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Ethnomedicinal Knowledge of Plants among the Indigenous Peoples of Santol, La Union, Philippines

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Research Article

Abstract

With today's younger and more educated populace, knowledge or information of these traditional herbal medicines is no longer valued as being useful. Further, with the advent of modern medicine and technology, the indigenous knowledge of herbal medicine and practices handed down from forefathers has been threatened to extinction. Thus, this research identified the types of medicinal plants used by local people and investigated the extent to which the plants are used. A total of 40 informants were interviewed, allowing for Calculated Informant Consensus Factors (ICF), Use Value (UV) and Fidelity Levels (FL) for each medicinal plant species used to cure various ailments. This helped to establish a consensus on which species are effective for a particular ailment, as well as the species' relative importance, and enabled us to understand the extent of potential utilization of each species. The therapeutic effects of 109 plant species used medicinally against 13 categories of ailments. The highest ICF values were cited for diseases of the eye and adnexa and for genitourinary system. High FL values were found for gatas-gatas/tawa-tawa (*Euphorbia hirta* L.) and malmalukong/takip-kuhol *(Centella asiatica* (L.) Urb.) used for the treatment of sore eyes and inflamed ears, respectively. The highest UV (1.00) was for guava (*Psidium guajava* L.) and lagundi (*Vitex negundo* L.). All plants with high UV were used for exogenous diseases, diseases of the skin and subcutaneous tissues, respiratory and digestive system. There are different modes of preparations of the medicinal plants. For instance, immediate treatment for cuts was demonstrated by using crushed leaves of Pantalyon/suob-kabayo (*Hyptis suaveolens* Poir.). This study demonstrated that many plant species are important in local healing practices and that knowledge of traditional medicine is utilized and plays a significant role in Santol, La Union. The documentation of this rich traditional enthomedicinal knowledge has paved way for novel information for pharmacological investigations to improve health care for a range of ailments.

Keywords: Ethnomedicine; Informant Consensus Factor (ICF); Fidelity Level (IF); Use Value (UV); Bago Tribe; Kankanaey Tribe.

1. Background of the Study

The connection between man and plants is enormously important because plants affect every aspect of man's existence by providing an incessant source of varying materials i.e. food, timber, fibres, dyes, tools and many others. Medicinal plants have been used for treatment since ancient times and are still in use all over the world. Of the 422,000 flowering plants found globally (Govaerts [1] as cited by Abe et al. [2]) more than 50,000 are used for medicinal purposes [3]. The practices of plant-based traditional medicine are based on hundreds of years of belief and observations which predate the development of modern medicine [4].

Medicinal plants and herbs have been used for many centuries as a source of people's medicines for the prevention and treatment of diseases and still provide the first line of primary health-care even in the present age to major segments of the population worldwide. According to the World Health Organization (2003), it is estimated that up to 80% of the population depends exclusively on plants for their health and healing.

Indigenous knowledge refers to the cumulative and complex bodies of knowledge, know-how, practices and representations that are maintained and developed by local communities, who have long histories with interactions with the natural environment. With the growing threat of losing traditional knowledge in the modern time, many efforts have been made to record and publish this knowledge. In the past few years, a renewed interest on the natural method of treatment or traditional medicine arose worldwide. In recent years, work on ethnobotanical knowledge worldwide has dramatically increased especially in some parts of Europe, Asia and Africa (Pieroni et al. [5] as cited by Balangcod [6]). Despite many ethno-medicinal studies that were performed all over the world, a relatively few documentation on ethno-medicinal plant is done in the Philippines, with some focusing only on well-known indigenous peoples including the *Pinatubo Negritoes* and their use of plant resources; the *Tasadays* in Mindanao, who have been a subject of various studies; the *Itawes* of Cagayan and the *Ibaloi* of Benguet province and their utilization of forest resources [7].

The information and folk knowledge regarding the medicinal and therapeutic uses of these indigenous plant materials have been handed down from generation to generation through verbal communication [8,9]. Studies in the ethnobotany of cultural groups that rely on the oral tradition to pass on traditional medicinal plant knowledge from generation to generation indicates that in addition to the great wealth of knowledge of economically useful plants, these cultural groups also have an extensive knowledge of economically useful plants and the traditional techniques used to manage, harvest and conserve these species [10,11].

There is no specific history record as to how Santol got its name but tradition speaks of two accounts which are tied up to a tree called Santol. The first version states that this place was once a favourite hunting ground of people of the Ilocandia, notably the people from San Vicente, Ilocos Sur who were very much interested in sculpture especially in the making of images. They came to see a big tree which is now called as Santol tree and from then on made it their main material in making images. During those days then, idols/images locally termed as "Santo" were made out mostly of said tree. In the same manner that the tree got its name 'Santol', because of its common use as material for making "Santo", the municipality also got its name from that historic tree, hence, Santol.

According to the second version, the more popular one, it was during the Spanish-American war that Santol got its name. It is said that when the Spanish soldiers pass by the place, they met women carrying baskets full of ripe santol fruits. The soldiers asked the name of the place, but, the women did not understand Spanish and just though that the soldiers were asking the name of the fruit they are carrying. They answered, "Santol, Apo." The soldiers did not understand the local dialect and all they remembered was the word Santol, hence the name of the place.

During the early settlement of the Spaniards, the ancient inhabitants were Igorots and new Christians. The Igorots lived in the formerly virgin forests along the deep streams when a group of new Christians came. Slowly, they pushed the Igorots to the remote mountain sides. Intermarriages between Ilocanos and Igorots soon followed. From this, more and more people adopted Ilocano as their dialect. As of 1995 census, 70% of the population speak Ilocano. Other dialects spoken are kan-kanaey by 31.20%, Bontoc by 0.15% and Tagalog by 0.33%.

Santol considered being formerly a part of the municipality of Balaoan becomes a township in 1908 under the sub-province Amburayan, Mountain Province. In 1922, Mountain Province relinquished Santol to become a part of the municipal district of La Union.

The town of Santol is considered a safe harbor for there had been no distinct destruction of lives or properties during the historic events regarding wars and calamities. Such was true during the Spanish regime and Japanese occupation. Evidence of this is that Barrio Mangan was set aside as the place of the military emergency hospital. It was also here where the center of distribution of food supplies for army personnel was located while Barrio Banbanaba was site of message center directly in touch with all the barrios of Balaoan, Santol, San Gabriel and Sudipen.

Most of the residents are farmers who live near/on mountains, plains and farmlands. Based on the 2010 Census of Population and Housing, out of the 12, 007 residents, 5016 are considered to be indigenous peoples of *Kankaney* and *Bago* origin. The indigenous peoples in Santol exhibit a remarkably high degree of cultural and environmental interdependence.

The use of plants by indigenous peoples all over the world has been underreported and this prevents the scientific community from benefiting from traditional knowledge which has taken centuries to develop in the form we know them today. Nowadays, indigenous knowledge on medicinal plants is fast diminishing because as more plants are lost, so is the knowledge of their value to humanity. In the study, the relationship between the *Kankanaey* and *Bago* and plants will be demonstrated. This study aimed to document the indigenous knowledge of medicinal plants among the indigenous peoples of Santol in terms of the (a) plants they used to combat disease, (b) parts of the plant used, (c) modes of preparation, (c) how such knowledge is obtained and transmitted, and (d) frequency of use. It also defined the previous and current status and cultivation practices pertinent to the plant utilized for medicinal purpose and provided insights on some possible threats to their traditional knowledge. The conservation of ethnobotanical knowledge is becoming increasingly important; thus this research aimed to document the use of medicinal plants and healing practices in Santol, La Union, identify the most important species, determine the relative value of species and calculate the informant consensus factors. Finding of this research will provide a data base for future research and potential source for the development of new drugs.

2. Methodology

2.1 Study area

Santol, the site of the study, is a fourth class municipality in the province of La Union. It is located 16°46′N 120°27′E with a total land area of 93.70 km^2. It is situated in the eastern mountainous area of La Union at the boundary of Ilocos Sur (Figure 1). It is bounded on the north by the Municipality of Sudipen, on the northeast by the upland Municipality of Sugpon in Ilocos Sur, on the south by the Municipality of San Gabriel, and on the west by the Municipality of Balaoan. Santol is politically subdivided into 11 barangays. Santol comprises mostly of hilly and mountainous areas and a small portion of alluvial plains.

Figure 1. Map of La Union showing the location of Santol.

There are nine barangays in the municipality inhabited by indigenous peoples namely Lettac Norte, Lettac Sur, Mangaan, Poblacion, Puguil, Ramot, Sapdaan, Sasaba and Tubaday. The ethnic groups are predominantly *Kankanaey* and *Bago*. There are health centers in every barangay and one Rural Health Unit (RHU) located in the town center. Typically, local people utilize plants to address their health concerns. Only when they cannot be treated that they choose to visit the health centers. Not all residents have accessed to sanitary toilet facilities and safe drinking water.

2.2 Data collection

Preceding the conduct of the study, approval and endorsement of the National Commission on Indigenous Peoples (NCIP)-ROI was sought. Upon approval by the NCIP-ROI, a prior informed consent was pursued through several consultations with the community. Data regarding ethnobotanical knowledge were gathered through extensive survey, focused group discussions and semi-structured interviews with residents and informal conversations with Medical Personnel from the RHU. The information gathered through interviews was consolidated by field observations. A total of 40 individuals (16-90 years old) were interviewed including the elderly and Barangay Health Workers (BHWs), who were identified by the local administrators and community leaders. Several visits were conducted for validation purposes. Field visits involved direct contact with the community. Ethnobotanical surveys to the forest areas were accomplished with the help of several key informants. At same occasions, plant samples were collected and brought to the communities for identification, local names and the ethnomedicinal uses.

The informants were about their knowledge of the plants they used to combat disease, parts of the plant used, and modes of preparation, and details concerning how each plant are administered to patients, how such knowledge is obtained and transmitted and frequency of use. The previous and current status and cultivation practices were also investigated.

The plants' vernacular names were collected with the help of the local people. Scientific names were determined by identifying herbarium species and checked against references in the Dictionary of Philippine Plant Names [12]. Scientific names of plants were determined using The Plant Names Index [13].

The gender, educational background, occupations, monthly cash incomes and PhilHealth membership of the informants were also recorded.

2.3 Data analysis

Use categories

The medicinal plants were identified based on the information obtained from the informants in the study area, and the reported applicable ailments were classified into 13 categories based on the International Classification of Diseases (ICD-10) by the World Health Organization. The categories are infectious and parasitic diseases; endocrine, nutritional and metabolic diseases; diseases of the eye and adnexa; diseases of the ear and mastoid process; diseases of the circulatory system; diseases of the respiratory system; diseases of the digestive system; diseases of the skin and subcutaneous tissue; diseases of the musculoskeletal system and connective tissue; diseases of the genitourinary system; diseases during the postpartum period; undefined pains or illness; and injury and poisons from external causes. Moreover, information on plants that have a medicinal use but that also used for food or other economical uses will also be noted. Every time a plant was mentioned as being used to any extent, it will be considered to be one use-report. If one informant used a plant to treat more than one ailment in the same category, it was considered a single use-report [14]. However, a multiple use-report was considered when at least two interviewees mentioned the same plant for the same ailments.

Informant consensus factor

To determine the agreement between informants over which plants should be used for each category of ailments, the Informant Consensus Factors (ICF) was calculated (Trotter [15]) using the formula: ICF=(Nur–Nt)/(Nur–1), where Nur refers to the number of use-reports in each category and Nt refers to the number of taxa used for a particular category by all informants. The ICF provided a range of 0-1, where high values (approaching 1) are obtained when there is a well-defined selection criterion in the community and/or if information is exchanged between informants, and values are low (near 0) when plants are chosen randomly or if there is no exchange of information about their use among informants.

Use value

The use values for plants (Philips et al. [16]) was calculated to provide a quantitative measure for the relative importance of species known locally: UV=(∑Ui)/n, where Ui is the number of use-reports cited by each informant for a given species and n refers the total number of informants. Use values are high when there are many use-reports for a plant, implying that the plant is important, and low (approach to 0) when there are few reports related to its use. The use value however, does not distinguish whether a plant is used for single or multiple purposes.

Fidelity level

Because many plant species are utilized in the same use category, the most preferred species used for the treatment of a particular ailment must be determined by calculating Fidelity Levels (FL) (Friedman et al. [17]): FL=Np/N, where Np is the number of use-reports cited for a given species for a particular ailment, and N is the total number of use-reports cited for any given species. High FL values (near 100%) are obtained for plants for which almost all use-reports refer to the same method of use (that is, the plants were considered the most preferred species for a particular ailment category), whereas low FLs are obtained for plants that are used for many different purposes.

2.4 Statistical analysis

Descriptive statistical method was employed to analyse and summarize the ethnomedicinal data on the reported medicinal plants and associated knowledge (Tables 1 and 2).

The relative importance of different plants was computed based on the consensus of informants' responses. It was calculated from the proportion of informants who independently reported knowledge on a given use against a particular disease or disease category following the approach used by Phillips et al. [16]. The informants' consensus was used to examine the effectiveness of medicinal plant/s to treat a particular ailment.

Table 1: Categories of ailments and informant consensus factor (ICF).

Category	Diseases or ailments	ICD-10	No. of use-reports	% of all use-reports	No. of species	% of all species	ICF	Most frequently used species	FL (% in this category)
Diseases of the ear and mastoid process	Earache, mumps	VIII	9	1.04	4	1.84	0.63	Malmalukong /takip-kuhol *(Centella asiatica* (L.) Urb.*)*	56
Diseases of the respiratory system	Asthma, nasal congestio n, pneumoni a, cough, sore throat	X	128	14.81	24	11.05	0.82	Five leaved chaste tree; lagundi (*Vitex negundo)*; Oregano *(Plectranthus amboinicus* Lour.)	11.72
Diseases of the eye and adnexa	Red eyes, sore eyes	VII	3	0.34	1	0.46	1	Gatas- gatas/ Tawa- tawa (*Euphorbia hirta* L.*)*	100
Diseases of the circulatory system	Anemia, high blood pressure	IX	44	5.09	14	6.45	0.7	Garlic; Bawang *(Allium sativum* L.*)*	14
Injury and poisons of external causes	Allergy, burns, cuts and wounds, dislocation / fracture, sprain, insect bites, poison	XIX	117	13.54	29	13.36	0.76	Pantalyon/su ob-kabayo (*Hyptis suaveolens* Poir.)	26
Diseases of the genitourinary system	Urinary, chronic cystitis, kidney	XIV	143	16.55	22	10.14	0.85	Sambong (*Blumea balsamifera* (L.) DC.)	11

Undefined pains or illness	Abdominal pain, headache, body pain, cough, fever, backache, stunned	XVIII	83	9.61	28	12.9	0.67	Turmeric; Luyang dilaw (*Curcuma longa* L.)	6.02
Diseases during the postpartum period	Abortive, menstruation, newly delivered	XV	40	4.63	10	4.61	0.77	Herbaka (*Artemisia vulgaris* L.)	13
Infectious and parasitic diseases	Ascariasis, chicken pox, head lice, herpes, ringworm, scabies	I	33	3.82	9	4.15	0.75	Bayabas (*Psidium guajava* L.)	45.45
Diseases of the skin and subcutaneous tissue	Boils, skin eruptions,	XII	86	9.95	24	11.06	0.73	Hibiscus; Gumamela (*Hibiscus rosa-sinensis* L.)	17.44
Diseases of the digestive system	Constipation, diarrhea, inflammation of rectum, ulcer, toothache, mouth sore	XI	134	15.51	38	17.51	0.72	Bayabas (*Psidium guajava* L.)	15
Endocrine, nutritional and metabolic diseases	Diabetes, nutrients, tonic	IV	21	2.43	5	2.3	0.8	Horseradish tree; Malunggay (*Moringa oleifera* Lam.)	24
Diseases of the musculoskeletal system and connective tissue	Arthritis, rheumatism, swollen muscles	XIII	23	2.66	9	4.15	0.64	Turmeric; Luyang dilaw (*Curcuma longa* L.)	22

3. Results and Discussion

In the Philippines, ethnomedicinal knowledge is intrinsic among ethnic groups and is inherited from their great ancestors by oral communication. In the study, the relationship between the indigenous peoples of Santol and plants are demonstrated. A total of 109 medicinal species distributed to 20 genera and 15 families were cited to treat different kinds of ailments. Based on responses and personal observations, the common health problems are respiratory diseases and stomach ailments.

3.1 Knowledge of medicinal plants

Differences in occupation or educational background did not influence the reported knowledge of medicinal plants. Additionally, those aged over 60 were more well-informed than the younger generation and the use of medicinal plants decreased with decreasing age. Although almost all informants reported that knowledge of medicinal plants was inherited form their ancestors through oral tradition, the number reporting this varied by age, which implies that knowledge of the use of medicinal plants may be threatened gradually.

3.2 Frequency of use of medicinal plants

Most people in the upland barangays used medicinal plants. They are isolated from the town proper by towering mountains. Further, public utility vehicles are only available during Mondays and will cost them one hundred forty pesos (Php 140.00). With that, people in the upland barangays namely Sapdaan, Sasaba, Mangaan, Tubaday, Puguil and Ramot do not have opportunity to buy over-the-counter medicines and geographically prevented from having access to professional healthcare compared with residents of the lowland barangays.

3.3 Characteristics of medicinal plants

The data obtained from field surveys are summarized in Table 2. Both the scientific and vernacular names for the medicinal plants are given by taxonomic category and family. In this survey, 109 plant species were

Table 2: Medicinal plants used by indigenous peoples of Santol, La Union and Use Value (UV).

Plant No.	English/Common Name/ Scientific Name	Family	Local Name	No. of Use-Reports	Use Values (UV) [a]	Diseases or Ailments	Parts Used[b]	Preparation and Administration[c]
1	*Gouania javanica* Mia.	Rhamnaceae	Rungo-rungo	5	0.13	Mouth Sore	Sp	E Apply
2	Oregano *(Plectranthus amboinicus* Lour.)	Labiatae/Lamiaceae	Oregano	14	0.43	Cough Sprain	Lf	I Roast partly and squeeze; drink the sap or juice thrice a day
							Lf	E Fastened pounded and heated leaves with coconut oil
				3				
3	Lemon grass; tanglad (*Cymbopogon citratus* DC. Stapf*)* Syn: *Andropogon citratus* DC.	Graminae/Poaceae	Baraniw	1	0.25	Inflammation of Lower Limbs Menstruation Abdominal pain Difficulty of urination Profused sweating UTI; difficulty of urination	St	I Drink decoction
				1			Lf	I Drink decoction
				1			Lf	I/E Drink decoction of stems Apply pounded leaves on abdomen
				5			Whole Parts	I Drink decoction
				1			Br	I Drink decoction
				1			Lf	I Drink decoction thrice a day
4	Hibiscus; Gumamela (*Hibiscus rosa-sinensis* L.)	Malvaceae	Kayanga; Gumamela	15	0.38	Boils	Lf, Fw	E/I Apply pounded leaves or flowers on affected area. Drink decoction of flowers
5	Mahogany (*Swietenia mahogani* Jacq*)*	Meliaceae	Mahogany	3	0.08	Diarrhea	Sd	I Drink decoction of seeds or chew and swallow the juice or sap
6	Grass; Kogon *(Imperata Cylindrical* L.*)*	Graminae/ Poaceae	Pan-aw/Kogon	1	0.25	Menstruation Difficulty of urination Productive cough	Rt	I Drink decoction
				8			Rt	I Drink decoction
				1			Lf	I Drink decoction

7	Horseradis h tree; Malunggay (*Moringa oleifera* Lam.)	Moringaceae	Marungga y/ malungg ay	3	0.8	Skin eruption, cuts and wounds Nutrients Anemia, high blood pressure Insect bite Induce lactation Swollen muscles Toothache	Lf	E Pound until soft and juicy, apply directly or topically
				15			Lf, Sd	I Eat cooked leaves as vegetables
				5			Lf, Sd	I Eat fresh or cooked leaves or seeds as vegetable.
				1			Lf	E Apply fresh, heated leaves on bitten area
				5			Lf	I Eat cooked leaves as vegetable
				1			St	E Fastened pounded and heated stem or leaves with banana leaves and coconut oil
				2			Lf	E Apply crushed leaves on affected tooth
9	*Alstonia scholaris* (L.) Poir	Apocynaceae	Dalipaoen/ Dalipaon	12 2 2	0.4	Diarrhea Malaria Abortifacient	Bk	I Drink decoction
10	Soursop; Guyabano (*Annona muricata L.*)	Annonaceae	Guyabano	3	0.1	Swollen muscles; rheumatism	Lf	I/E Drink decoction thrice a day. Apply on swollen muscles with few drops of oil
				1		Stunned		E Smell crushed leaves

11	Ginger; Luya (*Zingiber officinale* (Willd.) Roscoe)	Zingiberaceae	Laya	1	0.33	Skin eruptions Arthritis; body pains Cough Sore throat	Rz	E Apply pounded rhizomes
				2				E Fastened pounded and heated rhizomes or leaves with coconut oil
				5				I Pound and squeeze, drink the sap or chew fresh rhizome
				5				I cut into small pieces and use as lozenges (candy), allow to stay in mouth for several hours
12	Guava; Bayabas (*Psidium guajava L.*)	Myrtaceae	Bayabas	20	1	Cuts, wounds and sores; post-partum care in women Diarrhea Scabies, skin eruptions Vaginal Infections	Lf, Sp	E Apply sap directly.
								Wash with decoction of
								leaves.
				20			Lf, Fr Lf	
				15				I/E Drink decoction of
								Leaves. Chewed young
								leaves or young fruits and
								swallowed Apply leaves
								on navel with oil
				5			Lf	E Wash with decoction of
								leaves.
								E Use decoction
								(lukewarm) as an
								antiseptic wash
13	Queen's Crape-myrtle; Banaba (*Lagerstroe mia speciosa* (L.) Pers.)	Lythraceae	Banaba	12	0.35	Difficulty of urination Flu	Lf, Fr	I Drink decoction
				2			Lf, Br	E Chopped and boiled leaves for cold or hot bath sponges
11	Bougainvill ea (*Bougainvill ea spectabilis*)	Nyctaginaceae	Bougainvillea	1	0.03	Diarrhea	Lf	I Drink decoction

12	Sambong (*Blumea balsamifera* (L.) DC.)	Asteraceae	Subusob	5 15 15	0.88	Fever; headache; flu Difficulty of urination Cough	Lf	E Chopped and boiled leaves for cold or hot bath sponges I Drink decoction I Drink decoction
13	Five leaved chaste tree; lagundi (*Vitex negundo*)	Verbenaceae	Dangla	15 15 4 9	1	Fever; headache; flu Cough; asthma Difficulty of urination Profused sweating	Lf Lf Lf Lf	E Chopped and boiled leaves for cold or hot bath sponges I Drink crushed leaves diluted by water I Drink decoction E Chopped and boiled leaves for cold or hot bath sponges
14	Taheebo (Handroanthus impetiginosus)	Bignoniaceae	Tahibo	3 1 2 3	0.23	Abdominal pain High blood pressure Detoxification Cough	Br	I Drink decoction
15	Cat's whisker; Balbas- pusa (*Orthosiphon aristatus* (Blume) Miq.)	Lamiaceae	Balbas- pusa	10 5	0.38	Gout and renal disorders Difficulty in urination	Lf	I Drink decoction
16	Alligator pear; Avocado (*Persea americana Mill.*)	Lauraceae	Abukado	10 3	0.33	Diarrhea Difficulty of urination	Lf, Bk Lf, Bk	I Drink decoction thrice a day I Drink decoction thrice a day
17	Ampalaya (*Momordica charantia* L.)		Paria (wild type) Ampalaya (domesticated)	4 4 3	0.3	Tinea flava Anemia; diabetes Cough	Lf	E Apply crushed or pounded leaves I Eat fresh leaves. Drink decoction I Drink leaf juice/extract

18	Chinese chives; kuchai (*Allium odorum Linn*.)	Liliaceae	Kutsai	13	0.7	Swelling; Wounds; Sprain Cough	Lf	E Apply pounded and extracted juice from fresh leaves. Fastened heated leaves with coconut oil.
				15				E Rubbed fresh or heated leaves with coconut oil then heat for 3–5 s before apply chest and back
19	Garlic; Bawang (*Allium sativum L*.)	Alliaceae	Bawang	6	0.35	High blood pressure	Rz	I Eat 2 raw or half cooked bulbs 2–3 times a day.
				5		Toothache		Drink decoction with calamansi
				2		Dog bite; cuts and wounds		E Apply crushed rhizome in the affected area.
				1		Fever		E Apply crushed rhizomes on a forehead
20	Red pepper; sili (Capsicum frutescens L.)	Solanaceae	Sili	6	0.3	Cuts and wounds Arthritis Mouth sore	Fr	E Rub on crushed fruits
				2			Fr	E Rub with coconut oil as an irritant
				4			Lf	E Apply extract/ juice
21	Pepper- elder; Pansit- pansitan (*Peperomia pellucida* (L) Kunth.)	Piperaceae	Pansit- pansitan	2	0.13	Arthritis; rheumatism	Lf	I Eat fresh leaves as salad.
				1		Abdominal Pain		I/E Drink decoction. Apply pounded leaves on abdomen
				2		High Uric acid; kidney stones		I Drink decoction
22	Star apple; Caimito (*Chrysophy llum cainito* L.)	Sapotaceae	Kaimito	3	0.08	Diarrhea	Fr	I Eat fresh fruits
							Lf	I Drink decoction thrice a day
23	Sweet basil; albanaka (*Ocimum americanum Jacq*.)	Lamiaceae	Biday	1	0.05	Toothache Skin eruptions	Lf	E Apply pounded and decocted the leaves as mouth wash (gargle). Pounded leaves as tooth drops
				1				

25	Panax ginseng (*Panax ginseng* C.A. Meyer or *Panax quinquefoli us* L.)	Euphorbiaceae	Ginseng	1	0.03	Detoxification ; High uric acid	Rt	I Drink decoction
26	Cucumber; Pipino (*Cucumis sativus* L.)	Cucurbitaceae	Pipino	3	0.08	High cholesterol	Fr	I Eat fruits
27	Banana bush; windmill bush; kampupot (*Tabernae montana pandacaqui Poir*.)	Apocynaceae	Kuribetbet	3	0.08	Wounds	Lf	E Fastened heated leaves with coconut oil.
29	Turmeric; Luyang dilaw (*Curcuma longa* L.) Syn. *Cucurma domestica Valet.*	Zingeberaceae	Luyang dilaw	3	0.2	Arthritis	Rz	E Fastened pounded and heated rhizomes or leaves with coconut oil
				5		High blood pressure		I Boil with water for 15 mins. Drink thrice a day
30	Wild spikenard; suob- kabayo (*Hyptis suaveolens Poir*.)	Rubiaceae	Pantalyon/ litalit	30	0.75	Cuts and wounds; bleeding	Lf	E Apply crushed leaves directly to wounds to stop bleeding. Rub on crushed leaves
31	String bean; sitaw (*Vigna unguiculata* (L.) Walp. subsp. Sesquipeda lis)	Leguminosae	Utong (shoots)	5	0.13	Difficulty of urination	Lf	I Eat tops as vegetables
32	Prayer beads; Saga (*Abrus precatorius* L.)	Fabaceae	Bugaiong	10	0.3	Cough; Asthma Bleeding	Lf; Rt	I Drink decoction
				2			Lf	E Rub on crushed leaves to stop bleeding
33			Kullo- kullot	1	0.05	Insect bite	Lf	E Apply fresh, heated, steamed leaves on prick of poison fish, sea urchin, or insect bites
				1		Difficulty of urination		I Drink decoction

34	Corn; Mais (*Zea mays* L.)	Graminae/ Poaceae	Mais	11	0.3	Difficulty of urination	Sk	I Drink decoction of young hairs thrice a day
				1		High blood pressure		I Drink decoction of young hairs thrice a day
35	*Jatropha gossypifolia* L.	Euphorbiaceae	Tagumba w	10	0.25	Dislocation/fracture	St	E Fastened heated stens with coconut oil for 3–5 s
36	Wild castor; Kirisol (*Ricinus americanus Miller*)	Fabaceae	Tagumbau	10	0.38	Bleeding, ulceration of wound	Lf Bk	E Use fresh leaves, 2 to 3 blades, remove petiole, pound and extract juice, decoct in water.
				5		Snake bite		E Bark, slightly pounded, placed in the mouth as cure for snake bites; also applied to bites of various animals.
37	Snake weed; asthma weed; tawa-tawa (*Euphorbia hirta* L.)	Euphorbiaceae	Tawa- tawa/Gatas- gatas/Bot onis	3	0.43	Anemia Cuts and wounds High fever and dengue fever Abdominal Pains Skin eruptions; scabies; local bleeding Snake bite	Whole plant Lf	I Drink decoction thrice aday
				1			Lf	E Apply crushed leaves on affected area
				3			Sp	I Drink decoction thrice a day
				1			Lf	E Apply sap on abdominal area
							Rt	E Apply crushed leaves on affected area
				1			Lf	E Apply extract from crushed roots on affected area
				1			Sp	
				3				
				3		Kidney stone Sore eyes		I Drink decoction
								E Apply sap with regulation. Stop use when irritation persists.

38	Noni; Apatot (*Morinda citrifolia* L.)	Rubiaceae	Apatot	2	0.05	Diarrhea	Lf	I Drink decoction
39	Petroleum nut (*Pittosporu m resiniferum* Hemsl.)	Pittosporaceae	Dael	2	0.05	Diarrhea	Sd	I Eat fresh seeds
40	Malabar hoary; Palis *(Callicarpa candicans* (Burm.) F. Hochr.)	Verbenaceae	Anobrang	3 3	0.15	Cough Dysmenorrhe a	Lf	I Drink decoction.
41	Kamatis (*Lycopersicon esculentum* Mill.) Syn. *Physalis peruviana* L.	Solanaceae	Kamatis	1	0.025	Burns	Lf	E Apply pounded leaves
42	Lima bean; patani (*Phaseolus lunatus* L.)	Leguminosae	Patani	1	0.03	Scabies	Lf	E Mix leaf juice/ extract with oil and apply liberally on the affected part
43	Melon tree; Papaya (*Carica papaya* L.)	Caricaceae	Papaya	2 2 2	0.15	Constipation Dog bite Appendicitis	Fr Fr Fw	I Eat a lot of ripe fruits E Rub crushed unripe fruits on the bite area I Drink decoction
44	Sweet tamarind; Kamatsile (*Pithecellob ium dulce* (Rorb.) Benth)	Leguminosae	Damortis/ kamatsile	1 2	0.08	Cuts and wounds Indigestion	Bk	E Apply pounded bark directly I Drink decoction
45	Common resurrectio n lily;Dusol (*Kaempferi a galangal* L.)	Zingiberaceae	Dusol	1 1	0.05	Dog bite; Snake bite Wound	Lf Rz	E Rub crushed or pounded leaves E Apply crushed rhizome mixed with oil
46	Lead tree; Ipil-ipil(*Leucae na leucocephal a* Lam.)	Mimosaceae	Ipil-ipil	1	0.03	Intestinal worms	Sd	I Chew and eat raw seeds

47	Candle bush; Senna; Akapulko (*Cassia alata* Linn.) Syn. *Cassia sophera* Linn*; Senna alata* L. Roxb.	Fabaceae	Andadasi	0.5	0.2 0.2	Ringworm, scabies, eczema, tinea infections, itches, insect bites	Lf	E Pound enough fresh leaves; express (squeeze out) the juice and apply on the affected skin morning and evening. Improvement should be noticed after 2 -3 weeks of treatment.
48	Pigeon pea; Kadios *(Cajanus cajan* (L.) Huth)	Fabaceae	Kardis	2 1	0.08	Cough Ulcers of the Mouth	Sd	I Eat cooked seeds as vegetable E Apply juice/ extract from pounded seeds
49	Ashitaba (*Angelica keiskei* (Miq.) Koidz.)	Apiaceae	Asitaba	1 1	0.05	Diabetes High blood pressure	Lf	I Eat fresh leaves. I Eat fresh leaves
50	Flamingo lily; Anthurium (*Anthurium andraeanum* Linden ex Andre)	Aracaceae	Anthorium	1	0.03	Kidney disease	Lf	I Drink decoction
51	Benghal day flower; bias-bias (*Commelina benghalensis* Linn.)	Commelinaceae	Kulkul-lasi	1	0.03	Boil	Lf	E Apply pounded leaves
52	Makahiya (*Mimosa pudica* L.) Syn. *Mimosainvisa Mart.*	Fabaceae	Bain- bain/makahiya	15 5 2 2 1 1 1	1	Difficulty of urination Tooth bleeding Cuts and wounds Abdominal pain Dysentery Dysmenorrhea Swollen muscles	Rt Rt Rt Rt Rt Rt Lf	I Drink decoction E Apply juice/ extract E Apply juice/ extract I Drink decoction I Drink decoction I Drink decoction E Apply crushed leaves on affected area

53	Elephant's ear; Bagambang (*Macaranga tanarius* (L.) Muell.Arg)	Euphorbiaceae	Sabauil	3	0.08	Bleeding	St	E A handful of leaves are salted and oiled, then heated over embers and stroked over the entire body, from head to foot
54	Long pepper; Litlit (*Piper retrofractum Vahl*)	Piperaceae	Liwliw/Am aras	3	0.08	Postpartum fevers and chills	Lf	E Apply heated with oil or fresh leaves
55	Curranttree; Bignay (*Antidesma bunius* Linn. Spreng) Syn. *Antidesma ciliatum Presl*.	Euphorbiaceae	Bugnay	3 1 4 1 1 1	0.28	Diarrhea Fever Urinary Tract Infection Kidney disease Cough High cholesterol	Lf Lf Lf Bk Lf Lf	I Drink decoction
56	Tiger grass; Indian pennywort; Takip-kuhol (*Centella asiatica* (L.) Urb.)	Umbelliferae	Petngag/ Malmalluk ong/ laplap ayag	2 1 5	0.18	High fever Difficulty of urination; UTI Mumps; boils	Lf	E Apply fresh leaves on a forehead I Drink decoction E Apply juice/ extract on affected area
57	Rice; Palay (*Oryza sativa* L.)	Graminiaceae/Poaceae	Pagai	1	0.03	Boils; Mumps	Grain	E Rice, boiled, drained and mashed, is made into a paste or moulded into balls. Apply in the affected area
58	Tobacco;Tabaco (*Nicotiana tabacum* L.)	Solanaceae	Tabako	1	0.03	Constipation	Lf	E Use as suppository
59	Betel leaf pepper; Ikmo (*Piper betle* L.)	Piperaceae	Gaued	10	0.25	Cough	Lf	E Rubbed fresh or heated leaves with coconut oil then heat for 3–5 s before apply chest and back
60	Chinese orange; Calamansi (*Citrus microcarpa Bunge*)	Rutaceae	Kalamansi	15	0.38	Dry cough and colds	Fr	I Roast partly and squeeze. Drink the juice

61	Herba Buena (*Mentha arvensis* L. vararvensis)	Lamiaceae	Yerba buena	1 2	0.08	Body pain Stomach cramps	Lf	E Apply crushed leaves on the temple, nape, back, arms, and legs. Cover the patient with blanket to induce sweating. I Drink crushed leaves diluted by water
62	Seed- under-leaf; Sampa-sampaluka n (*Phyllanthu s niruri* L.)	Euphorbiaceae	Talta-likud	3 4	0.18	Abdominal pain Cough	Whole Plant Lf	I Drink decoction I Drink extract/ juice from crushed leaves
63	Wing stem grass; Sambong- gala; (*Pterocaulon redolens* (Forst: f.) F.-Vill	Asteraceae	Subusob; Subusob-a-balang	5 15	0.88	Fever; headache; flu Difficulty of urination Cough	Lf Lf	E Chopped and boiled leaves for cold or hot bath sponges I Drink decoction I
64	Areca nut palm; Bunga (*Areca catechu* L.)	Arecaceae	Boa/mama	5 10	0.38	Intestinal worms Strengthen teeth	Fr; Sd Fr; Sd	E Chewed and kept in mouth (betel chew)
65	Rosewood; Narra (*Pterocarpu s indicus Willd*.)	Fabaceae/ Leguminoseae	Narra	1	0.03	Kidney stone	Heartwood	I Drink decoction thrice a day
66	Painted nettle; Mayana (*Plectranthus scutellarioides* (L.) R. Br.)	Labiatae/Lamiaceae	Mayana	1 6	0.18	Sprain; cuts and wounds and bruises	Lf	E Pound until become soft and juicy, apply directly or topically
67	Weeping fig; Balete (*Ficus benjamina* L.)	Moraceae	Balete	2 2	0.1	New delivered mother Hematoma; muscle pain	Br; Lf Br	E Pounded and extracted juice from fresh leaves or decoction of bark, and use as shampoo for newly delivered mother Decoction as a hot compress
68	Sweet elder; Sauko (*Sambucus javanica Blume*)	Caprofoliaceae	Galamat	2	0.05	Cuts and wounds	Lf	E Rub on crushed leaves

69	Niyog (*Cocos nucifera* L.)	Palmae/ Arecaceae	Niyog	16	0.55	Difficulty of urination Intestinal Worm Scabies; skin eruptions Diarrhea	Fr	I Drink buko juice
				3				I Eat the coconut meat
				1				E Apply coconut oil directly
				1				I Burn the coconut husk to ashes; dilute the ashes with water and drink.
				1		Goiter	Fr	E Rub the ashes on the throat area. Fastened.
70	Black plum; Duhat (*Syzygium cumini* L. Skeels)	Myrtaceae	Lomboy/longboi	10	0.48	Sore throat; tonsillitis Diarrhea	Bk	I Drink decoction
				9				I Drink decoction
71	Heavenly elixir; Makabuhay (*Tinospora crispa* (L.) Hookf & Thorns)	Menispermaceae	Makabuhay	2	0.15	Diarrhea Skin eruptions Cough Intestinal worms	St	I Drink decoction
				1			Rt	E Apply extract
				2			St	I Drink decoction
				1			Rt	I Drink decoction
72	Maiden wort; damong- maria (*Artemisia vulgaris* L.)	Asteraceae	Erbaka	5	0.4	Menstruation Cough Headache Skin eruptions	Lf	I Drink juice/ extract
				5				I Drink juice/ extract
				5				E Apply juice/ extract on forehead
				1				E Apply juice/ extract
73	Deadly nightshade; Kamatis-kamatisan; Lubi-lubi (*Solanum nigrum* L.)	Solanaceae	Mala- kamatis	1	0.03	Toothache	Sd	E Burn the seeds and apply on affected throat.
74	White silk cotton tree; Balios (*Ceiba pentandra* L.)	Bombaceae	Kapas sanglai	6	0.18	Diarrhea Toothache	Lf, St, Bk	I Drink decoction. I Drink decoction
				1				
75	Sarcandra glabra (Thunb.) Nakai	Chloranthaceae	Gipas/Gap as	3	0.3	Detoxification Diarrhea Cuts and wounds	Lf	I Drink decoction
				6				I Drink decoction
				3				E Apply crushed leaves on wounds

76	Lipstick plant; Achoete (*Bixa orellana* L.)	Bixaceae	Atsuete	1	0.03	Cough	Lf	E Rubbed fresh or heated leaves with coconut oil then heat for 3–5 s before apply chest and back
77	Common horsetail; buntot-buntotng kabayao (*Equisetum ramossisimum* (Roth.) Alston)	Equisetaceae	Putputod	10	0.28	UTI; Kidney disease Cough	Lf; St Lf	I Drink decoction thrice a day
				1				I Drink decoction
78	Saging (*Musa paradisiaca* L.)	Musacaeae	Saba	1	0.03	Fever; headache	Lf	E Apply young leaves on a forehead with oil.
79	Chesa; Egg fruit tree; Tiesa (*Pouteria campechiana* (HBK) Baehni)	Sapotaceae	Tiesa	1	0.03	Diarrhea	Lf	I Drink decoction
80	White calachue; Temple flower; Kalachuchi (*Plumeria acuminata* L.)	Apocynaceae	Kalanuche	7	0.18	Skin eruption	Tk	E Apply sap from trunks with few drops of oil
81	Mango; Mangga (*Mangifera indica* L.)	Anacardiaceae	Mangga	1	0.03	Fever	Lf	I Drink decoction thrice a day.
83	Jackfruit; Langka (*Artocarpus heterophyllus* Lam.)	Moraceae	Langka	1	0.03	Diarrhea	Bk	I Drink decoction thrice a day
84	Aaron's rod (*Solidago virgaurea* L.)	Compositae	Tantanduk	5	0.13	bladder stones, throat swelling and pain, tonsillitis, cough, cold, sprains, bruised	Fw; Lf	I Decoction of leaves and/or flowers used as tea.
85	Rosas de Japon; Chrysanthemum; Mansanilla (*Chrysanthemum indicum* L.)	Asteraceae	Mansanilla	4	0.15	Diarrhea; bloated stomach/flatulence	Lf Lf	E Apply heated leaves on a stomach
				1		Boils		E Apply decoction
86	Gali nut; Apunga; Komintana (*Myrobalanus chebula Gaertn.*)	Combretaceae	Bangles	1	0.03	Diarrhea; abdominal pain	Bk, Rt	I Drink decoction

87	Chayote; Vegetable pear; Sayote (Sechium edule (Jacq.) Sw.)	Cucurbitaceae	Sayote	1	0.03	Hypertension	Fr	I Eat cooked fruit as vegetable
88	Arabian coffee; kape (*Coffea arabica* L.)	Rubiaceae	Kape (Arabica)	1	0.05	Fever	Sd	I Drink brewed coffee
				1		Diarrhea	(beans)	
89	Hyacinth Bean; Bataw (*Dolichos lablab* L.)	Fabaceae	Parda	1	0.13	Fever Cuts and wounds Abdominal pain Abnormal bleeding during menstruation Inflamed ear	Sd	I Drink decoction. E Apply decoction
							St	E Apply extract/ juice
90	Pinya (*Ananas comosus* (L.) Merr.)	Bromeliaceae	Pinya	1	0.08	Detoxification	Fr	I Drink juice/ extract
				1		Fever	Lf	I Drink decoction
				1		Constipation	Fr, Lf	I Eat fruits. Drink decoction of leaves
91	Comfrey; Komprey (*Symphytum officinale* L.)	Boraginaceae	Camprey	1	0.08	Diarrhea Cuts and wounds	Lf	I Drink decoction
				2				E Apply extract/ juice on affected area
92			Atchibar	1	0.05	Dysmenor-rhea	Lf	E Apply crushed leaves
				1		Boils	Lf	E Apply extract/juice on affected area
93			Penga-penga	1	0.03	Cough	Rt	E Rubbed fresh or heated leaves with coconut oil then heat for 3–5 s before apply chest and back
94	Cacahuati (*Theobrama cacao* L.)	Malvaceae	Cacao/kak aw	7	0.25	Fever	Sd	E Apply pounded seeds on forehead
				3		Skin eruptions	Sd	E Apply pounded seeds on affected area
95	Wild teas; Tsaang- gubat (*Ehretia microphylla Lam.*)	Boraginaceae	Itsa/Icha- ti-bakir	6	0.15	Abdominal pain	Lf	I Drink decoction

96	Madre de cacao (*Gliricidia sepium* (Jacq.) Kunth) Senna spectabilis (DC.) Irwin and Barneby	Fabaceae	Madre de cacao/ kak awate	8	0.28	Scabies	Lf Lf	E Apply extract/ juice on affected area
				3		Rheumatism		
97	Soap pad; Acacia *Acacia concinna* ((Wllld)	Leguminosae	Acacia	1	0.03	Bloody diarrhea	Bk	I Drink decoction
98	Carrot (*Daucus carota* L. ssp sativus (Hoffm) Arcang.	Apiaceae	Carrot	1	0.03	High blood pressure	Rt (special ized)	I Eat as raw vegetable
99	Aloe vera (*Aloe barbadensis Mill.*)		Aloe vera/Sabil a	5	0.25	Alopecia	Sp	E Apply sap directly on the scalp. Let it stay for 5 mins and rinse.
				5		Skin eruptions; cuts and wounds	Lf	E Apply crushed leaves
100	Loly fruit; santol (*Sandoricum koetjape Merr.*)	Meliaceae	Santol	2	0.38	Fever	Fr	I Eat fresh fruits
				3		Diarrhea	Bk	I Drink decoction
				10		Embalming	Bk	E Bark placed in the casket
101	Pamienta (*Piper nigrum* L.)	Piperaceae	Paminta	2	0.05	Cough	Lf	E Rubbed fresh or steamed leaves with coconut oil then heat for 3–5 s before apply chest and back
102	Gumbo; lady's fingers; okra (*Abelmosch us esculentus* (Linn.) Moench.)	Malvaceae	Okra	1	0.05	Hypertension	Fr	I Eat cooked fruits as vegetables. Drink juice/ extract
				1		Constipation		I Eat raw fruits 1 h before and after meals.
103	Sugar apple; Atis (*Annona squamosa* L.)	Annonaceae	Atis	2	0.08	Skin eruptions; scabies	Lf	E Apply decoction while still lukewarm
				1		Fever	Lf	E Apply on head as cold compress
104	Rose balsam; kamantigi (*Impatiens balsamina* L.)	Balsaminaceae	Kamantigi	2	0.05	Athlete's foot	Fw	E Rub extract

105	Stink grass; lantana; Kantutay (*Lantana camara* L.)	Verbenaceae	Bangbagsit	2	0.05	Mumps	Lf	E Apply crushed leaves
106	Alugbate (*Basella alba* L.)	Basellaceae	Alugbati	1	0.03	Boils	Lf	E Apply extract/ juice directly on affected area
107	Jute; Saluyot (*Corchorus olitorius*)	Tiliaceae	Saluyot	1	0.05	Kidney stones	Rt	I Drink decoction
				1		Constipation	Lf	I Eat cooked leaves as vegetables.
108	Sweet potato; Kamote (*Ipomoea batatas* (L.) Poir.var. edulis (Thunb.)Ku ntze)	Convolulaceae	Kamote	5	0.13	Anemia	Lf	I Eat tops as vegetable
109	Panama Cherry; Mansanitas (*Muntingia calabura* L.)	Elaeocarpaceae	Mansanitas/ Aratiles	8	0.2	Diarrhea	Br	I Drink decoction thrice a day

[a] UV is the sum of the number of use-reports cited by each informant for a given species divided by the total number of informants.
[b] Bk, barks; Fr, fruits; Fw flowers; Lf, leaves; Rt, roots; Rz, rhizomes; Sd, seeds; Sk, silk; Sp, sap/juice; St, stems; Tk, trunk
[c] I, internal; E, external.

recorded for their medicinal use, and these belonged to 15 families and were used to cure ailments in 13 categories. For three (3) out of the 109 species, only the local name was documented. In terms of the number of species used, of the 109 plant species identified, Solanaceae with four species, followed by Poaceae and Asteraceae with three species, respectively are dominantly used. The Solanaceae family contain a large variety of phytotoxins, mainly alkaloids, diterpenesm esters, glycosides and ricin-type toxins [18].

The Department of Health (DOH) has recommended *Sampung Halamang Gamot* in its traditional health maintenance program namely *Blumea balsamifera, Cassia alata, Psidium guajava, Allium sativum, Momordica charantia, Vitex negundo, Mentha sp., Peperomia pellucida, Quisqualis indica and Carmona retusa.* The pharmacological effects of these plants have been clinically proven to be significant. Of these ten medicinal plants recommended by the DOH, the first eight species mentioned were reported in this survey. The utilization of these plants is higher than for any of other plants.

3.4 Collection sites

Medicinal plants are collected in the wild by individuals or their family members. Five percent of medicinal plants used were cultivated for medicinal purposes, and 15% were cultivated as vegetables, with 80% found growing wild in fields, backyards, or forests. Most plants could be easily found near homes, reflecting that the current study area is rich in natural resources allowing for the collection, rather than cultivation, of medicinal plants. However, in the future, to stem the loss of knowledge regarding medicinal plants and prevents the eradication of these resources, it is necessary to consider intentional cultivation of these useful plants. One must consider that the medicinal properties of plants, as well as the secondary metabolites produced under stress and competition, are not always expressed in fast-growing monocultures. Rather, higher levels of active compounds may be present in wild populations where plants grow more slowly [2,19]. Therefore, it is necessary to conduct further investigation into the components of medicinal plants and to conduct chemical analyses.

3.5 Plant part used

All parts of various plant species are used against a variety of diseases. The most frequently used part is the leaves (55%), followed by bark (15%), stems (10%), fruits (5%) and sap or juice (5%). The utilization of the underground organs, both roots and rhizomes (5%) were also observed. The fact that leaves are the most frequently used part corresponds to similar results reported in many other ethnomedicinal studies in Asia [2,20]. It was also observed that residents have been using leaves to identify medicinal plants. Additionally, leaves

are the main photosynthetic organs in plants, and photosynthates are translocated to other parts, such as the roots, bark, fruits and seeds. These can act as toxins for protection against predators and some are of medicinal value to humans.

3.6 Preparation and administration

The main method of preparation was use of the intact plants (31%), followed by pounding or crushing (21%), decoction (20%), heating (15%), boiling (6%) and steaming (4%), while burning and drying represented the least used preparation methods. In other words, 52% of the plants were used fresh and 48% were heated somehow. Both internal and external methods of administration were used to cure ailments. External application is safer because external application results in indirect yet immediate local effects on the area and allows for easier regulation of dosages depending on the concentrations of beneficial or toxic compounds.

Sap/juice from crushed leaves has been used for cuts and wounds, and large, thick leaves have been used for hot or cold compress to relieved pain, headache, rheumatoid arthritis or fever. The leaves are sometimes pretreated by applying coconut oil before application to the afflicted area to facilitate adhesion of the leaves to the affected area.

3.7 Use value

UVs, representing the relative importance of plants, were high for *Vitex negundo* (1.00), *Mimosa pudica* L. (1.00), *Psidium guajava* L. (1.00), *Moringa oleifera* Lam. (0.88), *Blumea balsamifera* (L.) DC. (0.88), and *Hyptis suaveolens* Poir. (0.75). These were the most frequently used plant species for each ailment category: *Vitex negundo* for diseases of the respiratory system, *Mimosa pudica* L. and *Blumea balsamifera* (L.) DC. for diseases of the genitourinary system, *Psidium guajava* L. and *Hyptis suaveolens* Poir for diseases of the digestive system and injury of external causes and *Moringa oleifera* Lam. for endocrine, nutritional and metabolic diseases.

3.8 Informant consensus factor

ICFs were calculated using the reports in each of the 13 categories. The results ranged from 0.63 to 1.00 (Table 1). The highest ICF value, 1.00, indicates that people use a particular plant consistently in that category. However, the number of use-reports (Nur) in these high-ICF categories was extremely low. After excluding categories with a Nur of less than eight (0.5%), the highest remaining ICF category was for diseases of the genitourinary system (0.85), diseases of the respiratory system (0.82) and endocrine, nutritional and metabolic problems (0.80). The most frequently used plant species in each category were those plants with high UV. *Blumea balsamifera* (L.) DC. for genitourinary system diseases, *Vitex negundo* and *Coleus amboinicus* for respiratory illnesses and *Moringa oleifera* Lam. for endocrine, nutritional and metabolic problems. The low ICF for some plant species may be explained by the availability of easily accessible pharmaceuticals that provide alter- natives to traditional medicine. These pharmaceuticals may reduce the use of some traditional remedies.

The ailments with the highest ICF values were Urinary Tract Infection and kidney stones predominantly considered by difficulty of urination. The following plants were utilized for the said ailments: *Imperata cylindrica* (L.) P. Beauv, *Lagerstroemia speciosa* (L.) Pers., *Blumea balsamifera* (L.) DC.), *Vitex negundo, Persea americana* Mill., *Zea mays* L.) and *Cocos nucifera* L.). Leaves of such plants were commonly utilized, boiled in water for 30 minutes and decoctions were taken internally for thrice a day.

3.9 Fidelity level

FLs for plant species for specific diseases varied widely, ranging between 6.02% to 100%. Most of the plants with high FL values have pharmacological effects that have been proven scientifically. On the other hand, the lowest FL indicated less-preferred species for treating specific ailments. In contrast, these plants have been widely used for several diseases. High ICFs and FLs for specific species suggest that the plants might contain valuable phytochemical compounds. These traditional medicines, handed down despite their traditional back- ground, have high ICFs and FLs because of their efficacy and safety.

4. Conclusion

This study confirms that plants are still a major source of medicine for the local people in Santol, La Union. Modern healthcare systems in this area are not adequate, and some parts of the population have limited means to buy modern medicine. Thus, traditional medicine remains the most popular solution to health issues. Most of the recorded plants grew in the wild. Notably, the uses of some plants have not been reported in the literature. The results also reveal the urgency of collecting ethnopharmacological data because knowledge of medicinal plants is vanishing. Residents use several plants against conditions such as hypertension and urinary disorders. This study suggests that detailed pharmacological evaluation of these plants is required because the pharmacological basis for the activity of some plants has not been determined. Further research can encourage the continued use of medicinal plants.

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