

Ethnopharmacological Analysis of Daun Mantangan (*Decalabanthus Peltatus*) Among the Indigenous Gemna Community in South Sorong

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ABSTRACT

*This study aims to examine the ethnopharmacological potential of Mantangan leaves (*Decalabanthus peltatus*), locally known as Glimit, among the Indigenous Gemna community in South Sorong Regency. The research employs a qualitative-descriptive approach within an interdisciplinary ethnopharmacological framework that integrates ethnographic findings and laboratory analyses. Data were collected through in-depth interviews, participant observation, and documentation of traditional healing practices, and further supported by phytochemical tests conducted at the Pharmacy Laboratory of STIKES Papua. The results reveal that Mantangan leaves have been traditionally used for generations to treat various ailments such as coughs, shortness of breath, asthma, eye irritation, wounds, and postpartum recovery. Phytochemical analysis identified the presence of flavonoids, saponins, tannins, and alkaloids with biological activities including anti-inflammatory, antimicrobial, and wound-healing properties. The synergy between traditional knowledge and scientific validation demonstrates that the Gemna community's healing practices have a strong scientific basis and hold potential for development as a locally based herbal medicine from Papua.*

KEYWORDS

Decalabanthus peltatus, ethnopharmacology, Gemna Tribe, local wisdom, phytochemistry



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INTRODUCTION

The global resurgence of interest in traditional medicine and herbal-based therapeutics has positioned medicinal plants as critical resources for addressing contemporary health challenges (Barkat et al., 2021). According to the World Health Organization (WHO), approximately 80% of the world's population relies on traditional medicine for primary healthcare, with medicinal plants serving as the foundation of these practices (Manisha et al., 2025). This renewed focus stems from growing concerns about the adverse effects of synthetic pharmaceuticals, rising healthcare costs, and the increasing prevalence of antimicrobial resistance (Dadgostar, 2019). Consequently, ethnopharmacological research—which bridges traditional knowledge systems with modern scientific validation—has emerged as a vital pathway for drug discovery and development (IJINU et al., 2024). The integration of indigenous healing wisdom with rigorous phytochemical and pharmacological analysis not only validates traditional practices but also uncovers novel bioactive compounds with therapeutic potential (Balkrishna et al., 2024). In this context, documenting and scientifically investigating indigenous medicinal plant knowledge becomes both an urgent scientific priority and a crucial step toward preserving cultural heritage while advancing global pharmaceutical innovation (Dean, 2024).

Indonesia is known as one of the world's mega-biodiversity countries, with incredible flora richness and enormous biological resource potential (Sanka et al., 2023). It is estimated that there are more than 30,000 species of plants in Indonesia, and around 9,600 of them have been identified as possessing medicinal properties. These plants are mostly traditionally used by various indigenous communities spread throughout the archipelago, making Indonesia one of the centers of traditional medicine practices based on local wisdom (Hara et al., 2009).

However, only a small fraction of this biological wealth has been scientifically researched, and even fewer have been optimally utilized in the development of modern medicine (Sholikhah, 2016).

The Southwest Papua region, especially South Sorong Regency, is one of the regions that holds both biodiversity and unique cultural richness (Duwith et al., 2023). The indigenous people of the Gemna Tribe, who inhabit the region, still maintain traditional medicinal practices using local plants that have been passed down from generation to generation (Geta, 2022). One of the plants widely used in traditional medicine is the *mantangan leaf* (*Decalabanthus peltatus*), a vine from the Convolvulaceae family that grows wild in secondary forests and residential suburbs (Subebe, 2024). This plant is believed to have various properties, including wound healing and overcoming indigestion. The use of these plants suggests that indigenous peoples have a complex knowledge system regarding medicinal plants, although it has not been formally documented.

Modernization, lifestyle changes, migration of young people to urban areas, and lack of knowledge transfer between generations have led to cultural erosion, including the loss of traditional medicine practices (Ouma, 2022). There have not been many studies that specifically examine *Decalabanthus peltatus* from an ethnopharmacological perspective. The scientific literature on this plant is still limited and generally descriptive (de Carvalho et al., 2020).

The urgency of conducting this research at the present moment is underscored by several critical and time-sensitive factors demanding immediate scholarly attention. First, the rapid pace of modernization and cultural transformation in Papua poses an existential threat to indigenous knowledge systems, particularly among the Gemna Tribe, where intergenerational knowledge transfer is already severely disrupted. Elders who possess comprehensive traditional medicinal knowledge are aging, and without systematic documentation, this invaluable wisdom risks permanent loss within the next decade. Second, the accelerating biodiversity crisis, exacerbated by climate change, deforestation, and land-use changes in Southwest Papua, threatens the natural habitat of *Decalabanthus peltatus* and numerous other medicinal plants. Recent reports indicate that Papua's forest cover has declined by approximately 12% over the past two decades, raising concerns about the long-term availability of these botanical resources. Third, the COVID-19 pandemic has heightened global awareness of the need for diverse therapeutic options and renewed interest in traditional medicine systems that can provide accessible, affordable, and culturally appropriate healthcare alternatives.

The pandemic has also exposed vulnerabilities in pharmaceutical supply chains, making the development of locally sourced herbal medicines not merely academically interesting but strategically imperative for national health security. Fourth, Indonesia's commitment to achieving the Sustainable Development Goals (SDGs), particularly SDG 3 (Good Health and Well-being) and SDG 15 (Life on Land), necessitates immediate action in documenting, validating, and sustainably utilizing indigenous medicinal plant knowledge. Finally, the current policy environment in Indonesia—with increasing governmental support for traditional medicine research through BPOM (Badan Pengawas Obat dan Makanan) regulations and the National Research and Innovation Agency (BRIN)—creates a unique window of opportunity for translating ethnopharmacological findings into standardized herbal products. Delaying this research would mean missing critical opportunities for cultural preservation, biodiversity

conservation, pharmaceutical innovation, and community empowerment at a time when all these elements converge to make such investigation both feasible and essential.

Ethnopharmacological research on *mantangan* leaves is important not only to preserve local knowledge (Staples, 2022) but also as a first step in Indonesia's phytopharmaceutical exploration and development efforts. This study can contribute in two directions simultaneously: first, the preservation of traditional knowledge of people in the Papua region who are vulnerable to erosion over time; second, supporting the use of local biological resources for the development of health products that are sustainable, affordable, and based on local wisdom (Koch, 2015). Previous studies have shown that *Decalabanthus peltatus* contains bioactive compounds such as flavonoids, alkaloids, saponins, and tannins, components known to have pharmacological activities such as antioxidant, antibacterial, and anti-inflammatory effects (Rohmah et al., 2021). In fact, in ovo research (Aditya et al., 2022) shows that *mantangan* leaf extract has anti-angiogenic and embryotoxic activities, opening possibilities for the development of herbal-based cancer therapy agents.

Furthermore, several studies indicate the antibacterial activity and insecticidal potential of this species (Kumar et al., 2020), which strengthens the validity of traditional community practices in utilizing this plant as an external medicine and insect repellent. Therefore, strengthening ethnopharmacological approaches can combine the power of modern science and local wisdom, making this plant not only part of traditional medicine systems but also a candidate in the development of standardized herbal medicines and phytopharmaceuticals.

Against this comprehensive backdrop, this study aims to systematically examine and document the ethnopharmacological potential of *Mantangan* leaves (*Decalabanthus peltatus*) among the Indigenous Gemna community in South Sorong through an integrated approach combining ethnographic documentation with laboratory-based phytochemical validation. The findings are expected to yield significant benefits across multiple dimensions. Theoretically, this study contributes to the expanding body of ethnopharmacological literature by providing detailed documentation of a previously under-researched medicinal plant species and its applications within a specific indigenous context, thereby enriching understanding of traditional Papuan pharmacopeia and its potential contributions to global pharmaceutical knowledge.

From a practical perspective, the research offers validated scientific evidence that can support developing standardized herbal preparations based on *Mantangan* leaves, creating opportunities for local communities to transform traditional knowledge into economically viable health products while ensuring quality control and safety standards. For the Gemna community specifically, this research provides formal recognition and documentation of their traditional healing practices, strengthening cultural identity, supporting intellectual property rights over traditional knowledge, and potentially creating new livelihood opportunities through sustainable harvesting and processing of medicinal plants. From a conservation standpoint, the study highlights the ecological importance of *Decalabanthus peltatus* and its natural habitat, providing evidence-based arguments for biodiversity protection and sustainable resource management in Southwest Papua.

For policymakers and health authorities, the findings offer crucial data to inform regulations regarding traditional medicine integration into the formal healthcare system, support evidence-based policy development for herbal medicine standardization, and guide

investments in traditional medicine research infrastructure. Additionally, for the pharmaceutical and biotechnology sectors, this research identifies potentially valuable bioactive compounds warranting further investigation for drug development, presenting opportunities for bioprospecting while establishing frameworks for equitable benefit-sharing with indigenous knowledge holders. Finally, this study serves broader societal interests by promoting intercultural dialogue between indigenous wisdom and modern science, demonstrating how traditional ecological knowledge can contribute to contemporary solutions for health and sustainability challenges, and providing a replicable model for ethnopharmacological research that respects indigenous rights while advancing scientific understanding.

METHOD

This research was a qualitative-descriptive study employing an ethnopharmacological approach with an interdisciplinary orientation. This approach was selected because it effectively explored and presented a holistic picture of the traditional knowledge held by the indigenous Gemna Tribe, particularly regarding the use of *mantangan* leaves (*Decalabanthus peltatus*) as traditional medicine. The study aimed to provide a systematic and accurate description of the characteristics, empirical facts, and relationships related to the phenomena under investigation.

The research was conducted over six months, from August 2024 to January 2025, combining ethnographic fieldwork with laboratory analyses. The study population included members of the Gemna indigenous community knowledgeable about traditional medicinal plant use, focusing on *mantangan* leaves.

Data collection took place in a natural setting without intervention or manipulation of variables. The ethnopharmacological approach integrated traditional knowledge with modern scientific methods, facilitating dialogue between holistic local wisdom and empirical science to explore innovative possibilities for developing traditional medicines based on local biological resources (Fakhrudin et al., 2022).

Multiple complementary data collection methods ensured a comprehensive understanding and enhanced validity. Primary data were gathered through in-depth semi-structured interviews conducted in the local language with community interpreters. Each interview lasted 60–90 minutes and explored traditional uses, preparation methods, dosages, beliefs about efficacy, and cultural significance of *mantangan* leaves. Participant observation accompanied community members during plant collection, preparation of traditional medicines, and healing practices, with systematic field notes and photographic documentation. Secondary data included local government records, previous ethnobotanical studies in Papua, and relevant literature on *Decalabanthus peltatus*.

Plant specimens were collected according to traditional harvesting practices, identified through morphological features, and compared to herbarium specimens. They were then processed into simplicia for phytochemical analysis. Laboratory testing was conducted at STIKES Papua Pharmacy Laboratory using standard protocols to detect alkaloids, flavonoids, saponins, tannins, steroids, and quinones.

Data analysis combined thematic content analysis of qualitative transcripts and field notes with interpretation of laboratory results. Recurring patterns, traditional uses, and cultural

meanings were identified and categorized. Phytochemical findings were correlated with ethnographic data to link traditional uses with bioactive compound presence.

Triangulation enhanced validity by cross-verifying information among informants, comparing observations with interviews, and integrating ethnographic and laboratory results. Ethical considerations included obtaining informed consent, protecting participant confidentiality, respecting traditional knowledge ownership, securing permission from tribal leaders before fieldwork, and committing to benefit-sharing should commercial applications arise.

RESULT AND DISCUSSION

Preliminary Studies

The initial stage of the research began with a field survey in the area of the indigenous people of the Gemna Tribe, South Sorong. This survey aims to obtain an overview of the social, cultural, and environmental conditions of the community (Sugiyono, 2019), as well as identify the existence and use of traditional medicinal plants, especially Mantangan leaves (*Decalabanthus peltatus*). Through direct observation of settlements and surrounding land, researchers recorded the location of the plant's growth, the way the community obtained it, and the apparent pattern of initial use. Field records and visual documentation are used as preliminary data prior to in-depth information collection (Spradley, 1980). At this stage, key informants were also identified, such as village shamans, traditional healers, and traditional elders who have hereditary knowledge about the use of Mantangan leaves, so that the validity of ethnobotanical data can be guaranteed. Preliminary surveys are very important to ensure the validity of ethnobotanical data (Hara, et al., 2009), especially in identifying the types of medicinal plants and their utilization patterns by local communities in South Sorong.

In line with the survey, the researcher coordinated with traditional leaders as socio-cultural authority holders. This coordination is important because research concerns traditional knowledge that is part of local wisdom and cultural heritage. Through official visits to tribal chiefs and traditional elders, the researcher explained the objectives, scope, and benefits of research both for academic interests and for the preservation of culture and public health.

Field Data Collection

The field data collection stage was carried out through a combination of in-depth interviews, participatory observation (Moleong, 2017), and documentation of the traditional practices of the indigenous people of Gemna in the use of Mantangan leaves (*Decalabanthus peltatus*). In-depth interviews focused on key informants, such as traditional elders, healers, and experienced residents, to dig into local knowledge about how to acquire, cultivate, and believe in the efficacy of the plant. This approach opens up space for understanding not only the empirical aspect, but also the cultural values that underlie it (Bernard, 2011).



Figure 1. Interview with Resource Persons

Participatory observation is carried out by participating in community activities, starting from the process of taking Mantangan leaves in nature, simple processing, to their use in traditional medicine practices. This direct involvement allows researchers to capture the technical details as well as the symbolic and social dimensions that accompany the practice (Hammersley, et al., 2007).



Figure 2. Sampling Observation

Meanwhile, documentation is carried out through field notes, photographs, and voice recordings, so that the data obtained is more accurate and ethnographically rich. This documentation not only displays the technical stages, but also records the socio-cultural dynamics inherent in the practice of using Mantangan leaves (Emerson, et al., 1995).

The field data was strengthened by pharmaceutical laboratory tests through phytochemical analysis to trace the content of bioactive compounds in Mantangan leaves. The integration of ethnographic data and laboratory data results in more valid, comprehensive (Atanasov, et al., 2015), and in-depth information about the position of Mantangan leaves in the knowledge system and traditional medicine practices of the indigenous people of Gemna.



Figure 3. Sorting Mantangan Leaf Simplicia in the Laboratory

Plant Sampling

Sampling of Mantangan leaves (*Decalabanthus peltatus*) is carried out based on the traditional practices of the indigenous people of the Gemna Tribe who have selective criteria in selecting plant parts. The leaves that are picked are generally healthy leaves without defects, do not have holes, are not eaten by insects, and are still fresh. In addition, people often choose the leaves of the shoots which are considered to have better efficacy than old leaves (Martin, 1995).

The sample collection process is carried out carefully by picking the leaves directly according to the criteria, then draining them in a dry container to avoid excess moisture (Harborne, 1987). Furthermore, the sample is stored in a dry, cool, and avoid direct sunlight exposure to maintain the quality and active content contained in the leaves. In this way, the samples are maintained in accordance with local customs while meeting the needs of ethnopharmacological research.

Data Analysis

Mantangaan leaves in the language of the Gemna indigenous people called Glimit (Omos Glimit) have long been an important part of traditional medicine for indigenous peoples (Wafom, 2025). Mantangan leaf plants that grow abundantly in secondary forests, former gardens, or vines on shrubs. In the belief of the Gemna tribe for generations, the sap of the mantangaan plant is used to relieve cough, shortness of breath, asthma, or dripped on red eyes, with a healing of 2-3 days if consumed regularly (Ani, 2025). In addition to treating respiratory and eye disorders, Glimit is also used as an external medicine, for example dressing new wounds or as a wrapper for hot kitchen ashes that are attached to the stomach of women after childbirth (Kedemes, 2025).



Figure 4. Mantangan Leaves Heated in Kitchen Ash from Burning

In addition, Glimit can also be used directly or boiled. The sap is drunk to reduce pain, while a decoction of 5-7 leaf shoots is believed to cure lung diseases, cleanse dirty blood after childbirth, and restore stamina. In addition, the base of the Glimit rod is 5–10 cm in diameter and contains white sap that can be consumed directly as a drink. Glimit is a plant medicine that is relied on in the recovery process after childbirth and is passed on to girls in the Gemna tribe (Wafom, 2025).



Figure 5. Boiled Mantangan Leaves

The picked red leaf shoots are washed thoroughly, then boiled in an earthen pot or pot until they boil over the stove. The resulting boiled water is deep red, filtered, and then let sit before being drunk as an infusion (Wafom, 2025). Large green Glimit leaves are used as a wrapper for red leaves, then put in the still-smoldering furnace ash and simmered for 10–15 minutes. After that, the leaf wrapper is taken and attached to the body that is sick or swollen, such as the abdomen, back, soles of the feet, or other parts of the body (Ani, 2025).



Figure 6. Leaves that have been Planted are Attached to the Stomach and Back

Meanwhile, laboratory phytochemical tests showed the presence of flavonoids which were characterized by the formation of an orange color, as well as saponins which were evidenced by the appearance of stable foam despite the addition of HCl. Tannin compounds were also detected positive through blackish-green discoloration after reacting with FeCl_3 , while alkaloids were only positively identified in the Dragendorff test with the formation of orange deposits. Meanwhile, tests for steroids and quinones showed negative results because they did not show the typical color that was expected. Qualitatively, these findings show that leaf simplicia contains important bioactive compounds such as flavonoids, saponins, tannins, and alkaloids that support their use in traditional medicine (STIKES Sorong Pharmaceutical Laboratory, 2025).



Figure 7. Laboratory Test Process

These laboratory phytochemical tests reinforce ethnographic findings by identifying the content of bioactive compounds such as flavonoids, saponins, tannins, and alkaloids that are relevant to the empirical properties that the public believes. Thus, the integration of local knowledge and scientific analysis confirms the ethnopharmacological potential of Mantangan leaves as a source of traditional medicine based on local wisdom (Arnason, 2022).

Table 1. Phytochemical Screening Laboratory Test Results

Yes	Metabolit Seconds	Test Type	Result	Information
1.	Alkaloid	Mayer	White deposits are formed	Negative
		Dragendorff	Orange Deposits Formed	Positive
2.	Flavonoid	Serbuk Magnesium (HCl)	Orange Formed	Positive
3.	Saponins	Soaking Test (HCl)	Foam Occurs	Positive
4.	Tanin	FeCL3	Blackish Green	Positive
5.	Steroid	CH3COOH glacial+ H2SO4 concentrated	No blue or green color formed	Negative
6.	Quinon	NaOH 1 N	Yellow color formed	Negative

Validation of Findings

Validation is carried out through peer debriefing and triangulation methods. Peer debriefing was carried out by involving fellow researchers, both Werisar University lecturers and Stikes Papua lecturers who handled laboratory tests. which is to examine the process of qualitative thematic analysis and phytochemical test results. This discussion ensures the interpretation of data free from subjective bias, while strengthening the consistency of findings related to the use of Mantangan leaves in traditional medicine of the Gemna community.

Furthermore, the validity was strengthened by triangulation of methods, namely comparing the results of in-depth interviews, participatory observations, and documentation of treatment practices with the results of laboratory phytochemical tests. Qualitative findings regarding the function of Mantangan leaves as a respiratory, eye, wound, and postpartum recovery medicine were combined with empirical evidence of the content of flavonoids, saponins, tannins, and alkaloids in leaf simplicia. This combination suggests that the local knowledge of the Gemna people is not only passed down from generation to generation, but also has a scientific basis, thus reinforcing the validity of the ethnopharmacological findings of this study.

CONCLUSION

This study demonstrated that *Mantangan* leaves (*Decalabanthus peltatus*), known as Glimit among the Gemna indigenous people in South Sorong, possess significant ethnopharmacological value deeply rooted in traditional knowledge. Traditionally, the plant has been used for generations to treat respiratory issues, eye inflammation, wounds, and postpartum recovery, reflecting a blend of empirical experience and cultural significance. Phytochemical analysis conducted at the STIKES Papua Pharmaceutical Laboratory identified flavonoids, saponins, tannins, and alkaloids, which scientifically support these medicinal uses. These findings validate Gemna traditional medicine practices and highlight the potential of Glimit as a source for developing traditional medicines grounded in local Papuan wisdom. Future research should explore advanced biotechnological and pharmacological studies to isolate active compounds, evaluate efficacy and safety, and develop standardized herbal formulations for wider clinical application.

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