



Review Article

SIDDHA CULINARY MEDICINE: ETHNOPHARMACOLOGICAL STUDY OF *SUNDU KARA SELAVU RASAM* - A TRADITIONAL POLYHERBAL FUNCTIONAL FOOD

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Article info

Article History:

Received: 13-04-2026

Accepted: 19-05-2026

Published: 07-06-2026

KEYWORDS:

Siddha medicine,
Sundu Kara Selavu,
Functional food,
Polyherbal
formulation,
Ethnopharmacolog
y, Erode district,
Respiratory health,
Post-pregnancy
nutrition,
Phytochemicals.

ABSTRACT

Sundu Kara Selavu rasam is an age-old polyherbal functional food preparation practiced in the Erode district of Tamil Nadu. Rooted in the classical Siddha system of medicine, this culinary formulation incorporates a diverse array of phytochemically rich botanicals known for their bioactive compounds. **Objectives:** To document the ethnopharmacological basis of *Sundu Kara Selavu rasam*, identify the active phytochemicals in constituent plant species, and correlate their pharmacological activities with traditional indications including respiratory illness, post-pregnancy recovery, and generalized fatigue. **Methods:** Ethnobotanical data were collected through structured interviews with traditional healers and household practitioners in Erode district. Ingredient plants were identified and authenticated using standard botanical references. Phytochemical profiling was conducted through literature review, cross-referencing with PubMed, Google Scholar, and Ayush databases. **Results:** *Sundu Kara Selavu rasam* comprises 20 medicinal plant ingredients, each contributing synergistic bioactive molecules. Key phytochemicals identified include gingerol (anti-bacterial, expectorant), glycyrrhizin (antioxidant, immunomodulatory), piperin (anti-bacterial), coumarin (anti-viral), and 1,8-cineol (expectorant). Collectively, the formulation exhibits antimicrobial, antioxidant, immuno-stimulant, anti-asthmatic, and galactagogue properties. **Conclusion:** The Siddha culinary preparation *Sundu Kara Selavu rasam* is a scientifically plausible multi-target functional food. Its polyherbal composition provides a pharmacological rationale for its traditional use in respiratory disorders, post-partum care, and immune reconstitution. Systematic clinical validation is strongly recommended.

INTRODUCTION

The Siddha system of medicine, one of the oldest surviving classical medical traditions of the world, originated in the Tamil Nadu region of South India. Documented over millennia in palm leaf manuscripts (*Olai Chuvadis*), Siddha medicine integrates herbal therapeutics, mineral preparations, yoga, and culinary practices into a holistic framework for health maintenance and disease management. Unique to Siddha is the concept of '*Pathiam*'- a dietary regimen prescribed in conjunction with medicinal treatment- reflecting the system's deep appreciation for the healing potential of food.

Functional foods- dietary items that deliver health benefits beyond basic nutrition- have attracted considerable scientific attention in recent decades. The global burden of chronic respiratory diseases, post-partum morbidity, and immune dysfunction has renewed interest in traditional polyherbal dietary preparations as accessible, cost-effective, and culturally accepted therapeutic agents. The Siddha culinary tradition of Tamil Nadu embodies this principle through regionally prepared formulations that blend culinary satisfaction with medicinal potency.

Sundu Kara Selavu rasam is one such traditional functional food, commonly prepared by families in Erode district, Tamil Nadu. The dish is conventionally prepared and offered to postpartum women, individuals recovering from respiratory illnesses, and those experiencing generalized weakness or fatigue.

Access this article online	
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	https://doi.org/10.47070/ijapr.v14i6.4222
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Despite its widespread use, *Sundu Kara Selavu rasam* has not been subjected to formal scientific documentation or phytochemical characterization. This study aims to fill that gap by conducting an ethnopharmacological survey, documenting ingredients, and providing a scientific basis for the observed traditional claims. The rich phytochemical profile of its ingredients makes it a compelling subject for evidence-based integration into integrative and functional medicine.

Ethnobotanical Background and the Siddha Framework

The Siddha system conceptualizes health as a balance of the three humors- *Vatham* (air-ether), *Pitham* (fire-water), and *Kabam* (earth-water)- which collectively govern physiological and mental processes. Disease is understood as a derangement of this *Tridoshic* equilibrium. Respiratory ailments, including bronchitis, asthma, and productive cough, are predominantly classified as *Kabam* disorders, characterized by mucus accumulation and reduced pulmonary function. Post-pregnancy states represent a combined *Vatham-Kabam* imbalance, necessitating warming, expectorant, and tonic dietary interventions.

Erode district, situated in the Western Ghats transitional zone of Tamil Nadu, is a biodiversity hotspot for medicinal plants and has historically served as a center for traditional healing practices. Local communities maintain oral and practical knowledge of several functional food preparations passed through generations by household healers, particularly women. The elderly population of the region remains the primary custodian of these practices, underscoring the urgency of formal ethnobotanical documentation.

Sundu Kara Selavu Rasam is a community-validated preparation, regularly prepared in rural households following childbirth, during the winter season, or when a family member presents with respiratory symptoms. Its ingredients are locally available, affordable, and well-recognized within the community, reflecting the principle of Siddha that medicine and diet should be regionally appropriate and accessible.

MATERIALS AND METHODS

Ethnobotanical Survey

A field survey was conducted in Erode district, Tamil Nadu, India, covering six sub-districts: Erode,

Bhavani, Gobichettipalayam, Sathyamangalam, Perundurai, and Anthiyur. A total of 45 informants- including traditional Siddha practitioners (Siddha Vaidyars), elderly homemakers, and village health workers- were interviewed using structured and semi-structured questionnaires. Data collected included ingredient names (in Tamil and scientific nomenclature), proportions used, preparation methods, route of administration, indicated conditions, contraindications, and historical provenance of the recipe.

Plant Identification and Authentication

Botanical specimens for each ingredient were collected and identified using standard flora references including the Flora of the Presidency of Madras, the database of the Botanical Survey of India, and the WHO Monographs on Selected Medicinal Plants. Voucher specimens were deposited at the Regional Herbarium, Government Siddha Medical College, Palayamkottai.

Phytochemical Literature Review

A systematic literature search was performed using PubMed, Google Scholar, Web of Science, and the AYUSH Ministry's Traditional Knowledge Digital Library (TKDL). Search terms included individual plant species names combined with terms such as 'phytochemistry,' 'bioactive compounds,' 'pharmacological activity,' and 'anti-inflammatory,' 'antimicrobial,' 'expectorant,' 'antioxidant,' and 'immunomodulatory.' Only peer-reviewed articles and monographs published between 1990 and 2024 were included.

Preparation Documentation

The standard preparation method was documented through direct observation and practitioner interviews. Photographs and video documentation were obtained with informed consent. The recipe was standardized into measurable proportions and validated with three experienced practitioners for consistency.

Ingredient Profile and Phytochemical Analysis

Primary Therapeutic Ingredients

The core formulation of *Sundu Kara Selavu Rasam* includes eleven primary botanicals with well-characterized pharmacological activities. Table 1 presents these ingredients along with their principal active compounds and demonstrated biological actions.

Table 1: Primary Plant Ingredients, Active Compounds, and Pharmacological Actions

Plant/Ingredient	Active Compound(s)	Pharmacological Actions	Relevance to Indications
<i>Zingiber officinale</i> (dried ginger/ <i>Sukku</i>)	Gingerol, Shogaol, Zingerone	Antibacterial, expectorant, anti-inflammatory	Loosens bronchial secretions; reduces airway inflammation; warming action on uterus post-partum.
<i>Helicteres isora</i> (screw	Anthraquinone	Immunomodulatory,	Supports hormonal rebalancing post-

tree / <i>Valampuri</i>)	Glycosides, Lupeol	estrogenic, antiviral	delivery; modulates innate immunity.
<i>Glycyrrhiza glabra</i> (Licorice/ <i>Athimathuram</i>)	Glycyrrhizin, Liquiritin	Antioxidant, immunostimulant, demulcent	Soothes inflamed mucous membranes; reduces oxidative stress; promotes milk secretion.
<i>Piper nigrum</i> (black pepper)	Piperine, Piperic Acid	Antibacterial, bioavailability enhancer	Enhances absorption of co-administered phytochemicals; bactericidal action on respiratory pathogens.
<i>Cuminum cyminum</i> (cumin / <i>Seeragam</i>)	Cuminaldehyde, Coumarin	Antiviral, carminative, galactagogue	Stimulates breast milk production; relieves post-partum flatulence.
<i>Anethum graveolens</i> (Dill / <i>Sathakuppai</i>)	Carvone, Anethole, Limonene	Expectorant, uterine stimulant	Promotes clearance of mucus; classical galactagogue in Siddha and Ayurveda.
<i>Piper cubeba</i> (cubeb pepper / <i>Vaal Milagu</i>)	Monoterpenes, Cubebin	Antioxidant, antimicrobial, bronchodilatory	Relieves bronchospasm; antifungal activity against pulmonary pathogens.
<i>Piper longum</i> (long pepper / <i>Thippili</i>)	Piperine, Piplartine, Alkaloids	Anti-asthmatic, analgesic, immunomodulatory	Classical Siddha drug for <i>Kabam</i> disorders and respiratory disease.
<i>Sepia officinalis</i> (Cuttlebone/ <i>Kadalnurai</i>)	Calcium Carbonate, Chitin	Antimicrobial, antacid, bone mineralizer	Post-partum calcium repletion; antacid action reducing GI discomfort.
<i>Alpinia galanga</i> (Greater Galangal/ <i>Kichili Kilangu</i>)	1,8-Cineol, Galangin, Alpinetin	Expectorant, anti-inflammatory, antifungal	Potent mucolytic; reduces airway inflammation; antifungal against <i>Candida</i> .
<i>Foeniculum vulgare</i> (fennel/ <i>Seeragam</i> variety)	Anethole, Fenchone	Galactagogue, antispasmodic, carminative	Widely documented for promotion of lactation and uterine tone.

Synergistic Secondary Ingredients

Beyond the primary therapeutic constituents, *Sundu Kara Selavu rasam* incorporates ten additional botanicals (listed in Table 2) that contribute nuanced pharmacological effects and enhance the overall synergistic profile of the formulation. Many of these are used in smaller proportions as flavor modifiers but carry significant bioactive payloads.

Table 2: Secondary Ingredient Plants and Their Traditional Uses

Scientific Name	Tamil Name	Traditional Use	Key Phytochemical
<i>Solanum trilobatum</i>	<i>Thuthuvalai</i> (துதுவளை)	Bronchitis, cough, antihistamine	Solasonine, solanine
<i>Mukia maderaspatana</i>	<i>Musumusukai</i> (முசுமுசுகை)	Febrifuge, anti-asthmatic	Cucurbitacins, flavonoids
<i>Delonix elata</i>	<i>Vaadha Naraayani</i> (வாத நாராயணி)	Joint pain, anti-inflammatory	Lupeol, betulinic acid
<i>Cardiospermum halicacabum</i>	<i>Mudakkatran</i> (முடக்கற்றான்)	Arthritis, anti-rheumatic	Phytol, apigenin
<i>Ocimum sanctum</i> (Holy Basil)	<i>Thulasi</i> (துளசி)	Adaptogen, antibacterial, antistress	Eugenol, ursolic acid
<i>Abutilon indicum</i>	<i>Thuthi</i> (துத்தி)	Galactagogue, anti-inflammatory	Mucilage, beta-sitosterol
<i>Erythrina variegata</i>	<i>Mul Murungai</i> (முள் முருங்கை)	Analgesic, antipyretic, diuretic	Hypaphorine, erysotrine
<i>Ferula asafoetida</i>	<i>Perungayam</i> (பெருங்காயம்)	Antispasmodic, carminative, antiviral	Ferulic acid, farnesiferol
<i>Vadhanarayani</i> (Sitrarathai)	<i>Sitrarathai</i> (சிறற்றரத்தை)	Emmenagogue, uterine tonic	Sesquiterpenes, azulene
<i>Piper nigrum</i> (White variety)	<i>Vellai Milagu</i> (வெள்ளை மிளகு)	Bioavailability enhancer, stimulant	Piperine, piperic acid

Preparation Method

Traditional Recipe

The following preparation protocol was documented from three senior practitioners in Erode district and represents the standardized community recipe. The method follows classical Siddha principles of 'Murai' (procedural adherence) and 'Thadai' (compatible combinations), ensuring potency is preserved during processing.

Ingredients (base preparation for four servings):

- Ground *Sukku* (dried ginger), *Kadalnurai* (cuttlebone), *Athimathuram* (licorice root), *Sitrarathai*, *Valampuri* (*Helicteres isora*), and *Idampurikaai*- in approximately equal proportions
- *Milagu* (black pepper), *Vellaimilagu* (white pepper), *Seeragam* (cumin), *Sathakuppai* (dill seeds), *Vaal Milagu* (cubeb pepper), *Thippili* (long pepper), *Thithuvalai* (*Solanum trilobatum*), *Musumusukai*, *Vadhanarayani*, *Mudakattran*- in smaller supplementary quantities.
- *Thulasi* (holy basil), *Thuthi*, *Mul Murungai*- added fresh or dried as garnish.
- Two tablespoons cold-pressed sesame oil or gingelly oil.
- Mustard seeds, dried curry leaves, asafoetida, turmeric powder, and rock salt to taste.
- Sufficient water to achieve desired consistency.

Procedure

- Coarsely grind the dry ingredients (*Sukku*, *Kadalnurai*, *Athimathuram*, *Sitrarathai*, *Valampuri*, *Idampurikaai*) together into a coarse powder.
- Heat a heavy-bottomed vessel over medium flame. Add two tablespoons of sesame oil.
- Temper with mustard seeds. When they splutter, add asafoetida and dried curry leaves.
- Add the ground spice mixture followed by *Milagu*, *Vellaimilagu*, *Seeragam*, *Sathakuppai*, *Vaal milagu*, *Thippili*, *Thithuvalai*, *Musumusukai*, *Vadhanarayani*, and *Mudakattran*.
- Stir-fry the mixture briefly until aromatic (approximately two minutes) to allow volatile oil extraction into the lipid medium.
- Add measured water, a pinch of turmeric powder, rock salt, and bring to a gentle boil for 5–8 minutes.
- Add fresh *Thulasi*, *Thuthi*, and *Mul murungai* leaves in the final minute to preserve heat-labile volatile compounds.
- Serve warm. May be consumed as a side dish, broth, or mixed with rice.

Pharmacological Rationale for Preparation Technique

The use of sesame oil as a lipid medium is pharmacologically significant. Fat-soluble bioactive compounds such as piperine, gingerol, 1,8-cineol, and

cubebin demonstrate substantially enhanced intestinal absorption when co-administered with lipids. The initial dry-frying step serves to activate Maillard reaction products in dried ginger and spices, generating additional aromatic compounds with antimicrobial and antioxidant properties. The final addition of fresh herbs preserves thermolabile polyphenols and volatile terpenoids. The use of mustard seeds as a tempering agent contributes allyl isothiocyanate, a potent antimicrobial and anti-inflammatory molecule.

Therapeutic Indications and Scientific Correlation Respiratory Illness

The combination of piperine (*Piper longum*, *Piper nigrum*), 1,8-cineol (*Alpinia galanga*), carvone (*Anethum graveolens*), and solasonine (*Solanum trilobatum*) creates a robust anti-*Kabam* respiratory profile. Piperine has demonstrated bronchodilatory and anti-histaminic properties in animal models. *Solanum trilobatum* is classified as a 'Kasaharamarundhu' (cough remedy) in classical Siddha texts. 1,8-Cineol (eucalyptol) is the primary mucolytic compound used in modern respiratory medicine, and its presence in *Alpinia galanga* provides scientific validation for this ingredient's inclusion. Collectively, these compounds target airway inflammation, bronchospasm, and mucociliary clearance.

Post-Pregnancy Diet and Recovery

Post-partum care in Siddha medicine requires restoring *Vatham* balance, stimulating uterine involution, supporting lactation, and rebuilding nutritional reserves. The estrogenic activity of anthraquinone glycosides from *Helicteres isora*, the galactagogue effects of dill (*Anethum graveolens*) anethole, the calcium supplementation from cuttlebone, and the uterine tonic action of *Sitrarathai* collectively address these post-partum needs. Glycyrrhizin from licorice supports adrenal recovery following parturition. *Abutilon indicum* mucilage provides sustained nutritional release and promotes milk flow.

Generalized Fatigue and Immune Reconstitution

Generalized fatigue is commonly attributed in Siddha medicine to depleted *Ojas* (vital essence) and *Vatham* aggravation. Glycyrrhizin from *Glycyrrhiza glabra* is one of the most studied adaptogenic and immunostimulatory phytochemicals, acting on the hypothalamic-pituitary-adrenal axis. Eugenol from *Ocimum sanctum* has demonstrated anti-stress, antioxidant, and neuroprotective properties. Piperine enhances bioavailability of multiple co-administered nutrients, acting as a natural bioenhancer. Zingerone from dried ginger has demonstrated anti-inflammatory activity against NF- κ B pathways implicated in chronic fatigue syndrome.

DISCUSSION

The results of this ethnopharmacological study demonstrate that *Sundu Kara Selavu rasam* is not merely a culturally embedded culinary tradition but a pharmacologically coherent polyherbal formulation with a multi-target mechanism of action. Each ingredient contributes demonstrable phytochemical activity that collectively supports the three primary traditional indications: respiratory illness, post-partum recovery, and fatigue.

A particularly noteworthy aspect is the synergistic role of piperine, present in both black pepper (*Piper nigrum*) and long pepper (*Piper longum*). Piperine is a well-documented P-glycoprotein inhibitor and CYP3A4 modulator, capable of increasing the intestinal absorption of co-administered phytochemicals by 20–60%. This suggests that the inclusion of two *Piper* species is not accidental but reflects an empirically derived pharmaceutical optimization- a form of traditional bioenhancement that predates modern pharmacokinetic science.

The formulation also demonstrates the Siddha principle of '*Muppu*'- the use of mineral-based ingredients to anchor volatile herbal compounds and extend bioactivity. Cuttlebone (*Kadalnurai*), the only mineral ingredient, provides calcium carbonate as a base matrix, potentially buffering gastric acidity and improving the oral bioavailability of alkaloids such as piperine and glycyrrhizin, which exhibit pH-dependent solubility.

Compared to other classical Siddha formulations such as *Trikadugu Chooranam* or *Sirunelli Legiyam*, *Sundu Kara Selavu* is distinguished by its culinary delivery form, which ensures palatability, compliance, and accessibility without requiring pharmaceutical preparation. This aligns with emerging global trends toward food-as-medicine approaches and the integration of functional foods into preventive healthcare.

Limitations of this study include the absence of original in vitro or in vivo experimental data. The phytochemical characterizations cited are drawn from published studies on individual ingredients rather than on the complete formulation. Synergistic, antagonistic, or modulatory interactions between the 20 constituents remain to be elucidated through systematic pharmacological studies. Clinical trials in the three indication areas are strongly warranted.

CONCLUSION

Sundu Kara Selavu is a botanically diverse, phytochemically rich traditional functional food from the Siddha medical tradition of Erode district, Tamil Nadu. This study provides the first comprehensive ethnopharmacological and phytochemical documentation of this preparation. The 20 constituent botanicals collectively offer antimicrobial, expectorant,

immunostimulatory, antioxidant, galactagogue, and adaptogenic activities that substantiate its traditional use in respiratory illnesses, post-partum care, and the management of generalized fatigue.

The preparation technique- specifically the lipid extraction, tempering, and late addition of heat-sensitive herbs- reflects sophisticated empirical pharmacology embedded within culinary tradition. *Sundu Kara Selavu* represents an important node at the intersection of Siddha medicine, ethnobotany, nutritional science, and integrative health. Its validation through standardized phytochemical analysis, safety profiling, and randomized clinical trials would contribute meaningfully to the global evidence base for traditional functional foods.

The preservation and scientific validation of such community-based formulations is an ethical and scientific imperative, given the accelerating erosion of traditional medical knowledge and the growing global burden of respiratory and post-partum morbidities.

Acknowledgments

The author expresses sincere gratitude to the traditional healers and household practitioners of Erode district who generously shared their knowledge. Special thanks to the faculty of the Department of Siddha Medicine and the staff of the Regional Herbarium, Government Siddha Medical College, Palayamkottai, for their guidance in plant authentication.

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Cite this article as:

Varunapriya. M, Seethaladevi. A, Sundararajan. S. Siddha Culinary Medicine: Ethnopharmacological Study of Sundu Kara Selavu Rasam- A Traditional Polyherbal Functional Food. International Journal of Ayurveda and Pharma Research. 2026;14(6):270-275.

<https://doi.org/10.47070/ijapr.v14i6.4222>

Source of support: Nil, Conflict of interest: None Declared

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