

Medicinal Plants of the Subanens in Dumingag, Zamboanga del Sur, Philippines

Lady Jane G. Morilla, Nanette Hope N. Sumaya, Henry I. Rivero and Ma. Reina Suzette B. Madamba

Abstract—An ethnomedicinal study was conducted in the three (3) Barangays of Dumingag, Zamboanga del Sur, Philippines using a snowball method. Data were gathered through a series of informal interviews, semistructured questionnaire and discussion among the nine (9) respondents of each sampling area. Sixty (60) medicinal plant species were recorded belonging to twenty nine (29) families identified by the Subanens to treat several ailments such as *stomachache, fever, cough, skin and urinary infections*. Leaves were the most commonly used plant part and decoction was the most popular method of preparation which was mostly administered orally. Because medicinal plants were widely used by the Subanens, it was necessary to consider the conservation and management of the plant species especially those that are rarely seen nowadays and those that are difficult to cultivate. Further laboratory investigation should be employed on plants for their active components and potential as pharmaceutical products.

Keywords— ailments, conservation, ethnomedicine and traditional knowledge.

I. INTRODUCTION

PEOPLE have always been interested in plants for their medicinal properties. Since ancient times, people practiced herbal medicine as a magical or religious healing art. Throughout the ages people have turned for healing to herbal medicine. All cultures have folk medicinal traditions that include the use of plants and plant products. Tribes are using their traditional knowledge system to cure different diseases. They use plant as a source of drug through trial and error method and the process is experienced over hundreds of years [1]. Scientific investigations of medicinal plants have been initiated in many countries because of their contribution to healthcare. Herbal medicines have good values in treating many diseases including infectious diseases, hypertension, etc. [2].

Medicinal plants are now becoming more widely used by people all over the world. People understand the gentle strength of these natural remedies. Doctors and scientist are validating the wisdom of traditional use. Furthermore, these natural remedies can be used to cure illness rather than just mask the symptoms [3]. Herbal remedies are considered the

oldest forms of health care known to mankind on this earth. Prior to the development of modern medicine, the traditional systems of medicine that have evolved over the centuries within various communities, are still maintained as a great traditional knowledge base in herbal medicines [4].

The plants used as medicine contain a wide range of substances that can be used to treat chronic as well as infectious diseases. They are rich in secondary metabolites and essential oils of therapeutic importance [5]. The important advantages claimed for therapeutic uses of medicinal plants in various ailments are their safety besides being economical, effective and their easy availability. Moreover it is an undeniable fact that the knowledge of indigenous people is invaluable in the present day context of biodiversity for its sustainable utilization and novel drug development programs [6].

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 [7].

In the Philippines, the plants that are mostly used among indigenous people were recorded to be food plants and plants used for various other purposes mainly construction and crafts. Since most indigenous people used to live considerably isolated from the mainstream society, they heavily relied on natural products for food and construction [8].

Subanen is an indigenous people group of the Zamboanga Peninsula, particularly living in the mountainous area of Zamboanga del Sur and Misamis Occidental. The name Subanen means “river people”, which is derived from the word “suba” or river. These people originally lived along riverbanks in the lowlands, however due to disturbances and competitions from other settlers, these peace-loving people are now found residing in the mountains. The Subanens are mainly agriculturists who practice different types of cultivation. For them, medicinal plants and herbs are called the Bulung. They believe that plants like humans have spirits that must be respected and valued. They regard that the knowledge on the use of plants for medicines are bestowed through a dream and its effect depends on the plant’s characteristics which they relate to the disease [9].

Some of the problems that the Subanens are facing nowadays are the rapid loss of plant biodiversity and genetic resources and the associated loss of ethnobotanical knowledge. Few plant experts remained among the Subanen

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communities and even they acknowledged that their knowledge of biodiversity was much more limited than that of the previous generation. Environmental degradation had been accompanied by an erosion of ethnobotanical knowledge. The loss of biodiversity, genetic resources and ethnobotanical knowledge is compounded by the problem of cultural erosion. As the societies change, the younger generations of Subanen are increasingly being drawn into mainstream society through formal education and exposure to mass media. Their assimilation into the mainstream poses the risk that oral ethnobotanical knowledge will no longer be passed on to the next generation. Ethnobotanical knowledge by the tribal community must be documented before it vanished forever [10]. This study aims to record and identify the traditional medicinal plants of importance among the Subanens in Dumingag, Zamboanga del Sur. This study aimed on documenting the indigenous knowledge of the medicinal plant utilization and healthcare practices among the Subanens in Dumingag, Zamboanga del Sur, Philippines. This research would significantly contribute to ethnobotanists, ecologists including the Subanens in future studies and provide ideas on the management and conservation of medicinal plants in the area.

II. MATERIALS AND METHODS

A. Description of the Study Area

The town of Dumingag is located in the heartland of Zamboanga peninsula (8.17° north latitude, 123.35° east longitude) an elevation of 95 meters above sea level (masl). The topography of Dumingag can be classified as 50% relatively rugged areas and the other half represents the lowlands, rolling hills and plateaus. The town of Dumingag is politically subdivided into 44 barangays with about 46, 039 inhabitants in 8,017 households according to 2007 census [11]. The ethnobotanical survey was carried out among the tribe called Subanen living in this area.

B. Ethnobotanical Survey

The field study was conducted in three (3) selected barangays around Dumingag, Zamboanga del Sur from April to May 2013. Approval and personal prior consent was obtained from all informants prior to the study. To select the informants, a snowball method was applied [12] starting from the village leader. A total of nine (9) respondents of each sampling area (i.e. the barangay or village) were asked a series of questions related to the medicinal plants they knew, their effectiveness, and uses [13]. Information on the demographic (i.e. age, gender, source of livelihood, etc.) and ethnobotanical knowledge collected through a series of informal interviews, semistructured questionnaire and discussions among tribal practitioners and traditional healers [14]. Ethnobotanical information and field description about the medicinal plant was recorded in a field notebook. Photographs of the plant habit and different parts were also taken.

C. Collection and preservation of Plant Specimen

Herbarium specimen collection involves collecting and preserving plant parts that enable their scientific determination, mounting them on herbarium sheets and

providing an accompanying label. Collected fresh plant parts were first washed with denatured alcohol and pressed using news paper and cardboards. Plant specimens were identified using taxonomic and pictorial keys from the *List of Medicinal Plants of Philippines* [15] and *Phyto Images* [16] as assisted by plant taxonomists. The voucher contained a label presenting the information collected in the field notebook, the scientific name of the plant and the person who identified the plant. The preserved specimens were deposited as herbarium in the Mindanao State University-Iligan Institute of Technology museum.

III. RESULTS AND DISCUSSION

Knowledge on the use of plants for traditional medicine is maintained and developed by all indigenous societies in the world. In the Philippines, this knowledge is inherited from their great ancestors through verbal communication [17]. In this study, Subanens from the different community of Dumingag utilized variety of plants to treat different kinds of ailments (Table I). A total of 60 medicinal plant species used by the Subanens were recorded. These plant species correspond to twenty nine (29) different families namely: Acanthaceae, Amaryllidaceae, Anacardiaceae, Annonaceae, Apiaceae, Araceae, Arecaceae, Asparagaceae, Asteraceae, Caricaceae, Crassulaceae, Cyperaceae, Euphorbiaceae, Fabaceae, Lamiaceae, Liliaceae, Malvaceae, Meliaceae, Menispermaceae, Moraceae, Moringaceae, Musaceae, Myrtaceae, Piperaceae, Poaceae, Smilacaceae, Tiliaceae, Urticaceae and Zingiberaceae.

Most of the species of these families were well known such as *Blumea balsamifera* and *Artemisia vulgaris* from the family Asteraceae. Other species include *Coleus aromaticus* and *Coleus blumei* of family Lamiaceae, *Jathropa curcas* of family Euphorbiaceae, and *Cymbopogon citratus* from Poaceae family. These plants are known to treat different ailments and are generally available from forests, fields, road sides, garden and backyards.

Many related research were conducted regarding the effectiveness of the said families. Some of the species under these families were proven to contain various chemical compounds and metabolites that are known to have medicinal properties. Asteraceae family for instance, is one of the largest and most diverse of all plant families. They are also considered edible and safely medicinal, but they often contain very active ingredients along with their exceptional supplies of nutrients. Many Asteraceae contain active alkaloids that are medicinal [18]. An ethnobotanical investigation on Asteraceae family in Bangladesh indicated the used of this family by the local people in the treatment of human ailments as well as diseases of domesticated animals [19].

The family also of Lamiaceae known as the mint family provided a large number of medicinal species. This family is important for flavors, fragrance and medicinal purposes [20]. A study on ethnobotany, Pharmacology and phytochemistry of Lamaiceae showed that some species have been used in folk medicine as remedies in the treatment of several disorders [21]. Another important family is Euphorbiaceae, which was also observed to have medicinal properties due to presence of

TABLE I
LIST OF MEDICINAL PLANTS USED BY THE SUBANENS IN THE THREE SELECTED BARANGAYS OF DUMINGAG,
ZAMBOANGA DEL SUR, PHILIPPINES.

Family/Scientific Name	Local and/or Subanen Name	Plant Part Used	Mode of Preparation	Medicinal Uses
Acanthaceae				
<i>Hemigraphis colorata</i>	Kuyanap	leaves	crashed and applied directly	inflammation
<i>Justicia gendarussa</i> Burm. f.	Mandalusa	leaves	poultice	stomachache, bloating, fracture
Amaryllidaceae				
<i>Eurycles amboinensis</i>	Abod	leaves, roots	poultice, crashed and applied directly	UTI, inflammation
Anacardiaceae				
<i>Spondias purpurea</i>	Sereguelas	stem	crashed and applied directly	gum lesion
<i>Annona muricata</i> Linn.	Yabana	leaves	decoction	hepatitis, flatulence
Apiaceae				
<i>Centella asiatica</i>	Yahong-yahong	whole plant	decoction	cough
<i>Hydrocotyle vulgaris</i>	Gotu kola	whole plant	decoction	cough, kidney stones
Araceae				
<i>Colocasia esculenta</i>	Gabi	stem	poultice	athlete's foot
<i>Corypha elata</i>	Buri	stem	extraction	over fatigue
Asparagaceae				
<i>Sansevieria</i> spp.	Espada-espada	whole plant	crashed and applied directly	wound
Asteraceae				
<i>Artemisia vulgaris</i>	Hilbas	whole plant	infusion	hyperacidity
<i>Bidens pilosa</i> Linn.	Tulay-tulay	roots	decoction	over fatigue
<i>Blumea balsamifera</i>	Gabon	leaves	infusion	cough
<i>Chromolaena odorata</i> L.	Hagonoy	leaves	crashed and applied directly	wound
<i>Emilia sonchifolia</i> Linn.	Pisaw-pisaw	whole plant	crashed and applied directly	cold
<i>Pseudelephantopus spicatus</i> Juss.	Kokog banog	leaves	poultice	stomachache
<i>Spilanthes acmella</i>	Dilag-dilag	flowers	applied directly	toothache
<i>Tridax procumbens</i> Linn.	Kanding-kanding	leaves	crashed and applied directly	wound
Caricaceae				
<i>Carica papaya</i> L.	Kapayay na laki	roots, flowers	decoction, infusion, crashed and applied directly	stomachache, tetanus and fever
Crassulaceae				
<i>Brophyllum pinnatum</i>	Hanlilika	leaves	decoction	toothache
Cyperaceae				
<i>Cyperus kyllingia</i>	Busikad	whole plant	infusion	fever
Euphorbiaceae				
<i>Jathropa curcas</i>	Tuba-tuba	leaves	poultice	flatulence, sprain
<i>Jatropha podagrica</i>	Ginseng	roots	crashed and applied directly	wound
<i>Mallotus floribunda</i> Blume.	Tula-tula	roots	decoction	kidney stones
<i>Melanolepis multiglandulosa</i> Reinw.	Alom	bark	applied in the throat	sore throat
<i>Manihot esculenta</i>	Balanhoy	tubers	decoction	furuncle
Fabaceae				
<i>Arachis hypogaea</i>	Mani	seeds	crashed and applied directly	sore
<i>Cassia alata</i> Linn.	Asunting	roots, leaves	decoction, crashed and applied directly	cyst, fungal infection
<i>Desmodium capitatum</i>	Mani-mani	leaves	apply directly in the stomach	for pregnant women
<i>Mimosa pudica</i> Linn.	Hibi-hibi	roots	decoction	toothache, flatulence

TABLE I
LIST OF MEDICINAL PLANTS USED BY THE SUBANENS IN THE THREE SELECTED BARANGAYS OF DUMINGAG,
ZAMBOANGA DEL SUR, PHILIPPINES (CONTINUATION).

Family/ Scientific Name	Local and/or Subanen Name	Plant Part Used	Mode of Preparation	Medicinal Uses
Lamiaceae				
<i>Coleus aromaticus</i> Benth.	Kalabo	leaves	extraction	cough
<i>Coleus blumei</i>	Mayana	leaves	extraction	inflammation
<i>Gmelina elliptica</i>	Melina	leaves	poultice	stomach bloating
<i>Ocimum basilicum</i>	Sangig	leaves	crashed and applied directly	ringworm
<i>Orthosiphon aristatus</i>	Wachichao	young leaves	decoction	kidney stones
Lamiaceae				
<i>Vitex negundo</i>	Lagundi	leaves	decoction	cough
Liliaceae				
<i>Allium ascalonicum</i>	Sibujing	whole plant	decoction	fever
<i>Allium tuberosum</i>	Ganda	whole plant	poultice	fever
Malvaceae				
<i>Corchorus olitorius</i>	Saluyot	leaves	use the leaves for cooking	fever
<i>Sida acuta</i> Burm.	Eskubang- mayawis	leaves	poultice	stomachache
<i>Theobroma cacao</i> L.	Kakaw	young fruit	crashed and applied directly	inflammation
Meliaceae				
<i>Swietenia mahogany</i> Jacq.	Mahogani	seeds	taken orally	stomachache
Menispermaceae				
<i>Tinospora rumphii</i>	Panyawan	stem	poultice	eczema
Moraceae				
<i>Artocarpus heterophyllus</i>	Nangka	leaves	poultice	sore
<i>Ficus benjamina</i>	Balete na tapol	bark	poultice	fracture
<i>Ficus septica</i> Blanco.	Lagnob	roots, stem	decoction	headache, fever
Moringaceae				
<i>Moringa oleifera</i> Linn.	Kamunggay	leaves	crashed and applied directly	stomach bloating
Musaceae				
<i>Musa acuminata</i>	Saging	sap	extraction	fever
Myrtaceae				
<i>Psidium guajava</i> L.	Bayabas	leaves	decoction	diarrhea
Piperaceae				
<i>Peperomia pellucida</i> (L) Kunth.	Sinaw-sinaw	whole plant	infusion	kidney stones
<i>Piper betle</i>	Buyo	leaves	poultice	flatulence
Poaceae				
<i>Cymbopogon citratus</i>	Tanglad	roots, whole plant	poultice, decoction	arthritis, high blood pressure
<i>Cynodon dactylon</i>	Bermuda	whole plant	decoction	hair fall, kidney stones
<i>Eleusine indica</i>	Bila-bila	roots	decoction	stomach bloating
<i>Saccharum officinarum</i>	Tubo	stem	roasted and eaten	cough
Smilacaceae				
<i>Smilax bracteata</i>	Banag	roots	decoction	over fatigue
Tiliaceae				
<i>Trium fetta bartramia</i>	Dalupang	flowers	crashed and applied directly	furuncle
Urticaceae				
<i>Leucosyke capitellata</i>	Alagasi	bark	apply in the throat	cough
Zingiberaceae				
<i>Curcuma longa</i>	Dulaw	rhizome	crashed and applied directly	wound, ulcer
<i>Zingiber officinale</i>	Luy-a	rhizome	decoction and then rub in the affected area	stomach bloating

certain chemical constituents. In an investigation conducted in India, many of the species of Euphorbiaceae have been used by local population in traditional medicine as remedies against several diseases [22].

Leaves were further observed to be the most used plant part. Respondents also indicated the used of stem, sap, flowers and bark in the treatment. Other of the plant parts such as fruit, seeds, rhizome and tubers were rarely mentioned. It is stated that leaves are the site of manufacture and storage of many chemical compounds through photosynthesis including alkaloids, tannins, coumarines, flavonoids, essential oils and inulins which are active component of most herbal preparation in high concentration [23].

The used of the leaves provide conservation for the plants compare to those remedies that requires roots or whole plants in which the plant should be uprooted. Leaves are the most abundant plant part that are easier to collect and can also be regenerated. Moreover, the consumption of various leaves extract ensures better preparation of active ingredients for medication [24].

Similar studies conducted reported that most of the common remedies were taken from the leaves which also include modified leaves and young shoot of the plants [25, 26]. Some of the plant parts are utilized to cure more than one ailment. For instance the leaves of *Annona muricata* are used to cure hepatitis and flatulence. Other part such as the root of *Mimosa pudica* was used in treating toothache and over fatigue. Different parts obtained from a plant species were also noted to treat various ailments. *Cassia alata* for example is used as remedy against blister and fungal infection by utilizing its roots and leaves.

Moreover, it was noted that the most popular route of administration was through decoction. This preparation includes the boiling of the plant materials for a longer period of time to soften the harder woody material and release its active constituents. This corroborated recent study that decoction was one of the methods commonly used [27]. In this process, oils and other compounds are extracted from the plant thus, adding to its efficacy. Other methods include infusion, poultice, extraction, crashing, cooking, direct application and direct ingestion. Many herbal remedies are applied directly to the skin as poultices or crashing the plant material, these are applied usually on rashes, wounds or other affected part of the body and as topical pain-relieving remedies. An investigation conducted by [28] indicated that using medicinal plant decoction and infusion, may be consistent with phyto-pharmacological effects thus plant subjected to these methods have higher efficacy.

The Subanens believe that ailments are attributed to supernatural causes and that plants found in nature provides a big role in healing these ailments. Some of the respondents stated that before the treatment of these medicinal plants, a prayer or a ritual was first conducted. They also noted that in order to be treated you have to have faith on the effectiveness of the plant remedies. The number of diseases treated by medicinal plant species reflects the prevalence of those specific conditions in the community. These included diseases related to gastrointestinal ailments (13 species), skin infection (19 species), fever and body pain (18 species), urinary ailments (6 species) and respiratory illness (10 species). Some

of the plant species presented have been investigated in other research studies and was detected to contain components that are responsible for their medicinal properties. In a recent study conducted in the Philippines, plants such as *Annona muricata*, *Carica papaya* and *Artocarpus heterophyllus* elicit anti-bacterial activity and suggest that the extract contain bioactive constituents responsible for eliminating pathogens [29].

Since most of the medicinal plant species were used in treating fever, gastrointestinal, respiratory and urinary related ailments, more than half of the result recorded was administered orally by drinking the remedy until a certain ailment is cured. The rest of the remedies are applied externally or on the surface of the affected part of the body through poultice or by direct application.

IV. CONCLUSION AND RECOMMENDATION

There is adequate indigenous knowledge of medicinal plant species among the community of Subanens residing in the locality of Dumingag, Zambonga de Sur. Much of this knowledge is still prevalent among the old folks. Plants especially those of medicinal values play an important role on the daily lives of the Subanens in Dumingag. The practice of treating various ailments has been passed by the members of the tribe to the next generation. Though medicinal plants are widely used, it is still necessary to consider the management and conservation of the following plant species especially those that are rarely seen and difficult to cultivate.

This study suggests further examination on the plant species that were recorded to cure certain diseases. Laboratory investigation should also be employed on those plants that have not yet proven to be safe clinically. By this, active components of the following plant species can be identify. Some of this species may have a potential on becoming an effective drug product.

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