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A Literature Review of Zingiberaceae Plant Utilisation in Ethnomedicine Across Five Major Indonesian Islands

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ABSTRACT

The Zingiberaceae family is a group of plants that has an important role in traditional medicine in Indonesia. Some species that are commonly used are ginger (Zingiber officinale), galangal (Kaempferia galanga), java ginger (Curcuma xanthorrhiza), and turmeric (Curcuma longa). The use of these plants vary in each region, depending on geographical factors, culture, and developing local wisdom. This article aims to review the use of four Zingiberaceae species in traditional medicine on the islands of Sumatra, Java, Kalimantan, Sulawesi and Papua. Based on the review conducted, ginger and turmeric are widely used in Sumatra and Java as herbs to increase stamina and cure digestive disorders. In Kalimantan and Sulawesi, ginger is more often used to maintain liver health and increase appetite. Meanwhile, in Papua, several types of ginger and turmeric are used as natural antiseptics and wound medicine. This ethnobotanical diversity reflects how local ecology and culture influence traditional medicinal practices. This review highlights the significance of Zingiberaceae in Indonesian ethnomedicine and supports the preservation of local medicinal knowledge within public health initiatives.

Keywords:
Zingiberaceae; Ethnomedicine; Zingiber officinale; Kaempferia galanga; Curcuma longa

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1. Introduction

Ethnomedicine is a branch of science that studies traditional medicine practices developed in various cultures, including the use of plants as medicinal materials. In various traditions in Indonesia, ethnomedicine plays a significant role in supporting public health, especially for those who still rely on herbal medicine. Ethnomedicine not only includes the use of medicinal plants but also reflects cultural heritage, beliefs, and health practices that have been passed down from generation to generation [1]. One of the plant groups often used in ethnomedicine is the *Zingiberaceae* family, which has various species with widely recognised medicinal properties.

The Zingiberaceae family is widely utilised in traditional medicine throughout Indonesia. Some species from this family that are often used in medicine include ginger (*Zingiber officinale*), turmeric (*Curcuma longa*), temulawak (*Curcuma xanthorrhiza*), and kencur (*Kaempferia galanga*). These plants are known to have various health benefits, such as overcoming digestive disorders, relieving inflammation, increasing endurance, and

improving liver function [2]. The use of *Zingiberaceae* in traditional medicine is not only based on hereditary experience, but has also been extensively studied to identify its bioactive compounds responsible for various pharmacological effects.

The Zingiberaceae family has a wide distribution in Indonesia, especially in tropical areas such as Sumatra, Java, Kalimantan, Sulawesi and Papua. Each region has species that are commonly used in traditional medicine, which are often adapted to the environmental conditions and availability of plants in the area. In Sumatra and Java, ginger and turmeric are mostly used as herbs to increase stamina and treat digestive disorders. In Kalimantan and Sulawesi, temulawak is often used to treat liver disorders and increase appetite [3]. Meanwhile, in Papua, several types of forest ginger and galangal are often used as antiseptic ingredients and wound treatment [4].

The distribution of *Zingiberaceae* species in different regions is also related to local traditions that have developed over the years. People in each island have unique knowledge on how to select, process and utilise these plants according to their health needs. In addition, geographical factors also play a role in determining the types of *Zingiberaceae* that can grow well in an area. This makes each region have its own speciality species that are more commonly utilised in traditional medicine practices.

In addition to differences in the species used, the way plants from the *Zingiberaceae* family are processed also varies from region to region, depending on local traditions and wisdom. In some areas, these plants are used in fresh form, such as ginger and turmeric, which are directly chewed or ground before consumption. Meanwhile, some other regions are more likely to process it into a decoction or herbal concoction that is drunk regularly. In Java, turmeric and temulawak are often processed into traditional herbal medicine combined with other ingredients such as tamarind and brown sugar to enhance flavour and health benefits [5]. In Kalimantan and Papua, people often mix *Zingiberaceae* plants with other spices to increase the effectiveness of treatment [4,6]. These differences in utilisation and processing show how important an understanding of ethnomedicine is in maintaining the heritage of traditional medicine in Indonesia.

This review aims to synthesise ethnomedicinal knowledge of Zingiberaceae species—specifically ginger, kencur, temulawak, and turmeric—across Indonesia's major islands, including Sumatra, Java, Kalimantan, Sulawesi, and Papua. By examining how local communities utilize these plants in their daily lives, this study seeks to evaluate traditional use patterns in relation to geographic and cultural factors, while also providing insight into the significance of Zingiberaceae in ethnomedicine and its potential for future development.

2. Methods

This study employed a descriptive qualitative method through a literature review of ethnomedicinal use of Zingiberaceae species in Indonesia. Qualitative data was obtained through literature study to find out the use of the *Zingiberaceae* family for traditional medicine in various ethnicities in Indonesia. This research was conducted by searching scientific articles using the narrative review method. The inclusion criteria for literature articles are research articles published in 2015-2025, open access, original articles, related to ethnomedicine research on *Zingiberaceae* family plants as traditional medicines and their pharmacological use. Literature articles were obtained from several journal articles obtained from Google Scholar. Search terms included "ethnomedicine", "Zingiberaceae as traditional medicine", and "traditional plant use in Indonesia". The articles obtained were selected based on articles representing several ethnicities on the

islands of Java, Sumatra, Kalimantan, Sulawesi and Papua. Based on the scientific articles found, the study results were categorised based on species name, local name, efficacy, parts used and mode of use. The article selection process is illustrated in **Figure 1.**

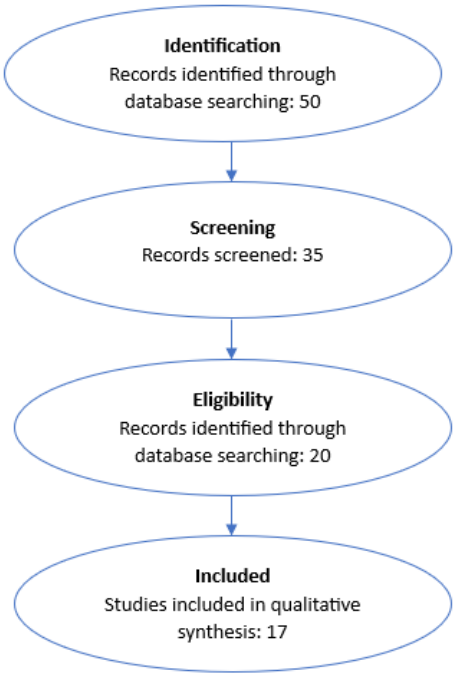

Figure 1. *PRISMA flowchart of article selection on Zingiberaceae plant utilization in traditional medicine across five major Indonesian islands.*

3. Results and Discussion

Based on the results of the literature review, the results of the use of plants of the *Zingiberaceae* family which includes the species *Zingiber officinale*, *Kaempferia galanga*, *Curcuma xanthorrhiza* and *Curcuma longa* in several islands in Indonesia are presented in Table 1.

Table 1. Utilisation of Zingiberaceae Family Plants Across Several Indonesian Islands

Zingiber officinale				
No.	Local Name	Part Used	Benefits	Publications
1.	*Passaleya (Sulawesi)*	*Rhizome*	*Cough and sore throat medicine*	[1, 2, 3, 4, 6, 7, 8, 9-11]
2.	*Jahe (Java)*	*Rhizome*	*Gout medicine, cough medicine, internal heat, bruises, body warmer, body stamina guard, and diabetes.*	
3.	*Liyak (Kalimantan)*	*Rhizome*	*Cough and body ache medicine*	
4.	*Layak (Sumatra)*	*Rhizome*	*Swelling medicine, rheumatism medicine, cough, flu, headache, nausea, postpartum recovery and*	

			gout	
5.	*Hite (Papua)*	*Rhizome*	*Appetite enhancer and bad breath preventer*	

Kaempferia galanga

No.	*Local Name*	*Part Used*	*Benefits*	*Publications*
1.	*Cakkuru' (Sulawesi)*	*Rhizome*	*Medicine for cold, sore throat, flatulence, asthma and headache.*	[1, 2, 3, 4, 6, 7, 8, 9-11]
2.	*Kencur (Java)*	*Rhizome*	*Cough medicine, lump medicine, energy booster after activity, appetite booster*	
3.	*Cekur (Kalimantan)*	*Rhizome*	*Cleansing medicine for dirty blood in the mother and head poultice and cold powder in the baby*	
4.	*Tabau (Sumatra)*	*Rhizome*	*Cold medicine,* postnatal *care, rheumatism and cough medicine*	
5.	*Sihor (Papua)*	*Rhizome*	*Malaria medication*	

Curcuma xanthorrhiza

No.	*Local Name*	*Part Used*	*Benefits*	*Publications*
1.	*Temmu (Sulawesi)*	*Rhizome*	*Internal medicine and appetite enhancer*	[1, 2, 3, 4, 6, 7, 8, 9-11]
2.	*Temulawak (Java)*	*Rhizome*	*Medicine for back pain, cough, and ulcer*	
3.	*Entomu (Kalimantan)*	*Rhizome*	*Painkillers, cold powder, and appetite enhancers*	
4.	*Kunik tomu (Sumatra)*	*Rhizome*	*Headache Medicine*	
5.	*Temulawak (Papua)*	*Rhizome*	*Malaria medication*	

Curcuma longa

No.	*Local Name*	*Part Used*	*Benefits*	*Publications*

1.	*Kunyi' (Sulawesi)*	*Rhizome*	*Deep wound medicine Riau: measles, malaria, abdominal swelling, stomach pain, headache, chest pain, stomach cancer*	[1, 2, 3, 4, 6, 7, 8, 9-11]
2.	*Kunir (Java)*	*Rhizome*	*Measles medicine, wound pain relief, inflammation relief, arthritis and mouth ulcers*	
3.	*Kunyik (Kalimantan)*	Rhizome	Ulcer medicine, diarrhoea, menstrual pain relief, vaginal discharge, appetite enhancer	
4.	Bongah (Sumatra)	Rhizome	Medicine for stomach ulcers, hepatitis, menstruation, postpartum recovery, swelling due to collision	
5.	*Podi (Papua)*	*Rhizome*	*Shingles medicine*	

Diversity of medicinal plants in

Indonesia, as a tropical country with fertile soil and a favourable climate, is known as a producer of various agricultural commodities, including medicinal plants. Traditional medicine is a cultural heritage that has been passed down from generation to generation, both orally and in writing. Local communities have important knowledge about medicinal plants to sustain their survival, but this knowledge is in danger of being eroded due to the development of modern medicines. This research shows the need to increase local people's knowledge about the utilisation of plants as traditional medicine. The management of biological resources in Indonesia, especially in the utilisation of plants as medicine, has developed rapidly. The utilisation of herbal plants, especially the *Zingiberaceae* family, is due to the content of secondary metabolites in them. This secondary metabolite compound comes from the secondary metabolic process of a plant. Secondary metabolites can be alkaloid, flavonoid and terpenoid compounds that are used as antimicrobials [2]. Based on the literature review that has been done, there are 4 species of the *Zingiberaceae* family that are commonly used by people on 5 major islands in Indonesia **(Table 1)**.

Utilisation of *Zingiber officinale* (Ginger) in various regions

Zingiber officinale

Zingiber officinale or Ginger is one of the plants in the *Zingiberaceae* family with morphological characteristics having rhizomes that tend to be flat and not bulging, and the rhizome flesh is white, yellow or red. This plant is found in several regions of Indonesia with their respective utilisation. In Java and Kalimantan, people call it ginger, while the people of Sumatra call it Layak, the people of Sulawesi know it as Passaleya and the people of Papua call it Hite. The people of Sulawesi utilise ginger by boiling and drinking the boiled water to be used as a cough and sore throat medicine [2]

In addition, the use of ginger plants on the island of Java is as a medicine for gout, cough medicine, internal heat, bruises, body warmers, body stamina maintainers, and diabetes. The way ginger is processed in traditional medicine is by boiling or mixing

with other rhizomes. Meanwhile, the people of Kalimantan utilise Layak as a cough and body aches medicine. Before consumption, Layak is boiled first and then the boiled water is drunk to cure coughs and reduce aches [6]. The use of *Zingiber officinale* or Layak in the Sumatra region is as a medicine for swelling, rheumatism, cough, flu, headache, nausea, postpartum recovery and gout. The use of worth as a medicinal ingredient is by boiling the rhizome with water or without water until it releases liquid [9]. In addition, the processing of ginger as a swollen medicine is done by peeling and grating ginger and then applying it to the dislocated or swollen part of the body [10]. Papuans use ginger, known as hite, as an appetite enhancer and bad breath preventer. The method of using hite is ginger that has been washed, peeled, chewed and eaten [4]

Kaempferia galanga

Kaempferia galanga or Kencur is also one of the plants of the *Zingiberaceae* family, the morphological characteristics that are owned and distinguish it from Ginger are the leaves creeping on the surface of the soil with a short stem and yellowish brown root fibres. While the rhizome is short in size, shaped like a blunt brown finger and the skin of the rhizome is shiny brown, the flesh is white with a fibrous texture. In kencur, it is believed that there are chemical compound components that have a positive impact on health, so people often use it [12]. On the island of Java, people call it kunir, in Kalimantan they call it cekur, while in Sumatra, people call it Tabau, in Sulawesi people call it Cakkuru' and Papuan people call it Sihor. Each island has differences in its utilisation and processing.

In Java, kencur is often used as a cough medicine, lump medicine, energy booster after activity, and appetite enhancer. Processing for cough medicine is by cutting it into small pieces, then boiling it, and drinking the boiled water. Furthermore, for lump medicine, kencur is processed by pounding and applying to the bump. Then for energy boosters and appetite enhancers, it is processed by making kencur rice jamu and drinking it [13]. On the island of Sulawesi, kencur is used as a medicine for flu and sore throat, with processing similar to cough treatment in Java, namely by grating fresh kencur rhizomes, squeezing them to get the juice, and mixing them with honey before drinking. The sineol and flavonoids in kencur act as anti-inflammatory and expectorant, helping to relieve the symptoms of flu and sore throat.To treat flatulence, kencur rhizomes are grated and applied to the stomach. Meanwhile, for asthma, the juice of kencur rhizome is mixed with honey and chicken egg yolk before consumption. If you have a headache, kencur leaves are pounded and placed on the forehead as a natural compress [14]. On the island of Borneo, kencur is used to treat dirty blood cleansing in mothers and head poultices and cold powder for babies. The processing method carried out for dirty blood cleaning drugs is by grating then squeezing and drinking the water, while head poultices and cold powder are processed by pounding then applying [15]. On the island of Sumatra, tabau is used to treat colds, coughs, rheumatism, and postnatal care. The processing of tabau for colds and coughs is similar to the processing of galangal in other regions. For rheumatism, kencur rhizomes are pounded until smooth and rubbed on painful body parts. In postnatal care, kencur is processed by making it into kencur rice jamu, which when consumed by postnatal mothers is believed to help facilitate breast milk [16]. On the island of Papua, sihor is used as a malaria medicine with one of the processing methods is to boil the kencur rhizome that has been cut into small pieces, then the boiled water is drunk several times a day. In addition, kencur can also be pounded and squeezed to extract the juice, which is then consumed directly or

mixed with honey. Some people mix kencur with other herbs such as papaya leaves, temulawak, and turmeric to increase its effectiveness.

Curcuma xanthorrhiza

Curcuma xanthorrhiza or temulawak is also one of the plants from the *Zingiberaceae* family that is widely used, the morphology of this species is also different compared to some other species, temulawak stems are in the form of upright pseudo-stems and can reach a height of about 2-2.5 metres, higher than other species which generally only reach about 1 metre. The leaves are elongated lanceolate with a larger size than other species in this family, and have a purple stripe in the centre, which is characteristic. Meanwhile, temulawak rhizomes are elongated round with a yellow colour, the branch rhizomes usually have a smaller size and a lighter colour [17]. On the islands of Java, Sumatra, Sulawesi, and Papua, this species is known by the same name, Temulawak, then in Kalimantan it is known as Entomu, only the way of utilisation and processing is different.

In Java, temulawak is often used to cure lumbago, cough, and ulcers. Processing done for lumbago and cough medicine is by boiling together with cat whisker leaves and keji beling leaves then filtered and drunk. As for ulcer medicine, it is processed by pounding, squeezing, and drinking the juice [5]. On the island of Sumatra, temulawak is used as a headache medicine with the processing method carried out, namely grated then squeezed, and the juice is drunk [16]. In Sulawesi Island, temulawak is used to overcome body aches and as an appetite enhancer. Traditional processing involves making jamu by boiling sliced temulawak rhizomes with other ingredients such as tamarind and brown sugar. After boiling and straining, this concoction is drunk while warm to relieve body aches and increase appetite. It can also be used as a stomach medicine by boiling it with sambiloto leaves, turmeric, egg yolk and honey and then drinking it [14]. On the island of Borneo, temulawak is used as an internal medicine, appetite enhancer, and cold powder. Temulawak rhizomes are usually processed into instant drinks by adding sugar and sour flavourings to improve the taste, so that it is preferred by various groups, including children, for cold powder is processed by pounding and then applied [15]. In Papua Island, temulawak is used as a malaria medicine with one of the processing methods is to boil the rhizomes that have been cut into small pieces, then the boiled water is drunk several times a day.

Curcuma longa

Curcuma longa or turmeric is a plant in the *Zingiberaceae* family. Turmeric is utilised as a traditional medicinal ingredient. Turmeric has morphological characteristics including, dark yellow to orange rhizomes, a distinctive aroma, and tastes slightly bitter and spicy. The leaves are hairless, elongated lanceolate, and bright green in colour. The stem is a cylindrical pseudo-stem composed of leaf midribs. The flowers are pale white or yellow with a white base, arranged in a series of spikelet-shaped inflorescences [7]. On the island of Papua turmeric is called Podi, where people process Podi by pounding turmeric rhizomes and rubbing the water on the skin to be used as a cure for scabies [4]. People in Java utilise turmeric as a measles medicine by pounding it together with camote leaves and rice, then applying it to the area affected by measles. In addition, turmeric is used to relieve pain caused by wounds, inflammation, arthritis, and mouth ulcers.

Meanwhile, the people of Sulawesi use turmeric as an internal wound medicine. The processing method is by mashing turmeric, squeezing and drinking the water or

boiling turmeric and drinking the boiled water [2]. Sumatran people use turmeric to smooth menstruation and facilitate childbirth. In addition, turmeric is used as a medicine for stomach ulcers, hepatitis, and to reduce swelling due to impact [10]. In addition, the people of the island of Kalimantan process turmeric to be used as a medicine for ulcers, diarrhoea, menstrual pain relief, vaginal discharge, appetite enhancers

Ethnomedicinal-based biopharmaceutical development strategy of *Zingiberaceae* member plants

The development of ethnomedicine-based biopharmacology in five major islands in Indonesia has great potential in supporting public health and increasing the economic value of medicinal plants. Strategic steps that can be taken include standardising the cultivation of medicinal plants to ensure the sustainability of raw material supply, optimising the extraction process of active compounds to increase therapeutic effectiveness, and strengthening scientific studies for pharmacological validation[12,17] In addition, the synergy between local wisdom and modern technology needs to be strengthened through collaboration between researchers, the pharmaceutical industry, and local communities scientifically validated and sustainably practiced. With a systematic approach, the development of ethnomedicine-based biopharmacology can contribute to national health security as well as open up opportunities for exporting high-quality herbal products to the global market.

However, this review is limited by the availability and accessibility of published ethnobotanical studies from all regions of Indonesia, which may result in underrepresentation of certain local practices, particularly from remote or less-documented areas. Additionally, the data relied primarily on qualitative descriptions without standardized pharmacological validation, which restricts comparative analysis. Future studies are encouraged to include field-based verification and ethnopharmacological testing to strengthen the integration of traditional knowledge into evidence-based medicine.

4. Conclusion

The use of ginger, kencur, temulawak, and turmeric in traditional medicine has become part of the public health culture in various parts of Indonesia, especially in Sumatra, Java, Kalimantan, Sulawesi, and Papua. Each region has different ways of utilisation according to environmental conditions, traditions, and local medical needs. Ginger and turmeric are more commonly used in Sumatra and Java as stamina enhancers and indigestion remedies, while temulawak in Kalimantan and Sulawesi is utilised for liver health and appetite. In Papua, some types of ginger and turmeric are used as natural antiseptics and wound medicines. These findings highlight the depth of ethnomedicinal knowledge and the cultural significance of Zingiberaceae species. Future research should focus on pharmacological validation and the integration of local practices into formal healthcare systems to support evidence-based medicine while preserving indigenous knowledge.

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useful insights into the important role of ginger, kencur, temulawak, and turmeric in traditional medicine and enrich the understanding of ethnomedicine in various regions.

Conflicts of Interest:

The authors declare no conflict of interest regarding the publication of this article.

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