

PRESERVING NUTMEG : HISTORICAL SIGNIFICANCE, MEDICINAL BENEFITS, AND CLIMATE CHANGE THREATS TO INDONESIAN NUTMEG

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ABSTRAK

Selama seribu tahun terakhir, para sarjana dan praktisi, dari berbagai bidang seperti budaya, filsafat, sosiologi, dan sejarah, telah mendokumentasikan bahan obat, termasuk pala, bumbu khas warisan Indonesia. Penelitian ini mengeksplorasi makna sejarah pala di Indonesia, perannya dalam pengobatan, dan ancaman perubahan iklim terhadap budidaya pala. Tujuannya memberikan wawasan penting tentang pala bagi masyarakat Indonesia, termasuk manfaat pengobatannya, dan menganalisis potensi dampak perubahan iklim terhadap produksi pala. Temuan penelitian menyoroti beragam manfaat pala di Indonesia dan tantangan perubahan iklim terhadap produksinya. Menekankan perlunya kebijakan iklim kuat dan strategi adaptasi proaktif untuk menjamin keberlanjutan pertanian pala. Kesimpulannya, penelitian ini menggambarkan sejarah, pengobatan, dan tantangan perubahan iklim pala di Indonesia, menekankan kebutuhan langkah-langkah komprehensif untuk mengatasi dampaknya dan memastikan pertumbuhan ekspor pala Indonesia yang berkelanjutan.

Kata kunci: pala, pengobatan, perubahan iklim

ABSTRACT

Over the past thousand years, scholars and practitioners, drawing from diverse fields including culture, philosophy, sociology, and history, have meticulously documented the intricacies of various medicinal substances and their applications. In this continuum of knowledge, nutmeg, a quintessential spice of Indonesian heritage, has held a prominent place. This study aims to explore the historical significance of nutmeg in Indonesia, its role in medicinal practices, and the threats posed by climate change to nutmeg cultivation. The research seeks to provide valuable insights into the cultural and historical importance of nutmeg in Indonesian society, as well as its medicinal benefits. Additionally, the study aims to analyze the potential impact of climate change on nutmeg production in Indonesia. The study uncovered nutmeg's diverse significance in Indonesia across historical, cultural, medicinal, and economic realms. It emphasized nutmeg's medicinal potential and the climate change challenges to its production. Findings stressed the necessity of robust climate policies and proactive adaptation strategies to ensure nutmeg farming sustainability. In conclusion, this study highlights nutmeg's historical, medicinal, and climate change-related challenges in Indonesia. It stresses the necessity of comprehensive measures to address climate change impacts and integrate resilience strategies into nutmeg farming practices and policymaking. These findings offer valuable guidance for policymakers and stakeholders to ensure the sustainable growth of Indonesian nutmeg exports amidst environmental changes.

Keywords: nutmeg, medicine, climate change

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1. INTRODUCTION

Nutmeg, a spice endemic to Maluku Province, Indonesia, has had significance for Indonesian people throughout history. It is not only valued as a spice, but also functions as a commodity that has geopolitical significance.¹ Indonesia has a rich history of nutmeg cultivation and trade, which has contributed to its cultural and economic development. Historically, nutmeg played an important role in the spice trade, attracting traders from all over the world to the Indonesian archipelago. Indigenous peoples in the Maluku province of Indonesia have utilized nutmeg, particularly *Myristica fragrans* Houtt., for various purposes throughout history. This includes fruit and nutmeg. Nutmeg has been used for culinary purposes, as a medicinal herb, and even as a symbol of status and wealth. Apart from that, nutmeg is ingrained in Indonesian culture and traditions. It has been used in traditional ceremonies, rituals, and as a flavoring ingredient in Indonesian cuisine. Although its botany, cultivation and history have been studied, ethnobotanical studies of nutmeg in its place of origin are still very lacking.²

The lack of ethnobotanical studies of nutmeg in its place of origin highlights the need for further research into the historical and cultural significance of nutmeg in Indonesian society. The historical and cultural significance of nutmeg in Indonesian society cannot be underestimated. It played an important role in the spice trade, attracted traders from all over the world, and served as a symbol of status and wealth.

Not only does nutmeg have important historical value for Indonesian society, it also has a medicinal perspective because it has been used in traditional Indonesian medicine for centuries. In traditional Indonesian medicine, nutmeg is believed to have various medicinal properties and is commonly used to treat digestive problems, relieve pain, and as a natural sedative. Active compounds in nutmeg, such as myristicin and elemicin, are thought to contribute to its therapeutic effects.³

In addition, nutmeg has also been researched for its potential health benefits, including its antioxidant and anti-inflammatory properties. Research suggests that nutmeg may have protective effects against certain chronic conditions, such as heart disease and diabetes. Additionally, several studies have investigated nutmeg's potential in supporting cognitive function and brain health.

In Indonesian society, the use of nutmeg in traditional medicine reflects the deep-rooted cultural and historical significance of this spice. Its role in treating various health problems makes it an integral part of traditional health care practices in Indonesia. Understanding the medicinal perspective of nutmeg provides valuable insight into the cultural and historical importance of this spice in Indonesian society.⁴

Moreover, from its history and benefits, nutmeg as a tropical climate plant is under threat from climate change. In this article we will examine the history of nutmeg for Indonesia, nutmeg for Islamic medicine in a literature review which of course also presents the threat of climate change to the nutmeg plant.

2. METHOD

The research method used in this research involves a comprehensive literature review with a descriptive approach, which utilizes secondary sources from research articles. Literature searches were conducted through various academic databases and search engines, including but not limited to PubMed, Science Direct, Google Scholar, and other leading publishers. Keywords relevant to this research, such as nutmeg, climate change, and Islamic medicine, were used to ensure a thorough exploration of the existing literature.

3. DISCUSSION

3.1 Historical Significance of Nutmeg:

Historically, nutmeg was highly valued and sought after by European traders during the colonial period. The Dutch, in particular, controlled the nutmeg trade in Indonesia and established plantations on the island of Banda to monopolize its production. This led to fierce competition between European countries, and England eventually wrested control of the nutmeg trade from the Dutch in the early 19th century. However, nutmeg cultivation and trade in Indonesia existed long before the arrival of European traders. Indigenous people in Maluku province have cultivated and used nutmeg for centuries. These spices have deep cultural significance for these communities, as they are used in traditional rituals, ceremonies and medicinal practices. Even today, nutmeg still has important cultural value in Indonesia. Apart from having cultural significance, nutmeg also plays an important role in the Indonesian economy.

Maluku plays an important role in the nutmeg industry, and the province is the main producer of nutmeg in Indonesia. The production and export of nutmeg makes a significant contribution to the local economy, providing income and employment for many people in the region. Global demand for nutmeg increasingly supports the economic importance of nutmeg for Indonesia. Indonesia is one of the largest producers and exporters of nutmeg in the world and contributes a large portion of global nutmeg production.⁵

Nutmeg cultivation and trade not only generate state income but also contributes to foreign exchange earnings. Additionally, the nutmeg industry in Indonesia supports the livelihoods of many farmers and workers involved in cultivation, harvesting, processing and export.⁶

Apart from its traditional cultivation and significance in Maluku province, nutmeg also holds an important position in the economy of South Aceh. The region has become a significant producer and exporter of nutmeg, contributing to Indonesia's overall dominance in the global nutmeg market.⁵

The nutmeg industry in South Aceh not only strengthens the local economy but also has a major impact on the cultural identity of the region. The cultivation and trade of nutmeg has been closely related to the lives of the people of South Aceh, shaping their customs, traditions

and social structure. The historical and contemporary importance of nutmeg in the provinces of Maluku and South Aceh shows the long-term impact of this spice on Indonesia's cultural tapestry and economic landscape.⁵

Research conducted by ⁷ discusses the performance and competitiveness of Indonesian nutmeg in the export market, with a focus on nutmeg products and nutmeg powder. This study analyzes the comparative and competitive advantages of Indonesian nutmeg in various export destination markets, as well as export trends and shares. The analysis methods used include Revealed Comparative Advantage (RCA) and Export Product Dynamics (EPD) in the 2014-2018 period. The findings show that Indonesian nutmeg products have demonstrated competitiveness in all export destination markets, although there is a weakening trend, especially in the European market. This study emphasizes the need for active efforts to secure current export markets and explore new markets to increase competitiveness and diversify export products.⁷

Furthermore, the paper highlights the importance of the nutmeg industry in Indonesia, emphasizing the high economic value of nutmeg and its potential to increase the country's foreign exchange earnings. Also discussed are the challenges faced in the nutmeg industry, such as problems related to cultivation, post-harvest processes, and trade facilitation. The study recommends policies related to cultivation, post-harvest processing, processing and trade facilitation to increase competitiveness and diversification of export products.

In conclusion, this paper provides insight into the performance and competitiveness of Indonesian nutmeg in the global export market, highlighting the need for strategic steps to secure existing export markets, increase product competitiveness, and explore new export opportunities. The findings and recommendations of this study can be a valuable guide for policy makers and stakeholders in the nutmeg industry to develop and implement strategies for sustainable growth of Indonesian nutmeg exports.⁷

3.2 Medicinal Benefits:

The health benefits of nutmeg also strengthen its role and importance in the spread of Islam. Apart from being a trade commodity, nutmeg has medicinal properties which are used in traditional medicine. As an alternative medicine, nutmeg is used to relieve various health problems such as indigestion, nausea, and has antimicrobial properties. The use of nutmeg in traditional medicine can strengthen social relations between Muslim traders and local communities, strengthening the legitimacy of Islam's presence in various trading areas.

In the literature study that the researchers conducted, we succeeded in collecting various information related to nutmeg. This information will be presented in detail in the following table. Our literature study covers various aspects of nutmeg, its uses, associated health benefits, and other applications.

Table 1. Research on Nutmeg and Its Applications

No	Category	Research Title	Research Purpose	Findings	Ref
1.	Cardiovascular Health	"Combination of Bay, Gotu Kola, Cogon Grass, and Nutmeg on Cardiovascular Function of Essential Hypertensive Patients"	Examining the effects of a combination of bay leaves, gotu kola, alang-alang grass, and nutmeg on cardiovascular function in patients with essential hypertension.	Reduced systolic and diastolic blood pressure, mean arterial pressure, heart rate, pulse pressure product, and pulse pressure.	8
2.	Nutmeg Extract	"Nutmeg Extracts for Painful Diabetic Neuropathy: A Randomized, Double-Blind, Controlled Study"	Investigating the effectiveness of topical nutmeg extract in reducing painful diabetic neuropathy (PDN).	Both groups experienced significant reductions in pain and improvements in quality of life, but there were no significant differences	9
3.	Essential Oil	a) "Evaluation of Phytochemical Compounds, In-vitro Antioxidant Properties, and Toxicity of Essential Oil from <i>Myristica fragrans</i> Houtt (Nutmeg) Using <i>Danio rerio</i> (Zebrafish)"	Evaluating the antioxidant potential and toxicity of nutmeg essential oil.	Significant antioxidant potential and adequate safety profile of nutmeg essential oil.	10
		b) "Nutmeg (<i>Myristica fragrans</i> Houtt.) essential oil: A review on its composition, biological, and pharmacological activities"	To examine the composition, biological and pharmacological activities of nutmeg essential oil.	Nutmeg has been shown to have antioxidant, antimicrobial, anti-inflammatory, and other potential therapeutic properties.	11

4.	Traditional medicine	"Pharmacognostical standardization of nutmeg seeds (<i>Myristica fragrans</i> Houtt.)-a traditional medicine"	Discusses the pharmacognostic standardization of nutmeg as a raw material for traditional medicine.	The findings show the importance of standardization to ensure the quality and authenticity of nutmeg in the manufacture of traditional medicine.	12
5.	Toothpaste	"Formulation and Physicochemical Evaluation of a Herbal Dentifrice Formulated with <i>Myristica fragrans</i> (Nutmeg): An In Vitro Study"	Discusses the formulation of nutmeg toothpaste and evaluates its physicochemical properties.	Improved foaming ability, abrasion and stability of nutmeg toothpaste compared to commercial herbal toothpastes.	13

The studies included in the table reveal the potential of nutmeg in health applications, both as a traditional medicine and in extract form. From research conducted to evaluate the use of nutmeg in diabetic neuropathy patients, topical nutmeg extract did not show additional advantages in reducing pain compared to the control group. However, nutmeg showed positive effects in reducing blood pressure in essential hypertension patients in studies using a combination of nutmeg with other herbal ingredients. In addition, evaluation of the chemical components and biological activities of nutmeg demonstrated its antioxidant, antimicrobial, and anti-inflammatory potential, supporting its use as an alternative health therapy. Nevertheless, studies on toothpaste formulations with nutmeg show promising results in improving the quality of dental products. In conclusion, nutmeg shows potential in a variety of health applications, but still requires further research to fully understand its benefits and mechanism of action.

Especially for Islamic medicine, further research is needed to understand in depth the benefits of nutmeg. Such studies could include analysis of the chemical content of nutmeg, clinical trials to evaluate its effectiveness in medicine, exploration of the cultural and spiritual context associated with its use, as well as documentation of traditional knowledge to enrich understanding of the role of nutmeg in Islamic medicine. Thus, this research will provide a strong foundation for developing the use of nutmeg in Islamic medicine in a more effective and targeted manner.

3.3 Climate Change Threats to Indonesian Nutmeg:

The nutmeg plant, with its rich history and benefits, is now facing serious threats due to climate change. Rising global temperatures, erratic rain patterns and intensifying natural disasters threaten its survival.

The research article entitled "Climate change in Indonesia and its impact on nutmeg production: Analysis in the framework of the high resolution CORDEX-CORE regional simulation" provides insight into the influence of climate change on nutmeg production in Indonesia, with a focus on Banda Neira Island. This study uses a high-resolution regional climate model to examine spatial patterns of rainfall and temperature and their influence on nutmeg cultivation.¹⁴

From this paper found that projected changes in climate variables, such as changes in the frequency of wet days, increased heavy rainfall, increased average temperatures, and prolonged heat waves, pose significant challenges to nutmeg production. This shift in climatic conditions creates an unfavorable environment for nutmeg cultivation, thus potentially impacting the socio-economic dynamics of nutmeg-producing areas.

This study underscores the importance of implementing strong climate policies and regulations at multiple levels—global, regional, and local—to mitigate the adverse impacts of climate change on nutmeg production. By highlighting the vulnerability of nutmeg cultivation to changing climate patterns, Anripa et al. advocating for proactive adaptation strategies to maintain the sustainability of nutmeg farming and the well-being of communities that depend on this crop.¹⁴

In summary, research conducted by ¹⁴ underlines the importance of comprehensive measures to address the threat of climate change to nutmeg production in Indonesia. Their findings emphasize the importance of integrating climate resilience strategies into agricultural practices and policymaking to ensure the long-term sustainability of nutmeg cultivation amidst evolving environmental challenges.

2.4 Preservation Strategies:

For a conservation strategy to maintain nutmeg in Indonesia, the following steps can be proposed:

- a. **Habitat Protection:** Protection of the nutmeg's natural habitat, including the rainforests where the nutmeg grows, is essential. This involves strict law enforcement against illegal deforestation and forest burning, as well as restoration and reforestation efforts to expand nutmeg growing areas.
- b. **Maintenance of Superior Varieties:** Supporting programs for the maintenance and development of genetically superior nutmeg varieties can help increase plant resistance to climate change and disease.
- c. **Farmer Education:** Providing training and education to nutmeg farmers on sustainable farming practices and adaptation to climate change can increase yields and minimize risks.

- d. **Business Diversification:** Encouraging diversification of agricultural businesses in areas where nutmeg grows can help reduce economic pressure on nutmeg and reduce the risk of vulnerability to climate change.

For a discussion of the policies and practical actions needed to protect nutmegs from the threat of climate change and promote sustainable use, the following steps can be considered:

- a. **Environmental Protection Policy:** Encourage the implementation of strict policies related to forest and land management, as well as the protection of endemic plant species such as nutmeg.
- b. **Investment in Research and Technology:** Support research and development of innovative agricultural technologies to increase nutmeg resilience to climate change, including efficient irrigation techniques and environmentally friendly pest and disease control methods.
- c. **Sustainable Agriculture Certification:** Encourage a sustainable agriculture certification program for nutmeg, which can help promote environmentally friendly farming practices and increase access to markets that value sustainably produced products.
- d. **Partnership and Collaboration:** Encourage cooperation between government, the private sector, and civil society in implementing policies and programs to protect nutmegs and promote sustainable use.

By implementing appropriate conservation strategies and policies, it is hoped that nutmeg can be maintained sustainably in Indonesia while overcoming the threat of climate change and ensuring prosperity for the people who depend on this plant.

4. CONCLUSION

The conclusion of the paper is that nutmeg has importance in Indonesian history, culture and economy. The nutmeg industry makes a significant contribution to the local economy, especially in the provinces of Maluku and South Aceh. In addition, nutmeg also has deep cultural value in Indonesian society, being used in traditional rituals, ceremonies and medicinal practices. However, nutmegs face serious threats due to climate change, such as increasing global temperatures, erratic rain patterns, and intensification of natural disasters.

This study highlights the importance of implementing strong climate policies and regulations to mitigate the adverse impacts of climate change on nutmeg production. In addition, conservation strategies such as habitat protection, maintenance of superior varieties, farmer education, and business diversification are also needed to protect nutmegs from the threat of climate change and promote sustainable use. By implementing appropriate conservation strategies and policies, it is hoped that nutmeg can be maintained sustainably in Indonesia while overcoming the threat of climate change and ensuring prosperity for the people who depend on this plant.

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