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ORIGINAL ARTICLE**Medicinal Plants Used by the Higaonon Tribe of Rogongon, Iligan City, Mindanao, Philippines****Lilybeth F. Olowa, Mark Anthony J. Torres, Eduardo C. Aranico and Cesar G. Demayo***Department of Biological Sciences, College of Science and Mathematics, Mindanao State University-Iligan Institute of Technology, Iligan City*

Lilybeth F. Olowa, Mark Anthony J. Torres, Eduardo C. Aranico and Cesar G. Demayo: Medicinal Plants Used by the Higaonon Tribe of Rogongon, Iligan City, Mindanao, Philippines

ABSTRACT

This paper presents the ethnobotanical study conducted in Rogongon in Iligan City, Philippines on the indigenous medicinal plant utilization and healthcare practices among the Higaonon tribe. Informal interviews, using a semi-structured questionnaire, involving 65 informants (ages 30-78 years old) provided information on 62 plant species of medicinal value belonging to 34 families and 56 genera. Leaves were the most widely used plant parts which were commonly prepared by boiling in water (decoction) and administered orally. Stomach ailments, respiratory diseases, wounds or cuts, and muscle pains or over fatigue in women were the most common health problems treated by the identified medicinal plants. Some of the medicinal plants enumerated in the study were also utilized by other indigenous groups in the Philippines. Such widespread use of these plants by different groups could to a certain extent be attributed to their efficacy.

Key words: ethnobotany, Higaonon, medicinal plants, indigenous groups**Introduction**

Since the beginning of human civilization people have used plants as medicine. The earliest uses are found in Babylonia circa 1770 BC in the code of Hammurabi and in ancient Egypt circa 1550 BC [15]. The relationship between man and plants is extremely important because plants affect every aspect of man's existence by providing a continuous and infinite source of varying materials such as food, timber, fibers, dyes, tools, and many others [2]. Popular knowledge of plants used by humans is based on thousands of years experience. By "trial and error," people learned how to recognize and use plants, including those with a magic-religious function. Until the middle of the 19th century, plants were the main therapeutic agents used by humans and even today their role in medicine is still relevant [3]. Many of today's drugs have been derived from plant resources.

In recent years, work on ethnobotanical knowledge worldwide has increased especially in some parts of Europe, Asia, and Africa. Despite many ethnobotanical studies were performed all over the world, in the Philippines, ethnobotanical documents are relatively few, with some focusing on well known indigenous groups like the Pinatubo Negritos, the Tasadays in Mindanao, the Itawes of Cagayan, and the Ibaloi of Benguet province

[9,5,16,11,1]. The Higaonon tribe is one of the 18 Lumad (a group of Non-Moro Indigenous Communities in Mindanao) ethno-linguistic groups in the Philippines. Lumads comprise 12 to 13 million or 18% of the Philippine population and are divided into 110 ethno-linguistic groups living in hinterlands, forests, lowlands, and coastal areas. The Higaonon tribe is located on the provinces of Bukidnon, Agusan del Sur, Misamis Oriental, and Rogongon (in Iligan City). Most Higaonons still have a rather traditional way of living where farming is the most important economic activity [14]. The term Higaonon is a combination of the root words: 'HIGA' which means 'to live' or 'to lay in bed,' 'GAON' which means 'mountain,' and 'ONON' which means 'people'. Thus people who live in the mountains— our Higaonon spiritual leaders and scholars— defined as "People in the Living Mountains" (UNAH I Mindanao Inc.). The Higaonons have lived and continue to live in their ancestral forest homes, undisturbed, managing the forest in a natural way, and protecting it against destruction by loggers who started cutting their way into the forested homeland more than sixty years ago [13]. This present paper was conducted to document the indigenous knowledge of medicinal plant utilization and healthcare practices among the Higaonon tribe of Rogongon, Iligan City. Nowadays, indigenous knowledge on medicinal plants is fast

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diminishing because as more plants are lost, so is the knowledge of their value to humanity. Thus, the findings of this research would be of great help to ethnobotanists and ecologists in the future studies and provide insights on the management and conservation of medicinal plants in the area.

Materials And Methods

Rogongon is one of the 44 Barangays in Iligan City, Philippines. It is situated in the northeastern part of Iligan City, 34 kilometers away from the city proper, 1010 meters above sea level (masl), and having a land area of 38,000 hectares. It consists mainly of patches of residual forest and dipterocarp forest. This Barangay has 23 sitios or puroks inhabited by the Higaonons, Maranaos, a mixture of Higaonon-Maranao, and some Christians. There are access roads in the Barangay but can only be possible by riding a motorcycle or “habal-habal,” about 1-2 hours ride from the city proper which costs 200-300 pesos for a one way ride.

A prior informed consent was done through their Barangay chairman and some local administrators. Six (6) residential settlements were selectively chosen as sampling sites, namely: Poblacion, Scaling, Bayanihan, Kasayanan, Malandog, and Tawagon because these areas are occupied mostly by the pure Higaonons. Information on demographic (age, gender, source of livelihood, etc.) and ethnobotanical knowledge (medicinal plants and its uses) were gathered from a series of interviews between January to March 2012 using a semi-structured questionnaire. The interviews were developed as informal conversations in order to let them speak spontaneously and not feel pressured. A total of 65 individuals (30-78 years old) were interviewed mostly elderly, “datus” (recognized community leader of the tribe), and some babaylans (local healers), who were identified by the “datus”

and other local people as owning huge knowledge on medicinal plants. The data acquired for each plant comprises the common local name (Higaonon name), the part of the plant used, its preparation and mode of administration, and its uses or effects. Some of the plants were observed *in situ* during short field walks with the local people and samples were collected for scientific identification. Photos were taken especially the uncommon species of plants. Collected plants were pressed, dried, identified, and deposited in the herbarium. Plants were identified with the help of the literature [6,7,4,8].

Results And Discussion

Knowledge on the use of plants for traditional medicine is maintained and developed in all indigenous societies in the world. In the Philippines, this knowledge is inherited from their great ancestors through verbal communication. In this study, a total of 62 (two are fern allies) plant species distributed to 56 genera and 34 families were documented as medicinal plants utilized by the Higaonons to treat different kinds of diseases and ailments (refer to Table 1). Family Asteraceae/Compositae was represented by the highest number of species (8 species) followed by Moraceae (5 species), Graminae/Poaceae (4 species), and Solanaceae and Zingiberaceae (3 species). Families Annonaceae, Apocynaceae, Euphorbiaceae, Fabaceae or Leguminosae, Labiatae/Lamiaceae, Musaceae, Myrtaceae, Palmae/Arecaceae, Verbenaceae, and Sellaginellaceae were represented by two (2) species each, while the rest of the families were all represented by one (1) species. It indicated that the area consists of considerable diversity of plant species of medicinal value. Moreover, because the area is far from the city and their access to modern healthcare is limited, thus, most of the Higaonons still resort to traditional healthcare practices.

Table 1: Medicinal plants used by the Higaonon of Barangay Rogongon, Iligan City, Mindanao, Philippines.

FAMILY/ SCIENTIFIC NAME	ENGLISH/ COMMO N NAME	LOCAL/ HIGAONON NAME	PLANT PART USED	PREPARATION AND MODE OF APPLICATION	MEDICINAL USES
Alliaceae					
<i>Allium sativum</i> L.	Garlic	Ahos	stem (bulbs)	chew and eaten raw	lowers hypertension and as an antioxidant
Anacardiaceae					
<i>Mangifera indica</i> L.	Mango	Mangga	leaves	boil with water, drink thrice a day	treats diarrhea
Annonaceae					
<i>Annona muricata</i> L.	Soursop	Abana/labana	leaves	boil with water, drink thrice a day	treats diarrhea
<i>Annona squamosa</i> L.	Sugar apple	Atis	leaves	boil with water, drink thrice a day	diarrhea; diabetes; and rheumatism
Apocynaceae					
<i>Plumeria obtuse</i> L.	White calachuche	Kalatsutsi	leaves	roast partly, put in chest and back with a piece of cloth or “hampol” boil with water, drink thrice a day	relief of muscle pains or over fatigue or “bughat” in women diarrhea
<i>Voacanga mindanaensis</i> Merr.	—	Nilo	bark	boil with water, drink thrice a day	relief of irregular or heavy menstruation (bleeding) in

& Quis.					women
Asteraceae/Compositae					
<i>Acmella oleracea</i>	Spilanthes or Toothache plant	Beto-on	flower	chew, put in decaying teeth	produces numbing effect to tongue and gums for the relief of toothache
<i>Artemisia vulgaris</i> L.	Mugwort	Hilbas	leaves	roast partly, squeeze, drink the sap	relief of stomachache
<i>Bidens pilosa</i> L.	Beggar ticks	Tuway-tuway or Kadagom	roots	boil with water, drink thrice a day	diarrhea and stomachache
<i>Blumea balsamifera</i>	Camphor plant	Gabon/Pahid	leaves	boil with water, drink thrice a day	Cough; colds; and fever
				roast partly, squeeze, rub or massage the leaves into the body	lowers hypertension; mild stroke; gas pains; edema
<i>Chromolaena odorata</i>	Hagonoy	Hagonoy	leaves	pound, apply directly	abate bleeding on cuts or wounds
<i>Emilia sonchifolia</i> (L.) DC. ex Wight	Lilac tassel flower	Pisaw-pisaw	leaves	roast partly and squeeze, drink the sap or juice	common colds
<i>Lindheimera texana</i> Gray & Engelm.	Lindheimer daisy	Tae sa talapan	leaves	pound, put in forehead with a piece of cloth or "hampol"	relief headache and fever; and cure wounds
<i>Pseudoelephantopus spicatus</i> (Juss.) Rohr.	Tobacco weed	Dila-sa-iro	leaves	boil with water, drink thrice a day	cures cough; expel phlegm
Bombacaceae					
<i>Durio zibethinus</i> Murr.	Durian	Durian	bark	boil with water, drink thrice a day	diarrhea with vomiting
Boraginaceae					
<i>Cordia dichotoma</i>	Soap berry	Anonang	leaves	boil with water, drink thrice a day	treat tuberculosis
Caricaceae					
<i>Carica papaya</i> L.	Papaya	Kapayas	flower	roast, apply on the neck wrapped with a piece of cloth or "hampol"	relief of inflamed tonsils
Crassulaceae					
<i>Kalanchoe pinnata</i> (Lam.) Pers.	Life plant	Kataka-taka/Danggaw	leaves	pound and apply directly	heals wounds and boils
Elaeocarpaceae					
<i>Muntingia calabura</i> L.	Panama cherry	Mansanitas (use with Makopa)	bark	boil with water, drink thrice a day	treats diarrhea
Euphorbiaceae					
<i>Euphorbia hirta</i> L.	Cat's hair	Tawa-tawa/Mangagaw	whole plant	boil with water, drink thrice a day	lowers very high fever and dengue fever
<i>Jatropha curcas</i>	Tuba-tuba plant	Tuba-tuba (with Gabon)	stem	roast partly, scrape, squeeze and rub or massage on the body	mild stroke and relief of flatulence or "panuhot"
				roast partly, scrape, apply directly on joints with a cloth or "hampol"	relief of rheumatism and arthritis
Fabaceae/Leguminosae					
<i>Caesalpinia sappan</i>	Sappanwood	Sedocaw	stem	boil with water, drink	treat tuberculosis
<i>Pterocarpus indicus</i> Willd.	Rosewood	Narra/Tagok	bark	scrape and squeeze the sap, apply directly on gums	relief of swollen gums
Graminae/ Poaceae					
<i>Cymbopogon citratus</i>	Lemon grass	Tanglad	leaves	boil with water, drink thrice a day	lowers hypertension
			roots	crush or boil with water, put on decaying tooth	relief of toothache
<i>Eleusine indica</i> (L.) Gaertn	Goosegrasses	Bila-bila/Bangat with roots of <i>Sida rhombifolia</i>	whole plant	boil with water, use as first bath for baby and mother	prevent diseases in newborn and muscle pains or over fatigue or "bughat" of mother
<i>Imperata cylindrica</i>	Grass	Kogon	roots	boil with water, drink thrice a day	treats kidney infections; induces urination
<i>Zea mays</i> L.	Corn	Mais	young hairs	boil with water, drink thrice a day	stimulate urination in person with kidney infections

Labiatae/ Lamiaceae					
<i>Coleus amboinicus</i>	Oregano	Kalabo/kanabo (used with pisaw-pisaw)	leaves	roast partly and squeeze, drink the sap or juice thrice a day	cures cough
<i>Coleus blumei</i>	Painted nettle/ Mayana	Mayana	leaves	pound until become soft and juicy, apply directly or topically	heals wounds and bruises
				roast partly and apply/put over the forehead while still hot	relief of sinusitis
Lauraceae					
<i>Persea americana</i> Gaertn.	Alligator pear	Abukado	leaves	boil with water, drink thrice a day	treats diarrhea
			bark	boil with water, drink thrice a day	relief of stomach pains and vertigo
Malvaceae					
<i>Hibiscus rosasinensis</i> L.	Hibiscus	Antuwanga	flower buds	pound until become soft and juicy, apply directly or topically	heals swellings, bruises; and as anti-inflammatory agent
Meliaceae					
<i>Swietenia mahogani</i> Jacq.	Mahogany	Mahogany	seeds	chew and swallow the juice or sap	relief of stomachache
Menispermaceae					
<i>Tinospora reticulata</i>	Heavenly Elixir	Panyawan/ Kamangyawan	stem	boil with water, drink once a day	stomachache; induces abortion
				latex or sap, squeeze over tooth	relief of toothache
Mimosaceae					
<i>Leucaena leucocephala</i> Lam.	Lead tree	Ipil-ipil	seeds	chew and eaten directly	expel intestinal parasites or worms
Moraceae					
<i>Artocarpus heterophyllus</i> Lam.	Jack fruit	Nangka (often used with Bayabas and Kaimito)	leaves	boil with water, drink thrice a day	treats diarrhea
<i>Ficus benjamina</i>	Banyan tree	Salin-ubod or Matamsi (used with Banag & Lanagon)	roots	boil with water, drink thrice a day	relief of muscle pains or over fatigue or "bughat" in women; appetite stimulant
<i>Ficus gul</i> Laut. & K Schum.	—	Kayakaya	bark	boil with water, drink thrice a day	enhance milk production in women after giving birth
<i>Ficus minahassae</i> Tesym. & De Vr.	Hagimit	Logemit	roots	boil with water, drink thrice a day	enhance milk production in lactating mothers; relief of muscle pains or over fatigue or "bughat" in women
			leaves	roast, pound, mix with oil, apply directly	heals boils and bruises
<i>Poikilospermum suaveolens</i> (Blume) Merr.	—	Hanopol	stem	cut a portion of the stem to extract latex or sap then apply or drop on the eyes	relief or heals sore eyes
Moringaceae					
<i>Moringa oleifera</i> L.	Horse radish tree	Kamunggay	leaves	pound until soft and juicy, apply directly or topically	antibiotic for wounds, cuts and sores
			young leaves	boil with water, drink thrice a day	enhance the flow of milk in lactating mothers; induces normal urination
Musaceae					
<i>Musa paradisiaca</i>	Banana	Saging	young leaves (shoots)	pound until soft and juicy, squeeze the juice over the wound and apply bandage (piece of cloth)	abate bleeding wounds
<i>Musa textilis</i> Née	Abaca	Abaka	young shoot	roast partly and squeeze, drink the sap or juice thrice a day	treats diarrhea
Myrtaceae					
<i>Psidium guajava</i>	Guava	Bayabas	leaves	boil with water, use as an antiseptic wash	Wounds and scabies; and post-partum care in women
			bark	boil with water, drink thrice a day	diarrhea, vertigo
<i>Syzygium malaccense</i> (Linn.) Merr. and Perry	Malay apple	*Makopa/Tubal (often used with Bayabas and	bark	boil with water, drink thrice a day	diarrhea; relief gas pains or stomach pains

		Avocado)			
Palmae/ Arecaceae					
<i>Caryota rumphiana</i> Mart.	Fishtail palm	Pugahan	roots	boil with water, drink thrice a day	prevent muscle pains or over fatigue or "bughat" in women who gave birth
<i>Cocos nucifera</i> L.	Coconut	Lubi	husk	scrape, apply topically on navel	heal wounds on navel(newborn)
Piperaceae					
<i>Piper porphyro-neuria</i>	—	Bagalbal	stem	cut into small pieces, chew and used as lozenges	relief of toothache
			cut into small pieces, chew and drink the sap or apply directly (for snake bites)	eliminate poison, sting, or venom due to insect or snake bites	
Rutaceae					
<i>Citrus microcarpa</i> Bunge	Chinese orange	Limon	leaves	boil with water, drink thrice a day	lowers hypertension
			fruits	roast partly and squeeze, drink the juice	cures cough and colds
Sabiaceae					
<i>Meliosma</i> sp.	—	Kadabudabo	stem	remove the bark, scrape the stem until soft and juicy, apply directly on affected area	antibiotic and abate bleeding in wounds or cuts
Salicaceae/Flacourtiaceae					
<i>Flacourtia rukam</i> Zoll. & Mor.	Governor's plum/Rukam	Lanagon (often used with Banag)	roots	boil with water, drink thrice a day	relief of muscle pains over fatigue or "bughat" in women; stomach ulcer; lung infection; enhance menstruation in women after birth; and for anemia
Sapotaceae					
<i>Chrysophyllum cainito</i> L.	Star apple	Kaimito	bark	boil with water, drink thrice a day	treats diarrhea
Smilacaceae					
<i>Smilax bracteata</i> Presl.	Sarsaparilla vine	Banag	roots, bark	boil with water, drink thrice a day	relief of muscle pains or over fatigue or "bughat" in women
Solanaceae					
<i>Capsicum frutescens</i> L.	Red pepper	Sili/Katumbal	leaves	pound and rub on chest	cold comfort for asthmatic attack
<i>Nicotiana tabacum</i>	Tobacco	Tabako	leaves	chew, allow to stay in mouth for several hours	relief of toothache
			stem	roast, mix with apog with aceite manzanilla, rub or apply directly on the navel	fast healing on the wound of the navel of newborns
<i>Solanum verbascifolium</i> L.	—	Tabako-salako	roots	boil with water, drink thrice a day	to stop excessive bleeding after a miscarriage
Verbenaceae					
<i>Stachytarpheta jamaicensis</i> L.	Bastard vervain	Kanding-kanding/ Kabirobiro	leaves	pound until soft and juicy, apply directly on affected areas	abate bleeding in fresh wounds or cuts; cures ulcers and sores
<i>Vitex negundo</i> L.	Five-leaved chaste tree	Lagundi	leaves	boil with water, drink thrice a day	cures cough and relief muscle pains or over fatigue or "bughat" in women
Zingiberaceae					
<i>Zingiber officinale</i> Roscoe	Ginger	Luy-a	stem (rhizome)	pound and squeeze, drink the sap	cures cough
			cut into small pieces and use as lozenges (candy), allow to stay in mouth for several hours	relief of sore throat	
<i>Costus igneus</i>	—	Mantawasi	bark	scrape the stem, squeeze the sap or juice in the eyes	relief of sore eyes
<i>Curcuma longa</i> L.	Turmeric	Dulaw/Kalawag	Stem (rhizome)	boil with water, drink thrice a day	treats diarrhea, abdominal pain, flatulence, arthritis; lowers hypertension
(Fern allies) Sellaginellaceae					
<i>Sellaginella oregano</i> and <i>Sellaginella</i>	Spikemoss	Duknay	roots	pound and squeeze the sap directly on fresh wounds or cuts	to abate bleeding in wounds and cuts

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Based on the responses, the common health problems in most Higaonons were stomach ailments (due to diarrhea), respiratory diseases (such as common colds and cough), wounds or cuts, and muscle pains or over fatigue in women or “bughat.” The preparation and administration (application) of the medicinal plants vary based on the type of disease treated. The usual method of preparation was boiling the plant part (usually leaves) with water and by oral (drink the juice) administration. For immediate treatment of cuts or wounds, either the leaves (crushed) or stems (scraped and juice is extracted) were used and administered topically (externally). The leaves of some plants such as *Plumeria obtuse*, can be roasted (heated) partly and applied directly (or “hampol”) on the chest and back for the relief of muscle pains or over fatigue or “bughat” in women, especially those who gave birth. Conversely, leaves of *Artemisia vulgaris* can be roasted (heated) partly and the juice or sap is extracted (squeezed) and taken internally for the treatment of stomachache; leaves of *Emilia sonchifolia* and *Coleus amboinicus* for curing common colds and cough; and young shoots of *Musa textilis* to treat diarrhea. Few were prepared from underground (modified) plant parts such as the bulbs of *Allium sativum* and the rhizomes of *Zingiber officinale* and *Curcuma longa*.

The most commonly used plant part for herbal preparations was the leaves. It indicated that the survival and continuity of useful medicinal plants in Rogongon is greatly maintained and protected by the Higaonons in their use mostly (only) of the leaves, thus, it ensures sustainability in the utilization of their medicinal plants. Stems, roots, bark, fruit or seeds and others were often used in their preparations. The use of either bark or roots in some of their preparations was observed to be related to reproductive healthcare in women. The bark of *Voacanga mindanaensis* can relieve irregular or heavy menstruation while the roots of *Solanum verbascifolium* abates excessive bleeding after a miscarriage; the roots or bark of *Smilax bracteata* and *Caryota rumphiana* relieve and prevent muscle pains or over fatigue or “bughat” in women especially after giving birth; and *Ficus gul* (bark) and *Ficus minahassae* (roots) enhance milk flow in lactating mothers.

Other indigenous groups in the Philippines exhibit similar utilization pattern of medicinal plant use with the Higaonons of Rogongon to treat certain diseases. For example, the findings on the medicinal plant utilization of the Kalanguya tribe in Tinoc, Ifugao showed that the Kalanguyas used boiled leaves of *Blumea balsamifera* and *Vitex negundo*, and rhizomes of *Zingiber officinale* to cure cough; observed that *Citrus microcarpa* can lower hypertension; *Acmella oleracea* or *Spillanthus*

acmella causes numbing effect on the gums and relieves toothache; and a person with urinary tract (kidney) infection would drink the boiled roots and young hairs of *Imperata cylindrica* and *Zea mays*, respectively, because these grasses stimulate normal urination [1]. Moreover, the Tasaday of Mindanao, Itawes of Cagayan, Ibalois of Tabaan Norte, and Kalanguyas of Ifugao also use *Psidium guajava* as an antiseptic wash for wounds and other skin diseases. Relative to other tribes in the country, plant mixtures were also noted to be more effective in treating a particular ailment, like the mixture of boiled leaves of *Persea Americana*, *Artocarpus heterophyllus*, *Psidium guajava*, *Syzygium malaccense*, and *Chrysophyllum cainito* is more effective to treat diarrhea. Other medicinal plants were utilized to treat two or more diseases like *Annona squamosa* which are used to treat diarrhea, diabetes, and rheumatism and *Lindheimeria texana* relieves headache, fever, and cure wounds. In contrast, several species of plants were used to treat the same ailment or disease, such as *Plumeria obtuse*, *Eleusine indica*, *Ficus benjamina*, *Ficus minahassae*, *Flacourtia rukam*, *Smilax bracteata*, and *Vitex negundo* which were used to relieve muscle pains or over fatigue or “bughat” in women.

Generally, different indigenous groups in the country exhibited similar utilization patterns of their plants with medicinal value probably because their knowledge on traditional medicine is intrinsic among them and inherited from their great ancestors. Most of these tribal communities have strong beliefs on spirits which are thought to be protectors of the bountiful resources of nature, such as plants. Further, they believe that certain diseases are caused by supernatural beings. In Ibaloi and Kalanguya societies, the main cause of illness is claimed to be caused by dissatisfied spirits or a dead relative [2]. Thus, rituals and certain ceremonies were performed relative to their utilization of medicinal plants which were believed to enhance the efficacy of these plants. In Rogongon, Higaonons usually perform rituals and offerings or “himata” before they can reveal or share their indigenous knowledge on medicinal plants because they believe that these plants are protected by spirits as well as to maintain its effectiveness.

Ethnobotany is perhaps the most important method to study the natural resources and their management by indigenous people [10]. Unfortunately there is no provision or law for the protection of the indigenous knowledge or intellectual property rights of the native people. Today, herbal medicine plays an important role in rural areas and some locally produce drugs are still used as household remedies for various diseases. This is because modern medicine and healthcare services are very expensive. The use of traditional medicine (indigenous knowledge) is now globally

recognized and accepted. In fact, some of these herbal drugs are marketed worldwide.

In this study most of the medicinal plants were gathered from the wild while some were found in the deeper parts of the forests. Some species were cultivated by few Higaonons as ornamental plants and crops such as *Plumeria obtuse*, *Blumea balsamifera*, *Kalanchoe pinnata*, *Coleus blumei*, *Hibiscus rosa-sinensis*, *Zingiber officinale*, *Nicotiana tabacum*, *Musa textilis*, and *Zea mays*. Although the Higaonons practice sustainability in their use of the medicinal plants, still many of these important medicinal species are facing the danger of extinction. There are various factors considered as main threats to these medicinal plants that were recorded by interviewing the participants, like deforestation, land conversion or agricultural expansion, and natural calamities or disasters (drought). For example, some areas in Rogongon were affected by the tropical typhoon "Sendong," experienced landslides which destroyed their homes including their cultivated medicinal plants. Moreover, the Higaonons indigenous knowledge on medicinal plant use was observed more on their older community members like the datu and their folk healers. Younger members of their community are less knowledgeable because they are taught by their elders only once they reach a certain age or rank in their society (such as a Datu or Chieftain). If this knowledge is not documented, the plants, especially those with high medicinal value, would eventually become extinct.

Conclusion:

The Higaonons have managed to maintain the skills and knowledge that will protect its forested mountains. This was clearly exhibited in their own indigenous knowledge in traditional medicine using medicinal plants. Their belief that these plants are protected by supernatural beings ensures sustainable pattern of their medicinal plant use. A close similarities in the traditional use of plants as medicine was observed among the Higaonons with other tribal groups in the country. Probably because the indigenous knowledge is inherent to them and they share the same cultural traditions and also because this traditional medicine has been practiced by our indigenous communities for several decades. However, there is still a need to test the active component of these medicinal plants in terms of its pharmacologic effects especially the species collected in the wild and rarely used. In the other hand, there is also a need to conserve the medicinal plants in the area and in any other areas in the country as many important medicinal species of plants are facing danger of extinction due to the continued deforestation and land conversion in different areas in the Philippines. There is a need of coordination and cooperation among various agencies in the country for the achievement of well

established protection of our biodiversity, as a whole, and ensures the transmission of this indigenous knowledge to the succeeding generations. This study records the ingenuity of the Higaonons on their use of various medicinal plants as well as their traditional healthcare practices.

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