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ENTOPHARMACOLOGICAL STUDY OF CANDLENUT PLANT (ALEURITES MOLUCCANA L.) AS A TREATMENT FOR BANJAR COMMUNITY DISEASE

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Abstract

Candlenut plants also known as keminting have various benefits for the Banjar community, especially in the fields of health, economy, and culture. However, its use in the perspective of ethnobotany based on local wisdom has not been widely studied, especially in the pharmacological aspect. This study aims to analyze the use of candlenut plants as natural medicine in Banyu Irang Village, South Kalimantan. The research method was snowball sampling with data collection techniques through observation, semi-structured interviews, and documentation. Ethnopharmacologically, various parts of the candlenut plant, such as roots, stems, leaves, and seeds, have long been used in traditional medicine. Candlenut oil is used for hair care and skin health, while the boiled water of the leaves is used to improve digestion and help the body's detoxification process. Local communities still maintain this practice for generations as part of their cultural heritage. In addition to its health benefits, candlenut also has economic potential as a raw material for the pharmaceutical, cosmetic, and herbal industries. However, its utilization and on-site management are still limited, so efforts are needed to improve cultivation and crop processing innovations to optimize its economic benefits. The results of this study are expected to support efforts to conserve candlenut plants while maintaining the local wisdom values of the Banyu Irang Village community. In addition, further studies on the ethnobotanical aspects and potential commercialisation of candlenut can provide knowledge of its use in people's lives in a sustainable manner.

Keywords: ***Entopharmacology, Candlenut, Banjar community, utilization.***

INTRODUCTION

South Kalimantan Province is one of the regions in Indonesia that has rich biodiversity due to the presence of peatlands that dominate this region (Rahmini, 2021). Peatlands are not only a habitat for endemic plants, but also hold great potential in the economic and health sectors. The uniqueness of peatland ecosystems in South Kalimantan is reflected in the diversity of plant species that grow with adaptations to humid and nutrient-rich environmental conditions, allowing plants to develop with morphological characteristics that are different from other regions (Sudrajat & Subekti, 2019).

This diversity not only impacts ecological aspects, but also brings added value in its utilisation as a source of traditional medicine (Utomo, 2017). This can be seen from local communities in South Kalimantan, one of which is Banyu Irang Village, which has long relied on this natural wealth to fulfil their natural medicinal needs (Norfajrina, 2025). The tradition of using medicinal plants has been passed down from generation to generation through hereditary recipes that contain local wisdom (Yassir & Asnah, 2019).

One of the interesting plant findings to be studied is candlenut (*Aleurites moluccana* L.), which has long been known among the community as a plant with various health benefits (Arsyad, 2021). In Banyu Irang Village, the tradition of using candlenuts as medicine has become an integral part of the community's life. The people of this village have passed down their knowledge on how to select, process, and apply candlenuts in the form of medicinal

concoctions. The existence of this practice shows that candlenuts not only act as an economic element, but also as a valuable health resource.

The utilization of candlenut as a medicine and immunity booster is becoming increasingly relevant amidst the increasing attention to alternative medicine, especially during the pandemic, which has increased public awareness of the importance of the immune system (Lanur & Mago, 2018). The local wisdom embodied in the processing of candlenuts in Banyu Irang Village illustrates the integration of traditional knowledge and modern efforts in addressing various health problems.

Although various literatures have discussed the medicinal potential of various plants, specific studies on candlenut (*Aleurites moluccana* L.) are still limited. Therefore, this study was motivated by the need to explore the benefits of candlenut as an immunostimulant and disease treatment agent, and to systematically document the traditional processing methods used by the people of Banyu Irang Village. The use of candlenut as a medicine has been part of traditional medicine practices that have been passed down from generation to generation.

This study was conducted because it shows that there is a tendency for the people of South Kalimantan to increasingly choose herbal-based medicine. This choice is based on the belief that herbal medicine is able to provide additional protection against various diseases, especially in improving the body's immune system. In addition, the increasing awareness of the side effects of synthetic drugs also encourages people to switch to natural remedies that are considered safer and have lower side effects. These factors reinforce the urgency of research on candlenuts as a potential source of herbal medicine.

Scientific support for the use of herbal medicine is also strengthened by various studies showing that medicinal plants have bioactive compounds that function as immunomodulators (Ton, 2025). One study mentioned that the utilisation of herbal medicine as an immunomodulator is a strategic step that needs to be developed in the face of pandemics and other diseases in the future. Therefore, research on medicinal plants that have been used empirically by the community, including Candlenut, needs to be developed further to ensure its effectiveness based on systematic scientific studies.

The natural wealth and local wisdom stored in South Kalimantan provide a great opportunity to explore the potential of herbal medicine through more in-depth studies. This research aims to identify plants that are used by local communities as medicines and immunity enhancers. In addition, this research will also explore traditional processing methods and classify plant species based on their habitat. Thus, this research is expected to add insight into the field of ethnobotany and contribute to the development of science-based herbal medicine.

In addition to providing further understanding of the benefits of candlenuts, this research also aims to document traditional methods that have long been applied by the people of Banyu Irang Village. This documentation is very important so that local wisdom is not lost with the times and can still be passed on to future generations. The results of this research are also expected to serve as a reference for historians, health practitioners, and the government in establishing policies that support the sustainable use of plants. Finally, this research is expected to make a significant scientific contribution by presenting in-depth data and analyses regarding the role of candlenuts in improving immunity and treating diseases, as well as encouraging the development of alternative solutions in the field of modern health.

LITERATURE REVIEW

The literature review is a critical component of your research paper, providing a comprehensive overview of existing research and theoretical frameworks related to your topic. This section serves to establish the context of your study by summarizing and synthesizing relevant literature, highlighting key findings, methodologies, and gaps in current knowledge.

In this section, you should:

- Identify and critically evaluate previous studies pertinent to your research question. This includes examining the strengths and weaknesses of earlier work, and how they inform your own research.
- Discuss the theoretical frameworks and concepts that underpin your study, providing insights into how they relate to your research objectives.

- Highlight any controversies, discrepancies, or debates within the existing literature, emphasizing areas where your study contributes new knowledge or perspectives.
- Conclude with a clear statement regarding the gaps in the literature that your research aims to address, setting the stage for your study's significance and intended contributions.

Ensure that the literature review is well-organized, flowing smoothly between topics, and logically leading to your research questions or hypotheses. Proper citations and references are essential to uphold academic integrity and provide credit to original authors.

METHOD

This research is a field research with a qualitative descriptive approach that aims to deeply understand the use of candlenut plants (*Aleurites moluccana* L.) by the Banjar tribe in Banyu Irang Village, Bati-Bati Sub-district, Tanah Laut Regency, South Kalimantan. The main focus of this research was to gather information on the utilisation of candlenut plants in improving immunity and treating diseases as well as documenting the traditional processing and use methods. This research location was chosen because the local community still maintains traditional medicine practices that have been passed down from generation to generation. This research was conducted over a period of time in accordance with the research stages, from data collection to analysis of results.

The sampling technique in this study used the snowball sampling method by determining informants gradually based on recommendations from previous informants. This approach allows researchers to obtain broader and more in-depth information from individuals who have knowledge about the use of candlenut in traditional medicine. The main informants in this study include community leaders, village healers or shamans, and residents who actively use candlenuts as medicine.

Data were collected using three main techniques: direct observation, semi-structured interviews and documentation. Observations were made by directly observing candlenut habitats and practices in traditional medicine. Semi-structured interviews were conducted with the local community to obtain information on how candlenut is utilised and the belief in its effectiveness. Documentation in the form of written notes, photographs, and audio and video analysis recordings were used as supporting materials in the research.

The data obtained was analysed using a qualitative descriptive method consisting of three main stages, namely data reduction, data presentation, and conclusion drawing. Data reduction is done by selecting, organising, and organising the information that has been collected to make it more systematic. Data presentation is done in the form of descriptive narratives, tables, or pictures to provide a clearer understanding of the research results. After that, analysis of the data that has been obtained is carried out to draw conclusions about the role of candlenut as an immunostimulant and disease treatment agent.

o ensure data validity, this research applied triangulation techniques including source triangulation, technique triangulation, and time triangulation. Source triangulation was conducted by comparing information from various informants to ensure data consistency. Technical triangulation used more than one data collection method (observation, interview, and documentation) to make the research results more accurate and comprehensive. Meanwhile, time triangulation was done by collecting data at different times to avoid temporal bias in the research.

RESULTS AND DISCUSSION

The candlenut plant is commonly known in the Banjar community as '*keminting'* and has its own meaning. The name refers to the fruit which is often associated with a warm and soothing flavour, reflecting its uses in traditional medicine to culinary. In the Banjar language, kemiri also appears in various proverbs and figures of speech that describe its resilience and hidden benefits. One well-known expression is 'tough candlenut, full of benefits,' which symbolises that something that appears tough and difficult on the outside often holds great value on the inside.

This is supported according to Candlenut oil (*Aleurites moluccana*) has long been known as one of the non-timber forest products (NTFPs) that has a variety of benefits, especially in hair care (Miftahurahma et al., 2023). For generations, hazelnut oil has been used by various communities as a hair conditioner and fertiliser. Candlenut oil extraction process can be done by various methods, both traditional and modern (Sari et al., 2024). On a laboratory

scale, hazelnut oil can be obtained through distillation and soxhletation processes, while on an industrial scale, oil extraction is carried out using a mechanical press to obtain more efficient results and in larger quantities (Nabilla et al., 2023).

The candlenut tree (*Aleurites moluccana* L. Willd.) in Banyu Irang Village demonstrates that this plant has a habitat consisting of a tree that can grow to a height of 15–25 metres, with branches that spread widely or hang down. Its trunk is woody, cylindrical in shape, and has a varying diameter depending on the age of the plant. The colour of the trunk is generally greenish-purple in the younger parts, while the older sections tend to be brownish-grey. The surface of the trunk is rough with a considerable number of branches, which supports the structure of the tree, allowing it to remain sturdy in various environmental conditions.

The candlenut leaf is singular in shape with an alternate arrangement. The leaf shape varies, ranging from oval to three to five lobes, with a length of approximately 10–20 cm. The leaves are green with a somewhat hairy surface, particularly on the young leaves. Additionally, candlenut leaves also possess glands that exude a distinctive secretion, serving to protect the plant from pest and pathogen attacks. The leaves are elongated or oval, with wavy edges, a smooth surface, a pointed base, and a blunt tip. The leaf texture is somewhat coarse, measuring approximately 7–12 cm in length and 4–6 cm in width.

The candles nut flower is small in size, yellowish-white in colour, and arranged in clusters at the tips of the branches. This flower is unisexual, with both male and female flowers found on the same tree (monoecious). Pollination generally occurs with the assistance of insects or the wind. The candles nut flower features a cluster protection with small, round flowers that are bright yellow and located at the ends of the stems. Each flower has five sepals, five petals, five stamens, and one pistil. Its simple yet effective floral structure enables this plant to reproduce successfully in a natural setting.

Figure 1. Leaf, Flower And Fruit Parts of Candlenut
Source: Data processing results

The candle nut fruit is round in shape with a diameter of about 4–6 cm. The outer skin of the fruit is thick and hard, protecting the seeds inside, which also possess a hard shell that is dark brown in colour. The root system of this plant is fibrous with white roots, allowing the plant to absorb nutrients effectively from the soil. Candle nut seeds contain a high amount of oil, which is often utilised as a raw material in the vegetable oil industry and traditional medicine (Rahmi, 2020). The oil content in the candle nut seeds plays a crucial role in various applications, including as an energy source, cosmetic ingredients, and herbal medicine.

The specific morphology of candlenut also influences its germination process. Studies have shown that the characteristics of hard seeds with high oil content affect the speed and success rate of germination (Putria et al., 2022). Therefore, the cultivation and conservation techniques for candlenut need to consider special treatments for its seeds, such as soaking or scarification, in order to expedite germination and enhance plant production optimally.

Based on the research findings, the utilisation of candlenut (*Aleurites moluccana* L.) by the community of Banyu Irang Village shows that the most frequently used part is the seed (57%), followed by the leaf (21%), stem

(15%), and root (7%) for ethnopharmacological purposes. This data can be viewed in more detail in the following graph:

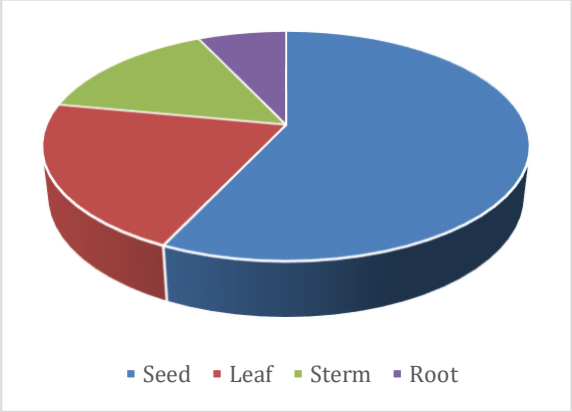

Diagram 1. Botanical Section of Candlenut Utilisation

Kemiri (*Aleurites moluccana* L. Willd.) has long been recognised by the indigenous Banjar community in Banyu Irang Village as a plant with extensive pharmacological properties. This plant is not only utilised as a food source and natural cosmetic, but also plays a vital role in traditional medicine. The seeds of the kemiri are the main component in the practice of herbal healing, particularly through the extraction of its oil, which is used for various health purposes. Kemiri oil has been traditionally used for nourishing hair, tackling dandruff, as well as treating minor burns and skin irritation. Furthermore, the anti-inflammatory and antimicrobial properties of kemiri oil make it a substance believed to alleviate skin disorders such as eczema and rashes.

Chemically, candlenut oil contains various essential fatty acids, including heptadecanoic acid, linoleic acid, linolenic acid, oleic acid, and palmitic acid, which possess a range of pharmacological benefits (Song et al., 2025). This composition makes candlenut oil not only beneficial for hair care, but also has potential as a pharmaceutical agent in the healing of wounds and skin inflammation (Wibowo & Mariani, 2024). One medical application of candlenut oil that has been researched is its use in burn wound healing gel (Leny et al., 2021). The research findings demonstrate that a gel containing 25% candlenut oil is as effective as Burnazin, a medication commonly used in the treatment of burns. This indicates the potential of candlenut oil as a natural ingredient in the fields of pharmacy and dermatology.

Not only the seeds, but other parts of the candlenut tree also possess significant medicinal value. Candlenut leaves are often boiled to make a brew that functions to reduce fever, alleviate pain, and assist in post-natal recovery. In some traditional medical practices, the infusion of candlenut leaves is also used to address mild respiratory disorders, such as coughs and shortness of breath. Meanwhile, the trunk and roots of the candlenut tree are sometimes used as an ingredient in remedies for digestive issues, such as diarrhoea or bloating.

Furthermore, candle nut oil also holds significant value in the traditional medicine of the community. Candle nuts have long been used as a hair conditioner by burning the fruit until it releases oil, which is then applied to the hair to accelerate growth and naturally darken its colour (Mercya & Ramadani, 2024). Not only the seeds are utilised; other parts of the candle nut plant, such as the leaves, bark, and flesh of the seed, are also used in various traditional remedies. The leaves are often processed into herbal concoctions to alleviate fever, pain, and skin issues, while extracts from the bark are used in medicinal mixtures to address digestive disorders (Adawiyah, 2017).

However, in the village of Banyu Irang, the presence of candle nut trees is quite limited, and there is no widespread storage for the harvest. The large candle nut trees in this village are generally owned by a single family, which means that production and utilisation are exclusively for personal consumption. Nevertheless, candle nut still has significant potential for development into high-value economic products, such as herbal medicine.

In the economic context, this research also identifies candlenut as one of the high-value crops frequently utilised as a traditional medicine in various regions (Yassir & Asnah, 2019). Candlenut oil is not only employed as a raw material in the cosmetic and pharmaceutical industries, but it also holds potential for further development in innovative products, such as essential oils, ointments, or herbal creams (Ton, 2025). With the increasing public awareness of natural products, the processing of candlenut oil could represent a promising economic opportunity for local communities.

Furthermore, local terms such as "*mengemiri*" which means to extract oil from the candlenut seeds, reflect how agrarian activities and the processing of natural resources have become deeply ingrained in the culture of local communities. This linguistic knowledge is passed down orally through folklore, traditional songs, and advice from elders. This indicates that candlenut is not merely a natural resource but also a part of the identity and cultural heritage that connects communities to their ancestral traditions.

From a linguistic perspective, in the Indonesian language, the name “kemiri” is derived from an adaptation of local languages that has developed through generations. This name is closely tied to local understanding, community beliefs, and the use of the plant in daily life. Over time, kemiri has remained an important part of cultural heritage, encompassing traditional, medicinal, and economic aspects. Therefore, further studies on the potential and diversification of kemiri-based products could support the preservation of traditional knowledge while enhancing the welfare of communities that rely on this plant.

With appropriate management, the utilisation of kemiri can make a significant contribution to the economic welfare of communities, while also demonstrating how local wisdom and traditional knowledge can be integrated with modern economic practices. In line with research conducted by Hakim et al. (2019), the community in Dusun Kopen Dukuh does not cultivate kemiri in their gardens but instead purchases the seeds at traditional markets for use in various dishes and other household needs.

n general, the candlenut tree plays an important ecological role in the landscape of Ulukambat Village. This plant is often found in community gardens or around customary forests as part of traditional agroforestry practices. The sturdy roots of the candlenut tree serve to prevent soil erosion, particularly in areas with steep topography, thereby supporting the stability of the ecosystem in the village. Furthermore, the tree's dense canopy can provide shelter for surrounding plants and offer habitat for various types of birds and pollinating insects.

With its vast potential benefits, in terms of health, economy, culture, and ecology, the candlenut is a plant of strategic value to the community. Therefore, efforts towards the conservation and sustainable cultivation of candlenut need to be developed to ensure that its benefits can continue to be enjoyed by future generations. Further studies in ethnobotanical-linguistic research could also help to uncover how Indonesian people utilise candlenut in their daily lives and how this plant contributes to shaping their culture and language.

CONCLUSION

The candlenut tree (*Aleurites moluccana* L.) has extensive benefits in health, economy, culture, and ecology. In pharmacology, candlenut oil contains essential fatty acids that play a role in wound healing, skin care, and possess anti-inflammatory and antimicrobial properties. Economically, candlenut is highly valued as a raw material in the pharmaceutical, cosmetic, and herbal industries, although its utilisation in Banyu Irang village remains limited. Culturally, candlenut holds symbolic meaning within the Banjar community, as reflected in local terms and inherited practices. Ecologically, the roots of the candlenut tree help prevent erosion, while its canopy serves to protect other plants and provide habitat for pollinating insects. Therefore, efforts towards conservation and the development of sustainable cultivation are essential to ensure its benefits for future generations, as well as to expand ethnobotanical and linguistic studies related to its use in the lives of Indonesian communities.

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