reference Value
BLOOD - HAEMATOLOGY		
HAEMOGLOBIN Method : Colorimetric - ICSH	: 8.6 gm/dl	Male : 13.5 - 17.0 gm/dl Female : 12.0 - 15.5 gm/dl
TOTAL WBC COUNT	: 8100 cells/cmm	4000 - 10,000 cells/cmm
DIFF. WBC COUNT		
Neutrophilis	: 56 %	40 - 65 %
Lymphocytes	: 34 %	30 - 50 %
Eosinophils	: 8 %	2 - 8 %
Monocytes	: 2 %	2 - 4 %
Basophils	: 0 %	0 - 1 %
ESR Method : Westergren		
1/2 Hour	: 36 mm	
1 Hour	: 70 mm	
BLOOD - SEROLOGY		
A.S.O. TITRE	:NEGATIVE	Adults : upto 200 IU/ml Children : upto 100 IU/ml
RHEUMATOID FACTOR	:POSITIVE	Less than 25 IU/ml : Negative 25 - 50 IU/ml : Slightly Elevated 50 - 100 IU/ml : Elevated More than 100 IU/ml : Highly Elevated
C.R.P.	:POSITIVE	Less than 0.6 mg / dl Negative More than 0.6 mg / dl Positive

Peter Tennyson
B.sc DMLT

End of Report

Working Hours : 7-00 am to 9.00 pm Sunday : HOLIDAY

HOUSE VISIT UNDERTAKEN

AFTER TREATMENT

ANNA DIAGNOSTIC CENTRE

9, Dharmaraja Koil Street, (Opp. S.B.I.), Trunk Road, Poonamallee,
Chennai - 600 056. Cell : 98413 36416 / 98415 86827

REPORT

Ref. by Dr. S.PAVANAN Date: 19/10/2007

Name : MRS.TAMILARASI Age : 40 Sex : M / F

BLOOD HAEMATOLOGY

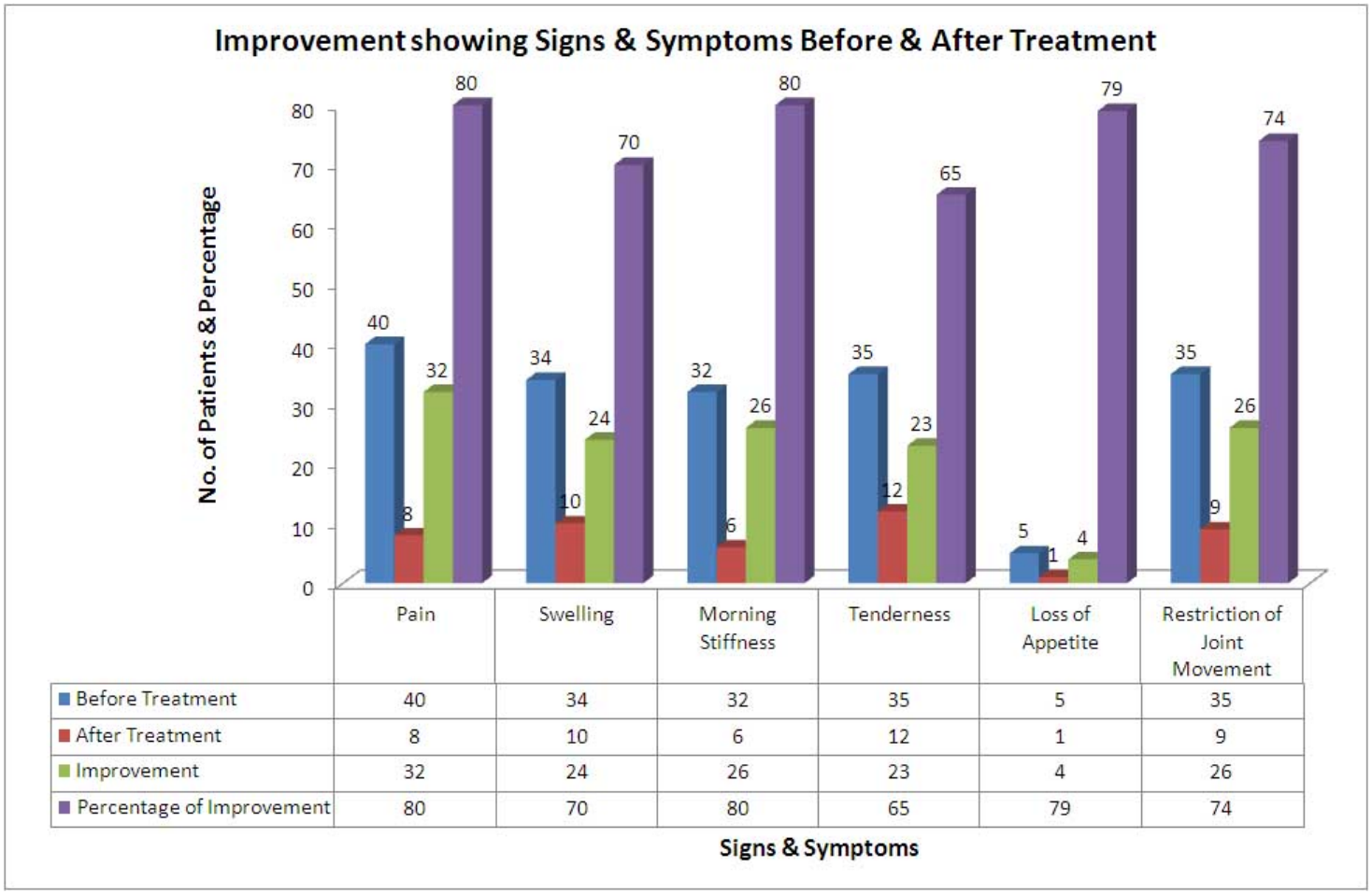
TC	: 9,000 cells
HB	: 9.5 gms
DC	: P60 L34 E6
ESR	: 10 / 22 mm

BL SEROLOGY

ASO TITRE	: NEGATIVE
RA FACTOR	: NEGATIVE
CRP	: NEGATIVE

** *** **

ANNA LAB & ECG.
407,PETER RAJA STREET,
P.H. ROAD, (OPP.) ANNA ARCH
ARUMBAKKAM, CHENNAI - 10
Cell : 9841586627
NEAR : SARAVANA FAR.



	Pain	Swelling	Morning Stiffness	Tenderness	Loss of Appetite	Restriction of Joint Movement
Before Treatment	40	34	32	35	5	35
After Treatment	8	10	6	12	1	9
Improvement	32	24	26	23	4	26
Percentage of Improvement	80	70	80	65	79	74

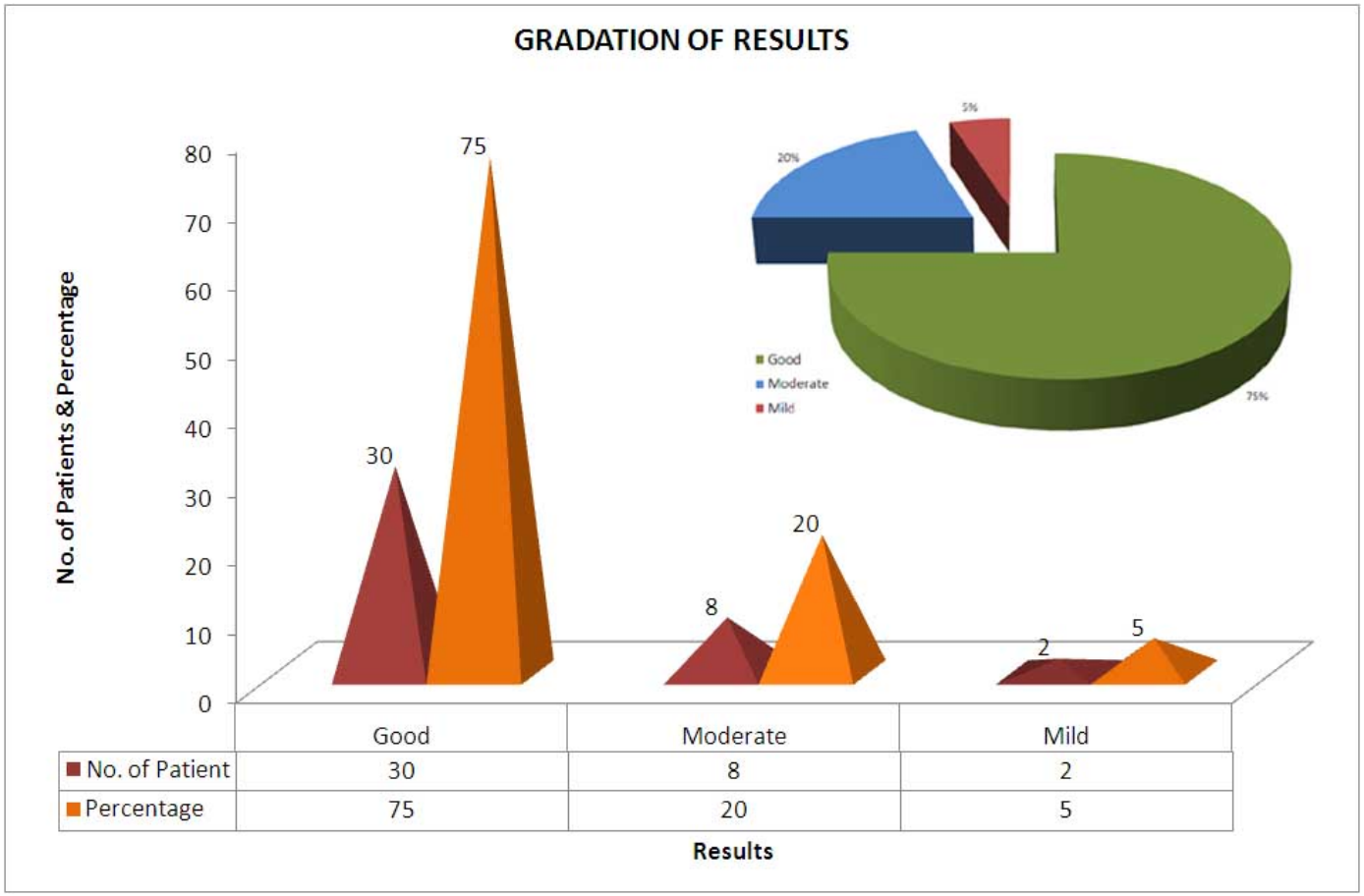

GRADATION OF RESULTS
No. of Patients & Percentage
80
70
60
50
40
30
20
10
0
75
30
20
8
5
2
5%
20%
75%
Good
Moderate
Mild
Good
Moderate
Mild
No. of Patient
30
8
2
Percentage
75
20
5
Results

Table - 3 : Results of Statistical analysis of subjective parameters observed before and after treatment of (n = 40) patients.

S. No.	Parameters	Percentage present			Statistical test criterion	Probability Value (P)	Statistical Significance of the Difference
		Before Treatment	After Treatment	Difference			
1	Pain	40/40 (100)	32/40 (80)	20.00	Z = 9.8	< 0.05	Significant
2	Swelling	34/40 (85)	24/34 (70.58)	29.41	Z = 7.7	< 0.05	Significant
3.	Morning Stiffness	32/40 (80)	26/32 (81.25)	18.75	Z = 7.2	< 0.05	Significant

DISCUSSION

The whole plant of Mudakkatran (Cardiospermum halicacabum) was selected to find its efficacy in the treatment of the disease "Vali Azhal Keelvayu".

Literature evidences were collected from various books and magazines about the drug. They all strongly support the anti-inflammatory action of the plant Mudakkatran.

The chemical analysis of the drug showed the presence of sulphate, oxalate, zinc, Magnesium, Iron, Arsenic, Tannic acid, Unsaturated compound and albumin.

The Pharmacognostic study of the plant *Cardiospermum halicacabum* was done in the Central Research Institute for Siddha, Chennai.

Anti microbial effects and pharmacological action of Mudakkatran plant were done in Vel's College of Pharmacy, Pallavaram, Chennai.

The anti-inflammatory and analgesic activity of the drug was studied and compared. In the Cotton pouch granuloma test significant anti inflammatory activity was exerted by the Mudakkatran Chooranam.

For clinical trial 40 patients of both sex diagnosed as Vali Azhal Keelvayu according to siddha aspect and also with support of laboratory investigations and radiological findings.

The drug Mudakkatran Chooranam was given to the patients at the dose of 1 gm. with hot water, thrice daily after food for a maximum period of 70 days.

The prognosis was observed with keen interest and noted accordingly. It is noted that in all patients the pain and swelling were reduced. Other clinical symptoms were also gradually reduced.

The routine investigation of blood, urine, X-Ray were done after treatment.

The suvai of Mudakkatran is Thuvarppu. Thuvarppu suvai is made by the combination of the elements Mann (Earth) and Vali (Air). It also possesses Veppa veeriyam. In siddha maruthuvanga surukkam, it is said that veppa veerium reduces the diseases caused by Vatham. So the selected drug reduces the pain and inflammation.

Out of 40 patients,

- Good response was observed in 30 patients.
- Moderate response in 8 cases.
- Mild response in 2 cases.

All the above studies of Mudakkatran Chooranam give a clear picture of its efficacy in the treatment of Vali Azhal Keelvayu.

SUMMARY

Mudakkatran is a well known plant to us. Whole plant of this herb was used in the form of chooranam. The taste is thuvarppu.

The literary collection describes the anti-inflammatory and analgesic activity of Mudakkatran.

Botanical aspect deals with the identification description, cultivation, collection and ethno medical importance of the plant.

Gunapadam aspect expressed that the drug possess good anti vatha property.

The chemical analysis revealed that the Mudakkatran chooranam has sulphate, oxalate, zinc, magnesium, Arsenic, Iron, Tannic acid, unsaturated compound and albumin.

Pharmacological studies showed that the drug has significant anti-inflammatory and analgesic activity.

In clinical study the drug has showed good response in 75% of cases. The patients were responding well from the begining of the treatment and no adverse effects were reported.

The present study suggests that Mudakkatran has the remarkable medicinal value for the disease Vali Azhal Keelvayu.

CONCLUSION

The trial drug "Mudakkatran" has been selected and its efficacy was analysed in the treatment of Vali Azhal Keelvayu.

- Mudakkatran is a very easily available drug.
- Preparation of the drug is very very economical
- This selected drug has got significant anti inflammatory and analgesic effect.
- Clinical studies revealed that the drug has effective and good response in 75% of the cases, moderate response in 20% of the cases.
- So this present study about the herb **Mudakkatran** gives a new hope in the field of **Vali Azhal Keelvayu** treatment.

INTRODUCTION

The therapeutic system of Tamizhians is one of the oldest system of medicine dating upto 5000 years. The ancient tamils made an insight into themselves in search of longevity. They developed two ways by which they achieved mastery over nature.

The one is YOGIC WAY

And the other is THROUGH MEDICINE

These scholars were called siddhars. Hence the therapeutic system propagated by them is also known as "Siddha system of Medicine".

Siddha system emphasis a harmonious blending of physical, mental, social, moral and spiritual welfare of an individual.

Siddha system considers body as a whole of five elements viz., "Mann", "Neer", "Thee", "Vali", "Akayam". These are the fundamental principles of creation, protection and destruction of the world. The forces behind the three are respectively referred to as vatham, pitham, kapham in the case of human body. In a healthy person the respective ratio is 1:1/2:1/4. Any imbalance in this ratio can cause disease.

Nowadays people are getting too very stressed in order to keep in pace with the modern life style. Modern life style seems to be equally attractive and destructive in different views. In one view, advanced and sophisticated lives may woo the people to live in destructive mechanical and stressful environment. Fortunately the advances in modern medicine provide good discoveries and innovations to solve the arising health ailments. Despite these efforts some diseases seems to be not curable completely due to the nature of frequent recurrences and remissions.

Adding fuel to the five, the advent of the fast foods, tinned food and the other junk ones are giving more trouble to the gastro intestinal tract. Hence over straining of the gastro intestinal tract may lead to a lot of Acid peptic disorders, which is becoming a common disease of the world.

It is estimated that roughly 10% of the population is expected to develop peptic ulcer disease during their life time and the percentage seems to be rising at an alarming rate.

By following the simple basic disciplines of habits and food laid down by our ancestors, the diseases of stress such as peptic ulcer disease can be prevented and even cured.

There are many drugs in Siddha, which prove good against peptic ulcer disease. One of them, is PACHAI KARPOORATHI CHOORANAM, has a strong evidence in our siddha literature. Hence I have chosen it as the "Trial drug" for my dissertation.

AIM AND OBJECTIVE

Aim : The aim of this disseration work is to prove the efficacy of PACHAI KARPOORATHI CHOORANAM to treat GUNMAM.

Object : Gunmam is one of the commenst disease in the gastro intestinal tract.

It is caused by excessive secretion of HCL / Pepsin, infection of Helicobacter pylori and also caused by stress and anxiety.

Dietary use of spicy food, coffee, tea and use of NSAID, alcohol, tobacco are major casuses of Gunmam.

The signs and symptoms of Gunmam is characterised by pain in the epigastric region, heart burn, abdominal discomfort, nausea and vomiting. In Siddha literatures PACHAI KARPOORATHI CHOORNAM is mentioned for Gunmam.

So the author choose the anti-ulcer property of the pachai Karpoorathi Chooranam through the Bio-chemical analysis, pharmacological studies and clinical trials.

PACHAI KARPOORATHI CHOORANAM was studies in the following aspects:

- Photo Chemical aspect
- Gunapadam review
- Bio-Chemical analysis
- Microbiological study
- Pharmacological study
- Clinical trials
- Bio Statistical study

REVIEW OF LITERATURE

PHYTOCHEMICAL & GUNAPADAM ASPECT

PACHAI KARPOORAM (BORNEO CAMPHOR)

Phyto chemical review of borneo camphor:

Botonical name : *Dryobalanops aromatica* Gaertnif.

Synonyms name : *Dryobalanops Camphora*

Family : Dipterocarpaceae

Distribution of the plant :

Sumatra, Malay penisula and Borneo

Habitate : Large tree

Leaves : Stipulate

Flowers : Bisexual, perianth is pentamerous

A characteristic feature of this family is the presence of resin canals as welll as persistent calyx. The tree is 50m, tall with reddish chocolate brown wood with large patterns.

Borneo camphor is found in cavities or fissures in the wood of *Dryobelanops aromatica* and is collected by scraping. It occurs in white translucent masses and closely resembles true camphor from cinnamomum camphora in many respects.

It is distinguished from the latter in being heavier than water, not volatilizing at ordinary temperature and in possessing a characteristic pungent odour and burning taste.

It is used in the same manner as camphor in meidicine and perfumery, it is also employed in organic synthesis. Borneo camphor is highly prized in

Indian Medicine. It is converted into ordinary camphor by treatment with boiling nitric acid[1].

Actions :

Diaphoretic, Stimulant of skin, Cardiac Antiseptic, Expectorant, Sedative, Temporary Aphrodisiac, Narcotic.

Properties and Uses :

It is very peculiant fragrant and penetrating odour bitter. Pungent and aromatic taste. It is extremely volatile and inuammable burning with a bright light and much smoke.

It is good in typhus, confluent small pox and all fevers and eruptions of typhoid class; also in measles, febrile delirium, whooping cough, hiccup, spasmodic asthma, hysteria, dysmenorrhoea, puerperal mania, chorea, epilepsy, acute rheumatism, myalgia, toothache, chronic bronchitis, diarrhoea, etc. It is stimulant in prostration of fevers, sedative in delirium treatment and chordae. It exhilarates in moderate doses and raises the pulse with producing febrile symptom.

It is given in doses of 3 to 10 grains in pills, powder and in emulsion. Sniffed upto the nostrils it relieves cold in the head.

In cases of spermatorrhoea, chordae, pruritic chronic rheumatism, pills of camphor and opium in the proportion of 3 grains of the former to half-grain of the latter taken at bed time are found to be very efficacious.

In uterine pains 6 to 8 grains pills are administered and the liniment of camphor is rubbed on the abdomen.

Three or four grains of camphor with an equal quantity of asafoetida and made into a pill and administered in asthma, insomnia and delirium gives much relief.

Camphor liniments, simple and compound, prepared by dissolving camphor in olive oil or rectified spirit and which are used externally as stimulants and counter irritants, especially in rheumatic pains of joints and muscles.

Camphor liniment is used for relief of pain in muscular rheumatism, sprains, fibrositis and neuralgia. It is also used as a cardiac stimulant.

The bark of the plant is used as sedative, spasmodic diaphoretic and anthelmintic. The roots and leaves are used for hardness of spleen and liver.

Ethanolic extract (50%) of fruits showed antibacterial activity against several gram negative and gram positive bacteria.

PHYTO CHEMISTRY [1,4]

Chemical Constituents :

d- borneol ($C_{10}H_{17}OH$)

Borneol

Camphene

Terpinol

Sequiterpene

Dryobalanone

The mature leaves and twigs from Assam yield an essential oil (1.8 - 2.3% fresh wt basis) having the following physico - chemical constants. Sp gr 20^{o}, 0.9526; N^{20}/D, 1.4710; acid val, 7; ester val 18; and ester val after acytylation, 93. The oil contains 1, 8 - cineol (69.6%) as major constituent presence of α - and β - terpineol, α - and β - pinene, lemonene, camphene, and p cymene is also reported[7].

Two alkaloids -1 aurolitsine (norboldine) and reticuline isolated as perchlorates from roots[8].

Sesquiterpeniods - 1 - α - y tangene, 1 - β-elemene, 1-β caryophyllene, hulhumulene, selinene and d - nerodidol from leaf oil and twigs.[9]

Two new sesquiterpeniods - camphorenone and camphorenol from essential oil.[10]

High boiling fraction of camphor oil contained sesquiterpene - α - ylangene, β - santalene, δ - guainene, δ - Cadinene, Calamenene, Calacorene, η - Patchoulene and 1,6 - dimethyl 4 - isopropyl 7,8 - dihydronaphthalene[9].

பச்சை கற்பூரம் - BORNEO CAMPHOR[58]

பச்சை கற்பூரம் காரசாரம் இருபத்தைந்து வகையினுள் ஒன்றாகும். இது இயற்கையாகவும், செயற்கையாகவும் கிடைக்ககூடியது.

வேறுபெயர்கள் :

பச்சைகற் பூரத்தின் பெயரைக் கேளு
பலகையாம் பூரமது சந்திரனுக்காகும்
உச்சைக்கண்ணீ ராக்கியுதை பாவிக்கஞ்சி
உண்மையாங் கதலியுப்பு மதிபூரமாமே
கொச்சை மதன் சரியாகுங் குருவுக்காகும்
கொடிதான முக்கண்ணி லொரு கண்ணாகும்
கச்சையாம் படிசோமன் சீதள மானோன்
கர்ப்பூர மென்றேபேர்கரு வாய்ப்பாரே[50]

இமவாலுகம், கதலியுப்பு, கௌத்தி பச்சை, சசி, சந்திரன், சோமனுப்பு, சீதளம், சீதகற்பூரம், பச்சையூரம், பலிகை, பார்மகன் சாரி, பூரம், மதி, மருவாளி, விந்தம், விரலிப்பச்சை, இரவி கஞ்சி, பச்சை கனசாரம்.

பச்சை கற்பூரத்தில் மூன்று வகைகள் உள்ளன. அவை,

1. ஈசன் 2. வீமன் 3. பூதாச்சிறையன்

ஈசன் குணம் :

"ஈசனென்னும் பூரவெண்மை யென்பரது காரமுமாம்
பேசரிய சீதமுஷ்ணம் பித்தமயல் - வீசுகின்ற
பீநிசமுட் டாகியவை போர்த்துவிடுங் காந்தியுண்
டான தாதுவசிய மாம்"

பொருள் :

ஈசன் என்னும் பச்சை கற்பூரம், வெளுப்பு, தளதளப்பு காரம் உடையது. கபசுரம், பித்தம், மயக்கம், நாசிநோய், தாகரோகம், ஆகியவைகளை போக்கும் வசியத்துக்காகும்.

வீமன் குணம் :

"வீமனென்னுங் கற்பூரம் மேகவழுக்கு வெண்மை
சேமமுறுங் குளிர்ச்சி தின்றக்கா - னாமருவு
நோயகலுந் தாகமகலும் நுண்பே தியுமாருந்
தூய மதிமுகந்தாய் சொல்"

பொருள் :

அழுக்கு வெண்மை கலந்த மேக நிறமுள்ள வீமனால் நாக்கு முள், தகாரோகம் நீங்கும். தேக நலமும் குளிர்ச்சியும் அற்ப விரேசனமும் உண்டாம்.

பூதாச்சிறையன் குணம் :

"பூதாச் சிறையனெனும் பூரமஞ்சள் கைப்பாகுங்
கோதையர்க்காங் காசங்கொடு மேகம் வாதாதி
என்னுந் தனித்தோட மேறுமுத்தோடஞ் சொறியுங்
குன்ன விரணமும் போக்கும்"

பொருள் :

மஞ்சள் நிறமும் கைப்புச் சுவையுள்ள பூதாச் சிறையனால் இருமல், அரித்திரா மேகம், வாதபித்த கப தோடங்கள், திரிதோடம்,நமை, நெருங்கிய புண்கள் ஆகியன நீங்கும்.

பச்சை கற்பூரத்தின் பொதுகுணம் :

"அட்டகுன்மஞ் சூலை யணுகாது வாதமொடு

துட்டமேகப் பிணியுந் தோற்றாதே - மட்டலருங்

கூந்தலுடை மாதே கொடியகபம் போகுஞ்

சார்பச்சைக் கர்ப்பூரத்தால்"

பொருள் :

பச்சை கற்பூரத்தால் எண்விதக குன்மங்கள் கீல்களில் குத்தல், வாதநோய், சீழ்பிரமேகம், கொடிய கபம் நீங்கும்.

பச்சை கற்பூர மகிமை [61]

பாரென்ற பூரத்தின் பருவம் கேளு

பாங்கான கர்ப்பூர வாழைக் குள்ளே

பூரென்ற பொலுபொலனப் பொருமி நிற்கும்

பெருங்காற்றைக் கண்டதுமே பறந்து போகும்

நேரென்ற நீர்மலம்போல் எரிந்து போகும்

நேராக இதை எடுத்து மிளகிட்டு

வாரென்ற வாழையிலை கீழ்மேல் இட்டு

வளமாக பெட்டிக்குள் மருவிவையே

- கருப்பூர வாழைக்குள்ளே பொலபொல என பொருமி நிற்கும்.
- பெருங்காற்றில் பறந்து போகும்.
- குற்றமில்லாத கண்ணிலிட்டால் கரைந்து போகும்
- உலோகங்களை அரித்துபோகும்.
- ஆவிபட்டால் மாயமாகும்.
- வாசனையும் குளிர்ச்சியுமுடையது.

பச்சை கற்பூர வைப்பு : [47]

காணப்பா இன்னமொரு வைப்பு கேளு
கருவான பூரமடா பச்சை பூரம்
புணப்பா சூடனொருப லமும்வாங்கிப்
புனித முள்ளவெடிக் காற்ப லந்தான்
தோணப்பா வுவருப்புப் பலம ரைதான் கூட்டி
துரிதமுள்ள புனுகுடனே ஏலந் தானும்
வேணப்பா கஸ்தூரிவ கைக்குத் தானும்
விளங்கவே யரைகழஞ்சு வேண்டு வாயே[47]

பொருள் :

சூடன் - 1பலம்

வெடியுப்பு - 1/4 பலம்

கறியுப்பு - 1/2 பலம்

புனுகு - 1/2 கழஞ்சு

ஏலம் - 1/2 கழஞ்சு

கஸ்தூரி - 1/2 கழஞ்சு

மேற்கூறிய சரக்குகளை கல்வத்திலிட்டு அரைத்து புட்டு போல பிசறி வைத்து கொள்ள வேண்டும். தூய்மையான காசிகுப்பியில் அரைப்பங்கு இம்மருந்தை மாக்கல்லால் மூடிஏழு சீலைமண் செய்ய வேண்டும். பிறகு ஒரு தாழியில் மணல் இட்டு அதன் மேல் இந்தக் குப்பியை வைத்து பின்பு மேலும் மணல் இடவேண்டும். தாழி நிறைய மணல் இட்டு மேல் ஒடு கொண்டு மூடி ஏழுசீலை மண் செய்து சூரிய வெப்பத்தில் காய வைத்து கணபதியை பூசித்து வாலுகையில் ஏற்றி ஒரு சாமம் தீபம்போல எரிக்கவும். பிறகு மெல்ல ஆற வைத்து குருவடியை வணங்கி எடுத்து பார்க்க வேண்டும். எடுத்துப் பார்க்கையிலே பச்சை கற்பூரமானது சிறுபொடியாக தாமரைப்பூ மணம் உடையதாக இருக்கும் அல்லது செங்கழுநீர் பூவினை போல மணம் வீசும்.

பச்சை கற்பூர வைப்பு முறை கீழ்காணும் நூல்களிலும் கூறப்பட்டுள்ளது.

மச்சமுனி நாயனார் கலைஞானம் - 800

பதார்த்த குண விளக்கம்

பச்சைக் கற்பூரமானது ஆகாயபூதச் சரக்கு என்பதை ,

"விரிந்து பார் பூரமுடன் வழலை தானும்

மேலான ஆகாசக் கூறுமாச்சு"

என்ற போகர் காரசாரத் திரட்டில் கூறப்பட்ட தொடரினால் அறியலாம்.

நட்பு சரக்கு, பகை சரக்கு :

"சீனத்துக் கினமே புரம்"

"பூரத்தால் இலிங்கம் சாகும்"

என்ற தொடர்களினால் பச்சை கற்பூரத்தின் நட்புச் சரக்கு - சீனம், பகைச்சரக்கு - இலிங்கம் என்றும் அறியலாம்.

சுவை : கைப்பு, உப்பு

வீரியம் : சீதவீரியம்

செய்கை :

குளிர்ச்சியுண்டாக்கி

உடல் உரமாக்கி

கோழையகற்றி

சமனகாரி

அளவு : 8 - 162 மி.கி. வரை

உபயோகங்கள் :

1. பச்சை கற்பூரம், குங்குமப்பூ, வெற்றிலைக் காம்பு இவைகளை அரைத்து தாய்பாலில் கலந்து துணியில் நனைத்து சுரநோயினருக்கு நெற்றியிலிட சுரந்தணியும்.
2. பச்சை கற்பூரம் அரை அரிசி (32 மி.கி.) எடையை ஒரு பலம் சந்தன குழம்பில் கலந்து மேலுக்கு உபயோகிக்க அஃது உடலுக்கு குளிர்ச்சியை தந்து சிரங்கு, கோடையில் உண்டாகும் வியர்வை, உடல் எரிச்சல் முதலியவற்றை நீக்கும். உள்ளுக்கு தர வெள்ளை நோய் தீரும்.

3. பண்டைய நாளில் தாது விருத்திக்காகப் பச்சைக் கற்பூரத்தை உட்கொண்டதை,

"கடிமாலை சூடி கருப்பூர முக்கி....
தொடைமாலை மென்முலையார் தோடாய்ந்து மைந்தர்"

(சிந்தாமணி 1574)

என்ற அடியால் அறியலாம்.

4. பச்சை கற்பூரம், கஸ்தூரி இரண்டையும் கலந்து வெப்பமுண்டாக்கி செய்கைக்காகவும், கபவாதசுரம், காசம், சுவாசகாசம், முதலிய நுரையீரல் பற்றிய நோய்களுக்கும் உபயோகிக்கலாம்.

5. பச்சை கற்பூரம் 5கிராம் எடுத்து 100 மிலி எண்ணெயில் கலந்து காய்ச்சி சூடாக்கி, வாதவலி, மூட்டுவலிக்கு வெளிப்பிரயோகமாக உபயோகிக்கலாம்.

பச்சை கற்பூரம் சேரும் குன்மநோய் தீர்க்கும் மருந்துகள் :

1. கற்பூராதி சூரணம்[21]

பச்சை கற்பூரம் பூலாக்கிழங்கு ஏலம் சாதிக்காய் சாதிபத்திரி	}	சமஅளவு
கிராம்பு	-	35 கிராம்
சிறுநாகப்பூ	-	35 கிராம்
மிளகு	-	105 கிராம்
திப்பிலி	-	140 கிராம்
சிறுமூலம்	-	175 கிராம்
இந்துப்பு	-	210 கிராம்
சுக்கு	-	245 கிராம்

இவைகளை பொடி செய்து கொண்டு சீனி சர்க்கரை சமமாய் கூட்டி தேனில் உண்ணவும.

தீரும் பிணிகள் ;

சுவாசகாசம், மூலம், குன்மம், எரிச்சல், ஒக்காளம், நெஞ்சடைப்பு

2. மேகராஜாங்க இளகம்[23]

3. வாதத்துக்கு அமுத சர்க்கரை[57]

4. நந்தி மெழுகு[31]

5. மகாவசந்த குசுமாகர மாத்திரை[31]

பச்சை கற்பூரம் சேரும் பிற மருந்துகள் :

1. மகாவீர மெழுகு[31]

2. வசந்த குசுமாகர மாத்திரை [31]

3. மகாஏலாதி குளிகை[31]

4. பச்சை கற்பூர மாத்திரை[31]

5. கோரோசனை மாத்திரை[32]

6. கஸ்தூரி கருப்பு[31]

7. இளநீர் குழம்பு[33]

8. மிருதுவாதிக்குழம்பு[24]

9. பச்சை கற்பூர சுண்ணம்[25]

10. இரசகற்பூர பற்பம்[56]

11. இடிபூரணாதி இளகம்[39]

12. இருமல் மாத்திரை[31]

13. பச்சை கற்பூர பொடி[58]

14. பச்சை கற்பூர அஞ்சன குளிகை[58]

15. அமிர்த சஞ்சீவி குளிகை[56]

16. பச்சை கற்பூர உருண்டை[56]

17. வினோத சஞ்சீவி மாத்திரை[56]

18. பச்சை கற்பூர செயநீர்[25]

19. கோரோசனைக் குளிகை[32]

20. கோரோசனை மாத்திரை[57]

21. கஸ்தூரி மெழுகு[58]

22. பெரிய சாதி சம்பீரக் குழம்பு[26]

23. கற்பூராதி இளகம்[56]

24. பஞ்சசூத மெழுகு[56]

25. பச்சை கற்பூர மெழுகு[56]

26. திராட்சை நெய்[56]

27. கோரோசனை மெழுகு[56]

***Myristica fragrans* Houtt.**

Vernacular name [2] :

Sans	-	Jati-phalam
Eng	-	Nut meg
Hind	-	Jaepatri
Pun	-	Jayiphal
Tel	-	Jajikaya
Tam	-	Jadikkay
Mal	-	Jatika
Arab	-	Sauz - bawwa

Part Used : Nut meg.

History and Distribution[5] :

A native of Molluccas, cultivated in many tropical countries. Grown in Kerala, Karnataka. The Nilgiris and West Bengal.

Phyto Chemistry[62] :

Myristicin, $C_{11}H_{12}O_3$, constituting 4 per cent of the oil is interesting as the fraction responsible for many of the pharmacological effects Chemically, myristicin resembles three other aromatic ether components of Myristica oil : eugenol, isoeugenol, and safrolof nutmeg and mace.

Chemical Composition[1] :

Moisture	-	14.3	Phosphorous	-	0.24%
Protein	-	7.5	Iron	-	4.6 mg/ 100 g
Ether extr.	-	36.4	Volatile oil	-	6-16%
Carbo hydrate	-	28.5	Starch	-	14.6 - 24.2%
Fibre	-	11.6	Pentosans	-	2.25%
Mineral matter	-	1.7%	Furfural	-	1.5%
			Pectin	-	0.5 - 0.6%

Medicinal Uses[1,62] :

- Nut meg is stimulant, carminative, Astringent and Aphrodisiac.
- It is used in tonics and electuaries and forms a constituent of preperations prescribed for dysentery, **stomach ache**, flatulence, nausea, vomiting, malaria, rheumatism and sciatica and early stages of leprosy.
- Arab physicians seem to have used nutmeg as a drug from the first centuries A.D., although just how they used it is not known. *Myristica* was recommended for a variety of disorders in this early period but was taken mainly for diseases of the digestive organs from the mouth to the stomach to the intestines, to the liver and spleen, as well as for freckles and skin blotches.

சாதிக்காய் - NUT MEG

வேறுபெயர் : குலக்காய்

சாதிக்காயின் பேர்தனையே சாற்றக்கேளு
சாதிய லஞ்சதிச் சியமுமாகு
மாதிக்காய் சாலூரம்மால் தீபலமாம்
மதசவுண் டஞ்சாதி சூகமமுமாகும்
காதிக்காய் கப்பிலினீ துரைச்சியாகும்
கடுக்காயின் கிரிதான்பல் லழகி
சூதிக்காய் கிரக்கணி பித்தனாகுஞ்
செப்பினதோர் சாதிக்காய்ப் பேருமாமே[50]

சுவை : துவர்ப்பு, கார்ப்பு

தன்மை : வெப்பம்

பிரிவு : கார்ப்பு

செய்கை :

வெப்பமுண்டாக்கி

அகட்டுவாய்வகற்றி

மூர்ச்சையுண்டாக்கி

மணமூட்டி

காமம்பெருக்கி

உரமாக்கி

பொதுகுணம் :

தாது நட்டம் பேதி சருவாசி யஞ்சிர நோய்

ஒதுசுவா சங்காசம் உட்கிராணி - வேதோ

டிலக்காய் வரும்பிணிபோம் ஏற்றமயல் பித்தங்

குலக்கா யருந்துவார்க்குக் கூறு (அகத்தியர் குணவாகடம்)

பொருள் :

விந்து குறைவு, பெருங்கழிச்சல், தலைவலி, இரைப்பு, இருமல், நாட்பட்ட கழிச்சல், வெப்பப் பிணிகள் இவற்றை போக்கும். ஆனால் மயக்கத்தை தரும். வயிற்றுவலி, வயிற்று பொருமல், அக்கினி மந்தம் இவைகளை போக்கும்.

வழங்கும் அளவு : 320 - 1000 மி.கி.

சாதிக்காய் சேரும் குன்மம் போக்கும் மருந்துகள் :

1. குன்மத்துக்கு மருந்து[27]

குங்கிலியம், வேப்பம்பட்டை, சீந்தில்தண்டு, கண்டங்கத்திரி, ஏலக்காய், சாதிக்காய், வாலுளுவை, அரத்தை, சுக்கு, கொதுமல்லி, கிராம்பு, அதிமதுரம், கொடிவேலி, மிளகு - இவை அனைத்தும் தலா 2 வாரகன் எடை

சர்க்கரை - 5 பலம்

தேன் - 5 பலம்

பசுநெய் - 2 1/2 பலம்

தேன் மற்றும் நெய் இவைகளைத் தவிர மற்றதை இடித்து சூரணித்துக் கொள்ளவும். சர்க்கரையைப் பாகுசெய்து சூரணத்தையும் கொட்டி பிறகு தேன், நெய் சேர்த்து பக்குவஞ் செய்து கொள்ளவும்.

அளவு : கழற்சியளவு, இருவேளை

தீரும் பிணி : நெஞ்சுவலி, வயிற்று சூலை, **குன்மம்**, அதிசாரம்.

2. தாளிச பத்திரி சூரணம்[39]

3. கந்தக ரசாயனம்[34]

4. நந்தி மை[31]

5. நாரத்தை இளகம்[35]

6. வில்வாதி இளகம்[36]

7. மேகராசாங்க இளகம்[23]

8. கண்டங்கத்திரி கிருதம்[32]

***Mesua ferrea* Linn.**

Vernacular name[2] :

Sans	-	Nagkesara
Eng	-	Cobra's saffron
French	-	Mesua Naghas
Hind	-	Naga-kesara
Tel	-	Naga shap-pu
Ben	-	Nagesar
Tam	-	Cheru-Nagapu
Mal	-	Naga champakam
Arab	-	Narae-Kaisar

Part Used :

Fruits, seeds, flowers, leaves and bark.

History and Distribution[5] **:**

Find in the Eastern Himalayas, Assam, West Bengal, Eastern and Western Ghats as well the Andamans, Ascending to an elevation of 1500 m.

Chemical Composition :[1]

- Mesua seeds contain a pale yellow Lactone, Mesuol, Mesuone (has anti bacterial activity against micrococus pyogens)
- Mesuol is more active than mesuone and activities of both are markedly depressed in the precence of normal serum.
- Mesuol is an active as allicin and 0.1% as active as penicillin 'G' against M.pyogens.
- Kernel meal freed from oil is rich in nitrogen and phosphorus.

Medicinal uses[6] :

- Flowers are Astringent, digestive, carminative, anthelmintic, stomachic, aphrodisiac and cardio tonic.
- They are useful in asthma, cough, leprosy, scabies, skin diseases, vomiting, dysentery, haemorrhoids, **ulcers**, burning sensation of feet, leucorrhoea, haemoptysis, fever and cardiac debility.
- The seed oil is used in skin diseases.
- Leaves are applied to the head in severe cold.

சிறுநாகப்பூ

வேறுபெயர் :

சிறுநாகப் பூபேரைச் செப்பக்கேளு
செயமான ஒமகாஞ் சனமுமாகும்
நருநாகப் புட்பியர்த்த புட்பியாகும்
நாக சேகரமா மூர்க்கமாகும்
தருநாகஞ் சாம்பியம் நாக்கிஞ்சலக்கம்
சாம்பூந்தம் ஆடகம்பீத சேகரமாம்
உறுநாகம் யோகமே சங்கேயாகும்
உரைத்த சிறுநாகப்பூ வுண்மையாமே[50]

பொருள் : நாகம், நாகபுட்பம், நாகேசரம், கேசரம், சாம்பேயபம்

சுவை : சிறுகைப்பு, துவர்ப்பு

தன்மை: தட்பம்

பிரிவு : கார்ப்பு

செய்கை : துவர்ப்பி, அகட்டுவாய்வகற்றி, மணமூட்டி

பொதுகுணம் :

சிறுநாகப் பூவினது செய்கைதனைச் சொல்வோம்

குறியாகும் மேகத்தைக் கொல்லும் - நெறிவிட்டுத்

தீதாய்ச் செல்வாயுவையுந் தீர்க்குமிகு மற்போக்கும்

கோதாய் ! இதையறிந்து கொள்.

பொருள் :

வெள்ளை, இருமல், கழிச்சல், நீரடைப்பு, குருதிப்போக்கு, புண், கொப்புளம், காலெரிச்சல் முதலியன போக்கும்.

சிறுநாகப்பூ சேரும் குன்மம் போக்கும் மருந்துகள் :

1. அமுக்கிரா சூரணம்[32]
2. கந்தகரசாயனம்[34]
3. தாளிசாதி சூரணம்[31]
4. நாரத்தை இளகம்[35]
5. வில்வாதி இளகம்[36]
6. மகாஏலாதி சூரணம்[52]
7. மேகராசாங்க இளகம்[23]

***Cinnamomum zeylanicum* Breyn.**

Vernacular Name[5]

Sans	-	Tvacha
Hindi	-	Tvakh
Beng	-	Daruchini
Tam	-	Ilavanga Pattai
Eng	-	Cinnamon

Part Used : Bark

History and Distribution[5] :

Found wild in the southern costal region of western India upto elevation of 1828 m. Abudant in the regions 30 - 215 m above the sea level fairly common upto 1100 m.

Chemical Constituents[1] :

- Aqueous extract of bark showed significant anti allergic activity in geunea pig.
- The extracts also shows potent **antiulcerogenic** activity in rats and is comparable in a activity with cimetidine.
- Anti ulcerogenic compounds have been isolated from bark.
    - Cassioside ($C_{20}H_{32}O_9$)
    - Cinnamoside ($C_{24}H_{38}O_{12}$)
    - 3,4,5 tri methoxyphenol

        β - D - apiofuranosyl

        β-D-Glucopyranoside

Medicinal Uses[5] :

- The dried inner bark constitutes the drug, used in diarrhoea, nausea and vomiting.
- Oil obtained from bark is used as a stomachic and carmintive. It cures gastric debility and flatulence. It is germicide and fungicide as well.

இலவங்கப் பட்டை

வேறுபெயர் : கருவாப்பட்டை

சுவை : கார்ப்பு, இனிப்பு

தன்மை : தட்பம், வெப்பம்

பிரிவு : இனிப்பு, கார்ப்பு

செய்கை : வெப்பமுண்டாக்கி, அகட்டுவாய்வகற்றி, காமம்பெருக்கி

பொதுகுணம் :

தாதுநட்டம் பேதி சருவவிஷம் ஆகியநோய்
பூதகிர கஞ்சிலத்திப் பூச்சிவிடஞ் - சாதிவிடம்
ஆட்டுமிரைப் பொடிருமல் ஆகியநோய்க் கூட்டமற
ஓட்டுமில வங்கத் துரி
சன்னலவங் கப்பட்டை தான்குளிர்ச்சி யுண்டாக்கும்
இன்னுமிரத் தக்கடுப்பை யீர்க்குங்காண் - முன்னமுறும்
உந்திக் கடுப்பகற்றும் ஊண்மூலப் புண்போக்கும்
கந்தமிகு பூங்குழலே ! காண்.

பொருள் :

பாம்புகடி, சிலந்திபூச்சிக்கடி, முதலியவைகளின் நஞ்சைப் போக்கும். இஃது இரைப்பு, இருமல், **வயிற்றுக் கடுப்பு,** உள்மூலப்புண் முதலியவற்றைப் போக்கும். உடற்குக் குளிர்ச்சியை உண்டு பண்ணும்.

வழங்கும் அளவு : 65 - 260 மி.கி.

இலவங்கப்பட்டை சேரும் குன்மம் போக்கும் மருந்துகள் :

1. கந்தக ரசாயணம்[34]
2. சரபுங்க வில்வாதி இளகம்[32]

3. தாளிசாதி சூரணம்[31]

4. வில்வாதி இளகம்[36]

5. மேகராசாங்க இளகம்[23]

***Cinnamomum tamala* Nees & Eberm**

Vernacular names[5] :

Sans	-	Patraka
Hind	-	Tejpata
Eng	-	Indian Cassia

Part Used : Leaves

History and Distribution[5] :

Found in tropical and sub-tropical Himalayas (900 - 2500 m) and Khasi and Jaintia hills (900 - 1200 m)

Chemical Constituents[1]:

- d - α - phelladrene
- eugenol
- Cinnamic aldehyde

Medicinal Uses :

Leaves used as carminative in colic and diarrhoea.

இலவங்க பத்திரி

வேறு பெயர் : தமாலப்பத்திரி, தாளிசபத்திரி

சுவை : கார்ப்பு

வீரியம் : வெப்பம்

பிரிவு : கார்ப்பு

செய்கை :

வெப்பமுண்டாக்கி, அகட்டுவாய்வகற்றி, பசித்தீத்தூண்டி, வியர்வை பெருக்கி

பொதுகுணம் :

மேகசுரம் சீதசுரம் வெட்டைசுவா சங்காசம்
தாகபித்தம் வாந்திசர் வாசியநோய் - மேகத்தின்
கட்டியொடு தாதுநட்பாய் கைப்பருசி போக்கிவிடும்
இட்டஇல வங்கத் திலை

பொருள் :

மேகசுரம், ஐயசுரம், வெட்டை, இரைப்பு, இருமல், நீர்வேட்கை, அழல், **வாந்தி, வாய்ப்புண்,** மேகக்கட்டி, தாதுநட்டம், கைப்புசுவை இவைகளை போக்கும்.

இலவங்கப்பத்திரி சேரும் குன்மம் போக்கும் மருந்துகள் :

1. கந்தக ரசாயனம்[34]
2. தாளிசாதி சூரணம்[31]
3. கற்பூராதி சூரணம்[28]

***Piper nigrum* Linn.**

Vernacular name[11] :

Beng	-	Golmorich
Guj	-	Kalmorich
Hind	-	Kalimirch
Kan	-	Kare menosu
Mal	-	Kurumulaku
Tam	-	Milagu
Tel	-	Miriya Latige
Eng	-	Black pepper

Part Used : Fruit

History and Distribution[11]:

A climbing perennial shurb cultivated in the hotter and moist parts of India.

Chemical composition[11]:

The major components of the oil are,

- Sabinene
- Myrcene
- Limonene
- α - & β - Pinenes
- Caryophyllene
- α - bergamotene
- α - humulene
- p - cymene
- α - selinene

Medicinal uses :

- Dried unripe fruits constitute the drug.
- It is stimulant, carminative and stomachic.
- The fruit is pungent, bitter, hot, anthelmintic
- Useful in kapha and vatha, asthma, pains, disease of throat, piles, urinary discharges, night blindness; Brings on sleep and epileptic fits.
- Useful in tooth ache, inflammation, pain in the liver and muscles, lumbago, leucoderma, chronic fevers and paralysis.

மிளகு

வேறுபெயர் :

மிளகினுட பெயர்தனையே மொழியக் கேளு
முதிர்ந்துநின்ற திரைபோக்கி மிரிசியாகும்
வளகினுட வல்லசமாந் தீட்சணமுமாகு
மகத்தான தூவினமா மசியமாகுங்
குளகினுட முஷ்ணமாம் பத்துவநேஷ்டங்
கோளகமாஞ் சரபந்த நிதியமாகும்
வளகினுட வாதத்தை யறுக்கின்ற
மகத்தான மிளகுக்கு நாமமாமே[50]

பொருள் :

கலினை, கறி, காயம், கோளகம், திரங்கல், மிரியல், சருமபந்தம், வள்ளிசம், மாமசம், குறுமிளகு, மலையாளி

சுவை : கைப்பு, கார்ப்பு

தன்மை : வெப்பம்

பிரிவு : கார்ப்பு

செய்கை :

காறலுண்டாக்கி

அகட்டுவாய்வகற்றி

முறைவெப்பகற்றி

தடிப்புண்டாக்கி

வெப்பமுண்டாக்கி

வீக்கங்கரைச்சி

வாதமடக்கி

நச்சரி

பொதுகுணம் :

சீதசுரம் பாண்டு சிலேத்மங் கிராணிகுன்மம்

வாதம் அருசிபித்தம் மாமூலம் – ஒதுசன்னி

யாசமபஸ் மாரம் அடன்மேகம் காசமிவை

நாசங் கறிமிளகினால்

(அகத்தியர் குணவாகடம்)

கோணுகின்ற பக்கவலி குய்யவுரோ கம்வாத

சோணிதங்க முத்திற்குள் தோன்றுநோய் – காணரிய

காதுநோய் மாதர்குன்மங் காமாலை மந்தமென்றீர்

ஏதுநோய் காயிருக்கில் ஈங்கு

(தேரையர் குணவாகடம்)

பொருள் :

குளிர்சுரம், பாண்டு, கோழை, கழிச்சல், குன்மம், வாயு, சுவையின்மை, வெறி, மூலம், சன்னியாசம், அபஸ்மாரம், பிரமேகம், இருமல், பக்கவாதம், குய்யரோகம், சோணிதவாதம், களநோய், செவிவலி, **இரத்தகுன்மம்,** செரியாமை, காமாலை இவை போகும்.

மிளகின் பெருமை

மிளகு, வளி, தீ, கபகுற்றங்கள் இவை அனைத்தையும் நீக்கும். அன்றியும் திமிர்வாதம், கழலை, வளி, சளி இவைகளையும் அகற்றும்.

(தேரன் வெண்பா)

மிளகு சேரும் குன்மம் போக்கும் மருந்துகள்

1. மிளகு பொடி - 51 கிராம்

   நீர் - 700 மி.லி.

   மிளகு பொடியை நீரிலிட்டு அரைமணிநேரம் காய்ச்சி வடிகட்டி, அதில் 30 - 60 மிலி வீதம் தினம் இருவேளை தர தொண்டை கம்மல், தொண்டைபுண் மற்றும் **வயிற்றைச் சேர்ந்த நோய்களும்** நீங்கும்.[51]

2. மிளகு, சுக்கு, திப்பிலி, சோம்பு, பாறைஉப்பு இவைகள் ஓர் அளவாகச் சேர்த்து பொடி செய்து 2 - 4 கிராம், உணவுக்கு பின் வாயிலிட்டு மென்று விழுங்க, செரிப்பை பிறப்பித்து **வயிற்று நோயையும்** போக்கும்.

3.

சுக்கு **மிளகு** திப்பிலி அதிவிடயம் **சிறுநாகப்பூ** **இலவங்கப்பட்டை** **சாதிக்காய்** சாதிபத்திரி ஓமம்	இவை அனைத்தும் தலா 1 பலம்
சுண்டை வற்றல்	1/2 பலம்
பெருங்காயம்	1/2 பலம்
உலர்ந்த பிரண்டை	2 பலம்
இந்துப்பு	1 சிட்டிகை

மேற்படி சரக்குகளில் இந்துப்பை தவிர மற்ற சரக்குகளை பொடித்து 2 படி நீர் விட்டு 8ல் 1 பங்காக காய்ச்சி வடித்து 1/2 ஆழக்கு குடிநீரில் இந்துப்பு பொடியைச் சேர்த்து காலை மாலை கொடுக்க குன்மக் கழிச்சல் தீரும்.[29]

4. அமுக்கிரா சூரணம்[32]

5. தாளிசாதி சூரணம்[31]

6. திராட்சாதி சூரணம்[41]

7. கந்தகரசாயணம்[34]

8. குமட்டிக்குழம்பு[35]

9. குன்மகுடோரி மெழுகு[31]

10. சிவனார் அமிர்தம்[31]

11. நவஉப்பு மெழுகு[31]

செவ்வியம்[51] - Black Pepper Root

வேறுபெயர்

செவ்வியத்தின் பெயர்தனையே செப்பக்கேளு
செவ்விகமாங் கோலவல் லீசமாகும்
அவ்வியமாங் கெந்தாகா கொலியுமாகும்
ஆர்க்கமாங் கண்டூரங் கடூஷணியாகுஞ்
சிவ்வியமாந் திமிரகத்து மதீரனாகுஞ்
சிலேட்டு மத்தைப் போக்குகின்ற திறமானாகும்
வவ்வியமாம் வந்தகோப சமனியாகும்
வகுத்துரைத்து செவ்வியத்தின் பேருமாமே[50]

பொருள் : கண்டூரை, சவிகை, சவியம், மிளகின்வேர்

பொதுகுணம் :

சூலை அருகிசன்னி தொல்லிருமல் ஈளைபித்தம்
மேலைக் குரற்கம்மல் வெங்களநோய் - மூலசுரம்
கவ்வியங்கத் தேறு கனதா வரவிடமுஞ்
செவ்வியங் கொள்ள விடுந் தேர்

(அகத்தியர் குணவாகடம்)

பொருள் :

இது மிளகின் வேராகும். மிளகின் குணங்கள் இதற்குண்டு. ஆனால் மிளகின் காரம் இதற்கு கிடையாது.

செவ்வியத்தால் சூலை, சுவையின்மை, முப்பிணி, நாட்பட்ட சுரம், நீடித்த இருமல், ஈளை, வெளி, குரற்கம்மல், தொண்டை நோய், சுரம், எலும்பைப்பற்றி ஏறுகின்ற நஞ்சு முதலியன போகும்.

செவ்வியம் சேரும் குன்மம் போக்கும் மருந்துகள் :

1. நந்தி மை[31]
2. பாவன கடுக்காய்[38]

***Illicium Verum* Hook**

Vernacular name[1]:

Hind	-	Anasphal
Tel	-	Anaspuvu
Tam	-	Takkolam, Anasi-pu
Bombay	-	Badian
Eng	-	Star anise

Part Used : Fruit

History and Distribution:[1]

It does not occur in India. But it's fruits imported from China and Indo-China. It is an evergreen tree attaining a height of 8 - 15 m.

Phyto Chemistry :

Shikimic Acid is an monomer which is extracted from Illicium verum Hook. f., Shikimic Acid is a key precursor of many alkaloids, aromatic amino acids, indole derivatives. Chinese herb Star Anise (Illicium verum Hook.f.) have been used in Chinese medicine for centuries, instead of normal used to flavour

ingredients, it also have been widely used for the treatment of indigestion, stomach ache, colic in babies, and even facial paralysis, in recently years, scientists also have found that star anise has possible cancer-fighting properties[63].

Medicinal uses :

- Star anise plant is used for flavouring foods and confectionary.
- It is considered useful for Colic, constipation and insomnia.
- It is given for the treatment of indigestion, loss of appetite.
- Oil of the frutit if applied to the abdomen of the children, it relieves the pain resulting accumulation of gas in the alimentary canal.
- The dried flowers are used to cheek vomiting.

தக்கோலம் - Annasippu[51]

சுவை : இனிப்பு, விறுவிறுப்பு

தன்மை : வெப்பம்

பிரிவு : கார்ப்பு

செய்கை : பசித்தீதூண்டி, வெப்பமுண்டாக்கி, உரமாக்கி

குணம் :

இது செரியாமை, மாந்தம், வன்மைக்குறைவு முதலிய நோய்களைப் போக்கும்.

தக்கோலம் சேரும் மருந்துகள் :

1. கற்பூராதி சூரணம் :

கற்பூரந் தக்கோலஞ் சாதிக்காயில்
வங்கயிலை கிராம்பு சுக்குஞ்
சொற்பெரிய மிளகுடன் வெவ்வியமுங் கூடச்
சுகமாக வொவ்வொன்று விராகனெடை ஆறாய்
மற்படிய தூளாக்கிச் சர்க்கரை தேனிற்கொள்ள

மாறிவிடுங் குன்மசயம் வருந்தாதென்ன

துற்பாவங் கற்பூராதி சூரணத்தின் சேதி

சொன்னபடி செய்யமுனி சொல்லுகின்றாறே[28]

பொருள் :

கற்பூரம், **சாதிக்காய், தக்கோலம், மிளகு, செவ்வியம், இலவங்க பத்திரி,** சுக்கு, கிராம்பு இவைகளை வகைக்கு 6 வராகனெடை வீதம் எடுத்து இடித்து வஸ்திரகாயஞ் செய்து, சூரணத்தை தேன் அல்லது சர்க்கரைக் கூட்டி உட்கொள்ளவும்.

தீரும் பிணிகள் : சயம், குன்மம்

2. கற்பூராதி குளிகை[30]
3. கந்தக ரசாயனம்[34]
4. இலகு சந்தனாதி தைலம்[37]
5. நெல்லிக்காய் இளகம்[43]
6. பறங்கிப்பட்டை ரசாயனம்[32]
7. வல்லாரை நெய்[44]

***Saccharum officinarum* Linn.**

Sans	-	Ikshu
Hind	-	Pundia
Tel	-	Cheruku
Tam	-	Karumbu
Kan	-	Khabbu
Mal	-	Karinpa

Part Used : Sugar

Chemical Constituents [4] :

- A non-source portion of juice from stalks markedly reduce blood sugar level in mice.
- Six glycans - saccharans A,B,C D & F isolated from hypoglycaemic fraction of stalk juice, neocarlinoside; neoisochaftoside; orientin; vincenin-2 and p - coumaric, ferulic, caffaeric and 3,4 di -0- methyl caffaeric acids isolated.

Properties and Uses[3] :

- The stems are cooling, emollient, laxactive, cardiac tonic, diuretic, galactogague, aphrodisiac, expectorant, haemostatic and tonic.
- They are useful in fatigue, leprosy, **gastropathy**, cardiac debility, cough, bronchitis, anaemia, **ulcers of the skin and mucus membrane**, general debility.
- In cambodia, sugarcane enters into the composition of remedies used for the treatment of **ulcers of the skin and mucusmembrane.**

சருக்கரை - Sugar[51]

சுவை : இனிப்பு

தன்மை : தட்பம்

பிரிவு : இனிப்பு

செய்கை: அழுகலகற்றி, உள்ளழலாற்றி

பொதுகுணம் :

சீனிசருக் கரைக்குத் தீராத வன்சரமுங்
கூனிக்கும் வாதத்தின் கூட்டுறவும் - ஏனிற்கும்
வாந்தி யொடு கிருமி மாறாத விக்கலுமே
போந்திசையை விட்டு புரண்டு

(அகத்தியர் குணவாகடம்)

பொருள் :

இதனால் வாதசுரம், வாந்தி, நுண்புழு, விக்கல் இவைகளை போக்கும்.

கிளியூரல் பட்டை[51] **- Kiliyuram bark**

சுவை : கைப்பு

தன்மை : தட்பம்

பிரிவு : கார்ப்பு

செய்கை : குளிர்ச்சியுண்டாக்கி

பொதுகுணம்

மணவருக்க மாகும் வருசுரத்தைப் போக்குந்
தணலாய வெப்பைத் தணிக்குங் - குணமார்
கிளியூரற் பட்டையது கீதம் பயிலு
மளியூரும் பூங்குழலே யாய்[60]

பொருள் :

வெப்பத்தை தணிக்கும். வெப்பம், சுரம் முதலியவைகளை போக்கும்.

கிளியூரல் பட்டை சேரும் மருந்து :

1. அரக்கு தைலம்[37]

MATERIALS AND METHODS

Prepation of the Trial Drug

The ingredients of Pachai karpoorathi chooranam are[56],

1. Borneo camphor	-	1 part
2. Kiliyuram Bark	-	2 part
3. Takkolam	-	5 part
4. Nut meg	-	2 part
5. Lavanga pathiri	-	5 part
6. Cinnamon Bark	-	8 part
7. Chiru - nagappu	-	7 part
8. Black pepper	-	8 part
9. Black pepper root	-	9 part
10. Cane sugar	-	45 part

Collection of Drug :

The above 10 raw drugs were bought from the raw drug shop in Chennai and were identified by siddha faculty, Gunapadam Dept., G.S.M.C., Chennai.

Purification of Drugs :

1. PACHAI KARPOORAM :

Soaked in the juice of Senguvalai flowers for 24 minutes.[58]

2. TAKKOLAM:

Kept under sunlight and made dried.[39]

3. NUT MEG :

The skin of the dried fruit was peeled out and fried in ghee[48].

4. LAVANGA PATHIRI

Dried under sunlight[39]

5. CINNAMON BARK

Kept under the sunlight and made dried[39].

6. CHIRUNAGAPPU

Kept under sunlight and made dried[39].

7. BLACK PEPPER

Soaked in the sour butter milk for 3 hours and made dried.[39]

8. BLACK PEPPER ROOT

The outer skin was removed and sliced into pieces and dried under sunlight[39].

Preparation of Drug :

Purified drugs were finely powdered. Then it was sieved by a fine white cloth.

Purification of Chooranam :

Purified by steam - cooking in milk (Pittavial method). The same was later dried, powdered and sieved again and preserved.

Preservation :

The purified chooranam was stored in an air tight glass container. As the shelf - life of Chooranam is only three months, it was used with in that period.

Administration of the Drug

Route	:	Enteral
Dose	:	2.1 gms, 3 times a day; Before food
Vehicle	:	Ghee

Figure 4

பச்சை கற்பூரம்

சாதிக்காய்

கிளியூறல்

தக்கோலம்

சிறுநாகப்பூ

இலவங்கப்பட்டை

இலவங்கப்பத்திரி

மிளகு

சர்க்கரை

பச்சை கற்பூராதி சூரணம்

METHODOLOGY

For the clinical trial

1. Bio Chemical Analysis
2. Antimicrobial study
3. Pharmacological study
4. Clinical Study
5. Statistical analysis

were done on the Pachai Karpoorathi Chooranam and the methods of analysis are as follows and the observation and results of the analysis are given in appropriate headings.

BIO-CHEMICAL ANALYSIS

Preparation of Extract

5 gm. of Pachai Karpoorathi Choornam was weighed accurately and placed in a 250 ml clean beaker and added with 50 ml of distilled water. Then it was boiled well for about 10 minutes. Then it was cooled and filtered in a 100 ml volumetric flask and made upto 100 ml with distilled water.

SI.No	Experiment	Observation	Inference
1.	**I. Test for Acid Radicals.** **1. Test for sulphate :**		
I. a)	2 ml of the above prepared extract was taken in a test tube. To this add 2 ml of 4% Ammonium oxalate solution.	Cloudy appearance white precipitate was obtained	Presence of sulphate
b)	2 ml of Sodium carbonate extract was added with 2 ml of dilute Hydrochioric acid was until the effervescence ceases off. Then 2 ml of Barium chloride solution was added.	White precipitate insoluble in Con. Hcl was obtained	Sulphate was confirmed
II.	**Test for Chloride :** 2 ml of Sodium carbonate extract was added with dilute Nitric acid till the effervescence ceases. Then 2 ml of Silver Nitrate solution was added.	Cloudy white precipitate completely soluble in excess of Ammonium hydraxide solution was obtained.	Chloride was confirmed

III.	**Test for Phospate :** 2 ml of the extract was treated with 2 ml of Ammonium Molybdate solution and 2 ml of concentrated Nitric acid.	Presence of yellow precipitate	Presence of phosphate
IV.	5 drops of clear solution was added with 2 ml of dilute Sulphuric acid and slightly warmed. To this, 1 ml of dilute Potassium permanganate solution was added.	$KMnO_4$ solution was decolurised	Presence of Oxalate.
V.	**Test for Zinc:** To the 2 ml of extract sodium hydroxide solution was added in drops to excess.	White precipitate soluble in excess of NaoH was obtained.	Zinc was confirmed.
VI.	**Test for Calcium :** 2 ml of the extract was added with 2 ml of 4% Ammonium Oxalate solution	Presence of cloudy appearance	Presence of calcium
VII.	**Test of reducing sugar :** 5 ml of Benedict's qualitative solution was taken in a test tube and allowed to boil for 2 minutes and added 8 to 10 drops of the extract and again boiled for 2 minutes. The colour changes were noted.	Dark green colour developed	Presence of reducing sugar

VIII. a)	2 ml of extract was treated with 2 ml of Picric acid	Yellow colour developed.	Presence of Alkaloid
b)	2 ml of the extract was treated with 2 ml of Phosphotungstic acid	White Precipitate developed.	Presence of Alkaloid
IX.	**Test for Tannic acid :** 2 ml of the extract was treated with 2 ml of Ferric chloride solution.	Black precipitate was obtained	Presence of Tannic acid
X.	**Test for unsaturated compound :** To 2 ml of the extract 2 ml of Potassium permanganate solution was added.	$KMnO_4$ was decolourised	Presence of un saturated compound
XI.	**Test for Aminoacid :** 2 drops of the extract was placed on a filter paper and dried well. After drying 1% Ninhydrine is sprayed over the same and dried well.	Violet colour develops	Presence of Amino acid.
XII.	**Test for Albumin :** 2 ml of the extract was added with 2 ml of Esboch's reagent.	Yellow colour Precipitate formed.	presence of Albumin.
XIII.	**Test for type of compound :** 2 ml of the extract is added with 2 ml of Ferric chloride solution.	Green colour developed	Oxyquinole epinephrine and pyrocatechol

The results are shown in observation and results.

ANTI-MICROBIAL STUDY

Preparation of Extract :

To 5 gms of Pachai Karpoorathi Chooranam 50 ml. of water was added and kept in a boiling water bath for 20 minutes and then filtered.

The extract of the drug was tested with the following micro organism.

1. Staphylococcus aureus.
2. Escherichia coli
3. Klebsiella
4. Proteus
5. Pseudomonas
6. Candida albicans.

Procedure :

The tube dilution method was used as a homogenous dispersion of the drug was more effective to test the antimicrobial activity of the drug. Dilution method was used in the preliminary screening of the antimicrobial activity.

To the 5 ml of Nutrient Broth culture 0.5 ml. of the extract was added and the tubes were incubated at $37^{o}C$ overnight. The next day the tubes were examined for turbidity and subcultures were made on Nutrient Agar plates. Control tubes without drug were also included. The plates were incubated overnight at $37^{o}C$ and the next day the reading was taken.

The results are shown in observation and results.

PHARAMCOLOGICAL STUDIES

Acute Toxicity Study of Pachai Karpoorathi Choornam

Vehicle used:

Ghee was used as vehicle. Starting dose was 5mg/kg. And the subsequent doses are 10, 50, 100, 250, 500, 1000, 2000 and 4000mg/kg p.o. used in this study.

Acute Toxicity Study

Pachai karpoorathi choornam suspended in Ghee was administered to the groups of wistar rats in a single oral dose by gavage using a feeding needle. The control group received an equal volume of the Ghee vehicle. Six females and males were used for each dosage level. The principles of laboratory animal care were followed. Observations were made and recorded systematically 1, 2, 4 and 24 h after substance administration. The visual observations included skin changes, mobility, aggressiveness, sensitivity to sound and pain, as well as respiratory movements. They were deprived of food, but not water 16–18 h prior to the administration of the test suspension. Finally, the number of survivors was noted after 24 h and these animals were then maintained for a further 13 days and observations made daily. At the conclusion of the experiment, all surviving animals were sacrificed with anesthetic ether and their organs such as liver, lungs, heart, spleen, adrenals, kidneys, testes and ovaries were excised and weighed. The pathological observations of these tissues were performed on gross. The toxicological effect was assessed on the basis of mortality, which was expressed as LD_{50}.

Evaluation of the Antiulcer Activity of Pachai Karpoorathi Chooranam, In Experimentally Induced Acute And Chronic Ulcers

Materials and Methods

Albino rats of either sex weighing between 150-250 g were used for gastric ulcer models. They were fed with standard chow diet and were divided into groups of eight each. The distribution of animals in the groups, the sequence of trials and the treatment allotted to each group were randomised. Coprophagy was prevented by fasting the animals in cages with grating on the floor. Pachai Karpoorathi Chooranam and cimetidine were suspended in 1% solution of carboxy methyl cellulose (CMC) and administered orally in the dose of 200 µg/kg and 50 mg/kg respectively in each experimental model. The suspensions of drugs were freshly prepared before administration. Gastric contents were assayed for total acidity by titration against 0.01 N NaOH to pH 8.0 using phenolphthalein as an indicator. The amount of HCl was calculated and expressed as mEq/L. The volume of the gastric content was measured and the total acid output was estimated. Pepsin activity of the gastric juice was determined and expressed in terms of µg/ml of tyrosin liberated per 4 h of gastric juice. Other bio-chemical parameters measured included total carbohydrates (TC) i.e. sum of total hexoses, hexosamine, and sialic acid'. The protein content (PR) of the gastric juice was also measured. Finally, the total carbohydrates to protein (TC/ PR) ratio i.e. the mucin activity, was determined. Only pylorus ligation was performed on one parallel group of animals (control PL), which received only 1% CMC solution. The same parameters were checked in this group so as to differentiate the additional effects of aspirin upon the pylorus-ligated group.

Experimental acute gastric ulcers:

1. **Aspirin plus pylorus ligation model:**

Aspirin was suspended in 1% CMC solution and administered orally in the dose of 200 mg/kg in non-fasted rats once daily for 5 days. Pachai Karpoorathi Chooranam and cimetidine were administered orally to the respective treatment groups 30 min before each aspirin treatment whereas the control group received only vehicle (1% CMC solution). On the sixth day, immediately after aspirin treatment, pylorus-ligation was performed under ether anaesthesia on 36 h fasted rats. Four hours after pylorus-ligation, the animals were sacrificed by giving overdosage of ether. The stomachs were removed and opened along the greater curvature and the gastric lesions were observed using a 6.4 binocular magnifier. The gastric contents were collected, measured, centrifuged and subjected to biochemical analysis. The gastric ulcers were measured and the ulcer index was determined.

2. **Ethanol-induced gastric ulcer model**:

1 ml of 80% ethanol was administered p.o. to 36 h fasted rats. In the treatment groups, Pachai Karpoorathi Chooranam and cimetidine were administered one hour before the administration of ethanol and the control group received 1% CMC solution. Two hours after ethanol administration, animals were sacrificed by giving overdosage of ether, and the ulcer index of the gastric mucosa was determined as mentioned above.

Experimental chronic gastric ulcers:

Acetic acid-induced gastric ulcer model:

Rats were starved for 24 h prior to an experiment and were divided into three groups, one for control and the other two for 10 days of chronic treatment with Pachai Karpoorathi Chooranam and cimetidine. Under light ether anaesthesia, a mid-line epigastric incision (0.75 to 1 .O cm) long was made and the stomach was exposed. 0.05 ml of 100% acetic acid was applied topically

using a cylindrical mould (7.5 mm diameter) which was allowed to remain there for 60 seconds. The acid solution was then removed by rinsing with 0.9% saline to prevent possible damage to the surrounding tissues close to the point of acid application. The abdomen was closed and from the second day after the operation, Pachai Karpoorathi Chooranam and. cimetidine were given once daily to the respective treatment groups for 10 days while the control group received only the vehicle. Rats were sacrificed on the 10th day, stomachs were removed, and the ulcer index as well as the score for intensity of the gastric lesions was measured where score 0 = no ulcer, 1 = superficial mucosal erosion, 2 = deep ulcer or transdermal necrosis, and 3 = perforated or penetrated ulcer.

Ulcer index = 1 O/X where,

$$X = \frac{\text{Total area of stomach mucosa}}{\text{Total ulcerated area}}$$

The results are showed in observation and results.

CLINICAL ASSESSMENT

The drug PACHAI KARPOORATHI CHOORANAM has chosen as a therapeutic agent for GUNMAM.

About the Disease :

குன்மம்[53]

வேறுபெயர்கள் :

குல்மம், வயிற்றுள்புரளல், வயிற்றுள் புரளலுடன் நோதல்.

இயல் :

செரியாமை, வயிற்றில் எரிச்சல், வாந்தி, உடல்வன்மை குறைதல், தேகம்மெலிதல், மனம் குன்றல் ஆகிய குணங்களையுடைய நோயாம். மேலும் வயிற்றுள் உணவு செரிக்காமல் காற்று கூடி வலியுடன் பந்து போல் புரளச் செய்யும் நோய் எனவும், இந்நோயால் வருந்தும் போது மனம் குன்றும் காரணத்தாலும், வலி வரும் போது நோயினனை முன்பக்கம் குன்ற வைக்கும் காரணத்தாலும் இதனை குன்மநோய் என்பர்.

நோய்வரும் வழி :

According to the siddhars, Agasthiyar and Yugi the aetiology of Gunmam are,

"ஏகிய குன்மந்தானும்
எழுந்தோர் விதங்கள் சொல்வோம்
வாகிய பித்தத்தோடு
வாதமும் பிரிந்து சேரில்
வாகிய வாய்நீர் சேரும்
வாந்தியாகும் பாரே[35]"

"செய்யான குன்மத்தினுற் பத்தி தன்னைச்
செப்பிடவே துவர்ப்பான பொசிப்பினாலும்
மையான மங்கையுடன் மார்க்கத் தாலும்
வகையாகுங் கிழங்குவகை யருந்தலாலும்
உய்யான மிளகுகா யுரைப்பி னாலும்
உறுபசியை யடக்கிடினு மந்தத் தாலும்
தையாள சண்டாள கோபத் தாலும்
சலிப்பாலுங் குன்மம் வந்து தாக்கும் பாரே[54]"

In our system, It is mainly caused by

i. Dietic variations

ii. Karmic Low

iii. Excessive consumption of astringent food.

iv. Excessive indulgence in sexual intercourses.

v. Excessive intake of roots and spices.

vi. Unhealthy food habits - especially not adhering to a proper time schedule.

vii. Emotional imbalance - anger, fear, anxiety etc.

"குன்மம் வந்து காரணந்தா னேதோ வெனில்
குடிகெடுத்து வயிறெரிச்சல் கொண்ட பாவம்
நன்மையில்லா மனக்கவடு பெருத்த பாவம்
நல்லோரை மனம்நோகப் பழித்த பாவம்
தன்மையில்லா பிறர்பசிக்க வுண்டபாவஞ்
சண்டாள தத்துவமே செய்த பாவம்
இம்மையிலே இப்பாவம் வந்து சுற்றி
யதனாலே குன்மமென வெடுத்த வாறே"[19]

The line portrays than Gunmam as the cumulative effect of sins committed by an individual like,

1. Spoiling the harmony of a family
2. Despicable thoughts, words and action.
3. Talking ill of others especially nobel men and
4. Not sharing the food with poor and needy.

These ill-attitudes of the people can cause perpetual tension to them and to their neighbours.

The perpetual tension and agony impact a malfunctioning of the body especially the stomach and the ultimate result in gastric disorders.

குறிகுணங்கள்[18] :

- வயிறுபுரட்டி நோதல்
- உணவில் வெறுப்பு
- பசியின்மை
- குமட்டல், வாய் நீர் ஊறல்
- எதிரெடுத்தல்
- புளியேப்பம்

Selection of the Patients :

In our Siddha system of medicine, so many single and compound medicines are available for Gunmam.

The clinical study was carried out in O.P.of Arignar Anna Government Hospital, Chennai - 106.

40 cases from both sex of various age group were selected and treated as out patient department. They were clinically diagnosed on the basis of siddha principles with modern laboratory findings.

The routine investigation of blood, urine, motion, blood sugar, urea, serum cholesterol and endoscopy have been studied.

Including Creteria :

- Age 20 - 60 years, sex, occupation, personal habits and diets, socio - economic status.
- Epigastric pain.
- Heart burn.
- Regurgitation.
- Nausea
- Vomiting
- Loss of appetite
- Distension of abdomen

Excluding Creteria :

- Complication of peptic ulcer such as
  - Haemorrhage
  - Perforation
  - Gastric outlet obstruction.
- Radiating abdominal pain as in pancreatitis, appendicitis.
- Acute abdominal colics
- Cancer of the stomach.
- Gall stone and Hiatus hernia
- Cirrhosis of liver and Jaundice

Drug and Dosage :

The patients were only administered Pachai Karpoorathi Chooranum as a dose of 2.1 gram three times daily, before food with ghee.

Diet and Medical Advise[14]

It has been told by Hippocrates, the father of medicines long since that,

"Your food shall be your medicine"

Do's

Following foods to be taken more,

1. Timely food
2. Banana
3. Almond milk
4. Raw goat's milk
5. Carrots and cabbage juice
6. Butter milk
7. He should chew every morsel throughly
8. Meals must be small and frequent

Don'ts

1. Intake of food stuff during stress and anxiety.
2. Foods and drinks which are too hot or too cold can be avoided.
3. Spicy foods, carbonated drinks.
4. Smoking and consumption of alcohol.
5. Intake of steroids and NSAIDS

Line of Treament :

All the selected patients were undergone for the diagnosis of Gunmam by the symptoms like Epigastric pain, Heart burn, Regurgitation, Nausea, vomiting, Distension of abdomen and investigation like endoscopy, blood and urine routine.

Then the test drug was administered to the patients for 9 weeks. The clinical signs and symptoms like Epigastric pain, Heart burn, Regurgitation and Distension of abdomen were observed regularly under the supervision of HOD, Lecturers and Asst. Lecturers.

BIO-STATISTICAL STUDY

Bio-statistical study was carried out 40 out-patients in Post-graduate's Department of Gunapadam, Govt. Siddha Medical College attached to Arignar Anna Hospital of Indian Medicine, Chennai - 106.

CRETERIA FOR SELECTION OF BIO-STATISTICS

Analysis of Subjective parameters : (Before and After Treatment)

- Epigastric pain
- Heart Burn
- Abdominal distension

The results of Bio-statistical analysis of subjective parameters are explained at Results and Observation (Table - 8).

OBSERVATION AND RESULTS

The test drug Pachai Karpoorathi Chooranam was analysed under the following studies Bio-Chemical analysis, Anti-microbial study, Pharmacological study, Bio-statistical study and Clinical study.

Bio-Chemical Analysis :

Done at Government Siddha Medical College, Chennai - 106.

Extract of pachai Karpoorathi Chooranam shows the presence of,

Acid Radicals :

Sulphate, Chloride, Oxalate and Phosphate.

Basic Radicals :

Calcium, Zinc, Copper, Iron.

Miscellaneous :

Reducing sugar, Alkaloid, tannic acid, unsaturated compound, Amino acid, albumin, Oxyquinole, epinephrine and pyrocatechol.

Phsico-Chemical Standards of Pachai Karpoorathi Chooranam :

Loss on drying @ 105^{o}C	5.16%
Ash Value	2.59%
Water solublity	44.68%
Acid insoluble ash	0.55%
Alkalinity as $CaCO_3$ in water soluble ash	0.10%
pH at 10% aqueous solution	5.15

Inorganic Analysis - Quantitative :

Copper as Cu	12 mg / kg
Zinc as Zn	27 mg / kg
Iron as Fe	675 mg / kg.

ANTI-MICROBIAL STUDY :

Done at Vel's College of Pharmacy, Pallavaram, Chennai.

Extract of Pachai Karpoorathi Chooranam shows,

- Staphylococcus aureus, candida albicans, proteus - Not sensitive.
- Escheritia coli and klebsiella - Highly sensitive.
- Pseudomonas - Moderatively sensitive.

PHARMACOLOGICAL STUDY

The acute toxic study and antiulcer activity of Pachai Karpoorathi Chooranam were done at Vel's College of Pharmacy, Pallavaram, Chennai.

Acute Toxicity-Results

Death was recorded during the treatment period in treated groups given 4g/kg of Pachai karpoorathi choornam orally. The animals showed changes in general behavior and other physiological activities like giddiness, sniffing, aggressiveness, tachypnoea, convulsion finally at the dose level of 4g/kg.. There were no significant differences between the control and treated groups in the body and organ weights of rats. There is a significant difference in the organs like lung, liver (**P<0.01) and heamatological parameters like Hb (*P<0.05) and W.B.C. (**P<0.01) were observed. Similarly there was a remarkable alterations in biochemical parameters like Glucose, Sodium, AST and ALP (**P<0.01). Pathological examinations of the tissues on a gross and macroscopic basis indicated that there were no detectable abnormalities. Hence, it can be concluded

that a test substance is practically toxic or lethal after an acute exposure at the dose range of 4g/kg. This test limit for acute oral toxicity is generally considered to be 4.0 g/kg body weight.

RESULTS OF ANTIULCER STUDY

Aspirin plus pylorus-ligation model :

In this model, the parameters investigated were the ulcer index, the volume of gastric content, total acidity, total acid output, pepsin activity, total carbohydrates (TC), protein content (PR) and the TC/PR ratio. Same parameters were also checked in the control PL group. Aspirin plus pylorus-ligated (aspirin+PL) group showed significant increase in the ulcer index and acid secretory parameters like the volume of gastric content, total acidity and total acid output (Table 4), and decrease in mucin activity of gastric mucosa (Table 5) when compared with those of control PL group of animals. Administration of Pachai Karpoorathi Chooranam resulted in significant reduction in the ulcer index (0.25+0.05) when compared with its control (aspirin+PL) group (Table 4). Though, the volume of the gastric content increased significantly, the rise in the total acid output was insignificant as total acidity decreased significantly when compared with the control group. In the cimetidine-treated group, the ulcer index, the volume of the gastric content, total acidity, the total acid output and the pepsin activity were reduced as compared to the control group (Table 4). Pachai Karpoorathi Chooranam was also studied for its effect on the dissolved mucus content of the gastric juice. It showed insignificant rise in hexosamine and fructose with fall in total hexoses ($P < 0.05$) and sialic acid (Table 5) when compared with the control group. Hence, the total carbohydrate content (TC) was found to be reduced by Pachai Karpoorathi Chooranam pretreatment whereas all the four individual carbohydrate contents were found to increase significantly by cimetidine pretreatment and thereby there was a significant rise in TC in this group (Table 5). Simultaneously, there was a fall in the protein content (PR) of the gastric juice in both Pachai Karpoorathi Chooranam as well

as cimetidine treated groups. However, the fall was found to be statistically significant in the later group (Table 5). As a result, TC/PR ratio was found to be increased significantly in the cimetidine treated group whereas the rise was insignificant in the Pachai Karpoorathi Chooranam treated group when compared with that of the control group (Table 5).

Ethanol-induced gastric ulcer model:

Ethanol produced haemorrhagic gastric lesions in the glandular portion of the stomach mucosa. Pachai Karpoorathi Chooranam reduced these lesions as was evident from the significant reduction in the ulcer index when compared with the control group. Cimetidine also significantly reduced the ulcer index of ethanol induced ulcers (Table 6).

Acetic acid-induced gastric ulcer model:

The topical administration of acetic acid produced penetrating lesions in the pyloric portion of the gastric mucosa at the site of application. Pretreatment with Pachai Karpoorathi Chooranam for 10 days resulted in a significant reduction of the ulcer index, score for intensity, and total lesion area (Table 7). Mortality of animals was prevented in presence of Pachai Karpoorathi Chooranam against acetic acid-induced gastric ulceration. Cimetidine did show a significant protective effect against chronic gastric ulcers (Table 7).

DISCUSSION

In the present study, Pachai Karpoorathi Chooranam has been shown to possess antiulcer activity against experimentally induced acute and chronic gastric ulcer models. It has shown a significant reduction in the gastric lesions of the aspirin treated pylorus ligated group of animals. Its antiulcer activity in this model is evident from its significant reduction in acid secretory parameters viz. total acidity and pepsin activity. The stomach digestive effect of accumulated gastric juice in the induction of gastric ulcers is well documented in the pylorus ligation model. Increased gastric secretion is also implicated in the causation of

gastric ulcer by anti-inflammatory agents. Pachai Karpoorathi Chooranam has also been studied in this model for its effect on soluble mucosubstances as increased. It is thought to be initiated by back diffusion of HCI into the mucosa. It has been reported that back diffusion of HCI and increased capillary permeability induced by acetic acid. Hence, it can be suggested from our study that Pachai Karpoorathi Chooranam possesses antiulcer activity against experimentally induced acute and chronic gastric ulcer models. The mechanism of its action can be attributed to its antisecretory action and cytoprotective property.

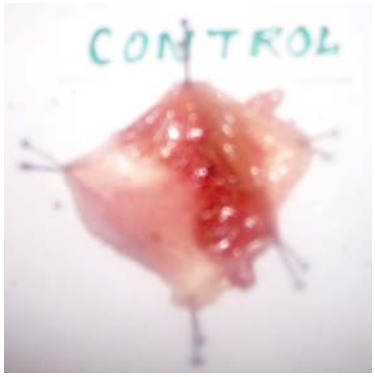
Table 4 Effect of PKC on total and free acidity, gastric volume and ulcer index

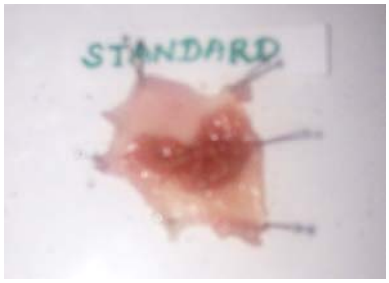
Groups	Total acidity (mEq/l)	Free aciditly (mEq/l)	Gastric Volume (ml/100g)	Ulcer index
Normal	159±1.46ns	116.33±0.55	2.55±0.07	1.11±0.03
CMC control	160±1.39ns	118.83±0.94	2.5±0.05	1.21±0.04
Control (Aspirin + ligation)	252±2.54	182.33±0.66	4.97±0.04	4.37±0.04
Ranitidine (50mg/kg)	178±2.37**	132.16±0.94**	3.03±0.03**	1.44±0.03**
PKC (400mg/kg)	207±5.16**	146.16±0.7**	3.54±0.01**	2.11±0.07**
PKC (800mg/kg)	197±2.31**	140.32±0.66**	3.23±0.02**	1.87±0.04**

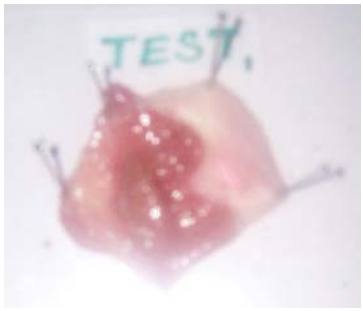
*P values <0.05 as compared to Aspirin + ligation control

Figure 5 :

ANTI-ULCER STUDY ON ALBINO RATS







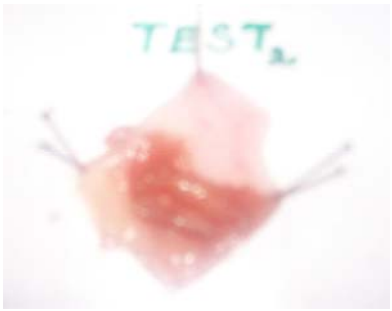


Table 5 - Effect of PKC on mucin activity of gastric juice in aspirin +pylorus ligation induced ulcers

Groups	Protein (mg/ml)**	Hexose (mg/ml)**	Hexosamine (mg/ml)**	Fructose (mg/ml)**	TC (mg/ml)**	TC:P**
Control	252.5±2.56	1082±29.49	428.83±6.26	93.66±1.52	1636.83±21.13	6.06±0.08
SCMC control	.251±5.68	1064±27.62	423±4.91	63.16±0.83	1667.66±17.82	6.06±0.11
Aspirin+ligation control	440.66±5.14	617.66±4.96	190.83±4.81	85.5±1.33	905.66±13.86	1.9±0.05
Ranitidine (50mg/kg)	305.5±4.25	972.5±5.41	347.33±5.58	102±0.73	1535.83±37.27	4.71±0.07
PKC (400mg/kg)	340.83±3.62	783±3.42	263.16±7.23	94±0.73	1232.83±15.46	3.55±0.04
PKC (800mg/kg)	312.16±4.34	809±5.12	286.83±3.97	97.66±0.42	1317.66±22.06	4.13±0.04

*P values: <0.01 as compared to aspirin + ligation control TC-Total carbohydrate, P- Protein. All values represent Mean±SEM; n=6 in each group.

Table 6. Effect of Pachai Karpoorathi Chooranam on ethanol-induced gastric ulcer.

Treatment	Dose	Ulcer index
Control	----------	0.87 ± 0.07
P.K.C.	400 mg/kg	0.30 ± 0.02*
P.K.C.	800 mg/kg	0.19 ± 0.01*
Cimetidine	50 mg/kg	0.18 ±0.01*

'P <0.01 when compared with control group.

All values represent mean±SEM; n = 6 in each group.

Table 7. Effect of Pachai Karpoorathi Chooranam on acetic acid-induced chronic gastric ulcer for 10 days.

Treatment	Dose	Ulcer incidence		Ulcer index	Total lesion area (mm*)	Score for intensity	Mortality	
		No.	%				No.	. %
Control	--------	6/6	100	0.87±0.07	41.25±3.54	2.71±0.16	3/6	50
P.K.C.	400mg/kg	6/6	100	0.30±0.02*	8.12±0.78	0.1±0.03	2/6	33
P.K.C.	800mg/kg	6/6	100	0.24±0.01*	7.34±0.66**	0.06±0.05	0/6	0.00
Cimetidine	50mg/kg	6/6	100	0.20±0.01**	5.11±0.58	0.09±0.03	0/6	0.00

*P <0.05; **P <0.001 when compared with control group. All values represent mean±SEM; n = 6 in each group.

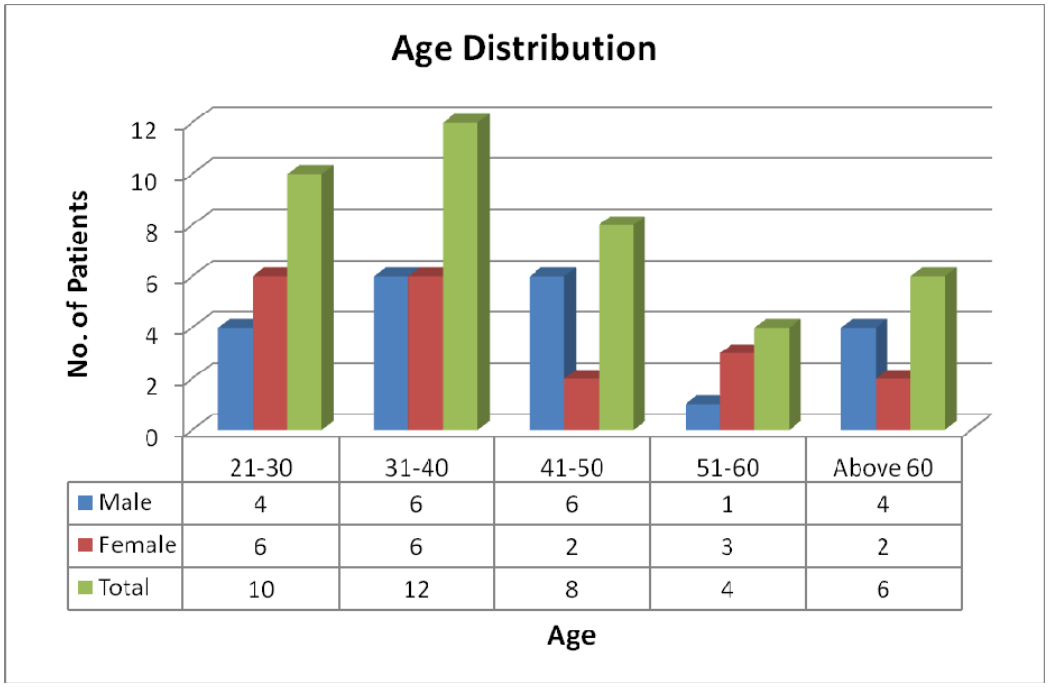
CLINICAL OBSERVATIONS

The test drug Pachai Karpoorathi Chooranam was given daily to the patients and they were examined clinically. Reduction of epigastric pain, heart burn and abdominal distension were taken as important signs of progress. The duration of treatment ranged between 48 to 63 days according to the severity of signs and symptoms of the patient. The clinical investigations were done before and after treatment.

The observation regarding,

- Age variation
- Sex Difference
- Personal Habits
- Signs and Symptoms during admission
- Results
- Improvement showing signs and symptoms after treatment

are recorded and tabulated as follows .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No. of Patients
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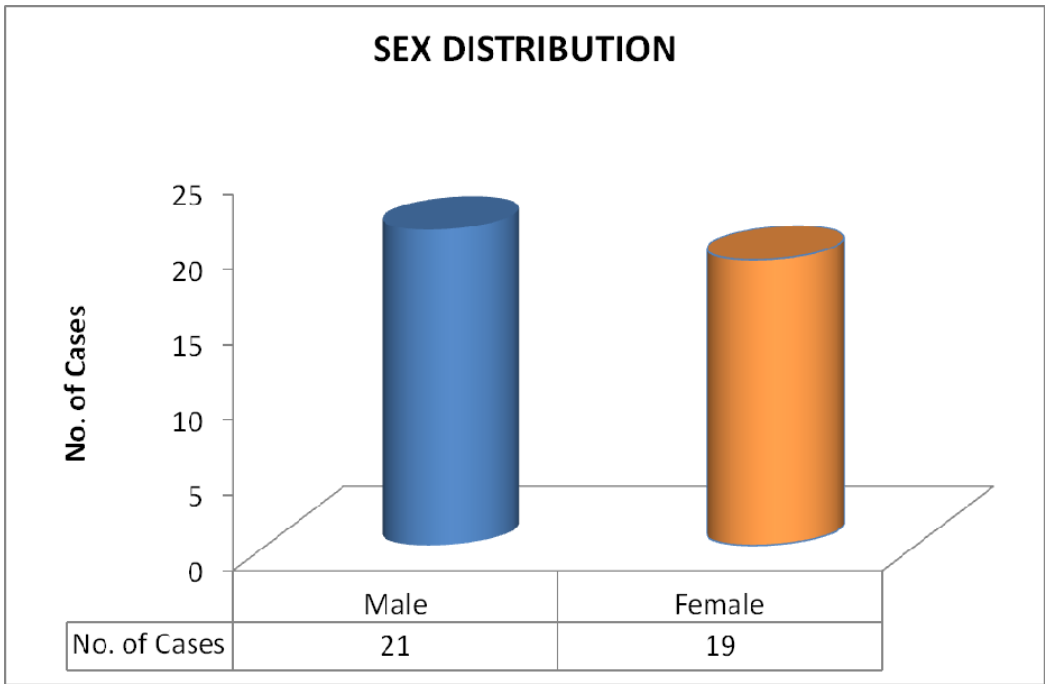
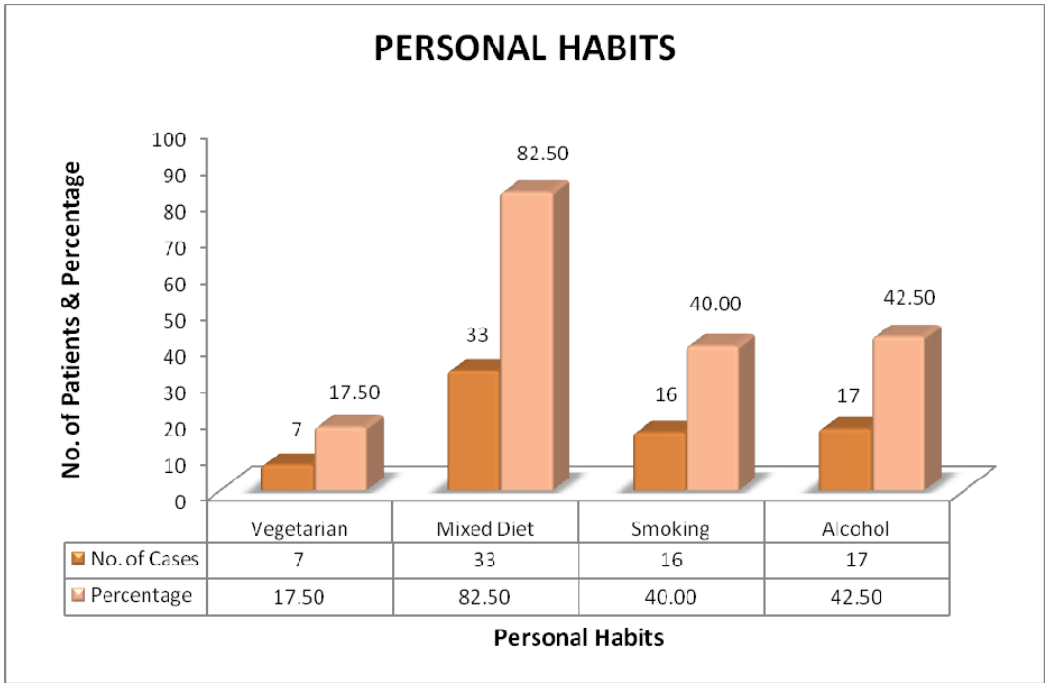
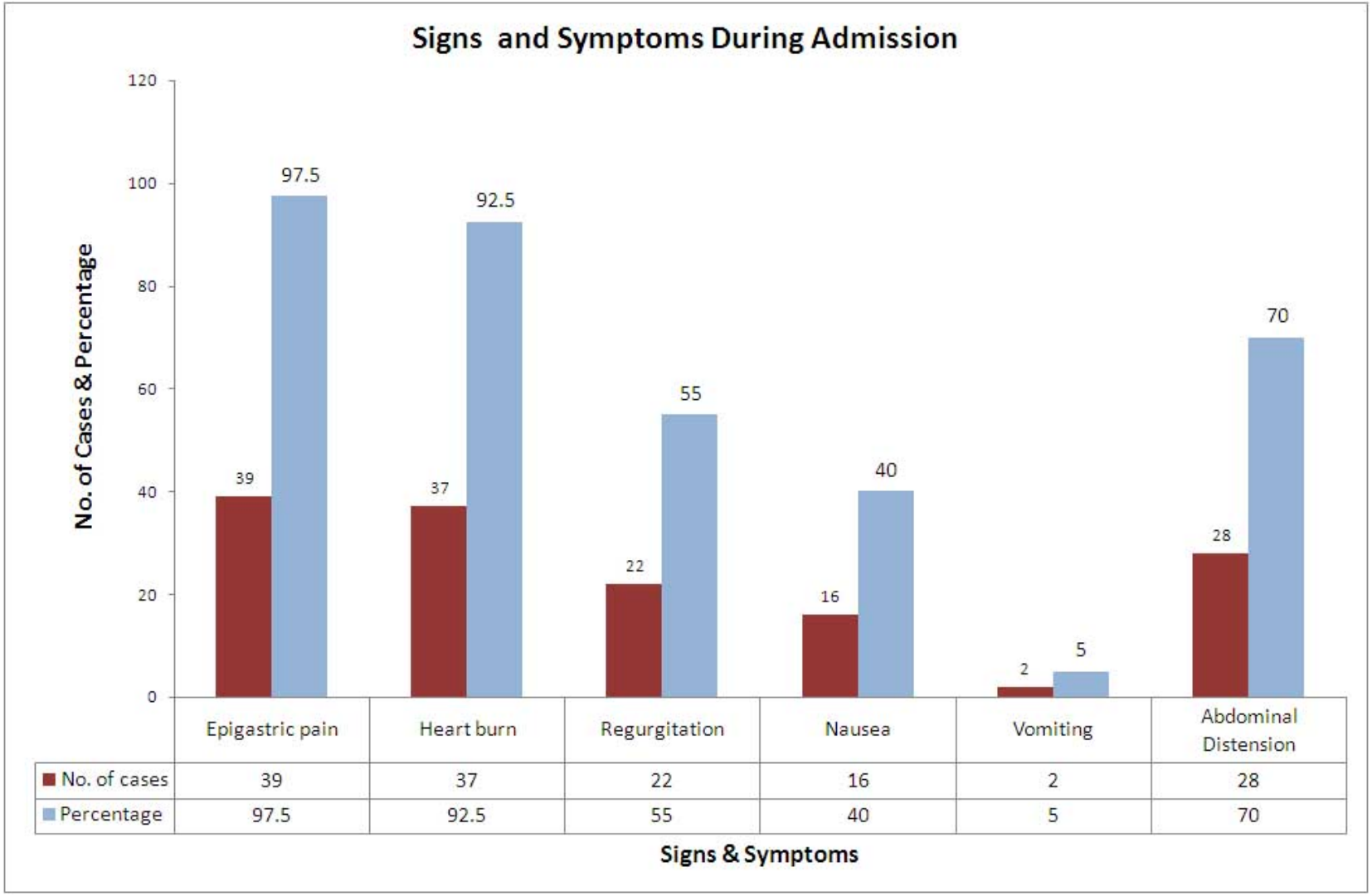
10
8
6
4
2
0
21-30
31-40
41-50
51-60
Above 60
Male 4 6 6 1 4
Female 6 6 2 3 2
Total 10 12 8 4 6
Age


SEX DISTRIBUTION
No. of Cases
25
20
15
10
5
0
Male
Female
No. of Cases 21 19


PERSONAL HABITS
No. of Patients & Percentage
100
90
80
70
60
50
40
30
20
10
0
7
17.50
33
82.50
16
40.00
17
42.50
Vegetarian
Mixed Diet
Smoking
Alcohol
No. of Cases
7
33
16
17
Percentage
17.50
82.50
40.00
42.50
Personal Habits


Signs and Symptoms During Admission
No. of Cases & Percentage
120
100
80
60
40
20
0
97.5
92.5
55
40
70
39
37
22
16
2
5
28
Epigastric pain
Heart burn
Regurgitation
Nausea
Vomiting
Abdominal Distension
No. of cases
39
37
22
16
2
28
Percentage
97.5
92.5
55
40
5
70
Signs & Symptoms

CLINICAL STUDY ON PACHAI KARPOORATHI CHOORANAM IN OUT-PATIENT DEPT. IN THE MANAGEMENT OF GUNMAM

S. No	O.P. No.	Name, Age / Sex	Complaints	Duration of Treatment in days	BT & AT	BLOOD										URINE			MOTION		X Ray BMS / Endoscopy	Result
						TC Cells / Cumm	DC (%)			ESR (mm)		Hb g %	Sug mg%	Ur mg%	Cho mg%	Alb	Sug	Dep	Ova	Cyst		
							P %	L %	E %	1/2 Hr.	1 Hr.											
1	5472	Rukkumani 45/F	Epigastric pain, heart burn, regurgitation, abdominal distension	56	BT	8400	57	40	3	14	25	12	87	25	182	N	N	FEP	N	N		Good
					AT	9100	60	37	3	12	20	12	90	22	178	N	N	N	N	N		
2	8468	Basha 35/M	Epigastric pain, heart burn	63	BT	9000	58	36	6	10	20	10.5				N	N	OPC	N	N		Good
					AT	9400	61	29	10	12	24	11	136	22	184	N	N	OPC	N	N		
3	9747	Purushothaman 41/M	Epigastric pain, heart burn,regugitation, nausea, abdoninal distension	63	BT	10800	62	33	5	20	38	11	255	22	181	N	N	OPC	N	N		Good
					AT	9600	65	31	4	10	19	11.5	230	3	197	N	N	OPC	N	N		
4	1162	Adhimoolam 40/M	Epigastric pain, heart burn, regurgitation, abdominal distension	63	BT	10900	67	29	4	8	20	11	130	28	208	N	N	N	N	N		Good
					AT	10300	63	35	2	5	12	11	112	24	202	N	N	N	N	N		
5	9980	Mannar 60/M	Epigastric pain, heart burn, regurgitation, abdominal distension.	56	BT	10600	61	34	5	15	34	11	148	23	179	N	N	FPC	N	N		Good
					AT	10200	57	38	5	12	20	11	135	28	194	N	N	FPC	N	N		
6	2292	Moorthi 68/M	Epigastric pain, heart burn, abdominal distension, constipation	56	BT	10500	63	31	6	12	25	11	92	22	211	N	N	OPC	N	N		Moderate
					AT	9200	67	30	3	15	26	11.5	94	21	204	N	N	OPC	N	N		
7	5078	Kanagaraj 37/M	Epigastric pain, regurgitation, nausea, abdoninal distension.	56	BT	9700	56	40	4	7	14	14	112	14	186	N	N	N	N	N		Moderate
					AT	8900	59	37	4	5	15	14	121	13	185	N	N	N	N	N		
8	5317	Pushpam 57/F	Epigastric pain, heart burn, regurgitation, abdominal distension	63	BT	10900	60	34	6	24	40	10	266	30	207	N	N	OPC	N	N		Good
					AT	10200	58	36	6	20	37	10	236	27	202	N	N	OPC	N	N		
9	6021	Sukira velu 67/M	Epigastric pain, heart burn, nausea	56	BT	9400	62	31	3	5	12	14.2	113	13	234	N	N	N	N	N	AG & BD	Good
					AT	8700	56	42	2	4	8	15	110	14	227	N	N	N	N	N	N	
10	6382	Gnanasekaran 46/M	Epigastric pain, heart burn, abdominal distension	56	BT	10200	60	34	6	2	3	11	113	20	189	N	N	N	N	N		Moderate
					AT	9600	56	40	4	4	9	12	110	24	196	N	N	N	N	N		
11	7256	Sankar 43/M	Epigastric pain, heart burn regurgitation, neusea, abdominal distension	63	BT	10600	63	31	6	10	18	12	133	311	184	N	N	N	N	N		Good
					AT	10400	60	37	3	10	14	12.5	135	24	197	N	N	N	N	N		
12	7583	Periasami 50/M	Epigastric pain, regurgitation, nausea, vomiting, abdominal distension	63	BT	9900	60	34	6	11	26	9.5	260	28	189	N	N	N	N	N		Good
					AT	10200	56	42	2	12	23	10	223	27	204	N	N	N	N	N		
13	7890	Vaidegi 32/F	Epigastric pain, heart burn	56	BT	8500	70	24	6	8	15	8	98	26	201	N	N	N	N	N		Moderate
					AT	8700	64	37	3	5	10	8	102	23	210	N	N	N	N	N		
14	9568	Selvi 37/F	Epigastric pain, heart burn, nausea.	56	BT	9700	55	40	5	24	35	9.5	110	32	178	N	N	FPC	N	N		Good
					AT	10100	60	38	2	20	30	9.5	98	23	187	N	N	FEC	N	N		
S.	O.P.	Name,	Complaints	Duration of	BT &	BLOOD										URINE			MOTION		X Ray BMS /	Result

No	No.	Age / Sex		Treatment in days	AT	TC Cells / Cumm	DC (%)			ESR (mm)		Hb g %	Sug mg%	Ur mg%	Cho mg%	Alb	Sug	Dep	Ova	Cyst	Endoscopy	
							P %	L %	E %	1/2 Hr.	1 Hr.											
15	494	Valli 40/F	Epigastric pain, heart burn, abdominal distension	63	BT	9500	59	36	5	12	20	10.5	80	18	175	N	N	N	N	N		Good
					AT	10200	60	37	3	10	22	11	93	22	187	N	N	N	N	N		
16	94	Pooranam 45/F	Epigastric pain, heart burn, nausea, abdominal distension	63	BT	10800	66	30	4	25	54	11	104	21	208	N	N	OPC	N	N		Good
					AT	10300	65	29	6	18	38	12	97	24	210	N	N	OPC	N	N		
17	1101	Selvam 39 / M	Epigastric pain, heart burn, regurgitation, nausea, abdominal distension, loss of appetite, constipation	56	BT	10600	63	32	5	2	3	12	93	20	183	N	N	FPC	N	N	AG	Moderate
					AT	10800	65	29	6	3	5	11	97	24	169	N	N	N	N	N	N	
18	4795	Arumugam 32/M	Epigastric pain, heart burn regugitation, nausea, vomiting	56	BT	7800	70	28	2	6	13	13	127	31	205	N	N	N	N	N		Good
					AT	9100	64	34	2	8	17	13	115	24	210	N	N	N	N	N		
19	7644	Venkatesan 29/M	Epigastric pain, heart burn	56	BT	10300	52	45	3	9	15	2.5	90	20	197	N	N	N	N	N		Good
					AT	11000	54	44	2	10	17	13	97	23	210	N	N	N	N	N		
20	7839	Annamalai 65/M	Epigastric pain, heart burn	56	BT	9800	57	36	7	4	11	10	109	31	189	N	N	N	N	N		Good
					AT	9200	59	36	5	5	10	11	100	27	180	N	N	N	N	N		
21	1641	Kamalam 60/M	Epigastric pain, heart burn, abdominal distension	56	BT	9100	57	38	5	82	100	9	83	21	179	N	N	N	N	N		Good
					AT	9800	55	40	5	47	85	10	92	24	182	N	N	N	N	N		
22	1732	Vasantha 64/F	Epigastric pain, heart burn, regurgitation, nausea, abdominal distension	56	BT	9800	60	33	7	12	20	10	93	25	197	N	N	FEC	N	N		Good
					AT	10200	65	30	5	10	17	9	94	26	180	N	N	FEC	N	N		
23	3782	Ramanan 41/M	Epigastric pain, heart burn, regurgitation, oral ulcer	48	BT	9000	52	44	4	15	26	12	101	24	190	N	N	N	N	N		Moderate
					AT	9400	56	39	5	10	24	12	107	22	186	N	N	N	N	N		
24	9071	Valli ammai 62/F	Epigastric pain, heart burn, regurgitation, nausea, abdominal distension	56	BT	10000	62	32	6	20	44	10	95	25	196	N	N	N	N	N		Good
					AT	9600	60	37	3	20	40	10	101	24	182	N	N	N	N	N		
25	3096	Rengammal 40/F	Heart burn, oral ulcer, abdominal distension	48	BT	9400	57	38	5	4	12	10	89	22	177	N	N	N	N	N		Good
					AT	9600	58	38	4	5	10	10	92	24	184	N	N	N	N	N		
26	5806	Kumar 23/M	Epigstric pain, heart burn, loss of appetite, constipation	48	BT	9200	63	30	7	3	7	12	93	27	160	N	N	N	N	N		Good
					AT	9700	65	28	7	4	8	12	98	30	177	N	N	N	N	N		
27	5994	Tharani 30/F	Epigastric pain, heart burn, regurgitation, nausea, abdominal distension	56	BT	9800	57	38	5	24	40	10	115	18	169	N	N	OPC	N	N		Mild
					AT	10100	58	38	4	20	35	12	104	20	174	N	N	N	N	N		
28	2621	Usha Devi 25/F	Epigastric pain, regurgitation, abdominal distension	56	BT	9800	60	34	6	12	20	11	85	24	153	N	N	OEC	N	N		Good
					AT	10100	63	35	2	17	30	10	94	26	169	N	N	OPC	N	N		

S.	O.P.	Name,	Complaints	Duration of	BT &	BLOOD	URINE	MOTION	X Ray BMS /	Result

No	No.	Age / Sex		Treatment in days	AT	TC Cells / Cumm	DC (%)			ESR (mm)		Hb g %	Sug mg%	Ur mg%	Cho mg%	Alb	Sug	Dep	Ova	Cyst	Endoscopy	
							P %	L %	E %	1/2 Hr.	1 Hr.											
29	4856	Ramasami 28/M	Epigastric pain, heart burn, nausea	56	BT	9400	52	44	4	10	16	11	84	18	150	N	N	OPC	N	N		Moderate
					AT	9800	60	37	3	8	15	11	89	24	166	N	N	N	N	N		
30	4899	Selvaraj 44/M	Epigastric pain, heart burn, regurgitation, abdominal distension	48	BT	10200	62	27	11	12	20	12	108	26	192	N	N	FPC	N	N		Good
					AT	10600	61	33	6	4	8	12	96	27	185	N	N	FPC	N	N		
31	7487	Prabu 22/M	Epigastric pain, heart burn, constipation	48	BT	8800	65	32	3	10	15	13	104	30	197	N	N	FEC	N	N		Good
					AT	8900	65	32	3	12	19	13	116	30	186	N	N	FEC	N	N		
32	7590	Malliga 57/F	Epigastric pain, heart burn, regurgitation, loss of appetite, abdominal distension	48	BT	9200	63	31	6	12	25	10.5	83	23	195	N	N	OPC	N	N		Good
					AT	9400	60	36	4	10	15	11	97	26	187	N	N	N	N	N		
33	8599	Ameer boy 40/M	Epigastric pain, heart burn regurgitation, abdominal distension	56	BT	9900	60	34	6	10	18	12	137	31	215	N	N	N	N	N	BD	Good
					AT	9700	56	42	2	14	21	12	118	27	203	N	N	N	N	N	N	
34	8622	Jeya 26/F	Epigastric pain, heart burn, abdominal distension	48	BT	10500	58	37	5	6	14	12	99	28	210	N	N	N	N	N		Good
					AT	9500	60	36	4	12	30	13	105	27	195	N	N	FEC	N	N		
35	9406	Jai Shanthi 35/F	Epigastric pain, heart burn regurgitation, nausea, abdominal distension	56	BT	8600	71	27	2	2	4	9	87	24	185	N	N	FEC	N	N		Good
					AT	9100	66	30	4	3	5	9	88	26	191	N	N	FEC	N	N		
36	9481	Sheela 20/F	Epigastric pain, heart burn, regurgitation, nausea	48	BT	10000	63	31	6	12	20	10	99	15	143	N	N	OEC	N	N		Mild
					AT	9700	57	37	6	13	24	11	104	17	152	N	N	N	N	N		
37	9642	Samundeeswari 23/F	Epigastric pain, heart burn, abdominal distension	48	BT	9800	54	38	8	12	20	11	103	28	176	N	N	OEC	N	N		Moderate
					AT	10500	55	39	6	10	14	11	109	24	197	N	N	N	N	N		
38	9726	Uma 30/F	Epigastric pain,heart burn, loss of appetite, nausea, abdominal distension	48	BT	10200	62	33	5	5	12	10	118	27	163	N	N	FEC	N	N		Good
					AT	9800	60	37	3	2	3	10.7	104	19	172	N	N	FPC	N	N		
39	337	Perumal 62/M	Epigastric pain, heart burn, regurgitation, abdominal distension.	48	BT	9000	55	42	3	8	13	12	137	18	182	N	N	N	N	N		Good
					AT	9600	58	40	2	5	13	13	139	18	184	N	N	N	N	N		
40	827	Deepa 35/F	Epigastric pain, heart burn, regugitation, abdominal distension	48	BT	10500	62	34	4	8	15	9	110	29	209	N	N	FPC	N	N		Moderate
					AT	10300	61	36	3	9	17	9	104	30	212	N	N	FPC	N	N		

Abbreviation :

BT - Before Treatment, AT - After Treatment, TC - Total WBC Count, DC - Differential Count, Hb - Haemoglobin, Sug - Glucose, Ur - Urea, Cho - Cholesterol, Alb - Albumin, Dep - Deposit, OPC - Occasional Puss Cells, FPC - Few pus cells, N - Nil, P - Neutrophills, L - Lymphocyte, E - Easinophills, AG - Antrl Gastritis, BD - Bulbar duodenitis

BEFORE TREATMENT

Patient Name	Mr.SUGIRVELU.	Sex	MALE
Patient Id	A01652	Visit Date	02 June 2007

AGE:68YRS. OP:197/07
INSTRUMENT: VIDEO ENDOSCOPE GIF TYPE V70

VIDEO ENDOSCOPY REPORT

FINDINGS:

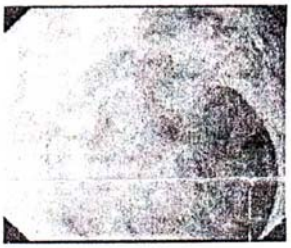
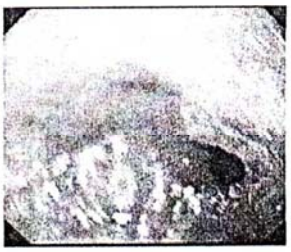
OESOPHAGUS :DISTAL 5CM INFLAMMED.
Oesophago - Gastric Junction :38CM.

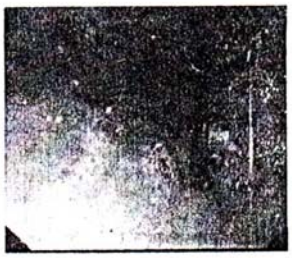
STOMACH
Fundus :NORMAL.
Body :EROSIONS +
Antrum :EROSIONS +
Pylorus :EROSIONS +

DUODENUM
1st Part :ERSIONS +
2nd Part :NORMAL.

CONCLUSION :DISTAL ESOPHAGITIS/EROSIVE CORPUS +/ ANTRAL GASTRITIS/BULBAR DEODENITIS.

DR.VENKATESWARAN.
GASTROENTEROLOGIST

AFTER TREATMENT

AFTER TREATMENT

Balaji Hospitals (P) Ltd.

No.1, LAWYER JAGANATHAN STREET, GUINDY, CHENNAI - 600 032.
Phone : 22342402, 22343863, 22345282 Fax : 044 - 22324570

PATIENT'S NAME : Mr. SUKIRA VELU — Age / Sex : 67 / M

Ref. by : Dr. S. PAVANAN, M.D. (S) — Date : 29/10/07

REPORT ON ENDOSCOPY

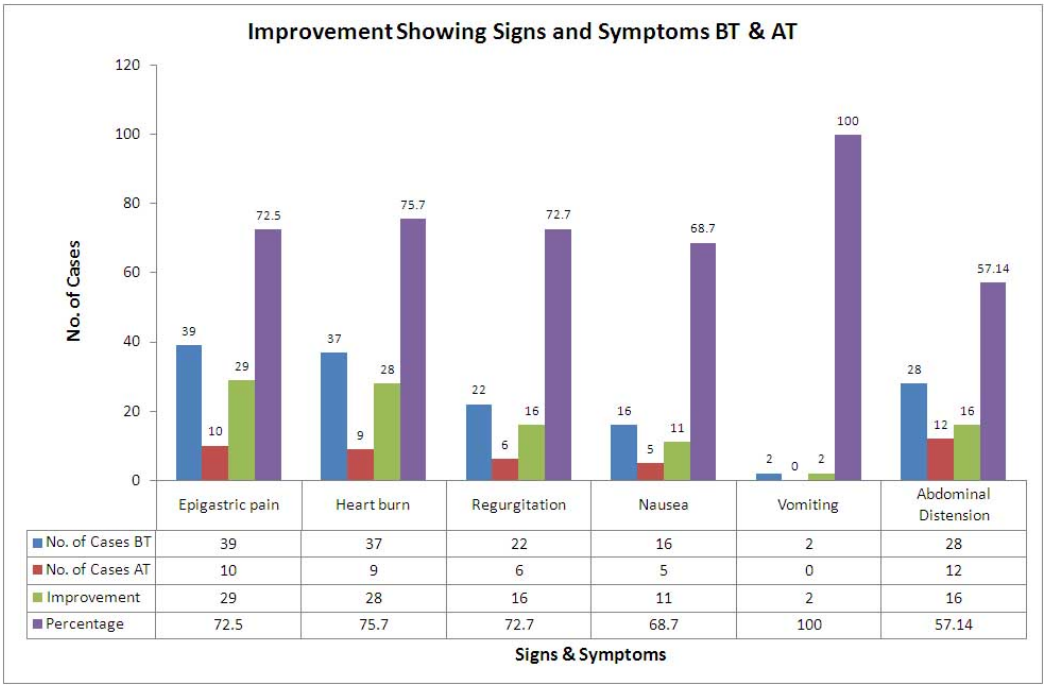
OESOPHAGUS	:	AT 40 cm., Normal mucosal Study
STOMACH	:	Fundus - Normal mucosal study, no ulcer growth
		Body - Normal mucosal study no ulcer growth
		Antrum - Normal mucosal study, no ulcer growth
DUODENUM	:	I PART - Normal, No ulcer growth
		II PART - Normal, No ulcer growth
IMPRESSION	:	NORMAL STUDY

Dr. S. CHANDRASEKAR, M.D.,D.M.,

Result :

The results are based on the clinical improvement on signs and symptoms before and after treatment.

- The total relief from symptoms were considered as **good** relief.
- The relief from epigastric pain, heart burn, regurgitation were considered as **moderate** relief.
- The relief from heart burn, nausea and vomiting were considered as **mild** relief.



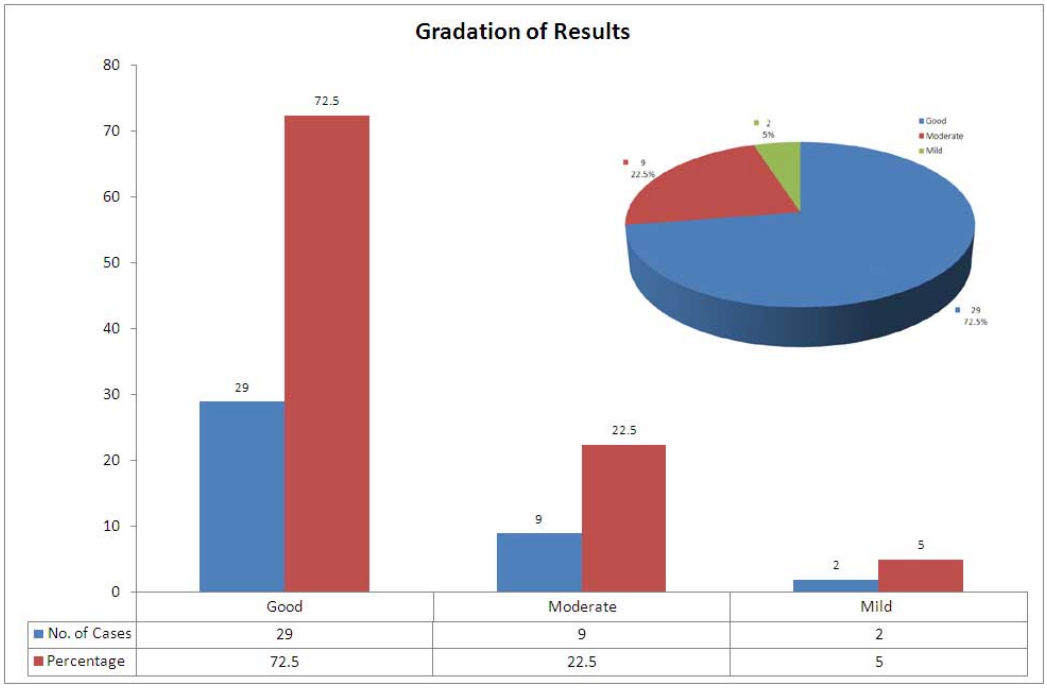


Table - 8 : Results of statistical analysis of subjective parameters observed before and after treatment of (n = 40) patients.

S. No.	Parameters	Percentage present			Statistical test criterion	Probability Value (P)	Statistical Significance of the Difference
		Before Treatment	After Treatment	Difference			
1	Epigastric pain	39/40 (97.5)	29/39 (74.35)	23.74	Z = 9.8	< 0.05	Significant
2	Heart Burn	37/40 (92.5)	28/37 (75.67)	18.19	Z = 8.7	< 0.05	Significant
3.	Abdominal distension	28/40 (70)	16/28 (17.14)	18.37	Z = 7.3	< 0.05	Significant

DISCUSSION

Todays fast moving life style with its unhealthy food habits and increased stress are taking its roll on human health. Gunmam is one of them, increasing at an alarming rate.

As it has been told by Hakkem P. Mohamad Abudllah Saibu in ANUBOGA VAIDYA NAVANEETHAM (Part VIII) that Pachai Karoorathi Chooranam, an antiulcer medicine and also its ingredients Pachai Karpooram Cinnamon bark, black pepper are used to cure Acid peptic disorders. Nut meg, cinnamon leaves, siru-nagappu and black pepper root are having carminative and stomachic actions. This medicine can be known to act good on peptic ulcer disease more over the informations from literatures and web sites proved this evidence true.

"தொடர் வாத பந்தமிலாது குன்மம் வராது" (தேரன்)

As per siddha system, Gunmam is caused by the derangement of vatha kutram.

Pachai Karpooram is having salt and bitter taste.

"சிறுக அளவோடு .....
அமுலகற்றும் ..... பாக்கும்
..... செய்கை நவில்" (ம.த.பா.)
"கொடிறுவாய் தொண்டை .....
..... உப்பால் வரும்"[64]

Quoted that a lot of salivation occurs in the mouth due to the taste salt. The production of saliva help better digestion of food.

"குடற்புழு குட்டம் .....
.....
வளர்க்கும் மெளிதாம் செரிக்கக் கரகரப்...."[64]

From the above poem, it is understood that bitter taste has vermicide action heals the ulcers caused by the worms and also improves the digestion.

As per the siddha text, Gunmam is caused by the derangement of vatha kutram,

"வாதம் மேலிட்டால் மதுரம் புளியுப்பு" (கண்ணுசாமியம்)

It is proved that vatham is passified by salt taste.

Hence the drug Pachai Karpoorathi Chooranam which is salty in taste, reduce the deranged vatha kutram.

Bio-chemical analysis of pachai karpoorathi chooranam shows the presence of calcium, zinc, copper, Iron which have the antiulcer properties.

The anti-microbial study of Pachai karpoorathi Chooranam shows that it is highly sensitive E-coli and klebsiella and moderatively sensitive to pseudomonas.

The pharmacological study of pachai karpoorathi chooranam shows that it passifies the acidity levels of the gastric juice and protects the gastric mucosa from injury. Hence it is proved to be good for Gunmam.

The clinical study was conducted under the following creteria age, sex, soci-economic status, personal habits, diet and occupation.

40 patients of age from 20 to 60 were selected and pachai karpoorathi chooranam was given with ghee three times a day before food.

"மேகம் வயிற்றெறிவு விக்கலழல் - மாகாசங்
குன்மம் வறட்சி ....."[60]

The above lyrics states that cow ghee has the anti ulcer activity.

Diagnosis was done on the basis of modern and siddha principles. The routine investigations of blood, urine, stools and endoscopic studies were done. All patients were diagnosed as Gunmam.

Among 40 patients, the epigastric pain was found to be decreased in 73% of patients.

The heart burn was found to be decreased in 76% of patients.

Abdominal discomfort was found to be decreased in 57% of patients.

My clinical findings showed that the people belonging to the age group of 20 to 40 years are mostly affected. It is noted that people belonging to poor socio economic group, mostly of males who are drivers and labours are more prone to Gunmam. People taking much of non-vegetarian food items and alcohol are also commonly affected.

On giving pachai karpoorathi chooranam, people belonging to the following category showed better improvement.

- Male, middle class and rich people
- 20 to 40 years age group
- Students and house wives

The alcoholics, non vegetarians and smokers showed late recovery.

Pachai karpoorathi chooranam acts good in 73%, moderate 23% and mild in 5%.

After the treatment the complete blood, urine, motion examinations were done and the results were normal as they found before.

No unwanted and adverse effects have been noted during the course of treatment.

From the above studies, it is found that Pachai Karpoorathi Chooranam has antiulcer property and effective in the treatment of Gunmam.

Hence, the **Pachai Karpoorathi Chooranam** has been proved to be clinically effective for Gunmam.

SUMMARY

The formulation of Pachai Karpoorathi Chooranam was selected for anti-ulcer activity with great inspiration since it was described in siddha literature as a effective drug for all types of Gunmam.

Gunapadam aspect of the drug gave so much hope about the ulcer healing activity of the drug.

Modern aspect showed the drug is beneficial in gastro-intestinal disorders.

The bio-chemical analysis expressed the presence of calcium, zinc, copper, Iron which are known well for their ulcer healing property.

The microbial analysis showed the drug was highly sensitive to E-coli and klebsiella.

The phamacological study of the drug showed significant antiulcer activity.

The clinical study also proved the pharmacological action of drug shows,

- Good response in 73% of cases.
- Moderate response in 23% of cases.
- Mild response in 5% of case.

The above studies of the drug "Pachai Karpoorathi Chooranam" state that it can be successfully used for the treatment of Gunmam.

CONCLUSION

The drug **Pachai Karpoorathi Chooranam** has been selected and various studies carried out to find out its efficacy in the treatment of Gunmam.

- Availability, preparation and preservation of the drug is easy and also economical.
- The various studies clearly showed the antiulcer activity of the drug.
- The clinical study proved that the drug was effective and good in 73% of cases and showed moderate response in 23% of cases.
- All the above studies and results lead to a fact that the formulation of **"Pachai Karpoorathi Chooranam"** can play a good role in **Gunmam**.

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