

# ETHNOMEDICINAL PLANTS USED BY MIDDLE-AGED RESIDENTS IN SAN ANTONIO, TANDAG CITY, SURIGAO DEL SUR, PHILIPPINES

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## ABSTRACT

People all around the globe are always looking for ways to use plants as medicines to treat various ills and diseases. The study on medicinal plants and their traditional usage is currently popular around the world. Moreover, with the arising diseases and the need for more cost-effective medications, documentation of the claimed medicinal plants by local communities is vital because it will open a lot of opportunities for the discovery and improvement of new and affordable plant-based medicines. In the province of Surigao del Sur Philippines, the older generation are the ones who apply their traditional knowledge on the use of herbal plants. Thus, this study limits on the middle-aged residents in the village of San Antonio, Tandag City in Surigao del Sur Philippines on their use of traditional knowledge in using herbal plants. Forty-six respondents were chosen following the convenient sampling technique. Gathered data on demographic profile of the respondents, plant part used, methods used in the preparation of herbal plant, name of ailments was quantified using descriptive statistics (frequency, sum, and percentage). Likewise, calculation of used value was determined using percentage. Correlation between the age and gender to methods of plant parts used were done using Pearson Correlation. A total of 46 (7 males and 39 females) served as respondents in this study. Highest number of respondents belonged to ages 45 to 49. Almost one third of the respondents residing in the said barangay for 41-50 years. Meanwhile, most of the respondents were using medicinal plants for 1-10 years. It was also found that most of the respondents obtained their source of ethnomedicinal knowledge from their ancestors. Twenty-three medicinal plants from 15 families, the majority of which belonged to the Lamiaceae genus were used as herbal plants. Most of these plants are collected as herbs and shrubs. Leaves are commonly harvested for use and taken orally as decoctions. Viral diseases (cough and cold) were the most dominant ailments treated by the herbal plants. Oregano/Kalabo (*Coleus aromaticus*) had the highest use-value. It further shows that age is correlated with the changes to the methods of plant preparation while gender is not correlated. The study shows that despite increased urbanization, the village of San Antonio still has a range of plant species with medicinal importance. Thus, in the context of a wider local use as well as possible scientific and pharmaceutical applications, these herbal plants might be further examined for safety and efficacy.

## KEYWORDS

*Ethnomedicine, Middle-Aged Residents, Barangay San Antonio, Tandag City, Surigao del Sur*

## 1. INTRODUCTION

People across the world are constantly searching for the potential of plants as medicinal sources in relieving different ailments and diseases. The study of medicinal plants and their traditional usage is currently popular around the world. The issue is that traditional knowledge about medicinal plants is rapidly vanishing as a result of the advent of new technology and changes in traditional society. [1].

Moreover, with the arising diseases and the need for more cost-effective medications, documentation of the claimed medicinal plants by local communities is vital because it will open a lot of opportunities for the discovery and improvement of new and affordable plant-based medicines. In Surigao del Sur province, the traditional knowledge on plant utilization is normally trapped in the older generation, thus there is a danger that the ethnomedicinal knowledge was hopelessly lost if not quickly documented [2].

Ethnomedicine is connected to the cultural interpretations of wellbeing, disease, and illness, and addresses the healthcare-seeking process and healing practices [3]. Significant portions of the population worldwide still use medicinal plants and herbs as their first line of primary health care today. They have been used for many years as a source of people's medication for the treatment and prevention of illnesses, disorders, and the promotion of good health. [4]. Ethnomedicine is always effortless and less expensive that is also accessible. Plant- based traditional medicine plays a vital part in the advancement of novelties in drug discovery [5].

Tandag City, Surigao del Sur in the Philippine archipelago is home to residents who were plummeted from native and tribal groups affected by the fast modernization of the country. Most of the inhabitants are farmers and fishermen who live close to mountains, plains and farmlands, and on the coastal regions. These modernized citizens have been practicing traditional folk medicine since the days of yore. The traditional knowledge of herbal medicine and traditions passed down from their ancestors have been threatened with extinction by the development of modern medicine and technology. Barangay San Antonio was chosen as the barrio that would be covered by the research. The purpose of the current study was to provide documentation of information regarding the usage of native flora and herbal remedies in healthcare. The results of this research study will serve a baseline data for future researches and potential resources for the improvement of new drugs. It also serves as a baseline for developing scientists' attention towards consideration of non-indigenous rural folks as a source of ethnomedicinal knowledge.

## **2. METHODS**

### **2.1. Research Method**

This study utilized descriptive research method using structured questionnaire to gather pertinent data such as the demographic profile of the respondents. It also classified the herbal plants identified based on the family, scientific name, local or common name, plant parts used, preparation, mode of administration and its corresponding use-value. Research that describes the characteristics of a population and focuses on the “what” of the subject rather than the “why” is known as descriptive research. [6].

### **2.2. Study Area/site and Population Description**

The research study was conducted in the village of San Antonio, Tandag City, Surigao del Sur. The village shares a common border with the villages of Buenavista and Balibadon, TandagCity The total population of barangay San Antonio as of year 2015 is 669 as what was reported by the Philippine Statistics Authority. Out of the said population, there are 92 residents whose ages ranges from 45 to 59 years old. Owing to the COVID-19 epidemic, of the 92 residents, only 46 respondents of either gender, and, marital status. were chosen for this study. Those 46 respondents resided near the researcher's residence.

### 2.3. Sampling Method

This study employed convenient sampling technique, due to the restrictions of COVID-19 pandemic. This type of sampling employs the convenience to the researcher [7]. In this study the researcher find it convenient to choose residents which are close the researcher's residence. Structured questionnaire was administered to 46 respondents whose age ranges from 45 to 59 years old. This age range is considered middle aged, since retirement age which is considered as old age is beyond 59 years old. For this investigation, a sample representing 50% of the population was employed. They were interviewed through a voice record on their traditional knowledge and practice of utilizing diverse medicinal plants.

### 2.4. Statistical Analysis

Descriptive statistics such as sum, frequency and percentage were used to describe the mean percentage of ethnobotanical data in terms of plant parts used, preparation, mode of administration and its corresponding use-value. The Use-Value was analyzed to know the commonness of use of each plant in the village of San Antonio, Tandag City. This was determined using the following formula:  $UV$  is equal to  $Nur/Ni$ , where  $Nur$  is the total number of respondents and  $Ni$  is the number of plant usage reports in the research region. Correlation was used between the age, and gender of the respondents to the methods of plant preparation.

## 3. RESULTS

### 3.1. Demographic Profile of the Respondents

Table 1 displays the demographic profile of the respondents. A total of 46 including seven (15.22%) male and 39 (84.78%) female respondents were interviewed.

The age of respondents is within the three age groups 45 to 49, 50 to 54, and 55 to 59 years having the numbers of 31 (67.39%), 7 (15.22%), and 8 (17.39%), respectively.

With regards to their residency in the barangay, 14 (30.43%) are residence in the said barangay for 1-10 years, six (13.04%) are residing for 11-20 years, six (13.04%) are residing for 21-30 years, two (4.35%) for 31-40 years and 15 (32.61%) for 41-50 years.

Pertaining to the number of years they used the medicinal plants, 26 (56.52%) of the respondents were using medicinal plants for 1-10 years, three (6.52%) are using it for 11-20 years, one (2.17%) were using it for 21-30 years, 11 (23.91%) were using for 31-40 years, four (8.70%) were using it for 41-50 years, and one (2.17%) was using it for 50-60 years.

Table 1. Demographic Profile of the Respondents

Category	Frequency	Percentage
<b>A. SEX</b>		
Male	7	15.22
Female	39	84.78
SUBTOTAL	46	100
<b>B. AGE RANGE</b>		
45-49	31	67.39
50-54	7	15.22
55-59	8	17.39
SUBTOTAL	46	100
<b>C. LENGTH OF RESIDENCY</b>		
1-10 years	14	30.43
11-20 years	6	13.04
21-30 years	6	13.04
31-40 years	2	4.348
41-50 years	15	32.61
<b>D. LENGTH OF USING MEDICINAL PLANTS</b>		
1-10 years	26	56.52
11-20 years	3	6.52
21-30 years	1	2.17
31-40 years	11	23.9
41-50 years	4	8.70
50-60 years	1	2.17
<b>E. SOURCE OF ETHNOMEDICINAL KNOWLEDGE OBTAINED</b>		
Ancestors	40	86.96
Naturally gifted	1	2.17
Neighbors	5	10.87
SUBTOTAL	46	100
MEAN	46	100

### 3.2.1. List of the Families, Scientific Names, Local or Popular Names, and uses made by People in the Village of San Antonio in Tandag City, Surigao Del Sur

The respondents used herbal plants of fifteen different family groupings, with the Lamiaceae family having the most medicinal plant species with four in total, followed by the Euphorbiaceae family with three. Subsequently, Zingiberaceae, Poaceae, and Asteraceae contained two medicinal plant species, the remaining species each had one plant species belonging to their family group: Amaranthaceae, Annonaceae, Bixaceae, Burseraceae, Costaceae, Moringaceae, Myrtaceae, Phyllantaceae, Piperaceae and Solanaceae. The Lamiaceae family is one of the largest and most diverse of the plant families with regards to plants containing medicinal properties, which are based on the volatile oil concentration within the plant.

### 3.2.2. Plant Part Used

Plant part used is demonstrated in Table 2. Multiple responses were reported by the respondents in this table. The numerous plant components that each responder said offered distinct advantages were generally used in conjunction by the respondent. As observed in table 3, respondents reported that 39 (76.47%) species of herbal plants uses leaves as medicinal plants to; five (9.80%) species follows wherein roots were used as herbal plant ; four (7.84%) species used the combination of two or three plant parts of the plant; two (3.92) species used the stem as the herbal plant; one (1.79%) species, wherein the flowers were used as the herbal plant; and the remaining parts which is the seeds and fruit got no usage.

Shrubs and vines were abundantly cultivated in local gardens, implying that vines and shrubs' therapeutic properties are more readily available on the barrio. The results of the 'plant parts used' section revealed that respondents similarly claimed that the leaves were the most usually used portion of the plant. A study attested to this findings, were respondents find it easier to use the leaves of the plants compared with the other plant parts [8].

These findings are not indicative of all plants, as the sorts of components used vary by species, such as the roots of Duwaw (*Curcuma longa L.*), which have been scientifically proven to have medicinal characteristics. The use of plants in the village of San Antonio for various illnesses and disorders was exclusive to those plants. For instance, Duwaw (*Curcuma longa L.*) juice was used to heal wasp stings in India, and the leaves were used for several other things all over the world.

Table 2. Plant part used

Plant Parts	Frequency	Percentage
Leaves	39	76.47
Roots	5	9.80
Combination of 2 or 3 Plant Parts	4	7.84
Stem	2	3.92
Flower	1	1.96
Seeds	0	0
Fruit	0	0
TOTAL	51	100

### 3.2.3. Method used in Preparation of Herbal Plants used

Method used in the preparation of herbal plants is posited in Table 3. Multiple responses were reported by the respondents in this table. Seventeen species were prepared as fresh extract, 19 species were boiled, and only seven species were prepared as dried plant as herbal preparation. Eight plants in total used varied preparation techniques (a combination of two or three of the preparation methods). This is consistent with information about boiling food, which, in contrast to fresh forms of the same food, is known to remove nutritional significance from that food. This may also be indicative of using medicinal plants, which are likely to lose their medicinal value after the initial extraction from the root.

Table 3. Method used in preparation of herbal plants used

Mode of Preparation	Frequency	Percentage
Boiled	19	37.25
Fresh	17	33.33
Combination of 2 or 3 methods of preparation	8	15.69
Dried	7	13.73
TOTAL	51	100

### 3.2.4. Administration of Herbal Plants used

Administration of herbal plants used was reported in Table 4. Multiple responses were reported by the respondents in this table. The main route of administration was through oral route (internally) with 25 species (49.02%) solely using this method. Only 14 (27.45%) plants were applied onto the skin (topically/externally). Twelve (23.53%) plants within the total had various administration (a combination of both oral and topical). Both methods of administration are advantageous, but the oral route stands out for its simplicity. According to several responders, infusing the leaves of the particular plant in hot water is considerably simpler than applying the plant physically. Internal tissues will connect with oral transmission, depending on the ailment the herb is utilized for.

Table 4. Administration of herbal plants used

Mode of Administration	Frequency	Percentage
Orally	25	49.02
Topical	14	27.45
Both Oral and Topical	12	23.53
TOTAL	51	100

### 3.2.5. Name of Ailments Treated with Herbal Plants

Name of ailments is shown in Table 5. Multiple responses were reported by the respondents in this table. Out of the 15 ailments, the most dominant ailments were respondents used the herbal plants was for viral problems such as; cough and colds (32.31%). This was closely followed by stomach-ache (15.38%). Fever, skin rashes diarrhea and high blood also contributed to a large proportion of the respondents' main uses of medicinal plants having a value of 6.15% while sprain, wound, Urinary Tract Infection (UTI) and diabetes were amongst the smaller proportion of diseases which contributed to 4.62%. Kidney stones got 3.08%. Certain diseases were only mentioned once by respondents, such as dengue, ulcer, uric acid, and headache with a percentage of 1.54%.

The use if herbal plants for viral problems such as; cough and colds as what was dominantly reported by the respondents, living in slum area in the barangay wherein houses are small and constricted posing alarming incidence of respiratory diseases. According to the World Health Organization, infectious illnesses are the sixth most common cause of early mortality worldwide, and there is a strong need for pharmaceuticals to treat these conditions [9].

Table 5. Name of ailments treated with herbal plants

Name of Ailments treated	Frequency	Percentage
Cough and cold	21	32.31
Fever	4	6.15
Skin Rashes	4	6.15
Diarrhea	4	6.15
Stomach ache	10	15.38
Dengue	1	1.54
Sprain	3	4.62
High blood	4	6.15
Kidney stones	2	3.08
Wounds	3	4.62
Ulcer	1	1.54
Urinary Tract Infection (UTI)	3	4.62
Diabetes	3	4.62
Uric Acid	1	1.54
Headache	1	1.54
TOTAL	65	100

### 3.2.6. Name of plant and Use-Value of Plants

Name of plant and Use Value of Plants is shown in Table 6. Multiple responses were reported by the respondents in this table. According to Table 7, the plant with the highest use value (0.24) was oregano/kalabo (*Coleus aromaticus*), which got 11 usage reports. This was closely followed by Duwaw (*Curcuma longa L.*) (0.087) which had four reports. The lowest use values were calculated at 0.02 by 14 species which were each only mentioned by one respondent for each species. The village has high plant richness and accessibility. Several diseases can be treated by oregano/kalabo (*Coleus aromaticus*). It is used against malarial fever, liver problems, calculi associated by renal diseases, cough, chronic asthma, bronchitis, against helminths, colic, convulsion and epilepsy [10].

Table 6. Name of Plants and its Use-Value

Name of Plants	Frequency	Percentage	Use Value
Oregano/Kalabo ( <i>Coleus aromaticus</i> )	11	21.56863	0.24
Malinaw ( <i>Ocimum basilicum L.</i> )	1	1.960784	0.02
Buyo ( <i>Piper betle L.</i> )	1	1.960784	0.02
Pili ( <i>Canarium pachyphyllum Perk.</i> )	1	1.960784	0.02
Tawa-tawa ( <i>Euphorbia hirta</i> )	1	1.960784	0.02
Duwaw ( <i>Curcuma longa L.</i> )	4	7.843137	0.09
Tangad ( <i>Cymbopogon citratus</i> )	3	5.882353	0.07
Sambag-sambag ( <i>Phyllanthus niruri</i> )	1	1.960784	0.02
Sagbong ( <i>Blumea balsamifera L.</i> )	2	3.921569	0.04
Kalibre ( <i>Manihot esculenta</i> )	1	1.960784	0.02
Hilbas ( <i>Artemisia vulgaris L.</i> )	7	13.72549	0.15

Name of Plants	Frequency	Percentage	Use Value
Kalamunggay ( <i>Moringa oleifera</i> Lam.)	3	5.882353	0.07
Mayana ( <i>Plectranthus scutellarioides</i> (L.) R. Br.)	1	1.960784	0.02
Awoy ( <i>Amaranthus spinosus</i> )	1	1.960784	0.02
Insulin plant ( <i>Chamaecostus cuspidatus</i> )	3	5.882353	0.07
Bayabas ( <i>Psidium guajava</i> L.)	1	1.960784	0.02
Tada-tada ( <i>Jatropha curcas</i> L.)	2	3.921569	0.04
Paragis ( <i>Eleusine indica</i> (L.) Gaertn)	1	1.960784	0.02
Sayote ( <i>Sechium edule</i> )	1	1.960784	0.02
Guyabano ( <i>Annona muricata</i> L.)	2	3.921569	0.04
Sili ( <i>Capsicum annum</i> )	1	1.960784	0.02
Tahebo ( <i>Tabebuia avellanedae</i> Lorentz ex Griseb)	1	1.960784	0.02
Luya ( <i>Zingiber officinale</i> Roscoe)	1	1.960784	0.02
Total	51	100	

### 3.3.1. Correlation Between The Age to the Methods of Plant Preparation

Correlation between the age to the methods of plant preparation is shown in Table 7. It revealed a strong relationship between two variables (Pearson  $r = 0.65$  which is a positive correlation). This means that changes in age are correlated with the changes to the methods of plant preparation. It further implied that as the age of respondents increases, the methods on how they prepared the herbal plants also increases.

Table 7. Correlation between the age to the methods of plant preparation

Age	Frequency	Methods of Plant Preparation
45-49	31	27
50-54	7	8
55-59	8	24
Total	46	59
	<i>Frequency</i>	<i>Methods of Plant Preparation</i>
Frequency	1	
Methods of Plant Preparation	0.650178396	1

### 3.3.2. Correlation between the Gender to the Methods of Plant Preparation

Correlation between the gender to the methods of plant preparation is posited in Table 8. This result of Pearson  $r$  is a weak relationship between 2 variables. This means that changes in gender are not correlated with the changes to the methods of plant preparation. We may deduce that our variables are not strongly connected because the Pearson's  $r$  value is  $-1$ , which is a negative correlation. This correlation denotes that the methods of plant preparation did not vary in either male or female respondents.

Table 8. Correlation between the gender to the methods of plant preparation

<b>Gender</b>	<b>Frequency</b>	<b>Methods of Plant Preparation</b>
Male	7	27
Female	39	8
Total	46	59
	Frequency	Methodsof Plant Preparation
Frequency	1	
Methods of Plant Preparation	-1	1

#### **4. CONCLUSION**

This study revealed that the respondents in Barangay San Antonio in Tandag City still maintains a lot of ethnomedicinal knowledge and practices. This study gives data on a wide range of medicinal plants that can be explored further for future scientific and pharmaceutical applications.

#### **CONFLICT OF INTEREST**

The authors declare no conflict of interest.

#### **AUTHOR CONTRIBUTIONS**

The authors equally contributed to the conduct of the research study.

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