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MADU (CYCAS ZEYLANICA) IN SRI LANKA: AN ETHNOBOTABICAL STUDY OF CULINARY TRADITIONS, MEDICINAL POTENTIAL, AND CONSERVATION CHALLENGES

I.G.P.R. Kulanatha

ABSTRACT

The Madu plant (*Cycas zeylanica*), a culturally significant cycad species in Sri Lanka, is facing numerous ecological threats despite its long history of traditional use. This ethnobotanical study, investigating the relationship between people and plants, aimed to explore the plant's cultural significance, culinary applications, and potential health benefits, as well as the challenges to its conservation. Key informant interviews in the research reviews and a review of historical and botanical literature have been revealed diverse culinary applications of Madu flour derived from the plant's seeds, with regional variations in the preparation of dishes such as Madu Ginipu, Madu Gotu, and Madu Pittu. Additionally, preliminary analyses showed slight differences in the nutritional composition between non-forest and forest varieties of Madu, highlighting the potential impact of environmental factors on its nutritional value. The study also highlighted Madu's potential as a source of nutrients and bioactive compounds with potential antioxidant and anti-inflammatory properties. However, the plant's status as Critically Endangered, due to habitat destruction, overharvesting, and the impact of natural disasters, underscores the urgent need for conservation efforts. Additionally, while Madu has been traditionally used for its medicinal properties, the absence of documented detoxification practices in Sri Lanka, despite reports of toxicity in related species, raises concerns about its safe consumption. This study emphasizes the importance of understanding the complex interplay between cultural practices, traditional knowledge, and ecological conservation in ensuring the sustainable use and preservation of Madu, a valuable component of Sri Lanka's biocultural heritage. Further research is needed to validate traditional knowledge, explore therapeutic applications, and address potential safety concerns related to Madu consumption.

Key Words: *Cycas zeylanica, ethnobotany of Madu , traditional food Sri Lanka, Madu Ginipu, Gotu and Pittu, cycasin, indigenous knowledge, endangered biocultural heritage*

INTRODUCTION

The *Madu* plant (*Cycas zeylanica*), a culturally significant cycad species endemic to Sri Lanka, holds a unique place in the island's rich tapestry of traditional knowledge and practices. This plant, known by various vernacular names such as "*Madugaha*" in Sinhala, "*Salaparai*" in Tamil, "*Varaguna*" or "*Hintalah*" in Sanskrit, and referred to as Ceylon sago, False sago, False sago-palm, Queen sago, or Spiny-leaved cycas in English (Sivapalan & Sanmugarajah, n.d.), has been used as a versatile resource for local communities. This ethnobotanical study delves into the multifaceted relationship between the *Madu* plant and the people of Sri Lanka, examining its diverse roles in culinary traditions,traditional medicine, and cultural heritage.Its seeds, processed into flour, are a key ingredient in various traditional dishes like *Madu Ginipu*, *Madu Gotu*, and *Madu Pittu*, each showcasing regional culinary adaptations and resourcefulness.Preliminary analyses have revealed slight differences in the nutritional composition between non-forest and forest varieties of *Madu*, underscoring the influence of environmental factors on its nutritional value.

Beyond its culinary value, *Madu* has a long-standing history of use in traditional medicine and folklore. Various parts of the plant, including the stem, roots, and leaf bases, have been traditionally harvested for their purported magical and medicinal properties (Whiting, 1963; Jones, 1993; Osborne et al., 1994; Norstog & Nichollas, 1997). Cycad products have been used in diverse forms, such as beverages, teas, purgatives, and pain relievers (Harrison, 1966). In fact, the traditional knowledge surrounding *Madu*'s medicinal properties has even permeated into modern times, with some cycad-derived compounds finding applications in proprietary drugs. In Kerala, India, the fruits of a closely related species, *Cycas circinalis*, have been and continue to be harvested and sold for their medicinal value.

The *Madu* plant (*Cycas zeylanica*) is currently listed as Critically Endangered by the International Union for Conservation of Nature (IUCN), primarily due to habitat destruction, over-harvesting of its seeds, and the devastating impact of the 2004 tsunami (Bösenberg, 2010). Although historically widespread across Sri Lanka, the tsunami severely impacted the remaining populations, leading to its current classification as primarily endemic to the Andaman and Nicobar Islands (Bōsenberg, 2010; Christenhusz et al., 2011)

This decline raises significant concerns about the preservation of this culturally important species and the traditional knowledge associated with it. While *Cycas circinalis*, another cycad species culturally significant in Sri Lanka, is not the primary focus of this study, it's worth noting its continued presence in local traditions, such as the folk poetry of the Uva region (Gunatilleke et al., 2008).

Furthermore, the use of *Madu* seeds in culinary preparations raises important questions regarding their safety. While Indian literature documents various processing methods to reduce toxins inherent to cycad seeds (Anitha, 2011), the absence of reported toxicity in Sri Lanka, despite a lack of documented detoxification processes, suggests potential differences in toxin levels between *Cycas zeylanica* and its Indian counterpart, *Cycas circinalis*, or the presence of inherent detoxification mechanisms in traditional Sri Lankan preparation methods.

This study, conducted as part of a broader investigation into the culinary traditions of the Kandy region, examines the *Madu* plant (Cycas zeylanica), with a particular focus on its under-researched data set of culinary and medicinal uses, as well as its status as a red-listed species

By delving into this specific aspect of *Madu*, this study seeks to complement and expand upon the existing body of knowledge on Kandy cuisine while also contributing to a deeper understanding of the plant's significance in Sri Lanka's biocultural heritage. Specifically, this research explores the culinary preparations, potential health benefits, ecological challenges, and safety concerns associated with *Madu*, offering insights into the complex interplay between cultural practices, traditional knowledge, and ecological conservation surrounding this unique plant. Ultimately, this research aims to inform future research directions in plant conservation, sustainable utilization, and safety assessment of *Cycas zeylanica*, including investigations into its genetic diversity, potential therapeutic applications, and the development of standardized protocols for detoxification and consumption.

RESULTS

Key informant interviews have been revealed two primary *Madu*-based dishes in the Kandy region: *Madu Ginipu* and *Madu Gotu*. *Madu Ginipu*, described as a simpler preparation, consists of *Madu* flour, scraped coconut, sugar, and salt, steamed into a flat *Roti* shape on a banana leaf (Key Informant 'P'). *Madu Gotu*, considered richer and more filling, incorporates coconut milk for added texture and flavor (Key Informant 'Q'). Key informants 'K' and 'L', both respected traditional physicians within the Kandy region, had emphasized the historical reliance on the *Madu* plant for its unique flour, used to prepare traditional dishes like *Madu Ginipu* and *Madu Gotu*, which were believed to have Ayurvedic health benefits

The use of *Madu* flour extends beyond these two dishes. In other regions of Sri Lanka, *Madu Pittu*, a steamed dish similar to string hoppers or rice flour *Pittu*, is commonly prepared using *Madu* flour, sometimes in combination with rice flour. Key Informant 'N had mentioned, "*We also add other flours like rice or Kurakkan to Madu Pittu to stretch it further and add different flavors.*" The diverse preparations demonstrate *Madu's* versatility and cultural significance across different regions of Sri Lanka.

In certain regions of Sri Lanka, a variation known as *Madu Roti* has been documented, where rice, finger millet, or wheat flour is combined with *Madu* flour before being cooked on a banana leaf (Key Informant N). This culinary adaptation demonstrates the ingenuity of local communities in utilizing *Madu* while incorporating other readily available grains,highlighting the flexibility of traditional practices in response to resource availability.

Preliminary analyses suggest that *Madu* flour is a good source of carbohydrates and contains potentially bioactive compounds with antioxidant and anti-inflammatory properties (ආයුර්වේද ඖෂධ සංග්‍රහය, 1985). Key informants also highlighted *Madu*'s traditional use for various ailments, including piles, hemorrhoids, and constipation. As Key Informant 'K' explained, "*We've used Madu for generations to address digestive issues. It's a gentle and effective remedy.*" These accounts underscore the potential nutritional and therapeutic benefits of *Madu*.

Despite its cultural and potential health significance, the *Madu* plant (Cycas zeylanica), classified within the Cycadales order (Christenhusz et al., 2011), is currently listed as Critically Endangered on the IUCN Red List (Bösenberg, 2010).Habitat destruction, overharvesting of seeds for flour production, and the devastating impact of the 2004 tsunami have severely reduced its population in Sri Lanka. This stark reality highlights the urgent need for conservation efforts to protect this unique species and its associated cultural practices.

DISCUSSION

The diverse culinary applications of *Madu* flour in dishes like *Madu Ginipu*, *Madu Gotu*, and *Madu Pittu* underscore its importance as a traditional food source in Sri Lanka. These dishes not only provide sustenance but also serve as a testament to the resourcefulness and adaptability of local communities in utilizing indigenous ingredients. The regional variations in preparation methods reflect the dynamic nature of culinary traditions and the influence of local preferences and ingredient availability.

The diverse utilization of *Madu* in Sri Lankan cuisine exemplifies the cultural richness and regional adaptability inherent in the island's food traditions. In the Kandy region, *Madu* flour is predominantly used to create sweet snacks like *Madu Gotu* and *Madu Ginipu*, which often serve as sub-meals. Conversely, in regions where *Madu* is also available, the flour finds its way into savory dishes like *Pittu* and *Roti*, commonly served with spicy red chili paste for breakfast or dinner.This culinary diversity not only reflects the versatility of *Madu* as an ingredient but also underscores the distinct flavors and preferences that have evolved across different regions of Sri Lanka.

However, the declining awareness of these traditional dishes, particularly among younger generations, raises concerns about the erosion of cultural knowledge and the potential loss of valuable culinary practices. This loss is compounded by the ecological threats facing the *Madu* plant, which could further limit its availability and cultural significance.Revitalizing interest in *Madu* cuisine could not only preserve cultural heritage but also create economic opportunities for local communities through sustainable cultivation, value-added product development, and culinary tourism initiatives.

The evidence suggesting *Madu*'s potential health benefits underscores the need for further research to validate traditional knowledge and explore its therapeutic applications. Understanding the nutritional and phytochemical composition of *Madu* could lead to the development of novel food products and nutraceuticals that promote health and well-being. Such research could also contribute to evidence-based traditional medicine practices and potentially open new avenues for pharmaceutical development.

Preserving the *Madu* plant and its associated culinary traditions requires a multifaceted, biocultural approach. This includes habitat restoration, sustainable harvesting practices, ex-situ conservation through seed banks and botanical gardens, and robust community engagement. Raising awareness among local communities about *Madu*'s ecological and cultural importance is crucial for fostering a sense of ownership and encouraging active participation in conservation efforts.

The apparent lack of reported toxicity from consuming *Madu* seeds in Sri Lanka, despite the absence of formal detoxification protocols, is a compelling observation that deserves further attention. This discrepancy between documented toxicity in related cycad species and the safe consumption of *Madu* in Sri Lanka, without explicit detoxification steps, raises questions that resonate with both scientific inquiry and cultural heritage. Does this reflect a unique characteristic of the *Cycas zeylanica* species itself, suggesting lower inherent toxin levels compared to its Indian counterpart, *Cycas circinalis*? Or, perhaps, have generations of Sri Lankan communities unknowingly developed and passed down preparation methods that effectively mitigate the potential risks of cycad consumption? This intriguing possibility

highlights the intricate interplay between human ingenuity, cultural practices, and adaptation to local environments.

In addition to investigating the factors contributing to the safe consumption of *Madu* in Sri Lanka, further research is needed to explore the plant's genetic diversity, potential therapeutic applications through clinical trials, and a comprehensive documentation of its traditional uses across different regions of Sri Lanka. By valuing and protecting this indigenous resource, we can ensure that future generations can benefit from its culinary, medicinal, and cultural legacy.

CONCLUSION

The *Madu* plant, a cornerstone of Sri Lankan culinary and medicinal heritage, stands at a crossroads. Its precarious existence, threatened by habitat loss, overharvesting, and climatic shifts, paints a stark picture of vulnerability. Yet, the *Madu*'s story is not solely one of decline. It is a narrative of resilience, a testament to the enduring cultural significance of this ancient cycad.

Our research reveals a fascinating paradox. While *Madu* seeds contain known toxins, their continued consumption in Sri Lanka without documented ill effects challenges conventional understanding. This raises tantalizing questions about potential variations in toxicity levels between *Cycas zeylanica* and its close relatives, or perhaps, the existence of unrecognized detoxification practices embedded within Sri Lankan traditions. Unraveling this mystery is not merely an academic pursuit; it is a matter of cultural preservation and public health.

Indeed, *Madu*'s value extends far beyond its potential as a food source or a medicinal ingredient. It is a living embodiment of the intricate relationship between people and plants, a tangible link to the past that informs our present and shapes our future. As we grapple with the complexities of biodiversity conservation and sustainable utilization, the *Madu* plant emerges as a powerful symbol of the interconnectedness between nature, culture, and human well-being.

To secure a future for *Madu* is to embrace a holistic approach that encompasses scientific inquiry, ecological restoration,sustainable harvesting practices, and the revitalization of traditional knowledge. By recognizing *Madu* as an integral part of Sri Lanka's biocultural heritage, we can inspire a renewed appreciation for this remarkable plant and forge a path towards its conservation. Only through a collective effort, one that bridges the gap between scientific understanding and cultural wisdom, can we ensure that the legacy of *Madu* continues to enrich Sri Lankan lives for generations to come.

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