International Journal of Research and Review
[Indexed, Peer-Reviewed Journal]
Volume 13; Issue: 5; May 2026
Website: www.ijrrjournal.com
Research Paper *E-ISSN: 2349-9788; P-ISSN: 2454-2237*

Phytochemical Evaluation of *Sarathulathi Chooranam*: A Traditional Siddha Formulation for Gastrointestinal Disorders

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DOI: https://doi.org/10.52403/ijrr.20260557

ABSTRACT

Sarathulathi Chooranam is a classical Siddha polyherbal formulation traditionally prescribed for gastrointestinal disorders such as Gunmam (peptic ulcer), Akkini Mantham (dyspepsia), Athisaram (diarrhea), and derangements of Pitham. The present study aimed to qualitatively evaluate its phytochemical constituents using standard PLIM protocols. The formulation comprises medicinal ingredients including *Piper nigrum*, *Piper longum*, *Plumbago zeylanica*, *Nardostachys jatamansi*, *Coriandrum sativum*, *Cuminum cyminum*, *Cissampelos pareira*, *Ferula asafoetida*, *Trachyspermum ammi*, and sodium chloride. Phytochemical screening revealed the presence of alkaloids, flavonoids, phenols, tannins, saponins, steroids, triterpenoids, sugars, and betacyanins, while glycosides, coumarins, proteins, and anthocyanins were absent. These findings indicate the presence of bioactive constituents with potential antioxidant, anti-inflammatory, and gastroprotective properties. This study provides preliminary scientific evidence supporting the traditional use of the formulation in gastrointestinal disorders.

Keywords: Sarathulathi Chooranam, Siddha medicine, phytochemical screening, gastrointestinal disorders, polyherbal formulation, PLIM

INTRODUCTION

The Siddha system of medicine is one of the oldest traditional medical systems, developed by Siddhars through experiential knowledge, spiritual insight, and systematic observation of nature. It encompasses 32 types of internal and 32 types of external therapeutic formulations, each designed for specific clinical applications. Among these, *Chooranam* (powdered formulations) represents an important dosage form due to its ease of administration, rapid absorption, and therapeutic efficacy.

Phytochemicals are naturally occurring bioactive compounds present in plants that play a significant role in defense against environmental stress and pathogens. These compounds exhibit diverse pharmacological activities, including antioxidant, anti-

inflammatory, antimicrobial, and gastroprotective effects. Consequently, phytochemical analysis is essential for validating the therapeutic potential of traditional herbal formulations.

Sarathulathi Chooranam is a classical Siddha formulation indicated for the management of gastrointestinal disorders such as Gunmam (peptic ulcer), Akkini Mantham (indigestion), Athisaram (diarrhea), and Pitham-related conditions. The formulation contains ingredients known for their carminative, digestive, and antimicrobial properties.

The present study was undertaken to qualitatively analyse the phytochemical constituents of Sarathulathi Chooranam and to provide a scientific basis for its traditional therapeutic use.

MATERIALS AND METHODS

SARATHULATHI CHOORANAM

PREPARATION OF THE DRUG:

The raw drugs used in the formulation of Sarathulathi Chooranam were collected from the authentic herbal drug store in Nagercoil and the drugs were authenticated by the Head of the Department of Gunapadam, Govt Siddha Medical College, Palayamkottai. The raw drugs were purified and processed and Sarathulathi Chooranam was formulated as per classical siddha literature, *Athma Ratchamirtham Enum Vaithiya Sarasangeeragam* (p. 483) by Kandhaswamy Muthaliyar.

INGREDIENTS:

- Milagu (*Piper nigrum*)
- Thippili (*Piper longum*)
- Thippili moolam (*Piper longum*)
- Chithiramoolam (*Plumbago zeylanica*)
- Jatamansi (*Nardostachys jatamansi*)
- Malli (*Coriandrum sativum*)
- Narseerakam (*Cuminum cyminum*)
- Ponmusuttai ver (*Cissampelos pareira*)
- Perunkayam (*Ferula asafoetida*)
- Omam (*Trachyspermum ammi*)
- Indhuppu (Sodium chloride)

INDICATION: Gunmam, Akkini mantham, Athisaram, Pitham

DOSAGE: 800-1000 mg (Thirikadi alavu)

VEHICLE/ ADJUVANT: Lukewarm water

SAMPLE PREPARATION:

The formulation was prepared as per classical Siddha guidelines. The powdered sample was sieved to obtain a uniform particle size. For phytochemical analysis, the powdered material was subjected to ethanol extraction by macerated in ethanol for 48 h at room temperature with intermittent shaking, followed by filtration. The obtained extract was concentrated and used for qualitative phytochemical screening. All reagents used in the study were of analytical grade.

PHYTOCHEMICAL ANALYSIS:

METHOD OF ANALYSIS: PLIM-Protocol – ASU Formulation

Test for alkaloids:

Mayer's Test: To the test sample, 2mL of mayer's reagent was added, a dull white precipitate revealed the presence of alkaloids.

Test for coumarins:

To the test sample, 1 mL of 10% sodium hydroxide was added. The presence of coumarins is indicated by the formation of yellow colour.

Test for saponins:

To the test sample, 5 mL of water was added and the tube was shaken vigorously. Copious lather formation indicates the presence of Saponins.

Test for tannins:
To the test sample, ferric chloride was added, formation of a dark blue or greenish black colour showed the presence of tannins.
Test for glycosides- Borntrager's Test
The test sample was hydrolysed with concentrated hydrochloric acid for 2 hours on a water bath, filtered and the hydrolysate is subjected to the following tests. To 2 mL of filtered hydrolysate, 3 mL of chloroform is added and shaken, chloroform layer is separated and 10% ammonia solution is added to it. Pink colour indicates presence of glycosides.
Test for flavonoids:
Alkaline reagent test. Two to three drops of sodium hydroxide were added to 2 mL of extract. Initially, a deep yellow colour appeared but it gradually became colourless by adding few drops of dilute HCl, indicating that flavonoids were present.
Test for phenols:
Lead acetate test: To the test sample; 3 mL of 10% lead acetate solution was added. A bulky white precipitate indicated the presence of phenolic compounds.
Test for steroids:
To the test sample, 2 mL of chloroform was added with few drops of concentrated sulfuric acid (3 mL), and shaken well. The upper layer in the test tube was turned into red and sulfuric acid layer showed yellow with green fluorescence. It indicates the presence of steroids.
Triterpenoids
Liebermann–Burchard test: To the chloroform solution, few drops of acetic anhydride was added then mixed well. 1 mL concentrated sulfuric acid was added from the sides of the test tube; appearance of red ring indicates the presence of triterpenoids**.**

Test for Cyanins
A. Anthocyanin:
To the test sample, 1 mL of 2N sodium hydroxide was added and heated for 5 min at 100 ^{o}C. Formation of bluish green colour indicates the presence of anthocyanin.
Test for Carbohydrates - Benedict's test
To the test sample about 0.5 mL of Benedict's reagent is added. The mixture is heated on a boiling water bath for 2 minutes. A characteristic-coloured precipitate indicates the presence of sugar.
Proteins (Biuret Test)
To extracts 1% solution of copper sulphate was added followed by 5% solution of sodium hydroxide, formation of violet purple colour indicates the presence of proteins.

RESULTS

QUALITATIVE PHYTOCHEMICAL INVESTIGATION OF SARATHULATHI CHOORANAM

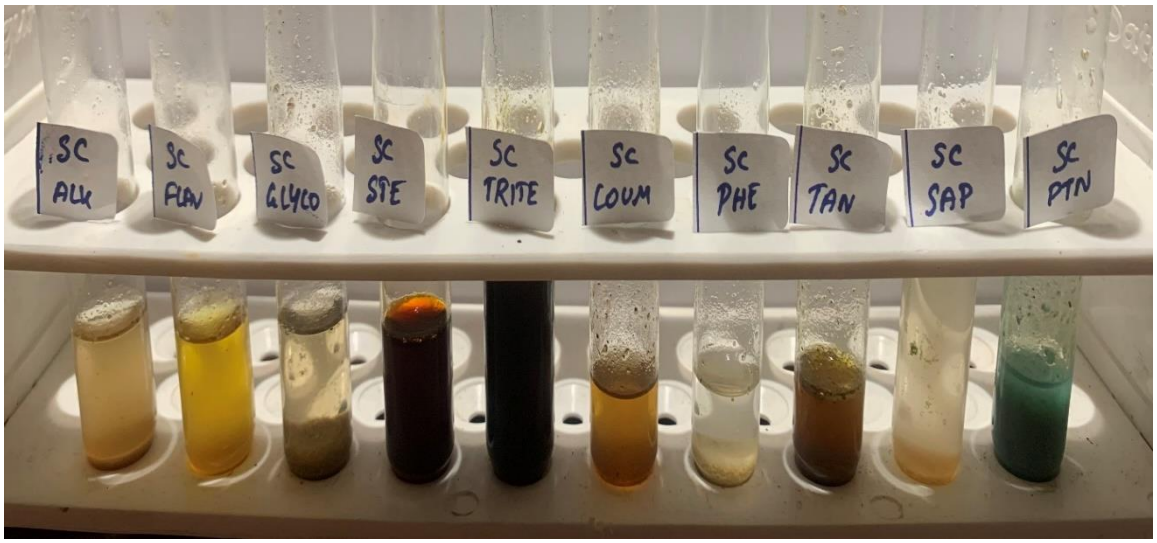

Table 1: QUALITATIVE PHYTOCHEMICAL PROFILE OF SARATHULATHI CHOORANAM

S. No	PHYTOCHEMICAL	RESULT
1	ALKALOIDS	+
2	FLAVONOIDS	+
3	GLYCOSIDES	-
4	STEROIDS	+
5	TRITERPENOIDS	+
6	COUMARINS	-
7	PHENOLS	+
8	TANNINS	+
9	SAPONINS	+
10	PROTEINS	-
11	SUGAR	+
12	ANTHOCYANIN	-
13	BETACYANIN	+

(+) -> Indicates Positive and (-) -> Indicates Negative

The qualitative phytochemical screening revealed the presence of alkaloids, flavonoids, steroids, triterpenoids, phenols, tannins, saponins, sugars, and betacyanins. Glycosides, coumarins, proteins, and anthocyanins were not detected. These findings indicate a diverse phytochemical composition predominantly consisting of secondary metabolites.

DISCUSSION

The study demonstrates a diverse phytochemical profile of *Sarathulathi Chooranam*, a classical Siddha polyherbal formulation indicated for gastrointestinal disorders such as Gunmam, Akkini Mantham, and Athisaram. The results confirm the presence of a wide spectrum of bioactive constituents, including alkaloids, flavonoids, phenols, tannins, steroids, triterpenoids, saponins, sugars, and betacyanins, while glycosides, coumarins, proteins, and anthocyanins were absent, suggesting a selective yet therapeutically significant phytochemical composition.

Alkaloids identified in the formulation are known to exhibit potent pharmacological activities, including anti-inflammatory, analgesic, and gastroprotective effects, thereby contributing to mucosal defense mechanisms. Flavonoids and phenolic compounds, which were prominently detected, are well-recognized for their strong antioxidant properties, playing a crucial role in scavenging free radicals and mitigating oxidative stress—one of the key factors involved in gastric mucosal injury and ulcer formation. The presence of tannins further augments therapeutic efficacy through their astringent action, forming a protective layer over the gastric mucosa and facilitating tissue repair.

Steroids and triterpenoids contribute significantly to anti-inflammatory and cytoprotective effects, thereby enhancing mucosal integrity and resistance against gastric irritants. Saponins, another important class of phytoconstituents identified in the formulation, are reported to stimulate mucus secretion, strengthening the gastric mucosal barrier and promoting gastroprotection. Betacyanins, a class of betalain pigments, are recognized for their potent antioxidant and anti-inflammatory activities, which may further enhance the gastroprotective efficacy of the formulation by mitigating oxidative stress-induced mucosal damage. Furthermore, the presence of sugars may impart demulcent properties, which aid in soothing irritated mucosal surfaces and support the healing process.

The overall phytochemical composition supports the Siddha principle of polyherbal synergy, wherein multiple constituents act through complementary and potentially synergistic mechanisms to produce a holistic therapeutic effect. These findings align with existing knowledge on traditional formulations, highlighting the role of

secondary metabolites in mediating pharmacological activities.

However, the present study is limited to qualitative phytochemical evaluation. Therefore, further investigations involving quantitative analysis, advanced analytical techniques, pharmacological validation, and clinical studies are essential to establish the efficacy, safety, and mechanism of action of *Sarathulathi Chooranam* within the framework of evidence-based medicine.

CONCLUSION

Sarathulathi Chooranam exhibits a rich and diverse phytochemical profile comprising bioactive constituents with well-documented antioxidant, anti-inflammatory, and gastroprotective properties. These findings provide scientific validation for its traditional use in Siddha medicine for gastrointestinal disorders. The synergistic interaction of these phytoconstituents underscores its therapeutic potential; however, further quantitative, pharmacological, and clinical investigations are warranted to substantiate its efficacy and facilitate its integration into modern evidence-based healthcare systems.

Declaration by Authors

Acknowledgement: None

Source of Funding: None

Conflict of Interest: None.

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How to cite this article: Visakh K Raj, Sowmini Preetha K, G Chenthamarai Selvi, S Balamani. Phytochemical evaluation of *Sarathulathi Chooranam*: a traditional siddha formulation for gastrointestinal disorders. *International Journal of Research and Review*. 2026; 13(5): 618-622. DOI: *https://doi.org/10.52403/ijrr.20260557*

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