Journal Ethnoscience and Educational Studies
Vol.2, No.1, February, 2026, Page 147-156

Research Article

A Case Study on the Potential of Fever Medicinal Plants in Pulau Birandang Village, Kampar, Indonesia

Robiah Adwiyah Hasibuan[1], Diva Fatihah Kaila[1], Irsyadul Fikri[1], Silvia Anggraini[1], Widia Lestari[1], Dian Puspita Eka Putri[1], Muhammad Arif[2]

[1]Department of Science Education, Faculty of Education and Teacher Training, Universitas Islam Negeri Sultan Syarif Kasim Riau, Riau, Indonesia
[2]Department of Pharmacy, Faculty of Science and Health, University Muhammadiyah Riau

Article Info

Received: 07-01-2026
Revised: 16-02-2026
Accepted: 25-02-2026

Corresponding author:
Dian Puspita Eka Putri
Email: dianpuspitaep@uin-suska.ac.id

ABSTRACT

Traditional medicinal plants represent an essential component of cultural heritage and remain a primary source of healthcare in many rural communities. In Pulau Birandang Village, Kampar Regency, Indonesia, fever is commonly managed using locally available plant species, yet systematic documentation and scientific evaluation of these practices remain limited. This study aimed to identify medicinal plants used for fever, characterise preparation and application methods, and examine their potential pharmacological basis. A qualitative descriptive methodology was employed, combining field observations, semi-structured interviews with traditional healers and community members, and systematic documentation of plant species and preparation techniques. Each plant was identified by local and scientific names, and information on plant parts utilised, preparation methods, and modes of application was collected. Data were analysed descriptively and interpreted in light of known bioactive compounds and their therapeutic properties. Seven medicinal plants were documented as central to traditional fever management: turmeric, castor plant, life plant, kapok tree, hibiscus, winter melon, and bilimbi. Leaves, rhizomes, flowers, and fruits were the primary plant parts used, prepared through slicing, maceration, boiling, and grating, and applied topically, orally, or via bathing. The practices involve the extraction of bioactive secondary metabolites, including flavonoids, alkaloids, saponins, tannins, and terpenoids, which exhibit antipyretic, anti-inflammatory, and antimicrobial effects. The findings indicate that traditional knowledge in Pulau Birandang is empirically grounded and culturally embedded, demonstrating sophisticated strategies for maximising therapeutic efficacy. This research highlights the potential of locally available medicinal plants for fever treatment and contributes to the preservation of ethnomedicinal knowledge. The integration of traditional practice with scientific understanding supports the development of evidence-based herbal therapies, encourages sustainable use of biodiversity, and provides a foundation for further pharmacological and clinical investigations.

Keywords:
Local Wisdom, Ethnomedicine, Ethnopharmacology, Fever, Medicine plant

INTRODUCTION

The utilization of medicinal plants has been integral to human healthcare practices since ancient times and remains a cornerstone of traditional medicine in many regions of the world. Across Southeast Asia, and particularly in Indonesia, communities have developed extensive knowledge regarding local flora and its therapeutic applications. This knowledge is embedded within cultural traditions and is often transmitted across generations through oral practices and community rituals. Ethnomedicine, the systematic study of indigenous medical knowledge and practices, provides critical insights into how local populations understand disease, select remedies, and administer treatments (Putri, 2022; Syahfitri et al., 2024). In contemporary times, despite the widespread availability of modern healthcare services, traditional plant-based medicine continues to play a significant role, particularly in rural or isolated areas where access to formal medical facilities is limited (Mujahid et al., 2019). Studies have highlighted that traditional knowledge of medicinal plants not only contributes to community health but also supports cultural identity, fosters biodiversity conservation, and enhances the sustainable use of local natural resources (Saranani et al., 2021).

Fever is one of the most common physiological responses encountered by local communities, and its management often relies on both traditional and modern interventions. The global burden of febrile illnesses remains substantial, especially in tropical regions where vector-borne infections and other infectious diseases are prevalent (Septiani et al., 2025). While pharmacological agents such as paracetamol and non-steroidal anti-inflammatory drugs are widely used for antipyretic purposes, they are associated with limitations including potential side effects, cost barriers, and reduced availability in remote regions. Consequently, local communities often rely on traditional remedies that utilise locally available plant species. These remedies are frequently prepared using simple techniques, such as boiling, grating, or soaking, which effectively extract bioactive compounds from plant tissues (Ningsih et al., 2022; Nugroho, 2017). Recent ethnobotanical surveys have identified a diverse array of plants employed for fever management across Indonesia, with efficacy frequently attributed to the presence of secondary metabolites, including flavonoids, alkaloids, saponins, and polyphenols, which exhibit pharmacological activities relevant to antipyretic, anti-inflammatory, and antimicrobial mechanisms (Amelia, 2022; Suproborini et al., 2018).

Despite the documented utility of medicinal plants, several challenges persist in understanding the breadth and depth of traditional knowledge in specific communities. One major concern is the lack of systematic documentation and scientific validation of plant species traditionally used to treat fever. Local knowledge is often tacit and dispersed, existing primarily within the memories of elders and traditional healers, making it vulnerable to loss amid rapid socio-economic transformations and generational shifts (Arifin et al., 2023). Furthermore, variability in preparation methods and plant part selection can influence therapeutic outcomes, introducing inconsistencies that hinder broader application and pharmacological standardisation (Prihandiwati et al., 2021). Conventional pharmacological approaches alone have not fully addressed these challenges, as they tend to focus on isolated compounds rather than the holistic methods utilised by traditional practitioners. Therefore, a comprehensive approach that combines ethnomedicinal documentation with phytochemical analysis and scientific interpretation is essential to bridge the gap between traditional practices and modern medical validation.

In addition, while fever management is a global healthcare concern, studies often overlook the regional specificity of plant-based treatments. Research conducted in one ecological or cultural context cannot always be generalised to other regions due to differences in local flora, climate, and cultural practices (Silalahi et al., 2018). Consequently, region-specific studies are crucial for identifying locally available medicinal plants, elucidating preparation and administration techniques, and understanding the sociocultural dynamics that shape their use. For instance, studies in North Sumatra and Sulawesi have highlighted the importance of preserving indigenous ethnomedicinal knowledge while emphasising the need to validate traditional remedies with evidence (Syahfitri et al., 2024; Saranani et al., 2021). The lack of such localised research creates a knowledge gap that limits both the conservation of cultural heritage and the potential development of novel herbal therapeutics.

Previous studies have also demonstrated that secondary metabolites present in medicinal plants, such as flavonoids, saponins, and alkaloids, provide biochemical explanations for the observed therapeutic effects. Flavonoids, for example, inhibit the cyclooxygenase pathway and reduce prostaglandin synthesis, thereby contributing to antipyretic effects similar to those of synthetic drugs such as paracetamol (Widyasari et al., 2018; Samiun et al., 2020). Saponins and terpenoids exhibit

antioxidant activity that supports immune system modulation and enhances recovery from febrile conditions (Sutardi, 2016). Alkaloids possess cytotoxic, antimicrobial, and analgesic properties, which further contribute to the overall therapeutic profile of traditional plant-based remedies (Udayani et al., 2022; Putri Rachman & Basuki, 2020). These findings underscore the need to integrate ethnomedicinal observations with modern pharmacological understanding to provide a scientifically robust rationale for traditional fever treatments.

Moreover, preparation and application methods employed in traditional contexts, such as slicing rhizomes, macerating leaves, and boiling plant parts, have been shown to optimise the extraction and bioavailability of active compounds (Nugroho, 2017; Yulianingtyas & Kusmartono, 2016). For example, slicing turmeric rhizomes releases curcumin and other secondary metabolites that exhibit anti-inflammatory and antimicrobial activity (Ningsih et al., 2022). Similarly, soaking hibiscus or bilimbi leaves in water enables the gradual extraction of bioactive flavonoids and saponins, which are applied topically or consumed to alleviate fever (Priyanto, 2007; Prihandiwati et al., 2021). These preparation methods reflect a sophisticated understanding of plant chemistry by local communities, although they remain largely underexplored in scientific literature. Therefore, detailed ethnobotanical studies that incorporate both cultural context and phytochemical analysis are required to validate the efficacy of traditional remedies and facilitate their integration into modern healthcare frameworks.

The current literature demonstrates both the potential and the limitations of existing research on medicinal plants for treating fever in Indonesia. While multiple studies have identified plant species and described traditional applications, few have systematically linked local knowledge with scientific explanation, particularly in the context of Pulau Birandang Village, Kampar Regency. Most prior work emphasises general ethnobotanical surveys or isolated phytochemical analyses without providing comprehensive insights into community practices, preparation methods, and the specific pharmacological rationale behind fever treatments (Silalahi et al., 2018; Syahfitri et al., 2024). This gap highlights the need for research that combines descriptive ethnomedicinal documentation, rigorous plant identification, and phytochemical evaluation, thereby enabling evidence-based validation of traditional knowledge while preserving cultural heritage.

In response to this knowledge gap, the present study aims to document and analyse the potential of medicinal plants used for fever treatment in Pulau Birandang Village, Kampar Regency, Indonesia. This research adopts a descriptive qualitative methodology, employing field observations, structured interviews with traditional healers and community elders, and systematic identification of plant species. The study seeks to map the types of plants used, the parts of the plants utilised, the preparation methods, and the modes of application. In addition, it aims to correlate local knowledge with known pharmacological properties of the plants, thereby providing a scientific basis for their antipyretic effects. The novelty of this research lies in its combination of ethnomedicinal practice documentation, phytochemical interpretation, and community-based insights within a single ecological and cultural context. The study also delineates the scope of traditional knowledge preservation and the potential development of herbal therapeutics, and contributes to a global understanding of sustainable, culturally grounded, and scientifically validated medicinal plant use in tropical communities.

METHODS

The present study employed a qualitative descriptive methodology to investigate the potential of medicinal plants utilised for fever treatment in Pulau Birandang Village, Kampar Regency, Indonesia. Qualitative research is particularly suited for exploring complex social and cultural phenomena, such as ethnomedicinal practices, because it enables researchers to capture the depth of local knowledge, perceptions, and behaviours through systematic observation, interaction, and interpretation (Hamdi, 2014). This approach allows for an in-depth understanding of how communities identify, prepare, and administer plant-based remedies while preserving the context in which such knowledge is practised. The qualitative descriptive design provides a framework that emphasises the collection and presentation of data in ways that accurately reflect participants' experiences and practices, facilitating the documentation of ethnobotanical knowledge without imposing preconceived theoretical assumptions (Sandelowski, 2000; Silalahi et al., 2018). The choice of this methodology aligns with previous ethnomedicinal studies that emphasise culturally embedded practices in the utilisation of natural resources and healthcare (Putri, 2022; Syahfitri et al., 2024).

The research was conducted in Pulau Birandang Village, located within the Kampa District of Kampar Regency, Riau Province. This site was selected based on preliminary investigations indicating

the continued use of traditional medicinal plants among the local community, particularly for treating febrile conditions. Pulau Birandang offers a unique ecological and socio-cultural environment in which indigenous knowledge is preserved through community practices and local healers known as battra. The village is geographically positioned in a lowland area with abundant rainfall and diverse flora, creating optimal conditions for the growth and accessibility of medicinal plants (Ilhami et al., 2021). Understanding the spatial distribution of these plants and their integration into local healthcare practices required field-based observation and structured engagement with knowledgeable community members. Fieldwork was conducted on 26 October 2025, allowing researchers to observe seasonal variations that may influence plant availability and use patterns, which are critical in ethnobotanical studies (Martin, 1985; Silalahi et al., 2018).

The study combined multiple data collection techniques to ensure comprehensiveness and triangulation. Data were obtained through direct observation of plant species, semi-structured interviews with local informants, documentation through photography, and analysis of local records or oral histories. Observations focused on identifying the plant species present in the village, recording their growth habitats, and noting the parts of the plants utilised for medicinal purposes. This technique facilitated a visual and contextual understanding of the plants in their natural environment, which is essential for accurate identification and ethnobotanical interpretation (Rully, 2014; Nugroho, 2017). Semi-structured interviews were conducted with key informants, primarily local healers who possess extensive knowledge of plant properties, preparation techniques, and therapeutic applications. Additional interviews included ordinary community members to capture variations in knowledge and use patterns, allowing the study to assess both expert and lay perspectives. The interview questions addressed plant identification, local and scientific nomenclature, plant parts utilised, preparation methods, administration modes, and observed therapeutic outcomes. These interviews provided rich qualitative data that reflected both the practical and cultural dimensions of plant-based healthcare (Arrozi et al., 2020; Bunga et al., 2025).

Data collection was supported by systematic documentation to ensure the accuracy and reliability of the findings. Photographic evidence and field notes were used to record morphological characteristics, preparation methods, and application procedures. Each plant specimen collected or observed was assigned an identification code, which was cross-referenced with scientific literature and local nomenclature for accuracy. The identification of plants and their active components was supplemented by a literature-based validation framework. Secondary metabolites such as flavonoids, alkaloids, saponins, and polyphenols were considered in interpreting the observed therapeutic effects. This integration of empirical field data with the phytochemical literature allows the methodology not only to describe but also to scientifically rationalise traditional practices, providing a framework for further pharmacological investigation.

RESULTS AND DISCUSSION

Identification of Medicinal Plants for Fever Treatment

The field survey and semi-structured interviews conducted in Pulau Birandang Village identified seven plant species traditionally used to treat fever. These included turmeric (*Curcuma longa L*), castor plant (*Ricinus communis*), life plant (*Kalanchoe pinnata*), kapok tree (*Ceiba pentandra*), hibiscus (*Hibiscus rosa-sinensis*), winter melon (*Benincasa hispida*), and bilimbi (*Averrhoa bilimbi*). Data collected through observation, documentation, and informant interviews indicated that leaves, flowers, fruits, and rhizomes were the most frequently used plant parts for therapeutic purposes. Table 1 provides a comprehensive overview of the identified plants, including local names, utilised plant parts, preparation methods, modes of application, and perceived efficacy.

Table 1. Traditional Medicinal Plants Used for Fever in Pulau Birandang Village

No	Scientific Name	Local Name	Plant Part Used	Preparation Method	Mode of Application	Therapeutic Function
1	*Curcuma longa*	Kunyik	Rhizome	Sliced	Topical	Fever reduction, anti-inflammatory

No	Scientific Name	Local Name	Plant Part Used	Preparation Method	Mode of Application	Therapeutic Function
2	*Ricinus communis*	Niaak	Leaves and sap	Soaked	Topical	Fever reduction, immune support
3	*Kalanchoe pinnata*	Sidingin	Leaves and sap	Soaked	Topical	Fever reduction, anti-inflammatory
4	*Ceiba pentandra*	Kape Ponji	Leaves and sap	Squeezed	Oral consumption	Fever reduction, antimicrobial
5	*Hibiscus rosa-sinensis*	Bungo Ayo	Flowers and water	Soaked	Bathing	Fever reduction, anti-inflammatory
6	*Benincasa hispida*	Kundu	Fruit and honey	Grated	Oral consumption	Fever reduction, immune support
7	*Averrhoa bilimbi*	Blimbiong	Leaves and water	Boiled	Bathing	Fever reduction, antimicrobial

The identification of these seven plants confirms that the Pulau Birandang community retains substantial ethnomedicinal knowledge concerning fever management, consistent with previous reports on Malay communities in Riau Province (Saranani et al., 2021; Syahfitri et al., 2024). Turmeric rhizomes were primarily sliced and applied topically, consistent with documented practices that release curcumin and associated flavonoids with anti-inflammatory and antipyretic activity (Ningsih et al., 2022; Suproborini et al., 2018). Castor leaves and life plant leaves were commonly macerated or soaked in water for topical application, reflecting an empirical understanding of solvent-based extraction of bioactive compounds, such as sitosterol and flavonoids, which exhibit immunomodulatory effects (Setyaningsih et al., 2013; Putri Rachman & Basuki, 2020). The inclusion of kapok tree leaves and hibiscus flowers in traditional remedies illustrates the integration of culturally significant flora with practical pharmacological function, as these parts contain saponins, flavonoids, and tannins that contribute to both antimicrobial and anti-inflammatory activities (Mitarlis et al., 2024; Putra & Fitri, 2023). Similarly, the consumption of grated winter melon mixed with honey leverages the natural solvent properties of the grated winter melon to facilitate the extraction of bioactive compounds, while the use of boiled bilimbi leaves for bathing demonstrates a traditional understanding of heat-assisted extraction, aligning with contemporary phytochemical insights (Prihandiwati et al., 2021; Nugroho, 2017).

Data collected indicated a diversity of preparation techniques employed by the community, including slicing, grating, maceration, and boiling. These methods were not applied randomly but rather reflected nuanced local knowledge concerning the optimal release and bioavailability of active compounds. For instance, slicing turmeric rhizomes promotes the exudation of yellow curcuminoid-rich sap, which contains secondary metabolites such as saponins, alkaloids, flavonoids, tannins, and essential oils that possess antipyretic, anti-inflammatory, and antimicrobial activities (Ningsih et al., 2022; Udayani et al., 2022). Boiling bilimbi leaves extracts flavonoids, triterpenoids, and saponins into water, facilitating their application in medicinal baths, which may deliver bioactive compounds transdermally and support traditional claims of fever reduction (Prihandiwati et al., 2021; Kurniawati & Lastri, 2016). Maceration of hibiscus and life plant leaves allows gradual leaching of active phenolic compounds into water, consistent with known mechanisms of maceration that disrupt cell walls and enhance extraction efficiency (Yulianingtyas & Kusmartono, 2016; Yennie & Elystia, 2013).

The pharmacological rationale underlying these methods is supported by literature indicating that flavonoids inhibit cyclooxygenase enzymes, reducing prostaglandin synthesis, and consequently lowering body temperature, a mechanism analogous to conventional antipyretic drugs (Widyasari et al., 2018; Samiun et al., 2020). Saponins, present in kapok tree and hibiscus leaves, enhance antioxidant defences and modulate immune responses, potentially mitigating inflammatory processes associated with febrile conditions (Sutardi, 2016). Alkaloids, including those in turmeric and life plant, provide analgesic and cytotoxic properties, further supporting the multifaceted therapeutic effects observed in community applications (Suproborini et al., 2018; Putri Rachman & Basuki, 2020). These findings indicate a strong alignment between empirical ethnomedicinal practice and scientific phytochemistry,

underscoring the rationality of traditional preparation methods in achieving desired pharmacological outcomes.

The study revealed three principal modes of application: topical use, ingestion, and bathing. Topical application was the most common, particularly for turmeric, castor leaves, and life plant extracts, suggesting an understanding of direct skin absorption of bioactive compounds. Ingestion was employed primarily for grated winter melon mixed with honey and boiled kapok tree leaves, highlighting the oral bioavailability of compounds such as flavonoids, vitamins, and saponins (Al-Snafi, 2013; Mubarak et al., 2018). Bathing with decoctions of bilimbi and hibiscus leaves represents a culturally embedded practice that likely combines physical cooling effects with transdermal absorption of phytochemicals.

The efficacy of these treatments, as reported by informants, ranged from partial to complete reduction in fever symptoms, consistent with the pharmacological properties of the plant constituents identified in prior studies. For instance, topical application of turmeric demonstrates anti-inflammatory effects, while ingestion of flavonoid-rich plant extracts modulates systemic immune responses (Hawary et al., 2025; Hartono et al., 2025). The use of multi-component plant mixtures further reflects an empirical strategy to enhance therapeutic efficacy through synergistic interactions between different phytochemicals, a concept increasingly recognised in contemporary herbal medicine research (Amelia, 2022; Suproborini et al., 2018).

Phytochemical analysis and literature review indicate that the therapeutic potential of the identified plants is attributable to secondary metabolites with bioactive properties. Flavonoids, alkaloids, saponins, tannins, and terpenoids are consistently associated with anti-inflammatory, antioxidant, antimicrobial, and antipyretic activities (Azzahra et al., 2025; Ningsih et al., 2022; Suproborini et al., 2018). In turmeric, curcumin and associated flavonoids are believed to inhibit prostaglandin synthesis, supporting the empirical observation of fever reduction following topical application. Castor plant leaves contain flavonoids and phytosterols, which modulate immune signalling pathways and contribute to reduced inflammation and fever (Setyaningsih et al., 2013). Hibiscus and bilimbi leaves contain saponins and polyphenols, which exert antioxidant and antimicrobial effects, enhancing recovery from febrile conditions (Prihandiwati et al., 2021; Mitarlis et al., 2024).

The identification of these compounds provides a biochemical explanation for observed traditional practices. The selective use of plant parts, preparation techniques, and application methods appears to optimise the extraction and efficacy of these secondary metabolites, demonstrating an empirical understanding that parallels modern pharmacological principles (Nugroho, 2017; Yulianingtyas & Kusmartono, 2016). The findings confirm that the therapeutic practices of Pulau Birandang villagers are not arbitrary but grounded in sophisticated and context-specific knowledge, which aligns with the concept of ethnoscience as an interface between cultural practice and empirical observation (Gusmarti, 2021; Yasir, 2025).

Table 2. Scientific Reconstruction of Ethnomedicinal Practices for Fever Treatment

No	Local Knowledge	Scientific Explanation	Bioactive Compounds	
1	Slicing turmeric rhizome	Cell walls rupture upon slicing, releasing yellow sap rich in active metabolites	Curcumin, saponins, flavonoids, tannins, essential oils (Ningsih et al., 2022)	 turmeric rhizome

No	Local Knowledge	Scientific Explanation	Bioactive Compounds	
2	Soaking castor leaves, life plant leaves, and hibiscus mixture	Maceration facilitates gradual extraction of metabolites via pressure differential between cell interior and solvent	Flavonoids, saponins, alkaloids, phenolic compounds (Yulianingtyas & Kusmartono, 2016; Priyanto, 2007)	 castor leaves
3	Squeezing kapok leaves	Reduces particle size, increases surface area, enhancing extraction efficiency	Flavonoids, saponins, triterpenoids (Nugroho, 2017)	 kapok leaves
4	Boiling bilimbi leaves	Heat-assisted extraction facilitates solubilization of bioactive compounds	Flavonoids, saponins, tannins, triterpenoids (Prihandiwati et al., 2021)	 Belimbing wuluh
5	Grating winter melon and mixing with honey	Cell wall disruption enhances extraction and bioavailability; honey acts as natural solvent and immune enhancer	Flavonoids, saponins, vitamins, antioxidants (Nugroho, 2017)	

Knowledge Preservation and Cultural Significance

The study further highlights the role of local knowledge in preserving community health practices. Informants reported that knowledge regarding the identification, preparation, and application of medicinal plants has been transmitted across generations through elders and traditional healers. This transmission reflects broader patterns of cultural inheritance documented in ethnomedicinal research, where traditional knowledge is maintained and adapted in response to environmental and social change (Mujahid et al., 2019; Putri, 2022). Preservation of this knowledge is crucial for sustaining both community health and biodiversity, as reliance on locally available medicinal plants fosters conservation awareness and sustainable harvesting practices (Saranani et al., 2021). The study also emphasises that cultural beliefs and practices, including plant selection and preparation methods, are deeply intertwined

with therapeutic outcomes, underscoring the inseparability of ethnomedicine from its socio-cultural context.

The convergence of field observations with phytochemical literature validates many traditional practices in Pulau Birandang. The empirical selection of plants, preparation methods, and application modes closely corresponds to the known pharmacological activities of the identified secondary metabolites. This integration provides a scientifically grounded rationale for the continued use of these medicinal plants in fever management and underscores the potential for developing evidence-based herbal therapeutics (Amelia, 2022; Tsaniyah et al., 2025). Moreover, the study demonstrates that ethnomedicinal research benefits from combining qualitative documentation with phytochemical interpretation, bridging local cultural knowledge and modern scientific understanding (Silalahi et al., 2018; Putri, 2022).

The findings underscore the importance of systematic ethnobotanical documentation in preserving traditional knowledge while providing a basis for pharmacological investigation. Future research should focus on isolating and quantifying bioactive compounds, evaluating their synergistic effects, and assessing clinical efficacy in controlled studies. Additionally, ecological studies on the availability and cultivation of these medicinal plants can support sustainable use and conservation strategies, ensuring that traditional practices remain viable amid environmental and socio-economic pressures (Nugroho, 2017; Syahfitri et al., 2024).

Conclusion

The present study demonstrates that Pulau Birandang Village retains substantial ethnomedicinal knowledge of local plants for the management of fever. Seven species were identified as primary remedies: turmeric (*Curcuma longa L*), castor plant (*Ricinus communis*), life plant (*Kalanchoe pinnata*), kapok tree (*Ceiba pentandra*), hibiscus (*Hibiscus rosa-sinensis*), winter melon (*Benincasa hispida*), and bilimbi (*Averrhoa bilimbi*). Community practices involve the selective use of leaves, rhizomes, flowers, and fruits, prepared through techniques such as slicing, maceration, boiling, and grating, and applied topically, orally, or by bathing. Analysis indicates that these practices correlate with the presence of bioactive secondary metabolites, including flavonoids, alkaloids, saponins, tannins, and terpenoids, which provide scientifically plausible mechanisms for their antipyretic, anti-inflammatory, and antimicrobial effects. The findings reveal that traditional knowledge in Pulau Birandang is both empirically grounded and culturally embedded, reflecting a sophisticated understanding of plant properties and preparation techniques that optimise therapeutic efficacy. This study contributes to the ethnobotanical literature by systematically documenting plant species, preparation methods, and application modes, and by linking traditional practices to contemporary phytochemical insights. The integration of qualitative field data with pharmacological interpretation offers a framework for validating indigenous remedies and supports the sustainable use of local biodiversity. Future research should focus on quantitative phytochemical analysis, pharmacological validation, and clinical evaluation of these remedies, as well as conservation strategies for locally significant plants. The study underscores the importance of preserving ethnomedicinal knowledge as both a cultural heritage and a potential source of novel therapeutic agents in fever management.

AUTHOR CONTRIBUTIONS

Robiah Adwiyah Hasibuan wrote the manuscript, collecting and analyzing data. Diva Fatihah Kaila and Irsyadul Fikri contributed to collecy data. Silvia Anggraini and Widia Lestari collaborated in conducting the primary field data collection through in-depth interviews. Muhammad Arif contributed to review the manuscript. Dian Puspita Eka Putri Nurbaiti contributed to drafting, reviewing, and finalizing the manuscript for publication.

DECLARATION OF CONFLICTING INTERESTS

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and publication of this article

REFERENCE

Amelia, E. K. (2022). Review Artikel: Tanaman Obat yang Memiliki Aktivitas Antipiretik secara in vivo. Journal of Farmaceutics, 11(1), 67-76.

Anggraini. D. D, Nurcahya, I., Yuniati, S., Ridhwan, M., Kartikasari, M. N. D., Jawang, U. P., Lewu, L. D., Andalia. N., Yassir, M., Killa, Y. M., Susanti, L., Syamsi, N., & Putri, N.R. (2022). *Tanaman Obat Keluarga*. Padang: PT Global Eksekutif Teknologi.

Anova, I. T., Kamsina, K., Firdausni, F., Diza, Y. H., & Yurnita, Y. (2021). Pengaruh ukuran saringan dan konsentrasi gula terhadap sifat fisiko-kimia konsentrat sari buah kundur (Benincasahispida (Thunb.) Cogn). Indonesian Journal of Industrial *Research*,11(2), 145-150.

Arrozi, P., Burhanuddin, N. F. N., & Saharudin, N. F. N. (2020). Leksikon Etnomedisin dalam Pengobatan Tradisional Sasak: *Kajian Antropolinguistik*. Mabasan, 14(1), 17-30.

Azzahra, Z., Nurbaiti, N., Syahfitri, T., Yolandari, A., Larasati, H., Habibah, A., & Sarina, G. (2025). A Scoping Review: traditional uses and pharmacology study of Piper crocatum. *Journal of Ethnoscience and Educational Studies*, *1*(1), 8-19.

Bunga, C. D., Rianawati, L., Nurkhayati, N., Azizah, B. R., Yuliastuti, F., Lutfiyati, H., & Azzahra, A. L. (2025). Studi Etnomedisin: Analisa Potensi Pemanfaatan Tumbuhan Obat Tradisional Di Desa Tempurejo. *Jurnal Mandala Pharmacon Indonesia*,11(1),91-109.

Emda, A. (2023). Etnosains Strategi Pembelajaran Berbasis Budaya Dan Kearifan Lokal. *Jurnal Ilmiah Mahasiswa*, 1(1), 106-116.

Hartono, Yulia Sari, Nurhasan Agung Prabowo, & Desy Puspa Putri. (2025). *Kurkumin pada Demam Dengue*. Yogyakarta: Tahta Media Group. ISBN 978-623-147-723-1.

Hawary, R., Nurbaiti, N., Justeza, R., Sinaga, Y. P., Putri, E. N., & Syifa, A. N. (2025). A Scoping Review: Pharmacology study of Kalanchoe pinnata. *Indonesian Journal of Health Pharmacy*, *1*(1), 46-58.

Ilhami, A., Diniya, D., Susilawati, S., Sugianto, R., & Ramadhan, C. F. (2021). Analisis Kearifan Lokal Manongkah Kerang Di Kabupaten Indragiri Hilir, Riau Sebagai Sumber Belajar IPA Berbasis Etnosains. *Sosial Budaya*, 18(1), 20-27

Insan, R. R., Faridah, A., Yulastri, A., & Holinesti, R. (2019). Using Belimbing Wuluh (Averhoa Blimbi I.) as a functional food processing product. *Jurnal Pendidikan Tata Boga Dan Teknologi*, 1(1), 47-55.

IPB, P. S. B. T. L., & Ulung,G.(40). Resep Wedang Rimpang & Bumbu Dapurempon-empon, Penangkal Virus, Penambah Imun. *Jakarta: PT Gramedia Pustaka Utama*, 135.

Mitarlis, Utiya Azizah, dan Wahyu Budi Sabtiawan.2024. *Indikator Asam Basa Alami*. Ponorogo: Uwais Inspirasi Indonesia.

Ningsih, A. W., Nurrosyidah, I. H., & Hisbiyah, A. Y. (2020). Pengaruh perbedaan metode ekstraksi rimpang kunyit (Curcuma domestica) terhadap rendemen dan skrining fitokimia. *Journal Of Pharmaceutical Care Anwar Medika (J-Pham)*, 2(2), 96-104.

Nugroho,A.(2017). *Teknologi Bahan Alam. Buku Ajar.* Universitas Lambung Mangkurat, Banjarmasin.

Putra, A., & Fitri, KAMI (2023). *Kasiat Tanaman Pekarangan Berobat Dipekarangan Sendiri* . Mega Press Nusantara

Putri Rachma N., A., & Basuki, N. S. (2020). *Hidup Sehat Kembali Merasakan Kemurnian Alam*. Stiletto Book.

Pratiwi, R. H. (2017). Potensi ekstrak etanol batang kapuk randu sebagai anti bakteri. Bioeksperimen: *Jurnal Penelitian Biologi*, 3(1),29-38.

Prihandiwati, E., & Rahim, A. (2021). Pemanfaatan Tanaman Untuk Meningkatkan Daya Tahan Tubuh Di Desa Tatah Layap, Martapura, Kalimantan Selatan*. Jurnal Bakti Untuk Negeri,* 1(1), 33-37.

Saranani, S., Himaniarwati, H., Yuliastri, W. O., Isrul, M., & Agusmin, A. (2021). Studi Etnomedisin Tanaman Berkhasiat Obat Hipertensi di Kecamatan Poleang Tenggara Kabupaten Bombana Sulawesi Tenggara. *Jurnal Mandala Pharmacon Indonesia*, 7(1), 60-82.

Sarimole, E., Martosupono, M., Semangun, H., & Mangimbulude, J. C. (2014). Manfaat jarak pagar (Jatropha curcas) sebagai obat tradisional. *In Prosiding Seminar Nasional Raja Ampat* (pp. 9-12).

Septiani, D., Meliala, A., Lestari, R., Paramasari, W. D. S., Ashan, H. R., Purnamasari, R., Sagitta Putri, U., Primayanti,T., Andromeda,A., Wibowo,S.G., & Hidayati, S. (2025). Mikrobiologi Kedokteran. Editor: Tri Lestari. Padang: CV. Gita Lentera. ISBN 978- 634-7237-14-9.

Septiani, F., Suriani, C., Adilla, A., Huzaifah, A., Hasni, A. M., Siallagan, N. A. F., & Syahru, Z. A. N. (2025). Studi Etnobotani Berbasis Literatur: Pemanfaatan Daun Sibangun Dan Tapak Dara Dalam Pengobatan Tradisional Demam Oleh Masyarakat Sidamanik. *Jurnal Intelek Insan Cendikia*, 2(10), 16936-16944.

Setyaningsih,D., Nurmilah, O. Y., & Windarwati, S. (2013). Kajian Aktivitas Antioksidan Dan Antimikroba Ekstrak Biji, Kulit Buah, Batang Dan Daun Tanaman Jarak Pagar (Jatropha curcas L.). *Jurnal Teknologi Pangan*, 4(2).

Silalahi, M., Nisyawati, N., Walujo, E. B., & Mustaqim, W.A. (2018). Etnomedisin Tumbuhan Obat oleh Subetnis Batak Phakpak di Desa Surung Mersada, Kabupaten Phakpak Bharat, Sumatera Utara. *Jurnal Ilmu Dasar*, 19(2), 77-92.

Suproborini, A., Laksana, M. S. D., & Yudiantoro, D. F. (2018). Etnobotani Tanaman Antipiretik Masyarakat Dusun Mesu Boto Jatiroto Wonogiri Jawa Tengah. *Journal of Pharmaceutical Science and Medical Research*, 1(1), 1-11.

Suryanti, V., Marliyana, S. D., & Musmualim, M. (2018). Identifikasi Senyawa Kimia dalam Buah Kundur (*Benincasa hispida* (Thunb) Cogn.) dengan Kromatografi Gas- Spektrometer Massa (KG-SM). *Alchemy Jurnal Penelitian Kimia*, 14(1), 84-94.

Sutardi, S. (2016). Kandungan Bahan Aktif Tanaman Pegagan Dan Khasiatnya Untuk Meningkatkan Sistem Imun Tubuh. *Jurnal Penelitian Dan Pengembangan Pertanian*, 35(3), 121-130.

Syahfitri, L. S. A., Nastiti, K., Kurniawati, D., & Rohama, R. (2024). E Etnomedicine Tumbuhan Obat di Masyarakat Desa Belangian, Kalimantan Selatan. *Journal Pharmaceutical Care and Sciences*, 4(2), 217-227.

Tsaniyah, W. I., Nurbaiti, N., Situmeang, N. N. S., Putri, A. M., Nursalam, L., Tazkiyyah, L., & Ilhami, A. (2025). A Scoping Review: Research Trend pharmacology Of Annona muricata. *Indonesian Journal of Health Pharmacy*, *1*(1), 20-32.

Udayani, N. N. W., Ratnasari, N. L. A. M., & Nida, I. D. A. A. Y. (2022). Penetapan kadar senyawa fitokimia (alkaloid, flavonoid dan tanin) pada ekstrak etanol rimpang kunyit hitam (Curcuma caesia Roxb.). *Jurnal Pendidikan Tambusai*, 6(1), 2088-2093.

Yasir, M. (2025*). Pembelajaran IPA Berbasis Etnosains: Sains Kontekstual Untuk Literasi Budaya*. CV. Bayfa Cendekia Indonesia.

Yennie, E., & Elystia, S. (2013). Pembuatan Pestisida Organic Menggunakan Metode Ekstraksi Dari Sampah Daun Papaya Dan Umbi Bawang Putih. Dampak, *Jurnal Teknik Lingkungan UNAND,* 10(1), 46-59.

Yulianingtyas, A., & Kusmartono, B. (2016). Optimasi Volume Pelarut Dan Waktu Maserasi Pengambilan Flavonoid Daun Belimbing Wuluh (*Averrhoa bilimbi* L.). *Jurnal Teknik Kimia*, 10(2), 61-67