

Ethnomedicinal Plants Used by Residents in Northern Surigao del Sur, Philippines

Gemma A Gruyal¹, Romeo del Rosario² and Nenita D Palmes²

¹Surigao del Sur State University, Cantilan, Surigao del Sur, Philippines

²Mindanao University of Science and Technology, Philippines

Abstract

The study was conducted to document the medicinal plants utilized for the treatment of various ailments among residents in the northern part of Surigao del Sur. The mode of preparation and treatment is also included in the documentation. Demographic and ethnobotanical knowledge was gathered through interviews using a semi-structured questionnaire. Fifty (50) informants were involved in providing information on the 65 plant species documented as medicinal plants and utilized by the residents to treat different kinds of diseases and ailments. The most frequently used plant part in terms of percentage of the total number of species was the leaves (84.3%). This was followed by stem (8.9%), roots (7.1%), bark (4.3%), hair and rhizome (1.4%). The methods applied in the preparation of the herbal medicine were pounding, crushing, preheating, soaking, decocting and infusing. The most common health problems treated by the identified medicinal plants were stomach ailments, respiratory diseases, wounds, boils and muscle pains. Most of the medications were administered orally.

Keywords: Ethnobotany; Medicinal plants; Utilization; Common ailments

Introduction

Medicinal plants and herbs have been used for many centuries as a source of people's drugs for the treatment and prevention of diseases, disorders and the promotion of good health [1] and still provide the first line of primary health-care even in the present age to major segments of the population worldwide [2]. According to the World Health Organization (2003), it is estimated that up to 80% of the population depends exclusively on plants for their health and healing. The information and folk knowledge regarding the medicinal and therapeutic uses of these indigenous plant materials have been handed down from generation to generation through verbal communication [3]. As modernization progresses however, the use of traditional medicinal plants has been threatened in many parts of the world. One of the major threats to these plants is that of habitat destruction. Due to modernization, natural vegetation is destroyed for the building of infrastructures that caters to the industrialization needs of the locale. Other concerns are those of over-harvesting of the plant medicine since vital parts of the plants are those that are used extensively causing their death and decrease in population [4]. Introduction of new western medicinal practices has resulted to the gradual replacement of traditional practices [5]. This is evident, nowadays, in the younger generations who do not possess as much knowledge of medicinal plants as the older generations [4].

With the growing threat of losing traditional knowledge in the modern era, many efforts have been made to record and publish this knowledge. In the past few years, a renewed interest on the natural method of treatment or traditional medicine arose worldwide. The work on ethno-medicinal knowledge has increased especially in some parts of Europe, Asia and Africa [6]. Despite many ethno-medicinal studies that were performed all over the world, a relatively few documentation on ethno-medicinal plant is done in the Philippines, in most cases focusing only on indigenous groups while the knowledge of traditional agriculturists and forest dwellers is neglected [7].

Northern Surigao del Sur in the Philippine archipelago is home to citizens who were descended from native and tribal groups influenced by the rapid modernization of the country. Most of the residents are farmers and fishermen who live near/on mountains, plains and farmlands, and on the coastal regions. These modernized dwellers

have been practicing traditional folk medicine since time immemorial. With the advent of modern medicine and technology, the indigenous knowledge of herbal medicine and practices handed down from their forefathers has been threatened to extinction. Some of these folk medicines were relegated to the side-lines or are no longer practiced. With today's younger and more educated populace, knowledge or information of these traditional herbal medicines is no longer valued as being useful. This present study was conducted to document the knowledge of indigenous plant utilization and healthcare practices in the Northern part of Surigao del Sur. Findings of this research will provide a data base for future research and potential resource for the development of new drugs. It also provides a base for enhancing scientists' attention towards consideration of non-indigenous rural folks as source of ethno-botanical knowledge.

Materials and Method

Northern Surigao del Sur, comprising five districts, namely Carrascal, Cantilan, Madrid, Carmen and Lanuza, or collectively known as CarCanMadCarLan, lies in the northernmost coast of the province in the Philippines. Situated between latitudes 09°22'-09°14' N and longitudes 125°56'-126°04' E, this piece of land is bordered by the Carrascal bay at the north and the Lanuza bay at the south with a total land area of 1097.71 square kilometers. The tropical region has vast timberlands mainly of coconut trees with over six thousand hectares of government-irrigated lands, seawaters in the east, and mountains in the west, north and south, having an average monthly precipitation of 257.2 millimeters. Aside from timberlands, it harbours mangrove forests, shrubs, and evergreens.

A barangay from each municipality was chosen purposively as

***Corresponding author:** Gemma A Gruyal, Surigao del Sur State University-Cantilan, College of Education Business and Management, Linintian, Cantilan, Surigao del Sur 8317, Philippines - 083-212-5132, Tel: 9088838950; E-mail: gemma_gruyal@yahoo.com

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study area and a prior informed permission was made through their Barangay chairman and some local administrators before the study was conducted. In each chosen barangay from the five municipalities, ten local residents (30-82 years old) served as informants, having wide knowledge on medicinal plants. Over all they were 50 people interviewed, 15 were male and 35 were females. They were interviewed via semi-structured questionnaires. The information gathered includes demographic profile like age, gender, the barangay where they belong and source of livelihood. Their knowledge on ethno-medicinal plants and its uses were also included. Interviews were conducted through informal conversations in order to allow for spontaneous replies and minimize feeling pressured. A series of interviews were made from October to March 2013, consolidated by field observations. The data acquired from each plant comprised the local name (Surigaonon name), the plant part used, its preparation and mode of administration and the ailment treated. Standard taxonomical procedures were used in gathering plant specimens, which were pressed, dried, identified and deposited in the herbarium at the Mindanao University of Science and Technology (MUST) and the student herbarium at the Institute of Biological Sciences, University of the Philippines Diliman. Photographs of every specimen were taken during the survey. Plant identification was carried by referring to various literatures such as [8-11].

Results and Discussions

The use of traditional medicine has been practiced in various countries since time immemorial [2]. In the Philippines, knowledge on the use of plants as medicine was inherited from great ancestors through oral tradition [6]. In the present study, a total of 65 plant species were documented as medicinal plants utilized by the Surigaonons. The species were classified into 44 families each treating different kinds of health disorders or ailments. Table 1 showed that Family Gramineae (4 species) and Verbenaceae (4 species) were represented as the highest number of species utilized as medicinal plant followed by Labiatea (3 species) and Malvaceae (3 species). Family Rutaceae, Apocynaceae, Anacardiaceae, Fabaceae, Asteraceae, Euphorbiaceae, Solanaceae,

Myrtaceae and Zingiberaceae were represented by two (2) species each, while the rest of the families were all represented by one (1) species. In terms of habit, there are 22 species of herbs (33.9%), 21 species of shrubs (32.3%), 19 species of trees (29.2%), and 3 species of climbers (4.6%). Results indicated that the area has a diversity of plant species of medicinal value. Furthermore, because of the region is far from the city proper and their access to modern healthcare services is limited, most of the residents still resort to using traditional medicinal practices. Based on the results gathered, the leaves (84.3%) are the most frequently used plant part for herbal medicine. This is also true in the studies of Del [12] among traditional healers in Southwest Cebu, Philippines and [6] on the Higaonon Tribe of Iligan City, Philippines wherein leaves were commonly prepared by boiling water (decoction) and administered orally. The frequent use of leaves helps in the survival and continuity of useful medicinal plants in Northern Surigao del Sur. It ensures the sustainability of the plants to grow in the area in order to cater to the needs of the rural populace for medicinal plants. However, in the studies of [5,13] on the Temuans and by Ong and Nordiana [14] on the Malay villagers, the roots of the plants were the most utilized portion as herbal medicine. Other parts of the plants such as stems (8.9%), roots (7.1%), bark (4.3%), hair and rhizome 1.4% and, fruits and seeds were often used in the preparations. The most common ailments were stomach discomfort due to diarrhea, respiratory diseases like common colds and cough, urinary tract infection and skin diseases. The preparation and administration of the medicinal plants varies based on the type of disease treated. The very common method of preparation was boiling the plant part or decoction until a desired concentration is achieved. Most of the treatments were administered orally. For immediate treatment like bleeding of wounds, leaves were pounded and crushed to extract the juice and applied topically or directly on the affected area.

As shown in Table 1, leaves are commonly used in treating ailments. However, the mode of administration varies from ailment to ailment as in the case of *Lantana camara* and *Stachytarpheta jamaicensis* L., wherein their leaves are boiled and used to clean wounds of the skin, while the leaves of *Annona squamosa*, *Premna*

Series No.	Scientific Name	Family	Local Name	Plant part used	Preparation	Mode of Application	Ailment treated
1	<i>Anona muricata</i> L.	Anonaceae	Guyabano	Leaves	Boil with water	Drink one glass three times a day, during ailment occur.	Treat for diarrhoea, relief stomach-ache
2	<i>Conyza cinerea</i> L.	Asteraceae	Albahaka	Leaves	Preheat the leaves, extract the juice	Rub or massage on the chest and back.	To soften cough, "panuhot"
3	<i>Artemisia vulgaris</i> L.	Asteraceae	Hilbas	Leaves	Preheat the leaves, extract the juice	Applied on the chest and back to loosen the phlegm.	For cough and fever
4	<i>Annona squamosa</i> L.	Anonaceae	Atis	Leaves	Boil with water	Drink thrice a day, induces normal urination	Treat kidney infection
5	<i>Artocarpus heterophyllus</i> Lam.	Moraceae	Nangka	Roots	Boil with water	Drink four times a day	For diarrhoea, stomach problem
6	<i>Aloe barbadensis</i> Mill	Liliaceae	Sabila	Stem	Extract the sap	Apply on the skin as emollient.	For sun burn
7	<i>Amaranthus viridis</i> L.	Amaranthaceae	Hayom	young leaves	Infusion of leaves	Drink during ailment occur	For stomach disorder.
				Leaves	Pound or crush the leaves	Apply directly or topically on affected area	Bruise and sprain
8	<i>Averrhoa carambola</i> L.	Oxalidaceae	Balingbing	Leaves	Crushed the leaves and extract the juice.	Rub and massaged all over the body	Lower body temperature due to fever
9	<i>Blumea balsamifera</i>	Compositae	Sagbong	Leaves	Boil with water	Drink four times a day to induce urination.	Treat kidney infection
10	<i>Bryophyllum pinnatum</i> (Lam.) Oken	Crassulaceae	Anghelika	Leaves	Pound leaves until soft	Apply and attach to the affected area.	Relief of toothache
11	<i>Biva orillana</i> L.	Bixaceae	Sijotes	Leaves	Leaves are heated	Apply directly on the affected area.	For sprain
				roots	Boil with water	Drink Thrice a day to soften cough	For cough

12	<i>Basella rubra</i> L.	Basellaceae	Alugbati	Leaves	Crush the leaves	Apply directly on affected area	For boils
13	<i>Cymbopogon citratus</i>	Gramineae	Tangyad	Leaves	Boil with water	Drink three times a day	Lower hypertension
14	<i>Coleus aromaticus</i>	Labiatae	Garabo	Leaves	Preheat the leaves and extract juice with agridulsi	Take one tablespoon three times a day	Relief and soften cough
15	<i>Citrus microcarpa</i> Bunge	Rutacea	Agridulsi + Garabo	fruit juice + Leaves	Extract juice + Preheat then extract juice then mix.	Take one tablespoon three times a day	Relief cough
16	<i>Cassia alata</i> L.	Fabaceae	Sunting	Leaves	Boil with water	As washing or antiseptic.	For athletes foot
17	<i>Coleus blumei</i>	Labiatae	Mayana	leaves	Pound until soft and juicy	Apply the leaves directly to affected area.	For mumps
18	<i>Carica papaya</i> L.	Caricaceae	Kapaja	Seeds	Seeds with water	Drink thrice a day.	As antihelmentic
19	<i>Curcuma longa</i> L.	Zingiberaceae	Duyaw	Rhizome	Preheat the rhizome and extract the juice mixed with coconut oil	Apply directly on the affected area.	Heals bruise and boils
20	<i>Centella asiatica</i> L.	Umbelliferae	Jahog-jahong	leaves and stem	Infusion of the leaves and stem	Drink three times a day.	For diabetes, stomach-ache , amoeba
21	<i>Cocos nucifera</i> L.	Palmae	Nijog + Kumentang	roots + Leaves	Decoction of the roots and a few number of kumentang leaves	Decoction of the roots and a few number of kumentang leaves	For arthritis
22	<i>Citrus aurantium</i> L.	Rutaceae	Kahel	young leaves	Crushed the leaves	Apply on the forehead.	Relieved headache
23	<i>Chromolaena odorata</i>	Asteraceae	Hagonoy	leaves	Pound leaves to soften and extract the juice.	apply to affected area	For boils
24	<i>Chrysophyllum cainito</i> L.	Sapotaceae	Kaymito	Leaves	Boil with water	Drink three times a day	For diarrhoea, relief stomach-ache
25	<i>Capsicum frutescens</i> L.	Solanaceae	Sili	Leaves	Crush the leaves mix with coconut oil.	rub on the chest	For asthma
26.	<i>Dasymaschalon clusiflorum</i> Merr.	Rutaceae	Tabog	Leaves	Pound the leaves to soften	Apply on the affected area.	For boils in the eye lid
27	<i>Syzygium malaccense</i> L.	Myrtaceae	Bongogon	Leaves	Boil with water	Drink four times a day to induce urination	For kidney infection
28	<i>Euphorbia hirta</i> L.	Euphorbiaceae	Tawa-tawa	leaves and stem	Boil in water	Drink three times a day.	For dengue fever
29	<i>Eleusine indica</i> (L.) Gaetn	Graminae	Bila-bila	Leaves	Boil in water	Drink three times a day	As diuretic
30	<i>Ficus benjamina</i> L.	Moraceae	Diyaket	Bark	Preheat and pound the bark	Apply directly on affected area.	For rheumatism
31	<i>Gmelina arborea</i> Roxb.	Lamiacea	Gemilina	leaves	Pick fresh leaves	Apply directly on chest and stomach	Relief muscle pain and can induce flatulence due to panuhot
32	<i>Hibiscus rosasinensis</i> L.	Malvaceae	Gumamela	Bud	Pound until become soft	Apply topically on affected area.	Heals swelling and as anti-inflammatory agent
33	<i>Heliotropium indicum</i> L.	Boraginaceae	Elepante	Leaves	Boil with water	Drink three times a day	For diarrhoea and stomach-ache
34	<i>Hyptis suaveolens</i> Poir.	Lamiaceae	Pilodo	leaves and stem	Boil with water	Drink three times a day	As antispasmodic
35	<i>Imperata cylindrica</i>	Graminae	Kogon	Roots	Boil with water.	Drink four times a day to induce urination	for kidney infection and stomach-ache
36.	<i>Impatiens balsamina</i> Linn.	Malvaceae	Suwangga	Leaves	Crushed the leaves	Apply as poultice	Cure scabies
37.	<i>Jatropha curcas</i>	Euphorbiaceae	Tuba-tuba	Stem	scrape the stem preheat, squeeze to produce juice	Apply externally rub and massaged on the body.	Relief of flatulence or panuhot that causes cough
38.	<i>Kyllinga monocephala</i>	Cyperaceae	Bosikad	Stem and leaves	Soaking in water during night time	Drink the water morning time.	Relief headache, muscle pain, fever
39.	<i>Luffa acutangula</i> L.	Cucurbitaceae	Patola	Leaves	Boil with water	Drink three times a day	Treatment for dysmenorrheal
40.	<i>Leucaena glauca</i> L.	Mimosaceae	Ipil-ipil	Seeds		Eat five seeds in every dose for three days	As dewormer
41.	<i>Stachytarpheta jamaicensis</i> L.	Verbenaceae	Kanding-kanding	Leaves	Boil in water	Used as washing and antiseptic.	Cleaning of wounds
42.	<i>Mangifera indica</i> L.	Anacardiaceae	Manga	Bark	Boil with water	Drink three times a day	For dysmenorrheal
43.	<i>Mimosa pudica</i> L.	Fabaceae	Hibi-hibi + Amorsiko	Roots	Boil with water	Drink three times a day	Treatment for Goiter
44.	<i>Andropogon aciculatus</i> Retz.	Graminae	Amorsiko	Roots	Boil with water	Drink three time a day	Treatment for goiter

45	<i>Musa paradisiacal</i>	Musaceae	Saging	Young leaves		Apply directly lower portion of the stomach	Give cooling effect, induce normal urination or " bus-aw"
46	<i>Moringa oleifera</i> L.	Moringaceae	Kalamungay	Leaves	Crushes the leaves	Apply on the open wound	Abate bleeding
47	<i>Manihot esculenta</i> Crantz	Euphorbiaceae	Kamoting-kahoy	Leaves	Boil with water	Use in bathing	After healing of measles
48	<i>Mentha arvensis</i>	Labiataeae	Helba buena	Leaves	Boil with water	Drink three times a day	For stomach discomfort
49	<i>Premna odorata</i> Blanco	Verbenaceae	Adgao	Leaves	Boil with water	Drink four times a day	Relief and loosen cough
50	<i>Pterocarpus indicus</i> Willd.	Fabaceae	Naga	Bark	Scrape and squeeze the sap	Topically apply directly on affected area	Relief for herpes simplex
51	<i>Persea americana</i> Gaertn.	Lauraceae	Abukado	Leaves	Boil with water	Drink three times a day	For diarrhoea, relief stomach-ache
52	<i>Psidium guajava</i>	Myrtacea	Bayabas	Young leaves	Boil with water	Externally, used as washing or antiseptic Internally, drink three times a day.	Disinfect the wound, for diarrhoea.
53	<i>Plumeria obtuse</i> L.	Apocynacea	Kalatsutsi	Leaves	Pound and extract the juice	Apply directly on the affected area.	Treatment for herpes simplex
54	<i>Premna cumingiana</i> Schauer	Lythraceae	Banaba	Leaves	Boil with water	Drink three times a day to induce urination.	For kidney infection.
55	<i>Pandanus odorata</i>	Pandanaceae	Pandan tsina	leaves	Boil with water	Drink four times a day	For cough, induce urine, control cholesterol
56	<i>Portulacao leraceae</i> L.	Piperaceae	Sinaw-sinaw	leaves and stem	Infusion of leaves	Drink four times a day, induce urination.	For kidney infection, arthritis
57	<i>Solanum melongena</i> L.	Solanaceae	Biringhinias	Leaves	Boil with water	External, gargle with a little of salt	For swollen gums
58	<i>Symphytum officinale</i>	Boraginaceae	Comprey	Leaves	Boil with water	Drink three times a day.	For cough and colds
59	<i>Tinospora reticulate</i>	Menispermaceae	Panjawan	Stem	Boil with water	Drink three times a day to lower blood sugar.	For diabetes
60	<i>Vitex negundo</i> L.	Verbenaceae	Lagundi	Leaves	Infusion of leaves	Drink three times a day.	For cough and colds
61	<i>Viola odorata</i> L.	Violaceae	Bayoleta	flower, stem, leaves	Infusion of flower, stem and leaves	Internally, drink three times a day	Treat digestive disorder, for cough
62	<i>Muntingia calabura</i> L.	Elaeocaraceae	Mansanitas	Young leaves	Infusion of leaves	Drink three times a day	For diarrhoea, stomach-ache
64	<i>Zingiber officinale</i> Roscoe	Zingiberaceae	Luja	Rhizome	Pound and extract the juice and mixed with oil	Rub on affected area to induce gas pain.	For Stomach-ache
65	<i>Zea mays</i> L.	Graminae	Mais	Young hair	Soak in water	Drink three times a day to stimulate urination.	For kidney trouble.

Table 1: List of medicinal plants used by residents in Northern part of Surigao del Sur.

odorata and *Symphytum officinale*, and the young leaves of *Ziziph jujube* are boiled in water and taken orally to treat of kidney infection, common colds and cough, and diarrhoea, respectively. Results also show that leaves were mostly used to treat cough with different modes of application. The juice of *Conyza cinerea* L. extracted from the leaves is massaged on the chest and back (externally applied) to cure dry cough, while the leaves of *Coleus aromaticus* were preheated to extract the juice and taken orally (internally applied) three times a day to cure the same ailment. Other medicinal plants can be utilized to treat two or more diseases such as *Pandan tsina* which is used to treat cough and induce urination to relieve kidney trouble and *Kyillinga monocephala* (Bosikad) relieves headaches, muscle pain, and fever. In contrast, several species can also be used to treat the same ailments with the same mode of preparation, such as, decoction or boiling with water and taken orally as tea. Examples include *Anona muricata* L., *Artocarpus heterophylles*, *Chrysophyllum cainito* L. and *Persia Americana* G which all treat diarrhoea and relieve stomach-aches. However, parts of the plants used from each species differ to treat the same ailment. Other species can also be used to treat ailments with different modes of application. *Psidium guajava* is used externally as a disinfectant in wounds while it is also taken orally by the residents to cure diarrhoea. The infusion of young leaves of *Amaranthus viridis* L. used for stomach disorders is internally administered while matures leaves, for bruises and sprains, are topically applied on the affected area after extracting

the juice by pounding. Some of the plants were utilized (both internal and external) in treating the ailments, however, the plant part used is different. For example, *Bixa orellana* leaves were preheated over fire and applied directly on the affected area to relieve sprain while its roots were decocted for the treatment of cough.

It was also observed that some of the preparations used roots to treat various ailments such as cough, stomach-ache, arthritis, goitre and kidney infection. Although roots have many uses, it was revealed in the survey that utilization of roots (7.1%) is lesser compared to leaves (84.3%). This indicates that many of the residents in Northern Surigao del Sur were careful of their flora and fauna knowing that extraction of the entire plant destructs to the environment and lowers the regeneration of medicinal plants caused by the trampling of habitat soil.

In the Philippines, other indigenous groups exhibited similar utilization pattern of medicinal plants used to treat certain diseases. For example, in the study of [15,16], Kalanguyas in Tinoc Ifugao used the boiled leaves of *Blumea balsamifera* and rhizomes of *Zingiber officinale* to cure cough; and observed the boiled roots and young hairs of *Imperata cylindrical* and *Zea mays*, respectively, help cure people suffering from kidney infection, since these grasses induce normal urination. These medicinal plants, as documented in the study of Olowa et al. [6] are also utilized among in Higaonon Tribe of Rogongon. Moreover, the Tasaday of Mindanao, Kalanguyas of Ifugao, Higaonon

Tribe of Rogongon used *Psidium guajava* as an antiseptic wash for wounds and other skin diseases [6]. Traditional healers of Southwest Cebu also used *Cymbopogon citratus* and *Euphorbia hirta* L. leaves to lower hypertension and cure dengue, respectively. These are similarly utilized by the residents of the Northern part of Surigao del Sur.

Based on the studies mentioned above, indigenous groups in the Philippines exhibit similar utilization of medicinal plants in treating specific ailments. However, several species studied in this paper are used by the subjects differently from those in other indigenous groups. Examples include *Eleusine indica* which is used by traditional healers in Cebu to treat back pains and fractures [12], but is utilized by Surigaonons as a diuretic; *Persea Americana* leaves which are boiled and decocted to treat kidney stones of Cebuanos [12], but used in Surigao del Sur to cure diarrhea and relieve stomach-aches; and *Annona squamosa* L., which for Higaonons, is a cure for diabetes and rheumatism but a kidney infection medicine for the inhabitants of Northern Surigao del Sur. The difference in the usage of medicinal plants to treat specific ailments may probably be because of the different geographical location of inhabitants and their dissimilar ways of living and exposure to diseases. Generally, however, even with these differences in usage, different indigenous groups or even rural communities in the Philippines exhibit a similar way of valuing indigenous knowledge on traditional medicine which is intrinsic among them and inherited from their great ancestors.

The inhabitants from the Northern part of Surigao del Sur treated many types of ailments ranging from simple health problems such as skin diseases and stomach-ache to chronic diseases like diabetes, hypertension and goitre. Such knowledge can provide a basis for further scientific studies on the efficacy and search for bioactive components found in plants. However, there is still a need to test the active component of these medicinal plants in terms of its pharmacologic effects. According to Ong [5] it is important not only to record such ethno-medical knowledge and conduct further studies but also to take steps in conserving these medicinal plants before they are lost forever. The present study, affirms this idea since, Surigao del Sur particularly in the Northern part of the province, has several mining activities. With the advent of the mining industry in the area several plant species which are the subject of this study will be decimated due to the destruction of the forest or the plants natural habitat. Thus, if this knowledge is not documented, the plants utilized, especially those high in medicinal value, may become extinct.

Conclusion

This study shows that there is a prevailing knowledge on the traditional uses of medicinal plants treating certain ailments and health problems among the residents in the Northern part of Surigao del Sur. Most of the ailments treated in the region are cough, diarrhea and stomach ache, and kidney infection. The use of leaves indicates that many of the residents in Northern part of Surigao del Sur were careful to the extent of survival of medicinal plants. Results of this study suggest that rural folks should also be considered as important source of information about the use of medicinal plants. This study records not only the ingenuity of the Surigaonons on their use of various medicinal plants and traditional healthcare practices but documents the invaluable knowledge of the forefathers of the inhabitants so that it may survive amidst the rapid modernization of the country.

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