



Ethnobotanical Study on Medicinal Plants in Sesaot Forest, Narmada, West Lombok, Indonesia

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Abstract

Indonesia is one of the largest mega biodiversity countries in the world that is rich in biological resources. Plants can be an alternative in treating diseases by Indonesian people such as around the Sesaot Forest, the Buwun Sejati Village. This study aimed to determine the types of plants in Sesaot Forest which were used as medicine by the people of Buwun Sejati Village, Narmada District, West Lombok Regency. This research was conducted by interview method and field survey. Data analysis was carried out descriptively. Based on the research, there were 87 species included in 42 families used as medicine by the community of Buwun Sejati Village. The Zingiberaceae family was a plant family that was most widely used as a traditional medicine ingredient. There were 30 types of diseases treated using Sesaot Forest plants by the community of Buwun Sejati Village. Leaves were of the most common part of plant used as raw material for traditional medicine by the people of Buwun Sejati Village, Narmada District, West Lombok Regency. The advantages of traditional medicines include its widespread accessibility and relative low prices. Therefore, this data obtained from this study is necessary to inventory the kind of medicinal plants and their utilization by the community, so that, the traditional knowledge of the medicinal plants can be documented and preserved.

How to Cite

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INTRODUCTION

Indonesia is one of the largest mega biodiversity countries in the world that is rich in biological resources (Putra et al, 2012). The natural wealth of plants in this country covering 30,000 plant species from a total of 40,000 plant species in the world, 940 of them are medicinal plants. The use of local plants as a source of medicine is an alternative that can be developed because medicinal plants can be an alternative choice for treating various types of diseases. Moreover, the side effects arising from the use of traditional medicines (herbal) are smaller than the use of synthetic and chemical (modern) drugs (Anwar, 2013).

Indonesian society have long been familiar with the use of plants as medicine in tackling the health problems especially in rural communities. The local people of the rural areas have good knowledge about the uses of plants and they prefer medicinal plants due to their abundant availability and their lower prices than modern pharmaceuticals. This preference then form a local wisdom. Data from Basic Medical Research (Risksdas) on 2013 showed that 35.2 % of Indonesian society still retain and use traditional medicine for medication (Shanthi et al., 2014).

Local knowledge of existing vegetation is developed based on experiences that has been tested for centuries which is applied and adapted to the local culture and environment. Local knowledge also known as local wisdom. Local wisdom is a basic knowledge gained from living in balance with nature and related to certain community's culture which is accumulated and passed down from generation to generation. This wisdom can be both abstract and concrete, but the important characteristic is that it comes from experiences or evidences gained from life (Mungmachon, 2012).

Sesaot Protected Forest (SPF) has an area of approximately 5,950 hectares, located at the west of Mount Rinjani, West Lombok, West Nusa Tenggara, Indonesia. Astronomically, Sesaot forest is at position of 8 ° 30 ' - 8 ° 33' LS and 116 ° 13 ' - 116 ° 18' BT with the status of Protected Forest based on TGHK No. 758 / Kpts / Um / 1982 dated October 12, 1982. In general, the sloping terrain is bumpy and hilly, with elevations ranging from 225 to 684 m above sea level and the slope of the land varies from 15 - 45%. From the government administrative document, the Sesaot forest area is in the Narmada and Lingsar Districts, West Lombok Regency. There are 6 (six) villages directly adjacent to the forest area, namely Sesaot Village, Sempage Bee,

Sedau, Pakuan, Buwun Sejati (Narmada District) and Batu Mekar Village (Lingsar District). Most people there still depend on forest products, both timber and non-timber products (FKS, 2010).

The advantages of traditional medicines include its widespread accessibility and relatively low prices, when most people in Indonesia pay for medicines from their own pocket. Knowledge of traditional medicinal plants tend to be known by certain society and not by large community (Kinho et al., 2011). Therefore, it is necessary to inventory the kind of medicinal plants and their utilization by the community so that traditional knowledge of the medicinal plants can be documented and preserved. This study aimed to find out the types of plants in Sesaot Forest which are used as medicine by the people of Buwun Sejati Village. Traditional communities have high dependency on a variety of plants as a source of food and medicine. Ethnobotanical research of medicinal plants is important for conserving forests, endangered plant species, conserving local wisdom and cultural heritages; increasing the potential economic value of useful plants, and introducing natural drugs widely (Roosita et al., 2015). The results of this study were expected to document firsthand traditional and contemporary knowledge as well as to provide information to communities that can be used for their cultural or educational purposes.

METHODS

This research was conducted in Buwun Sejati Village, located in Narmada district, West Lombok Regency, West Nusa Tenggara Province (Figure 1). The average temperature is between 30° - 35° C. The amount of rainfall ranged from 7.055 mm/year or 588 mm/month or 26.73 mm/day. The number of rainy days ranged from 109 - 255 rainy days/year or on average between 9-22 rainy daysevery month. Buwun Sejati Village, the land area of 4.14 km², was inhabited by 4,220 people or 1,364 households (West Lombok regency Government, 2017). The majority occupations of the Villagers were farmer. In Buwun Sejati Village, there was a limited access to modern health center. However, commercials drug are available to the Villagers at many retailers.

The method used in this research was qualitative approach with descriptive analysis and based on ethnobotanical approach. Data was collected by semi-structured interviews with informants and direct observation in the field. Determination of the respondents used the snowball method (Bernard, 2006) and each respondent

were asked information about medicinal plants, local name, and utilization which has been used by communities in Buwun Sejati.

On direct observation, each plant sample found in Buwun Sejati Village was collected. Plant identification process was carried out directly in the field and a complete identification was carried out in the Laboratory of Botanical Taxonomy of Biology Department, Faculty of Mathematics and Natural Sciences, Al-Azhar Islamic University. Plant identification process was based on morphological characteristics of the plant (roots, stems, leaves, flowers, seeds and fruit) and was using *Buku Tumbuhan Obat Komersial* (Siswanto, 2004), *Atlas Tumbuhan Obat Indonesia, Jilid 6* (Dalimartha, 2009) and the book of *Flora* (Van Steenis, 2005). Ethnobotanical data was analyzed descriptively.

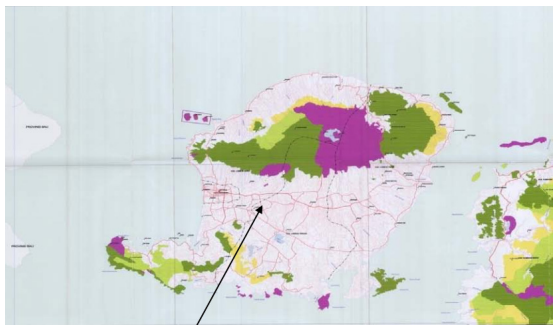


Figure 1. The Location of Sesaot Forest, Buwun Sejati Village in Narmada District, West Lombok Regency, West Nusa Tenggara Province, Indonesia

RESULTS AND DISCUSSION

Classification of Medicinal Plants Based on Their Familia

Based on the research, there were 87 species of plants in Sesaot Forest which were included in 42 families used as medicine by the community of Buwun Sejati Village. The Zingiberaceae family was a plant family that was most used as a traditional medicine ingredients by the community of Buwun Sejati Village by 11.50% that consist of 10 species of plants out of 87 species. Lamiaceae, Asteraceae, and Fabaceae families were used by 5.70%. The percentage of Euphorbiaceae family by 4.69%. Acanthaceae, Amaranthaceae, Malvaceae, Moraceae, Myrthaceae, Phyllanthaceae and Verbenaceae families by 3.40%. Lauraceae, Lythraceae, Piperaceae, Poaceae, Rubiaceae, Solanaceae, and Arecaceae families were 2.39% while other families were 1.14%.

According to Suganda and Ozaki (1996), Zingiberaceae family is a family that grows a lot

and is used for various purposes, specifically for medicines. Almost all traditional medicinal preparations such as herbal medicine and modern medicine in Indonesia come from plants belonging to the Zingiberaceae family. This plant is also easy to grow because it has vegetative roots that make it grows easily. Plant species included in the Zingiberaceae family contain secondary metabolites in the form of alkaloids, saponins, tannins, and flavonoids (Hartanto et al., 2014).

Antioxidant properties from such secondary metabolites are not reduced when the plant is prepared into traditional culinary and traditional medicinal recipes (Tilak, J.C., Barrierjee, M., Mohan, H., & Devasagayam, 2004). The components of secondary metabolites correspond to the characteristic of the plants that usually categorized as medicinal herbal. High versatility of medicinal plants could also indicate a higher diversity of active compounds contained by the species (Giday, M., Asfaw, Z., & Woldu, Z., 2009).

Most of the respondent said that Zingiberaceae was the most commonly used as medicinal plants because they were easily cultivated in the home garden and alternatively could be used as food spicy. The study that conducted by Roosita et al. (2008) showed that Zingiberaceae was the most common medicinal plants family that used by the villagers and herbalist healer in Sukajadi village located in Bogor district. Zingiberaceae was also commonly used by local people in Pangea, District of Kuantan Senggigi Riau as traditional medicinal herbal (Hartanto et al., 2014). Ethnobotanical study on traditional treatment for women in the Surakarta Hadiningrat Royal Palace Community by Shanthi et al., (2014) also showed that Zingiberaceae was mostly used as traditional medicine. Silalahi et al., (2015) reported that Zingiberaceae was the most common medicinal plants which have been traded in the Kabanjahe traditional market Karo Regency, North Sumatra.

Traditional medicinal plant not only used to treat simple diseases such us cough and influenza but also used to treat metabolic disease, on of which is Myrtacea family which is used to treat diabetes. Seed extract of *Syzygium* showed the presence of flavonoids in appreciable amount which accountable for the antidiabetic activities (Prabakaran, K. And Shanmugavel, G., 2017).

The data showed that Sesaot Forest is one area that has a wide variety of plant species used as traditional medicine community. Among that plants that commonly used as medicinal herb by society are exotic spesies. Exotic plants are non-native plants (not indigenous). Some exotic

Table 1. Medicinal Plants in Sesaot Forest Used by Buwun Sejati Villagers

Family	Botanical Name / Latin Name	Local Name	Use	Parts of Plants
Acanthaceae	<i>Graptophyllum pictum</i> (L.) Griff.	Daun Ungu	Fever	Leaves
	<i>Justicia gendarussa</i> Burm. F	Gandarusa	Headache	Leaves
	<i>Reulla napifera</i> Zoll Mor	Keji Beling	Bladder stones	Leaves
Amaranthaceae	<i>Amaranthus spinosus</i> L.	Bayam kikihan	Fever	Leaves
	<i>Alternanthera sessilis</i> R. Br.	Kremah	Stomachache	Leaves
	<i>Iresine herbstii</i> Hook	Bayam merah	Anemia	Leaves
Apiaceae	<i>Centella asiatica</i> (L.) Urban.	Kuku Kuda	High Blood Pressure	Leaves
Apocynaceae	<i>Alstonia scholaris</i> (L.) R. Br.	Lita	Toothache	Stem
Araceae	<i>Colocasia esculenta</i> (L.) Schott	Talas	Cough	Shoot
Arecaceae	<i>Arenga pinnata</i> (Wurmb) Merr	Aren	Skin rash	Root
	<i>Salacca zalacca</i> (Gaertn.) Voss	Salak	Diarhea	Fruit
Asparagaceae	<i>Cordyline fruticosa</i> (L.) A.Chev	Andong	Cough	Shoot
Asteraceae	<i>Blumea balsamifera</i> (L.) Dc.	Sembung	Rheumatism	Leaves
	<i>Gynura procumbens</i> (Lour.) Merr	Sambung nyawa	Wound	Leaves
	<i>Lantana camara</i> L.	Tembelekan	Wound	Leaves
	<i>Pluchea indica</i> L.	Beluntas	Malaria	Leaves
	<i>Taraxacum officinale</i>	Tarsakum	Inflammation	Herba
Athyriaceae	<i>Diplazium esculentum</i> (Retz.) Sw.	Paku Nyantoh	Stomachache	Leaves
Balsaminaceae	<i>Impatiens balsamina</i> L.	Pacar aik	Menstrual pain	FLower
Boraginaceae	<i>Symphytum officinale</i> L.	Kompre	High Blood Pressure	Leaves
Campalunaceae	<i>Laurentia longiflora</i> (Linn.) Peterm	Sangkobak	Wound	Leaves
Euphorbiaceae	<i>Antidesma bunius</i> (L.) Spreng	Wuni	Anti-inflammation	Leaves
	<i>Aleurites moluccana</i> (L.) Willd.	Kemiri	Diarhea	Seed
	<i>Acalypha indica</i> L.	Cakar Kucing	Wound	Herba
	<i>Euphorbia hirta</i> L.	Patikan	Throat Inflammation	Leaves
Fabaceae	<i>Caesalpinia sappan</i> L.	Sepang	Anti-inflammation	Twig
	<i>Cassia alata</i> L.	Ketepeng	Scabies	Leaves
	<i>Cassia siamea</i> Lamk	Johar	Malaria	Leaves
	<i>Clitoria ternatea</i> L.	Bunga biru	Abscess	Flower
	<i>Tamarindus indica</i> Linn	Asam	Fever	Fruit
Flacourtiaceae	<i>Pangium edule</i> Reinw.	Pakem	Wound	Leaves
Lamiaceae	<i>Coleus scutellarioides</i> (L.) Benth.	Mayana Merah	Cough	Leaves
	<i>Coleus amboinicus</i> Lour	Jinten	Cough	Leaves
	<i>Leucas lavandulifolia</i> Smith.	Leng-Lengan	Cough	Leaves
	<i>Ocimum basilicum</i> L	Kemangi	Flatulence	Leaves
	<i>Orthosiphon stamineus</i> Benth.	Kumis Kucing	Diabetes	Leaves
Lauraceae	<i>Persea americana</i> Mill	Alpukat	Stomachache	Leaves
	<i>Cynamomum aromaticum</i> Nees	Kayu manis	Diarhea	Bark
Liliaceae	<i>Dracaena angustifolia</i> Roxb.	Suji	Dysentery	Leaves
Lygodiaceae	<i>Lygodium circinatum</i> (Burm.) Sw.	Paku	Wound	Leaves
Lythraceae	<i>Lagerstromieia speciosa</i> Pers	Bungur	Diabetes	Leaves
	<i>Punica granatum</i> L.	Jeliman	Dysentery	Leaves

Malvaceae	<i>Durio zibethinus</i> Murr	Durian	Skin rashes	Fruit's skin
	<i>Sida rhombifolia</i> L.	Sidaguri	Dysentery	Leaves
	<i>Urena lobata</i> L.	Pulutan	Fever	Root
Meliaceae	<i>Swietenia mahagoni</i> (L.) Jacq.	Mahoni	Diabetes	Seed
Menispermaceae	<i>Tinospora crispa</i> (L.) Miers	Antawali	Fever	Stem
Moraceae	<i>Ficus benjamina</i> L.	Beringin	Cough	Leaves
	<i>Artocarpus heterophyllus</i> Lam.	Nangka	Cough	Leaves
	<i>Morus alba</i> L.	Murbei	Low back pain	Leaves
Moringaceae	<i>Moringa oleifera</i> Lamk.	Kelor	Diarhea	Leaves
Musaceae	<i>Musa x paradisiaca</i> L.	Pisang	Gastritis	Fruit
Myrtaceae	<i>Syzygium polyanthum</i> (Wight) Walp.	Jukut	High blood pressure	Leaves
	<i>Psidium guajava</i> L.	Jambu Biji	Dysentery	Leaves
	<i>Syzygium cumini</i> (L.) Skeels	Juwet	Diabetes	Fruit
Nyctaginaceae	<i>Mirabilis jalapa</i> L	Kembang sore	Anti-inflamation	Root
Phyllanthaceae	<i>Phyllanthus acidus</i> (L.) Skeels	Cermen	Nauseous	Leaves
	<i>Phyllanthus niruri</i> L.	Meniran	Swollen	Herba
	<i>Sauropus androgynus</i> L. Merr	Daun katuk	Influenza	Leaves
Piperaceae	<i>Piper sarmentosum</i> Roxb. Ex Hunter	Sesaer	Tootache	Leaves
	<i>Piper betle</i> L.	Sirih	Nosebleed	Leaves
Plantaginaceae	<i>Plantago major</i> L.	Daun sendok	Scabies	Leaves
Plumbaginaceae	<i>Plumbago zeylanica</i> L.	Bama	Wound	Leaves
Poaceae	<i>Bambusa vulgaris</i> Schrad. ex J.C	Bambu kuning	Cough	Stem
	<i>Imperata cylindrica</i> (L.) Beauv.	Re	Abscess	Root
Rubiaceae	<i>Gardenia jasminoides</i> J.Ellis	Kaca Piring	Low back pain	Leaves
	<i>Morinda citrifolia</i> L.	Pace	High Blood Pressure	Fruit
Rutaceae	<i>Murraya paniculata</i> (L.) Jack.	Kemuning	Rheumatism	Leaves
Salicaceae	<i>Flacourtia rukam</i>	Rukem	Diarhea	Fruit
Sapindaceae	<i>Nephelium lappaceum</i> L.	Rambutan	Fever	Fruit's skin
Sapotaceae	<i>Manilkara zapota</i> (L.) van Royen	Sawo	Cough	Leaves
	<i>Datura metel</i> L.	Kecubung	Constipation	Leaves
Solanaceae	<i>Solanum nigrum</i> L.	Ranti	Fever	Leaves
	<i>Guazuma ulmifolia</i> Lamk.	Jati Belanda	Slimmer	Leaves
Verbenaceae	<i>Clerodendrum japonicum</i> Thunb.	Senggugu	Abscess	Leaves
	Sweet			
	<i>Stachytarpheta jamaicensis</i> L. Vahl.	Pecut Kuda	Cough	Herba
Zingiberaceae	<i>Vitex trifolia</i> L.	Legundi	Cough	Leaves
	<i>Kaempferia galanga</i> L.	Kencur	Cough	Rhizome
	<i>Alpinia galangal</i>	Ilat-Ilat	Diarhea	Rhizome
	<i>Canna edulis</i>	Ganyong	Heatiness	Rhizome
	<i>Costus speciosus</i> Sm.	Pacing	Scabies	Rhizome
	<i>Zingiber officinale</i> Roscoe	Jahe	Cough	Rhizome
	<i>Curcuma domestica</i> Valeton	Kunyit	Fever	Rhizome
	<i>Curcuma zanthorrhiza</i> Roxb.	Temulawak	Stomachache	Rhizome
	<i>Amomum compactum</i> Soland ex Maton	Kapulaga	Cough	Rhizome
	<i>Zingiber purpureum</i> Roxb.	Banggele	Fever	Rhizome
<i>Zingiber zerumbet</i> Smith	Lempuyang gajah	Stomachache	Rhizome	



Taraxacum officinale



Symphytum officinale



Aleurites moluccana



Euphorbia hirta



Cassia alata



Cassia siamea



Clitoria ternatea



Orthosiphon stamineus



Persea americana



Cinnamomum aromaticum



Punica granatum



Durio zibethinus



Swietenia mahagoni



Artocarpus heterophyllus



Morus alba



Figure 2. Exotic plants that used as medicinal sources

plants found in Sesaot Forest and used as traditional medicine are as follows.

Classification of Medicinal Plants Based on Types of Disease treated

Based on data and results of interviews, there were 30 types of diseases treated using Sesaot Forest plants by the community of Buwun Sejati Village. Coughing is one of the most treated diseases using plants in Sesaot Forest by the people of Buwun Sejati Village.

A cough is a sudden and often repetitively occurring process which helps to clear the large breathing passages from secretions, irritants, foreign particles and microorganisms. When there is a blockage or irritation in the throat or upper air passage, the brain thinks a foreign element is present and tells the body to cough to remove that element (Chung, 2008). Some of the symptoms of a cough are itchy throat, chest pain and congestion. The repetition of coughing produces inflammation and discomfort, which in turn results in more coughing (Irwin, et al., 2008; Thompson et al., 2013).

Herbal products have gained increasing popularity in the last decade, and are now used by approximately 20% of the population. Herbal products are complex mixtures of organic chemicals that may come from any raw or processed part of a plant, including leaves, stems, flowers, roots, and seeds. The enduring popularity of herbal medicines may be explained by the tendency of herbs to work slowly, usually with minimal toxic side effects (Bent, 2008).

A study by Shahnaz et al., (2016) showed the use of suppressant that made of herbal such as *Acacia catechu* (L.f.) Willd. (Mimosaceae), *Acorus calamus* L. (Acoraceae), *Adhatoda vasica* Medic. (Acanthaceae), *Allium sativum* L. (Amaryllidaceae), *Angelica archangelica* L. (Apiaceae), and *Astragalus membranaceus* (Fisch.) Bunge (Fabaceae).

Classification of Medicinal Plants Based on the Plant Parts used

Leaves were the most common part of most medicinal plants used as raw material for traditional medicine by the people of Buwun Sejati Village, Narmada District, West Lombok Regency. There were 57.45% or 50 species of plants from Sesaot Forest which leaves were used to treat diseases. According to (Irawan, Y.R., Fitnawati, & Herman, 2013) it is because leaves are easier to obtain and they can be processed easily because they have a soft texture and high water

content (70% -80%), moreover in the leaves there are also chemical compounds that function as antioxidants.

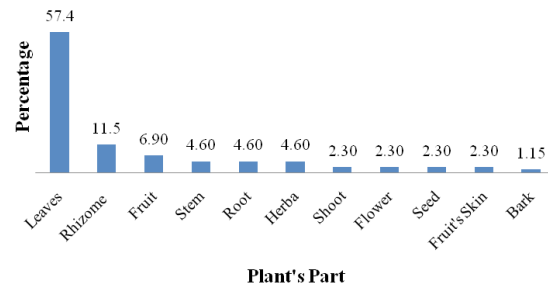


Figure 3. Percentage of plant parts used as medicine

Leaves are the plant's parts that most commonly used because the villagers usually believe that leaves contained the highest medicinal properties. A very high proportion of leaves was also observed in an ethnobotanical survey in Sukajadi village, located in Tamansari subdistrict, Bogor district, Jawa Barat province (Roosita et al., 2008).

Research on utilisation of plants for medicines in Indonesia has been done by many researchers but research about medicinal plants at Buwun Sejati Village that can be preserve as a local wisdom is still limited. The villagers are so conserve and the forest is still untouched so it is important to explore the medicinal plant inhabit there. The data obtained from this study is necessary to inventory the kind of medicinal plants and their utilization by the community so that traditional knowledge of the medicinal plants can be documented and preserved. This information also can be useful in medicine development industry.

CONCLUSION

There are 87 species of plants in Sesaot Forest which are included in 42 families used as medicine by the community of Buwun Sejati Village. The Zingiberaceae family is a plant family that is most widely used as a traditional medicine ingredient by the people of Buwun Sejati Village. There are 30 types of diseases treated using Sesaot Forest plants by the community of Buwun Sejati Village. Leaves are the most common part of most medicinal plants used as raw material for traditional medicine by the people of Buwun Sejati Village, Narmada District, West Lombok Regency.

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