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Original Article

Standardization and Chemical Analysis of *Rasam*: A South Indian Traditional Functional Food

Agilandeswari Devarajan[1], Muthu Kumaradoss Mohan Maruga Raja[2]

ABSTRACT

Objective: The traditional Indian food is "functional" as it contains high amounts of dietary fiber, antioxidants, and probiotics. *Rasam* is a South Indian traditional spice soup. Spices are reputed to possess several pharmacological properties. Due to geographical, ethnical, and traditional differences, *rasam* recipe and the preparation process have a wide difference. Hence, the objective was to standardize *rasam* and then to perform a chemical analysis so that its pharmaceutical potential beyond nutritive effect can be explored. **Materials and Methods:** The quantity of ingredients and the process followed for preparing *rasam* by the 17 volunteers selected from in and around Vellore, Tamil Nadu was standardized. The proximate, nutritive, elemental, and phytochemical analysis were determined for the standardized *rasam*. **Results:** The total ash, acid insoluble ash, water soluble ash, and sulfated ash were found to be 1.7%, 0.04%, 0.12%, and 1.86%, respectively. The extractive values such as water soluble, ethanol soluble, and ether soluble were found to be 4.5%, 3.93%, and 0.61%, respectively. The standardized *rasam* showed very low-energy content of 15.13 kcal/100 g. *Rasam* contained alkaloids, tannins, saponins, flavonoids, terpenoids, steroids, glycosides. and volatile oil. **Conclusion:** The ingredients used in the preparation of *rasam* are medicinally claimed for various ailments, which makes it a traditional functional food. The standardized procedure provided tremendous opportunity to study the pharmaceutical potential in a systematic scientific way beyond its culinary and nutritive effect.

Key words: *Chaaru*, Elemental analysis, Nutritional value, Proximate analysis, *Saaru*, spices.

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INTRODUCTION

The traditional Indian food is "functional" as it contains high amounts of dietary fiber (whole grains and vegetables), antioxidants (spices, fruits, and vegetables), and probiotics (curds and fermented batter products). Due to the chemical diversification of the ingredients, these Indian traditional functional foods exhibit the synergistic physiological effect. Epidemiological randomized clinical trials carried out in different countries have demonstrated numerous health effects related to functional food consumption such as reduction of cancer risk, improvement of heart health, stimulation of immune system, decrease of menopause symptoms, improvement of gastrointestinal health, maintenance of urinary tract health, anti-inflammatory effects, reduction of blood pressure, maintenance of vision, antibacterial effect, antiviral effect, reduction of osteoporosis, and anti-obese effect.[1] *Sambar*, a South Indian traditional dish, has shown preventive effect against colon cancer.[2] *Rasam*, also called as *chaaru* or *saaru,* is a South Indian traditional spice soup, consumed especially in Tamil Nadu. Spices are used as flavoring agents throughout the world. In addition, they are reputed to possess several medicinal and pharmacological properties.[3] It is traditionally prepared using tamarind juice as a base, with the addition of Indian sesame oil, turmeric, tomato, chili pepper, pepper, garlic, cumin, curry leaves, mustard, coriander, asafoetida, sea salt, and water. *Rasam* is a functional food since all the ingredients used in the preparation are medicinally claimed for various ailments.

In India, traditional foods are filled with multiples of uniqueness that are specific to each region. Similarly, the preparation process of *rasam* has a wide difference due to geographical, ethnical, and traditional variations exist in the ingredients used its quantity. There are more than 20 different types of *rasam* based on the permutation and combination of its constituent spices.[4] Various literatures cite *rasam* as an effective treatment for cold, fever, flu, and diabetes[3,5] but *rasam* used in those studies were consistent neither in their ingredients nor in the process of preparation. To explore the pharmaceutical potential of *rasam* beyond its culinary and nutritive effect, there arised a need to standardize the ingredients used, their quantity, and process involved in the preparation of *rasam*. Hence, the study was planned to standardize *rasam* prepared in and around a particular geographical location, Vellore, Tamil Nadu, India, and also to per-

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form a chemical analysis so that its pharmaceutical potential can be consistently explored in a scientific way.

MATERIALS AND METHODS

Location

Approximately 33 km in and around Vellore in four directions East, West, North, and South were set as zone of distribution for the study. Vellore was selected as a center of distribution (CoD). Around Vellore, 17 places (four in each direction) were selected. Seventeen volunteers one from each selected place were chosen as samples for studying the process involved in the preparation of *rasam* based on the following criterions;

Females above 50 years

Natives to the region for at least three generations, and

Vegetarians.

Standardization

The quantity of ingredients and the process used for the preparation of *rasam* by the 17 volunteers were partially optimized. All the 17 volunteers were provided with the sufficient quantity of ingredients (q.s.) and utensils to prepare a fixed volume (500 mL) of *rasam* in their traditional way. The ingredients were purchased from Arokya Organic Shop, Vellore. All utensils used for the preparation of *rasam* were of stainless steel of 316 grade. The whole processes of the preparation of *rasam* were divided into five different stages as stepwise standardization;

- Preparation of tamarind fruit pulp mixture (T1)
- Preparation of tomato fruit mixture (T2)
- Preparation of spice mixture (T3),
- Preparation of all mixture (T4), and
- Preparation of final product (T5).

The data regarding the accurate quantity of the ingredients used and the exact processes followed by the 17 volunteers in the preparation of *rasam* were individually recorded as phase wise, and standardized to a fixed recipe with a precise process. Statistical analysis was performed using GraphPad Instat Version 4 software, and the values were expressed as mean ± standard deviation.

Chemical analysis

Proximate analysis of standardized rasam

The standardized *rasam* was subjected to proximate analysis such as total ash, acid insoluble ash, water soluble ash, sulfated ash, water-soluble extractive, ethanol soluble extractive, and ether soluble extractive values.[6]

Nutritive and elemental analysis of standardized rasam

The quantity of water, carbohydrates, proteins, fats, fibers, and vitamins present in standardized *rasam* was estimated. Moreover, the quantity of calcium, magnesium, sodium, potassium, phosphorus, sulfur, chloride, iron, molybdenum, boron, copper, manganese, zinc, nickel, aluminum, and selenium present in standardized *rasam* were also estimated.[7-11]

Preliminary qualitative phytochemical analysis of standardized rasam

The standardized *rasam* was studied for the presence and absence of secondary metabolites such as alkaloids, tannins, saponins, flavonoids, terpenoids, steroids, glycosides, and volatile oil.[12]

RESULTS

The details of the selected 17 places, its coordinates, direction, and distance from the CoD are as shown in Table 1. The biological source of ingredients used for the preparation of *rasam* is as shown in Table 2. The quantity of ingredients and the processes used for the preparation of T1, T2, T3, T4, and T5 by 17 volunteers is as shown in Tables 3-5.

The procedure for standardized *rasam* is as follows;

T1 – 6.88 g of tamarind fruit pulp was immersed in 450 mL of water for 10 min which was then hand crushed for 45 times and strained. The strained liquid was rinsed with 5 mL water into which 0.4 g of turmeric powder and 4 g of sea salt was added.

T2 – 82.44 g of fresh tomato fruits was hand crushed for 60 times. The crushed fruit was rinsed with 5 mL of water.

T3 – 1.33 g of pepper drupes was crushed in a mortar and pestle for 85 times. 2.67 g of cumin fruits was added over to the crushed pepper drupes and crushed for 100 times. To the above-crushed mixture, 0.82 g of chili pepper was added and crushed for 50 times. To the above mixture, 9.63 g of garlic cloves was added and crushed for 90 times.

T4 – Tomato fruit mixture (T2) was rinsed with 10 mL of water, and spice mixture (T3) was rinsed with 10 mL of water. Both rinsing were added to tamarind fruit pulp mixture (T1).

T5 – 4 mL of Indian sesame oil was heated at 60°C for 2 min. After 5 s, 0.82 g of mustard seeds were added. After 3 s, 1.53 g of whole chili pepper was added. After 2 s, 0.61 g of curry leaves was added. Immediately, all mixture (T4) was rinsed with 20 mL of water and added. The whole liquid was allowed to boil for a 5 min. After 5 min, 1.50 g of coriander leaves was added. When the liquid frothed, 0.05 g of asafoetida was added, and the heating was switched off to yield the final product.

The ash values of standardized *rasam* such as total ash, acid insoluble ash, water soluble ash, and sulfated ash were found to be 1.7%, 0.04%, 0.12%, and 1.86% w/w, respectively. The extractive values such as water soluble, ethanol soluble, and ether soluble were found to be 4.5%, 3.93% and 0.61% w/w, respectively. The nutritional value of standardized *rasam* per 100 g is expressed in Table 6. Preliminary qualitative phytochemical analysis of standardized *rasam* results confirmed the presence of alkaloids, tannins, saponins, flavanoids, terpenoids, steroids, glycosides, and volatile oil.

DISCUSSION

The traditional foods of each specific region of India are primarily a component of its culture. If these traditional foods are to be standardized, it has to be evaluated within a specific region. Hence, a specific geographical location Vellore, Tamil Nadu was selected to standardize *rasam*. For better efficiency of the standardization process, 17 volunteers were selected based on specific criterions within the selected geographical zone. The required ingredients and the necessary utensils were provided to all 17 volunteers to maintain uniformity of the study. The 17 preparations from each volunteer were qualitatively and quantitatively recorded in phase wise. The quantity of ingredients and the processes followed by the 17 volunteers involved in the preparation of *rasam* were combined and standardized to a fixed recipe. Based on the derived recipe, a standardized *rasam* was prepared and further subjected to chemical analysis.

Ash values identified the presence of inorganic radicals such as carbonates, phosphates, silicates and silica of sodium, potassium, magnesium, and calcium. Total ash and sulfated ash of the standardized *rasam* indicated high quantity of carbonates and oxides. Inorganic variables such as calcium oxalate, silica, carbonate content affected the "total ash" values. Such variables were removed by the acid treatment (as they are soluble in hydrochloric acid) and then acid-insoluble ash value was determined.

Table 1: The selected places, its coordinates, direction, and distance from the center of distribution

Samples	Name of the place	State	Coordinates	Direction	Distance from center (km)
S1	Vellore	Tamil Nadu	12.9165° N, 79.1325° E	Centre of distribution	0
S2	Gudipala	Andhra Pradesh	13.1013° N, 79.1249° E	Toward north from center	22.4
S3	Nangamangalam	Andhra Pradesh	13.0518° N, 79.1725° E	Toward north from center	22.8
S4	Bomma Samudram	Andhra Pradesh	13.0534° N, 79.1266° E	Toward north from center	27.2
S5	Gangasagaram	Andhra Pradesh	13.1625° N, 79.1033° E	North end	30
S6	Perumugai	Tamil Nadu	12.9395° N, 79.1859° E	Toward east from center	8.1
S7	Arapakkam	Tamil Nadu	12.9477° N, 79.2219° E	Toward east from center	11.7
S8	Arcot	Tamil Nadu	12.9044° N, 79.3192° E	Toward east from center	24.1
S9	Thenkadapanthangal	Tamil Nadu	12.9134° N, 79.3951° E	East end	34.8
S10	Kuppam	Tamil Nadu	13.2132° N, 79.6895° E	Toward south from center	9.1
S11	Kaniyambadi	Tamil Nadu	12.8056° N, 79.1360° E	Toward south from center	13.6
S12	Kannamangalam	Tamil Nadu	12.7522° N, 79.1478° E	Toward south from center	21.2
S13	Padavedu	Tamil Nadu	12.6600° N, 79.1126° E	South end	33.5
S14	Virinjipuram	Tamil Nadu	12.9208° N, 79.0108° E	Toward west from center	16.1
S15	Pallikonda	Tamil Nadu	12.9023° N, 78.9430° E	Toward west from center	22.3
S16	Pasumathur	Tamil Nadu	12.9350° N, 78.9441° E	Toward west from center	26.4
S17	Gudiyattam	Tamil Nadu	12.9447° N, 78.8709° E	West end	32.4

Table 2: Biological source of the ingredients used in the preparation of *rasam*

Common names	Morphological part used	Nature of the material	Botanical name	Family
Tamarind	Ripped fruit pulp	Dried	*Tamarindus indica* L.	Fabaceae
Turmeric	Rhizome powder	Dried	*Curcuma longa* L.	Zingiberaceae
Sea salt	NA	Solid	NA	NA
Tomato	Ripped fruit	Fresh	*Solanum lycopersicum* L.	Solanaceae
Chili pepper	Crushed fruit of long chili pepper	Dried	*Capsicum annuum* L.	Solanaceae
Cumin	Ripped fruit	Dried	*Cuminum cyminum* L.	Apiaceae
Garlic	Bulb	Dried	*Allium sativum* L.	Amaryllidaceae
Black pepper	Unripe drupe	Dried	*Piper nigrum* L.	Piperaceae
Indian sesame oil	Seed	Oil	*Sesamum indicum* L.	Pedaliaceae
Black mustard	Seed	Dried	*Brassica nigra* L.	Brassicaceae
Chili pepper	Whole fruit of long chili pepper	Dried	*Capsicum annuum* L.	Solanaceae
Curry leaves	Leaves	Fresh	*Murraya koenigii* (L.) Sprengel	Rutaceae
Portable water	NA	Liquid	NA	NA
Coriander	Leaves	Fresh	*Coriandrum sativum* L.	Apiaceae
Asafoetida	Dried latex (oleogum resin) exuded from the rhizome or tap root	Powder	*Ferula assa-foetida* L.	Apiaceae

NA: Not applicable

Low acid insoluble ash indicated less silicious materials such as earth or sand. Extractive values are useful as an evaluation tool to provide an idea about the nature of the chemical constituents present. Extractive values of standardized *rasam* showed very high quantity of polar and moderately polar constituents than nonpolar constituents.

Rasam is used as an appetizer, and its ingredients such as tamarind, turmeric, cumin, black pepper, curry leaves, and asafoetida are known for their digestive aid activity. There are various foods that create a negative-calorie effect, which improves metabolism. These foods are usually plant-derived which are high in water content, rich in fibers, grains, legumes, vegetables, and fruits. A negative-calorie food is a food that requires more energy to digest the food than it provides. Standardized *rasam* almost contained water (95.03%) with only 15.13 kcal. Hence, the body has to burn more energy to digest than it receives. However, there is no substantial evidence to comprehensively prove that *rasam* has negative calorie effect.

Table 3: Quantity of ingredients used and the process involved to prepare the tamarind fruit pulp mixture (T1) and prepare the tomato fruit mixture (T2)

Samples	Tamarind fruit pulp (g)	Volume of soaking water (mL)	Soaking time (s)	Number of hand crushes	Volume of rinsing water (mL)	Turmeric powder (g)	Sea salt (g)	Tomato fruit (g)	Number of hand crushes	Volume of rinsing water (mL)
S1	7.2	439.4	573	39	4.2	0.39	3.85	78.62	57	4.5
S2	7.5	447.9	562	49	4.9	0.42	3.91	85.16	55	5.2
S3	6.8	452.4	588	47	5.5	0.46	4.17	79.28	59	4.6
S4	6.4	445.8	626	48	3.9	0.37	3.82	82.13	64	4.2
S5	6.2	455.2	615	55	5.6	0.34	4.15	84.3	63	4.3
S6	7.3	435.7	568	51	4.5	0.41	4.23	79.45	54	4.8
S7	6.2	455.2	577	38	5.9	0.45	3.95	77.8	62	5.6
S8	7.5	450.2	594	46	4.8	0.34	3.84	82.75	55	4.7
S9	7.0	452.3	619	52	3.7	0.38	4.05	79.92	65	5.5
S10	6.6	461.3	632	43	5.8	0.31	3.84	85.77	54	5.1
S11	6.2	460.7	643	47	5.3	0.45	4.31	85.17	63	4.9
S12	7.5	448.4	581	44	4.1	0.49	3.87	88.25	58	5.4
S13	7.3	451.6	594	36	6.2	0.35	4.33	76.52	61	5.1
S14	7.6	438.3	621	40	4.9	0.39	3.95	88.61	58	5.7
S15	6.7	456.6	602	42	5.4	0.45	4.10	83.36	66	5.2
S16	6.7	445.1	596	43	4.7	0.40	3.74	78.37	62	5.3
S17	6.3	455.2	604	47	5.3	0.46	3.91	86.04	58	4.7
Mean±SD	6.88±0.52	450.08±7.43	599.71±23.6	45.12±5.2	4.98±0.73	0.40±0.05	4.00±0.18	82.44±3.78	59.65±3.92	4.99±0.45

Table 4: Quantity of ingredients used and the process involved to prepare the spice mixture (T3) and prepare all mixture (T4)

Samples	Pepper drupes (g)	Number of crushes*	Cumin fruits (g)	Number of crushes* after cumin	Chili pepper (g)	Number of crushes* after Cp	Garlic cloves (g)	Number of crushes* after Gc	Volume of rinsing water used for T2 (mL)	Volume of rinsing water used for T3 (mL)
S1	1.12	75	2.94	85	0.78	45	9.91	75	7.6	8.7
S2	0.89	82	2.27	96	0.63	46	9.42	92	8.5	9.1
S3	0.91	94	2.48	110	0.83	52	8.88	79	11.2	10.4
S4	1.34	85	2.94	97	0.91	55	10.12	81	10.4	9.7
S5	1.86	88	3.05	92	0.72	58	9.63	84	10.2	10.3
S6	1.68	91	2.68	106	0.89	46	9.48	94	9.2	8.9
S7	1.29	67	2.51	88	0.92	53	9.18	92	9.7	10.8
S8	1.19	84	2.47	104	0.83	48	9.22	83	10.6	11.2
S9	1.91	104	2.77	94	0.87	41	9.94	80	11.7	9.3
S10	0.94	93	2.22	112	0.68	51	10.14	98	9.4	8.3
S11	0.91	78	2.84	107	0.73	60	9.15	96	10.8	9.4
S12	1.54	81	3.13	106	0.93	47	9.67	99	10.3	10.7
S13	1.02	71	2.57	96	0.76	56	10.24	103	10.4	11.2
S14	1.69	89	2.29	98	0.94	43	9.11	89	7.9	10.9
S15	1.85	95	2.23	111	0.84	54	9.87	107	11.9	10.6
S16	0.89	88	3.05	104	0.79	56	9.69	99	10.2	9.9
S17	1.57	82	2.96	96	0.88	44	10.07	81	9.8	10.1
Mean±SD	1.33±0.38	85.12±9.29	2.67±0.31	100.12±8.09	0.82±0.04	50.29±5.73	9.63±0.42	90.12±9.48	9.99±1.2	9.97±0.9

*Mechanical crushes. Cp: Chili pepper, Gc: Garlic cloves, SD: Standard deviation

Table 5: Quantity of ingredients used and the process involved to prepare the final product (T5)

Samples	Iso (mL)	T (°C)	ToH (s)	Ms (g)	ToA Ms (s)	Cp (g)	ToA Cp (s)	CuL (g)	ToA CuL (s)	Vrw for T4 (mL)	Bt (s)	CoL (g)	Asa (g)
S1	3.97	55	110	0.76	4	1.12	3	0.57	2	35.6	285	1.21	0.04
S2	3.78	58	123	0.87	5	1.54	3	0.49	3	24.4	293	1.67	0.05
S3	4.21	59	125	0.82	4	1.21	2	0.65	2	15.9	304	1.28	0.06
S4	4.05	63	115	0.79	3	1.67	2	0.59	3	26	291	1.68	0.03
S5	3.84	56	126	0.81	6	1.24	3	0.67	2	14.4	307	1.42	0.06
S6	4.06	61	118	0.74	4	1.68	3	0.64	2	36.9	310	1.67	0.06
S7	4.19	64	124	0.84	5	1.37	4	0.61	2	12.8	297	1.13	0.05
S8	3.66	54	119	0.77	6	1.95	4	0.62	2	18.5	289	1.88	0.03
S9	4.17	63	131	0.87	4	1.85	2	0.57	2	17.5	311	1.47	0.04
S10	3.81	61	129	0.82	5	1.96	3	0.56	2	10.1	306	1.87	0.05
S11	4.24	54	113	0.83	6	1.57	3	0.62	2	8.9	296	0.97	0.06
S12	3.95	62	118	0.88	4	1.33	4	0.67	3	21.1	303	1.28	0.05
S13	4.33	64	127	0.85	4	1.81	3	0.61	2	15.5	293	1.93	0.04
S14	3.89	58	111	0.78	4	1.64	2	0.64	3	32.3	312	1.34	0.06
S15	3.86	65	105	0.86	5	1.18	3	0.58	2	10.3	301	1.26	0.07
S16	3.99	63	127	0.85	6	1.65	4	0.62	2	24.8	308	1.68	0.04
S17	4.07	57	113	0.79	4	1.23	2	0.65	3	14.9	292	1.77	0.07
Mean±SD	4.00±0.18	59.82±3.71	119.65±7.59	0.82±0.04	4.65±0.93	1.53±0.28	2.94±0.75	0.61±0.05	2.29±0.47	19.99±8.77	299.88±8.49	1.50±0.29	0.05±0.01

Iso: Indian sesame oil, T: Temperature of cooking, ToH: Time of oil heating, Ms: Mustard seeds, ToA Ms: Time of addition for Ms after ToH, Cp: Chili pepper whole, ToA Cp: Time of addition for Cp after ToA Ms, CuL: Curry leaves, ToA CuL: Time of addition for CuL after ToA Cp, Vrw: Volume of rinsing water, Bt: Boiling time, CoL: Coriander leaves, Asa: Asafoetida, SD: Standard deviation

Rasam being an everyday traditional food, with high content of sodium, potassium, chloride, phosphorus and sulfur can be a daily dietary source. The presence of almost all the classes of secondary metabolites such as alkaloids, tannins, saponins, flavonoids, terpenoids, steroids, glycosides, and volatile oil is due to the chemical diversification in the ingredients used in *rasam*. These secondary metabolites may exert myriad physiological effects apart from digestive aid. The different ingredients used in *rasam* have been individually attributed to various pharmacological effects in preclinical and clinical studies. Hepatic tonic, anti-inflammatory, and antioxidant effect of tamarind fruit pulp;[2,12] hepato-protective,

Table 6: Nutritional value of standardized *rasam* (values expressed per 100 g)

Nutrition facts	Values	Units
Contents		
Water	95.03	g
Energy	15.13	kcal
Proteins	0.54	g
Total lipid (fat)	0.41	g
Carbohydrate	2.32	g
Fiber, total dietary	ND	NA
Minerals		
Calcium, Ca	ND	NA
Iron, Fe	0.5	µg
Magnesium, Mg	ND	NA
Phosphorus, P	10	mg
Potassium, K	100	mg
Sodium, Na	410	mg
Zinc, Zn	6	µg
Copper, Cu	0.8	µg
Manganese, Mn	<0.25	µg
Selenium, Se	<0.25	µg
Sulfur, S	400	µg
Chloride, Cl	750	mg
Molybdenum, Mo	<0.25	µg
Boron, B	<0.25	µg
Nickel, Ni	<0.25	µg
Aluminum, Al	<0.25	µg
Vitamins		
Vitamin C, total ascorbic acid	0.58	g
Thiamine	ND	NA
Riboflavin	ND	NA
Niacin	ND	NA
Vitamin B-6	0.34	g

ND: Not detected, NA: Not applicable

antioxidant, anti-inflammatory, anticarcinogenic, and antimicrobial, antidiabetic, antiangiogenic effect and antithrombotic effect of turmeric;[2,13] antioxidant and anticancer activity of chili pepper;[2] anti-flatulent, hypoglycemic, hypolipidemic, antimicrobial, antioxidant, and cytotoxic activity of cumin;[2,14] hepato-protective, hypoglycemic, anti-hypertensive, antimicrobial, anticancer, and antioxidant effects of garlic bulbs;[15,16] antioxidant, antimigraine, antiemetic, and antipyretic effect of black pepper;[17,18] hypoglycemic effect of black mustard;[19] hepato-protective, antimicrobial, anti-inflammatory, cardioprotective, hypoglycemic, and antipyretic activity of curry leaves;[20-22] diuretic, antioxidant, and antiplatelet activity of coriander leaves;[23,24] antiflatulent, anti-microbial, and antiasthmatic effect of asafoetida[25] are been reported. These facts ascertain that *rasam* is a classical example of traditional functional food.

CONCLUSION

The processing followed in the formulation of *rasam* involved heating the spices in water and oil. This processing provided tremendous opportunity for a completely altered/different chemical composition of *rasam*. The altered/different chemical composition of the *rasam* may be due to the loss of active principles or synergetic effect or breakdown of inactive metabolite to an active one or formation of new chemical entities. In the era of preventive medicines, a standardized procedure for the preparation of *rasam* can aid the exploration of its pharmaceutical potential in a systematic scientific way beyond its culinary and nutritive effect.

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CONFLICTS OF INTEREST

There are no conflicts of interest.

ABBREVIATION USED

CoD: Center of distribution; **T1:** Preparation of tamarind fruit pulp mixture; **T2:** Preparation of tomato fruit mixture; **T3:** Preparation of spice mixture; **T4:** Preparation of all mixture; **T5:** Preparation of final product; **Cp:** Chili pepper; **Gc:** Garlic cloves; **SD:** Standard deviation; **Iso:** Indian sesame oil; **T:** Temperature of cooking; **ToH:** Time of oil heating; **Ms:** Mustard seeds; **ToA Ms:** Time of addition for Ms after ToH; **ToA Cp:** Time of addition for Cp after ToA Ms; **CuL:** Curry leaves; **ToA CuL:** Time of addition for CuL after ToA Cp; **Vrw:** Volume of rinsing water; **Bt:** Boiling time; **CoL:** Coriander leaves; **Asa:** Asafoetida.

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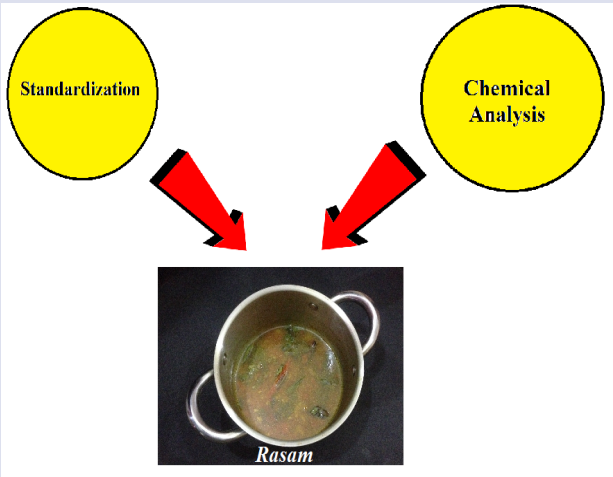
GRAPHICAL ABSTRACT



HIGHLIGHTS OF PAPER

- The ingredients used in the preparation of *rasam* are medicinally claimed for various ailments, which makes it a traditional functional food.
- Due to geographical, ethnical, and traditional differences, *rasam* recipe and the preparation process have a wide difference.
- The present study was aimed to standardize *rasam* and then to perform a chemical analysis.
- The standardized procedure provided tremendous opportunity to study the pharmaceutical potential in a systematic scientific way beyond its culinary and nutritive effect..

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