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Review Article

Ethnobotanical Insights into the Medicinal Application for Fever in the Kampar community

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ABSTRACT

The Kampar community practices traditional healing methods. In Penyasawan Village, located in Kampar Regency, several plants are used as sources of medicine. This study aims to explore the utilization of medicinal plants to treat fever by the local Kampar people. The research method used is a case study. The study was conducted in Penyasawan Village, Kampar District, Kampar Regency, Riau Province. The local community uses a variety of plants as alternative treatments. The data collection techniques used in this research were observation and interviews. The Kampar people use daun *kiman hujan* (*Zingiber spectabile*), daun *sugi-sugi* (*Justicia gendarussa*), and daun *sidingin* (*Kalanchoe pinnata*) as ingredients in traditional fever remedies. This local knowledge can serve as a valuable learning resource for science education, particularly in biology, under the topic of biodiversity. Students can learn science starting from the knowledge that already exists in their community, making it easier for them to understand science concepts related to biodiversity. Indonesia is the second richest country in terms of global biodiversity, including a wide variety of medicinal plants, with thousands of species already utilized by the public. Various ethnic groups use plants for ethnomedicine, characterized by unique formulations and preparation methods that demonstrate a deep understanding of medicinal flora by local communities. Traditional medicine based on local wisdom can enhance quality of life, both economically and in terms of public health. Education Based on Local Excellence is a conscious and planned effort that involves the wise exploration and utilization of local potential to create a meaningful learning environment, enabling students to actively develop their abilities, knowledge, and attitudes. This research aims to describe the process of preparing traditional herbal remedies and reconstruct it from indigenous science to formal scientific knowledge.

Keywords:
Local Wisdom, Ethnomedicine, Science Learning Resources

INTRODUCTION

Indonesia is a tropical country with high humidity, allowing various types of plants to thrive. In fact, Indonesia holds the position as the second richest country in the world in terms of biodiversity, including a vast array of medicinal plants—thousands of species of which have already been used by local communities. Various ethnic groups utilize plants as components of ethnomedicine, with unique formulas and preparation techniques that reflect the depth of indigenous knowledge about medicinal plants (Ilhami & Yasnel, 2022). Knowledge of medicinal plants is a part of the nation's cultural heritage that has been passed down from generation to generation and must be preserved. Technological and scientific advancements have not diminished the importance of traditional medicine. Therefore, one of

the alternative treatments that continues to be practiced is the use of medicinal plants within communities (Evizal et al., 2013).

Riau Province is located in the central eastern part of Sumatra Island. It is one of the regions in Indonesia endowed with abundant natural resources that support the local economy. The province has diverse ecosystems that include lowland tropical forests, peatlands, and extensive river networks. These landscapes provide timber, non-timber forest products, and a variety of plant species with medicinal value. Such resources sustain community livelihoods through agriculture, forestry, and fisheries. They also hold potential for the development of traditional medicine and other bio-based industries. Sustainable management of these resources is necessary to maintain community welfare and protect the environment (Dicky et al., 2016).

Traditional medicine, which is based on local wisdom, can improve people's quality of life both economically and in terms of health. If communities are able to optimize the use of traditional medicine, their access to healthcare becomes easier and more affordable, as it is adapted to local capacities and resources. Local wisdom refers to the behaviors and practices of communities in interacting with their environment (Widiarti et al., 2016). Local wisdom encompasses values and norms passed down across generations, usually in the form of oral traditions, religious beliefs, customs, and social systems within a community. This body of knowledge evolves through long-term adaptation to the natural and social environments in which communities live and interact (Juniarta et al., 2013).

Studies on the knowledge and use of medicinal plants have been widely conducted, particularly in relation to local communities. For example, Asution et al. (2020) reported that the Batak Toba ethnic group utilizes nine species from the Zingiberaceae family, such as *Zingiber officinale* (ginger), *Zingiber purpureum* (wild ginger), *Zingiber americans* (*lempuyang*), *Curcuma domestica* (turmeric), *Curcuma xanthorhiza (temulawak), Alpinia galanga* (galangal), *Kaempferia galanga* (aromatic ginger), *Etlingera elatior* (torch ginger), and *Amomum compactum* (cardamom). These plants are used primarily for healing, health maintenance, and traditional treatments. Another study by Lolobata et al. (2015) revealed that the people of North Maluku utilize various plant species to treat both external and internal illnesses, including chronic diseases. However, the use of such remedies is still limited to personal or household consumption, and the availability of medicinal plants depends largely on what can be harvested from the wild.

In Kampar Regency, particularly in Penyasawan Village, the use of medicinal plants forms an integral part of local healthcare practices. Residents frequently prepare remedies from the leaves and flowers of *kiman ujan* (*Zingiber spectabile*), the fruit of *kambe* or poyo (bitter melon), the leaves of *sugi-sugi* (*Justicia gendarussa*), and the foliage of *sidingin* (*Kalanchoe pinnata*). These plants are cultivated in home gardens or collected from surrounding areas where they grow naturally. The preparation methods remain simple and rely on boiling, pounding, or soaking, depending on the intended use. Such practices are not formally documented but are transmitted orally through generations as part of ancestral heritage. This transmission preserves not only practical knowledge but also cultural identity within the community. The continued reliance on these plants reflects both their perceived effectiveness and the community's trust in traditional wisdom. Such knowledge also represents a valuable resource for ethnobotanical studies and potential pharmaceutical development (Warida et al., 2015).

This study can be used as a reference in science education, particularly in the topic of biodiversity. Local wisdom about medicinal plants adds valuable insight for students and enhances their understanding of biodiversity in their own regions. Education Based on Local Excellence is a deliberate and structured effort to explore and utilize regional potential in a wise manner, aiming to create an engaging learning atmosphere that allows students to actively develop their skills, knowledge, and character, while contributing to national development (Paramita et al., 2018). Based on this background, the purpose of this study is to describe the process of preparing traditional medicinal herbs and to reconstruct the indigenous scientific knowledge into formal scientific understanding.

METHODS

This study employed a case study method. A case study is a series of scientific activities carried out intensively, in detail, and in-depth to investigate a particular program, event, or activity at the individual, group, institutional, or organizational level in order to obtain comprehensive knowledge

about the phenomenon being studied. It is a method used to explain and examine a specific object over a period of time or to analyze a phenomenon found in a particular place (Rangkuti et al., 2020).

The research was conducted in Penyasawan Village, Kampar District, Kampar Regency, Riau Province. In this area, members of the local community utilize a variety of plants as alternative medicine. The data collection techniques used were observation and interview, carried out on June 1, 2022. The primary source of information was a resident of Penyasawan Village who still actively uses various plants for traditional treatment.

RESULTS AND DISCUSSION

Traditional medicine is a form of treatment that is often practiced by the community in Penyasawan Village, Kampar. This treatment usually utilizes plants found around the residents' homes. Traditional medicine is already well known among the community, both in Penyasawan Village itself and in neighboring villages. The treatment is administered depending on the type of illness experienced by the patient. If the fever experienced is mild, plants such as *kiman ujan* leaves (*Zingiber spectabile*/ginger) in Figure 1, *kiman ujan* flowers in Figure 2, *kambe* leaves (bitter melon) in Figure 3, *sugi-sugi* leaves in Figure 4, and *sidingin* leaves (*Kalanchoe*) in Figure 5 will be used. So, the bottom part is called *ocik*, made from jackfruit wood, while kayu panyopik is made from coconut wood. Yes, because the ocik must be made from heavy wood, so that when we sit on it, it doesn't slide everywhere. Coconut wood is quite light, so it's easier to lift. (Dewiana, 2022)

Figure 1. *Kiman ujan* Leave
Source: Research Documentation

Figure 2. *Kiman ujan* Flower
Source: Google

Figure 3. *Kambe* Leaf
Source: Research Documentation

Figure 4. *Sugi-sugi* Leaf
Source: Research Documentation

Figure 5. *Sidingin* Leaf
Source: Research Documentation

The plants used for this traditional treatment are usually obtainable from around the home and can sometimes be planted and cultivated in the yard. However, if the plant is rare, it can be found in the bushes behind residents' homes, which the Kampar people usually refer to as *Lua.* In this research, the researcher conducted direct field observation to identify the various medicinal plants commonly used for traditional healing.

I've been practicing traditional medicine using natural plants for about 30 years. I learned from my late grandmother, who had deep knowledge of herbal remedies. Treatments include fever relief, wound care, and monthly ailments like menstrual pain. Remedies are prepared in a container, and specific plants are added based on the illness. Plants are torn by hand, not cut with a knife. Yes, prayers like Al-Fatihah and the 3 Quls are recited before applying the remedy to the affected area. Typically, the remedy is used for 2–3 days. After that, it can be prepared again using the same method (Mastuti, 2022)

Mastuti stated that she has practiced traditional medicine for about three decades. She learned this knowledge from her late grandmother who had extensive expertise in herbal remedies. The treatments she performs include relief for fever wound care and management of monthly ailments such as menstrual pain. The choice of plants depends on the illness being treated. For fever she uses kiman ujan leaves bamboo shoots and sugar cane leaves. For long-term treatments she uses the flowers of the kiman ujan plant. Some of these plants are grown at home for convenience. If they are unavailable she collects them from wild areas in the Lua. In preparing the remedies she places the selected plants in a container and chooses them based on the type of illness. The leaves or flowers are torn by hand rather than cut with a knife to preserve their natural potency. The treatment process is accompanied by the recitation of Islamic prayers such as Al-Fatihah and the three Quls. These are recited before applying the remedy to the affected part of the body. The remedy is typically used for two to three days. If needed it can be prepared again using the same method.

The leaves and flowers of *Zingiber spectabile* have potential as a natural treatment for fever due to their bioactive compounds with anti-inflammatory and antipyretic properties. Preliminary phytochemical studies on related species in the Zingiberaceae family have identified the presence of flavonoids and essential oils that can modulate the body's immune response and reduce elevated body temperature (Hamzah & Zubair, 2019). The aromatic compounds may contribute to vasodilation which supports heat dissipation during febrile conditions (Assiry et al., 2023). Traditional healers in Penyasawan Village report that the plant is prepared by tearing the leaves or petals by hand and applying them in water-based preparations. This process is believed to preserve the active components and enhance their medicinal effect. Although the plant is well known in local ethnomedicine, scientific validation through controlled laboratory and clinical studies is still limited.

The leaves of *Momordica charantia L*. commonly known as bitter melon are widely recognized in ethnobotanical literature for their therapeutic applications including fever reduction. This species

contains bioactive compounds such as charantin and momordicosides which are associated with anti-inflammatory effects that can indirectly support the body's regulation of temperature (Li et al., 2020) . The antioxidant content of the leaves may help reduce oxidative stress which often accompanies infections that cause fever (Tanwar et al., 2022) . In Penyasawan Village the leaves are prepared fresh and applied as a simple infusion or poultice depending on the severity of the symptoms. Empirical knowledge from local practitioners suggests that the remedy is most effective when used at the onset of fever. While M. charantia has been studied more extensively for its antidiabetic and antiviral properties, its direct antipyretic effects require further targeted investigation. Research into its pharmacodynamics and pharmacokinetics in relation to fever treatment could provide insights into optimal preparation methods and safe usage in both traditional and modern healthcare contexts.

Sugi-sugi leaves though less documented in the global scientific literature hold cultural importance in local healing practices for managing fever. Preliminary ethnopharmacological observations suggest that the plant contains tannins and possibly saponins which may contribute to its anti-inflammatory and antimicrobial activity (Amrul et al., 2023). These properties could assist in alleviating fever when the underlying cause is related to mild infections. In traditional applications within Penyasawan Village the leaves are gently torn and immersed in water to create a preparation that can be applied externally or consumed in small quantities under guidance. The method avoids metal tools to maintain the perceived vitality of the plant material. Limited academic work exists on the taxonomy and chemical profile of *sugi-sugi* which presents an opportunity for novel research. Detailed phytochemical screening and in vitro antipyretic testing would be valuable to determine the extent of its medicinal potential and to integrate it into broader studies on traditional Southeast Asian febrifuge plants.

Kalanchoe species are known in ethnomedicine across tropical regions for their broad pharmacological properties including anti-inflammatory and analgesic effects that may be relevant for fever treatment (Rahman et al., 2019). The leaves are rich in flavonoids bufadienolides and other phenolic compounds that can modulate immune responses and potentially lower elevated body temperature (Nascimento et al., 2023). In Penyasawan Village the fresh *sidingin* leaves are used in simple home remedies where they are torn by hand and applied as a topical compress or consumed in diluted preparations. This approach reflects both practical accessibility and the belief that minimal processing preserves medicinal potency. Although some Kalanchoe extracts have been studied for antimicrobial and wound-healing activities, research specifically addressing their antipyretic mechanism remains limited. Controlled experimental studies are necessary to determine effective dosage forms and to evaluate any potential toxicity given that some bufadienolides may have cardiotonic effects. Scientific validation could pave the way for integrating this plant into complementary fever management strategies. The local wisdom of the Penyasawan village, particularly in the field of ethnomedicine, can be reconstructed into scientific knowledge, as presented in Table 1:

Table 1. Reconstruction of Indigenous Science to Scientific Science

Topic	Traditional Knowledge	Scientific Knowledge
Kiman Ujan	According to local sources in Penyasawan Village, the plant is called Kiman Ujan. It is known to treat impotence, cough, muscle aches, dizziness, rheumatism, back pain, and colds.	*Zingiber spectabile* is a species of ginger native to Maritime Southeast Asia. Mostly cultivated in the West as an ornamental plant, but traditionally used in Southeast Asia as herbal medicine. Cylindrical in shape, flowers grow between leaf shoots with 6–7 cm stalks, yellow with pink edges, and purple lips with light yellow spots. Contains phenolic compounds with antioxidant properties that may protect cells from damage.
Kambe Leaf	Commonly known as bitter melon leaf (Daun Pare), used for traditional medicine. The bitter taste is due to high quinine content.	*Momordica charantia* belongs to the Cucurbitaceae family. Leaves are simple, long-stalked (1.5–5.3 cm), alternate arrangement, oval-shaped with 5–7 lobes, heart-shaped base, 3.5–8.5 cm long, 2.5–6 cm wide, dark green. Contains alkaloids, flavonoids, saponins, and

		tannins with antioxidant, antimicrobial, antidiabetic, antitumor, and anti-leprosy properties.
Sugi-sugi Leaf	Known as gandarusa or "*daun rusa,"* grows as a tropical shrub, often planted in yards or as a living fence. Believed to improve blood circulation, relieve nausea, and act as an anti-rheumatic. Leaves taste slightly spicy, sour, and bitter.	*Justicia gendarussa* has simple, elongated leaves (1–3.5 cm wide, 5–20 cm long), light green when young and darker when mature. Woody, branched stems with glossy brownish-black nodes. Contains flavonoids with antioxidant, anti-allergy, antiviral, anti-diarrheal, anti-aging, pollution-protection, and immunity-boosting benefits.
Plant Name: *Sidingin* Leaf	Known locally as cocor bebek, commonly used to heal wounds and replace antiseptics due to its antibacterial and anti-inflammatory properties.	*Kalanchoe pinnata* is an ornamental plant that reproduces via leaf buds. Leaves are oval, broad, and finely serrated on the edges. Also grows wild in rocky soil. Contains antibacterial and anti-inflammatory compounds that aid wound healing.

Based on Table 1, we can observe that the reconstruction of indigenous knowledge into scientific science includes proper explanations regarding the plant names, functions, and chemical content. This community knowledge can be used as a science learning resource, particularly for Biology subjects in the Biodiversity topic. Students can begin learning science from local knowledge in their environment, helping them understand science in a more relevant and meaningful Way

Table 2. The Potential of Local Wisdom in Biology Learning

Potential of Local Wisdom in Biology Learning	Relation to biology learning	
	Core Competencies of Biology Subject	Lesson Material
Traditional medicine is one form of treatment that utilizes natural plants as medicine, such as Kiman Ujan, *Sugi-sugi* leaves, *Kambe*/Poyo leaves, and *Sidingin* leaves. These plants are very easy to find in the residential areas of Peyayasawan Village, and some are even planted around home yards. In the preparation process, these leaves are first cleaned, then cut into pieces by hand and water is added as needed, followed by reciting prayers such as Al-Fatihah and also the three qul (Al-Ikhlas, An-Nas, Al-Falaq), after which it is applied to the body parts that feel hot or painful.	3.2 Analyze various levels of biodiversity. 3.7 Apply classification principles to group plants into divisions based on observations. 4.2 Present observation results of various levels of biodiversity. 4.7 Present data on the morphology and roles of plants.	1. Various levels of biodiversity 2. Plants, morphological characteristics, metagenesis, and their roles in sustaining life on earth

As shown in Table 3, the local wisdom in a region can be integrated into science learning, especially in Biology. It can be used as teaching material to help students better understand scientific content. Additionally, students become more familiar with the cultural knowledge of their area, increasing their cultural literacy.

CONCLUSION

Traditional medicine is one of the forms of local wisdom that still exists in Penyasawan Village, Kampar. This traditional treatment uses natural ingredients such as *Kiman ujan* Leaves, *Kiman ujan* Flowers, *Kambe*/Poyo Leaves, *Sugi-sugi* Leaves, and *Sidingin* Leaves. Before application to the body, the remedy is recited with prayers such as Al-Fatihah and the three Quls, and then applied to the body parts that feel hot or in pain. This local wisdom in traditional medicine can be used as a learning resource in science, particularly in Biology lessons on Biodiversity.

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