

# An Ethnobotanical and Sociocultural Study of the Utilization of Katojo as a Strategic Food Resource by the Kayuadi Island Community of the Selayar Archipelago

<sup>1</sup>Alin Liana; <sup>2</sup>Andi Nur Samsi;; <sup>3</sup>Irnayanti Bahar

<sup>1,2,3</sup>Universitas Patompo

Address: Jl. Inspeksi Kanal CitraLand No. 10 Makassar 90221, Makassar, Indonesia

Corresponding author

[alin.liana@unpatompo.ac.id](mailto:alin.liana@unpatompo.ac.id)<sup>1</sup>

**Abstract:** Katojo (*Tacca palmata* Blume), a wild tuber species, is known to be carcinogenic. However, for the people of Kayuadi Island in the Selayar Archipelago, this plant is an important food source, especially during the dry season. This study examines the ethnobotanical knowledge and sociocultural values associated with katojo utilization and its implications for local food security. This study employs a qualitative research method that combines participatory observation, in-depth interviews, and documentation of traditional processing methods and specimen collection. The results demonstrate that the people of Kayuadi Island not only treat katojo as an alternative food source but also as a symbol of resilience and independence. Additionally, local knowledge plays an important role in mitigating toxicity risks through traditional detoxification techniques that enable the safe consumption of katojo during food emergencies. These findings confirm that local knowledge is a valuable asset for food diversification relevant to the national food security agenda. Optimizing the development of katojo as an alternative food source requires scientific validation of traditional processing methods, food safety standardization, and strengthening the capacity of local communities. This study also emphasizes protecting traditional knowledge and preserving local biodiversity as integral parts of long-term food security strategies. The study is expected to contribute to our understanding of the relationship between ecology, culture, and food security and to open opportunities for integrating ethnobotanical practices into more inclusive and sustainable food policies.

**Keyword :** *Tacca palmata*, ethnobotany, socio-cultural, food security, Kayuadi Island, Selayar Archipelago.

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## Introduction

Small island regions in Indonesia, such as Kayuadi Island in the Takabonerate District of the Selayar Islands Regency, face unique food security challenges. These challenges include limited access to staple foods, dependence on external supplies, and changing environmental conditions due to seasonal changes, storms, and extreme weather. In this context, local communities rely on adaptive, often unconventional, local food sources. According to research by Liana et al. (2021) on Sangihe Island, the availability of local food is crucial for coping with unpredictable inter-island transportation constraints, weather conditions, and local geological conditions in island regions.

One native plant of Kayuadi Island that attracts attention is katojo (*Tacca palmata* Blume), which the local community uses as a strategic food source during

the lean season. However, from a botanical perspective, the *Tacca* genus is known to contain secondary compounds with cytotoxic or carcinogenic potential, such as spirostanol saponins in *Tacca plantaginea* (Bailly, 2024) and *Tacca chantrieri* (Yokosuka et al., 2002).

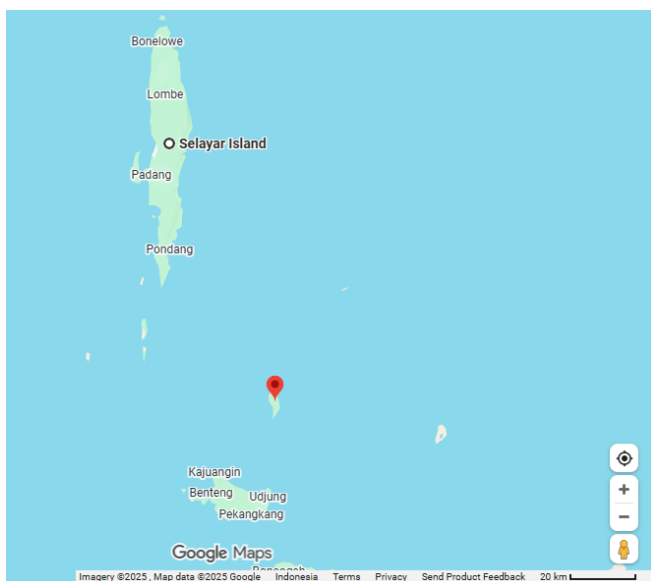
Studies on local food diversity have been extensively conducted in island regions or areas with limited access to staple foods. Relevant studies have explored food plants in Mount Ciremai National Park in West Java (Mazid et al. 2022); the Protected Forest of Panjang Island in Jepara, Central Java (Utami, 2017); West Kalimantan (Rais, 2004); Sangihe Island in North Sulawesi Liana et al. 2021; Mamasa Regency in West Sulawesi (Gidalti, 2023); Gowa Regency in South Sulawesi (Sulbi et al. 2025); NTT (Yusuf, 2015); and Maluku Island (Riry et al. 2023). Similarly, ethnobotanical studies of food crops in Indonesia have been conducted in several areas, including North Sukabumi and West Jakarta (Diani et al. 2021); the Using

community in Banyuwangi, East Java (Susanti et al. 2024); Nagari Kasang Padang Pariaman (Aliyah et al. 2023); and Labulia Village, Central Lombok (Amrullah et al. 2023). However, the phenomenon of the Kayuadi Island community processing and consuming plants with toxic potential is a paradox requiring a multidisciplinary approach. Namely, in the field of plant biology, which includes identification and toxicology activities; the field of ethnobotany, which includes local community knowledge about these plants and their processing techniques; and socio-cultural studies on the meaning, values, religiosity, and adaptation efforts of coastal communities. At the national level, food diversification based on local resources is an important strategy for improving food security and reducing dependence on rice as the primary source of carbohydrates (Sumarwati, 2022).

The aim of this study is to describe the morphological characteristics of katojo on Kayuadi Island, analyze local knowledge about processing and utilizing katojo as a strategic food source, reveal the sociocultural and religious meanings associated with katojo consumption among the people of Kayuadi Island, and evaluate the implications of utilizing katojo for local food security and food diversification efforts among island communities.

## Material and Methods

The research was conducted in July 2025 on Kayuadi Island in the Takabonerate District of the Selayar Islands Regency in South Sulawesi. Kayuadi Island is located at the coordinates  $6^{\circ}49'2.398''\text{S}$   $120^{\circ}47'57.085''\text{E}$  (Figure 1).



**Figure 1** Location of Kayuadi Island (red pin) relative to Selayar Island

The study employed a qualitative descriptive

approach with ethnobotanical and natural ethnographic methods. Data collection techniques included directly observing plants and the local community's process of making katojo flour. In-depth interviews were also conducted with community leaders. Documentation took the form of photographs of plants and plant specimens. To identify the taxonomic status of the plants, katojo plant samples were sent to the Plant Determination Laboratory of the National Research and Innovation Agency (BRIN). Data analysis involved reduction, categorization, and interpretation of cultural meanings.

## Result and Discussion

### Botanical Identification of Katojo Plants

Kayuadi Island is one of a group of small islands surrounding Selayar Island. It is located southeast of Selayar Island, approximately 54 miles away. Administratively, Kayuadi Island is part of the Takabonerate district in the Selayar Islands regency.

In addition to horn bananas and cassava, katojo is one of the unique commodities of Kayuadi Island. It is considered unique because, although it is toxic, the local community has specific processing methods that render it safe to consume. In the past, katojo flour was a staple food for the local community. It grows wild in residents' plantations during the rainy season. During the dry season, katojo goes dormant. Under these conditions, it is harvested and processed into flour, called kudareng or katojo sago.

Plant morphological identification results from the BRIN Plant Determination Laboratory indicate that katojo has the scientific name *Tacca palmata* Blume. It is one of the 19 species in the genus *Tacca*, which belongs to the Dioscoreaceae family, with reference number BO 1968608. According to Plant of the World Online (POWO), this species originates from Indochina to the Malay Archipelago and the Caroline Islands (Palau). Carl Ludwig Blume introduced the scientific name for this species in 1827. Katojo is a perennial herb with underground tubers. The plant generally grows to a height of 0.5–1.5 m. Its leaves are arranged in a basal rosette. They are palmate with five to fifteen narrow lobes that resemble fingers. They are dark green with smooth, glossy upper surfaces. The round, fleshy tubers are white to cream in color and are a traditional source of carbohydrates. Figure 2 shows the morphological characteristics of the katojo plant.

### Traditional Processing Techniques and Detoxification Efforts

The people of Kayuadi Island have a method of processing katojo that has been passed down from generation to generation since ancient times. They carry out these efforts to remove the plant's toxic effects.

Residents have traditionally known that the plant is toxic. Therefore, in order to consume the tubers, the plant must first undergo a detoxification process. The detoxification technique is carried out in the following sequence: (1) Peeling. The harvested tubers are peeled until clean. (2) Grating: The peeled tubers are grated using a coconut grater, which is commonly found in the community. (3) Soaking: The grated tubers are soaked in seawater for 24 hours or until the flour separates from the waste. (4) Drying: After 24 hours, discard the seawater and waste and squeeze the flour using a cloth. The squeezed flour is dried in the sun until completely dry, then stored until ready to use. This flour is called kudareng. When cooked, kudareng has a texture similar to sago. This is why residents often refer to it as "sago katojo." No literature has been found discussing how to detoxify katojo, either conventionally or scientifically, in other areas. Some food products made by the



community include cendol (sweet drink topping), dange (a cake to similar pukis cake), deppa (a cake to similar rolled pancakes), and ongol-ongol (steamed cake, sprinkled or rolled over with grated coconut).

**Figure 2. Morphological characters of *Tacca palmata* Blume**

The socio-cultural value of katojo utilization

- (1) Katojo as a symbol of community resilience and independence. During famines or supply

disruptions caused by the rainy season coinciding with the southwest monsoon, processing wild plants into food is an ecological adaptation and food security strategy based on local resources. Relying on local food sources, such as tubers and wild plants, often serves as "food insurance" for coastal and small island communities because it provides food reserves when the supply of main commodities is disrupted (Thattantavide & Kumar, 2024; Riry et al. 2023; Rosada et al. 2021). Ethnobotanical studies and research on traditional foods confirm that using wild edibles contributes to the nutritional and social resilience of communities, especially in remote areas (Mandal et al. 2023; Rahayu et al. 2024). These findings are relevant to understanding the role of katojo on Kayuadi Island as a symbol of food self-sufficiency mobilized in times of need.

- (2) From a religious perspective, katojo is a "provision from God" in the context of survival. In many agrarian and coastal communities, food's meaning transcends its nutritional value. Food is also interpreted through religious and moral lenses. For example, it is seen as a gift, a trust, or a test from God. The idea that "unconventional" food is a blessing when other options are limited is often tied to rituals, prayers, and ethical norms that govern how such food is obtained and distributed (Elimelech et al. 2023). Interdisciplinary studies on the relationship between food and religion, as well as studies of traditional foods in Asia, demonstrate how religious values can contribute to the social legitimacy of alternative food usage and strengthen solidarity during food crises (Anonymous, 2023). This context helps explain why the Kayuadi community may interpret katojo as not merely an emergency food source but also a moral and religious manifestation of the obligation to care for family and community (Harmayani et al. 2019).

### **Implications for Local Food Security**

Recognizing and utilizing local knowledge about wild plants, including traditional katojo processing techniques, contributes directly to food diversification at the community level and has the potential to do so on a broader scale. Ethnobotanical documentation shows that wild edible plants (WEPs) provide energy reserves during crises and contribute to dietary diversity and micronutrient intake. These benefits are often lost when communities rely on a few primary commodities (Hussain et al. 2023; Schunko et al. 2022). Mapping the species used, harvest seasons, consumed plant parts, and processing methods that reduce toxicity risks can integrate local knowledge into more inclusive food diversification strategies, improving nutritional security while preserving

food cultural heritage. Modern ethnobotanical studies confirm the important role of WEPs in strengthening local food systems. Thus, recognition of traditional knowledge should be incorporated into national food diversification efforts (Asfaw et al. 2023; Kidane & Kejela, 2021).

Several species from the *Tacca* genus have been reported to contain bioactive metabolites in the form of taccalonolides with strong biological activity, demonstrating the potential of these species (Li et al. 2022). However, experience with tubers and other WEPs shows that traditional detoxification techniques, such as soaking, fermentation, repeated cooking, and sun drying, can significantly reduce levels of harmful compounds, rendering the final product safe for consumption (Urugo & Tringo, 2023). Therefore, katojo has the potential to be developed as an alternative food source if traditional processing methods are documented and tested in a laboratory for effectiveness in reducing toxins. These methods must then be followed by validated community production protocols. These steps open opportunities for local food diversification and the development of value-added products. Phytochemical and pharmacological studies on the *Tacca* genus underscore the need to integrate laboratory research with field knowledge to ensure the safety and nutritional value of the final product.

Research on katojo aligns with national food security and biodiversity conservation policies, which emphasize food diversification, the availability of nutritious foods, and the sustainable use of local resources. International reports, recommendations, and food policies ("The State of Food Security and Nutrition in the World 2025," 2025) emphasize considering local food alternatives in the context of resilience and adaptation to climate pressures and supply chain disruptions. Therefore, the results of this study are recommended for inclusion in programs that: Validate the safety of traditional food processing through toxicology testing and nutritional analysis; Build community capacity for safe production and local marketing; Design participatory policies that protect local knowledge while maintaining species and habitat conservation. This integrated approach can achieve the dual goals of food security and agrobiodiversity conservation.

## Conclusion

Despite its toxic properties, Katojo (*Tacca palmata* Blume) has been safely utilized by the Kayuadi Island community through their local knowledge system. This study emphasizes the importance of integrating science (biology and toxicology) and culture (ethnobotany and religious values) to understand the

food security of small island communities. This local wisdom can serve as a model for conserving traditional knowledge in harmony with religious and ecological values.

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