



Ethnobotanical Study of Medicinal Plants *Piper betle* L. as Medical Plant in Srengseng Sawah Subdistrict, South Jakarta

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Abstract

Piper betle L., commonly known as betel leaf, is one of the traditional medicinal plants widely used by Indonesian communities because of its various pharmacological benefits. This study aimed to document and describe community knowledge regarding the utilization of betel as a family medicinal plant and its management practices in daily life among residents of Srengseng Sawah Subdistrict, South Jakarta. The research employed a qualitative ethnobiological approach through semi-structured interviews with 30 purposively selected informants. Data collected included plant parts used, preparation methods, types of diseases treated, frequency of use, and community perceptions of effectiveness. The results showed that the leaves were the most commonly utilized part, typically processed by boiling, crushing, or applying directly to the affected area. Betel leaf was mainly used to treat minor wounds, oral and dental problems, skin infections, digestive issues, and women's health concerns. Knowledge of its medicinal use was largely transmitted orally across generations within family environments, and many households cultivated the plant in home gardens due to its accessibility and cultural value. Most informants considered betel leaf to be safe, affordable, and effective for treating mild health conditions, although they recognized the importance of modern medical care for more serious illnesses. Overall, the findings demonstrate that traditional plant-based knowledge remains relevant in urban communities and plays an important role in supporting household healthcare practices while contributing to the preservation of local ethnobotanical heritage.

Keywords: Ethnobotany; *Piper betle* L.; medicinal plants; traditional knowledge; family medicinal plants; urban ethnobiology; South Jakarta; herbal medicine utilization.

1. Introduction

Medicinal plants have long played an essential role in traditional healthcare systems, particularly in tropical countries with high biodiversity such as Indonesia. The use of plant-based remedies is strongly influenced by cultural traditions, economic accessibility, and the perception that herbal medicine is safer and produces fewer side effects than synthetic drugs (Zamri et al., 2023). In many developing regions, medicinal plants remain the primary source of treatment for communities with limited access to modern healthcare services (Zamri et al., 2023). Furthermore, medicinal plants are recognized as valuable sources of bioactive compounds that can support pharmaceutical development and drug discovery (Nisa Asyifa et al., 2025). Therefore, documenting traditional knowledge related to medicinal plants is crucial for both cultural preservation and future scientific advancement.

One of the most widely known medicinal plants in Southeast Asia is *Piper betle* L., commonly known as betel leaf, which has been used for centuries in traditional medicine and cultural practices (Silalahi, 2019). This plant belongs to the Piperaceae family and grows abundantly in tropical regions, making it easily accessible to local communities (Silalahi, 2019). Betel leaf contains various phytochemical compounds, including flavonoids, tannins, alkaloids, and essential oils, which contribute to its medicinal properties (Adolf JN et al., 2023). These bioactive compounds are known to possess antimicrobial, antioxidant, anti-inflammatory, and wound-healing activities (Nisa Asyifa et al., 2025). Due to these benefits, betel leaf continues to be widely utilized as a traditional remedy across many Indonesian communities (Andrianto et al., 2020).

Scientific studies have provided strong evidence supporting the pharmacological potential of *Piper betle* through phytochemical and biological investigations (Salehi et al., 2019). Researchers have identified numerous phenolic compounds and secondary metabolites responsible for its biological activity (Salehi et al., 2019). These compounds have demonstrated significant antioxidant capacity and enzyme inhibition properties that are beneficial in preventing chronic diseases (Salehi et al., 2019). Additionally, several studies have reported antibacterial and antifungal activities of betel leaf extracts against pathogenic microorganisms (Putranti et al., 2021). Such findings strengthen the scientific basis for the continued use of betel leaf in traditional medicine (Putranti et al., 2021).

In urban areas, traditional medicinal plant use remains relevant despite the growing availability of modern healthcare facilities (Nisa Asyifa et al., 2025). Many households continue to cultivate medicinal plants in home gardens as part of family healthcare strategies and self-medication practices (Zamri et al., 2023). However, rapid urbanization, modernization, and lifestyle changes may contribute to the decline of traditional ethnobotanical knowledge. Therefore, ethnobotanical studies are essential to document community knowledge, understand utilization patterns, and support cultural preservation efforts. Such research also provides important baseline information for pharmacological studies and sustainable development of herbal medicine resources (Silalahi, 2019).

2. Materials and Methods

2.1. Informant selection

Informants were selected using purposive sampling to ensure the inclusion of individuals who possessed direct knowledge and practical experience regarding the use of *Piper betle* L. as a family medicinal plant. A total of 30 informants participated in this study, consisting of:

1. Community elders who were recognized as holders of traditional knowledge related to medicinal plant use;
2. Household members responsible for preparing and administering traditional herbal remedies;
3. Adult residents aged 30–70 years who had regularly used betel leaf for treating common illnesses.

The inclusion of both knowledge holders and general community members allowed cross-verification of information and improved data reliability. All informants were informed about the research objectives and provided verbal consent prior to participation.

2.2. Data Collection

Data were obtained using the following techniques:

a. Semi-structured interviews

Interviews were conducted using a flexible interview guide covering local names of the plant, plant parts used, preparation methods, types of diseases treated, frequency of use, and community perceptions of effectiveness. This method allowed informants to share experiential knowledge, cultural beliefs, and personal practices related to betel leaf utilization.

b. Direct observation

Observations were carried out in household settings to document how betel leaves were prepared and used in daily life. Activities observed included washing, boiling, crushing, soaking, and direct

application of plant materials. Field notes were recorded to capture preparation sequences, usage contexts, and variations in practices among households.

c. Plant documentation and identification

Betel plants mentioned by informants were photographed and documented in their growing locations, primarily home gardens. Plant identification was conducted using botanical references and taxonomic literature to confirm scientific names, family classification, and morphological characteristics. Verification was performed to ensure the accuracy of species identification.

2.3. Data Analysis

Data were analyzed descriptively by tabulating information related to local plant names, scientific names, plant parts used, preparation techniques, treated ailments, and perceived medicinal functions. Reported therapeutic uses were compared with existing ethnobotanical and pharmacological literature to assess their scientific relevance. Patterns of plant part utilization were also examined to evaluate sustainability aspects, particularly the dominance of renewable plant parts such as leaves.

To enhance validity, data triangulation was applied by comparing interview responses among informants and confirming them with observational findings. Information consistently reported by multiple informants was considered representative of commonly shared local knowledge regarding the use of betel leaf as a family medicinal plant.

3. Result

3.1. Community Knowledge and Cultivation of *Piper betle* L.

Based on interviews with 30 informants in Srengseng Sawah Subdistrict, 83% of respondents stated that they were familiar with *Piper betle* L. as a traditional medicinal plant. Approximately 80% reported that they currently cultivate betel plants in their home gardens or in pots due to limited urban land availability. The plant is generally grown along fences or supported by simple wooden structures, reflecting its climbing growth habit. Informants described betel as easy to maintain, requiring minimal care and capable of continuous leaf production throughout the year.

The high level of recognition indicates that betel leaf remains culturally embedded within household healthcare practices despite increasing access to modern medical facilities. Cultivation at the household level also suggests a form of self-reliance in primary healthcare management.

3.2. Utilization Patterns in Daily Life

Regarding daily utilization, 73% of informants reported using betel leaf primarily for minor wounds and skin infections. Other commonly mentioned uses included treatment of mouth ulcers, toothache, bad breath, vaginal discharge, itching, and body odor. Several respondents indicated that betel decoction is used as a mouth rinse, while others apply crushed leaves directly to affected skin areas.

These findings demonstrate that betel leaf is mainly utilized for external and mild health conditions. The reported applications are consistent with known antimicrobial and anti-inflammatory properties of the plant documented in pharmacological studies. This alignment between empirical knowledge and scientific evidence reinforces the validity of traditional usage.

3.3. Plant Parts Utilized

The leaf was identified as the most frequently used plant part (93% of responses), whereas stems and roots were rarely utilized. Informants emphasized that leaves are preferred because they are easy to harvest without damaging the plant and are believed to contain the highest concentration of beneficial substances.

The predominance of leaf utilization reflects sustainable harvesting practices, as leaves are renewable plant parts. The absence of root usage indicates awareness of maintaining plant survival and long-term availability, which indirectly supports conservation at the household scale.

3.4 Preparation Methods

Boiling was reported as the dominant preparation method (80% of informants). Fresh leaves are washed and boiled for approximately 10–15 minutes before being used as a rinse, compress, or wash. Some informants reported crushing fresh leaves for direct topical application, particularly for cuts and insect bites. A smaller proportion preferred soaking leaves in warm water to preserve aroma and reduce bitterness.

Preparation activities were primarily conducted by adult women, highlighting their central role in family healthcare management. The reliance on simple preparation techniques indicates that betel-based remedies remain accessible and practical for daily use.

3.5 Reported Medicinal Functions

Informants consistently reported antiseptic and cleansing properties as the main benefits of betel leaf. The most frequently cited therapeutic effects included faster wound drying, reduction of inflammation, elimination of body odor, relief of oral discomfort, and soothing of skin irritation.

Cross-referencing with existing ethnopharmacological literature confirms that *Piper betle* contains phenolic compounds, flavonoids, and essential oils with antimicrobial and antioxidant activity. The consistency between local explanations and scientific findings strengthens the credibility of traditional knowledge systems.

3.6 Knowledge Transmission

Approximately 77% of respondents stated that they first learned about the medicinal use of betel from parents or grandparents. Knowledge transmission occurred primarily through oral communication and practical demonstration rather than written sources. A smaller number of informants reported learning from neighbors or community discussions.

This pattern indicates that ethnobotanical knowledge is largely preserved through intergenerational transfer within families. However, several respondents expressed concern that younger generations are less familiar with traditional medicinal practices.

3.7 Comparison with Modern Medicine

Sixty percent of informants reported using betel leaf as a first-line treatment for mild symptoms before seeking modern medical care. For more serious or persistent conditions, respondents preferred consulting healthcare professionals.

This finding suggests that betel leaf functions as a complementary remedy rather than a substitute for clinical treatment. The coexistence of traditional and modern medicine reflects adaptive healthcare behavior in urban communities.

3.8 Perceived Effectiveness and Future Perspectives

A large majority of respondents (87%) considered betel leaf still effective for treating minor health problems. Reasons cited included affordability, accessibility, natural composition, and positive personal experience. Furthermore, 97% agreed that knowledge regarding betel utilization should be taught to younger generations to preserve cultural heritage and promote household health independence.

Although urbanization and modernization were perceived as factors contributing to declining usage among youth, community members emphasized the importance of maintaining ethnobotanical knowledge as part of local identity and sustainable health practices.

4. Discussion

The findings demonstrate that *Piper betle* L. remains functionally embedded in household healthcare practices in Srengseng Sawah, indicating resilience of ethnobotanical knowledge within an urban context. The predominance of leaf use and boiling as the primary preparation method reflects patterns commonly reported in ethnomedicinal studies, suggesting a practical rationale grounded in accessibility, sustainability, and extraction efficiency. Reported antiseptic and anti-inflammatory benefits correspond with established

phytochemical properties of *Piper betle*, reinforcing the empirical validity of community-based therapeutic claims. However, the reliance on self-reported effectiveness highlights the need for further pharmacological validation of locally cultivated varieties to assess consistency in bioactive compound composition.

At the same time, the data reveal a transitional healthcare dynamic in which betel leaf is primarily used for mild conditions, while modern medicine is preferred for more serious illnesses. This complementary pattern reflects adaptive integration rather than opposition between traditional and biomedical systems. Nevertheless, concerns regarding declining transmission of knowledge to younger generations indicate potential erosion of ethnobotanical literacy in rapidly urbanizing environments. Future research should therefore combine ethnobotanical documentation with quantitative phytochemical analysis and educational strategies to strengthen both scientific understanding and cultural sustainability of traditional medicinal practices.

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