

The ethnobotany of medicinal plants in supporting the family health in Turgo, Yogyakarta, Indonesia

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Abstract. Nahdi MS, Martiwi INA, Arsyah DC. 2016. *The ethnobotany of medicinal plants in supporting the family health in Turgo, Yogyakarta, Indonesia. Biodiversitas 17: 900-906.* The knowledge of healing using medicinal plants among the people of Turgo Hamlet, Purwobinangun, Sleman, Yogyakarta, Indonesia has been inherited from generation to generation. This knowledge must be studied and preserved. This study was conducted from January to June 2014 with an objective of studying the ethnobotany of medicinal plants in Turgo Hamlet community, including the local knowledge of medicinal plants to support the family health, the parts of plants used as medicines and the processing of medicinal plants. Qualitative and quantitative methods were used to collect data, using in-depth interview with 40 respondents selected purposively. The results showed that the people of Turgo Hamlet used 69 plant species from 36 families as medicinal plants. The most used part of plant was leaf (51%), followed by fruit (15%), rhizome (11%), stem (5%), root (4%), sap (3%), flower (3%), all parts (3%), tubers (3%), and endosperm (2%). The medicinal plants were processed or directly used as medicines. Most of the medicinal plants were boiled (62%); others were smeared on skin (15%), directly consumed (12%), cooked (4%), used for bathing (3%), burned (3%), and crushed using a kitchen blender (1%). The medicinal plants were used for external (33%) and internal (67%) diseases.

Keywords: Generation, heritage, in-depth interview, plant organs, purposive sampling

INTRODUCTION

It is important to study ethnobotany because it is related to sustainable rural development in a region. Ethnobotany can also be used to know the dynamics of traditional ecological knowledge as an effort for biodiversity conservation in the future (Pieroni et al. 2014). Conservation of specific mountain ecosystem requires a multidisciplinary approach, so that the utilization of the ecosystem can be done on a sustainable basis in order to preserve the ecosystem service as a life supporting system (Idolo et al. 2010; Kandari et al. 2012; Khan et al. 2013).

Indonesia has abundant natural resources, including many species of plants, more than 2,039 of which have medicinal effect (Zuhud 2009). Each community has their own knowledge of the use of plants, not only for economic and cultural purposes but also for medicinal use (Kandari et al. 2012; Matthew et al. 2013). The current medicines can be divided into two categories, namely modern and traditional medicines (Muhammad 2000). Modern medicines are produced by pharmaceutical industries using sterile and reactive chemicals. On the other hand, traditional medicines are usually processed using a simple technology, based on recipes inherited from generation to generation, following local traditions and belief. Some are based on magical power, while others are based on traditional knowledge. Although they have slow reaction, traditional medicines have some benefits: they are cheaper, easy to get, easy to digest and do not have side effects (Bodeker 2000; Martin 2004). The use of natural

substances as medicines and other products has been increasing. The substances have been used by lower-and middle-class families especially for prevention and curation of diseases, and rehabilitation and promotion of health. The researches on medicinal plants are increasing along with the increasing awareness of people of healthy life, and the demand on food has shifted. People not only care about the taste but also the effect of food on health (Setyowati 2010).

Turgo Hamlet is located in the slope of Mount Merapi with a total area of 200 hectares. It has an ecosystem influenced by the people's wide knowledge of medicinal plants. So, many species of medicinal plants are found in the hamlet and the people use the organs of the plants or the whole plants to maintain the family health. Their livelihood as farmers is in line with their hobby to preserve medicinal plants and to consume traditional medicinal plants for curation of diseases and maintenance of family health. Currently, there is a shift of their opinion regarding medicines. They know modern medicines and some of them abandon traditional medicines and prefer to use modern medicines which can react quickly. However, some of them, especially the native residents and farmers, still care about traditional medicines and preserve traditional healing.

Based on the above background, it is necessary to develop the local wisdom of Turgo Hamlet community in using belief and knowledge of medicinal plants as traditional healing heritage to maintain family health. There are other reasons why the medicinal plants in Turgo Hamlet needs to be documented: the potential of medicinal

plants is high; some residents still have knowledge of medicinal plants; there is land ecologically suitable for cultivation of medicinal plants which will help biodiversity conservation. Based on the above reasons, it is important to do research on the ethnobotany of medicinal plants in Turgo Purbowinangun Village, Yogyakarta, Indonesia, in order to know the local knowledge of medicinal plants to support family health, the parts of plants used as medicines and the processing of medicinal plants.

MATERIALS AND METHODS

This study was conducted in Turgo Hamlet, Purwobinangun, Pakem, Sleman, Yogyakarta, Indonesia from January to June 2014. This is the highest hamlet found in this rural area, located only 7 km from Mount Merapi. Geographically, it is located in 07°35.668 S and 110°25.118 E, with an altitude of 900-1000 m above sea level (Figure 1). The tools used in this study were: recorder, digital camera, note books, pens, scissors, plastic bags and questionnaire. The materials used were all medicinal plants found in the study site. The plants were identified using Steenis (1972) and Backer (1973).

A combination of qualitative and quantitative methods were used to collect information of ethnobotany of medicinal plants to support family health in order to know local knowledge of medicinal plants, the parts of plants used as medicines and the processing of medicinal plants. Ethnobotanical data were gathered through in-depth interview with respondents using open questionnaire. Respondents were selected using purposive sampling, based on certain criteria.

The number of respondents was 40. They were residents of Turgo Hamlet, consisting of native residents who were still concerned with medicinal plants, represented by 2 traditional midwife (5%), 7 old people (17.5%) and local community represented by 10 members of farmer group (25%), native residents represented by 16 medicinal plant farmers (40%). Based on their education, 40% of respondents graduated from elementary school, 30% from junior high school, and 30% from senior high school. Based on gender, 65% of respondents were female and 35% were male. Most respondents were farmers (85%), and the rest were civil servants and traders (15%) (Figure 2).

Information of medicinal plants were obtained from the community. Then the plants were collected from home gardens and forest around the hamlet. Every plant was identified using local name and scientific name. Unidentified plants were photographed and made into herbarium for further identification by botanist in the Laboratory of Botany and Ecology, Faculty of Science and Technology, University Islam Negeri Sunan Kalijaga Yogyakarta, Indonesia. The results of plant inventory were analyzed descriptively and quantitatively using tables.

RESULTS AND DISCUSSION

The results showed that the people of Turgo Hamlet have used 69 plant species, from 36 families as medicines, consisting of 14 species of trees (20%), 22 of shrubs (31%), 4 of lianas (5%), 26 of herbs (37%), and 3 of grasses (4%) (Figure 3). Family Zingiberaceae (10.14%) was the most used plants to cure various diseases and to maintain health and skin beauty (Tables 1 and 2).

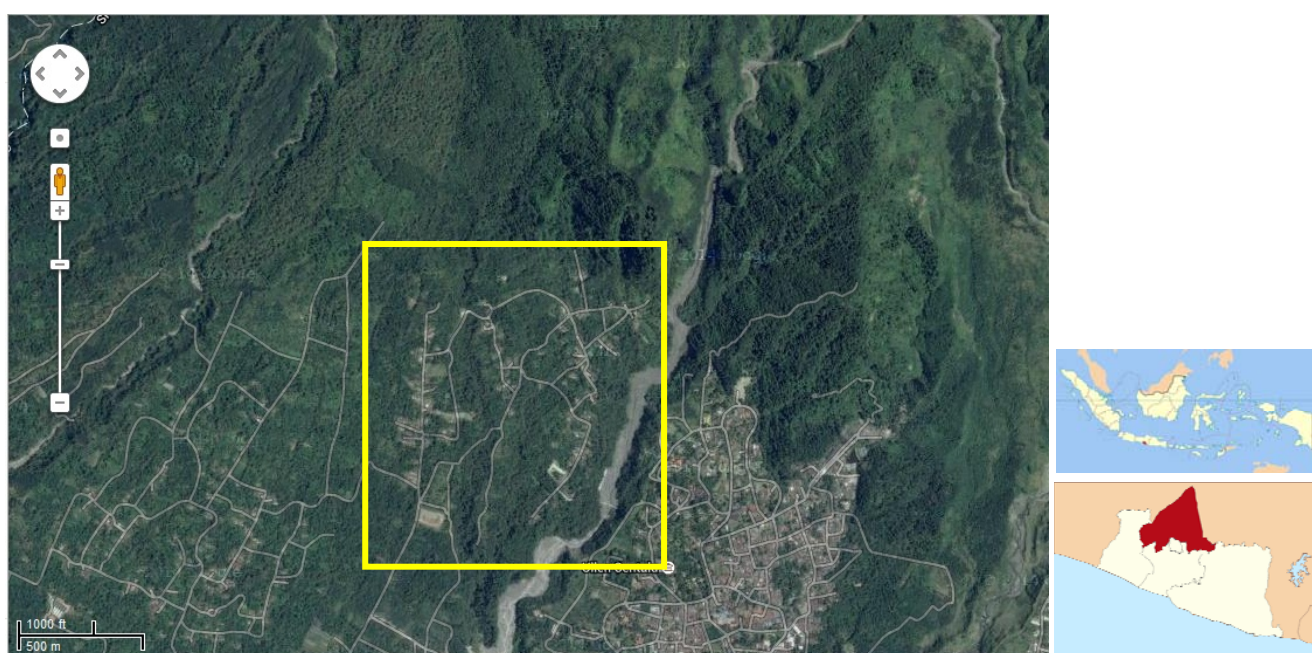


Figure 1. Location of study on the south slope of Mount Merapi, i.e.: Turgo Hamlet, Purwobinangun Village, District of Sleman, Yogyakarta, Indonesia

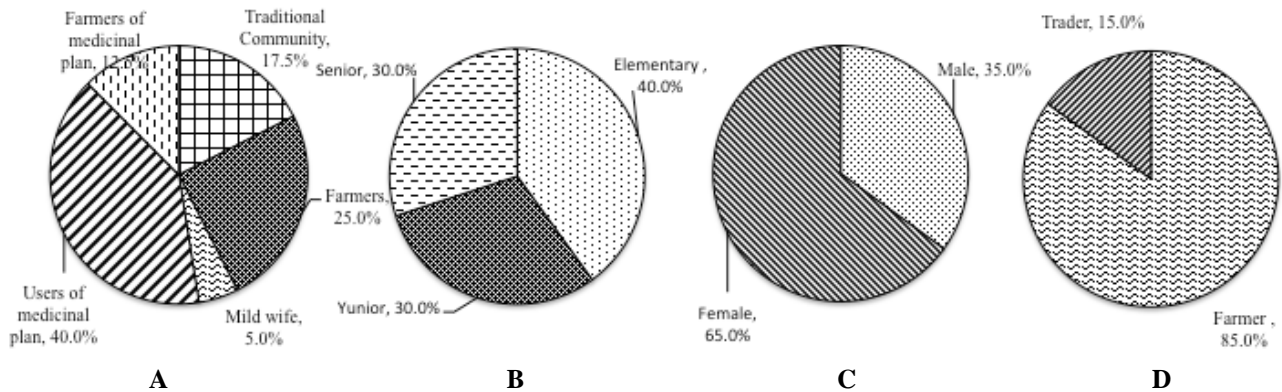


Figure 2. Qualification of respondents based on: A. Representation of community, consisting of native residents, traditional community and local community, B. Education level, C. Gender, and D. Occupation

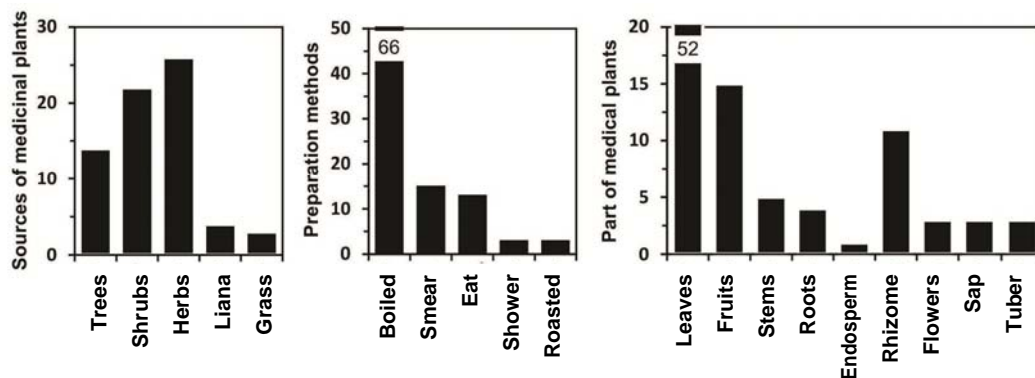


Figure 3. Medicinal plants in Turgo Hamlet based on: A. growth form, B. Processing, and C. parts of plants used

Species from Zingiberaceae, such as Dringo (*Acorus calamus* L.) was used to maintain body's immunity, tumeric kunir or kunyit (*Curcuma domestica* Val.) to cure liver disease, rheumatic, thypoid and diarrhea. Laos or lengkuas (*Alpinia galanga* (L.) Sw) to cure skin disease, temu giring (*Curcuma heynena* Vahl.) to lighten the skin for bride, Temuireng (*Curcuma aeruginosa* Roxb.) to increase appetite and to be used as vermicide. In addition, there were other species used for a variety of purposes, such as purple ginger or bengle (*Zingiber purpureum* Roxb.), jahe or ginger (*Zingiber officinale* Rosc.), and temulawak (*Curcuma xanthorrhiza* Roxb) (Table 1).

Family Asteraceae (8.7%) was the second most used for medicines for various diseases (Table 2), consisting of *bawukan* (*Ageratum conyzoides* L.), marsh fleabane or *beluntas* (*Pluchea indica* L.), *dewa* (*Gynura pseudochina* L.), *ireng-ireng* (*Eupatorium riparium* Reg.), *legetan* (*Synedrella nodiflora* L.), and *tempuyung* (*Sonchus arvensis* L.) (Table 1). The plants of this family were commonly found because they have made adaptation to tropical environment, and they have wide distribution and healing effect, so they are needed as solution to deal with the high price of modern medicines and the negative impacts of chemicals in modern medicines (Tjitrosoepomo 2010). Euphorbiaceae ranked third as medicinal plants (7.2%), consisting of *katuk* (*Sauropus androgynus* L.), *patikan cina* (*Euphorbia prostrata* Aiton), *patikan kerbau*

(*Euphorbia hirta* L.), cassava or *singkong* (*Manihot utilissima* Crantz), and *yodium* (*Jatropha multifida* L.) (Tables 1 and 2). The plants of this family are used as medicines because they are commonly found in cultivation and in the wild.

Leaf is the most used part of plant for medicines, taken from 37 species (51.39%) of plants (Figure 3), because it is the easiest part to get, easy too process, having healing effect, and its removal is not destructive to plants (Setyowati 2010). Leaf has high moisture content (70-80%), a place of photosynthesis, containing organic elements having medicinal effects and anti oxidants. Most green plants, such as avocado or alpukat (*Persea americana* Mill.), Indian pluchea or *beluntas* (*Pluchea indica* L.), mignonette vine or *binahong* (*Anredera cordifolia* (Ten.) Steenis), common comfrey or *komprei* (*Symphytum officinale* L.), *dadap serep* (*Erythrina lithosperma* (Hassk.) Merr), and *daun dewa* (*Gynura pseudochina* L) have leaves rich in carbohydrate, fiber, vitamin, and mineral (Table 1). Leaf was also the most used part of plant in traditional community of Gunung Simpang Nature Reserve, West Java, which was 31% of 74 species of medicinal plants, and also in the communities of Bulgaria and Gemedra, North Ethiopia, which was 50% of all total plants (Mesfin et al. 2013; Nedelcheva et al. 2013; Handayani 2015).

Table 1. Medicinal plants in Turgo Hamlet: local name, scientific name, family, processing and health benefit/ health problems solved by each species

Family	Scientific name	Local name	Parts of plant	Processing	Health benefit or health problems solved
Annonaceae	<i>Annona muricata</i> L.	Sirsat	Leaf	Boiled	Uric acid, high blood pressure
	<i>Stelechocarpus burahol</i> Blume	Kepel	Leaf	Boiled	Uric acid
Apiaceae	<i>Centella asiatica</i> (L.) Urban	Pegagan	Leaf	Boiled	Blood circulation
	<i>Eryngium foetidum</i> L.	Musi Arab	Leaf	Smear	Vermicide
	<i>Foeniculum vulgare</i> Mill.	Adas	Leaf	Boiled	Body's immune system
Araliaceae	<i>Panax ginseng</i> L.	Gingseng Jowo	Rhizome	Boiled	Body's immune system
Arecaceae	<i>Acorus calamus</i> L.	Dringo	Rod	Boiled	Body's immune system
	<i>Cocos nucifera</i> L.	Kelopo	Root Endosperm	Boiled Directly consumed	Nerve system Itchy skin
Asteraceae	<i>Monstera pertusa</i> (L.) de Vrise	Jalu Mampang	Leaf	Boiled	Appetite
	<i>Ageratum conyzoides</i> L.	Wedusan	Leaf	Smear	Skin cut
	<i>Eupatorium riparium</i> (Regel)	Ireng-Ireng	Leaf	Boiled	Malaria
	<i>Gynura pseudochina</i> Cass.	Dewa	Leaf	Boiled	Tumor
	<i>Pluchea indica</i> (L.) Less.	Beluntas	Leaf	Boiled	Increasing breast milk
	<i>Sonchus arvensis</i> L.	Tempuyung	Leaf	Boiled	Kidney stone
Araliaceae	<i>Synedrella nodiflora</i> (L.) Gaerth	Legetan	Leaf	Boiled	Skin cut, toothache
	<i>Polyscias scutellaria</i> Burm.F.	Mangko'an	Leaf	Boiled	Skin cut, diuretic
Bassellaceae	<i>Anredera cordifolia</i> (Ten.) Steenis	Binahong	Leaf	Smear	Skin cut
Boraginaceae	<i>Symphytum officinale</i> L.	Comprei	Leaf	Mashed	Breathing problem, diabetes
Bromeliaceae	<i>Ananas comosus</i> Mill.	Nanas	Fruit	Boiled	Fever
Cactaceae	<i>Epiphyllum</i> sp. Haw	Sambung Otot	Leaf	Boiled	Nerve system
Caricaceae	<i>Carica papaya</i> L.	Kates	Leaf	Boiled	Diarrhea
Cucurbitaceae	<i>Cucumis sativus</i> L.	Ketimun	Fruit	Eat	High blood pressure
	<i>Sechium edule</i> (Jacq) Sw.	Jipang	Leaf	Cook	High blood pressure
Euphorbiaceae	<i>Jatropha multifida</i> L.	Yodium	Leaf	Smear	Skin cut
	<i>Sauropus androgynus</i> (L.) Merr.	Katuk	Leaf	Boiled	Increasing breast milk
	<i>Euphorbia prostate</i> Aiton	Patikan Cina	All Species	Boiled	Diuretic, antipyretic
	<i>Euphorbia hirta</i> L.	Patikan Kerbau	All Species	Boiled	Asthma, diarrhea, kidney infection
Equisetaceae	<i>Manihot utilissima</i> Crantz	Singkong	Leaf	Smear	Cold
	<i>Equisetum debile</i> Roxb	Sangkal Putung	Leaf	Boiled	Cholesterol, skin cut, Broken bones
Fabaceae	<i>Gliricidia sepium</i> (Jacq.) Kunth ex Walp.	Kleresede	Leaf	Shower	Itchy Skin
Liliaceae	<i>Aloe vera</i> L.	Lidah Buaya	Leaf	Smear	Skin burn
	<i>Allium sativum</i> L.	Bawang Putih	Tuber	Directly consumed	Cholesterol
Lamiaceae	<i>Orthosiphon stamineus</i> Benth.	Kumis Kucing	Leaf	Boiled	Kidney
Lauraceae	<i>Persea americana</i> Mill	Alpoket	Leaf	Boiled	Uric acid, high blood pressure
Leguminosae	<i>Erythrina lithosperma</i> (Hassk.) Merr	Dadap Serep	Leaf	Boiled	Fever
	<i>Leucaena leucocephala</i> (Lam.) De Wit	Lamtoro gung	Leaf	Boiled	Skin cut, cancer, vermicide
Loranthaceae	<i>Loranthus</i> sp. Jacq.	Kemladean	Parasit	Boiled	Cancer
Malvaceae	<i>Hibiscus similis</i> Bl.	Waru Gombong	Getah	Smear	Eye problem
Marantaceae	<i>Maranta arundinacea</i> L.	Garut	Tuber	Roasted	Dyspepsia (gastritis)
Melastomataceae	<i>Medinella speciosa</i> Reinw. Ex Blume	Parijoto	Flower	Directly consumed	Strengthening embryo
Meliaceae	<i>Swietenia macrophylla</i> King.	Mahoni	Fruit	Directly consumed	Hemorrhoid
Menispermaceae	<i>Tinospora tuberculata</i> (Thunb.)	Brotowali	Rod	Boiled	Appetite, diabetes
Moraceae	<i>Artocarpus heterophyllus</i> Lam.	Nongko	Fruit	Directly consumed	Diarrhea
Musaceae	<i>Musa paradisiaca</i> L.	Pisang Kepok	Fruit	Roasted	Kidney stone, gastritis, female fertility
	<i>Musa textilis</i> Nee	Pisang Raja	Sap	Smear	Skin burn
Myrtaceae	<i>Syzygium aromaticum</i> L.	Cengkeh	Fruit	Boiled	Warming the body
	<i>Eugenia polyantha</i> Wight.	Salam	Leaf	Boiled	Uric acid, cholesterol
	<i>Psidium guajava</i> L.	Jambu klutuk	Leaf	Boiled	Diarrhea
Piperaceae	<i>Piper betle</i> Linn	Suruh	Leaf	Boiled	Fluor albus, cough, body's odor
	<i>Piper betle</i> var. <i>nigra</i>	Suruh ireng	Leaf	Boiled	Fluor albus, cough

	<i>Piper crocatum</i> Ruitz & Pav.	Suruh abang	Leaf	Boiled	High blood pressure
	<i>Saccharum officinarum</i> L.	Tebu	Rod	Directly consumed	Kidney, eye inflammation
Poaceae	<i>Cynodon dactylon</i> L.	Suket grinting	Leaf	Boiled	Uric acid
			Root	Boiled	Nerve system
	<i>Imperata cylindrica</i> L.	Alang alang	Leaf	Boiled	Skin cut
			Rod	Boiled	Fever, uric acid
Rubiaceae	<i>Morinda citrifolia</i> L.	Pace	Leaf	Boiled	High blood pressure, uric acid
	<i>Paederia scandens</i> L.	Sembukan	Leaf	Cooked	Increasing flatulence
Rutaceae	<i>Citrus aurantifolia</i> (Christm.) Swingle	Jeruk pecel	Fruit	Directly consumed	Cough
Solanaceae	<i>Capsicum annum</i> L.	Lombok	Fruit	Cooked	Influenza, appetite, aphthous stomatis
	<i>Solanum lycopersicum</i> L.	Tomat	Fruit	Directly consumed	Reducing risk of Cancer
Theaceae	<i>Camellia sinensis</i> L.	Teh	Leaf	Boiled	Cancer, Asam Urat, Rematik
Verbenaceae	<i>Clerodendrum japonicum</i> L.	Pagoda	Flower	Boiled	Diuretic, antiseptic, Haemostatic
	<i>Vitex trifolia</i> L.	Legundi	Leaf	Boiled	Uric acid
Zingiberaceae	<i>Zingiber purpureum</i> Roxb.	Bengle	Rhizome	Boiled	Body's immune system
	<i>Zingiber officinale</i> Roscoe	Jahe	Rhizome	Boiled	cold, stiff muscles
	<i>Alpinia galangal</i> (L.) Willd	Laos	Rhizome	Smearred	Skin fungus
	<i>Curcuma heyneana</i> L.	Temugiring	Rhizome	Shower	Skin smoothing cream
	<i>Curcuma aeruginosa</i> Roxb.	Temuireng	Rhizome	Boiled	Vermicide, appetite
	<i>Curcuma xanthorrhiza</i> Roxb	Temulawak	Rhizome	Boiled	Liver, appetite

Fruit was also frequently used as medicines. The medicinal fruits were taken from 11 species (15%) (Table 2), such as fennel or *adas* (*Foeniculum vulgare* Mill.), *cabai* or chili pepper (*Capsicum annum* L.), *mahoni* or magahony (*Swietenia macrophylla* King.), *nangka* or jackfruit (*Artocarpus heterophyllus* Lam.), and cheese fruit or *pace* or *mengkudu* (*Morinda citrifolia* L.). Fruits are used as medicines because they contain nutrient needed by human body such as potassium, pectin, beta-carotene and vitamin C. In addition, fruits also contain elements capable of cleansing food waste, has ready-to-use energy (Gunawan 2007). Rhizomes of 8 species (11%) were also used as medicines, such as, *empon empon* (Zingiberaceae): purple ginger of *bangle* (*Zingiber purpureum* Roxb.), tumeric or *kunyit* (*Curcuma domestica* Val.), Javanese ginger or *temulawak* (*Curcuma xanthorrhiza* Roxb.), and *jahe* or ginger (*Zingiber officinale* Rosc.). Rhizomes are used as medicines because they contain substances beneficial for health, such as zingiberene found in ginger (*Z. officinale*) which can be used to cure impotence and as beverage to warm the body (Figure 3).

Stem of four 4 species (5%), namely *brotowali* (*Tinospora crixspa* L.), sweet flag or *dringo* (*Acorus calamus* L.), blade grass or *rumpul ilalang* (*Imperata cylindrica* L.), and sugar cane or *tebu* (*Saccharum officinarum* L.) were also used as medicines. Roots of 3 species (4%) namely Bermuda grass or *rumpul grinting* (*Cynodon dactylon*), common comfrey or *comprei* (*Symphytum officinale*) and coconut or *kelapa* (*Cocos nucifera* L.) were used as medicines. Other organs, namely flower, sap, tuber, and the whole plant were rarely used. Medicinal flowers were taken from showy Asian grape or *parijoto* (*Medinilla speciosa* Reinw.) and bleeding heart or *pagoda* (*Clerodendrum japonicum* L.), while medicinal sap was taken from "king" banana or *pisang raja* (*Musa*

paradisiaca L.) and *waru gombong* (*Hibiscus similis* L.). Medicinal tubers were taken from garlic or *bawang putih* (*Allium sativum*) and *garut* (*Maranta arundinacea*), while the the medicines from whole plants were found in prostate sandmat or *patikan cina* (*Euphorbia prostate* Aiton.) and asthma plant or *patikan kerbau* (*Euphorbia hirta* L.). Only few people used parasitic plants and endosperm as medicines. Only 2 species (1%) of parasitic plants, namely parasitic plant in tea or *benalu teh* (*Loranthus* sp.), and coconut or *kelapa* (*Cocos nucifera*) were used as medicines (Table 1, Figure 3).

The people of Turgo Hamlet have used various processes of medicinal plant materials. Boiling (62%), in order to dissolve the active substance into the water, was conducted for leaves of 28 species, rhizomes 5 of species, fruits of 4 species, stems of 3 species, roots of 1 species, and 1 species of parasitic plant. Smearing on skin (15%) was done for leaves of 7 species, roots of 2 species, rhizomes of 1 species, and sap of 1 species, namely "king" banana *pisang raja* (*Musa paradisiaca*). Some parts of medicinal plants were consumed directly without processing (12%), such as showy Asian grape or *parijoto* (*Medinilla speciosa*), coconut's endosperm (*Cocos nucifera*), stem of sugar cane (*Saccharum officinarum*), tuber of garlic (*Allium sativum*). Cooking of plant materials were rarely done (4%). It was done for chilli pepper (*Capsicum* sp.), chayote or *jipang* (*Sechium edule*), and stinkvine or *sembukan* (*Paederia scandens*). Burning of plant materials was also rarely done (3%). It was done for tuber of arrowroot or *garut* (*Maranta arundinacea*) and banana or *pisang kepok* (*Musa paradisiaca*) (Table 1). In addition, some plant materials were used for bathing (3%), such as quickstick or *klereside* (*Gliricidia sepium*) and *temugiring* (*Curcuma heyneana*).

Table 2. Percentage of families used as medicinal plants in Turgo Hamlet

Family	Number of genera	Number of species	Proportion of species (%)
Annonaceae	2	2	2.90
Apiaceae	3	3	4.35
Araliaceae	1	1	1.45
Arecaceae	3	3	4.35
Asteraceae	6	6	8.70
Bassellaceae	1	1	1.45
Boraginaceae	1	1	1.45
Bromeliaceae	1	1	1.45
Cactaceae	1	1	1.45
Caricaceae	1	1	1.45
Cucurbitaceae	2	2	2.90
Equisetaceae	1	1	1.45
Euphorbiaceae	4	5	7.25
Fabaceae	1	1	1.45
Lamiaceae	1	1	1.45
Lauraceae	1	1	1.45
Leguminosae	2	2	2.90
Portulacaceae	1	1	1.45
Liliaceae	2	2	2.90
Loranthaceae	1	1	1.45
Malvaceae	1	1	1.45
Marantaceae	1	1	1.45
Melastomataceae	1	1	1.45
Meliaceae	1	1	1.45
Menispermaceae	1	1	1.45
Moraceae	1	1	1.45
Musaceae	1	2	2.90
Myrtaceae	3	3	4.35
Piperaceae	1	3	4.35
Poaceae	3	3	4.35
Rubiaceae	2	2	2.90
Rutaceae	1	1	1.45
Solanaceae	2	2	2.90
Verbenaceae	2	2	2.90
Zingiberaceae	3	7	10.14
Total	61	69	100

Table 3. Types of diseases cured with medicinal plants

Types of diseases	Name of diseases and health benefit
Mild diseases	Skin cut, skin burn, aphthous stomatis, stomach gas, fever, stiff muscles, rheumatic, toothache, gastritis, hemorrhoid, diuretic, <i>fluor albus</i> , influenza, skin infection, diarrhea, cough, itchy skin, worm, skin ulcer, skin fungus, eye inflammation, warming the body, binding skin cut, maintaining body's immune system, maintaining brain health, increasing fertility, anti inflammation, reducing body odor and mouth odor
Serious diseases	Cholesterol, cancer, broken bones, diabetes, kidney, diuretic, liver, uric acid, asthma, kidney stone, nerve, high blood pressure, diuretic, neutralizing intestines

The people of Turgo Hamlet had the capability of classifying diseases into two categories: mild and serious.

A disease is considered mild if it occurs to many people, and a disease is considered serious if it takes long time to heal it and it may cause death (Table 3). An example of mild disease is cold due to cold weather. The people cured this disease by consuming ginger (*Z. officinale*) which contains curcumin, capable of proliferating T cells, so it has good prospect to increase immunity system (Varalakshmi et al. 2008). A serious disease, diabetes was generally cured with *brotowali* (*Tinospora crispa*) which contains alkaloid and flavonoid, capable of reducing sugar concentration in the blood.

In addition, the community of Turgo Hamlet had knowledge of the use of medicine for external application, namely smearing, and internal application, namely consuming (Table 3) An example of external application was the smearing of coral bush or *daun yodium* (*Jatropha multifida*) on the skin cut, because the leaves contain alkaloid compound beneficial for blood coagulation and thus useful for new cut. The leaves of common guava (*Psidium guajava*) was used to cure diarrhea, because the leaves contain astringent (a substance which can line mollusc intestine wall with a layer, protecting the wall from the stimulation of the intestine content), which is alkaline in nature, and capable of killing bacteria, *Escherichia coli* and *Staphylococcus aureus*.

The belief of Turgo Hamlet people on traditional healing is inherited from generation to generation, developed and governed together by the community. In Turgo Hamlet medicinal plants were usually found in homegardens, plantations, shrubs and in cultivated land. This fact is in line with the results of research by Hariyadi (2011) that medicinal plants are not taken from natural forest, but from human-dominated ecosystems, especially shrubs and cultivated land. The local wisdom of Turgo Hamlet community has long influenced the paradigm of the people on health, and indirectly has encouraged them to conserve biodiversity of tropical forest, which consist of various ecosystem types and serve as storage of biodiversity (Hidayat et al. 2010). More than 2,039 species of medicinal plants are found in tropical forest, useful to maintain health and to cure various diseases of human and cattle (Zuhud 2009). Therefore, the belief and knowledge of community of the use of medicinal plants must be developed and protected as heritage of traditional healing to maintain family health.

The people of Turgo Hamlet have used 69 plants species, from 36 families, growing in home gardens and in forest nearby, as medicinal plants. Their knowledge of medicinal plants has been inherited from generation to generation. The most used part of plant was leaf, followed by fruit, rhizome, stem, root, sap, flower, all parts or the whole plant, tuber, and endosperm. The medicinal plants consisted of several growth forms, namely tree, shrub, herb, liana and grass. The processes of medicinal plants were: boiled, directly smeared on skin, directly consumed, cooked, used for bathing, and burned.

It is obvious that the people of Turgo Hamlet have achieved health sovereignty for themselves and their families, based on their knowledge inherited from their ancestors, supported by the potential of natural resources in

the village enabling them to do self healing for themselves and their families. In addition, they also have conducted ecosystem conservation through plant utilization for medicines. The community's knowledge will be improved if it is complemented with scientific research on the active substances of the medicinal plants, conducted by universities. So, sustainable research is needed in order to develop the knowledge qualitatively and quantitatively. It is also important to protect this local wisdom, so it will stay as the property of Indonesian nation.

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