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Ethnobotany of medicinal plants used by the Talaandig Tribe in Brgy. Lilingayon, Valencia City, Bukidnon, Philippines

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Abstract

This paper presents the ethnobotanical documentation on the medicinal plants used by the Talaandig tribe in Brgy. Lilingayon, Valencia City, Bukidnon, Philippines. The documentation was done through informal interviews of key informants including the Tribal leader and a subordinate healer. The ethnobotanical survey documented 66 species of medicinal plants belonging to 38 families. Families Asteraceae and Poaceae are the most represented with five species each. Skin diseases and women-related diseases are the most common health problems traditionally treated by the documented medicinal plants. Decoction is the most common method of preparation followed by direct application of the fresh plant part. The leaves are the most commonly used plant part. Results indicate that indigenous medicinal plants are good sources of plant-based safe drugs.

Key words : Asteraceae, diseases, healer, Poaceae

INTRODUCTION

Ethnobotany is the study of the interactions and relationships between plants and people specifically in the traditional knowledge and culture of tribal groups [1]. According to Mahmood et al. [2] about 25% of all drugs prescribed are plant-derived making a significant segment in the pharmaceutical industry and about 80% of people of developing countries are still dependent on traditional use of medicine for their healthcare. Thus, ethnobotany has been gaining significant attention particularly in geographically flora-abundant regions. For instance research studies on ethnobotany of medicinal plants of indigenous people were done in Central or Pacific America, particularly in Southern Belize [3] and Vanuatu [4], respectively, where climate is favorable for tropical forests. Similarly, in Asia, particularly countries such as India and the Philippines which are located near the equator have diverse ecosystems [5], thereby, rich ethnobotanical documentation is expected. In the Philippines, most ethnobotany documentation was done in indigenous communities such as the Kalanguya tribe in Tinoc, Ifugao, the Higaonon tribe of Rogongon, IliganCity, and the Subanens of Dumingag in Zamboanga del Sur where 125, 62, and 60 medicinal plant species were recorded, respectively [5, 6, 7].

The Philippine culture and tradition of using plants as medicine are still preserved despite the challenge of modernization. The Talaandig tribe of Bukidnon is one of the 110 indigenous groups of the Philippines [6]. This tribe lives harmoniously within the mountain range of Kitanglad, Bukidnon. It is one of the three sub divisions of Bukidnon tribe, including the Bukidnon tribe and Manobo tribe. The term "Talaandig" means dwellers of the steep places, locally "andig" means the people of the slopes [8]. Thus, this tribe lives at the foothills of mountains. The tribe is known for its profound use of traditional herbal medicine, even frequently visited by people seeking herbal medicine popularly known to cure certain diseases [9]. However, there are no documented records on medicinal plants and traditional medicine found within the tribe. Thus, this study documented the traditional knowledge of utilization of medicinal plants by theTalaandig Tribe in Brgy. Lilingayon, Valencia City, Bukidnon through key informant interviews.

MATERIALS AND METHODS

Talaandig tribe is among the inhabitants of Barangay Lilingayon, Valencia City, Bukidnon (7°54'15"N, 125°6'44"E) (Figure 1). There are approximately 65% Talaandigs in the barangay.

Fig 1: Map of Barangay Lilingayon, Valencia City, Bukidnon, Philippines [10, 11].

An informed consent was secured from the tribal chieftain and barangay captain where the tribe politically belongs. Gratuitous Permit (GP) from the Department of Environment and Natural Resources (DENR) was also obtained. Key Informant Interview (KII) was employed in the survey. Interviews were done informally in order to converse spontaneously [6]. During KII, interviewees (Datu George T. Antihao and HilgiyOculares) walked through the habitat of the medicinal plants. Basically, the key informants are those considered the most knowledgeable or have the most traditional knowledge on medicinal plants, like the "Datu" or Tribal chief, elders, and the "babaylan" or the healer [5, 6,13]. In the present study, DatuAntihao is the most known healer within the tribal sector. Series of questions were asked regarding the traditional knowledge of practices and preparations of the medicinal plants on certain diseases.

RESULTS

Sixty-six species of medicinal plants belonging to 38 families were documented. Family Asteraceae and Poaceae were the most represented with five species each. Families Cucurbitaceae, Lamiaceae, Fabaceae, and Euphorbiaceae were represented by four species each. Families Malvaceae, Moraceae, and Urticaceae, were represented by three species each and Families Rutaceae and Solanaceae with two species each. The rest of the plant families have only one representative species.Table 1 shows theplants in which the leaves are utilized for medicine while table 2 shows the plants where other plant parts are used.

Skin diseases such as fungal infection or "ap-ap," ringworms, "kagid-kagid" (due to insect bites), "kagid-kagid" (microbial infection), "ugahip" (mouth impetigo), "nuka-nuka" (seborrheic

Table 1: Ethnobotanical documentation of medicinal plants used by the Talaandig tribe of Valencia City, Bukidnon, Philippines.

Family	Talaandig name	Scientific name	Used Part	Disease/health problem	Preparation & application
Acanthaceae	Salimbangon	*Justiciagendarussa*	Leaves	Fever	D*; OR**
Annonaceae	Abana	*Annonamuricata*	Leaves	gastrointestinal cleansing; tumors	D; OR
Apiaceae	Yahung-yahung	*Centellaasiatica*	Leaves	Dengue	D; OR
Apocynaceae	Kalachuchi	*Adeniumobesum*	Latex	Scabies	DA; Ex
Araliaceae	Kapayawi	*Polysciasnodosa*	Bark	Damaged eyes of cow due to bug bites	J; Ex
Asparagaceae	Pinya-pinya	*Sansevieriatrifasciata*	Leaves	Snake bite	P; Ex
Asteraceae	Hagonoy	*Chromolaenaodorata*	Leaves	wounds, itch, skin rashes	P; Ex
	Hilbas	*Artemisia vulgaris*	Leaves	Colds	J; OR
	Wild sunflower	*Tithoniadiversifolia*	Flower	Scabies	DA; Ex
			Leaves	head lice	P; Ex
	Tuay-tuay	*Bidenspilosa*	Leaves	*Bughat*	D; OR
	Bangkaw-bangkaw	*Conyzasumatrensis*	Leaves	*Sinda* or twinges caused by roving body gas	DA; Ex
	Gabon	*Blumeabalsamifera*	Leaves	Cough	D; OR
Caricaceae	Kapayas	*Carica papaya*	Latex	Rabies	DA; Ex
			leaf bud (male)	Dengue	J; OR
Chrysobalanaceae	Tabon-tabon	*Atunaracemosa*	Fruit	Peptic ulcer	J; OR
Commelinaceae	Bangka-bangka	*Rheo discolor*	Leaves	*Bughat*	DA; Ex
Crassulaceae	Angelica/ kataka-taka	*Kalanchoepinnata*	Leaves	Cough	J; OR
				Fever	DA; Ex

Cucurbitaceae	Wild ampalaya	*Momordicacharantia*	Leaves	Oral thrush of infants	P; Ex
	Pipino	*Cucumissativus*	Fruit	Pimples	DA; Ex
	Kalabasa	*Cucurbita maxima*	Flower	Burn	DA; Ex
	Sayote	*Sechiumedule*	Fruit	Hypertension	J; OR
Cyperaceae	Talahid	*Scleriascrobiculata*	Young leaves	Cleansing for the eyes	P; Ex
Euphorbiaceae	Tuba-tuba	*Jatrophacureas*	Leaves	Diarrhea	D; OR
	Tawa-tawa	*Euphorbitahirta*	Whole part	Dengue	D; OR
	Balanghoy	*Manihotesculenta*	Leaves	Fractures; headache	DA; Ex
	Alim	*Melanolepsismultiglandulosa*	Leaves	Headache	DA; Ex
Fabaceae	Asunting	*Sennaalata*	Leaves	*Ap-ap*	P; Ex
	Mani	*Arachishypogaea*	Young legume	*Ugahip*	P; Ex
	Narra	*Pterocarpusindicus*	Trunk bark	*Lu-as*	P; Ex
	Sibukaw	*Caesalpinasappan*	Root	Anemia; obstetric hemorrhage; Blood on excreted body fluid	D; OR
Flacourtiaceae	Selari	*Flacourtiaindica*	Thorns	Chicken pox; measles	R, F; Ex
Lamiaceae	Lagundi	*Vitexnegundo*	Bark	Cough	D; OR
	Yerba Buena	*Menthe arvensis*	Leaves	Cough	D or In; OR
	Gmelina	*Gmelinaarborea*	Young leaves	*Panuhot*; Fever	DA; Ex
	Mayana	*Plectranthusscutellarioides*	Leaves	Cough	J; OR
Malvaceae	Escoba	*Sidarhombifolia*	Roots	Stomach ache; toothache	In; OR
	Native cotton	*Gossypiumarboreum*	Root	*Bughat*	D; OR
			Flower	Amoebiasis	In; OR
	Handalupang	*Urenalobata*	Leaves	*Salagpi* or (air) contact dermatitis	DA; Ex
Menispermaceae	Panyawan	*Tinosporarumphii*	Stem Latex	Toothache; ringworm	P; Ex
Moraceae	Lagnob	*Ficusseptica*	Roots	obstetric hemorrhage; miscarriage	D; OR
	Nangka	*Artocarpusheterophyllus*	Root bark	Hepatitis; Cancer; digestive tract cleansing	D; OR
Moringaceae	Kalamunggay	*Moringaolifera*	Leaves	Colds	J; OR
Musaceae	Saging	*Musa sapientum*	Withered leaves	Obstetric hemorrhage; miscarriage	D; OR
			Leaf bud	Hemorrhoid	DA (suppository)
			Young leaves	*Panuhot*	DA; Ex
			Young leaves	Fever; to induce sweating	DA; Ex

Myrtaceae	Manahos	*Syzygium* sp.	Roots	Diabetes; hypertension; cysts; tumors	D; OR
Poaceae	Mais	*Zea mays*	Fruit	Wound	DA; Ex
	Bagtuk	*Cephalostacyumpergracile*	Stem	Measles	DA; OR
	Tubo	*Saccharumviolaceum*	Roots	Kidney diseases	D; OR
	Tanglad	*Cymbopogoncitratus*	Leaves	Hypertension	D; OR
	Kawayan	*Bambusablumeana*	Withered leaves	Hypertension	D; OR
Primulaceae	Kawilan	*Embeliaphilippinensis*	Roots	Cancer; tumors; cysts; sedative	D; OR
Rhamnaceae	Tulay	*Alphitoniaphilippinensis*	Trunk bark	Body odor; *Kurikong*	D; Ex
Rubiaceae	Apatot	*Morindacitrifolia*	Root	*bughat*; muscle aches; stomachache	D; OR
Rutaceae	Limon	*Citrofortunellamicrocarpa*	Fruit	Colds	J; OR
	Baungon	*Citrus maxima*	Thorns	Chicken pox; measles	R, F; Ex
Solanaceae	Sili	*Capsicum annuum*	Roots	Hemorrhage; miscarriage	D; OR
				relief from spiciness from the plant's own fruit	DA; Ex
	Tabako	*Nicotianatabacum*	Leaves	Disinfect wounds; scabies	P; Ex
Urticaceae	Hanupol	*Poikolospernumsuaveolens*	Trunk	*Layag*;dysmenorrhea	D; OR
			Leaves	"Panuhot"	H; Ex
	Manumbilan	*Leucosykecapitella*	Trunk bark	Toothache; *kabuhi*;"peptic ulcer	D; OR
Verbenaceae	Kanding-kanding	*Stachytarphetacayennensis*	Leaves	*bughat*	D; OR
Concoctions (mixture of two or more plant species)					
Urticaceae	Alingatong	*Laporteabrunnea*	Roots	Relief from itch caused by its flowers	DA; Ex
Araceaea	Badjang	*Alocasiamacrorrhizos*		*Nuka-nuka*	C; Ex
Anacardiaceae	Kanipay	*Toxicodendronradicans*			
Arecaceae	Limbahon	*Cocosnucifera*	Roots	*Bughat*; goiter	C; OR
Boraginaceae	Anonang	*Cordiadichotoma*	trunk bark		
Lauraceae	Abocado	*Perseaamericana*	Leaves	Diarrhea	C; OR
Myrtaceae	Bayabas	*Psidiumguavaja*			
Sapotaceae	Kaimito	*Chrysophyllumcainito*			

*D-Decoction; DA- Direct Application; In-infusion; J-Juice; P-Pounding; C-Concoction; H-Heated; R-Roasted; F-Fumigated
**OR-Oral; Ex- Externally applied;

eczema cradle cap), herpes zoster, "kurikong" (eczema herpeticum), and pimples, are the most common health problems treated traditionally using 14 different medicinal plants. There were 10 different medicinal plants found to cure various women-related diseases, especially "bughat" (overfatigue in women manifested after giving birth), and dysmenorrhea, "layag" (delayed menstrual cycles), bleeding or obstetric hemorrhage, and miscarriage. Other commonly treated diseases/ health problems were also recorded such as cough, colds, fever, toothache, wounds, and gastrointestinal diseases such as diarrhea, "panuhot" or flatulence, digestive tumors, peptic ulcer, digestive system cleansing, and stomachache. Treatment for dengue, rabies and its after effects, snake bites, cancer, cysts, hemorrhoids, sedation, goiter, amoebiasis, chicken pox, measles, hepatitis, kidney disease, anemia, eye damage, head parasites, and oral thrush of infants was also recorded. Other diseases/health problems commonly recorded in previous ethnobotanical studies were also recorded in the present study, namely, hypertension,

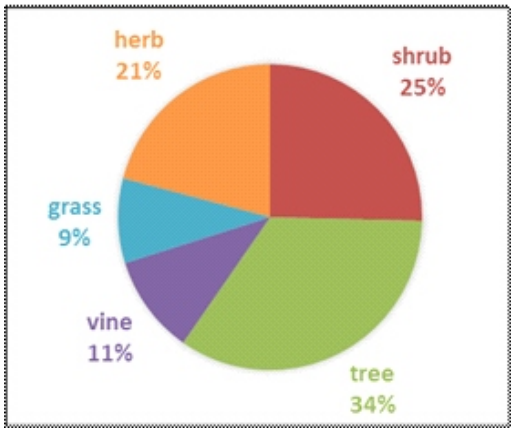

Fig 2: Habit of the medicinal plants used by the "Talaandigs" of Valencia City, Bukidnon.

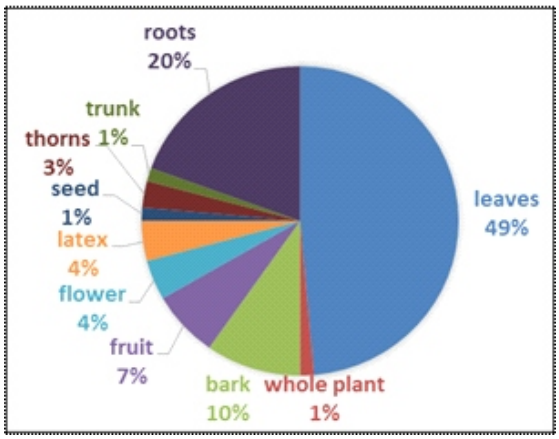

Fig 3: Plant parts used in the preparation of medicinal plants by "Talaandigs" in Valencia City, Bukidnon

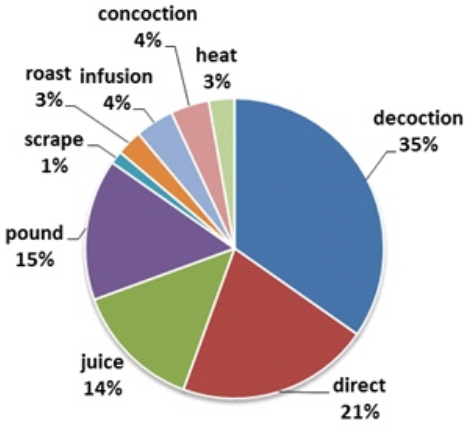

Fig 4: Traditional mode of preparation of medicinal plants by Talaandigs in Valencia City, Bukidnon.

diabetes, canker ("lu-as"), body odor, fractures, burns, colic, and body aches.

In the present study, five categories of plant habits (Figure 2) were recorded, namely, tree, shrub, herb, vine, and grass. Trees (34%) were the most used, followed by herbaceous plants (20%), shrubs (25%), vine or climbers (11%), and grasses (9%). Among the plant parts, leaves (49%) are mostly used for treating diseases (Figure 3).

Percent utilization of other plant parts are: bark (10%), fruit (7%), flowers (4%) which are usually used in treating gastrointestinal ailments, latex (4%), thorn (3%), seed (1%) and trunk (1%). Among the plants recorded, only *Euphorbahirta* is entirely prepared as decoction, that is, all of its parts are included in the preparation and is used to cure dengue. The present study, recorded nine categories of mode of preparation applied by the Talaandigs in the treatment of several diseases: decoction, infusion, concoction, pounding, scraping, heating, roasting, juice extraction, and direct application of the plant part (Figure 4).

Preparation via decoction (35%) or boiling the plant material with water is the most common method. It is followed by the direct usage or without prior extensive preparation. of fresh plant part into the affected or injured part (21%). Others involved the application or usage of the extracts prepared through pounding (15%), taking of freshly extracted juices (14%), infusion (4%) in hot water and in "lana" or traditional coconut oil, concoctionor mixture of two or more plants were also recorded (4%). In the study, pulverized charcoaled roots infused in coconut oil or "lana" was recorded.Roasting (3%) and heating (3%) or preheating of the fresh plant part before application into the affected body area is the least traditional mode used in the preparation of medicinal plants.

Application or administration of the medicinal plants is either external or internal. In the present study, 51% of the medicinal plant is taken internally or orally and 49% is used externally. Internal application which accounts for the most common mode of application involves mostly taking orally the extracts obtained from decoction, concoction, infusion, juice, and direct intake of fresh fluid product of the medicinal plant. On the other hand, the external application of the medicinal plants involves poultice, suppository for hemorrhoid treatment, smoke fuming for measles, direct application of decoction for eczema herpeticum and concoction extract in the treatment of cradle cap of infants. The last is the direct application of fresh plant materials into the affected part which is also the most used external application.

DISCUSSION

Traditional knowledge of the indigenous people in the Philippines is still intact despite modernization and progression of resource depletion mainly because it is an essential part of their lives as a cultural community. The "Talaandigs", likewise all tribal groups, believe in the existence of spirits and elementals living within the nature, as their protector and provider. They believe that the provider, with its blessing, rewards the people with the resources they needed. In return, tribal communities willingly look after and conserve nature. Similarly, it is very important for tribal leaders and/or healers to preserve their knowledge on the use of medicinal plants. Through time, this knowledge must be passed to the rightful one appointed by the healer or tribe leader and other authority within the group [9].

The present study recorded various species belonging from different families in which Family FamilyAsteraceae (herbs) and Poaceae (grasses) were the most represented indicating that these families are the most distributed and abundant. Family Asteraceae was also the most represented family recorded from previous studies [5, 13].

Ailments such as skin diseases are easily acquired, thus, in the study, they are commonly treated. The occurrence of these

diseases might be generally attributed to less accessibility of basic necessities such as water, electricity, hospitals, lack of monetary resources, poor hygiene and stress. Tribal communities are located in remote areas where healthcare facilities are rarely accessible. In the study, several of the treated ailments are caused by stress particularly over fatigue or chronic physical stress. All of the women-related ailments in this study appear to be associated with overfatigue. Locally, "bughat" is a manifestation or a symptom of an over fatigued body among women who just gave birth. It is characterized by severe body aches and loss of energy. Dysmenorrhea is a painful sensation in the pelvic region of women before and during menstrual period. In this case, physical stress was associated as a risk factor with the occurrence of dysmenorrhea. It was reported through solicited questionnaires that the increased sports activities [14], exercise [15], and other daily physical work [16] were associated with occurrence of dysmenorrhea. Miscarriage is popularly known, if not by serious accidents, to be caused by chronic physical stress [17]. "Layag" or delayed menstruation and obstetric hemorrhage are reportedly caused by overworking too. Obstetric hemorrhage was known to be due to lack of iron among vegetarians, teenage pregnancy, and anemia [18] which are common conditions that occur in the affected patients in the tribe. Besides, psychological-psychosocial stress has also been implicated as a good stressor influencing these diseases. It was reported that individuals or groups with lower socioeconomic status are frequently exposed to more stressors, hence, the prevalence [19].

In the present study, leaves were mostly harvested from trees, hence, their frequent use. According to Olowa et al. [6] the frequent use of leaves is to ensure that plant sustainability is maintained for species survival and continuity. Leaves are the center of food production in plants thus it might contain high concentration of several chemicals and metabolites that might contribute to their medicinal properties [5]. Previous studies have also reported leaves as the most used plant part material in the treatment of various diseases [1, 6, 20, 21,22]. On the other hand, the utilization of roots by the tribe obviously can negatively affect the plant's survival and biodiversity [1]. However, the "Talaandig" tribe has shown a sustainable management of root usage. Rarely available plants are kept for days (at most 3 consecutive days) air dried outside the house, high enough to ensure that nobody cannot step on or step over them after use. The "Talaandigs" harvest these roots during or a week before the Holy week which they believe medicinal plants will be at their best quality because it is the period where spirits and elementals are believed to be at their most powerful state [9]. Some perform infusion of roots in coconut oil to maximize their availability since this oil can preserve the plant material for longer period.

The mode of which medicinal plants are prepared might contribute to their effectiveness. For instance, the use of decoction is believed to present consistency with phyto-pharmacological effects of the plant and giving it higher efficacy [23]. Thus in the study, decoction has been used frequently and this is in agreement with other previous studies [5, 6, 24 25]. The direct application of the plant materials was the second most used mode of preparation which might be due to its convenience in the treatment of diseases. It is mostly used for ailments that need immediate aid or relief of pain or discomfort such as flatulence, fever, rabies, fractures, burns, itch, and wounds. In addition, the use of concoction which involves integration of two or more plant parts via decoction or infusion was also reported. Plants prepared in concoction might be more effective than prepared or used singly. According to Jeruto*et al*. [13] there are certain chemicals or drugs that are synergistic, that is, they only become active through interaction with another chemical, which are singly active. Medicinal plants might be more effective when administered internally or orally. Thus, the internal administration of the medicinal plants is frequently used in the treatment of various diseases.

CONCLUSION

Traditional knowledge on medicinal plants utilized by the "Talaandig" tribe in Bukidnon is still present and used profoundly, as shown in the abundance of species recorded. This study also revealed how the "Talaandigs" give importance to nature through basic sustainable management of the medicinal plants they use. Leaves are the most used plant part. Meanwhile, decoction is the most used traditional preparation of the medicinal plant in the treatment of diseases.

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