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Nutritional Benefits Of Dioscorea Esculenta In Promoting Good Health And Well-Being

Annik Zuliyanah[1], Athok Miftakhul Huda[2], H. Husama[31*]

ABSTRACT
ABSTRACT Dioscorea esculenta, commonly known as gembili, is a traditional tuber crop that has long been underutilized despite its considerable nutritional and health-promoting potential. This study aims to explore the role of D. esculenta as a functional food in supporting good health and well-being, aligning with Sustainable Development Goal 3. Through a review of recent literature and nutritional analyses, D. esculenta is shown to be rich in dietary fiber, resistant starch, essential vitamins, and minerals such as potassium, iron, and vitamin C. These compounds contribute to improved digestive health, glycemic control, cardiovascular function, and immune resilience. Furthermore, the presence of bioactive phytochemicals, including antioxidants and anti-inflammatory agents, positions D. esculenta as a promising component in disease prevention strategies, particularly for non-communicable diseases. Promoting the consumption and cultivation of D. esculenta not only enhances dietary diversity but also strengthens community health resilience, especially in rural and food-insecure areas. This paper highlights the need for greater integration of local, nutrient-dense crops like D. esculenta into public health nutrition policies and sustainable agricultural practices.

Keywords: Dioscorea esculenta, gembili, functional food, good health, nutrition, sustainable diet, SDGS 3

104 Introduction

Good health and well-being are fundamental to human development and are central to Sustainable Development Goal 3, which aims to ensure healthy lives and promote well-being for all at all ages (United Nations, 2015). Achieving this goal requires not only access to healthcare services but also access to adequate, diverse, and nutritious food. In this context, local and underutilized food crops such as Dioscorea esculenta (lesser yam or gembili) are gaining attention for their potential contribution to health and nutrition.

Dioscorea esculenta is a traditional tuber crop cultivated in various tropical regions, particularly in Southeast Asia and the Pacific. Despite being overshadowed by major staple crops, D. esculenta has several advantages: it is easy to grow, adaptable to marginal soils, and has a high nutritional profile (Coursey, 1976; Lebot, 2009). Nutritional studies have shown that this tuber is rich in complex carbohydrates, dietary fiber, resistant starch, essential minerals such as potassium, magnesium, and iron, as well as bioactive compounds with antioxidant and anti-inflammatory properties (Wanasundera & Ravindran, 1994; Okpalugo et al., 2010).

The health benefits associated with these nutrients are significant. Dietary fiber and resistant starch contribute to improved digestive health, lower cholesterol levels, and better glycemic control, making D. esculenta a potentially beneficial food for preventing non-communicable diseases such as diabetes and cardiovascular disease (Brownlee et al., 2017).

[1]Universitas Muhammadiyah Malang
[*]Alamat korespondensi: anikzuliyanah@gmail.com

Furthermore, the presence of antioxidants helps protect cells from oxidative stress, thereby supporting immune function and reducing the risk of chronic illnesses (Lobo et al., 2010).

Despite its benefits, D. esculenta remains underutilized and underrepresented in public nutrition policies and food innovation systems. Promoting its use can support dietary diversity, local food security, and community health resilience—especially in rural and food-insecure populations. Therefore, this paper aims to explore the nutritional benefits of Dioscorea esculenta and discuss its potential role in promoting good health and well-being in line with sustainable development goals.

105 Research Methods

Qualitative descriptive research method is a research approach that aims to describe or depict phenomena that occur naturally without intervening or manipulating the variables studied. This approach focuses on an in-depth understanding of phenomena, qualities, and social contexts, as well as the meaning contained in the data collected (Lexy, 2007) and (Ezmir, 2011). method was selected to ensure a comprehensive and structured approach in collecting and evaluating existing research findings related to the role of D. esculenta in promoting good health and well-being.

Search Strategy

Relevant articles were identified using electronic databases including Open Knowlage Map using combinations of keywords such as: “Dioscorea esculenta”, “gembili”, “nutritional value”, “functional food”, “health benefits”, “resistant starch”, “dietary fiber”, and “indigenous tubers”. The search was limited to peer-reviewed journal articles published between 2000 and 2024, in English or with available English translations. From 100 articles, 10 relevant or appropriate articles were taken.

Data Extraction and Analysis

Selected studies were screened based on titles and abstracts, followed by full-text review. Key information such as nutrient content, bioactive compounds, reported health effects, and methodological approaches were extracted and synthesized. A qualitative analysis was conducted to identify recurring themes, research gaps, and consensus among findings.

106 Result and Discussion

The systematic review identified 25 relevant studies that discuss various aspects of the nutritional composition, bioactive compounds, and potential health benefits of Dioscorea esculenta. The key findings are categorized into three main themes: (1) nutritional profile, (2) health benefits, and (3) potential applications in public health nutrition.

1. Nutritional Profile of Dioscorea esculenta The studies reviewed consistently indicate that D. esculenta is a rich source of complex carbohydrates, particularly resistant starch, which contributes to its low glycemic index (Wanasundera & Ravindran, 1994; Lebot, 2009). It also contains substantial amounts of dietary fiber, which plays a key role in maintaining digestive health. In terms of micronutrients, D. esculenta provides potassium, magnesium, iron, and vitamin C—nutrients essential for cardiovascular, muscular, and immune function (Okpalugo et al., 2010).
   In addition, several studies report the presence of polyphenols and other antioxidant compounds in the tuber. These phytochemicals have been linked to reduced oxidative

stress and inflammation, two processes associated with the development of chronic diseases such as diabetes and cancer (Lobo et al., 2010).

2. Health Benefits and Functional Properties The resistant starch in D. esculenta acts as a prebiotic, promoting the growth of beneficial gut bacteria and improving colon health. It has also been shown to improve insulin sensitivity and reduce postprandial blood glucose levels (Brownlee et al., 2017). This makes it particularly useful for individuals with or at risk of Type 2 diabetes.
   Moreover, the fiber and antioxidants found in gembili may help lower cholesterol levels and support heart health. Some studies suggest that the anti-inflammatory properties of its bioactive compounds could be harnessed in functional food formulations or traditional medicine (Coursey, 1976).
3. Implications for Public Health and Sustainable Diets Despite its nutritional richness, D. esculenta remains underutilized, partly due to low awareness and limited commercialization. Promoting the consumption of D. esculenta could contribute to food security, especially in rural and resource-limited settings. Its cultivation also supports sustainable agriculture due to its resilience to pests and adaptability to marginal soils.
   Integrating D. esculenta into national nutrition strategies and school feeding programs could improve diet quality and health outcomes, particularly in populations with limited access to diverse foods. Additionally, promoting indigenous crops aligns with global calls for sustainable and culturally relevant food systems (FAO, 2019).

107 Conclusion

The findings of this study highlight Dioscorea esculenta as a nutritionally rich and underutilized tuber with significant potential to contribute to public health and sustainable food systems. Its high content of resistant starch, dietary fiber, essential minerals, and bioactive compounds positions it as a valuable functional food that supports digestive health, improves glycemic control, and helps prevent chronic diseases such as diabetes and cardiovascular disorders.

Despite its health-promoting properties, D. esculenta remains largely overlooked in mainstream diets and agricultural systems. Enhancing public awareness, investing in research, and integrating this indigenous crop into national nutrition strategies and food security programs could provide a culturally relevant and sustainable approach to improving community health and resilience.

Therefore, promoting the cultivation and consumption of Dioscorea esculenta not only aligns with the goals of good health and well-being (SDG 3), but also supports local biodiversity and the revitalization of traditional food systems.

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