

RESEARCH ARTICLE

 OPEN ACCESS

Received: 04-11-2024

Accepted: 14-11-2024

Published: 24-12-2024

Citation: Abarna B, Raghavi M, Suresh R, Adithya RS, Amirtharaj D, Kanimozhi S (2024) An Evidence-Based Review of Parangipattai Pathangam for its Therapeutic Efficacy. Indian Journal of Science and Technology 17(47): 4929-4937. <https://doi.org/10.17485/IJST/v17i47.2673>

* **Corresponding author.**adithyasa83@gmail.com**Funding:** None**Competing Interests:** None

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Published By Indian Society for Education and Environment ([iSee](https://www.indjst.org/))

ISSN

Print: 0974-6846

Electronic: 0974-5645

An Evidence-Based Review of Parangipattai Pathangam for its Therapeutic Efficacy

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Abstract

Background: The Siddha system of medicine, integrates ancient philosophy with scientific principles, focusing on the transformation of metals and minerals into nanoparticles through various processes. Parangipattai Pathangam, a Siddha Herbo-mineral sublimate, illustrates this process by sublimating metals like mercury, sulphur, and cinnabar with pretreated Smilax china Linn soaked in various herbal juices to create a fine therapeutic powder. Scientific analysis confirm its stability, acidic nature, and bioactive compounds, validating its long shelf life and diverse applications. **Objective:** A review of the scientific literature on the ingredients of Parangipattai pathangam was undertaken. **Method:** This comprehensive assessment involved searching through Siddha literature, unpublished dissertations, Thesis, as well as relevant publications in multiple databases and electronic search engines, including National Library of Medicine (NLM), Pub Med Central, Science Direct, Embase, Mendely, Google scholar. The aim was to gather all pertinent information available on the subject. The pharmacological review highlights its anti-inflammatory, wound healing, and antioxidant activities, which align with traditional Siddha uses. Previous studies on advanced techniques such as HPTLC, FT-IR spectroscopy, SEM-EDS, and TGA characterize Parangipattai Pathangam, revealing particle sizes below 50 nm and a crystalline structure with enhanced bioavailability. Toxicity studies demonstrate its safety in controlled doses. **Novelty:** This study emphasizes the blend of ancient wisdom and modern scrutiny, offering the potential for contemporary medical advancements while preserving traditional

healing practices. Further research aims to expand its therapeutic applications.

Keywords: Parangipattai Pathangam; Siddha Sublimate; Siddha; Purification

1 Introduction

Siddha medicine incorporates a holistic approach to health, aiming to balance the mind, body, and spirit. This system emphasizes the use of herbs, minerals, metals, and animal sources in its treatments. Metals and minerals play a significant role in Siddha medicine. While metals can be detrimental in large quantities, the Siddha system has developed methods to purify and process them to make them safe for consumption⁽¹⁾. One such method involves breaking down the metals into micro-, nano- particles. Micro- nano- particles have unique properties which can alter their reactivity and bioavailability⁽²⁾. When taken in recommended dosages, these forms of metals do not accumulate in the body, reducing the risk of toxicity⁽²⁾. Such medicines in the Siddha system include Parpam, Chenduram, Pathangam, Chunnam, etc⁽³⁾. The benefits of micro, nano-particles include: 1. They are more easily absorbed by the body. 2. Properly prepared micro-, nano-particles do not accumulate in the body, minimizing potential toxicity. 3. The unique properties of micro-, nano-, particles can enhance the effectiveness of the medicine⁽⁴⁾. One such nano-particle is sublimate - Pathangam obtained by the process of sublimation. It is a critical process in the preparation of certain Siddha medicines which involves converting a solid directly into a vapor without passing through the liquid phase. Sublimation is an endothermic process as it requires the input of energy to take place. This energy is required for breaking the molecular band from solid to gas/Vapor⁽⁵⁾. In the context of Siddha medicine, this process is used to purify and transform substances, particularly metals and minerals, into a form that can be safely ingested. Sublimate is one of the 32 internal medicines mentioned in Siddha literature⁽⁶⁾. The preparation of sublimate involves both organic and inorganic substances, which are subjected to sublimation using a specific apparatus known as the Sublimation apparatus (Pathanga Karuvi)⁽⁶⁾. This apparatus facilitates the conversion of solids into vapor, which then condenses back into a purified solid form. The process begins with the selection of appropriate raw materials, which can include various metals and minerals. The Pathanga Karuvi is set up to ensure efficient sublimation. This apparatus usually consists of a container for the raw materials and a cooling section where the vapor condenses. The raw materials are heated in the apparatus. As they reach the sublimation point, they turn into vapor. The vapor rises and moves to the cooler part of the apparatus, where it condenses back into a solid form. This solid form is often purer and has different properties compared to the original raw material. The final product may be now in micro, nanoparticle form, which is collected and prepared for medicinal use. Dosages are carefully measured to ensure safety and efficacy⁽⁷⁾.

By carefully controlling the dosage and preparation methods, Siddha practitioners ensure the safety and efficacy of their medicines. Sublimates have a shelf life of 10 years⁽⁶⁾. Parangipattai Pathangam is one such Siddha Herbo-mineral sublimate that has been used for decades. The study was constrained by the limited availability of research articles specifically investigating the pharmacological properties of the plant parts utilized in Parangipattai Pathangam. Despite several studies on the individual ingredients used in the formulation, the collaborative action of the formulation has not yet been studied scientifically. Thus, the review discusses the drug profile of parangipattai Pathangam.

1.1. Research contributions

This research provides scientific validation of Parangipattai Pathangam, demonstrating its pharmacological efficacy, safety, and nanocrystalline characteristics. Bridging ancient wisdom with modern science, this study confirms the therapeutic potential of Parangipattai Pathangam and outlines future research directions.

1.2. Research Gaps

Despite its traditional use in treating various diseases, Parangipattai Pathangam remains understudied in terms of pharmacological effects. This study aims to bridge the research gap and stimulate further studies on the therapeutic potential of this formulation.

1.3. Research Questions

How does the pharmacological activity of individual ingredients interact to produce the overall therapeutic potential of Parangipattai pathangam?

2 Review Methodology

2.1 Collection of literature:

A systematic literature review was conducted for the period of 3 months, utilizing Siddha literature, dissertations, thesis, and electronic databases such as NLM, PubMed Central, ScienceDirect, Embase, Mendeley, and Google Scholar from the years 2019-2024. The search employed specific keywords related to Parangipattai Pathangam, including "Smilax china tuber," "Mercury," "Sulphur," "Cinnabar," "Anbarnesa," "Cow milk" and herbal plant parts like "*Acalypha indica*," "*Lippia nodiflora*," "*Clerodendron inerme*" and "*Eclipta prostrata*". Relevant articles on pharmacological activity were included, while irrelevant studies and those focusing on non-relevant plant parts were excluded. This comprehensive review aimed to provide an in-depth understanding of Parangipattai Pathangam and its efficacy.

2.2 Formulation:

Table 1. Ingredients of Parangipattai Pathangam

Ingredient	English Name	Chemical name/ Botanical Name	Quantity Required
Parangipattai	China root	<i>Smilax china</i> Linn	5 parts
Rasam	Mercury	Hydrargyrum perchloride (Hg)	5 parts
Gandhagam	Sulphur	Sulphur (S)	1 part
Lingam	Cinnabar	Red sulphide of mercury (HgS)	5 part

Table 2. Ingredients for pretreatment of Parangipattai

Solvent	Soaking Time
Donkey dung mixture	24 Hours
<i>Acalypha indica</i> Linn leaf juice	24 Hours
<i>Lippia nodiflora</i> Linn juice	24 Hours
<i>Eclipta prostrata</i> Linn juice	24 Hours
<i>Clerodendron inerme</i> Linn	24 Hours
Cow's milk	24 Hours

2.3 Purification:

Each ingredient is purified based on the literature⁽⁷⁾.

Mercury:

- Rasam (Mercury) is ground with Turmeric (*Curcuma longa* Linn) and Brick powder each for 1 hour and burn with *Acalypha indica* Linn leaf juice until the juice evaporates⁽⁷⁾.
- The required quantity of mercury is squeezed 1000 times with a thick cloth (Kambili). Then it is placed in an earthen pot and fresh water is added until the mercury level is raised by one inch. The pot is heated by a small fire. The water level is maintained by adding more water. When the mercury turns black, it is separated from the water⁽⁷⁾.
- The seeds are extracted from the chilly fruits and mercury is added. Ivy gourd leaf (*Coccinia grandis* Linn) poultice of four fingers thickness, is placed on the chilies and covered with seven layers of mud-paste-coated cloth, dried, and subjected to incineration using 10 cow dung cakes (Kukkuda pudam)⁽⁷⁾.
- Mercury (35 mg) is mixed with 166.25 gm of thumbai (*Leucas aspera* Willd) plant juice and subjected to Suriya Puda. For 10 days, repeat this process with fresh juice added daily. After that, the juice is not added and it is insulated. Additionally, this procedure is carried out once more on a day. The mercury is then placed in a clay pot together with the powder that was there. After adding the 2800 mg of thumbai juice (*Leucas aspera* Willd), it is sealed, buried, and left for 20 days. After giving it a quick wash with water, it is removed⁽⁷⁾.

Sulphur:

- Mix the *Lawsonia inermis* Linn leaf paste with cow's curd in a mud pot, cover it with another pitted pot, put sulphur on top and seal it with another mud pot, bury it in a hole, place cow dung cakes on top of the mud, and burn it until the sulphur melts and descends. Collect and repeat this seven times⁽⁷⁾.
- Sulphur is melted with cow's butter and poured into Cow's Milk. Then the resultant sulphur is taken, this procedure is done 30 times. Every time new milk should be used⁽⁷⁾.
- Instead of milk, sulphur is melted ten times in banana stem juice (*Musa paradisiaca* Linn). This method is done 10 times. By this method, it is said that the oil in the sulphur will be removed⁽⁷⁾.

Lingam:

- Soak lingam in Breast milk and lemon juice (*Citrus Limon* Linn) respectively for 1 day⁽⁷⁾.
- Lemon Juice, Milk, and Juice of *Acalypha indica*. Linn is mixed in equal proportion and allowed to fuse with Lingam as it gets into a consolidated form⁽⁷⁾.
- Cut and crush one ounce (1,400 gms) of *Alangium salvifolium* (L.f.) Wang bark, put in 5.2 liters of fermented rice water, and keep it in the moonlight overnight. Next morning, knead it well and mix it. Take 35 grams of cinnabar and make a pouch. Add this pouch to the above mixture and boil for 24 hours on low flame, take it and wipe it, and as before, the cinnabar pouch is boiled with the water mixed with tamarind mercy mixture and the fermented rice water mixed with nannari root (*Hemidesmes indica* Linn) separately⁽⁷⁾.

2.4 Preparation:

Initially, Parangipattai (*Smilax china* Linn) is made into small pieces and pretreated in Donkey dung mixture followed by *Acalypha indica* Linn leaf juice, *Lippia nodiflora* Linn juice, *Eclipta prostrata* Linn juice, *Clerodendron inerme* Linn and Cow's milk respectively each for 24 hours⁽⁶⁾.

Purified rasam (mercury), purified ganthagam (sulfur), and purified lingam (red sulfide of mercury) were ground together and placed in the lower pot of the Siddha sublimation apparatus. The pre-treated *Smilax china* Linn was loaded in a perforated mud plate and kept over the mouth of the lower pot. An inverted identical mud pot should be placed over it and sealed tightly with clay plasters and let to dry. Then, the lower pot was subjected to heat in a low flame for approximately 3 hours thus, condensation takes place leading to the sediment of vapor in the upper part of the lid. Then it was cooled adequately for 4 hours and the sublimated drug was collected carefully by using a brush and ground with the Parangipattai pieces (*Smilax china* Linn)^(6,7).

- **Dose:** 100 to 200mg⁽⁸⁾
- **Adjuvant:** Palm Jaggery⁽⁸⁾
- **Dosage:** 48 days without any dietary regimen⁽⁸⁾.
- **Indications:** Halitosis, venereal diseases, ulcers, skin diseases, scabies, hypo-hyper pigmentation, toothache, pain⁽⁸⁾.

3 Overview

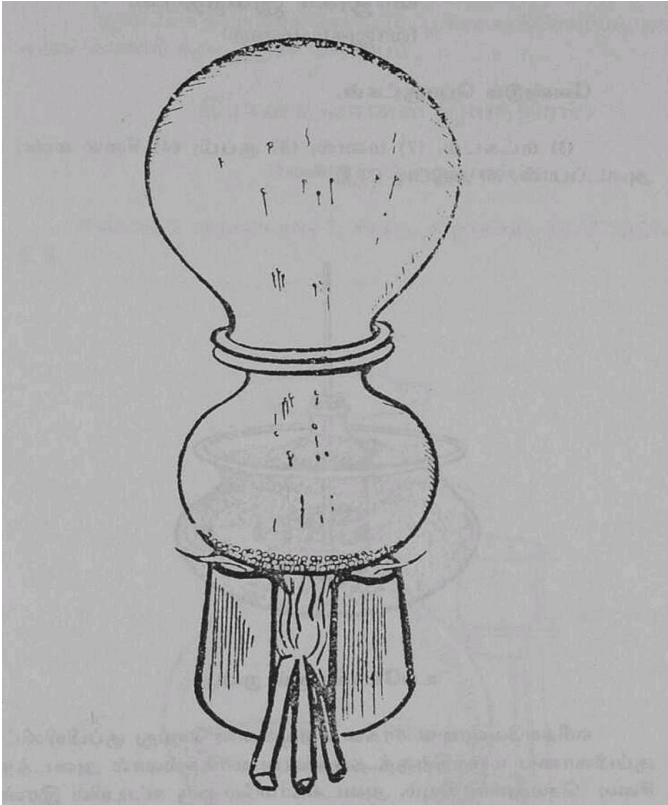


Fig 1. Siddha Sublimation Apparatus (Pathanga Karuvi)

Table 3. Characteristics of Metal/ Mineral raw drugs of Parangipattai Pathangam

Ingredient	English name	Color	Taste	Potency	Action
RASAM	Mercury	Silver white	Astringent Sour Bitter Salty pungent and Sweet	Hot and Cold	Tonic Alterative Lax- ative Cholagogue Diuretic Resolvent Sialogogue ⁽⁶⁾
GANDHAGAM	Sulphur	yellow, Straw & honey yellow, Yellowish brown, Greenish, Reddish to yellowish green	Bitter Astringent	Hot	Laxative Tonic Anti- septic ⁽⁶⁾
LINGAM	Red sulphide of Mercury	Red	No taste	Hot	Tonic ⁽⁶⁾

Table 4. Characteristics of Herbal raw drugs of Parangipattai Pathangam

Ingredient	Taste	Potency	Division	Action
<i>Smilax china</i> Linn	Sweet	Cold	Sweet	Alterative, Antisymphilitic, Aphrodisiac, Depura- tive ⁽⁹⁾
<i>Acalypha indica</i> Linn leaf juice	Bitter, pungent	Hot	Pungent	Anodyne, Anthelmintic, Cathartic, Diuretic, Emetic, Expectorant, Emmenagogue ⁽⁹⁾
<i>Lippia nodiflora</i> . Linn juice	Bitter, Astringent	Hot	Pungent	Demulcent, Deobstruent, Diuretic, Astringent, Expectorant, Tonic ⁽⁹⁾
<i>Eclipta prostrata</i> Linn juice	Bitter	Hot	Pungent	Cholagogue, Tonic, Alterative, Emetic, Purga- tive, Hepictonic, Astringent, Deobstruent ⁽⁹⁾

Continued on next page

Table 4 continued

<i>Clerodendrum inerme</i> Linn	Bitter	Hot	Pungent	Alterative, Febrifuge, Tonic ⁽⁹⁾
Juice				

Table 5. Literature review of Metal/Mineral ingredients of Parangipattai pathangam

Ingredient	Therapeutic Properties	Extracts	Studies Employed
MERCURY	Anti-inflammatory, Antibacterial, Anti-apoptosis	Mercury	Mercury and its compounds have been used for over 3,000 years for a variety of reasons, including anti-parasitic, anti-syphilis, antipruritic, preservative, anti-inflammatory, diuretic, and anti-bacterial agents, as well as in dental amalgams as replacements ⁽¹⁰⁾ .
SULPHUR	Anti-Microbial activity	Raw sulphur, purified sulphur and Gendhi mezhugu	In- Vitro – Antimicrobial activity against <i>E. Coli</i> , <i>P. Vulgaris</i> , <i>K. Pneumoniae</i> , <i>S. Aureus</i> , <i>S. Mutans</i> ⁽¹¹⁾
CINNABAR	Antioxidant activity	Cinnabar	In-Vitro - HK-2 cells induced by serum-nutrient starvation ^(11,12)
	Anti-inflammatory activity		In-Vitro and In-Vivo (Zebrafish) – reactive oxygen species (ROS) induced by hypoxia ^(11,13) In-Vivo (Mice) - against LPS plus MPTP-induced neurotoxicity and disturbance of gut microbiota ^(11,12)

Table 6. Literature review of Herbal ingredients of Parangipattai pathangam

Ingredient	Therapeutic Properties	Extract	Studies employed
	Anti-inflammatory	Aqueous extract of tuber	In-Vivo - Egg Albumin induced edema ⁽¹⁴⁾
	Anti-nociceptive	Aqueous extract of tuber	In-Vitro - Liposaccharide induced mouse macrophage cell ⁽¹⁴⁾ In-Vivo - Hot Plate Test ⁽¹⁴⁾
<i>Smilax china</i> Linn	Anti-Hyperurecemic activity	Petroleum ether, chloroform, ethyl acetate, n-butanol and residual ethanol fraction) of <i>Smilax china</i>	In-Vivo - Acetic acid induced abdominal constriction test ⁽¹⁴⁾ In-Vivo – Potassium oxonate induced hyperuricemia ⁽¹⁴⁾
	Antioxidant	Various extracts	DPPH radical scavenging activity ⁽¹⁴⁾ Total phenolic content ⁽¹⁴⁾
	Anti-inflammatory activity	Ethyl acetate and methanolic extract	Reducing power ⁽¹⁴⁾ DPPH Inhibition ⁽¹⁴⁾
	Analgesic activity		Carrageenan induced rat paw oedema ⁽¹⁴⁾
	Antibacterial activity	<i>Smilax china</i> L. root extract	Eddy's Hot plate method ⁽¹⁴⁾ In-Vitro - agar diffusion method against Two strains of <i>Cutibacterium acnes</i> strains Viz, KCTC 3314 and KCTC 3320 ⁽¹⁴⁾
<i>Acalypha indica</i> Linn leaf juice	Antioxidant activity	<i>Acalypha indica</i> root extract	Hydroxyl Radical Scavenging activity ⁽¹⁵⁾ Inhibition of hydrogen peroxide ⁽¹⁵⁾ Inhibition of lipid peroxidation ⁽¹⁵⁾
	Anti-inflammatory activity	Methanolic extract of <i>Acalypha indica</i>	In-Vivo – Carrageenan induced rat paw edema ⁽¹⁵⁾
	Antinociceptive		In-Vivo – Acetic acid induced writhing ⁽¹⁵⁾
	Wound healing activity	Extract of <i>Acalypha indica</i>	In-Vivo – Cutaneous wound in Incision wound model ⁽¹⁵⁾
<i>Lippia nodiflora</i> . Linn	Anti-inflammatory	Methanolic extract	In-Vivo – Carrageenan induced rat paw edema ⁽¹⁶⁾

Continued on next page

Table 6 continued

Eclipta prostrata Linn	Antimicrobial activity	Methanolic extract of leaves and flowers	In-Vitro - Disc Diffusion method against <i>Bacillus subtilis</i> , <i>B. cereus</i> , <i>Micrococcus luteus</i> , <i>Staphylococcus aureus</i> , <i>Pseudomonas aeruginosa</i> , <i>Klebsiella pneumoniae</i> , <i>K. oxytoca</i> and <i>Escherichia coli</i> , <i>Aspergillus niger</i> and <i>Candida Albicans</i> ⁽¹⁶⁾ DPPH ⁽¹⁷⁾
	Antioxidant	Extract and isolated compounds	Total Phenolic Content ⁽¹⁷⁾ Total Flavonoids Content ⁽¹⁷⁾ Mouse Writhing test ⁽¹⁷⁾
	Antinociceptive	Hydroethanol Leaf Extract	Formalin induced paw licking ⁽¹⁷⁾ Hot plate test ⁽¹⁷⁾ Haffner's Tail clip test ⁽¹⁷⁾
	Antibacterial activity	Leaf extract	In-Vitro by disc diffusion and Liquid dilution minimum inhibitory concentration method against <i>p. mirabilis</i> , <i>P. vulgaris</i> , <i>S. pneumoniae</i> , <i>A. baylyi</i> , <i>p. aerogenosa</i> ⁽¹⁷⁾
Clerodendron inerme Linn	Anti-inflammatory Analgesic activity Antioxidant activity	Methanolic extract of <i>Clerodendron inerme</i> <i>Clerodendron inerme</i> stem ⁽¹⁸⁾ Methanolic extract of <i>Clerodendron inerme</i> leaf	In-Vivo – Cotton pellet granuloma ⁽¹⁸⁾ In-Vivo – Acetic acid induced writhing ⁽¹⁸⁾ Total phenolic contents, total flavonoid contents, DPPH free radical scavenging assay, reducing power and percentage inhibition of linoleic acid peroxidation. ⁽¹⁸⁾ DPPH, Total phenolic content, Total flavonoids, DPPH, Reducing power, inhibition of linoleic acid peroxidation ⁽¹⁸⁾ .
	Antimicrobial activity	Leaf extract of <i>Clerodendron inerme</i>	In- Vitro by Disc Diffusion Method against <i>Staphylococcus aureus</i> , <i>Escherichia coli</i> , <i>Lactobacillus acidophilus</i> , <i>Lactobacillus plantarum</i> , <i>Rhizopus oryzae</i> , <i>Aspergillus niger</i> and <i>Mucor spp</i> ⁽¹⁸⁾
Cow's Milk	Antioxidant	Cow milk	DPPH ⁽¹⁹⁾ ABTS ⁽¹⁹⁾
	Anti-inflammatory activity	Cow milk	Ferric reducing antioxidant power ⁽¹⁹⁾ oxygen radical absorbance capacity ⁽¹⁹⁾ In-Vitro – Primary gingival fibroblasts and HSC2 cells ⁽²⁰⁾
Donkey Dung	Anti-ulcer activity Antinociceptive activity	Milk proteins	Ethanol induced gastric ulcer ⁽²⁰⁾ Acetic acid-induced writhing mouse ⁽²⁰⁾
	Antibacterial activity	Donkey Dung Smoke and Methanolic extract of Donkey dung Donkey dung smoke	Against <i>Staphylococcus aureus</i> and <i>E. coli</i> through well diffusion method ⁽²¹⁾ Against <i>Pseudomonas aeruginosa</i> and <i>Staphylococcus aureus</i> through direct contact with smoke ⁽²¹⁾
	Cytotoxicity	Donkey dung	In-Vitro – MTT Assay ⁽²¹⁾

3.1 Results and Findings:

Parangipattai Pathangam is a careful combination of ingredients such as metals like mercury, sulphur, and cinnabar transformed into sublimate, along with *Smilax china* Linn soaked in various herbal juices, Siddha medicine aims to harness the therapeutic potential of each component to treat a wide range of ailments. The process involves soaking the ingredient *Smilax china* Linn in juices and decoctions for 24 hours, which transforms the taste and potency of Parangipattai (*Smilax china* Linn) from sweet and cold to pungent and hot without affecting the therapeutic potential of the formulation. That is when antagonistic traits are combined; the dominant trait will overshadow the weaker one⁽²²⁾. This transformation reflects the profound understanding within Siddha medicine and philosophy, where every ingredient and preparation method is carefully selected to achieve specific

therapeutic outcomes.

The formulation is administered along with the adjuvant palm jaggery which has a sweet taste and cold potency. Also, palm jaggery has the potential in treating imbalances in three vital humors⁽²³⁾. Also, the biochemical analysis in previous study showed the presence of calcium, Sulphate, Chloride, Carbonate, and Ferrous iron⁽²⁴⁾. Thus, it would be effective in treating ulcers, halitosis, skin diseases like scabies and hypo/hyperpigmentation and venereal diseases. Additionally, due to its cold potency, the hot nature of the formulation will not affect the body.

Previous studies on Parangipattai Pathangam showed that it was a brown fine powder without any taste and odour having a pH of 6.4 indicating the acidic nature of the drug thus, it is well absorbed in the stomach. The loss on drying was measured at 6.29%, which is below the 7% threshold, suggesting the product has low moisture content and good stability. This supports the claim in the literature that it has a shelf life of up to 10 years. The water soluble and acid soluble ash are 0.98 and 0.19 respectively presence of inorganic residues. The water and alcohol extractive values are found to be 4 and 0.65, indicating the presence of phytochemical constituents. The microscopic analysis of Parangipattai Pathangam showed the presence of fibroscleroid pitted vessels⁽⁷⁾.

High-performance thin-layer Chromatography (HPTLC) of methanol extracts revealed multiple bands under various lighting conditions, indicative of diverse phytochemical constituents. Fourier Transform Infrared (FT-IR) spectroscopy identified functional groups such as C-O, C-C, and C-H, with a notable strong band at 3340 cm^{-1} , suggesting the presence of these molecular structures. Scanning Electron Microscopy coupled with Energy Dispersive Spectroscopy (SEM-EDS) revealed particle sizes below 50 nm and elemental composition including carbon, oxygen, mercury, and sulphur, with a 1:1 atomic ratio of mercury to sulphur⁽⁷⁾. Thermal Gravimetric Analysis (TGA) demonstrated a sharp decomposition peak around 350°C , reflecting the thermal stability. X-ray diffraction (XRD) and SEM-EDS confirmed the crystalline nature of HgS which exhibits lower toxicity and absorption compared to other mercury compounds due to its insolubility in water and biological fluids⁽⁷⁾. This poor solubility of HgS limits its bioavailability, meaning it is not easily absorbed by the body when ingested. Consequently, it poses a lower risk of mercury poisoning compared to more soluble forms of mercury⁽⁷⁾.

The Acute and chronic toxicity studies were conducted in Parangipattai Pathangam according to WHO Guidelines. The acute toxicity studies in 30 Wistar Albino rats were divided into 5 groups at different doses highest at a dose of 640mg/100mg and the results found that there were no toxicity or behavioural changes observed. The chronic toxicity study was carried out in 15 Wistar rats divided into 3 groups (Control, 40mg/animal, 80mg/animal) and administered for 90 days. Histopathological changes were observed and found that toxicity was found in liver and renal tissues at prolonged use⁽²⁴⁾. Thus, acute toxicity was deemed safe, but chronic administration of Parangipattai Pathangam resulted in changes in liver and renal tissues. Consequently, the Siddha system emphasizes taking drug holidays and using adjuvants to potentially prevent these toxic effects.

For instance, mercury and sulphur exhibit antioxidant and anti-inflammatory activities. The lingam formulation showcases a wide array of activities, including anticancer, antioxidant, anxiolytic, and anti-inflammatory effects. *Smilax china* Linn and other herbal extracts exhibit anti-inflammatory, analgesic, and antioxidant activities, which are crucial for managing various diseases (Tables 5 and 6). These studies not only validate the traditional use of these ingredients in Siddha medicine but also provide a scientific basis for their therapeutic efficacy. Further research into these compounds could pave the way for new treatments for various health conditions, bridging the gap between modern medicine and traditional healing practices. This not only advances medical science but also helps preserve the valuable knowledge embedded in traditional remedies. Ultimately, Parangipattai Pathangam highlights the rich complexity and depth of traditional medicine.

4 Conclusion

In recent years, inquisitiveness in the therapeutic potential of traditional medicine formulations has surged. The review clearly indicates the pharmacological properties, sensory characteristics, and chemical composition of all the ingredients align precisely with the indications. Despite individual ingredient studies, the synergistic effects of Parangipattai Pathangam remain unexplored. However, further in-vitro, in-vivo and clinical research are necessary to scientifically validate this medicine in scientific contexts.

Acknowledgements

The authors acknowledge The Director, National Institute of Siddha, and Faculties of Nanju Maruthuvam Department for supporting the study.

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