

Systematic Literature Review: Study Ethnobotany of Family Zingiberaceae in Several Ethnic Groups in Sumatra

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Abstract—Ethnobotany reveals that the relationship between human life and plants is one that cannot be separated. One of the plant families that is most widely used in everyday life is Zingiberaceae, also known as the ginger tribe. Many local ethnic groups in Indonesia use the family Zingiberaceae as ingredients for medicines (*ethnomedicine*), ethno-economics, ethno-ecology, traditional or ritual processions, and ethnopharmacology. Local people from various ethnicities in the world take advantage of this family because of the large amount available in nature and its distinctive aroma and taste that are different from other families. Several ethnic groups have used the family Zingiberaceae as raw materials for traditional medicine, food ingredients, and cultural traditions for generations, namely the Lingga Malay ethnic group in the Riau Islands, the local Rupert Island community in Riau, the Toba Batak ethnic community in North Sumatra, and the Minangkabau ethnic group in West Sumatra.

Keywords—*ethnic; ethnobotany; family Zingiberaceae; local communities.*

I. INTRODUCTION

Ethnobotany is a field of study that looks at how different ethnic groups in a certain area use plants in their everyday lives and in traditional ways, like in ceremonies, art, medicine, food ingredients, and so on [21]. The relationship between human life and plants is one that cannot be separated. Ethnobotany comes from the Greek word *ethnos*, which means the characteristics of a group or population, while botany is a science that studies plants [5]. A North American botanist, John Harshberger, first introduced ethnobotany and defined it as a science that studies the use of plants by primitive and aboriginal peoples [8].

In the field of ethnobotany, people also study how people use plants to meet their physical and cultural needs [1]. Humans, especially local communities, plants, the environment, culture, and nature are all covered by this knowledge study [26]. Today, ethnobotany doesn't just look at how a plant is used; it also looks at how a plant is cared for. This is because plants and ethnic communities are tied together in a way that can't be separated.

In the field of ethnobotany, there are two ways to study how different plant species are used. These are the emic approach and the ethical approach. The emic approach looks at how data is collected based on what people think about how plants are used and how they should be classified. The ethical approach looks at how data is collected based on what researchers and science have found [16]. Ethnobotany science also contributes to the renewal and development of information related to various types of new medicines from various types of plants used by various ethnicities, vegetation management, and sustainable development [20].

One of the plant families that many people use in their daily lives is the Zingiberaceae family, also known as the ginger tribe. The Zingiberaceae family is found in a number of places, including the tropics and subtropics, Southeast Asia, especially the

Malesia region, and other places where the plants live on land [14, 13]. Indonesia is one of the areas in the Malesia region that has a number of various Zingiberaceae species, including ± 76 species on Sumatra Island, ± 112 species on Kalimantan Island, ± 94 species on Java Island, ± 102 species on Sulawesi Island, ± 38 species on Maluku, and ± 125 species in Irian Jaya [18].

People of many different cultures around the world use ginger as a cooking ingredient. Several ethnic groups in Indonesia, including Javanese, Banjar, Madurese, Batak, Dayak, Bugis, Sundanese, and a small part of the Chinese, use the Zingiberaceae family in their daily lives as cooking spices and traditional medicine [12]. Its abundant availability in nature makes people use this family in their daily lives.

The development of modern times has resulted in problems for local people, who are starting to leave and forget this local knowledge. As for the factors that can result in the loss of local knowledge (*local wisdom*), because it is still of an oral nature, it is very easy to be threatened with loss. Based on these problems, this article review is focused on ethnobotanical studies of the family Zingiberaceae of several ethnic groups in Indonesia. The purpose of this journal review is to inform readers about the use of species from the Zingiberaceae family that are used as medicinal ingredients by several ethnic groups in Indonesia.

II. RESEARCH METHODS

A systematic literature review (SLR) is used in this paper. SLR is a method that aims to identify, review, evaluate, and interpret data in journals systematically according to the steps specified [18]. In searching for and collecting data related to a topic, study Ethnobotany of the family Zingiberaceae in several ethnic groups in Sumatra. The data were analyzed descriptively and tabulated into tables to summarize all the data obtained.

III. RESULT AND DISCUSSION

1. Plant of the family Zingiberaceae

The Zingiberaceae family, also referred to as the ginger tribe, is a plant family with numerous advantages that the community uses as food and medicine in daily life. There are several types of plants in the family Zingiberaceae (Tabel 1).

TABLE I. THE PLANT NAME FROM THE FAMILY ZINGIBERACEAE

Plant of Name	Family	References
<i>Alpinia galanga</i>	Zingiberaceae	[4],[11]
<i>Curcuma longa</i>	Zingiberaceae	[3],[11]
<i>Kaempferia galanga</i>	Zingiberaceae	[3],[11]
<i>Zingiber officinale</i>	Zingiberaceae	[3],[4],[11]

In general, plants in the Zingiberaceae family are herbaceous, have pseudostems, and have both single and whole leaves. In this family, the inflorescence organs have distinctive shapes and colors that can differentiate between species in the Zingiberaceae family. Has rhizomes that live below the surface of the soil, with different morphology in each species. In addition, the rhizomes of this family contain aromatic compounds in the form of essential oils. The secondary metabolite content of this plant makes this family widely used by the community because it has a distinctive aroma that is different from other plant families [9].

Several types of plants live wild in the forest, but some of them, such as ginger (*Zingiber officinale*), turmeric (*Curcuma longa*), galangal (*Alpinia galanga*), and kencur (*Kaempferia galanga*), have been widely cultivated by the community and used as food ingredients, especially cooking spices, and raw materials for medicines. traditional medicine. Local people are very fond of plants from the Zingiberaceae family for several reasons, such as their high nutritional value content, distinctive aroma and taste, abundant availability in nature, and ease of cultivation [7, 15]. Various local ethnic groups in Indonesia use the Zingiberaceae family as ingredients for medicines (Ethnomedisin), ethno-economics, ethnoecology, traditional or ritual processions, and ethnopharmacology [12, 9]. Based on their utilization value, there are 18 plant species from this family that have been identified,

including those from *Zingiber album* Nurainas. One of the islands that has the distribution and abundance of the Zingiberaceae family is Sumatra [19].

Several ethnic groups on the island of Sumatra utilize the Zingiberaceae family to support their daily needs, namely, the Lingga Malay ethnic community in Lingga District, Riau Archipelago Province, which utilizes several species of this family as a mixed ingredient in cooking [3]. In addition, local people on Rupat Island, Bengkalis Regency, and Riau Province use this family as a raw material in traditional medicine based on the results inherited from their ancestors [4]. The Toba Batak ethnic community uses this plant family as an ingredient in traditional medicine. The ingredients and recipes are still maintained based on sources of ancestral beliefs [17]. In contrast to some of the previous ethnic groups, the Minangkabau ethnic community uses this family as a mixture in the Balimau cultural tradition [10]. Management of cultural traditions that are good and maintained from ancestral heritage can make this local knowledge preserved and not extinct along with the development of the modernization era.

2. Ethnobotany of the Family Zingiberaceae in Several Ethnic Groups in Sumatra

Utilization of the Family Zingiberaceae by various ethnic groups in sumatra (Tabel 2).

TABLE II. UTILIZATION OF THE FAMILY ZINGIBERACEA BY VARIOUS ETHNIC GROUPS IN SUMATRA

Ethnicity	Province	Plant of Name	References
Malay of Lingga	Riau Island	<i>Kaempferia galanga</i> , <i>Curcuma longa</i> , <i>Zingiber Officinale</i>	[3]
Malay of Bengkalis	Riau	<i>Alpinia galanga</i> , <i>Boesenbergia rotund</i> ,; <i>Costus speciosus</i> , <i>Curcuma aeruginosa</i> , <i>C. caesia</i> , <i>C. domestica</i> , <i>C. mangga</i> , <i>C. xanthorrhiza</i> , <i>C. zedoria</i> , <i>Etlingera elatior</i> , <i>Kaempferia galanga</i> , <i>K. rotunda</i> , <i>Zingiber cassumanar</i> , <i>Z. officinale</i> , <i>Z. officinale</i> var. <i>rubrum</i> , <i>Z. zerumbet</i> .	[4]
Minangkabau	West Sumatra	<i>Alpinia</i> sp.	[25]
Batak Toba	North Sumatera	<i>Zingiber officinale</i> , <i>Z. purpureum</i> , <i>Z. americans</i> , <i>Curucuma domestica</i> , <i>C. Xanthorrhiza</i> , <i>Alpinia galanga</i> , <i>Kaempferia galanga</i> , <i>Etlingera elatior</i> , <i>Amomum compactum</i> .	[11]

The Lingga Malay are one of the groups of people who live in the Lingga district of the Riau Archipelago province. The Malay Lingga ethnic group has local knowledge that is unique and different from other Malay ethnicities. The Malay Lingga community has a long history of Malay civilization based on the customs of the Malay Lingga-Riau kingdom. The source of knowledge comes from the legacy of their ancestors, passed down from generation to generation. One of the traditions and customs that are still maintained is the processing of plants as medicinal ingredients [23]. The Malay Lingga community is different from other groups because they use plants from the Zingiberaceae family in their cooking. People in the area often use a mix of these plants, such as turmeric (*Curcuma longa*), kencur (*Kaempferia galanga*), and ginger (*Zingiber officinale*), in their cooking. People think that this family can give traditional Lingga dishes a smell and a taste that make them stand out. This distinctive taste can distinguish it from Riau Malay cuisine and other regions. Apart from being used as a food ingredient, the Zingiberaceae family is believed to be able to cure fever and be an ingredient in herbal medicine for childbirth. The parts used by plants are leaves and tubers [3]. Traditional cuisine is a form of preserving local knowledge because it is still being maintained and is not affected by modernization. The frequent consumption of these dishes helps the Lingga ethnic community maintain traditional dishes that are part of their ancestral heritage [3]. There are several factors that have resulted in these ethnic communities retaining the heritage of traditional cuisine, including the abundance of plant sources in nature, which makes people

prefer to use local plants as food, the awareness of the people who have carried out conservation by planting around their homes, and people who like to consume vegetables. vegetables as food.

Rupat Island is one of the islands that are right next to Malaysia. Because of this, it is considered the most distant island in the Bengkalis Regency of the Riau Province. The position, which is far from the provincial capital, causes the people in this area to still maintain local knowledge in utilizing plants as ingredients in traditional medicine. The composition of ingredients derived from plants and their processing into traditional medicines still closely follow the ancestral heritage, which was passed down orally [25]. Based on the results of research conducted by [4], they reported that as many as 16 species of Zingiberaceae plants were used as traditional medicine, namely, *Alpinia galanga*, *Boesenbergia rotunda*, *Costus speciosus*, *Curcuma aeruginosa*, *C. caesia*, *C. domestica*, *C. mango*; *C. xanthorrhiza*; *C. zedoria*; *Etlingera elatior*; *Kaempferia galanga*; *K. rotunda*; *Zingiber cassumanar*, *Z. officinale*; *Zingiber officinale* var. *rubrum*; *Z. zerumbet*. The types of treatment that are often used consist of women's health care and treatment of other diseases. While the part of the plant that is most widely used is the rhizome. The method of processing medicinal plants is more inclined to smooth the part of the plant used and then take the water or use it directly. The use of medicinal plants by drinking is more dominant for treatment in the body and applied topically for treatment outside the body. Based on the results of The Fidelity Levels (TFL) analysis, it shows results with a high level of accuracy in the use of medicinal plants, namely up to 100% for the plant species *Curcuma domestica*, so that these plants can be used to cure various diseases by all practitioners of traditional medicine (POT) [4].

The Balimau tradition is something that all residents do before the holy month of Ramadan. They do this by following the advice of their ancestors, which is based on their beliefs. This cultural tradition is both a way to clean oneself and a way to show gratitude and happiness. The balimau tradition is thought to be an annual event that the community never forgets before the start of Ramadan. It is also thought to keep bad things from happening in the area. The balimau procession is carried out in all water streams, such as rivers. The balimau tradition comes from the Minang language, which means bathing using the main ingredient of orange juice (lime). The orange used in balimau is lime. In addition, it also uses various types of plants that have a fragrant smell or aroma. The fragrant aroma of these plants can be used as a scrub in the balimau process. [24]. The number of plants used in the balimau tradition in the city of Pariaman, West Sumatra province, is 13 plant species, one of which uses the Zingiberaceae family. The plant species in this family are *Alpinia* sp. This type of plant is mixed with other plants as a body scrub and fragrance in the balimau tradition. The 13 types of plants used in the balimau tradition are *Cananga odorata*, *Michelia champaca*, *Michelia alba*, *Pandanus amaryllifolius*, *Vetiveria zizanioides*, *Rosa hybrida*, *Ixora javanica*, *Citrus aurantifolia*, *Citrus hystrix*, *Murraya paniculata*, *Mimusops elengi*, and *Alpinia* sp. While the parts of the plants used were flowers, leaves, roots, and stems [10], based on these results, the plants that are widely used come from cultivated plants. The use of various types of plants in the balimau tradition makes the community carry out conservation related to the types of plants in the procession, both in gardens and yards. So this indicates that there is awareness in the community to carry out conservation for the sustainability of local traditional cultural traditions [10].

North Sumatra is one of the provinces in Indonesia that has multiethnicity. The original ethnic groups originating from North Sumatra are the Batak, Nias, and Malay ethnicities. The Toba Batak ethnicity strongly adheres to the cultural heritage of their ancestors. Knowledge about the use of medicinal plants by the Batak ethnic community is still maintained both orally and in writing and is an ancestral heritage passed down from generation to generation. Several previous studies have revealed the use of Zingiberaceae family plants as medicinal ingredients by the Toba Batak ethnic community, including; finding as many as six types of plants in the Zingiberaceae family that are used by the Peadungdung village community as traditional medicinal ingredients [2]. In addition, 4 types of plants from this family were found in the Martoba village community. Another community, namely in the village of Pagaran Gastric [11].

The Toba Batak ethnic group utilizes various types of plants from the family Zingiberaceae, such as *Zingiber officinale* (ginger), *Zingiber purpureum* (bungle), *Zingiber americans* (lempuyang), *Curcuma domestica* (turmeric), *Curcuma xanthorrhiza* (curcuma), *Alpinia galanga* (galangal), *Kaempferia galanga* (kencur), *Etlingera elatior* (kecombrang), and *Amomum compactum* (cardamom). Based on its utilization, this family is widely used as an ingredient in medicine, care, and health [17]. The Toba ethnic community has long known medicinal plants originating from nature, these traditional medicines are processed in a simple way based on the experience of the community [6]. The Toba Batak ethnic community often utilizes various types of traditional medicine due to several factors, namely the abundance of plants in nature, which makes it easier to obtain traditional medicinal

ingredients as well as being cheaper and safer. In addition, the surrounding community also began to practice conservation by planting around their homes.

IV. CONCLUSIONS

Several ethnic groups on the island of Sumatra that use the zingiberaceae family for their daily needs include; the lingga malay ethnic community in lingga district, Riau Archipelago Province, which utilizes several species of the zingiberaceae family such as turmeric (*Curcuma longa*), kencur (*Kaempferia galanga*), and ginger (*Zingiber officinale*) used by the local community as mixed ingredients in traditional dishes. In addition, local people on rupa island, bengkalis regency, riau province utilize several types of plants from the zingiberaceae family, such as; *Alpinia galanga*; *Boesenbergia rotunda*; *Costus speciosus*; *Curcuma aeruginosa*; *C. caesia*; *C. domestica*; *C. mango*; *C. xanthorrhiza*; *C. zedoria*; *Etilingera elatior*; *Kaempferia galanga*; *K. rotunda*; *Zingiber cassumana*; *Z. officinale*; *Zingiber officinale* var. *Rubrum*; *Z. zerumbet*. This type is used for women's health care and other traditional treatments.

Another ethnic community that uses the Zingiberaceae family is the Toba Batak ethnicity. The ethnic community uses various types of plants from the Zingiberaceae family as raw materials for traditional medicine, care, and health. As for the types of plants, namely; *Zingiber officinale* (ginger), *Zingiber purpureum* (bungle), *Zingiber americanus* (leppuyang), *Curcuma domestica* (turmeric), *Curcuma xanthorrhiza* (curcuma), *Alpinia galanga* (galangal), *Kaempferia galanga* (galangal), *Etilingera elatior* (combrang), and *Amomum compactum* (cardamo). In contrast to some of the previous ethnic groups, the Minangkabau ethnic community uses this family as a mixture in the Balimau cultural tradition. The types of plants used as a mixture for the balimau procession are; *Cananga odorata*, *Michelia champaca*, *Michelia alba*, *Pandanus amaryllifolius*, *Vetiveria zizanioides*, *Rosa hybrida*, *Ixora javanica*, *Citrus aurantifolia*, *Citrus hystrix*, *Murraya paniculata*, *Mimusops elengi*, and *Alpinia* sp.

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