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Identification and utilization of medicinal plants in the village of the Kesatuan Pemangkuan Hutan (KPH) Saradan, Madiun

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Article Information	ABSTRACT
	The diversity of plants in Indonesia means that many plants have the potential to be used as medicine by the community. Because of its potential as a medicine, many people do not know about it, so it is important to study it. The use of medicinal plants by the community has been passed down from generation to generation, so there is still a lack of documentation regarding the use of medicinal plants. This study aims to identify medicinal plants in the Saradan Kesatuan Pemangkuan Hutan (KPH) area as well as the utilization of plants that are often used as medicine by the community in the Saradan KPH area. The research was conducted in March 2022. Ethnobotanical data were collected using the roaming method and the structured interview method using ethnobotanical interview sheets. Identification of medicinal plants using the help of books on medicinal plants by Widyaningrum. The selection of respondents was carried out randomly, according to the study, which documented 32 species of medicinal plants from 18 families. The most commonly found families of medicinal plants are the Zingiberaceae and Euphorbiaceae families. The leaves are the most useful part of the plant. and the method of treatment with medicinal plants is mostly done by boiling and pounding. The medicinal plant diversity documented in KPH Saradan village is 32 species. *Ocimum basilicum* L., *Alpinia Galanga* L. Willd., *Zingiber officinale* Rosc., and *Curcuma domestica* Val. medicinal plants that are most widely used by the community around KPH Saradan. **Keywords:** Ethnobotany; identification; medicinal plants
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INTRODUCTION

Indonesia is a country that has a very abundant diversity of plants. The biodiversity of an area is very important in forming the characteristics of that area. Indonesia is estimated to have 30,000 plant species that are very likely to be used to meet people's needs (Batlajery et al., 2022). The needs of the

Indonesian people for plants include food, clothing, potential medicinal ingredients, and materials used in traditional ceremonies (Oktafiani, 2018). The abundant diversity of plants has the potential to be utilized by the community in various ways, one of which is as a potential medicinal ingredient (Köberl et.al, 2011).

Plants with potential medicinal ingredients are plants used as ingredients that have properties to cure disease (Shakya, 2016). The use of potential medicinal ingredients in Indonesia has long been known and widely practiced by the local community, but this knowledge has not been well documented (Julung et al., 2018). Indonesia has 9,600 species of plants that are efficacious as medicinal ingredients from 30,000 plant species, and approximately 300 species have been used as medicinal ingredients by the traditional medicine industry (Slamet & Andarias, 2018). Only a few medicinal plants are used in the traditional medicine industry. The return to nature movement is being developed again, especially in the use of medicinal plants. This is because medicinal plants have a minimal negative impact. World Health Organization (WHO) also supports the "return to nature" movement by recommending the use of medicinal plants for public health maintenance, prevention, and treatment of various diseases (Andriani et al., 2022). Medicinal plants are positioned as ingredients that contain antioxidants (fight free radicals), immunomodulators (boost the immune system), and degenerative agents (Maldonado et al., 2022). This situation adds to the need for awareness about the use of medicinal plants through ethnobotanical studies. The village community is aware of the use and application of medicinal plants based on what their parents, who are still accustomed to using medicinal plants, are aware of. In that village, there are still many people who depend on medicinal plants to cure ailments such as coughs, colds, diarrhea, and flatulence, they prefer not to go to the doctor.

Ethnobotany is the science that studies the use of plants by certain tribes to meet their needs for clothing, food, shelter, and medicine (Suprianto & Prayogo, 2018). Currently, ethnobotanical studies are considered a very important study to carry out because many medicinal plants are not yet known and recorded, so exploration activities are needed to record, protect, and preserve existing medicinal plants, as traditional knowledge and intellectual property of the community (Widiastuti et al., 2017). At the moment, it is recognized that many plants have gone extinct before being recognized, either due to natural conditions or by the community, as well as the use of plants by rural communities, which are considered backward and may have gone extinct before being recognized by the community. researchers because their knowledge is oral and passed down from generation to generation. One of the previous studies, namely research Esa et al. (2017) carried out an ethnobotanical study on Lake Buyan, Bali by explaining the diversity of medicinal plants through tables regarding scientific names, parts used, and how to use them, but this research has not included several pictures of the identified plants. The research instruments used were interview tables and plant identification tables. The purpose of conducting ethnobotanical studies is to increase public knowledge about medicinal plants, improve public health and welfare (Eko Atmojo, 2015). The ethnobotanical study conducted in Indonesia is unique because the wealth of medicinal plants in Indonesia is very abundant, so many plants around it can be used as medicine. Thus, this study aims to identify medicinal plants in the Saradan Kesatuan Pemangkuan Hutan (KPH) area as well as the utilization of plants that are often used as medicine by the community in the Saradan KPH area.

RESEARCH METHODS

This type of research is called exploratory descriptive research. The research was started by conducting site surveys, interviews, and plant identification. The research was conducted on April 25-30 2022 in 3 villages in the Saradan sub-district. The research was conducted in the villages of Sukorejo,

Sidorejo, and Klumutan (Figure 1). Sukorejo Village has an area of 3.60 km2, Sidorejo Village has an area of 5.00 km2, and Klumutan Village is 6.12 km2. This area was chosen as the research location because the village is in the vicinity of the Saradan KPH area, and besides that, the village community still uses medicinal plants and even cultivates them individually.

Figure 1. Research Location

The research instrument used was an interview guide to make it easier to analyze interviews. The population in this study is the population of medicinal plants and the population of the village community in the KPH Saradan area. The medicinal plant population is identified based on their families and habits, whereas the people in the Saradan KPH area are the people of Sukorejo, Sidorejo, and Klumutan Villages. The samples used in this study were medicinal plant samples and community samples. Samples of medicinal plants, namely plants found using the roaming method according to the route determined and identified, while the community sample, namely 30 people, is the minimum number to collect basic data on people's views about their environment Wakhidah & Sari (2019) to find out about ethnobotanical studies of medicinal plants in the area.

The process of documenting and identifying plants is done by roaming method. During the roaming method, plants are identified according to the morphological characteristics found and a documentation process is carried out. For plants whose names are not known with certainty, further identification is carried out with books and literature related to these plants. Structured interviews with an interview guide were used to collect data for the ethnobotanical study of medicinal plants. There are 10 questions. The interview guide used contains plants used by the community. The number of respondents used was 30 people, taken based on Wakhidah & Sari (2019) which state that 30 people is the minimum number to collect basic data on people's views about their environment.

Data analysis using qualitative and quantitative analysis. Qualitative analysis was carried out by grouping plants based on their botanical families, identifying their habits, identifying the parts used, and summarizing the ways of using medicinal plants. Quantitative analysis was carried out by calculating the percentage of the UV value of each plant. Use value is used to determine the plants used by the community using the Use Value Index (UV) formula. The Use Value Index (UV) of medicinal plants can be calculated using the following formula (Esa et al., 2017).

$$UV = \sum Ui/n$$

Information

Ui   : The number of knowledgeable informants
n   : The number of respondents

FINDING AND DISCUSSION

In this study, 32 species from 18 families of medicinal plants were found that were used by local people in the villages of Sukorejo, Sidorejo and Klumutan (Figure 2). Based on observations, the species found are plants that are deliberately cultivated by the community and some plants that grow wild. This is in accordance with the results (Wahidah & Husain, 2018) according to which most of these traditional medicinal plants have been cultivated in a limited way in their respective yards and some still grow wild in the fields or on the roadside. Most of the medicinal plants found were plants commonly used by the community. Some plants have medicinal potential, are widely used as cooking ingredients.

Figure 2. Potential Medicinal Plants Found in the Villages of Sukorejo, Sidorejo, and Klumutan
(1) *Annona muricata*; (2) *Plumeria rubra*; (3) *Amorphophallus muelleri*; (4) *Aloe vera*; (5) *Elephantopus scaber*; (6) *Plunchea indica*; (7) *Carica papaya*; (8) *Jatropha curcas*; (9) *Jatropha multifida*; (10) *Manihot utilissima*; (11) *Phyllanthus urinaria*; (12) *Sauropus androgynus*; (13) *Ocimum basilicum*; (14) *Orthosiphon aristatus*; (15) *Syzygium aqueum*; (16) *Psidium guajava*; (17) *Syzygium polyanthum*; (18) *Swietenia mahagoni*; (19) *Moringa oleifera*; (20) *Averrhoa bilimbi*; (21) *Pandanus tectorius*; (22) *Piper betle*; (23) *Cymbopogon nardus*; (24) *Morinda citrifolia*; (25) *Paederia scanden*; (26) *Citrus aurantifolia*; (27) *Alpinia galanga*; (28) *Boesenbergia pandurate*; (29) *Curcuma domestica*; (30) *Curcuma zedoaria*; (31) *Kaempferia galanga*; and (32) *Zingiber officinale*

The plants found consisted of 18 families including *Zingiberaceae, Euphorbiaceae, Myrtaceae, Asteraceae, Lamiaceae, Rubiaceae, Annonaceae, Apocynae, Araceae, Asphodelaceae, Caricaceae, Meliaceae, Moringaceae, Oxalidaceae, Pandanaceae, Piperaceae, Poaceae,* and *Rutaceae. The most common families were Zingiberaceae, Euphorbiaceae,* and *Myrtaceae.* For more details, the species found in each family can be seen in Table 1. The *Zingiberaceae* family is abundant in this area because the plants are easy to grow and several plant species are also widely used (Jadid et al., 2020). The most widely used *Zingiberaceae* species are *Alpinia galanga, Curcuma domestica,* and *Zingiber officinale.* The *Euphorbiaceae* family found are mostly plants that grow wild around. How many plants were found, namely *Jatropha curcas, Sauropus androgynus, Jatropha multifida.* The *Myrtaceae* family found were plants that were deliberately planted. Some of the plants found were *Psidium guajava, Syzygium aqueum,* and *Syzygium polyanthum.*

Table 1. Number of Plant Species Found in Each Family and Habits

Family	Name of Species	Local name	Habitus
Annonaceae	*Annona muricata* L.	Sirsak	Tree
Apocynae	*Plumeria rubra* L.	Kamboja	Herbs
Araceae	*Amorphophallus muelleri* Blume	Porang	Herbs
Asphodelaceae	*Aloe vera* L.	Lidah buaya	Herbs
Asteraceae	*Elephantopus scaber* L.	Tapak liman	Herbs
	Plunchea indica L.	Beluntas	Bushes
Caricaceae	*Carica papaya* L.	Pepaya, Kates	Bushes
	Jatropha curcas L.	Jarak pagar	Shrubs
	Jatropha multifida L.	Jarak tintir	Shrubs
Euphorbiaceae	*Manihot utilissima* Pohl.	Ketela pohon	Shrubs
	Phyllanthus urinaria Linn.	Meniran	Bushes
	Sauropus androgynus (L.) Merr	Katuk	Shrubs
Lamiaceae	*Ocimum basilicum* L.	Kemangi	Herbs
	Orthosiphon aristatus (Bl.) Miq	Kumis kucing	Herbs
	Syzygium aqueum Burn. f. Alston	Jambu air	Shrubs
Myrtaceae	*Psidium guajava* Linn	Jambu biji, Jambu kluthuk	Shrubs
	Syzygium polyanthum (Wight.) Walp.	Salam	Tree
Meliaceae	*Swietenia mahagoni* Jacq.	Mahoni	Tree
Moringaceae	*Moringa oleifera* Lam.	Kelor	Shrubs
Oxalidaceae	*Averrhoa bilimbi* L.	Belimbing wuluh	Tree
Pandanaceae	*Pandanus tectorius* Parkinson ex Du Roi	Pandan	Shrubs
Piperaceae	*Piper betle* L.	Sirih	Lianas
Poaceae	*Cymbopogon nardus* (L.) Rendle	Sereh	Bushes
Rubiaceae	*Morinda citrifolia* L.	Mengkudu, Bentis	Tree
	Paederia scanden (Lour.) Merr	Sembukan, Daun kentut	Lianas
Rutaceae	*Citrus aurantifolia* Swingle.	Jeruk nipis	Shrubs
Zingiberaceae	*Alpinia galanga* L. Willd.	Laos, Lengkuas	Herbs
	Boesenbergia pandurate Roxb	Temu Kunci	Herbs
	Curcuma domestica L.	Kunyit, Kunir	Herbs
	Curcuma zedoaria (Christm.) Rosc	Kunyit putih	Herbs
	Kaempferia galanga Linn.	Kencur	Herbs
	Zingiber officinale Rosc.	Jahe	Herbs

There are 32 species found, 20 can be found in Sukorejo village, 23 in Sidorejo village and 32 in Klumutan village (Table 2). The species found in the three villages are not much different. This is due to several things, namely (1) Klumutan village has a wider area than other villages, (2) Klumutan village still

has many people who grow and use medicinal plants, (3) the Sidorejo village area has a lot of rice fields, and (4) the people of Sukorejo village do not grow and use medicinal plants. The results showed that the habitus of medicinal plants was dominated by herbs, shrubs, trees, bushes and lianas. The plants found were dominated by shrubs. Herbs are plants that have little (no) woody tissue, and have wet trunks because they contain lots of water and are scattered in groups, as individuals, or in solitary forms. The herbaceous plants found were *Alpinia galanga, Zingiber officinale, Curcuma domestica, Orthosiphon aristatus*, and *Ocimum basilicum*.

Table 2. Medicinal Plants Found in Villages

Species Name	Village Name		
	Sukorejo	Sidorejo	Klumutan
Annona muricata L.	✓	✓	✓
Plumeria rubra L.	✓	✓	✓
Amorphophallus muelleri Blume	-	-	✓
Aloe vera L.	✓	✓	✓
Elephantopus scaber L.	✓	✓	✓
Plunchea indica L.	-	✓	✓
Carica papaya L.	✓	✓	✓
Jatropha curcas L.	✓	✓	✓
Jatropha multifida L.	-	✓	✓
Manihot utilissima Pohl.	✓	✓	✓
Phyllanthus urinaria Linn.	✓	✓	✓
Sauropus androgynus (L.) Merr	-	-	✓
Ocimum basilicum L.	✓	✓	✓
Orthosiphon aristatus (Bl.) Miq	-	-	✓
Syzygium aqueum Burn. f. Alston	-	✓	✓
Psidium guajava Linn	✓	✓	✓
Syzygium polyanthum (Wight.) Walp.	✓	✓	✓
Swietenia mahagoni Jacq.	✓	-	✓
Moringa oleifera Lam.	✓	-	✓
Averrhoa bilimbi L.	-	✓	✓
Pandanus tectorius Parkinson ex Du Roi	✓	✓	✓
Piper betle L.	✓	✓	✓
Cymbopogon nardus (L.) Rendle	✓	✓	✓
Morinda citrifolia L.	-	-	✓
Paederia scanden (Lour.) Merr	-	-	✓
Citrus aurantifolia Swingle.	✓	✓	✓
Alpinia galanga L. Willd.	-	✓	✓
Boesenbergia pandurate Roxb.	-	✓	✓
Curcuma domestica L.	✓	✓	✓
Curcuma zedoaria (Christm.) Rosc	-	-	✓
Kaempferia galanga Linn.	✓	-	✓
Zingiber officinale Rosc.	✓	✓	✓
Total	**20**	**23**	**32**

The utilization of plants as traditional medicine can be in the form of whole parts of plants or only limited to certain parts (Slamet & Andarias, 2018). The plant parts commonly used are the leaves, stems, roots, and fruit. From the results of research conducted, the plant parts used as medicine are leaves, fruit, rhizomes, roots, bark, gel, sap, seeds, and tubers (Figure 3). The most widely used part of the plant is the leaves. The leaves are the most widely used because the leaves are easy to obtain and easier to process into traditional medicinal plants (Fikayuniar et al., 2019). Part of the plant as an ingredient of traditional medicine is carried out only based on knowledge passed down from generation to generation.
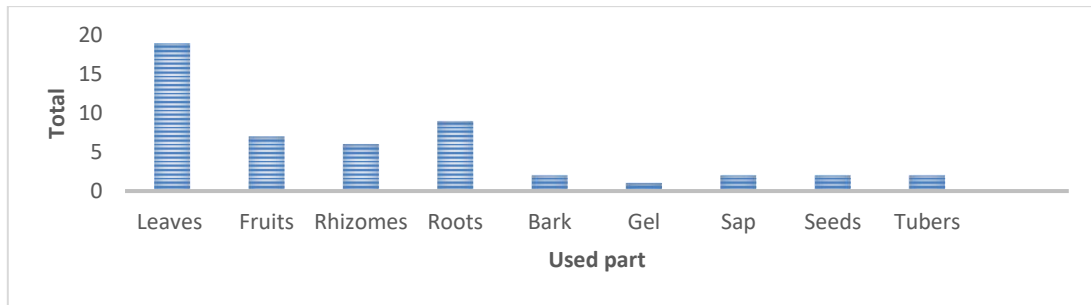
Figure 3. How to use medicinal plants

Medicinal plants used by the community have several methods of treatment. The method of treatment is carried out following the habits that have been passed down from generation to generation. The method of treatment with medicinal plants is done by boiling the plants, pounding them, eating them directly, smearing them, squeezing them, drying them, and making flour (Figure 4). Making flour is only done on porang tubers. Plants that are smeared, such as Aloe vera, are applied to external wounds. The processing method as medicine is mostly done by pounding and boiling.
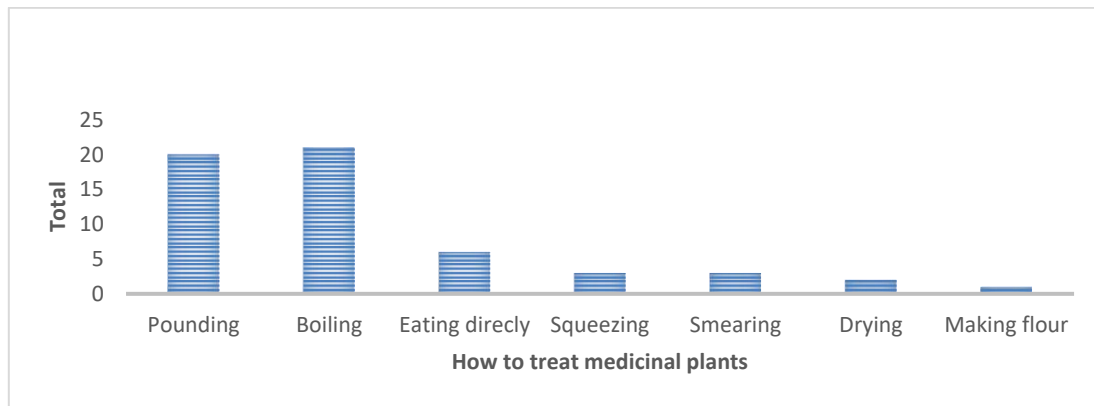

Figure 4. How to treat using medicinal plants

The use of medicinal plants has been carried out for generations. Diseases that are commonly experienced are aches, flu, colds, chills, and headaches. The use value index calculation is used to calculate the number of plant uses carried out by the respondents. Plants that have a high use value index (UV) mean that the use of these plants is widely used by the community. Plants with the highest UV value were *Ocimum basilicum* L. with a value of 1.00, *Alpinia Galanga* L. Willd. with a value of 0.50, *Zingiber officinale* Rosc. and *Curcuma domestica* Vall. with a value of 0.33. Medicinal plants that have the lowest UV value with a value of 0.00 include *Amorphophallus muelleri* Blume, *Elephantopus scaber* L., and *Syzygium aqueum* Burm. f. Alston. This is because plants that have high UV are easy to cultivate, widely used by the community, and the habits of people who grow medicinal plants while plants with low UV usually grow and are planted around but in their use as medicinal plants are less known by the public.

Environmental factors, both biotic and abiotic affect plant growth (Fiqa et al., 2021), from the people who carry out the maintenance and utilization of medicinal plants so that there are still many medicinal plants in the area. The *Ocimum basilicum* L. plant is used by the local community to reduce body odor. According to Widyaningrum & Alternatif (2019), the *O. basilicum* is used as a remedy for heartburn, heat, bad breath, and body odor. Fresh *O. basilicum* leaves can be eaten as a side dish. In addition to being useful as a medicine, it is also useful as a food ingredient. *Alpinia galanga* L. Willd. used by the local community as medicine or as a food additive, is a medicinal plant *Alpinia galanga* is used to increase

appetite, treat rheumatism, spleen pain, and follow sexual arousal in accordance with Kurnia (2019) which states it can help increase appetite, give flavor to food. and clear the throat. At present, people use galangal rhizomes as a cooking spice, this is due to people's ignorance of the medicinal properties of its rhizomes (Adawiyah, 2020).

Zingiber officinale Rosc. It is used by local people as a medicine for flatulence, coughs, to arouse appetite, heartburn, itching, wounds, and to warm the body. According to Syaputri et al. (2021) said that ginger is efficacious as a medicine for colds, boosts the immune system , helps to lose weight, relieves nausea, relieves pain, and detoxifies the body from toxins. People usually take *Z. officinale* Rosc. by pounding it coarsely and then brewing it with hot water. According to Syaputri et al. (2021), the *Z. officinale* plant is widely used as herbal medicine because ginger contains many substances that are good for health such as carbohydrates, fat, protein, fiber, sugar and several vitamins and minerals. The *Curcuma domestica* L. plant is widely used by the local community for stomach aches, fever, menstrual pain, and wound healing in accordance with which states that turmeric can cure fever and pain because turmeric is a plant that contains curcumin compounds that have fever-reducing properties (antipyretic). Turmeric has the potential to replace paracetamol to reduce fever which has fewer side effects.

Based on the results of interviews, the community deliberately cultivates medicinal plants for daily use. People have continued to use medicinal plants because they have been passed down from generation to generation, and some of the plants used have the ability to heal or reduce pain. According to Utami et al. (2019), public knowledge about the various types of medicinal plants and their treatment procedures is passed down through generations, as well as personal experience among the community. The excessive use of medicinal plants is considered safer than the use of modern medicine. This is because traditional medicinal plants have relatively fewer side effects than modern medicines (Sumayyah & Salsabila, 2017), but they also have drawbacks, namely that in using them people do not know the correct dosage, only using enough. Medicinal plants that are not used properly can also cause greater side effects. According to one respondent, because they did not know the appropriate dosage, they were afraid to use medicinal plants, fearing that the disease would not be cured and would have worse side effects. According to Sumayyah & Salsabila (2017), medicinal plants that are used in the right way will have small side effects including a) The correctness of the drug (must be able to correctly distinguish the function of the medicinal plants used because in Indonesia there are many types of medicinal plants which are sometimes difficult to differentiated), b) Accuracy of dosage (as is the case with factory-made drugs, the use of medicinal plants must adjust the dosage by comparison), c) Timeliness of use (consumed at the right time to minimize side effects, for example, turmeric plants are used to reduce pain but if consumed early in pregnancy cause miscarriage), d) Accuracy of how to use (Not all medicinal plants are consumed in the same way must be adjusted, for example amethyst treatment method by smoking, but there are those who use it by brewing it will cause drunkenness), e) Accuracy of seeking information (currently information is increasingly many obtained, but because of the amount of information need foresight u to find out valid information), f) Do not misuse (you may not use medicinal plants for other purposes as medicine), g) The correct selection of drugs for certain diseases (because one type of medicinal plant has more than one active substance, its use must be balanced between efficacy and side effects.

CONCLUSION

The results showed that the people in the 3 locations still cultivate and use medicinal plants. The results of the research in Klumutan Village were 32 species, Sidorejo Village had 23 species, and Sukorejo

Village had 20 species. The identification of plants in the three research locations yielded 32 species from 18 different families. Plants consist of 12 types of herbaceous plants, 4 types of Bushes, 9 types of shrubs, 2 types of lianas, and 5 types of trees. The plants most frequently found by researchers were the Zingiberaceae family (6 species) and Euphorbiaceae (5 species). The plant most commonly used by the community with the highest UV value is *Ocimum basilicum* L. The plants with the lowest UV are *Amorphophallus muelleri* Blume, *Elephantopus scaber* L., and *Syzygium aqueum* Burn. F. Alston. Related to the results of the research, it is hoped that the community will continue to cultivate and use medicinal plants in a sustainable manner, and that the management of medicinal plants is not only used traditionally but is also carried out with hygienic management.

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