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Ethnopharmaceutical Study of Medicinal Plants in Sumbersuko District, Lumajang Regency

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ABSTRACT

About 400 different ethnic groups in Indonesia (ethnic and sub-ethnic). Traditional medical practices are one example of the kinds of knowledge that have been handed down from one generation to the next in every nation, tribe, and subgroup within those nations. The people who live in the Lumajang Regency continue to have faith in the efficacy of traditional medicine. The practice of traditional medicine or shamans who treat residents around their residences in a number of districts in Lumajang, one of which is the Sumbersuko district, is evidence that this is the case. In the Sumbersuko District, there are a total of eight speakers who continue to uphold traditions related to the use of natural materials in medical practice. Interviews and questionnaires are being used as tools for the descriptive methodology that underpins this research project. According to the findings of this research, there are 37 different species of plants that are used as traditional medicine by the local community in the Sumbersuko District. These plants are categorized into 26 different families, with the Zingiberaceae family containing the most types of plants, including as many as 5 different species of plants. According to the findings of this research, the members of the community in the Sumbersuko District utilize the following plant parts: leaves, rhizomes, bulbs, fruits, skin, seeds, stems, flowers, sap, and all other plant parts. The leaf is the most commonly used component of the plant. To prepare plants for use, they are typically boiled, grated, ground, kneaded, and squeezed before being put to direct use.Keywords: consist of 3-5 words or phrases represent the focus of writing.

Keywords: Ethnopharmaceuticals, herbs, medicinal plants, folk remedies, Sumbersuko

Introduction

Indonesia has about 143 million hectares of tropical rainforest where about 80% of the world's medicinal plants can be found, making Indonesia a “living laboratory”. However, only about 25,000 to 30,000 plants have the potential to be used as medicinal plants, and about 7,500 to 9,000 of these plants have been tested for efficacy and used by the community as medicine. The traditional medicine industry uses about 200 species as raw materials (Dewanti et al., 2021). According to research conducted by the Health Research and Development Agency in 2011,

people who use medicinal plants as traditional medicine to maintain health tend to be over fifty years old. In contrast, younger people tend to use more practical modern medicine (Aryastami & Siahaan, 2018).One approach that can be used to explore the local knowledge of a community regarding the use of plants as medicine is ethnopharmaceuticals. Through this study, it is possible to trace traditional medicinal ingredients, and how they are used as cultural characteristics in a particular community (Ningsih et al., 2016).

Ethnopharmacy is a field of study that examines how cultural customs affect a group of people, especially from a pharmaceutical point of view. Cultural factors that determine, collect, identify, classify, and categorize natural materials used as traditional medicine (ethnobiology), the process of making pharmaceutical preparations (ethnopharmaceutics), the interaction between natural medicine and the body (ethnopharmaceutics), and medical social aspects in society are discussed in ethnopharmaceutical research (Pieronia et al., 2002; Sopiah et al., 2017). "Pharmacy", the field that studies medicines, and 'ethno', which refers to a tribe or group.

The diversity of plants used as traditional medicine can provide references and benchmarks for the world of medicine, especially with the increasingly incessant "back to nature" motto. Traditional medicine was originally known as herbal concoctions, until now herbal medicine is still regulated as an elixir to treat various diseases that have been developed in the modern industry. Knowledge about medicinal plants has different characters in a region (Nurrani L, 2013). Each plant contains several types of compounds that can treat various diseases. However, current research has not achieved satisfactory results. There is a lack of information about which plants are used in medicine in a region, which causes problems in the preservation of traditional medicine. And there are still some areas that have not been studied, such as Sumbersuko sub-district in Lumajang district.

Previous research on ethnopharmaceutical studies has been conducted, and several studies related to the utilization of medicinal plants by certain communities have been found. Ethnopharmacology studies have been conducted on the Tengger community by Hidayat et al (2011) in Senduro Sub-district, Lumajang Regency, specifically in Argosari and Ranupani Villages. Purposive sampling and snowball sampling were the two sampling methods used here. Indigenous village heads and traditional healers were recruited as interview subjects for this study. A semi-structured interview format was used as the data collection method in the meantime. As a result of this study, a total of 26 different diseases have been identified and cataloged. These illnesses have been classified into 8 different categories, which are as follows: diseases affecting the eyes, gastrointestinal tract, oral cavity and mouth, skin diseases, infectious diseases, pain diseases, and other diseases. In addition, thirty families have been assigned to the inventory of fifty-four plant species. The family known as Apiaceae has the greatest diversity of economically important species. In addition, 82 traditional recipes have been documented, and these recipes call for single plants or combinations of plants.

Methodology

During February and April 2022, this research was conducted in one of the villages in Sumbersuko sub-district, Lumajang district. There were a total of several different villages. This type of research is known as semi-quantitative qualitative research. Interviews and questionnaires were used as data collection tools in this research project. In the course of this research, semi-structured interviews that fall under the open-ended category will be conducted. Stationery, digital cameras, and recording devices are among the documentation tools as well as the set of questions used in this research project. While the components are all types of plants utilized in Sumbersuko sub-district, Lumajang district for traditional medicine. At the sampling stage, a combination of purposive sampling technique and snowball sampling approach was used. The researchers in this study used qualitative and semi-quantitative approaches to analyze the data. The ethnopharmaceutical qualitative research step was the first step in the data analysis process. The purpose of this step was to collect information about the plants, including their uses, the plant parts used, and how to combine them. The Use Value (UV), Informant Consensus Factor (ICF), and Level of Fidelity (FL) formulas will be used in the next step, which is the quantitative analysis calculation relating to different types and patterns of utilization.

1. Use Value (UV)

"Use value, also known as UV, provides an indication of the relative importance of locally known plant species. UV is calculated by considering the number of use reports provided by each informant for each species". (Napagoda et al. 2014)

$UV = \sum U/n$

Notes:

UV = Use Value of a Plant Species

U = Number of Informants Who Know/Utilize Per Species

n = Total number of respondents

2. Informant consensus factor (ICF)

"Calculated for each disease category to identify areas of community consensus regarding the types of plants used in the treatment of a particular disease". (Tariq et al. 2014).

$ICF = (Nur-Nt) / (Nur - 1)$

Description:

ICF = Informant Consensus Factor Value

Nur = Number of Plant Species Used for Each Disease Category

Nt = Number of Taxa Used in a Specific Category by All Respondents

3. Fidelity level (FL)

"Fidelity level (FL) is a useful tool for identifying the plants that respondents most prefer to use in the treatment of a particular disease" (Andriamparany et al. 2014).

$FL (\%) = (Np/N) \times 100$

Description:

FL = Fidelity Level Value

Np = Number of Respondents Who Reported the Utilization of Medicinal Plants/Certain Diseases.

N = Total number of respondents who mentioned the same plant for each type of disease.

Result and Discussion

1. Research Results

Sumbersuko sub-district of Lumajang district has 37 plant species. Thanks to research and interviews with 8 local informants, we know which ones are used for traditional medicine. Table 1 lists the plant species.

Table 1: Plant species utilized by the people of Sumbersuko sub-district

No	Family / Common Name / Scientific Name Part used	Part use	Efficacy	How to use	Empirical Dosage
1	Caricaceae/ Papaya Carica papaya Linn.	Leaves	Malaria	Drink the water 3 times a day	3 leaves per 1 meal
2	Myrtaceae/ Guava/ Psidium guajava Linn.	Leaves	Diarrhea	Eaten directly 3 times a day	3 leaves per 1 meal
3	Solanaceae/ Ciplukan/ Physalis angulata Linn.	All parts	Smallpox	Used for bathing in warm water 2 times a day	1 plant per 1 bath
4	Zingiberaceae/ Curcuma longa/ Curcuma xanhthorrhiza (Lin.)	Rhizome	Ulcer and appetite enhancer	Squeezed, then drink the water 3-4 times a day	3 cloves per 1 drink
5	Alliaceae/ Garlic/ Allium sativum Linn.	Tuber	Cholestrol	Cholestrol: eaten directly 1-2 cloves Itching: applied to the itchy part 1-2 cloves	1 clove
6	Piperaceae/ Betel leaf	Leaves	Eye cleanser	Boil and use the water to wash your face 3 times a day	3-4 leaves per 1 face wash
7	Xantorrhoeaceae/ Aloe vera Aloe vera Linn.	Leaves	Deep heat	Boiled and then drink the boiled water 2 times a day	1 stick for every 1 drink
8	Rutaceae/ Lime/ Citrus aurantifolia	Fruit	Cough	Squeezed and added 1 spoon of soy sauce, taken 3 times a day	1 piece for every 1 drink

9	Myrtaceae/ Salam/ Syzygium polyanthum (Wight.)Walpers	Leaves	High blood pressure	Boiled and drunk 2 times a day	5 strands per 1 drink
10	Zingiberaceae/ Red ginger Zingiberis officinale	Rhizome	Fever	Boiled and then drink the water 3 times a day	3 cloves every 1 time
11	Zingiberaceae/ Kencur/ Kaempferia galangal	Rhizome	Diarrhea	Grated and drunk 3-4 times a day	3 cloves per 1 drink
12	Zingiberaceae/ Galangal Alpinia galangal	Rhizome	Cholestrol	Grated and taken 3 times a day	3 cloves per 1 drink
13	Zingiberaceae/ Turmeric Curcuma longa	Rhizome	Ulcer	Grated and taken 3-4 times a day	3 cloves every 1 drink
14	Poaceae/ Lemongrass Cymbopogon citrates	Stem	Flu	Boiled and added sugar to taste and drunk 3-4 times a day	2 stems for every 1 drink
15	Euphorbiaceae/ Cassava/ Manihot esculenta crantz	Rhizome	Bloody bowel movements	Grated and water + 1 spoon of sugar is taken 3 times a day	1 seed per 1 drink
16	Pandanaceae Pandanus Pandanus amaryllifolius Roxb.	Leaf	Blood-lowering	Boil and drink the water 2 times a day morning and night	3 strands for every 1 drink
17	Arecaceae/ Coconut Cocos nucifra L.	Fruit	Fever	Take the water, drink it 3-4 times a day	1 fruit for 1 drink
18	Clusiaceae/ Mangosteen/ Garcinia mangostana L.	Skin	Poisoning	Peel off the skin. Boil and add 1 teabag. Add sugar. Drink 3 times a day	1-2 pieces for every 1 drink
19	Moringaceae/ Kelor Moringa oleifera L.	Leaves	Rheumatism	Take 1-2 tablespoons of powdered moringa leaves, brew, add sugar drink 2 times a day	5 sprigs
20	Ammonaceae/ Sirsak/ Annona muricata L.	Leaves	Cancer	Boil soursop leaves, put in a glass and drink 3 times	5 leaves per 1 drink

				a day.	
21	Phyllantaceae/ Meniran/ Phyllanthus urinaria L.	Whole part	Diabetes	Boil with 3 cups of water until boiling. Take the water and drink it 2-3 times a day	3 leaves per 1 drink
22	Bayam-bayaman/ Amaranthaceae/ Bayam/ Amaranthus L.	Leaves	Fever	Boiled and then squeezed. Take the water drunk 2 times a day	5 stalks every 1 drink
23	Fabaceae/ Asam jawa/ Asam jawa/ Tamarindus indica L.	Fruit	Rheumatism	Boil tamarind, add sugar. Strain and pour into a glass. Drink 2-3 times a day	2 seeds per 1 drink
24	Apiaceae/ Pegagan/ Pegagan/ Centella asiatica L.	Leaves	Wet lung	Take half a teaspoon of dried gotu kola leaves, add hot water to a glass. Strain, drink 3 times a day.	Half a spoonful of dried gotu kola leaves per 1 drink
25	Euphorbiaceae/ Jarak pagar/ Jarak pagar/ Jatropha curcas L.	Leaves,	Improves menstruation	Squeeze the leaves and stems, put the sap on the affected area 1-2 drops, then cover with cotton. Drip 2 times a day	1 leaf per 1-time use
26	Leguminosae/ Putri malu/ Mimosa pudica L.	Sap	Asthma	Boil a handful of leaves of putri malu with one or two glasses of water. Strain and drink the water twice a day.	(1-2 drops of sap)
27	Amarilisaceae/ Amarilisaceae Bawang merah/ Allium ascalonicum L.	Leaves	Ulcer	1. Peel 1 clove, boil and then strain the boiled water into a glass. Drink 2 times a day	A handful of leaves of putri malu for one drink

28	Euphorbiaceae/ Patikan kebo/ Euphorbia hirta L.	Tuber	Thrush	Dry one handful of patikan kebo leaves, boil until boiling then drink the water 2 times a day	1 clove
29	Acanthae/ Keji beling/ Sericocalyx crispus L.	Leaves	Itching	Boil some keji beling leaves until boiling. Then put the boiled water in a glass, drink it 2 times a day.	1 handful of leaves for 1 drink
30	Ranunculaceae/ Jinten hitam/ Nigella sativa L.	Leaves	Coughn Rhematik	Take 1-2 spoons of black cumin, boil with water until boiling. Strain, put in a glass, drink 2-3 times a day.	1-2 spoons
31	Lamiaceae/ Kumis kucing/ Orthosiphon aristatus	Leaves	Gout Kidney stones	Boil cat whisker leaves. Put the boiled water in a glass. Drink 3 times a day	3 leaves for 1 drink
32	Euphorbiaceae/ Yodium / Jatropa multifida	Seeds	Wounds	Take iodine stems, cut until the stems release sap, apply the sap on the wound 2-3 times a day	1 stick for every 1 dose
33	Poaceae/ Tebu Ireng/ Saccharum officinarum Linn.	Leaves	Fever Cough Diarrhoea	Squeeze sugar cane to release water then drink 3 times a day	1-2 stems for one drink
34	Rubiaceae / Mengkudu/ Morinda citrifolia	Sap	Lower blood pressure	Grate three noni fruits. Brew grated noni fruit with boiled water and strain. Drink once a day	3 fruits for every 1 drink
35	Musaceae / Musaceae Pisang kayu/ Musa paradisiacal	Stem	Lower bad cholesterol and lower blood	Steam some bananas, peel the skin, eat 3 times a day	2-3 bananas per 1-time consumption

			pressure		
36	Fabaceae/ Petai cina/ Leucaena leucocephala	Fruit	Scratches	Pound 1 handful of Chinese petai seeds, apply to wounds 2 times a day.	1 handful of Chinese petai for 1 treatment
37	Oxalidaceae/ Belimbing wuluh/ Averrhoa bilimbi	Fruit	Cough	Take a handful of star fruit flowers. Boil with water until it boils. Put in a glass. Drink 2 tablespoons 2 times a day	1 handful for 1 time processing

Plant Utilisation Based on the Method of Obtaining

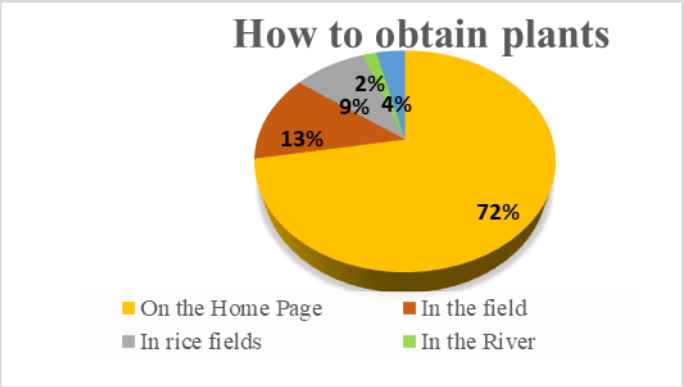

Figure 1. Diagram of how to obtain plants by the Sumbersuko community

Of the various types of plants used in traditional medicine, it can be concluded that cultivation is the way that produces the most plants, which is 51% of the total. In addition, up to 35% are obtained from gardens, and the remaining 75% are obtained from forests up to 14%. Since it is a type of plant that is used as a daily kitchen spice by the people in Sumbersuko Sub-district, Lumajang Regency, this plant is quite easy to find around their neighbourhood.

Plant Utilisation Based on Processing Method

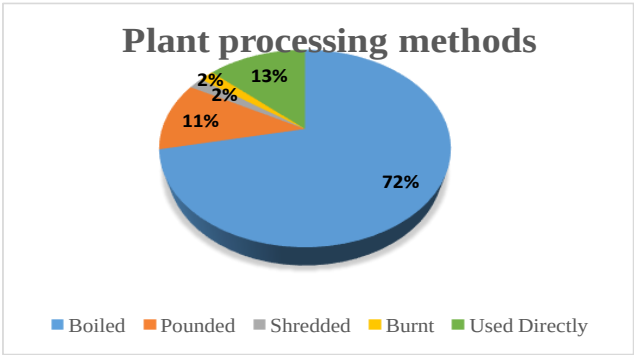

Figure 2. Diagram of plant processing by the Sumbersuko community

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The most common processing method carried out by the people of Sumbersuko Subdistrict is by boiling, which is 59%. Furthermore, by being grated as much as 16%, squeezed as much as 3%, used directly as much as 11%, squeezed as much as 5%, steamed as much as 3%, and pounded as much as 3%.

Plant Utilisation Based on the Part of the Plant Used

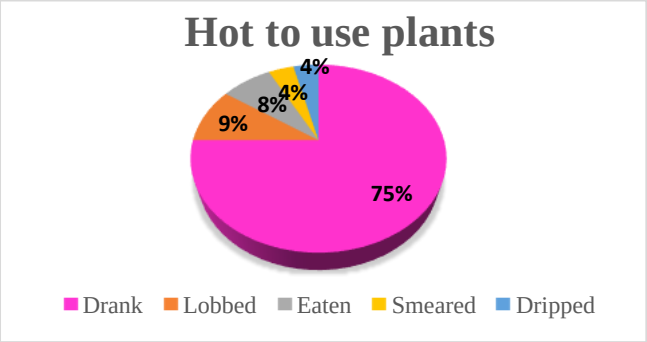

Figure 3. Diagram of plant parts used by the Sumbersuko community

People in Sumbersuko Sub-district utilised the leaves of the plant the most, which was 41% of the total plant utilisation. In addition, one sixteenth of one per cent of the plant's rhizomes, one quarter of its fruits, five per cent of its tubers, five per cent of its seeds, five per cent of its stems, five per cent of its sap, three per cent of its flowers, and three per cent of all its parts are poisonous. This is due to the fact that removing the leaves from the plant actually has little impact on the plant's ability to survive. In addition, processing the leaves is simpler than processing other parts of the plant, and the resulting product has superior properties (Kasrina and Veriana, 2014, p. 357).

Plants used as traditional medicine by the community in Sumbersuko Sub-district, Lumajang District can be categorised into a total of 26 families, with the Zingiberaceae family containing the most plant species (five different plant species), determined from the findings of interviews conducted with eight different informants. There were 37 plant species found in home gardens or cultivated in front yards. There were also some plant species that were obtained by the community from outside the village or sub-district yard.

Plant parts used in medicine can be seeds, stems, fruit, leaves, flowers, sap, skin, rhizomes, all parts of the plant and tubers. Plant parts taken leaves as many as 15 types, plant parts taken rhizomes as many as 6 types, plant parts taken tubers as many as 2 types, plant parts taken fruit as many as 5 types, plant parts taken skin as many as 1 type, plant parts taken seeds as many as 2 types, plant parts taken stems as many as 2 types, plant parts taken flowers as many as 1 type, plant parts taken sap as many as 2 types, and plant parts taken all parts as many as 2 types.
People in Sumbersuko sub-district, Lumajang district, utilise leaves of up to 15 types, mostly for traditional medicine. Judging from the parts of the plant used for traditional medicine, it seems that the leaves are the most widely used. This is because leaf collection does not significantly damage the plant's ability to survive.

The plant will not be harmed if the leaves are removed for medical purposes as it can easily grow back. In addition, processing the leaf component is simpler compared to processing other plant parts and offers superior yields (Kasrina and Veriana, 2014. p. 357). One of the strategies for conservation of medicinal plants is to utilise the leaves of the plant. Plant survival is not affected by the use of leaves for medicinal purposes. The use of plant elements such as roots, stems, bark, and tubers in medicine must be minimised because it can cause the plant to die (Elfirda, 2017). According to the results of the study, plants used as traditional medicine by the community in Sumbersuko Sub-district, Lumajang District are cultivated, collected from nature in the surrounding forest, and planted in the home yard. In the house yard, there are 13 different types of plants. In the forest around the settlement, there are 5 different types of plants. There are 19 species of plants planted.

According to the types of plants used as traditional medicine that are often used by respondents, these plants are quite easy to find in the neighbourhood or are widely planted, and are also the types of plants commonly used by the community in Sumbersuko Sub-district, Lumajang Regency as spices. As a result, people often choose conventional medicine because it is affordable and easy to obtain. In addition, common illnesses that affect individuals on a regular basis often include fever, cough, and diarrhoea.

People in Sumbersuko sub-district, Lumajang district, use 22 types of jamu that are processed by boiling in various ways. In Sumbersuko sub-district of Lumajang district, jamu is grated, pounded, squeezed, and pressed. Six plant species are grated, one is squeezed, and two are ground. Two classes of plants are used directly: those treated with drinking water and those whose sap is ingested. Fruit processing plants can be frozen or steamed.

Rhizomes, leaves, stems, roots, bark, fruits, and sap are incorporated. This investigation centred on the leaves. Kasrina and Veriana found that the plant quickly recovered from the damage caused by harvesting the leaves for medicinal purposes (2014, p. 5). Leaves contain chlorophyll, potassium compounds, phenols, and essential oils. The fine fibres of the leaves facilitate the extraction of medicinal chemicals (Handayani, 2003). According to Elfrida, each person uses medicinal plants differently (2017, p.23), some are learned from doctors, some are inherited.

Each community group may have different levels of knowledge about the utilisation and management of plant species diversity, partly due to variations in cultural sophistication and regional environmental factors. Each ethnic group has a considerable amount of knowledge about the different types of beneficial plants that grow in their neighbourhood, according to observations made in different parts of Indonesia. However, the percentage of recognised advantages used in daily life is less than 10%. (Rahayu et al. 2012).

Conclusion

Utilisation of medicinal plant species used by the community in Sumbersuko District, Lumajang Regency, in addition to being used as kitchen spices, these plants are also able to be used as traditional medicinal plants. In Sumbersuko Subdistrict, Lumajang Regency, researchers found as many as 37 species of medicinal plants

grouped into 26 families. These plants are utilised by the local community to make various medicines. Leaves, rhizomes, tubers, fruits, skins, seeds, stems, flowers, sap, and all parts of the plant are utilised by the community in Sumbersuko District, Lumajang Regency for medicinal purposes. In this study, the leaves have been utilised more than other parts. People living in Sumbersuko sub-district, Lumajang district, process medicinal plants in various ways. Some of these methods include boiling the plants, grating them, mashing them, kneading them, squeezing them, and using them directly. There are 22 different types of plants that can be processed by boiling. In Sumbersuko sub-district, Lumajang district, there are many medicinal plants. These plants can be consumed in various ways, including by drinking, smearing, dripping, or eating them directly. The community in Sumbersuko Sub-district, Lumajang Regency applies empirical measurements in the form of per piece, per hand, per stem, per clove, and per fruit. In addition, they also use the terms 'per piece' and 'per hand'. The empirical dosing method has the disadvantage of being less accurate than other methods.

Declaration of Competing Interest

The authors emphasise that there are no personal, financial or commercial interests that could influence the results of the study. In other words, this research was conducted independently and objectively, without any involvement of sponsors, companies, or other parties that could cause bias in the research.

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