

Development and Quality Evaluation of *Kasara* (*Poshan* Cookies)

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Abstract-

Background

This study aimed to develop and standardize *Kasara* (*Poshan* Cookies), a nutritious snack, based on a traditional Ayurvedic recipe found in the ancient literature (*Kshemkutuhulam*). The recipe was modernized into cookies to meet contemporary dietary preferences. Ayurvedic ingredients like *ashwagandha*, *shatavari*, and *anantamul* were combined with *ragi* flour, *singhara* flour, wheat flour, powdered rock sugar, and ghee for nutritional benefits and consumer appeal.

Methods

The recipe was formulated through trials. Two batches of cookies were tested, with the final batch (T2) containing 13% *ragi* flour, 10% *singhara* flour, 10% wheat flour, 1% *ashwagandha* powder, 2% *shatavari* powder, 1% *anantamul* powder, 2% cardamom powder, 27% cow's ghee, and 33% powdered rock sugar. Sensory characteristics, nutritional content, and microbial safety were evaluated.

Main Findings

Sensory evaluation revealed that the T2 batch had superior quality and acceptability. The blend of *Ayurvedic* herbs and flours created a well-balanced nutritional profile, with positive feedback on taste, texture, and appearance. Microbial testing confirmed the cookies were safe for consumption.

Conclusion

Kasara (*Poshan* Cookies) successfully integrated *Ayurvedic* ingredients with modern dietary needs, resulting in a nutritious, palatable, and safe product. This study demonstrates that traditional recipes can be innovatively adapted to fit modern lifestyles while preserving their cultural essence.

Keywords- *Kasara*, *Poshan* Cookies, *Ashwagandha*, *Shatavari*, *Anantamul*, *Ragi*, *Singhara*, Functional foods, *Ayurveda*.

1. Introduction:

Traditional Indian foods, rooted in *Ayurveda*, emphasize balanced nutrition and holistic health. The '*Kasara*' recipe from the *Kshemkutuhulamgrantha*, an *Ayurvedic* text authored by Kshema Sharma in the 16th century dealing with topics of dietetics and culinary art, presents an accessible and nutrient-dense snack option that is easy to prepare and enjoyable for consumers⁽¹⁾. *Kasara* is been traditionally consumed as a sweet *Vadi*- a small square shaped sweet which is dense in calories and has good carbohydrate, protein and fats along with essential nutrients required across all stages of life⁽²⁾. Originally, *Kasara* was prepared using Wheat flour, but it can also be prepared using black gram, lotus roots, *singhara* or rice flour⁽³⁾.

2. Aims and Objectives

2.1 Aims

To develop and analyze an innovative recipe, *Kasara* (*Poshan* Cookies) for its Sensory, Nutritional and Microbial Evaluation.

2.2 Objectives

1. To explore and understand the *Ayurvedic* herbs- *Ashwagandha*, *Shatavari* and *Anantamul* along with *Ragi*, *Singhara*, Wheat flour, Rock sugar powder and Ghee with respect to their nutritional and health benefits.
2. To develop and standardize a preparation method for *Kasara* (*Poshan* Cookies) by modifying the traditional *Ayurvedic* *Kasara* recipe into a modern and convenient form, cookie.
3. To conduct a comprehensive sensory evaluation of the developed cookies, assessing attributes such as appearance, color, taste, texture, shape, and overall acceptability.
4. To analyze the nutritional composition of the cookies, focusing on key nutrients, and to evaluate the microbial safety of the product to ensure its suitability for consumption.

3. Conceptual Study of *Kasara*

The original traditional recipe '*Kasara*' from *Kshemkutuhalam* underwent innovative adaptations to suit modern needs. This transformation involved reimagining the traditional *Kasara* into a format more suitable for contemporary consumption: Cookies. While retaining the essence and nutritional properties of the original recipe, the conversion to cookies ensured convenience and palatability, making it more appealing and accessible to consumer. The use of *Ayurvedic* herbs such as *Ashwagandha*, *Shatavari*, and *Anantamul* enhances the nutritional value and therapeutic properties of these cookies.

Ashwagandha (*Withania somnifera*) is also referred to as Indian Ginseng. The extract of this plant shows antioxidant, anti-inflammatory, and immunomodulatory activities. The plant extract and its bioactive compounds are utilized for the prevention and treatment of various conditions, including arthritis, impotence, amnesia, anxiety, cancer, neurodegenerative disorders, cardiovascular diseases, and more⁽⁴⁾. It is widely used in *Ayurvedic* medicine, the traditional medical system of India, as a *Rasayana* (tonic) due to its wide ranging health benefits⁽⁵⁾.

Shatavari (Asparagus racemosus) may constitute as a very important component for feed supplement in the diet because of their higher availability of nutrients like protein, crude fibre, and minerals like Calcium, Magnesium, Iron, Copper, and Zinc⁽⁶⁾. *Shatavari* is a well-known Ayurvedic *rasayana* (tonic) which prevents ageing, increases longevity, imparts immunity, improves mental function, vigor and also adds vitality to the body. It is can also be used in nervous disorders, dyspepsia, tumor, inflammation, neuropathy and hepatopathy⁽⁷⁾.

Anantamul (Hemidesmus indicus) is also known as *Sariva*. It contains chemical constituents like an essential oil containing 80% of 2-hydroxy 4-methoxy benzaldehyde, a ketone, fatty acids, saponin, tannins, resin acids, sterols, sitosterol, and stigmasterol⁽⁸⁾. *Anantamul* is beneficial as a *balavardhak* (supporting weight gain), while also acting as a blood purifier and a general tonic to enhance energy levels⁽⁹⁾. Today, *Anantamul* is receiving renewed attention as an Ayurvedic medicinal and herbal product that may have health benefits for blood purification, kidney and urinary disorders, and skin infections⁽¹⁰⁾. *Anantamul* has been indicated for all types of ulcers, skin diseases, urticaria, fever, diabetes, loss or lack of appetite, respiratory tract disorders, vomiting, nausea, cough, thirst, menorrhagia, diarrhea and toxicity⁽¹¹⁾.

Finger millet (*Ragi, Eleusine Coracana*) is rich in protein, iron, calcium, phosphorus, fibre, calcium, good quality protein along with the presence of essential amino acids, vitamin A and vitamin B⁽¹²⁾. *Ragi* can be incorporated as an excellent dietary choice for growing children, pregnant women, the elderly, and patients.

Water chestnut (*Trapa natans*) commonly known as *Singhara*, is an excellent source of energy due to its high starch content. *Singhara* is packed with nutrients, including omega-3 fatty acids, antioxidant compounds like phenolics and tannins and vitamins⁽¹³⁾. It has been used in traditional system of medicine like Ayurveda for centuries to address many health issues like stranguria, dysuria, polyuria, sexual debility, and general fatigue, sore throat, dysentery⁽²⁾.

Wheat (*Triticum aestivum*) is often considered primarily as a source of energy (carbohydrate), it also contains significant amounts of proteins, fibre, and minor amounts of lipids, vitamins, minerals, and phytochemicals which may contribute to a healthy diet⁽¹⁴⁾. Wheat is explained centuries before in Ayurvedic texts, as a dietary ingredient it is hailed to improve body strength and nourishment⁽¹⁵⁾.

Whole rock sugar powder is an unrefined variety of sugar, consisting primarily of sucrose. It is widely used in both culinary applications and traditional medicine. The repeated crystallization and recrystallization process of rock sugar enhances its digestibility and imparts a soothing effect on the body. It has shown positive effects in aiding weight gain, soothing sore throats, providing relief after meals, and offering a quick energy boost⁽¹⁶⁾.

Ghee is a type of clarified butter fat that has been produced and utilized since ancient times. Ghee has been accepted universally as superior fat because of its characteristic short chain fatty acids responsible for better digestibility and anti-cancer properties. Ghee also contains anti-oxidants, vitamin E & beta carotene⁽¹⁷⁾. Ghee is mentioned as a food in *Ayurveda* and is listed in *CarakaSamhita* as one of the eleven food items recommended for daily consumption - *Nityasevaniya Ahara*.

Cardamom (*Elettaria cardamomum*), often referred to as the "queen of spices," is celebrated for its delightful aroma and its wide use as a flavouring agent in various foods and beverages. It offers a range of medicinal benefits, including antiseptic (for respiratory issues),

antispasmodic (for neuromuscular relief), aphrodisiac, expectorant, anthelmintic, antibacterial, cephalic, cardiotonic, diuretic, and stomachic properties ⁽¹⁸⁾. The ancient Indian medical text, Charaka Samhita, mentions the use of cardamom as a remedy for food poisoning.

The developed recipe, *Kasara (Poshan Cookies)*, was named after its diverse range of ingredients and exceptional nutritional benefits. By infusing a variety of nutrient rich components, the cookies are the essence of nourishment, hence the name ‘*Poshan*,’ which translates to ‘nutrition’ in several Indian languages. Through the Ayurveda reference and innovative culinary techniques, *Kasara (Poshan Cookies)* stand as a blend of heritage and progress in nutrition.

The incorporation of Ayurvedic herbs like *Ashwagandha*, *Shatavari*, and *Anantamul* into the innovative *Kasara (Poshan cookie)* recipe not only enhances its therapeutic potential but also aligns with modern nutritional science, offering a functional food with both health-promoting properties and widespread appeal.

4. Materials and Methods

4.1 Selection of Ingredients

Raw materials (*Ragi* flour, *Singhara* flour, Wheat flour, Cardamom powder and Ghee) were procured from a local supermarket from Pune.

Other ingredients (*Anantamul* root powder, *Shatavari* powder, *Ashwagandha* powder and Rock sugar powder) were purchased from an authorized Ayurvedic shop in Pune.

4.2 Experimental Trials

The development of *Kasara (Poshan Cookies)* followed the traditional method of *Kasara* preparation, with some modifications for cookie-making. Two trial batches were conducted: (Please refer to Table 1)

T1 (Control): 60g *Ragi* flour, 60g *Singhara* flour, 60g Wheat flour, 8g *Ashwagandha*, 8g *Shatavari*, 3g *Anantamul*, 120g rock sugar powder and 110g cow’s ghee for moisture.

T2 (Optimized): 40% *Ragi* flour, 30% *Singhara* flour, 30% Wheat flour, 5g *Ashwagandha*, 5g *Shatavari*, 3g *Anantamul*, 100g rock sugar powder and 80g cow’s ghee for moisture.

Ingredients	T1 (control)	T2 (Optimized)
<i>Ragi</i> flour (g)	60	40
<i>Singhara</i> flour (g)	60	30
Wheat flour (g)	60	30
<i>Shatavari</i> powder (g)	8	5
<i>Ashwagandha</i> powder (g)	8	3
<i>Anantamul</i> root powder (g)	3	3
Cardamom powder (g)	3	5
Cow’s Ghee ((g)	110	80
Rock sugar powder (g)	120	100

(Table 1: Ingredients and quantities for T1 and T2)

4.3 Process:

The flour blends were mixed with cow's ghee, powdered rock sugar and a pinch of cardamom. The dough was shaped into small cookie rounds and baked at 160°C for 20 minutes. These cookies were evaluated for sensory attributes, nutritional content, and microbial safety. (Please refer to Table 2)

Sr. No.	Characteristics	Values
1.	Composition	13% <i>Ragi</i> flour + 10% <i>Singhara</i> Flour + 10% Wheat Flour + 1% <i>Ashwagandha</i> Powder + 2% <i>Shatavari</i> powder + 1% <i>Anantamul</i> root powder + 2% Cardamom Powder + 27% Cow’s ghee + 33% Powdered Rock Sugar
2.	Quantity of mixture used for trial	300g
3.	Number of Cookies in a batch	12 to 14
4.	Weight of each Cookie	25g
5.	Time required for baking	20- 25 minutes
6.	Colour of end product	Golden- brown

(Table 2: Processing characteristics of *Kasara (Poshan Cookies)*)

4.4 Analysis of *Kasara (Poshan Cookies)*

4.4.1 Sensory Analysis

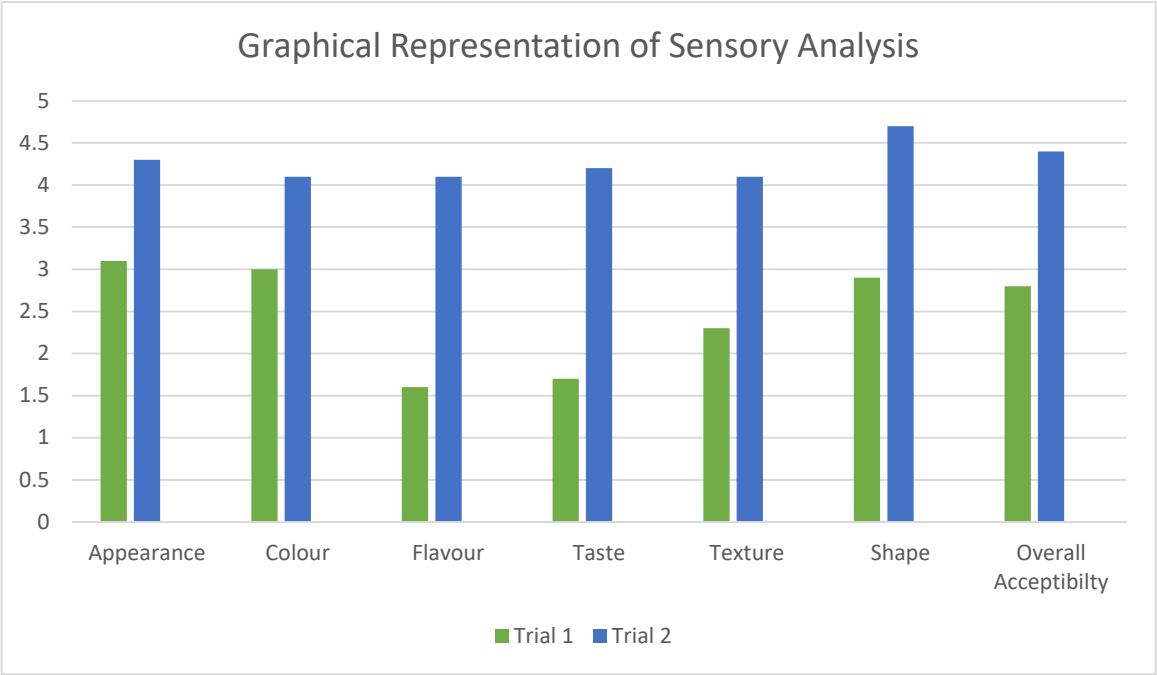
The sensory evaluation for *Kasara (Poshan Cookies)* was carried for attributes namely appearance, colour, flavour, taste, texture, shape and overall acceptability by a panel of 20 semi-trained judges on five point hedonic scale using score card. (Please refer to Figure 1)

(Figure 1: Sensory Analysis Scorecard as per Hedonic 5 point scale)

(Table 3: Screening of most acceptable treatment by sensory evaluation)

Ranking: Rank I- >3.5, Rank II- 3.5 to 2.5, Rank III- <2.5

(Figure 2: Graphical representation of sensory analysis of T1 and T2)



4.4.2 Nutritional Analysis

Nutritional analysis was carried out according to standard methods for evaluating total energy, carbohydrates, proteins, fat, fibre, iron and calcium content.

4.4.3 Microbial Analysis

Pour plating method was used for microbial testing. Total plate count was evaluated for control and test samples.

5. Result and Discussion

5.1 Development of *Kasara* (*Poshan* Cookies)

The traditional *Kasara* recipe, was innovatively adapted to create a modern, convenient snack in the form of cookies. The key challenge was to retain the nutritional and therapeutic benefits while making the product more palatable and suitable for contemporary consumers. Two trial batches were developed; the first batch (T1) followed the formulation using equal proportions of *Ragi*, *Singhara*, and Wheat flours, with higher concentrations of *Ashwagandha*, *Shatavari*, and *Anantamul*.

Based on sensory feedback from T1, adjustments were made in the second batch (T2), to the proportions of the *Ayurvedic* herbs, reducing the bitterness, and increasing the ghee content to improve texture and moisture. The final proportions were modified to 13% *Ragi* flour + 10% *Singhara* Flour + 10% Wheat Flour + 1% *Ashwagandha* Powder + 2% *Shatavari* powder + 1% *Anantamul* root powder + 2% Cardamom Powder + 27% Cow’s ghee + 33% Powdered Rock Sugar, respectively.



(Figure 3: *Kasara (Poshan Cookies)* T2)

5.2 Sensory Evaluation

The tabulated data gives the details of sensory evaluation of both the batches of *Kasara (Poshan Cookies)*. It is observed that trial 2 (T2) sample scored highest points next to control sample in terms of appearance, colour, flavour, texture, taste, shape and overall acceptability. (Please refer Table 3 and Figure 2)

5.3 Nutritional and Microbial Analysis

The tabulated data gives the details of the nutritional composition of the most accepted trial (T2) of *Kasara (Poshan Cookies)*. (Please refer to Table 4)

The microbial testing was carried out using TPC (Total Plate Count), to study the microbial quality of the product. It was a zero day evaluation; the sample was tested on the same day as that of production. (Please refer to Table 5)

Sr No.	Nutrient (Basic Components)	Result	Unit
1.	Total Energy	523.97	kcal/100g
2.	Total carbohydrate	61.33	g/100g
3.	Total Protein	6.46	g/100g
4.	Total Fat	28.09	g/100g
5.	Crude Fibre	1.51	g/100g
6.	Calcium	83.62	mg/100g
7.	Iron	7.91	mg/100g

(Table 4: Nutritional analysis for *Kasara (Poshan Cookies)*)

Parameter	Results	Unit	Test method
Total	7.7 ×	CFU/g	IS 5402:2012
Plate	10 ²		
Count			

(Table 5: Microbial testing for *Kasara (Poshan Cookies)*)

6. Conclusion

The developed product, *Kasara (Poshan Cookies)*, an innovative recipe from ancient *Ayurvedic* literature *Kshemkutuhalam*, has been guided with enhanced nutritional and sensory qualities.

Through comprehensive sensory analysis, we assessed the palatability, flavour, texture, and overall acceptability of the *Kasara (Poshan Cookies)* among our target consumers. Subsequently, based on valuable sensory feedback, we standardized the recipe by optimizing ingredient proportions and refining preparation methods to ensure consistent quality and taste across batches.

This product not only offers a delicious snack option but also serves as a functional food suitable for various life stages. The nutrient-dense ingredients, including *Ayurvedic* herbs and flours, make these cookies particularly beneficial for infants, adolescent girls and boys, pregnant women, and lactating mothers. The combination of healthy fats, proteins, and micronutrients supports growth, development, and overall well-being, offering essential nourishment for these vulnerable groups. The cookies can help meet the increased nutritional demands during growth and pregnancy, while also providing a convenient and enjoyable way to incorporate balanced nutrition into daily diets.

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