



**DIVERSITY OF ANTIPYRETIC PLANTS IN PURWOREJO REGENCY,
CENTRAL JAVA PROVINCE, INDONESIA**

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Abstract

*This study investigates the diversity of antipyretic plants traditionally utilized by local communities in Purworejo Regency, with a particular focus on Guyangan Village. Employing an ethnobotanical approach that integrates field observation, semi-structured interviews, and taxonomic identification, the research documents plant species used in the management of fever and analyzes associated traditional knowledge. The findings reveal that five plant species are commonly employed as antipyretic remedies: *Annona muricata*, *Bryophyllum pinnatum*, *Curcuma xanthorrhiza*, *Moringa oleifera*, and *Zingiber officinale*. These species are utilized in various preparation forms, reflecting localized knowledge systems and adaptive healthcare practices. The study highlights the importance of preserving ethnomedicinal knowledge while providing baseline data to support future phytochemical, pharmacological, and conservation research initiatives in Central Java.*

Keywords: *Flora, Fever Reducer, Potential, Java Island*

Abstrak

*Penelitian ini menyelidiki keanekaragaman tanaman antipiretik yang secara tradisional digunakan oleh masyarakat lokal di Kabupaten Purworejo, dengan fokus khusus pada Desa Guyangan. Dengan menggunakan pendekatan etnobotani yang mengintegrasikan observasi lapangan, wawancara semi-terstruktur, dan identifikasi taksonomi, penelitian ini mendokumentasikan spesies tanaman yang digunakan dalam pengobatan demam dan menganalisis pengetahuan tradisional yang terkait. Temuan menunjukkan bahwa lima spesies tanaman umum digunakan sebagai obat antipiretik: *Annona muricata*, *Bryophyllum pinnatum*, *Curcuma xanthorrhiza*, *Moringa oleifera*, dan *Zingiber officinale*. Spesies-spesies ini digunakan dalam berbagai bentuk sediaan, yang mencerminkan sistem pengetahuan lokal dan praktik perawatan kesehatan adaptif. Studi ini menyoroti pentingnya melestarikan pengetahuan etnomedisinal sekaligus menyediakan data dasar untuk mendukung inisiatif penelitian fitokimia, farmakologi, dan konservasi di Jawa Tengah di masa mendatang.*

Kata Kunci: *Flora, Penurun Demam, Potensi, Pulau Jawa*

INTRODUCTION

Purworejo is one of the regencies in Central Java Province that has biodiversity, including plants (Rahayu & Aprilyaningsih, 2026; Rahayu & Sunarto, 2020; Rahayu et al., 2016). Purworejo Regency, located in Central Java Province, represents a biologically and culturally rich landscape where traditional knowledge of medicinal plants remains deeply embedded in local communities. Indonesia, as one of the world's megadiverse countries, possesses extensive floristic diversity that supports a wide range of ethnomedicinal practices. Among these practices, the use of antipyretic plants—plants employed to reduce fever—constitutes an important component of primary healthcare, particularly in rural areas with limited access to



modern medical facilities. Fever is a common symptom associated with infectious and inflammatory diseases, and traditional plant-based remedies continue to play a complementary or alternative role alongside conventional pharmacological treatments.

Despite the widespread utilization of medicinal flora in rural Java, systematic documentation and scientific evaluation of antipyretic plant diversity at the local level remain limited. Rapid socio-economic transformation, land-use change, and generational shifts in knowledge transmission pose significant threats to the preservation of ethnobotanical heritage in Purworejo Regency. Without rigorous documentation, valuable indigenous knowledge regarding plant species identification, preparation methods, dosage, and therapeutic indications may be lost. Furthermore, the absence of comprehensive biodiversity records constrains opportunities for pharmacological screening and conservation planning, particularly for species that may possess bioactive compounds with antipyretic or anti-inflammatory properties.

Therefore, research on the diversity of antipyretic plants in Purworejo Regency holds both scientific and socio-cultural significance. Scientifically, it contributes to ethnobotany, pharmacognosy, and biodiversity conservation by providing baseline data on species richness, distribution, and utilization patterns. Such data may support future phytochemical and pharmacological investigations aimed at developing novel, evidence-based antipyretic agents. Socio-culturally, the study helps safeguard local knowledge systems and promotes sustainable resource management. Ultimately, this research can strengthen the integration of traditional medicine within broader public health strategies while supporting conservation efforts in Central Java. Until now, there has been no research focusing on the diversity of plants with potential as antipyretic in Purworejo Regency.

The objectives of this research are to systematically document and analyze the diversity of antipyretic plant species utilized by local communities in Purworejo Regency, Central Java Province. Furthermore, this research seeks to evaluate patterns of utilization and knowledge transmission across different demographic groups in order to understand the continuity and vulnerability of traditional medicinal practices. Another objective is to generate baseline data that can support biodiversity conservation strategies and provide a scientific foundation for subsequent phytochemical and pharmacological investigations of potentially bioactive compounds. Through these objectives, the study intends to contribute to the advancement of ethnobotanical research, sustainable resource management, and the integration of traditional medicine into evidence-based healthcare frameworks.

METHODS

This research was conducted using observation methods in Guyangan Village, Purwodadi Subdistrict, Purworejo Regency, Central Java Province. Identification was then carried out followed by a literature review to determine the potential of the plant species found as antipyretic. The observation method for plants with potential antipyretic properties began with the identification and selection of species based on ethnobotany or traditional literature reports. Observations were made by recording plant morphology, such as leaf, flower, and fruit shapes, as well as the plant parts commonly used (e.g., leaves, roots, or stems). Next, the selected plants were systematically observed in their natural habitats to

determine growth conditions, flowering season, and availability of materials. After that, representative samples were collected and traditional processing methods were recorded. Data analysis was carried out descriptively to determine the potential of various plant species as antipyretic.

RESULTS AND DISCUSSION

Based on research, there are 5 plant species that can be used to reduce fever (antipyretic) in Guyangan Village, namely: *Annona muricata*, *Bryophyllum pinnatum*, *Curcuma xanthorrhiza*, *Moringa oleifera*, and *Zingiber officinale*.

Annona muricata

Annona muricata (soursop) has been investigated for its traditional use in reducing fever, with the leaves most commonly studied as the medicinal part; these leaves are typically prepared as aqueous or ethanolic extracts through maceration or decoction and administered orally in experimental models to assess effects on fever or inflammatory processes in animals, consistent with ethnobotanical reports of antipyretic use in tropical medicine markets. Several *in vivo* studies using animal models have demonstrated that leaf extracts of *A. muricata* can significantly lower elevated body temperature induced experimentally, suggesting potential antipyretic activity that may be related to its rich content of flavonoids and other bioactive phytochemicals, though mechanistic and clinical evidence remains limited and primarily preclinical. Recent reviews and ethnobotanical analyses confirm that *A. muricata* continues to be documented for traditional therapeutic uses including fever and inflammation, and ongoing research emphasizes the need for controlled pharmacological and safety evaluations to support these traditional claims with contemporary scientific validation (Banne et al., 2017; Singh et al., 2025).

Bryophyllum pinnatum

Bryophyllum pinnatum (commonly known as cocor bebek) leaves have been traditionally employed as a natural antipyretic to alleviate fever, with preparations typically involving the extraction of leaf bioactive compounds through maceration or similar solvent-based methods to obtain ethanolic or aqueous extracts for administration or topical application. Scientific phytochemical and pharmacological investigations indicate that these leaves are rich in flavonoids, phenolic compounds, and triterpenoids, which contribute to anti-inflammatory pathways that may modulate prostaglandin synthesis and thus reduce elevated body temperature, supporting its traditional fever-reducing use (Dhumane et al., 2024).

Curcuma xanthorrhiza

Curcuma xanthorrhiza, commonly known as temulawak, particularly its rhizome (underground stem), which is rich in bioactive compounds such as flavonoids, curcuminoids, and xanthorrhizol that may modulate inflammatory pathways associated with fever. In experimental models of hyperpyrexia induced in rodents, ethanolic extracts of temulawak rhizome demonstrated measurable reductions in elevated body temperature, suggesting an inhibitory effect on pyrogen-mediated prostaglandin synthesis and cyclooxygenase activity, similar to established antipyretic mechanisms observed with non-steroidal agents. For example, ethanol-based formulations of temulawak extract were shown to lower fever in mice when administered at graded doses, with the highest dose exhibiting the most rapid return to normothermia compared with control groups. Furthermore, contemporary formulation research has explored incorporating temulawak rhizome

extract into transdermal delivery systems (e.g., patches) to evaluate its antipyretic efficacy *in vivo*, reinforcing the rhizome's role as the pharmacologically active part of the plant. These findings collectively support the scientific basis for temulawak's traditional use as a natural antipyretic, although continued clinical research is warranted to standardize dosing and confirm its effectiveness in human subjects (Cahyani et al., 2024).

Moringa oleifera

Recent pharmacological research has highlighted the potential of *Moringa oleifera* as a natural antipyretic agent, primarily through the use of its leaf extract, which has been shown to exhibit significant fever-reducing activity in experimental models; in comparative studies, methanolic extracts of *M. oleifera* leaves demonstrated greater antipyretic efficacy than bark or root extracts when evaluated against induced pyrexia, supporting traditional applications of leaf-based preparations for fever management (e.g., decoctions or leaf powder infusions) in ethnomedicine. In practice, the leaves are harvested, dried, and subjected to solvent extraction (e.g., methanol) or processed into aqueous herbal decoctions that are consumed orally, with the bioactive phytochemicals such as flavonoids, phenolics, and other secondary metabolites believed to modulate thermoregulatory pathways and inflammatory mediators. These findings align with a broader trend in recent literature that supports the scientific basis for traditional uses of kelor leaf formulations as adjunctive therapy for fever, while emphasizing the need for standardized extraction methods and clinical validation in humans (Jamil et al., 2024).

Zingiber officinale

Ginger (*Zingiber officinale*), primarily the rhizome portion of the plant, has been increasingly investigated as a natural antipyretic due to its bioactive phenolic constituents, especially gingerol and shogaol, which exhibit anti-inflammatory and prostaglandin-modulating properties that are central to fever reduction mechanisms. Recent experimental studies in animal models demonstrate that ginger extract significantly reduces elevated body temperature, red ginger (*Z. officinale* var. *rubrum*) extract produced a measurable antipyretic effect in febrile rodents, likely via inhibition of prostaglandin synthesis and reduction of inflammatory mediators, with higher active concentrations yielding greater efficacy (Lizhen & Suhartina, 2024). Traditional methods of utilization include preparation of ginger infusions, decoctions, or integration of extracts into formulations (e.g., hydrogel vehicles) that facilitate absorption of active compounds; these approaches leverage the rhizome's phytochemical profile to achieve fever-lowering effects (Panna et al., 2025). Contemporary systematic reviews and mechanistic studies also support that ginger's anti-inflammatory actions contribute to its antipyretic potential, underscoring the need for further high-quality clinical research to validate efficacy in humans (Verma et al., 2025).

CONCLUSION

Based on research, there are 5 plant species that can be used to reduce fever (antipyretic) in Guyangan Village, namely: *Annona muricata*, *Bryophyllum pinnatum*, *Curcuma xanthorrhiza*, *Moringa oleifera*, and *Zingiber officinale*. These species are utilized in various preparation forms, reflecting localized knowledge systems and adaptive healthcare practices. The study highlights the importance of



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