

Exploration of Ethno-medicinal Knowledge among Periurban Community of Hurip Jaya Village, Babelan, District Bekasi, West Java

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Abstract

The role of the community in the use of medicinal plants is very important to encourage the development of natural resources in the surrounding environment and improve the degree of public health. Medicinal plants that have been widely researched and are often used by the people of Indonesia since a long time ago, can be an alternative treatment or support conventional treatment therapies. The purpose of this study was to determine changes in society in relation to the use of medicinal plants, document the diversity of medicinal plants and how to use medicinal plants by the community, and obtain a list of plant species based on the use value of disease categories. Data collection is done by open interviews, participatory observation, focus group discussions (FGD). Data were analyzed descriptively to describe the changes that occurred in the community before and after the existence of medicinal plants, inventorying the composition of medicinal plant species and how to use them. Quantitative analysis is done by calculating the Local User's Value Index (LUVI). The changes that occur are people using medicinal plants for cultivation, curing diseases and maintaining health. There are 44 plant species from 40 genera and 26 plant tribes used to cure 46 diseases. Asteraceae is a plant species with the highest number of species that are used as medicinal ingredients. Based on the calculation of the value of LUVI, Dayak onions are medicinal plants that have the highest score, which is 6%. Then followed by bay leaves 4.65% and sidaguri 4.55%. Ten common diseases that occur in the community are diarrhea, gout, cholesterol, high blood pressure, gastritis, rheumatism, asthma migraine, stroke, fever. Utilization of medicinal plants carried out by the community that is, by making processed products such as instant simplicia powder, dried simplicia, herbal medicine and tea bags. There is a change in the use of medicinal plants from previously not using medicinal plants and currently using medicinal plants to cure a disease and maintain health. The change occurred because of the existence of the non-governmental organization Aliksa as a facilitator and local leader who managed and assisted the cultivation and utilization program of medicinal plants. Common diseases that occur in the people of Hurip Jaya village are diarrhea, gout, cholesterol, high blood pressure, gastritis, rheumatism, asthma migraine, stroke, fever. Utilization of medicinal plants used as processed products such as instant simplicia powder, dried simplicia, herbal medicine and tea bags.

Keywords: Local medicinal plant, behavioral change, facilitator

Introduction

Hurip Jaya Village is one of 9 villages located in the Babelan District area, Bekasi Regency. The village has an area of 1120 hectares with an allocation of 325 hectares for agriculture activities, and 400 hectares for fish ponds (Saribanon, 2016). Hurip Jaya is a village that lacks health facilities

such as health centers and hospitals, and this causes people to depend on drugs that can be purchased at drugstores or stalls (Fathurrohman, 2016).

Since 2016, the people of Hurip Jaya Village have begun to recognize alternative medicine, namely traditional medicines from plant-based ingredients, where previously the community was very dependent on synthetic medicines. Medicinal plants are plants that are known or believed to have medicinal properties, can be used to maintain health and contain active ingredients that have the potential as synthetic drug ingredients (Zuhud, 2004; Prbadi, 2009). This change was pioneered by Aliksa Organic SRI Consultant (AOSC/Aliksa). Aliksa is an institution engaged in the field of community empowerment that utilizes local potential, especially sustainable agriculture. Aliksa acts as a companion and provides counseling for 1 year from 2016 to 2017 regarding the cultivation and utilization of medicinal plants. This activity then affects people's behavior in maintaining health and how to treat disease.

People no longer depend on the medicines they usually buy at the warung, but instead turn to the use of medicinal plants. Seeing the high enthusiasm from the community regarding the use of medicinal plants, the village administration then provided support in the form of the building of the Family Medicinal Plants House (Rumah Toga) and a gazebo where the community meeting was located next to the village office. In this place the community is expected to be able to learn and know the efficacy of medicinal plants developed in Rumah Toga (Yura and Depi, 2017).

Based on preliminary studies, it is known that the people of Hurip Jaya Village plant a variety of medicinal plant species that are utilized based on the disease experienced by the community. This medicinal plant is used as medicine directly and several types are used as medicinal ingredients. For this reason, it is necessary to conduct research on community knowledge in the use of medicinal plants, and the importance of medicinal plants based on diseases experienced by the community.

The purpose of this study was to determine community changes in the use of medicinal plants, observe the diversity of medicinal plants cultivated by the community, obtain a list of plant species based on the use value of disease categories in Hurip Jaya Village. The research hypothesis proposed is that there are changes in community behavior before and after the introduction of medicinal plants; and there is a importance value of medicinal plants based on the disease experienced by the community. The results of this study are expected to be a source of information about the use of medicinal plants and changes in community behavior in the utilization of local medicinal plants.

Method

This research was conducted in April to May 2018 and September 2019 in Hurip Jaya Village, Babelan District, Bekasi. Data collection is done by open interviews, participatory observation, focus group discussions (FGD). Data were analyzed descriptively to describe the changes that occurred in the community before and after the existence of medicinal plants, inventorying the composition of medicinal plant species and how to use them. Quantitative analysis is done by calculating the Local User's Value Index (LUVI). The changes that occur are people using medicinal plants for cultivation, curing diseases and maintaining health. To obtain data on medicinal plants used and how to process them, it is carried out by using semistructural, open

interview techniques and observation of participation in community activities (Hoffman and Gallaher,2007).

Qualitative analysis was carried out descriptively to describe the diversity of medicinal plants and their uses by the community. Quantitative analysis was carried out by scoring (giving value) to medicinal plants used based on disease using the Pebble Distribution Method (PDM) in the FGD (S1 File) (Purwanto et al, 2011). The PDM method aims to assess the importance of a medicinal plant species recognized by the community based on their perceptions. PDM in this study uses marbles as gravel and is written on sheets of cardboard. The value that has been obtained is then analyzed in the Local User's Value Index (LUVI) formula. LUVI calculations use the Sheil formula (Sheil et al,2004).

$$LUVI = G_{ij} = \sum_{category=j} G_{ij} = RW_j \times R_{wij}$$

note:

i = species value, j = utility, G_{ij} = individual value, RW_j = weight assigned to a particular class of use (j) is located, R_{wij} = relative weight in category j in the use of plant species (i) that meets the requirements of member j.

The application of the LUVI formula is carried out in several stages, namely:

- Determining the value of the disease category, for example, for the diarrhea category, it has a score of 25 out of a total score of 100, which means that the class score for the disease category is 25/100.
- Determine the value for the plant species. After obtaining 10 important plant species from the diarrhea category, the respondents were scored. For example, dinudur (*Basella alba*) has a value of 30 out of 100, then the value of *Basella alba* is 30/100.
- The LUVI calculation for *Basella alba* in the diarrhea category is $25/100 \times 30/100 = 0.075$. The final LUVI result is multiplied by 100%.

Result

The majority of ethnomedicinal studies were represented on South America, meanwhile in Indonesia and geographically still lack of distribution in these kind of research (Camara et al, 2014; Aswani,2018). Based from gendered in ethnomedicine knowledge, Hurip Jaya people were present for both genders but rapidly changes to more used in women more than men. The results of the identification of medicinal plant species used by the community based on their use to treat certain types of diseases can be seen in the following table.

Table 2. Disease groups and a list of medicinal plant species

Disease Groups	Type of disease	Scientific Name	Local Name	number of species
Skin Desease	Boils	<i>Justicia gendarussa</i>	Gandarusa	8
		<i>Portulaca oleracea</i>	Krokot	

		<i>Kaempferia rotunda</i>	Kunir Putih	
	Ringworm	<i>Moringa oleifera</i>	Kelor	
		<i>Senna alata</i>	Ketepeng cina	
	Contusion	<i>Gynura segetum</i>	Daun dewa	
		<i>Aloe vera</i>	Lidah Buaya	
		<i>Justicia gendarussa</i>	Gandarusa	
		<i>Kaempferia rotunda</i>	Kunir putih	
		<i>Murraya paniculata</i>	Kemuning	
	Burns	<i>Aloe vera</i>	Lidah Buaya	
		<i>Moringa oleifera</i>	Kelor	
	Insect bite wound	<i>Portulaca oleracea</i>	Krokot	
Desease of the respiratory system	Cough	<i>Leucas lavandufolia</i>	Lenglangan	15
		<i>Coleus amboinicus</i>	Jinten	
		<i>Euphorbia Hirta</i>	Patikan kebo	
		<i>Sansevieria trifasciata</i>	Lidah mertua	
		<i>Oxalis corniculata</i>	Semanggi gunung	
		<i>Vernonia cinerea</i>	Sawi langit	
		<i>Talinum paniculatum</i>	Som Jawa	
		<i>Zingiber Officinale</i>	Jahe	
		<i>Rhoeo discolor</i>	Nanas kerang	
	Nose Bleeding	<i>Piper betle</i>	Sirih hijau	
	Influenza	<i>Euphorbia Hirta</i>	Patikan kebo	
		<i>Physallis peruviana</i>	Ciplukan	
		<i>Rhoeo discolor</i>	Nanas kerang	
	Asthma	<i>Coleus amboinicus</i>	Jinten	
		<i>Euphorbia Hirta</i>	Patikan kebo	
<i>Gomphrena Globosa</i>		Bunga kenop		
<i>Isotoma longiflora</i>		Kitolod		
<i>Artocarpus altilis</i>		Sukun		
Desease of the eye	Cataract	<i>Isotoma longiflora</i>	Ki tolod	2
	Eye Irritation	<i>Euphorbia Hirta</i>	Patikan kebo	
		<i>Isotoma longiflora</i>	Ki tolod	
Desease Group	Type of Desease	Scientific Name	Local Name	Number of species
Desease of the respiratory system (continue)	Laryngitis	<i>Euphorbia Hirta</i>	Patikan kebo	15
		<i>Physallis peruviana</i>	Ciplukan	
		<i>Oxalis corniculata</i>	Semanggi gunung	
		<i>Oldenlandia corymbosa</i>	Rumput mutiara	
		<i>Isotoma longiflora</i>	Kitolod	
		<i>Rhoeo discolor</i>	Nanas kerang	
Desease of the digestive system	Sprue	<i>Coleus amboinicus</i>	Jinten	21
		<i>Senna alata</i>	Ketepeng cina	
	Toothache	<i>Isotoma longiflora</i>	Kitolod	
	Ulcer	<i>Curcuma zanthorriza</i>	Temulawak	

		<i>Aegle marmelos</i>	Buah maja	
		<i>Coleus amboinicus</i>	Jinten	
		<i>Piper crocatum</i>	Sirih merah	
		<i>Anredera cordifolia</i>	Binahong	
		<i>Curcuma longa</i>	Kunyit	
		<i>Hisbiscus sabdariffa</i>	Rosella	
	Diarrhea	<i>Eleutherine palmifolia</i>	Bawang dayak	
		<i>Physallis peruviana</i>	Ciplukan	
		<i>Andrographis paniculata</i>	Sambiloto	
		<i>Rhoeo discolor</i>	Nanas kerang	
	Constipation	<i>Moringa oleifera</i>	Kelor	
		<i>Nothopanax scutellarium</i>	Mangkokan	
		<i>Senna alata</i>	Ketepeng china	
	Abdominal Pain	<i>Kaempferia rotunda</i>	Kunir Putih	
		<i>Peperomia pellucida</i>	Ketumpang air	
	Flatulence	<i>Curcuma longa</i>	Kunyit	
	Hemorrhoids	<i>Sonchus arvensis</i>	Tempuyung	
		<i>Plantago major</i>	ki urat	
	Hemorrhoids	<i>Sansevieria trifasciata</i>	Lidah mertua	
Disease of the genitourinary system	Pee Stones	<i>Gynura segetum</i>	Daun dewa	7
		<i>Oxalis corniculata</i>	Semanggi gunung	
		<i>Sonchus arvensis</i>	Tempuyung	
		<i>Plantago major</i>	ki urat	
		<i>Phyllanthus niruri</i>	Meniran	
		<i>Gomphrena Globosa</i>	Bunga kenop	
		<i>Nothopanax scutellarium</i>	Mangkokan	
Desease Group	Type of Desease	Scientific Name	Local Name	Number of species
Circulatory system disease	High blood	<i>Eleutherine palmifolia</i>	Bawang dayak	14
		<i>Plucea indica</i>	Beluntas	
		<i>Sonchus arvensis</i>	Tempuyung	
		<i>Oldenlandia corymbosa</i>	Rumput mutiara	
		<i>Hisbiscus sabdariffa</i>	Rosella	
		<i>Syzygium polyanthum</i>	Salam	
		<i>Artocarpus altilis</i>	Sukun	
		<i>Vernonia amygdalina</i>	Daun Afrika	
	Stroke	<i>Eleutherine palmifolia</i>	Bawang dayak	
		<i>Gynura segetum</i>	Daun dewa	
		<i>Anredera cordifolia</i>	Binahong	
		<i>Syzygium polyanthum</i>	Salam	
	Anemia	<i>Curcuma zanthorriza</i>	Temulawak	
	Cholesterol	<i>Eleutherine palmifolia</i>	Bawang dayak	
<i>Curcuma zanthorriza</i>		Temulawak		

		Plucea indica	Beluntas	
		Piper crocatum	Sirih merah	
		Andrographis paniculata	Sambiloto	
	Jaundice	Eleutherine palmifolia	Bawang dayak	
	Diabetes	Eleutherine palmifolia	Bawang dayak	
		Gynura pracumbens	Sambung nyawa	
		Piper crocatum	Sirih merah	
Pregnancy and Birth	Childbirth	Anredera cordifolia	Binahong	3
	Smooth out mother's milk	Etlintera elatior	Kecombrang	
		Talinum paniculatum	Som Jawa	
Womanhood	Reduce menstrual pain	Gynura segetum	Daun dewa	3
		Curcuma longa	Kunyit	
	Menstrual smooting	Gynura segetum	Daun dewa	
	Vaginal discharge	Piper betle	Sirih hijau	
Other desease	Fever Eliminate Body odor Catch a cold Men's Stamina	Justicia gendarussa	Gandarusa	19
		Andrographis paniculata	Sambiloto	
		Vernonia cinerea	Sawi langit	
		Oldenlandia corymbosa	Rumput mutiara	
		Curcuma longa	Kunyit	
		Gomphrena Globosa	Bunga kenop	
		Plucea indica	Beluntas	
		Etlintera elatior	Kecombrang	
		Zingiber Officinale	Jahe	
		Plantago major	ki urat	
Desease Group	Type of Desease	Scientific Name	Local Name	Number of species
Desease of the muscle and joints	Rheumatism	Eleutherine palmifolia	Bawang dayak	15
		Orthosiphon aristatus	Kumis kucing	
		Plucea indica	Beluntas	
		Anredera cordifolia	Binahong	
		Tinospora crispa	Brotowali	
		Moringa oleifera	Kelor	
		Justicia gendarussa	Gandarusa	
		Andrographis paniculata	Sambiloto	
		Plantago major	ki urat	
		Phyllanthus niruri	Meniran	
		Peperomia pellucida	Ketumpang air	
		Sida rhombifolia	Sidaguri	
	Uric acid	Eleutherine palmifolia	Bawang Dayak	
		Orthosiphon aristatus	Kumis kucing	
		Anredera cordifolia	Binahong	
Andrographis paniculata		Sambiloto		

		<i>Sida rhombifolia</i>	Sidaguri	
	Stiff	<i>Gynura pracumbens</i>	Sambung nyawa	
		<i>Orthosiphon aristatus</i>	Kumis kucing	
		<i>Moringa oleifera</i>	Kelor	
		<i>Portulaca oleracea</i>	Krokot	
		<i>Sida rhombifolia</i>	Sidaguri	
		<i>Peperomia pellucida</i>	Ketumpang air	
	Back pain	<i>Orthosiphon aristatus</i>	Kumis kucing	
	Sprain	<i>Murraya paniculata</i>	Kemuning	
Penyakit kepala	Headache	<i>Coleus amboinicus</i>	Jinten	6
		<i>Zingiber Officinale</i>	Jahe	
		<i>Leucas lavandufolia</i>	Lenglangan	
		<i>Peperomia pellucida</i>	Ketumpang air	
	Migraine	<i>Eleutherine palmifolia</i>	Bawang Dayak	
		<i>Vernonia amygdalina</i>	Daun Afrika	
Other diseases	No Appetite	<i>Curcuma zanthorriza</i>	Temulawak	
		<i>Tinospora crispa</i>	Brotowali	
		<i>Kaempferia rotunda</i>	Kunir Putih	
		<i>Curcuma longa</i>	Kunyit	
	Refresh your body	<i>Gynura pracumbens</i>	Sambung nyawa	
		<i>Hisbiscus sabdariffa</i>	Rosella	
	Insomnia	<i>Leucas lavandufolia</i>	Lenglangan	
		<i>Vernonia cinerea</i>	Sawi langit	

At the beginning, the people of Hurip Jaya village were not familiar with medicinal plants. Then in 2016, the public obtained information from Aliksa about medicinal plants. The process starts with the introduction of plants around the village of Hurip Jaya which can be used as medicinal ingredients. After that, the community was given training on plant cultivation, plant care and harvesting to training in making powder preparations for simplicia and herbal medicine (Table 3). After obtaining this information, the community started by looking for plants around the village of Hurip Jaya that grew wild and planted them in their respective yards. However, due to frequent flooding, the community planted it together in the Toga House, which was 10 x 12 meters wide (Figure attachment 2). In 2017 until now the community has started to routinely cultivate medicinal plants, use them in treating diseases and maintaining health. The increase in changes in society towards the use of medicinal plants can be seen in (Figure 2).

Table 3. The process of community change in the use of medicinal plants

Year of Community Change			
2015	2016	2017	2018
<ul style="list-style-type: none"> • Not knowing which plants have the potential to be medicinal • Still using the stall medicine to cure the disease 	<p>Aliksa Introduction:</p> <ul style="list-style-type: none"> • Introduction of medicinal plants • Training on medicinal plant cultivating • Training in making dry simplicia preparation • Training in making herbal medicine using herbal plants <p>Community Implementation:</p> <ul style="list-style-type: none"> • Looking for plant around the village to be plant in the yard 	<p>Implementation of community and advocacy Aliksa:</p> <ul style="list-style-type: none"> • Cultivation of medicinal plants by the community • Making compost • Construction of Toga House for Hurip Jaya villagers • Home care Toga together • Harvesting medicinal plants • Making of dry simplicia preparation 	<p>Implementation of the community independently:</p> <ul style="list-style-type: none"> • Planting and maintaining medicinal plants • Making compost • Home care Toga together • Harvesting medicinal plants • Processing of medicinal plants into dry simplicia and powder preparation • Making herbs and tea bags • Sales of processed medicinal plants during village event

Discussion

In 2018 the community has shown changes in behavior (table 4). The community is no longer dependent on drugs bought in stalls and people are aware of the importance of maintaining health from an early age. Hurip Jaya people were used the ethnomedicinal plants based on availability and amount of its. However, they did not always prepared with some specific ritual. They did in basically used, while the cultural values were more establish in plant areas and collection (Kunwar, et al, 2016; Weckerle, 2004)..

Table 4. Behavioral Changes in the Hurip Jaya community

Aspect	Changes	
	< 2016	> 2017
Treatment of disease	Still using drugs purchased at drug stalls	Start using medicinal plants
Preventive behaviors	If don't sick, people don't take medicine	Awareness in healthy care by drinking herbal medicine and fresh vegetables from <i>Sambung Nyawa</i>
Cultivation of medicinal plants	Not cultivating medicinal plants	Cultivating medicinal plants in Toga House

The community has managed independently in the use of medicinal plants. In the Toga group itself there is a local leader, who is one of the people who is an expert in processing medicinal plants into medicinal substances such as boiling from several sprays of medicinal plants and herbs. So that the community can also learn and practice with these local leaders. Activities carried out by the community routinely start from plant maintenance to the sale of processed medicinal plant products (Figure 3).

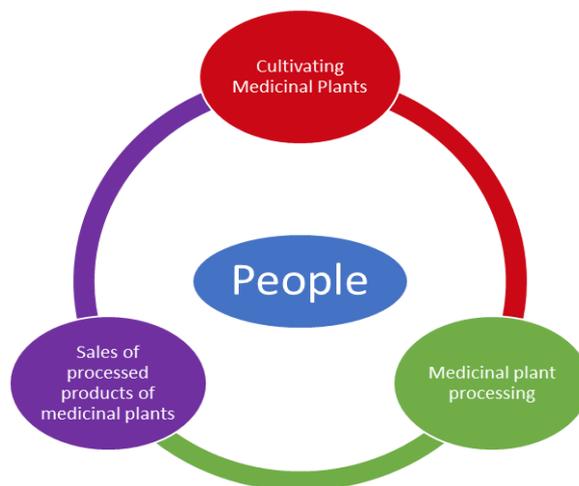


Figure 1. Community participation in the use of medicinal plants

The community will process medicinal plants into processed products such as instant simplicia powder from the Dayak species of onion, ginger (*Gynura pracumbens*), Dewa Leaves (*Gynura segetum*), Moringa (*Moringa oleifera*), turmeric (*Curcuma longa*) and ginger (*Zingiber Officinale*). Then dry simplicia from Dayak onions, continued life, Dewa leaves and Brotowali (*Tinospora crispa*). The jamu consists of sweet senje, tamarind turmeric, rosella syrup, betel turmeric and bandrek ginger in the form of bottles and tea bags made of Dayak onions. The processed medicinal plants are used by the Toga Group itself, the people of Hurip Jaya Village and also sold to people outside of Hurip Jaya Village.

Based on the results of the study, there were 44 plant species from 40 genera and 26 plant families that were used as medicinal plants (S2 file). The ten most widely used medicinal plant families are Asteraceae (6 species), Zingiberaceae (5 species), Piperaceae (3 species), Acanthaceae, Euphorbiceae, Rutaceae and Malvaceae (2 species each), as well as Iridaceae, Solanaceae and Moringaceae (respectively - 1 species each) (Figure 4).

The plant family that has the highest number of medicinal plant species is Asteraceae, that is, it consists of 6 species from 4 genera. Asteraceae is a family that has high diversity and has the second largest number of species in the Kingdom Plantae and is widely used because it is easily found around community settlements (Ardianingsih, 2015).

Plants from the Asteraceae family that are used include, for example, grafting which can be used as fresh vegetables and according to the community, the decoction of the leaves is effective for aching pain / refreshing the body, diabetes and canker sores. Connection of life is also known as traditional medicine for the treatment of fever, rash, kidney disease, migraine, constipation, hypertension, diabetes mellitus, and cancer (Sinaga, 2018). Then the leaves of the gods, beluntas

(*Plucea indica*), tempuyung (*Sonchus arvensis*), celestial mustard (*Vernonia cinerea*) and African leaves (*Vernonia amygdalina*), each of which has many benefits and how to use it (S2 File).

In the Zingiberaceae plant tribe, 5 species from 4 genera were found, namely ginger (*Curcuma zanthorriza*) as a medicine to increase appetite, cholesterol and anemia, kecombrang (*Etingera elatior*) for eliminating body odor and promoting breast milk, white turmeric (*Kaempferia rotunda*) as well as for drugs increase appetite, stomach ache, bruises and ulcers, and ginger, which people usually use as a herbal concoction. All of these Zingiberaceae were used as spices in primary food or medicinal soup in specific role from Dayak ethnicity, Indonesia and Yi ethnicity, Liangshan prefecture, China (Anshari, et al , 2018; Wang et al, 2020)

Conclusion

There is a change in the use of medicinal plants from previously not using medicinal plants and currently using medicinal plants to cure a disease and maintain health. Changes occurred because of Aliksa as the facilitator and local leader who made the activity of using medicinal plants running until now. The community of Hurip Jaya village uses 44 species of medicinal plants from 40 genera and 26 plant families for 46 diseases. The plant tribe that has the highest number of species utilized by the community is Asteraceae (6 species). Diseases that commonly occur in Hurip Jaya villagers are diarrhea, gout, cholesterol, high blood pressure, ulcers, rheumatism, migraine asthma, stroke, fever. The highest value of local importance (LUVI) of medicinal plants is Dayak onions (*Eleutherine palmifolia*) at 6%. Kalimantan dayak onions have a higher secondary metabolite content than Bekasi dayak onions. Utilization of medicinal plants used as processed products such as instant simplicia powder, dry simplicia, herbal medicine and tea bags.

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