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# A re-analysis of regional variation and adaptation in traditional *Kandyan* snacks and gruels

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**Abstract**

This study re-analyzes 32 traditional recipes and narratives from 17 key informants in Sri Lanka's *Kandyan* region (1474–1815) to investigate its culinary diversity. Ten culturally and geographically significant dishes were examined, including three gruel preparations—nourishing, semi-liquid foods typically made from grains boiled in water or milk—and iconic snacks like *Kiri-Roti*, *Gana-Athirasa*, and *Madu-Gotu*. Statistical analysis revealed *Kiri-Roti* (19%) and gruels (*Diya-Ulu-Kaṇda*, *Kurakkan-Keṇda*, *Uṇdu-Kaṇda*, a black gram gruel) exhibited distinct regional and sub-community variations in preparation and seasoning, central to *Kandyan* cuisine. Gruels like *Diya-Ulu-Kaṇda* were valued for cognitive and digestive benefits, while *Uṇdu-Kaṇda* offered nutrient-rich properties for pregnant women. Snacks such as *Gana-Athirasa* (9.38%) and *Kola-Lālu* (6.25%) highlighted the use of local ingredients, preserving cultural identity. *Kiri-Roti* specifically demonstrated intra-regional adaptations (e.g., *Kandy* vs. *Ūva* seasoning), integrating into everyday and ceremonial contexts. These findings challenge assumptions of culinary homogeneity, illustrating the interplay of local ecology, Ayurveda principles, and community knowledge in shaping food traditions. Despite dataset limitations, this research lays a foundation for exploring *Kandyan*-era food's nutritional and cultural dimensions. The analysis emphasizes documenting traditional recipes to preserve their medicinal and cultural significance for modern dietary application.

**Keywords** *Kandyan* cuisine, Traditional snacks, Gruels, *Kiri-Roti*, Cultural heritage, Functional foods

## 1 Introduction

Sri Lanka's diverse ecological landscape has profoundly influenced its rich culinary heritage, particularly in the Central Province during the *Kandian* era (1474–1815). This region, encompassing significant ecological and cultural landmarks such as the Knuckles Forest, has long been associated with traditional knowledge and practices. Amarasinghe's study on the use of the *Knuckles* Forest and indigenous knowledge highlights its importance, aligning with the research focus in the *Matale* and *Kandy* districts.

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The region's unique topography and biodiversity fostered a deep connection between nature and culture, evident in the use of indigenous ingredients and the sophisticated understanding of how microclimates influence flavor and medicinal properties within traditional food practices [2–4].

Despite the richness of *Kandyan* cuisine, documentation and analysis of its everyday food practices remain limited. This study addresses this gap by comprehensively reviewing historical and scholarly works, coupled with a systematic re-analysis of a previously collected dataset of traditional recipes and associated knowledge from 17 key informants in the *Kandy* region.

This study re-examines a dataset of traditional *Kandyan* recipes to challenge the hypothesis of culinary homogeneity. Through descriptive statistics and thematic analysis, it explores the diversity of dishes, preparation techniques, and associated knowledge, seeking to uncover regional variations, under-documented dishes, and the connections between food, culture, and health. This investigation contributes to preserving culinary heritage and explores its potential applications in contemporary contexts.

Research Question: To what extent do regional variations in preparation techniques and functional ingredients—particularly those evident in traditional *Kandyan* snacks and gruels—reflect or deviate from established Sri Lankan food heritage?

### 1.1 Literature review: traditional foodways inherited from the Kandyan era

Traditional food practices encompass a complex web of knowledge, skills, and rituals surrounding food production, preparation, and consumption. They serve as a repository of cultural heritage, offering insights into a community's history, social structure, environmental adaptations, and belief systems [5]. In Sri-Lanka, traditional food practices are deeply intertwined with Ayurveda principles, religious beliefs, and unique agricultural practices. This interconnectedness extends to the preservation of culinary techniques, many of which remain deeply rooted in the foundational geographical landscape [6].

### 1.2 Overview of sri-Lankan cusin

Rooted in ancient traditions, Sri-Lankan cuisine showcases a vibrant blend of indigenous practices, Ayurveda principles, and influences from diverse cultures [7]. Rice, the staple food, is complemented by an array of spices, vegetables, fruits, fish, and coconut, creating a symphony of tastes and textures. This diversity reflects the island's fertile landscape and its historical role as a trading hub.

Regional variations in Sri-Lankan cuisine are evident, with the mountainous Central Province developing a distinct culinary tradition. *Kandyan* cuisine is characterized by its own set of staple ingredients, cooking methods, and specific dish preparations, shaped by the region's history, geography, and the availability of local resources [2].

This regional distinctiveness highlights the diverse culinary landscape of Sri-Lanka and the importance of considering local adaptations and influences when studying its food traditions.

### 1.3 Specific focus on *Kandyan* era food practices

Despite its significance, everyday *Kandyan* cuisine of the historical period remains understudied. Existing research has often focused on broader trends or ceremonial

dishes [6] overlooking the culinary practices that shaped daily life in the region. This study aims to address this gap by analyzing a dataset of traditional recipes and associated knowledge from the *Kandyan* up-country.

### 1.4 Research gap and current study

Through a multi-faceted analysis of these recipes, alongside insights from key informants, this research seeks to document and analyze the diversity of dishes, ingredients, and preparation methods that characterized the *Kandyan* culinary landscape. By incorporating both qualitative and quantitative approaches, this study will explore the potential nutritional and medicinal properties of these dishes, examine regional variations, and offer insights into the historical and cultural context of food practices in the region.

This study challenges the null hypothesis of homogeneity in *Kandyan*-era food preparations. By analyzing the existing dataset, this research aims to uncover regional adaptations, forgotten dishes, and the interplay between culinary traditions and broader cultural factors.

## 2 Methodology

This exploratory study employed a dual approach: a comprehensive review of historical and scholarly works, and a systematic re-analysis of an existing dataset. The comprehensive review focused strictly on literature pertaining to traditional Kandyan cuisine, local ecological influences, and the intersection of Ayurved principles with food practices during the *Kandyan* era (1474–1815).

This existing dataset, comprising 32 traditional recipes (coded 1–32) and associated knowledge from 17 key informants (coded A–Q), was originally collected (2013/2014) for a Postgraduate Diploma course where the author served as a supervisor. This pre-existing data, primarily from elderly residents and traditional physicians in the Kandy region, was systematically re-analyzed for this study.

This re-analysis specifically addresses areas previously unexplored in the original work, challenging the hypothesis of culinary homogeneity and exploring the deeper cultural, medicinal, and regional variations. Descriptive statistics were used to summarize the data, while Thematic analysis of recipes and informant narratives provided qualitative insights into regional adaptations.

### 2.1 Data presentation

This study employs a mixed-methods approach, incorporating descriptive statistics, thematic analysis, and direct quotes from key informants. The presentation will begin with an examination of *Kandyan* snacks and their cultural significance, followed by an analysis of three breakfast gruels with implications for gut health. Future research directions for each dish will be presented in the discussion.

### 2.2 Limitations

This study acknowledges limitations in its sample size, geographic focus, and dish selection. For instance, only two *Kurakkan* dishes were analyzed despite the diversity of its preparations, limiting comparative study with other regions. Furthermore, due to scope constraints, a detailed examination of the unique use of *Chavya* leaves (*Piper retrofractum*) and a comprehensive exploration of leafy dishes and rice/grain traditions were

**Table 1** The Demographic and Geographical Details of the Informants

| Name (Village/Area) | GPS (Illustrative) | Altitude (m) | Ecology | Ethnicity | Language | Religion | Inhabitants (Est.) | Participants (N) | Gender (M:F) | Avg. Age | Occupation |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Kandy Suburb | 7.29°N, 80.64°E | 650 | Intermediate | Sinhala | Sinhala | Buddhist | 1,500 | 6 | 3:3 | 64 | Elder, Home Cook |
| Matale Region | 7.63°N, 80.60°E | 300 | Intermediate | Sinhala/Tamil | Sinhala | Buddhist/Hindu | 1,200 | 5 | 2:3 | 68 | Traditional Physician, Elder |
| Badulla/Ūva Region | 7.00°N, 81.05°E | 500 | Dry/Intermediate | Sinhala | Sinhala | Buddhist | 6 | 4:2 | 60 | Farmer, Elder | |
| TOTAL | - | - | - | - | - | - | - | 17 | 9:8 | 64 | - |

deferred to future publications. Despite these specific omissions and the inherent limitations in dataset size, this research provides valuable preliminary insights into *Kandyan* culinary diversity, laying a foundation for subsequent, more expansive studies.

## 3 Results

This section integrates quantitative and qualitative findings to provide a nuanced understanding of traditional *Kandyan* food practices. This mixed-methods approach paves the way for further research and conservation efforts.

### 3.1 Quantitative findings

Analysis of the 32 traditional recipes from 17 key informants in the *Kandyan* region revealed a diverse culinary landscape, challenging the initial hypothesis of homogeneity. Leafy green vegetables (*Kola*) feature prominently in the analyzed recipes, comprising 50% of the dataset. Snacks (34.38%) and rice-based dishes (21.88%) were the most prevalent categories, Gruels (*Kaṇda*) and leafy preparations (*Malluma*) account for 15.63% and 18.75%, respectively, while vegetable curries (*Ānama*) make up the smallest category with highlighting their importance in the traditional diet.

These dishes highlight a rich culinary legacy with regional variations in ingredients, techniques, and cultural significance, warranting further research into the factors shaping these adaptations. The subsequent discussion utilizes the thematic analysis of informant narratives and cross-cultural comparison to interpret these findings.

## 4 Discussion

This section explores the qualitative dimensions of traditional *Kandian* dishes, focusing on community-based preparation techniques and cultural exchange evident in each dish from the selected list. The discussion begins with an in-depth analysis of the Cultural Significance of Traditional *Kandyan* Snacks (*Kavili Varga*), specifically the *Athirasa* variations, followed by an examination of the hyper-local gruels and other regional specialties.

### 4.1 Synthesis of findings and cross-cultural comparison

Building upon the quantitative assessment of dish prevalence, this section provides an obligatory comparison of the data set's unique findings against established literature on Sri Lankan culinary heritage, addressing the research objectives (ROs) for novel reporting and cross-cultural interpretation.

#### *4.1.1 Novel reporting and hyper-local endemics*

Analysis confirmed the existence of novel reports that are largely undocumented in general Sri Lankan culinary texts, underscoring the hyper-local nature of these traditions:

*Extreme Hyper-localism* Dishes like *Kola Lālu* (DN 27) and the Cycas zeylanica preparations, *Madu Gotu* (MG) (DN 24) and *Madu Ginipu* (MGi) (DN 32), are absent from standard national reviews. Their documentation constitutes a novel report of highly localized specialization.

*Unique Ethnobotanical Practices* The consistent use of *Chavya* leaves (Piper retrofractum) as a fresh garnish in *Polos Ānama* (DN 4) is a hyper-local practice not widely recorded in major texts.

**Table 2** Characterization of Selected Traditional Kandyan Dishes

| Col. 1: Dish Name (DN) | Col. 2: Key Ingredients (Scientific Name/Sinhala) | Col. 3: Preparation Process (MOP) | Col. 4: Functional Claim / Ayurvedic Dōṣa | Col. 5: Consumption Context |
|---|---|---|---|---|
| I. Snacks (Kavili-Varga) | | | | |
| Gana Athirasa (GA) (DN 11) | Roasted rice flour, Jaggery, Garlic, Ginger, Oil. | Mixing, Flattening, Deep-frying. | Pitta-balancing (Traditional belief). | Festive occasions, Celebrations. |
| Wadana Athirasa (WA) (DN 17) | Roasted rice flour, Red rice flour, Milk, Spices, Jaggery. | Mixing, Shaping, Steaming. | Aids Digestion, Balances Kapha (Functional food). | Daily sub-meal, Administering medicine (Children). |
| Madu Ginipu (MGi) (DN 32) | Cycas zeylanica flour, Coconut, Jaggery, Salt. | Mixing, Shaping, Steaming on a Banana Leaf. | Mitigation of toxicity; Highly local functional staple. | Daily sub-meal/snack (Threatened). |
| II. Gruels (Kaṇda) | | | | |
| Diya Ulu Kaṇda (DUK) (DN 20) | Al Sahal rice, Fresh Ginger, Dry Ginger, Ghee, Water. | Slow cooking in a Clay Pot until ingredients "melt". | GIT Reset / Reduces Āma in Upper GIT (Morning remedy of Ayurveda). | Early morning/ Breakfast. |
| Uṇdu Kaṇda (UK) (DN 13) | Vigna mungo (Black Gram), Coconut Milk, Salt. | Boiling/Simmering. | Dhātu Pōṣaka (Tissue nourishing), Strength-promoting (Pregnant women). | Breakfast, Convalescence, Specific family/regional consumption. |
| III. Main Accompaniments | | | | |
| Polos Ānama (DN 4) | Tender Jackfruit, Spices, Chavya leaves (Piper retrofractum). | Tempering and Boiling. | Aids Digestion (Chavya); Cooling/ Sweet (Jackfruit). | Lunch/Dinner sub-meal (Chena communities). |
| Kurakkan Kiribath (KKb) (DN 19) | Freshly harvested Eleusine coracana (Finger Millet), Coconut Milk, Salt. | Cooking like standard Kiribath. | Balances Kapha/Pitta (due to preparation method); Seasonal consumption. | Breakfast (Regional staple in Kandy). |
| IV. Hyper-Local Delicacies | | | | |
| Kola Lālu (KL) (DN 27) | Rice Flour, Coconut Milk, *Kithul* Treacle. | Batter spread on Jackfruit Leaf, Steamed, Dried, Deep-Fried. | Appeals to children's senses; Promotes satiety (Traditional belief). | Snack/Sub-meal (Hyper-local *Kandy* suburb). |

*Medicinal Documentation Diya Ulu Kanda* (DUK) (DN 20), a gruel prepared with *Al Sahal* (red or white) rice, ginger, and ghee, is a novel finding revealed solely through informant interviews, reinforcing the deep integration of traditional diet and localized health practices.

#### *4.1.2 Commonalities, differences, and cultural interpretation*

Comparison of the regional practices documented in the dataset with the broader Sri Lankan culinary narrative reveals key patterns of adaptation and local knowledge resilience (Table 3).

### 4.2 Preparation techniques and culinary exchange

Following the synthesis that demonstrated the high level of adaptation in *Kandyan* foodways (Sect. 4.1), this section illustrates the concept of social context and knowledge exchange using the *Polos Ānama* case study.

*Polos Ānama*, originating in chena cultivation communities, is familiar to 19% of informants (A, E, F, G, H, I). Its unique texture, derived from specially processed tender jackfruit and a distinct spice blend, transcended its rural origins, spreading beyond

**Table 3** Synthesis of findings: cross-cultural comparison and local adaptation

| Comparison point | General Sri Lankan heritage (expected) | Kandyan hyper-local findings (observed) | Cultural interpretation (4c) |
|---|---|---|---|
| Rice base | White rice (*Samba/Kekulu*) is the staple; *Kiribath* is celebratory. | Emphasis on unique regional grains (*Kurakkan Kiribath, Udu Kanda*), reinforcing the importance of local varietals for functional food properties. | Ethnobotanical Optimization: Local knowledge prioritizes the specific health and energetic benefits of regional crops over generalized staples. |
| Preparation for safety | *Madu*-based dishes are known to require lengthy detoxification processes. | Consistent steaming and coconut milk addition in *Madu* preparations (MG, MGi). | Toxicity Mitigation Protocol: This represents an inherited indigenous mitigation protocol against specific, local plant toxins, directly validating Traditional Ecological Knowledge (TEK). |
| Festive food function | Festive snacks (*Kavili Varga*) are generally perceived as rich, celebratory food. | The complementary consumption of the rich, fried *Gana Athirasa* (GA) with the lighter, steamed, spiced *Wadana Athirasa* (WA). | AyurvedaDietary Balance: Demonstrates an integrated system of preventative digestive support (functional food) during periods of high intake. |
| Social context | Culinary practices are generally uniform across social strata. | *Polos Ānama*'s cross-strata presence (in both royal and rural contexts). | Socio-Cultural Interplay: Signifies the role of culinary practice as a cultural bridge, challenging simple binary views of 'folk' vs. 'elite' cuisine. |

farming households. A traditional physician further highlighted the dish's regional and Ayurvedarelevance.

This transfer across social strata is critical. *Polos Ānama's* documented presence in both royal (*Kandy* Castle Kitchen Cookbook) and rural contexts (chena communities) suggests a dynamic exchange of culinary knowledge across rigid social boundaries during the *Kandyan* era. This dual documentation challenges the simple binary view of 'folk' vs. 'elite' cuisine and highlights the dish's function as a social bridge.

Furthermore, the recipe's integrity is linked to functional adaptation. The jackfruit's high fiber content is traditionally complemented by the local practice of garnishing the dish with *Chavya* leaves (Piper retrofractum). *Chavya*'s known carminative and digestive properties, which aid in breaking down the dense jackfruit fiber and promoting better digestive health, are supported by scientific literature [5].

### 4.3 *Madu-Gotu* and *Madu-Ginipu*: endemic delicacies facing extinction

The *Madu*-based dishes, *Madu Gotu* (MG) (DN 24) and *Madu Ginipu* (MGi) (DN 32), exemplify the culinary and ethnobotanical vulnerability within the *Kandy* region. These unique delicacies, prepared using the endemic *Madu* plant (*Cycas zeylanica*), face a precarious future due to the increasing scarcity of the plant caused by environmental and land-use changes. The fragility of this hyper-local knowledge is evident in its transmission: it is shared by only six key informants, underscoring the risk of losing both culinary and associated medicinal knowledge.

#### *4.3.1 Preparation methods and implications*

Dish terminology and preparation methods reflect a sophisticated understanding of ingredient functionality. The shapes of the two preparations—"*Gotu*" (corn-cob) and "*Ginipu*" (flatbread)—accommodate batters of different consistencies, ensuring even steaming and optimal texture.

- MGi is a simple steamed flatbread made with *Madu* flour, coconut, sugar/jaggery, and salt. Its reliance on readily available ingredients suggests an emphasis on convenience.
- In contrast, MG is a cone-shaped, semi-solid dish combining *Madu* flour with coconut milk, sugar/jaggery, and salt. The utilization of coconut milk suggests a focus on enriching the dish or altering its texture for greater satiety.

#### *4.3.2 Preserving culinary heritage in the face of toxicity*

The most critical finding involves the indigenous safety protocols embedded within these preparations. Cycads, notably the seeds used for *Madu* flour, contain the hepatotoxin Cycasin [7]. The consistent use of steaming and the addition of coconut milk in *Madu* preparations represents an inherited detoxification protocol, ensuring proper cooking and potentially mitigating the mild toxic [16] effects associated with cycad consumption.

Ayurveda Medical Geography: As the availability of *Madu* diminishes, the loss extends beyond culinary heritage; it risks the disappearance of valuable insights into the use of indigenous ingredients for health in geographically distinct contexts, a concept central to Ayurvedamedical geography.

Vulnerability and Loss: This risk is amplified by the decline in the use of traditional names like "*Ginipu*," which, as one informant noted, *"makes me wonder if we're losing some of our old food traditions along with the Madu plant itself."*

This deep connection between *Madu* preparations and traditional medicine is further highlighted by an informant: *"We've used Madu for generations to address digestive issues. It's a gentle and effective remedy."* Preserving these dishes and their associated knowledge is vital for Sri Lanka's cultural heritage.

### 4.4 Regional variations in traditional foods

The Multiple Facets of Finger Millet (*Kurakkan*)-.– *Kurakkan* (finger millet, Eleusine coracana) exemplifies versatility in Sri Lankan cuisine, appearing in diverse culinary forms (like *Kanda*, *Kiribath*, *Thalapa*, *Halapa*, *Roti*, and *Pittu*) and highlighting distinct regional preferences for its utilization [21, 22].

The absence of *Thalapa*, *Halapa*, *Roti*, and *Pittu* in key informant interviews, coupled with the limited awareness of *Kurakkan* milk rice outside the *Kandy* region, suggests strong regional influences on its consumption. This underscores the importance of documenting local culinary practices, as they reveal subtle variations in preparation methods and taste preferences across the island.

#### *4.4.1 Seasonal delicacy and regional staple*

*Kurakkan Kiribath* (KKb) (DN 19), a traditional breakfast in the *Kandy* region, is prepared using freshly harvested finger millet seeds. This reliance on seasonal ingredients may explain its regional prevalence. From the perspective of Ayurveda, while finger millet increases *Vāta*, the KKb preparation method likely enhances its *Kapha* and *Pitta*-reducing properties, contributing to its suitability as a breakfast dish. Two elder informants (6.25%) shared their knowledge of this traditional meal, noting its suitability for all ages and its digestive benefits.

One informant confirmed: "*We also use Kurakkan to make Kiribath, using just-matured finger millet seeds… Cooked with coconut milk and salt, it's soft, creamy, and easy to digest, making it suitable for everyone. It helps balance Vāta and Kapha Dosas*."

#### *4.4.2 Kurakkan Kenda (KK): a functional gruel*

A village elder and traditional physician (3.12% of informants) described this traditional breakfast staple (DN 14): "*Kurakkan Kenda is a simple, nourishing porridge made from homegrown Kurakkan seeds… It's a staple in our village, keeping children full and balancing their Doṣa.*"

Finger millet is a nutritionally valuable grain, rich in carbohydrates, protein, and minerals like calcium and iron [8]. Research on calcium transport and accumulation in finger millet can help improve its nutritional value and address calcium deficiency, especially in old age [9].

#### *4.4.3 Kurakkan Thalapa (KT): a dry zone dinner tradition*

In stark contrast to KKb and gruel, favored as breakfast foods in the *Kandy* region, key informants highlight *Kurakkan Thalapa* (KT) as a traditional dinner staple in the southern (*Ruhuna*) and North Central (*Rajarata*) regions. This preference may align with KT's unique preparation, which, by utilizing boiling water with finger millet flour, may preserve the grain's *Vāta*-increasing properties, a quality potentially beneficial in drier climates.

While increasing *Vāta*, KT's simplicity, high fiber content (including resistant starch), and semi-solid texture promote gut health by fostering beneficial bacteria and reducing excess fermentation (Jayawardana et al., 2019). This balance, coupled with its satiating effect, further explains KT's historical role as a fulfilling evening meal in arid regions.

Traditional Knowledge and Culinary Adaptations: KT was likely paired with curries of varying *Tridosha*-balancing properties, showcasing culinary knowledge and adaptability to maintain balance.

### 4.5 Traditional food knowledge and digestive health (*Athirasa*)

The preparation and complementary use of the festive snacks *Gana Athirasa* (GA) (DN 11) *and Wadana Athirasa* (WA) (DN 17) demonstrate Sri Lanka's nuanced understanding of food and health. Known to 9.35% and 6.25% of informants respectively, these snacks, while conceptually similar oil cakes, exhibit distinct sensory and functional qualities. The Sinhala terminology reflects these differences: "*Wadana*" (steamed) and "*Ghana*" (thick) highlight contrasting preparation methods, while "*Athirasa*" suggests a common cultural or sensory context.

#### *4.5.1 Preparation and functional adaptation*

The culinary traditions surrounding GA and WA exemplify intentional adaptation to varying digestive needs:

- *Gana Athirasa* (GA): Its frying process imparts unique flavor and likely aids preservation. The final product, often dipped in honey, reveals traditional knowledge of functional food—an intuitive method for enhancing preservation and providing a targeted remedy.

- *Wadana Athirasa* (WA): This variation incorporates additional spices (pepper, cumin) and milk, distinguishing it through a steaming preparation. This approach makes WA suitable for those with digestive sensitivities, as the steamed nature could be ideal for administering traditional medicinal preparations aimed at alleviating indigestion in children [10, 11].

The high edges formed during the preparation of both GA and WA protect the dough from overcooking, showcasing traditional culinary knowledge. The addition of spices and milk to WA aligns with Ayurveda principles, potentially balancing *Kapha Doṣa.* Milk's inclusion might further support gut health [12].

#### *4.5.2 Complementary use and integrated wisdom*

The most compelling finding is the complementary use of the two preparations. The fried GA, being richer, is often reserved for special occasions, while the lighter, steamed WA could be seen as aiding digestion after indulging in the richer GA. This intuitive awareness of dietary balance within Sri Lankan food culture, passed down through generations, exemplifies the interweaving of cultural practices with an understanding of gut health and Ayurveda principles.

### 4.6 Rediscovering forgotten foods: the case of Uṇdu Kanda (black gram gruel)

The case of *Uńdu Kanda* (UK) (DN 13), a gruel prepared from Vigna mungo (black gram), highlights the potential for revitalizing traditional foods. While its prevalence declined due to limited ingredient availability, recent economic shifts have made this endemic grain more accessible, facilitating its reintroduction into contemporary diets.

#### *4.6.1 Traditional use and functional properties*

Informants consistently highlighted UK's traditional use for pregnant women, noting its strength-promoting and tissue-nourishing (*Dhātu posaka*) properties. This dish, rooted in ancestral knowledge, is used to alleviate *Vāta* and *Pitta* imbalances while promoting cognitive and digestive health, underscoring the connection between food and medicine.

Research supports the nutritional potential of black gram, which is rich in protein, carbohydrates, and minerals [13–15]. Furthermore, the unique composition of the *Uṇdu* grain is crucial: Black gram is a nutritionally valuable grain, and increased accessibility of this endemic grain facilitates its reintroduction into contemporary diets.

#### *4.6.2 Vulnerability and opportunity*

The vulnerability of this food tradition is evident in the informants' narratives: "*Only a few of the older folks in our village remember Uńdu-Kanda. It's a shame, because with Uṇduavailable again, it could be a good food for everyone." (Key informant F). "We shouldn't lose these old ways of eating… We need to grow Uńdu the right way, so we can always have Uńdu-kanda." (Key informant D).*

UK represents a clear opportunity to revitalize traditional food knowledge by bridging it with contemporary nutritional science and market trends. Further research should explore the nutritional profile, document the traditional preparation, and promote its consumption among those with high nutritional needs and vegans. Additionally, agricultural research is needed to ensure sustainable cultivation practices.

### 4.7 The case of Diya Ulu Kaṇda (DUK): unexpected findings

The discovery of DUK (DN 20), a traditional rice gruel specific to the *Mahiyangana* region, underscores the hyper-local nature of certain culinary traditions. This simple dish, prepared with *Al-Sahal* rice, ginger, ghee, and water in a clay vessel, is undocumented elsewhere and holds deep significance, passed down orally within a specific family. Rooted in ancestral knowledge, it is used to alleviate *Vāta* and *Pitta* imbalances while promoting cognitive and digestive health, underscoring the connection between food and medicine.

#### *4.7.1 Scientific rationale and functional properties*

DUK, a morning beverage, leverages key herbal components—fresh ginger, dry ginger powder, and ghee—to promote digestion and reduce *Āma* (metabolic toxins) throughout the gastrointestinal tract. This functional application aligns with research showing ginger's effectiveness in reducing metabolic levels and improving cognitive function [9, 11–20], and ghee's established digestive and cognitive benefits.

#### *4.7.2 Future research directions*

Further research on DUK should explore the synergistic effects of its ingredients, its impact on gut microbiome composition and metabolic markers, and the role of the clay vessel in its preparation. Clinical trials could assess its efficacy in managing digestive health and validate its traditional Ayurveda uses [8].

### 4.8 Discussion summary: insights into Kandyan culinary heritage

This study reveals a multifaceted *Kandyan* culinary tradition, highlighting regional variations, functional foods, and the dynamic nature of food practices. Hyper-local dishes like *Kola Lālu* (DN 27) underscore the diversity of knowledge even within a limited geographic area. The prevalence of gruels and their perceived health benefits emphasize the intrinsic connection between food and medicine, reflecting Ayurveda influences. However, the observed decline of certain dishes due to modernization highlights the vulnerability of traditional practices and the necessity for ongoing documentation and research.

### 4.9 Key findings and implications

These findings reveal diverse culinary adaptations in *Kandyan* cuisine, shaped by local ingredients, knowledge transmission, and changing lifestyles. This research provides a foundation for further studies exploring regional variations, validating traditional beliefs, and investigating the potential health benefits of these unique foodways.

## 5 Conclusion

This study investigated traditional food practices in Sri Lanka's *Kandyan* up-country, focusing on 14 hyper-local dishes selected from a dataset of 32 recipes documented from 17 informants. The analysis revealed a diverse culinary tradition, directly challenging the assumption of homogeneity within the *Kandyan* region.

The findings demonstrate significant regional variations, with unique dishes like *Kola Lālu* (KL) *and Kiri Roti* (KR) showcasing sub-community adaptations in preparation and seasoning. The documented foodways exemplify the deep integration of local ecology, cultural practices, and Ayurveda principles in shaping the cuisine. Specifically, the study

highlighted the functional properties of gruels (DUK, KK, UK) for gut health and the detoxification role of Madu-based preparations, underscoring the vital intersection of culinary and medicinal practices.

While limited by sample size and scope constraints, this research emphasizes the critical importance of preserving and documenting these vulnerable traditions. The findings offer a springboard for future studies to investigate the nutritional profiles, preparation methods, and evolving adaptations of these dishes in contemporary contexts. Ultimately, this study underscores the resilience of traditional *Kandyan* foodways and their relevance to modern health practices. Integrating scientific inquiry with cultural preservation can enhance our understanding of the interplay between food, health, and identity in Sri Lanka.

## Supplementary Information

The online version contains supplementary material available at https://doi.org/10.1007/s44187-025-00770-3.

Supplementary material 1.

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**Author contributions**
Dr. R.M.D.S. Ratnayake (Co-Author): Responsible for the original data acquisition (collection of 32 recipes and 17 informant interviews) and the initial thesis work which provided the essential resources and foundational dataset for this study.Dr. I.G.P.R. Kulanatha (Corresponding/Senior Author): Responsible for conceptualizing the re-analysis, performing the systematic quantitative and thematic analysis of the existing dataset, interpreting the final findings, and managing the manuscript revision and submission process.

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**Data availability**
Data is provided within this manuscript (Tables 1 and 2 in the Methodology) and its comprehensive supporting materials. The full dataset, including all 32 documented recipes, consumption time analysis, and detailed gruel characterizations, is available in the uploaded Supplementary Files (S1, S2, and S3).

## Declarations

**Ethics approval and consent to participate**
The requirement for ethical approval for this descriptive and re-analysis study was waived by the Institutional Review Board (IRB) of the Institute of Indigenous Medicine, University of Colombo. This decision was consistent with the institutional guidelines applicable during the original data collection period (2013/2014) for postgraduate diploma research. The research was carried out following the guidelines of the ethics committee listed in this ethics statement.

**Informed consent**
Informed consent was obtained from all 17 key informants (elderly residents and traditional physicians) prior to participation. By stating that informed consent was obtained, the authors attest that the participants were aware of the study purpose, risks, and benefits.

**Consent for publication**
Not applicable. No identifiable images/data of the participants are provided in the manuscript.

**Competing interests**
The authors declare no competing interests.

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