From Forest to Pharmacy: Repong Damar Ethnopharmacology as a Critical Resource for Novel Medicines in Karya Penggawa

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Abstract: Ethnopharmacological knowledge reflects the adaptive relationship between humans and biodiversity, serving as an essential foundation for discovering bioactive compounds and developing sustainable medicines. This study aimed to identify ethnopharmacological practices that are still actively maintained by the local community in Karya Penggawa Subdistrict, Pesisir Barat Regency, Lampung Province; to document the plant species utilized; and to identify the diseases treated through biodiversity resources within the Repong Damar ecosystem. Using an ethnographic approach, data were collected from July to October 2025 through in-depth interviews, observations, and documentation involving respondents selected via snowball sampling. The findings confirmed that traditional healing practices remain preserved, with eight out of the forty plant species identified in the study area being recognized for their medicinal properties. Frequently used plant parts included bark, fruit peel, and leaves, predominantly prepared through decoction (75%), mainly for treating gastritis, as well as infectious diseases such as fever and diarrhea, and metabolic disorders, particularly hypertension and diabetes mellitus. Only about 20% of the biodiversity was utilized, indicating selective yet empirically grounded knowledge. These results highlight Repong Damar as both a reservoir of indigenous wisdom and a potential source of pharmacological innovation. Further phytochemical and pharmacological studies are recommended to support bioprospecting efforts and integrate ethnopharmacology into sustainable health development in Indonesia.

1 INTRODUCTION

Ethnopharmacology plays a crucial role in advancing scientific knowledge and the modern pharmaceutical industry, as it serves as a foundation for discovering bioactive compounds with the potential for future drug development (Bhagawan and Suproborini, 2023). Traditional knowledge concerning the utilization of medicinal plants represents a long-term adaptation between humans and their environment (Febrianti *et al*., 2022). This indigenous wisdom functions not only as a traditional healing system but also as a reflection of the harmonious relationship between nature conservation and community well-being (Zulkarnain, 2025). A tangible manifestation of this interrelationship is observed in the mixed-garden system dominated by *Anthoshorea javanica* (Repong Damar) in Karya Penggawa District, Pesisir Barat Regency, Lampung Province.

The Repong Damar ecosystem harbors exceptionally high biodiversity and holds substantial potential as a natural source of medicinal compounds (Susanti *et al*., 2018). Various plant species thriving within this ecosystem, such as duku (*Lansium domesticum*), mangosteen (*Garcinia mangostana*), and senggani (*Melastoma malabathricum*), have been scientifically reported to possess pharmacological activities, including antibacterial, anti-inflammatory, and antidiabetic properties (Pratama and Jasmiadi, 2023; Purwoko *et al*., 2025). The utilization of these species by local communities reflects a strong interconnection among traditional wisdom, biodiversity utilization, and the conservation of natural resources.

However, modernization, urbanization, and changes in social and cultural values have increasingly marginalized traditional healing practices (Amanda *et al*., 2025), placing local knowledge at risk of being lost without proper documentation. The disappearance of ethnopharmacological practices signifies not only the erosion of cultural heritage but also the loss of substantial scientific potential for the bioprospecting of natural medicinal resources (Girsang *et al*., 2025). In the context of global health crises and the growing problem of chemical drug resistance, exploring new bioactive sources from local plants has become an urgent necessity for the development of safer, more effective, and environmentally sustainable medicines.

This study provides new insights into ethnopharmacological practices in Karya Penggawa Subdistrict, Pesisir Barat Regency, Lampung Province, as one of the first investigations conducted within the context of the Repong Damar ecosystem. To date, no scientific reports have documented the plant species utilized by local communities or the diseases treated through the use of biodiversity resources in this region. Accordingly, this research

enriches the body of ethnopharmacological knowledge in Indonesia by providing new empirical data from a previously unexplored area. Furthermore, the study introduces an integrative approach that not only identifies medicinal plant species and their therapeutic properties but also examines the scientific relevance of these traditional practices in relation to modern pharmacological findings. This novelty is expected to foster collaboration between indigenous knowledge systems and modern biotechnological research in the pursuit of discovering novel drug candidates from Indonesia's tropical biodiversity.

The urgency of this research lies in two fundamental dimensions: the preservation of local knowledge and the advancement of sustainable pharmaceutical science. First, from a sociocultural perspective, this study is essential for documenting and safeguarding ethnopharmacological practices that have been transmitted across generations. Scientific documentation serves as a strategic measure to prevent the erosion of indigenous knowledge resulting from modernization and changes in community lifestyles (Panamuan *et al*., 2025). Second, from a scientific standpoint, this research supports conservation-based bioprospecting efforts, where its findings can serve as a preliminary foundation for exploring bioactive compounds from local plant species with potential applications as natural drug precursors. Moreover, this study holds ecological urgency, as it reinforces the argument that preserving traditional ecosystems such as Repong Damar not only contributes to environmental conservation but also enhances public health resilience and national pharmaceutical independence. By strengthening local values through the application of scientific approaches, this research underscores that forests and biodiversity possess not merely ecological significance but also strategic importance as sources of inspiration and innovation for the future of pharmaceutical development.

The ethnopharmacological study conducted in Karya Penggawa Subdistrict, Pesisir Barat Regency, Lampung Province, provides an opportunity to further explore the relationship between local communities and the utilization of medicinal plants in the region. This research aims to identify ethnopharmacological practices that are still actively maintained by the local community in Karya Penggawa. In addition, it seeks to document the plant species utilized by the community and to identify the diseases treated through the use of biodiversity resources within the Repong Damar ecosystem.

2 METHODS

This research was conducted from July to October 2025 in the Repong Damar area, located in Karya Penggawa Subdistrict, Pesisir Barat Regency, Lampung Province. The research site is presented in (Figure 1).

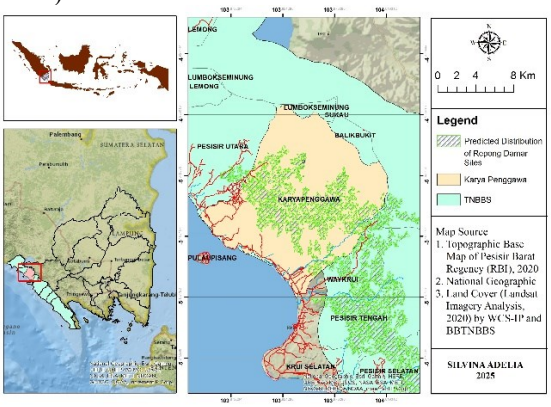

Fig.1 Research Location.

The primary instrument used in this study was a questionnaire, while the research objects comprised the Repong Damar agroforestry land and the local community managing it in Karya Penggawa Subdistrict, Pesisir Barat Regency, Lampung Province.

The study employed an ethnographic approach, which provides a detailed description of community behavior patterns and modes of thinking that have been culturally transmitted across generations, presented through written narratives, photographs, illustrations, or films (Sari *et al*., 2023). The ethnographic process involved several sequential stages, including the determination of respondents, interviews, observations, and documentation. A total of 55 respondents were selected using the snowball sampling technique, beginning with a key informant and subsequently expanding to other participants through referrals until data saturation was reached, as no new information, themes, or participant recommendations emerged (Nurdiani, 2014).

Interviews in this study were conducted using the in-depth interview method, characterized by a directed yet open, comprehensive, and semi-structured format (Fransiska *et al*., 2022). We prepared a set of guiding questions in the form of a questionnaire to facilitate the data collection process. The use of this questionnaire aimed to maintain the structured flow of the interviews while allowing respondents the flexibility to freely elaborate on their experiences, knowledge, and perceptions. The information sought included the types of plants utilized, part of plant used, and methods of preparation.

The documentation process encompassed various ethnopharmacological practices of the local

community in utilizing the biodiversity available within the Repong Damar ecosystem. This stage was carried out to support and validate the findings obtained from observations and interviews. Documentation also involved detailed field notes on each plant species observed, its preparation methods, and its contextual application. All documented data were subsequently used as both visual and textual references to strengthen the analysis and compilation of the research report.

3 RESULT AND DISCUSSION

Ethnopharmacological practices embedded in the traditions of communities in Karya Penggawa Subdistrict, Pesisir Barat Regency, Lampung Province, were confirmed to be still preserved and actively maintained by residents. The findings of this study revealed that out of 40 identified plant species within the Repong Damar ecosystem, 8 species were recognized for their medicinal properties (Table 1).

The community utilized 8 out of the 40 identified plant species for ethnopharmacological purposes. The most frequently used plant parts included the bark, fruit peel, leaves, and fruits. The predominant method of preparation was decoction, accounting for approximately 75% of the total usage. The most commonly reported therapeutic application was for anti-gastritis treatment.

Only about 20% of the available biodiversity is utilized by the local community, reflecting a selective pattern in the use of biological resources. This proportion indicates a selective utilization pattern similar to that reported by Jadid *et al*. (2020) among the Tengger community, where only a subset of local species was employed due to their proven efficacy and accessibility. The most frequently used plant parts were the stem bark, fruit rind, leaves, and fruits, consistent with the findings of Awoke *et al*. (2024), who noted the predominance of leaf use but also highlighted the application of stem bark in traditional medicine owing to its tannin and phenolic compound content.

The most common method of preparation was decoction (75%), aligning with the pattern reported by Mekonnen *et al*. (2022), which identified decoction as the primary technique because it is simple to perform and effectively extracts water-soluble active compounds. The most prevalent therapeutic application was anti-gastritis, corroborating the reviews by Prayoga *et al*. (2024) and Cherrada *et al*. (2024), which demonstrated that many traditional medicinal plants possess gastroprotective activity through anti-inflammatory and antioxidant mechanisms. This consistency in patterns underscores that traditional healing practices within the community remain deeply rooted in empirically tested principles and hold significant potential for further development in modern pharmacological research.

The results also indicated that several disease categories, including infectious and non-infectious conditions, as well as health-related uses, were treated through the utilization of biodiversity resources within the Repong Damar ecosystem (Table 1).

The local community of Karya Penggawa reported that gastritis was the most frequently treated ailment using medicinal plants in traditional ethnopharmacological practices. The disease categories commonly addressed included both infectious and non-infectious conditions. This pattern is consistent with numerous ethnopharmacological studies that have documented the extensive use of medicinal plants to treat gastrointestinal disorders as well as common infectious diseases in traditional societies (Beressa *et al*., 2024). The finding that *Lansium domesticum* possesses the broadest range of therapeutic applications within the community is supported by modern pharmacological evidence. Abdallah *et al*. (2022) reported that *L. domesticum* has been traditionally used to treat ulcers, diarrhea, fever, and infections, while several terpenoid compounds, including limonoids and sesquiterpenoids, have been identified with notable antimicrobial and anti-inflammatory activities (Sinaga *et al*., 2023).

Table 1: Ethnopharmacological Uses of Plant Species in the Repong Damar Ecosystem.

No.	Local Name	Scientific Name	Plant Part Used	Preparation Method	Disease Treated	Disease Classification	Therapeutic Class
1	Mangosteen	*Garcinia mangostana*	Fruit rind	Decoction	Gastritis	Non-infectious	Anti-gastritis
2	Langsat	*Lansium domesticum*	Fruit rind	Decoction	Fever, Diarrhea, Gastritis	Infectious/ Non-infectious	Antipyretic, Antidiarrheal, Anti-gastritis
3	Lantana	*Lantana camara*	Leaf	Pounded	Gastritis	Non-infectious	Anti-gastritis
4	Pinang	*Areca catechu*	Fruit	Decoction	Stamina enhancer	-	Tonic
5	Pakis	*Diplazium esculentum*	Leaf	Decoction	Stamina enhancer	-	Tonic
6	Senggani	*Melastoma malabathricum*	Fruit	Decoction	Hypertension	Non-infectious	Anti-hypertensive
7	Schismatoglottis	*Schismatoglottis wallichii*	Bark	Cooked	Stamina enhancer	-	Tonic
8	Stingi Bean	*Parkia speciosa*	Bark	Decoction	Diabetes mellitus	Non-infectious	Antidiabetic

4 CONCLUSIONS

This study confirms that ethnopharmacological practices in the Repong Damar ecosystem of Karya Penggawa Subdistrict, Pesisir Barat Regency, Lampung Province, remain actively preserved within the local community. From the 40 recorded plant species, eight were identified as medicinally important, primarily used to treat both infectious and non-infectious diseases such as gastritis, fever, diarrhea, hypertension, and diabetes mellitus. The findings demonstrate that only about 20% of the existing biodiversity is utilized, reflecting a selective yet knowledge-based approach rooted in empirical tradition. These results highlight the crucial role of traditional ecological knowledge in sustaining community health and conserving biodiversity resources. Practically, this study provides a scientific basis for promoting the integration of locally utilized medicinal plants into community-based healthcare programs and biodiversity conservation strategies. Future research should focus on phytochemical and pharmacological analyses of the documented species, particularly *Lansium domesticum* and *Melastoma malabathricum*, to validate their bioactive compounds and therapeutic potential through modern biomedical approaches. Furthermore, interdisciplinary studies linking ethnopharmacology, biotechnology, and sustainable forest management are recommended to strengthen the integration of traditional wisdom into national drug development strategies. The implications of this research extend to the broader framework of Indonesia's health development, emphasizing the importance of biodiversity-based innovation and the preservation of indigenous knowledge as strategic assets for achieving self-reliant, culturally grounded, and environmentally sustainable healthcare systems.

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