

# Study of Ethnobotany for Bioconservation Medical Plant (Zingiberaceae)

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## ABSTRACT

The plants have enormous benefits for the whole process of life on earth and for human, plant given the benefit through the production of secondary metabolites for drugs. Knowledge of traditional medicinal use of plants as usually done for generations and is the local knowledge so it is important to document local knowledge in order to remain sustainable and not eroded by modernization. Zingiberaceae is one of the plant that has high economic value, other than as a medicinal plant, also used as a spices and has great potential in the cosmetics industry as well as traditional and modern medicine.

The purpose of this study was to know the species of family Zingiberaceae used as medicinal plants, market price and the conservation efforts made by the community. The method are study literature and interviews with the general society, the sellers of carrying the traditional medicinal (jamu gendong), the sellers of empon empon and the massage, in the centre of medicinal plants in Jawa Tengah. The data of plants are gathered by doing several vegetation analysis. The method used is the quadrat method analysis with 5 x 5 metres in size.

The results showed that there are 17 species of the family Zingiberaceae used as a medicinal plant in the study area. Another benefit are the herb massage, body powder, spices, beverages and coloring materials. Kunyit (*Curcuma domestica*) has the highest of the use value. The highest average market price is kencur (*Kaempferia galanga*). Conservation efforts have been made that the development of the centers of the plant family Zingiberaceae in 6 areas of research that are the city of Semarang, Semarang regency, Boyolali regency, Sukoharjo regency, Karanganyar regency and Wonogiri regency.

**Key Word:** Ethnobotany, Zingiberaceae, Medicinal plant, Conservation.

## 1. INTRODUCTION

Ethnobotany is the science that studies about interrelationships between local communities and the natural environment, especially the system of knowledge about the natural resources of plants. Walujo (2000), The traditional community use plants around him as medicine because in the past the treatment is done traditionally. Method used to determine the plant useful as a medicinal by relying on local knowledge from each area. Ethnobotany still be maintained, because the science is start with the culture, history of community and the natural environment for the purpose of bio conservation natural resources and cultural that exist in their local communities. Local knowledge of community groups on the use of a plant for the treatment traditionally has contributed to the discovery of new compounds for the modern treatment (Purwanto, 2000). More easily to obtain and consume the products of modern medicine had significant negative impacts about the knowledge of Ethnobotany. Knowledge of the maximum utilization of plant both as medicinal plants and other benefits is the main key to implemented Ethnobotany with wisely and utilization of plants and effort of bio conservation for plants significantly increased. Traditional Botanical Knowledge were constitute the botanical knowledge possessed by local community, covering all aspects of utilization, ecological and cognitive aspects of the use of plants and plant resource management (bioconservation plants). The history of traditional use of plants as medicine by the community has been made since we are born. People's knowledge about the medicinal properties of plants they obtain from generation to generation. Traditional medicine is the medicine of nature derived from plants, animals, minerals, or mixtures of these materials that traditionally have been used for treatment based on experience (Katno & Pramono, 2006).

Department of Health classified Traditional medicine as Jamu, Fitofarmaka and Family Medicinal Plants (TOGA). Jamu is a drug derived from plant material and a mixture of other materials used in the treatment based on experience. Fitofarmaka is the drug that already clear about the safety and efficacy and the raw material consists of simplisia (Lestari, 2001). Jamu used by the Javanese to the drug native herbs from nature that does not use chemicals as additives. Traditional connotation is always attached to the medicinal herb (jamu) because it has been known for a long time before modern pharmacology comes in Indonesia (Sutarno, 2000). The development of the use of plants as traditional medicine by community is increasing. The increasing number of traditional medicines circulating in community, can be seen from the number of herbs

that have been processed in a modern herbal industry. Indonesia has about 30,000 species that have been identified and 950 species of them are known have medicinal functions; for example plants, animals, and microbes that have potential as medicine, health food, nutrition good for humans, animals and plants.

Approximately 180 species have been used in traditional medicine by the traditional medicine industry of Indonesia (Sampurno, 1999). Family Zingiberaceae (Temu temuan ) are plants with rhizomes that are used by local communities for herbs (Jamu) , spices, traditional medicines. Zingiberaceae is one of the plants that are found in tropical forests and tropical regions that have high rainfall. Zingiberaceae derived from the Sanscrit "Zingiber" means shaped like a horn. Species of the family Zingiberaceae, usually have rhizome that have use value as a spice, used as a mixture of food and beverage and herbs (jamu) in traditional medicine (Rismunandar 1988).

Zingiberaceae is one family of the ordo Zingiberales that all members in the form of perennial herbaceous. The members of this family have characteristic rhizome contains essential oils (Tjitrosoepomo, 2002). Plants that includes the family Zingiberaceae have aromatic part, therefore, often used as a spice, seasoning or drugs. (Heyne, 1987).

The natural use of plants, both as herbs , traditional medicine, spices, seasonings, body powder, and dyes, tend to increase. This is due to the increasing price of modern medicines are increasingly inaccessible to the public and the public awareness get back to nature by utilizing the abundant natural resources vegetation .

The purpose of this study was to explore the knowledge of local communities in utilize and conserve vegetation in this case are to identify the use of species from family Zingiberaceae , density , market prices, and the conservation efforts that have been made by the community

## 2. MATERIALS AND METHODS

Preliminary survey are done to determine the location of a representative sampling and get information about the location of many plants from family Zingiberaceae. The study are done in the cities that has been determined where some herbal plantation centres are located around Central Java, there are one city and 5 district : Semarang city, Semarang district, Boyolali, Sukoharjo, Karanganyar and Wonogiri. For every district, there are 3 subdistricts (6x3= 18 subdistricts). The data of plant are obtained by vegetation analysis. The method used is the quadrat method analysis with 5 x 5 metres in size. The parameters observed include the number of species and number of individuals. Identification and description of any specimens include (local name, scientific name, brief description, habitus, medical benefits and usefulness). Interviews with community, the sellers of carrying traditional medicinal (jamu gendong) , the sellers of empon empon (spices) and the massage, to recognize the names of each specimen and the medical uses of those plants as well. The identifications are also done manually by using literatures. The identifications refer to Backer & Bakhuizen v.d. Brink (1968). Heyne (1987), Indo (1991). Muhlisah (1999), Tjitrosoepomo (2005). Determined the coordinates point by GPS. Garmin 60CSx. We also take some data about the environmental factors including the altitude, weather temperature, the soil pH, light intensity and humidity.

## 3. RESULTS AND DISCUSSION

Based on the results from this research obtained , 17 species from the family Zingiberaceae are used as medicinal plant, with the density as follows (Table 1)

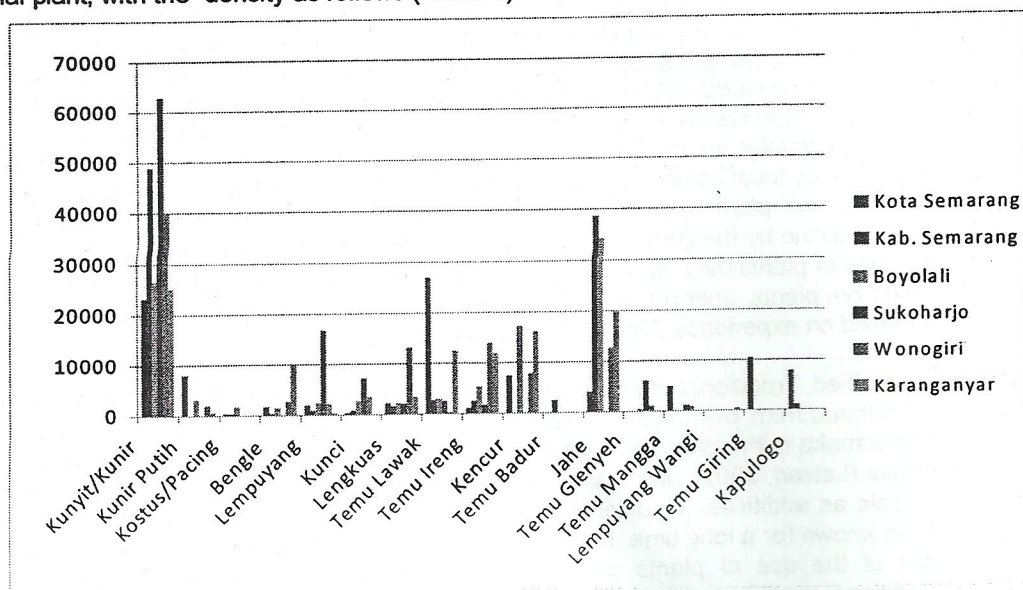


Figure 1. Diagram of the family Zingiberaceae species density per ha.

Family Zingiberaceae in Central Java has been cultivated by the herbal industry, this is evidenced by the central development of medicinal plants in Semarang city, Semarang regency, Boyolali, Sukoharjo Wonogiri and Karanganyar. The data obtained that turmeric/kunyit (*Curcuma domestica*) is commodities most widely planted by the community in Sukoharjo because in the area there are many traditional medicinal plants industry and turmeric as a raw material. Turmeric is also the most widely used by the community for raw material for herbs (*jamu*), spices, seasoning, dyes and traditional medicine.

Ginger/jahe (*Zingiber officinale*) is most prevalent in Semarang district as a suitable place to grow plants for cultivation of ginger, followed by Boyolali, Karanganyar, Wonogiri, and the city of Semarang. In the area research, ginger is not cultivated well, even though the market price is high at Rp 4.000 per kilogram. The prices at the farm level and at the market fluctuates depending on market needs.

Table 1. Table Of usefulness, Rhizome Market Price in Rp (Kg /Species).

No.	Species	Local Name	usefulness	Market Price
1	<i>Alpinia galanga</i>	Lengkuas	Panu drugs, spices, beverages, body warmers	2000
2	<i>Amomum cardamomum.</i>	Kapulogo	spices, beverages.	7000
3	<i>Curcuma aeruginosa</i>	Temu Ireng	appetite, stomach ache	1000
4	<i>Curcuma domestica</i>	Kunyit/Kunir	launched menstruation, diarrhea medicine, spices, beverages, dyes, launched ation, drug appetite, cure wounds, relieve itchy, lowering blood fat and cholesterol levels. Cosmetic raw materials.	1000
5	<i>Curcuma heyneana</i>	Temu Giring	Fertilize woman's womb, warm the body, coloring, body powder.	1250
6	<i>Curcuma mangga</i>	Temu Mangga	cure bruises, cancer drugs,	1000
7	<i>Curcuma petiolata</i>	Temu Badur, temu putri.	mixed herbals, cure bruises (Bobok)	-
8	<i>Curcuma soloensis</i>	Temu Glenyeh	cure bruises, anti jamur.	-
9	<i>Curcuma xanthorrhiza.</i>	Temu Lawak	Increase appetite, drug injury, stiff medicine, beverage, drug lever.	1500
10	<i>Kaempferia galanga</i>	Kencur	Medicine for rheumatism, coughs, influenza, flatulence, colds, ulcers, mouth sores, spices and beverages.	8000
11	<i>Kaempferia pandurata</i>	Kunci	vagina, mouth sores and itching, spices.	1000
12	<i>Kaempferia rotunda</i>	Kunir Putih	Reducing discharge, treat excess stomach acid, diarrhea, cancer.	2000
13	<i>Zingiber amaricans</i>	Lempuyang	Drug stiff, tired / fatigued.	1000
14	<i>Zingiber aromaticum</i>	Lempuyang Wangi	Drug stiff, pegel linu	1000
15	<i>Zingiber cassumunar</i>	Bengle	Obat sawan, tolak balak.	1000
16	<i>Zingiber officinale</i>	Jahe	Body Warm, cold medicines, spices, beverage, cough, abdominal pain, rheumatism, sore throat.	4000
17	<i>Costus speciosus</i>	Kostus/Pacing	contraceptive drug raw materials, diuretic.	1000

Semarang city has the highest density of Temulawak (*C. xanthorrhiza*) followed by Karanganyar district, Semarang, Boyolali, Sukoharjo and Wonogiri. Rhizome production is influenced by environmental factors around the growth. In the lowlands, rhizome production is greater than the plateau. To produce rhizome with high quality and a larger size, you should planted *C. xanthorrhiza* in a protected place. Raharjo (1983) in Kiswanto, *C. xanthorrhiza* can still grow well in places that are open. Rhizomes of Temulawak are used in the traditional medicine to cure liver disease, to increase appetite and beverage. The market price of *C. xanthorrhiza* is Rp 1.500., / kg.

Kencur (*K. galanga*) is a medicinal plant with high market price of Rp 8.000 / Kg. Boyolali and Karanganyar has the highest density, followed by Wonogiri and Semarang. With the high price, the cultivation of Kencur (*K. galanga*) must be optimized in order to become a profitable commodity.

The other plants, Temu Giring (*C. heyneana*) and Kapulogo (*Am. cardamomum*) both plants are found only

in the city of Semarang. Kapulogo has a high market price which is equal to Rp 7000 /Kg. The Community has not realized that may be Kapulogo become a profitable commodity.

The results of the price per hectare are available from (Figure 02). The data in Figure 02 shows that Jahe (*Zingiber officinale*) in Semarang district have the highest sale price, followed by Boyolali, Karanganyar, Wonogiri and Semarang city. Semarang District is the center of production of ginger because a suitable environment for the growth of the ginger plant. Kencur (*K. galanga*) have the highest Market Price/ hectare in Boyolali followed by Karanganyar, Wonogiri and the city of Semarang. Kunyit (*C. domestica*) has a market price is not too high when compared with Jahe (*Z. officinale*). Jahe (*Z. officinale*) also has a similar function for herbs, spices, traditional medicine, food coloring. Temu Glenyeh, Temu Mangga, Temu Badur, Pacing, Temu Kunci,, are the medicinal herbs that less favorable economic potential, although quite large benefits.

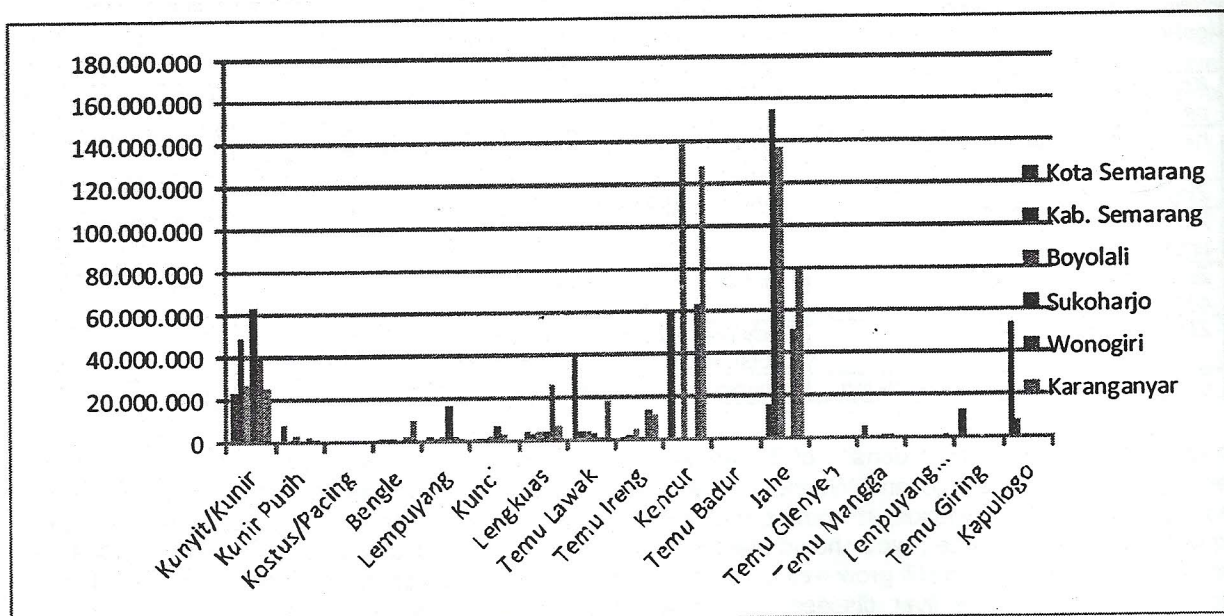
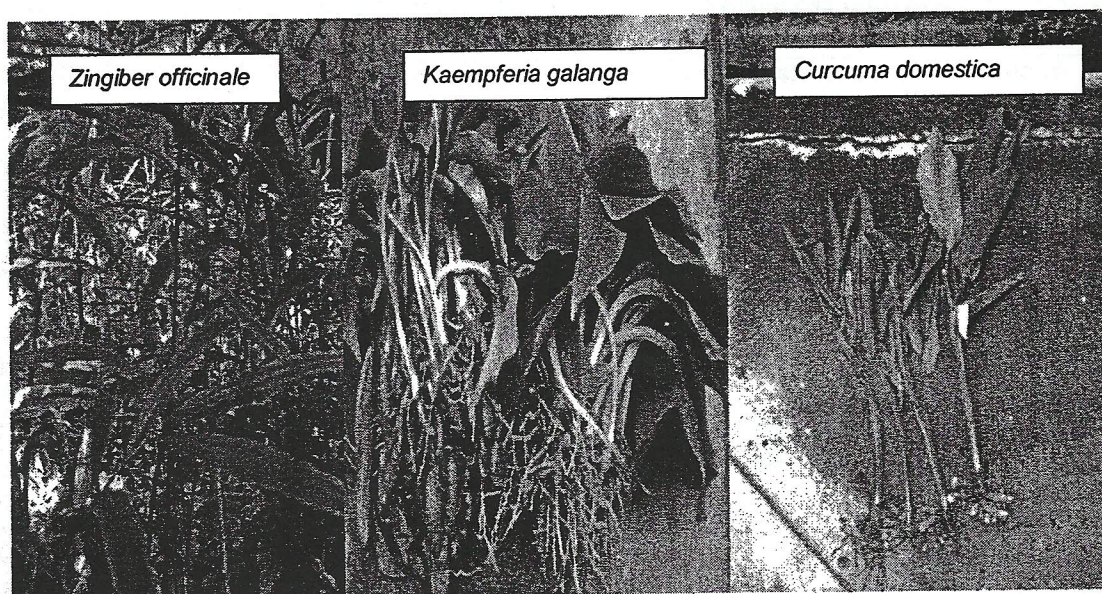


Figure . 2. Diagram Market Price of Medicinal Plants./ hectare.

Bio conservation efforts of medicinal plants has not been done by the local community. Medicinal plants still as a wild plants around houses, vacant land, on the sidelines of plants and on the side of the road. This is due to the low selling price and limited land ownership. The land and field only planted with rice and vegetables. Herbal industry has had own land to provide the necessary medicinal plants by setting up development centers medicinal plants (herbal center).

#### 4. CONCLUSION

Family Zingiberaceae uses as traditional medicine, herbal medicine industry, spices, beverages, body powder, massage, natural dyes and drink health.

Highest density of family Zingiberaceae starting from Kunyit (*C. domestica*), Jahe (*Z. officinale*) and Temulawak (*C. xanthorrhiza*)

Highest usefulness of Family Zingiberaceae and always used by the community are Kunyit (*C. domestica*), Jahe (*Z. officinale*) and kencur (*K. galanga*).

Central Java have a medicinal plant development centers for bioconservation medicinal plants, but it is still necessary for bio conservation effort of medicinal plants from the community

#### ACKNOWLEDGMENT

DIPA Year 2010 Diponegoro University in Semarang that has funded this research.

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