



## **Ethnobotany of Medicinal Plants Used by the Subanen Tribe of Lapuyan, Zamboanga del Sur**

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### **ABSTRACT**

*Ethnobotanical documentation was conducted in the Municipality of Lapuyan, Zamboanga del Sur. This was done through informal interviews, walk-through interviews, and focus group discussions with seven selected healers of the Subanen tribe. There were 89 medicinal plant species documented belonging to 39 genera under 41 families. Leaves were the most frequently used plant part which were prepared through decoction and taken internally. Respiratory-related diseases are the most common ailments that the Subanen tribe encountered. It appears that there is a need to conserve the important medicinal plants especially those that are rarely encountered species. Moreover, further pharmacological tests need to be undertaken to prove the efficiency and potency of the plants as medicine.*

**Keywords:** *conservation, decoction, efficiency, healers, pharmacological tests.*

Received 02.02.2016

Revised 14.02.2016

Accepted 10.03.2016

### **INTRODUCTION**

Medicinal plants have become a topic of global importance making an impact on both world health and international trade [1, 2]. Camacho *et al.* [3] reported that Filipinos of the olden times use herbal plants as treatment for different ailments long before the introduction of Western practice of healing. Popular knowledge of usage of plants by humans is said to be on thousand years of experience wherein people have recognized and utilize medicinal plants including magico-religious function through trial and error [4].

Traditional knowledge plays a vital role in the daily lives of people in many areas of the world [5]. It is the sum total of the knowledge, skills, and practices based on theories, beliefs, and experiences indigenous to different cultures, whether explicable or not, used in the maintenance of health as well as in the prevention, diagnosis, improvement or treatment of physical and mental illness. Traditional medicine has been practiced since long ago throughout the world and is mostly influenced by superstitions, myths, religion, and herbalism [6].

In the Philippines, indigenous groups have depended on their traditional knowledge for them to survive in an ever changing world. Even before civilization, tribes in their respective areas have long used their indigenous knowledge about their environment and nature in dealing with their daily activities and source of living for survival [7]. Approximately, there are 110 indigenous communities in the Philippines and more than 170 ethnolinguistic groups in the country and among these are the Subanens [6]. The Subanen tribe is the major occupant of the town of Lapuyan and the culture and practices are well-preserved up to now through family lines or inheritance [6, 8]. The Subanen tribe calls the medicinal plants as "*bulung*" and they believe that these plants have spirits that should be valued and respected [9]. Rapid loss of plant biodiversity and genetic resources, traditional, and ethnobotanical knowledge are some of the problems encountered by the Subanen tribe. Knowledge on herbal plants is rapidly declining since young generations know less or nothing at all on the utilization and importance of the medicinal plants. These problems make it urgent that people learn as much as possible before old remedies are forgotten or plant sources are destroyed due to technology. Realizing the continuous erosion in the

knowledge of many important medicinal plants, there is then the need to review valuable information for the development of the medicinal plant sector. Ethnobotanical knowledge must be documented before it vanished forever [11]. Thus, the study was conducted to document the knowledge or information and the utilization of indigenous herbal plants used by the Subanen tribe in the Municipality of Lapuyan, Zamboanga del Sur. The findings of this study would provide a database for future research and potential resource for the development of plant-based drugs through isolation and characterization of bioactive phytochemicals present in the plants.

## MATERIALS AND METHODS

The study was conducted in the municipality of Lapuyan, Zamboanga del Sur (Figure 1). Lapuyan was selected because of the following criteria: presence of traditional healers; willingness and the capacity of the community to participate; most of the people living in the area are Subanen; and the use of medicinal plants in healing [6]. Prior to the conduct of the study, permits were obtained from the Mayor and Tribal Leaders.



**Figure 1.** Map of the Municipality of Lapuyan, Zamboanga del Sur (<https://maps.google.com.ph/>, 2015).

Several courtesy calls to municipality officials, school heads, purok leaders, known relatives and neighbors of healers were made to pinpoint the healers who are actively practicing traditional medicine. The survey followed the protocol of Elago *et al.* [6] with modifications. In-depth and walk-through interviews as well as focus group discussions were employed in the survey. The respondents were interviewed regarding the local names of medicinal plants that they are using, type of ailments, the plant parts used, method of preparation and application. These were followed by the validation of data.

## RESULTS

Tables 1a and 1b show a complete overview on the plants documented including the parts used, preparation and mode of application, and the medicinal uses.

**Table 1a.** Medicinal Plants Used by the Subanen tribe of Lapuyan, Zamboanga del Sur.

Scientific Name	English Name	Tagalog Name	Subanen Name	Plant Part/s Used	Preparation and Application	Medicinal Uses
<b>Annonaceae</b>						
<i>Friesodielsa latifolia</i> (Hook & Thomson) Steeris	-	-	Mhemot balu	Roots	Wash a small root and chew.	Prevents hypertension
<i>Anona muricata</i> L.	Soursop	Guyabano	Malabanos	Young leaves	Pound seven leaves and apply around the wound	Tetanus
<b>Apiaceae</b>						
<i>Centellia asiatica</i>	Gotu kola	-	Jaong jaong	Whole plant	Decoction- Boil plenty of <i>jaong jaong</i> with enough water.	Diabetes

					Drink 3x a day with or without meal. Stop when blood glucose decreases to normal level	
<b>Apocynaceae</b>						
<i>Asclepias curassavica</i> (L.)	Tropical milkweed	-	Gapas-apas	Roots	Decoction- Boil enough roots with ample amount of water. Drink as often as needed.	Amoebiasis
<i>Alstonia scholaris</i> (L.)	White cheese wood	Dita	Malogatas	Trunk	Infusion- Scrape the outer layer 7x. Add 1/2 glass of water. Drink twice a day for 3 days. Decoction- Scrape the outer layer 7x. Boil the scraped pieces with 3 glasses of water. Drink thrice a day for 3 days	High blood pressure
<i>Voacanga megacarpa</i> Merr.	-	-	Thepalak mebagal	Roots	Juice-Pound enough roots and squeeze and apply the squeezed plant material on the wound	To abate bleeding of a fresh wound
<b>Araceae</b>						
<i>Alocasia macrorrhizos</i> (L.) G.Don	Elephant ear	-	Biga	Rhizome	Slice, pound, and apply on the affected part.	Early stage of inflammation
<i>Homalomena rubescens</i> (Roxb.) Kunth	-	Alipayo	Phayaw	Stem	Slice into pieces, pound, and smell often.	Cold
<b>Araliaceae</b>						
<i>Osmoxylon diversifolium</i>	-	-	Gulo-ulo	Stem	Decoction- Scrape stem 7x downward. Boil with enough water. Drink 1/2 glass thrice a day for 3 days.	Dysmenorrhea, Menorrhagia
<b>Areaceae</b>						
<i>Calamus</i> sp.	-	-	Dlebie	Juice	Cut stem, gather juice, and apply on the wound often.	Shingles caused by Herpes zoster
<b>Asparagaceae</b>						
<i>Cordyline fruticosa</i> (L.) A. Chev.	Good luck plant	Tungkod-pare	Guilala	Young leaf	Eat the leaf often until needed.	High blood pressure
<b>Asteraceae</b>						
<i>Chromolaena odorata</i> (L.)	Siam weed	Hagunoy	Gunoy	Young leaves	Juice - Pound young leaves. Squeeze the juice and apply on the area. Repeat for 3 days.	Fresh wound
<b>Bignoniaceae</b>						

<i>Oroxylum indicum</i> (L.) Benth. ex Kurz	Indian Trumpet flower	-	Bnenloy	Young leaves	Pound enough leaves and add little amount of water. Put on the head.	Body pain, fever
<i>Radermachera</i> sp	-	-	Phelebonayan	Trunk	Decoction- Boil enough size with ample amount of water. Drink often.	Diabetes, High blood pressure, Cough
<b>Cucurbitaceae</b>						
<i>Momordica charantia</i> L.	Bitter gourd	Ampalaya	Palya	Fruit	Heat over low fire. Eat as needed.	Diabetes
<i>Luffa acutangula</i> Roxb.	Sponge gourd	Patola	Tikwa	Leaves	Heat enough leaves until burnt. Apply and change when dry.	Early stage of inflammation
<b>Dilleneaceae</b>						
<i>Dillenia philippinensis</i> Rolfe	Elephant apple	Katmon	Dlhembog	Leaves	Decoction- Boil seven leaves with 1 1/2 glass of water. Once lukewarm, drink a half glass once	Diarrhea and vomiting
<b>Euphorbiaceae</b>						
<i>Melanolepis multiglandulosa</i> Rchb. & Zoll.	-	Alim	Ghalem	Trunk	Scrape the trunk thrice or seven times and apply the scraped plant material into the affected area.	Itchiness
<i>Euphorbia hirta</i> L.	Cat's hair , Asthma plant	Tawa-tawa	Tematik	Whole plant	Decoction- Boil with 3 glasses of water until 1 glass is left. Drink once or twice a day.	Recurring fever
<i>Euphorbia hirta</i> L.	Cat's hair , Asthma plant	Tawa-tawa	Tematik	Juice	Apply often	Cracked heels
<i>Breynia cernva</i> (Poir.) Mull. Arg.	-	-	Thetulog	Stem	Use a thin section of the stem as a toothpick	Toothache prevention
<i>Breynia cernva</i> (Poir.) Mull. Arg.	-	-	Thetulog		Pound handful of leaves. Squeeze the juice on the affected area.	Open wound
<i>Jatropha curcas</i> L.	Physic nut tree	Tubangbakod	Tuba-tuba	Leaves	Juice and Poultice- Collect enough juice/ sap from the stem using a cotton and put on the hole of the affected tooth or gum. Remove when pain subsides.	Toothache, Diarrhea and vomiting, Ulcer, Spasm
<i>Jatropha curcas</i> L.	Physic nut tree	Tubangbakod	Tuba-tuba	Juice	Infusion- Scrape the inner part and add hot water. Drink until needed.	Diarrhea and vomiting, Ulcer, Spasm

<i>Jatropha curcas</i> L.	Physic nut tree	Tubang-bakod	Tuba-tuba	Young leaves	Put 3 leaves on the area. Always change when the leaves are already dried.	Back pain
<b>Fabaceae</b>						
<i>Azelia rhomboidea</i> (Blanco) Vidal	Malacca-teak	-	Glonghigi	Trunk	Juice- Scrape trunk 3x and squeeze the juice. Apply on the head after shampoo. Leave for half an hour. Rinse.	To get rid of lice
<i>Flemingia strobilifera</i> (L.) W. F. Alton	Wild hops	Panapanarahan	Kolipes	Roots	Decoction- Boil with water and take regularly. Taking fresh water is prohibited.	Tuberculosis
<i>Flemingia strobilifera</i> (L.) W. T. Alton	Wild hops	Panapanarahan	Kolipes	Roots	Decoction- Pound enough roots and boil with 1/2 glass of water. Drink thrice a day for 3 days.	Diabetes
<i>Flemingia strobilifera</i> (L.) W. T. Alton	Wild hops	Panapanarahan	Kolipes	Leaves	Pound 7 leaves and apply on the inflamed area.	Inflammation
<i>Mimosa pudica</i> L.	Sensitive plant	Makahiya	Selompatay	Roots	Apply on the tooth	Toothache
<i>Derris elliptica</i> (Wall.) Benth.	Tuba root	Tubli	Thoba	Leaves	Pound plenty leaves and apply until itchiness subsides.	Itchiness
<i>Sesbania grandiflora</i> (L.) Pers.	West indian pea	Katuray	Thori	Trunk	Infusion- Scrape the trunk 7x and boil with enough water. Drink the infusion often until well.	Diarrhea
<b>Graminae</b>						
<i>Imperata cylindrica</i> (Linn.) Beauv. var. Koenigii (Retz.) Benth	Cogon grass	Kogon	Gegi	Roots	Decoction- Boil handful of roots with a glass of water. Drink thrice a day after meal for 3 days.	High blood pressure
<i>Eleusine indica</i> (L.) Gaertn	Goose grass	Paragis	Shelapid	Roots	Decoction- Boil with enough roots and drink often.	"Pagan"
<i>Eleusine indica</i> (L.) Gaertn	Goose grass	Paragis	Shelapid	Leaves	Get 2 leaves. Tie each leaf around each thumb of the toe.	Practice after giving birth for prevention from relapse
<i>Saccharum officinale</i> L.	Sugar cane	Tubo	Thebu	Stem	Eat frequently. Do not drink water afterwards	Hyperacidity
<i>Saccharium violaceum</i> Tussac	Sugar cane	Tubo	Thebu menubo	Stem	Eat the stem/fruit often.	Hepatitis

<i>Cymbopogon citratus</i> (DC.) Stapf	Lemon grass	Tanglad	Thenlad	Stem	Decoction- Boil several stems with enough water. Drink thrice a day for 3 days.	High blood pressure
<b>Lamiaceae</b>						
<i>Coleus aromaticus</i> Benth.	Oregano	Suganda	Gliganu	Young and/or mature leaves	Pound enough leaves and squeeze the juice. Give 1/2 tsp to a child twice a day	Children's cough
<i>Vitex negundo</i> L.	Five-leaved chaste tree	Lagundi	Lagundi	Young leaves	Pound and extract the juice. Drink 1 tbs often.	Cough
<i>Vitex negundo</i> L.	Five-leaved chaste tree	Lagundi	Lagundi	Young leaves	Decoction- Boil enough leaves with enough water. Drink regularly.	Cough
<b>Liliaceae</b>						
<i>Lilium</i> sp.	-	-	Niyog-niyog	Bulb	Decoction- Slice into 7 piece and boil with 3 glasses of water. Drink the decoction often until needed.	Kidney trouble, Internal illness, Tuberculosis, Vomits blood
<i>Allium cepa</i> L.	Onion	Sibuyas	Sibuyas	Leaves	Poultice	Oral thrush
<b>Malvaceae</b>						
<i>Ceiba pentandra</i> (L.) Gaertn.	Silk cotton tree , Kapok tree	Kapok	Kapok	Leaves	Pound 7 leaves and apply on the inflamed area.	Inflammation
<i>Pterocymbium tinctorium</i> Merr.	-	Taloto	Thelloto	Trunk	Poultice- Scrape the trunk thrice, put on the wound and secure with a bandage or cloth	Fresh wound
<b>Meliaceae</b>						
<i>Lansium domesticum</i> Correa	Langsat	Lansones	Buwahan	Trunk	Infusion- Scrape the trunk 3x and put 3/4 glass water and let it stay for half an hour. Drink 3x a day with or without meal. Do this as needed.	Hypertension/ High blood pressure
<i>Tinospora rumphii</i> Boerl.	Heavenly elixir	Makabu hay	Patawali	Stem	Pound enough size of the stem and apply several times	Itchiness
<b>Moraceae</b>						
<i>Ficus</i> sp.	-	-	Menaol	Leaves	Put 3 leaves on the forehead. Always change when the leaves are already dry.	Fever
<i>Ficus benjamina</i> L.	Weeping fig	Balete	Nunok	Trunk	Poultice- Pound, apply and secure with a cloth	Sprain
<i>Ficus heteropoda</i> Miq	-	-	Thetanek	Trunk	Infusion-Scrape the trunk many	Tuberculosis

					times and put in a glass of water. Take the infusion regularly.	
<i>Ficus heteropoda</i> Miq	-	-	ThetaneK	Trunk	Infusion- Soak small slices in a glass of water for several minutes. Drink only once.	Antibiotic after bleeding
<b>Musaceae</b>						
<i>Musa textilis</i> Nee	Manila hemp	Abaka	Abaka	Stem	Heat a small portion of the stem and roll over on the paralyzed part.	Paralysis
<i>Musa sapientum</i>	Banana	Saging	Saging	Young leaves	Wrap around the child's body. Change when dry.	High grade fever-children
<i>Musa sapientum</i> L. var. <i>cinerea</i> (Blco.) Teod.	Banana	Latundan	Solibadyu	Fruit	Eat including the fiber	Heart failure
<i>Musa sapientum</i> L. var. <i>cinerea</i> (Blco.) Teod.	Banana	Saging	Solibadyu	Leaves	Pound plenty leaves and apply on the affected part often.	Shingles
<b>Myrtaceae</b>						
<i>Psidium guajava</i> L.	Guava	Bayabas	Bayabas	Leaves	Decoction- Boil plenty leaves with enough water and use the decoction to wash the wound as needed.	Wound
<i>Syzygium malaccense</i> (L.)	Malay apple	Makopa	Tual	Trunk	Wash the inner part and eat until needed. Chew a portion of the inner part of the trunk. Swallow the juice.	Cough
<b>Oxalidaceae</b>						
<i>Biophytum sensitivum</i> (L.) DC	-	-	Guyenham	Leaves	Spread and mix leaves with the seedlings prior to planting. Spread the leaves all over the field and crops prior to harvest.	Ritual on planting and harvesting rice
<b>Piperaceae</b>						
<i>Piper betle</i> L.	Betel	Ikmo	Thalon	Leaves	Heat 5 leaves over low fire and apply on the back and chest	Cough
<i>Piper aduncum</i> L.	Spiked pepper	-	Thalon-thalon	Roots	Decoction- Boil 3 pieces 7 inches roots with enough water. Gargle some and drink the remaining. Do this as	Toothache

					needed.	
<i>Piper aduncum</i> L.	Spiked pepper	-	Thalon-thalon	Young leaves	Pound and squeeze the juice on the wound only once	Fresh wound
<i>Piper interruptum</i>	-	-	Thalon gekbek	Leaves	Pound leaves ,mix with lime powder and apply on the affected area often	Ringworm
<b>Rubiaceae</b>						
<i>Psychotria velutina</i> Elmer	-	-	Dlebalud	Trunk	Decoction- Scrape the inner part and boil with water. Drink until the bleeding stops.	Hemorrhage
<i>Psychotria velutina</i> Elmer	-	-	Dlebalud	Roots	Wash a small root and eat. Repeat the procedure until the bleeding stops	Hemorrhage
<b>Schizaeaceae</b>						
<i>Lygodium</i> sp.	-	-	Nitoan miha	Roots	Wash roots and eat regularly.	"Pagan"
<i>Selaginella delicatula</i> (Desv. ex. Poir.)	-	-	Dendunay	Leaves	Heat enough leaves until burnt. Apply powder around the wound.	Severe wound on the breast, Shingles
<b>Smilacaceae</b>						
<i>Smilax bracteata</i> Presl.	Sarsaparilla vine	-	Banag	Roots	Decoction- Boil with enough roots and drink often.	"Pagan"
<b>Solanaceae</b>						
<i>Datura metel</i> L.	Thorn apple	Katsubong	Gintelong	Seeds	Heat the seeds in a pot covered with coconut shell with a hole. Sip the fume through a straw and spit on a paper afterwards. Do this several times.	Toothache
<b>Urticaceae</b>						
<i>Leucosyke capitellata</i> (Poir) Wedd.	-	-	Glombilan	Stem	Eat a small portion until needed	Cough
<b>Verbenaceae</b>						
<i>Stachytarpheta jamaicensis</i> (L.) Vahl.	Bastard vervain	Kandila kandilaan	Dlompereng	Young leaves	Pound 3 young leaves and apply directly on the wound. Always change the poultice when dry.	Wound after being circumcised
<i>Gmelina arborea</i> Roxb.	Gmelina	-	Gemelina	Young leaves	Put 3 leaves on the area. Always change when dried	Back pain
<b>Zingiberaceae</b>						

<i>Curcuma longa</i>	Turmeric	Luyang dilaw	Dluya thembaga	Rhizome	Infusion-Soak rhizomes in a lukewarm water. Apply the infusion on the affected part.	Arthritis
<i>Kaempferia galanga</i> L.	Resurrection lily	Gisol	Gisol	Rhizome	Poultice	Deeply punctured
<i>Costus speciosus</i> (J. Koenig) Sm.	Spiral ginger	-	Tiwasi	Leaves	Decoction- Boil 2 glasses of leaves with ample water. Drink often.	Cough, Diabetes

**Table 1b.** List of medicinal plants the Subanen tribe uses in combination with other herbal plants

Scientific Name	Family	Local/ Subanen Name	Plant Part/s Used	Preparation and Application	Medicinal Uses
1. <i>Friesodielsia latifolia</i> (Hook.f. & Thomson) Steenis 2. <i>Solanum cumingii</i>	1. Annonaceae 2. Solanaceae	1. Mhemot balu 2. Ghebul gusa	Roots	Infusion- Gather enough bark measuring 10 inches long and 5 inches wide and 5-10 inches roots. Slice into small pieces. Add ample amount of tap water and let it stay until change in color is observed. Drink the infusion regularly for 3 consecutive nights.	Dysmenorrhea
1. <i>Friesodielsia latifolia</i> (Hook.f. & Thomson) Steenis 2. <i>Alstonia scholaris</i> (L.) 3. <i>Radermachera</i> sp. 4. <i>Flemingia strobilifera</i> (L.) W.F. Alton 5. <i>Ficus botryocarpa</i> Miq. var. <i>botryocarpa</i> 6. <i>Solanum</i> sp. 7. <i>Laportea</i> sp.	1. Annonaceae 2. Apocynaceae 3. Bignoniaceae 4. Fabaceae 5. Moraceae 6. Solanaceae 7. Urticaceae	1. Mhemot balu 2. Malogatas 3. Phelobenayan 4. Kolipes 5. Busyong 6. Thelong Subanen 7. Dlingeting	1. Roots 2. Trunk 3. Roots 4. Roots 5. Trunk 6. Roots 7. Roots	Decoction- Boil 10 inches long and 5 inches wide bark and 5-10 inches roots in an ample amount of water. Drink 1/2 glass often.	Cancer
1. <i>Areca catechu</i> L 2. <i>Cordyline fruticosa</i> (L.) A.Chev. 3. <i>Scleria scrobiculata</i> Nees and Meyen 4. <i>Urena lobata</i> L. 5. <i>Donax cannaeformis</i> (G. Forst.) K 6. <i>Piper betle</i> L	1. Arecaceae 2. Asparagaceae 3. Cyperaceae 4. Malvaceae 5. Manantaceae 6. Piperaceae	1. Maan 2. Guilala 3. Thelid 4. Dlelupang 5. Bemban 6. Thelon	1. Fruit 2. Roots 3. Roots 4. Roots 5. Roots 6. Leaves	Slice the fruit of <i>maan</i> and the roots 7 times and wrap in a <i>thelon</i> leaf. Chew and spit the chewed residue into the patient.	"Bulong Pagan"
1. <i>Friesodielsia latifolia</i> (Hook.f. & Thomson) Steenis 2. <i>Pinanga insignis</i> Becc.	1. Annonaceae 2. Arecaceae	1. Mhemot balu 2. Shelawag	1. Roots 2. Roots	Decoction- Boil enough roots with ample amount of water. Drink often.	Hypertension
1. <i>Mangifera indica</i> L. 2. <i>Alstonia scholaris</i> (L.) 3. <i>Morinda citrifolia</i> L. 4. <i>Arcangelisia flava</i> L	1. Anacardiaceae 2. Apocynaceae 3. Rubiaceae 4. Menispermaceae	1. Mangga (native) 2. Malogatas 3. Galig 4. Lethang	1. Roots 2. Trunk 3. Roots 4. Leaves	Infusion- Add enough hot water to enough parts mentioned. Drink as many as often  Decoction- Boil enough parts mentioned with sufficient water. Drink as many often.	Hepatitis
1. <i>Justicia gendarussa</i> Burm F. 2. <i>Cratogeomys sumatranum</i> (Jack) Blume	1. Acanthaceae 2. Hypericaceae	1. Selimbangon 2. Phenggulingan	Young leaves	Put the leaves on the forehead.	Anti-convulsant
1. <i>Justicia gendarussa</i> Burm F. 2. <i>Friesodielsia latifolia</i> (Hook & Thomson) Steenis	1. Acanthaceae 2. Annonaceae	1. Selimbangon 2. Mhemot balu	Roots	Decoction- Boil enough clean roots. Drink often.	"Pagan"
1. <i>Areca catechu</i> L. 2. <i>Piper betle</i> L. 3. <i>Selaginella delicatula</i> (Desv.)	1. Arecaceae 2. Piperaceae 3. Schizaeaceae	1. Maan 2. Thalony 3. Dendunay	1. Fruit 2. Leaf 3. Roots	Slice the roots and the fruit into small pieces and wrap them with a leaf.	Early stage of cancer

ex. Poir.)				Add lime, get a little portion, and chew properly. Massage in a circular manner around the breast without connecting the starting and the end points. Spit the residue on the affected area. Do this regularly.	
1. <i>Osmoxylon diversifolium</i> 2. <i>Flemingia strobilifera</i> (L.) W.F. Alton 2. <i>Ceiba pentandra</i> (L.) Gaertn.	1. Araliaceae 2. Fabaceae 2. Malvaceae	1. Gulo-ulo 2. Kolipes 2. Kapok	Young leaves	Poultice- Pound leaves, wrap with a banana leaf, heat over low fire and apply.	To reduce internal inflammation
1. <i>Asclepias curassavica</i> L. 2. <i>Morinda citrifolia</i> L.	1. Apocynaceae 2. Rubiaceae	1. Gapas-apas 2. Galig	1. Roots 2. Trunk	Decoction- Boil with water, drink as often	Leukemia, Hepatitis
1. <i>Friesodielsa latifolia</i> (Hook f. & Thomson) Steenis 2. <i>Areca catechu</i> L. 3. <i>Scleria scrobiculata</i> Nees and Meyen 4. <i>Piper betle</i> L.	1. Annonaceae 2. Arecaceae 3. Cyperaceae 4. Piperaceae	1. Mhemot balu 2. Maan 3. Thelid 4. Thelon	1. Roots 2. Fruit 3. Roots 4. Leaf	Slice the fruit and roots 7x into smaller pieces and wrap with a <i>Piper betle</i> L. leaf. Add lime powder, chew. Spit the residue to the patient.	"Bulong Pigis"
1. <i>Osmoxylon diversifolium</i> 2. <i>Flemingia strobilifera</i> (L.) W.F. Alton 3. <i>Ceiba pentandra</i> (L.) Gaertn. 4. <i>Musa sapientum</i> L.	1. Araliaceae 2. Fabaceae 3. Malvaceae 4. Musaceae	1. Gulo-ulo 2. Kolipes 3. Kapok 4. Saging	1. Young leaves 2. Young leaves 3. Young leaves 4. Mature leaf	Poultice-Slightly pound the leaves, add little salt, wrap with a banana leaf, and heat over low fire for few minutes. Apply on the area.	Mayoma, Cancer
1. <i>Homalomena philippinensis</i> Engl. 2. <i>Leucosyke capitellata</i> Wedd.	1. Araceae 2. Urticaceae	1. Phayaw 2. Glombilan	Stem	Make a necklace out of the thin outer layer of stem and put around the child's neck.	Colds-children
1. <i>Voacanga megacarpa</i> Merr. 2. <i>Morinda citrifolia</i> L.	1. Apocynaceae 2. Rubiaceae	1. Thepalak 2. Galig	Trunk	Scrape the trunk 7x and apply directly on the area.	Inflammation
1. <i>Blumea balsamifera</i> D.C. 2. <i>Zingiber officinale</i> L.	1. Asteraceae 2. Zingiberaceae	1. Dlebulan 2. Dluya	Mature leaves	Decoction- Boil and wash the body with a lukewarm decoction before sleeping.	To avoid varicose vein
1. <i>Homalomena philippinensis</i> Engl. 2. <i>Jatropha gossipifolia</i> L.	1. Araceae 2. Euphorbiaceae	1. Phayaw 2. Dlegasi	Stem	Make a necklace out of the thin outer layer and wear on the child's neck.	Colds-children
1. <i>Anona muricata</i> L. 2. <i>Mycetia javanica</i> Reinw. ex.Korth	1. Annonaceae 2. Rubiaceae	1. Malabanos 2. Ghiboyen	Young leaves	Pound and apply directly on the area	Rabies
1. <i>Cordia dichotoma</i> Forst. f. 2. <i>Homonoia riparia</i> Lour	1. Boraginaceae 2. Euphorbiaceae	1. Nonang 2. Mhemagos tubig	1. Trunk 2. Roots	Decoction- Boil to attain strong decoction. Drink 1/2 glass of decoction often.	"Pagan"
1. <i>Cordia dichotoma</i> Forst. f. 2. <i>Caesalpinia sappan</i> L. 3. <i>Saccharum violaceum</i> Tussac 4. <i>Musa sp.</i>	1. Boraginaceae 2. Fabaceae 3. Graminae 4. Musaceae	1. Nonang 2. Sibukaw 3. Thebu menubo 4. Thedyaw pula	1. Trunk 2. Trunk 3. Stem 4. Roots	Decoction- Boil and drink often for 3 days	Tuberculosis
1. <i>Jatropha curcas</i> L. 2. <i>Sesbania grandiflora</i> L.	1. Euphorbiaceae 2. Fabaceae	1. Tuba-tuba 2. Thori	1. Stem 2. Trunk	Infusion- Scrape the inner part, add enough water, and drink as water.	Amoebiasis
1. <i>Melanolepsis multiglandulosa</i> Rchb. & Zoll. 2. <i>Azfelia rhomboidea</i> (Blanco) Vidal 3. <i>Donax cannaeformis</i> (G. Forst) 4. <i>Poikilospermum suaveolens</i> (Blume) Merr.	1. Euphorbiaceae 2. Fabaceae 3. Manantaceae 4. Moraceae	1. Ghalem 2. Glonghigi 3. Bemban 4. Nopol	Trunk	Poultice- Scrape inner portion, squeeze the juice and spread on the area in a downward direction. Wrap in a cloth, soak in hot water and massage on the area.	Scabies
1. <i>Mimosa pudica</i> L. 2. <i>Biophytum sensitivum</i> (L.) DC 3. <i>Breynia cernva</i> (Poir.) Mull. Arg.	1. Fabaceae 2. Oxalidaceae 3. Phyllanthaceae	1. Selompatay 2. Guyengham 3. Thetulog	Shoot	Hang the shoots on the hammock or put under the infant's pillow.	To stop an infant from crying

1. <i>Flemingia strobilifera</i> (L.) W.F. Alton 2. <i>Coleus aromaticus</i> Benth. 3. <i>Leucosyke capitellata</i> Wedd.	1. Fabaceae 2. Lamiaceae 3. Urticaceae	1. Kolipes 2. Gliganu 3. Glombilan	1. Roots 2. Young and/or mature leaves 3. Trunk	Decoction- Pound leaves and boil with roots with enough water. Drink 1/3 glass a day. Eat small portion of sliced trunk often.	Cough
1. <i>Vigna radiata</i> (L.) R. Wierze 2. <i>Zingiber zerumbet</i> (L.) Smith	1. Fabaceae 2. Zingiberaceae	1. Bana 2. Thembak	1. Young leaves 2. New shoot	Pound and apply on the area	Pulls out deep puncture
1. <i>Persea americana</i> Mill. Gaertn. 2. <i>Citrus decumana</i> L. 3. <i>Chrysophyllum cainito</i> L.	1. Lauraceae 2. Rutaceae 3. Sapotaceae	1. Abokado 2. Buongon 3. Star apple	1. Trunk 2. Trunk 3. Trunk	Infusion- Scrape, put in a glass, add hot water, and drink until diarrhea stops.	Diarrhea
1. <i>Lansium domesticum</i> Correa 2. <i>Citrus aurantiifolia</i> (Christm.) Swingle 3. <i>Chrysophyllum cainito</i> L.	1. Meliaceae 2. Rutaceae 3. Sapotaceae	1. Buwahan 2. Gasem 3. Star apple	Young leaves and trunk	Decoction- Boil with ample water, drink until the pain disappears.	Stomachache
1. <i>Lansium domesticum</i> Correa 2. <i>Citrus aurantiifolia</i> (Christm.) Swingle 3. <i>Chrysophyllum cainito</i> L.	1. Meliaceae 2. Rutaceae 3. Sapotaceae	1. Buwahan 2. Gasem 3. Star apple	Young leaves and trunk	Decoction- Boil with ample water and drink until the pain disappears	Stomachache
1. <i>Syzygium cuminii</i> 2. <i>Citrus decumana</i> L.	1. Myrtaceae 2. Rutaceae	1. Lumboy 2. Buongon	Roots	Decoction- Boil roots (the length depends on the number of letters of the patient's name, 1 letter is 1 inch) with water and drink gradually.	Diarrhea
1. <i>Curcuma longa</i> 2. <i>Kaempferia galanga</i> L.	Zingiberaceae	1. Dluya thembaga 2. Gisol	Rhizome	Decoction- Boil handful of <i>dluya thembaga</i> and half a handful of <i>gisol's</i> rhizome with an ample amount of water. Drink gradually	Goiter

Total No. of Family- 41, Total No. of Genus-39, Total No. of Species- 89

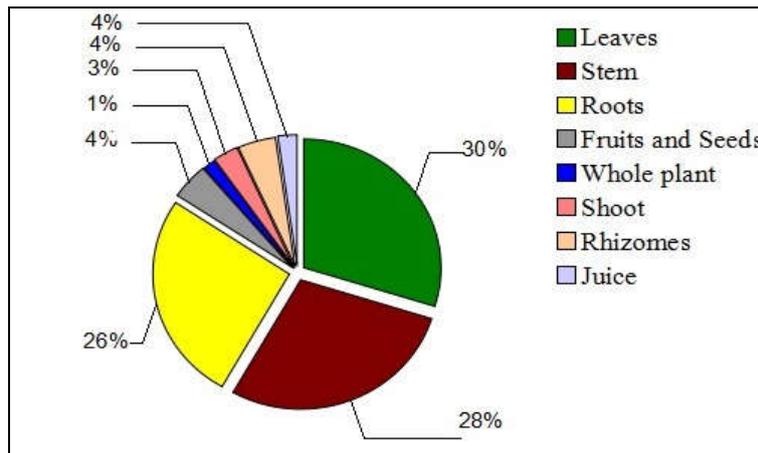
### Traditional Use of Herbal Plants

Based on the data recorded, medicinal plants are used to treat the most common or prevalent ailments which are the respiratory-related diseases such as cough, cold, and tuberculosis. This is followed by circulatory system-related diseases (such as hypertension and heart problems), cuts and wounds, gastrointestinal disorders (diarrhea, diarrhea with or without vomiting, stomachache, and amoebiasis), and muscle discomfort. Other diseases indicated are diabetes, dermatological problems, toothache, kidney problems, cancer, and inflammations.

Some plants are also used to treat local ailments such as "pagan" and "pigis". "Pagan" is most common to women after child birth. This is described by the tribe as cause of doing and carrying heavy chores and loads after giving birth. This is characterized by chills, severe fever, and headache, weakness of the body, and body pain. "Pigis" is described as sudden feeling of illness, nauseous, body pain, and stomachache. This is believed to be caused by an accidental contact with the unseen elements. In addition, the Subanen also used plants for healing rituals and practices such as during planting and harvesting of rice where the leaves of "*guyengham*" are spread and mixed with the seedlings prior to planting. Similarly, the leaves of "*guyengham*" are spread all over the crops prior to harvest.

### Plant Parts Used

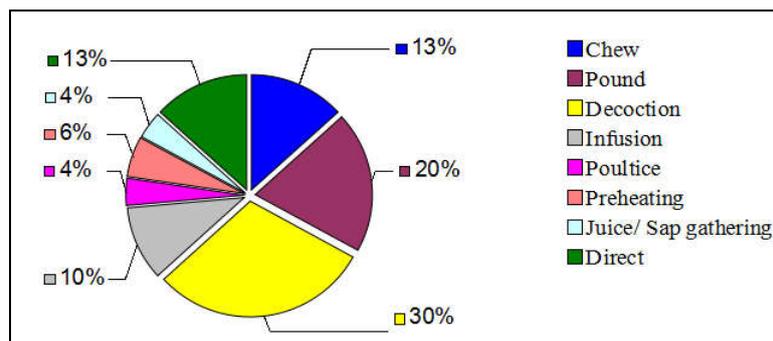
Based on the survey, the leaves (30%) are the most frequently used plant part for herbal medicine (Figure 2). This is followed by stem/ trunk (28%), roots (28%), fruits and seeds (4%), rhizomes/ bulbs (4%), juice/ sap (4%), and whole plant (1%). This result suggests that the continuous utilization of the stem/trunk and roots, although only small portions are utilized can lead to over utilization if not given attention.



**Figure 2.** Plant Parts Utilized by the Subanen of Lapuyan.

**Preparation Methods**

The preparation and application vary based on the type of ailment treated. There were eight types of preparations recorded (Figure 3). Decoction (30%) was the most employed preparation, followed by pounding (20%), chewing (13%), gathering or picking of plant parts applied directly (13%), infusion (10%), preheating (6%), and poultice (4%).



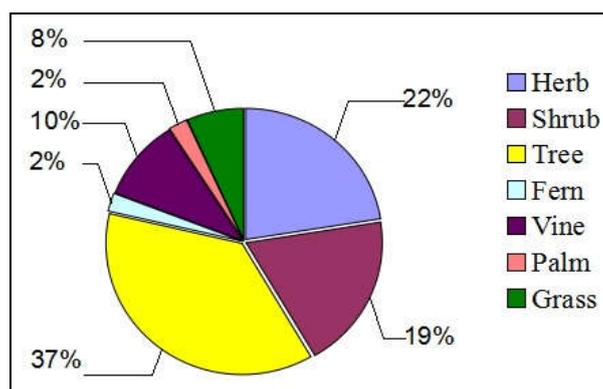
**Figure 3.** Methods of Preparation of the Medicinal Plants.

**Mode of Administration**

The prepared herbal plant materials are administered internally or externally depending on the plant species and type of ailment. Internal administration (51.43%) is more frequently employed than the external application (48.57%). Drinking (40%) is the most commonly used mode of internal application, followed by eating (10%), and chewing and swallowing (2%). In external administration, direct application of plant parts is usually employed where fresh or pounded plant parts are directly applied on the affected area. Smelling, sipping the fume, and as materials for rituals and practices are the least common way of using the medicinal plants. Thus, the most common administration route is oral, followed by cutaneous and the least is nasal administration.

**Diversity in Growth Forms/ Habit of Medicinal Plants**

As shown in Figure 4, the total plant species (n=89), 33 species ( 37.08%) used are trees, 20 species are herbs (22.47%), 20 species are shrub (22.47%), nine species are vines (10.11 %), six species are grass (6.74%) , two species are palm, and two species are fern (2.25%).



**Figure 4.** Plant Habit or Growth Form of the Medicinal Plants

## DISCUSSION

Traditional knowledge on the utilization of plants is maintained by indigenous societies in the world. Indigenous people are using their traditional knowledge in healing different diseases. Traditionally, tribal communities also rely on *shamans* or *gbelyans* who are traditional healers who belong to the same tribe to provide herb lore to heal sickness who they believe to have communication to the world of spirits. There are still many rural areas today having local *shamans* or *gbelyans* to help them cure ailments and perform some rituals [12]. They usually opt to use plants in treating diseases since modern medicine and health care services are very expensive nowadays.

Various studies have shown that there is an existence of considerable amount and wide varieties of indigenous ethnopharmacological knowledge in the different parts of the world [13]. Many efforts have been made to document and publish traditional knowledge since there is a growing threat on the loss of this knowledge in this modern era. This might be due to the fact that the information on the use of herbal plants has been passed from one generation to the next through oral tradition only. Furthermore, the lack of traditional knowledge of the younger generation makes the knowledge decline and obsolete [14].

The Subanen communities of Lapuyan have been practicing and using traditional knowledge since they believe that plants heal in a very effective way without spending any single centavo. They also believe that plants, like humans, have spirits that must be respected and valued. This belief urges the tribe to utilize plants even more in a useful and less destructing way, which is also due to practicality and economic instability they are facing. Furthermore, because Lapuyan is far from the city proper and has limited access to modern health care services, most of the Subanen people don't have any option but to rely on the use of traditional medicine. The informants were able to report a total of 89 medicinal plant species (two are ferns) having medicinal values which they use to treat various range of diseases. This number of species recorded demonstrates the depth of the traditional knowledge on indigenous herbal plants and their uses.

The 89 species of plants documented comprise 39 genera under 41 families and are mostly represented by Family Fabaceae with seven species, followed by Euphorbiaceae with six species, and Graminae and Moraceae both with five plant species. The other families include Acanthaceae, Anacardiaceae, Annonaceae, Apiaceae, Apocynaceae, Araceae, Araliaceae, Arecaceae, Asparagaceae, Asteraceae, Bignoniaceae, Boraginaceae, Cucurbitaceae, Cyperaceae, Dilleneaceae, Hypericaceae, Lamiaceae, Lauraceae, Lilaceae, Malvaceae, Manantaceae, Meliaceae, Menispermaceae, Musaceae, Myrtaceae, Oxalidaceae, Piperaceae, Rubiaceae, Rutaceae, Sapotaceae, Schizaeaeceae, Smilaceae, Solanaceae, Urticaceae, Verbanaceae, and Zingiberaceae. High number of documented species are part of the extraordinarily high floral diversity ranging from 10,000 to 14,000 plant species of vascular and non-vascular plants in the country [15].

The leaves are the most frequently used plant part followed by stem/trunk and roots. The leaves are the most abundant part of the plant that are easier to collect and can also be regenerated [16]. However, the continuous utilization of stem/trunk and roots although only small portions are used can lead to over utilization if not given attention. Importantly, the use of more trees and herbs may hint at the fact that the pressure due to harvesting herbal medicines is significant on plant diversity in the area [13].

The tribe prepared medicine using fresh plant parts through decoction, the most common technique, wherein plants parts are boiled with water and the crude extract is used. Infusion is a method where the plant parts are allowed to be soaked or suspended in water for a certain period of time. Juice extraction is prepared by cutting the succulent parts and the juice or saps are being collected. The chewing method involves plant parts to be chewed and spat or swallowed afterwards. Poultice is a method of preparation where plant parts are pounded and are wrapped with a fresh banana leaf or *Piper betle* (L.) leaves or

piece of clean cloth before applying to the affected area. Pounding to soften plant parts and extract juice is another method of preparation while preheating is to heat fresh plant parts over low fire before applying to the affected area. Plant parts are also applied directly. Among the eight preparations, decoction was found to be the most widely used preparation (30%). Heating the aqueous extracts is reported to be the most beneficial which might probably be due to the added extracting capacity of active phytoconstituents when heat is applied in the preparation [17].

In the utilization of plants by the Subanen, there is a need to practice sustainable resource management. Moreover, the documentation of this rich knowledge is important and this will play a significant role on the lives of younger generation and to the world of pharmaceuticals for the development of plant-based drugs.

## CONCLUSION

There are 89 medicinal plant species recorded which the Subanen tribe uses to treat various diseases such as respiratory-related diseases, among others, and are prepared through decoction, infusion, extraction of juice/ sap, chewing of plant parts, poultice, pounding, preheating, and gathering of plant parts. Medicinal plants are either taken internally or externally depending on the type of ailment and the plant species. Moreover, the study showed that the Subanen tribe of Lapuyan, Zamboanga del Sur possesses rich traditional knowledge and healing using medicinal plants continues to be practiced especially by the elders. Furthermore, this ethnobotanical documentation is essential on the preservation of the knowledge which will prevent knowledge degradation due to modernization and will serve as a database for future researches on the development of plant-based drugs.

## ACKNOWLEDGMENT

The authors express their gratitude to DOST-ASTHRDP and DOST-PCIEERD-BCDA for the research grant.

## CONFLICT OF INTEREST

The authors declare no conflict of interest.

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#### **CITATION OF THIS ARTICLE**

Pizon J R L, Nuñez O M, Uy M M, Senarath W T P S K. Ethnobotany of Medicinal Plants Used by the Subanen of Lapuyan, Zamboanga del Sur. *Bull. Env. Pharmacol. Life Sci.*, Vol 5[5] April 2016: 53-67