

# Ethnobotanical Survey of Medicinal Plants Used by the Y'Apayaos of Sta. Praxedes in the Province of Cagayan, Philippines

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## Abstract

*This ethnobotanical study documents the medicinal plant species used by the Y'Apayaos of Sta. Praxedes, Province of Cagayan, Northern Philippines. The descriptive design and the rapid rural ethnobotanical appraisal method were utilized in gathering the data from 39 elderly Y'Apayaos using a semi-structured interview guide as the tool in gathering the profile of the respondents and to find out the different medicinal plants used by the Y'Apayaos. Frequency counts and percentage distribution were used in treating the quantitative data. The findings show that the Y'Apayaos identified a total of 38 medicinal plant species used with the Subosub, or Sambong (*Blumea balsamifera*) as the most frequently identified medicinal plant. The medicinal plants, mostly trees and herbs, are commonly found around their dwelling places and in the nearby forests within their locality. Also, the Y'Apayaos use medicinal plants in curing ailments such as common cold, cough, flu, fever, stomach ache and urinary tract infection (UTI). The leaves are the most utilized parts for medicinal purposes and are prepared for concoctions.*

**Keywords:** ethnobotany, Y'Apayaos, medicinal plants, descriptive survey, Philippines

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## 1. Introduction

The use of herbal or medicinal plants has been known to be as old as the history of human beings. Prior to the many advancements in medicine and drug production, natural products with healing properties such as plants, minerals, and even animals were the main sources of traditional medicines used in healing different diseases even during the earliest human civilization in history.

People have always been interested in plants for their medicinal properties. Several ethnobotanical studies have already documented how various indigenous groups in the Philippines on how they have been utilizing herbal medicines. These groups include the Negritos in Pinatubo, the Aytas in Bataan, the Tasadays in Mindanao, the Itawes of Cagayan, the Ibaloi of Benguet, the Kalanguya in Ifugao, the Higaonon of Iligan, and the Ati Negrito in Guimaras Island (Balangcod *et al.*, 2011; Obico and Ragraio, 2014; Olowa *et al.*, 2012; Ong and Kim, 2014; Tantengco *et al.*, 2018). They use the plant as a source of medicine through trial and error method and the process is experienced over hundreds of years. Scientific investigations of medicinal plants have been initiated in many countries because of their contribution to healthcare. Herbal medicines have good values in treating many diseases including infectious diseases, hypertension, etc. (Morilla *et al.*, 2014).

In addition, Young (2007) claims that medicinal plants have been used as alternatives for therapeutic purposes which could be used specifically for particular health conditions. Morilla *et al.* (2014) expounded that the plants used as medicine contain a wide range of substances that can be used to treat chronic as well as infectious diseases. They are rich in secondary metabolites and essential oils of therapeutic importance.

Traditional medication, which was adopted and passed down to generation by local healers, remains as the basis of healthcare in developing countries because it is believed to be efficient, safe, cost-effective and accessible to the poor people and those who are living in remote areas (Trivedi, 2006; Liu and Gong, 2009).

Meanwhile, researches at present are into ethnobotanical survey of medicinal plants since it is assumed that the younger generation are already lacking awareness on the uses of the medicinal benefits of many flora species. This is also coupled with the idea that plants are vulnerable to environmental factors that may cause their extinction.

Ong and Kim (2014) noted that the Philippines is a multi-cultural country with over 169 living ethnolinguistic groups and about 140 of which are acknowledged as indigenous (Hirtz, 2003). These indigenous peoples represent 10% to 20% of the total Philippine population. Collectively, indigenous populations in the Philippines have been estimated at 12 million and are broadly classified as Lumad, Igorot, Ilongot, Palawan, Mangyan, and Negrito (Ting, Jr. *et al.*, 2008). The Y'Apayaos of Sta. Praxedes is another

indigenous group and are known by the town's people as the earliest settlers of their municipality. There is no recorded history of their existence.

There are several ethnobotanical researches conducted focusing on the different herbal medicines used by different indigenous people living in various parts of the Philippines like the Kalayunga Tribe in Tinoc, Ifugao; the Ati Negritos in Guimaras, Island; the Higaonon tribe of Rogongon, Iligan City; and, the Ivatan people of Batan Islan (Abe and Ohtani, 2013; Balangcod *et al.*, 2011; Ong and Kim, 2014). However, there is no existing literature yet which ventured on the medicinal plants used by Y'Apayaos in the Province of Cagayan, Northern Philippines. Because of this gap in literature, the researchers realized the importance of doing an ethnobotanical survey to systematically document the different medicinal plants that are used by the Y'Apayaos.

Generally, this study aimed at conducting an ethnobotanical survey of the medicinal plants that are used by the Y'Apayaos of Sta. Praxedes, Cagayan, Northern Philippines. Specifically, the present study aimed to (1) determine the profile of the existing Y'Apayaos in Sta. Praxedes in terms of their age, sex, civil status, highest educational attainment, occupation, and source of knowledge on the uses of medicinal plants; and to (2) identify and document the uses and preparation of the medicinal plants used by the Y'Apayaos in Sta. Praxedes to cure ailments.

## **2. Methodology**

### *2.1 Description of the Study Area*

The locations of the villages of the Y'Apayaos were located along the mountain ranges that border the province of Cagayan from Apayao and Ilocos Norte provinces. Villages were located far from the nearest hospital which is still in the nearby municipality of Claveria and from the rural health unit which is located in Centro, Sta. Praxedes. Hence, the idea of using traditional medication through medicinal plants is indeed an interesting subject for study considering the verdant vegetation and possible sources of locally used medicinal plants by these indigenous people.

## *2.2 Data Collection, Identification of Plant Species and Quantitative Analysis*

A total of 39 respondents were identified through non-probability sampling, particularly purposive sampling technique because there was already a pre-defined group that this research was looking for – the Y'Apayaos in Sta. Praxedes. Since there are no existing records in the Municipality as to who these Y'Apayaos specifically are, the researchers had to resort to identifying the identified locations of those who were known by the community people as Y'Apayaos and these included three barangays only in Sta. Praxedes: Cadongdongan, Makatel, and Salungsong. From here, the community people, through the help of the Barangay Council were asked to identify the Y'Apayaos living in these communities. In an interview with one of the elderly members of this indigenous group, the respondent explained that they were named Y'Apayaos to signify that their ancestors came from Apayao. During barrio fiestas, an activity which is known as Agpatung gathers the elders of the village in one place. In one of their sharing, they tried to trace where one came from. Their basis in determining the place where they came is the name of the river in which their tribe was located during the early times. For instance, one of the elders calls himself Y'Apayao because his tribe is located near Apayao River in Apayao. Another Elder is known as Y'Gasas, again their tribe is named after the river near to them. However, in general, Y'Apayao and Y'Gasas are collectively named as Y'Apayao. There are also Y'Apayaos located in Macatel (Sta. Praxedes), Adams (Ilocos Norte) and Dumalneg (Ilocos Norte).

This study used the descriptive research design and utilized the elements of both qualitative and quantitative research methodologies. Qualitative descriptions of the different medicinal plants that are used by the Y'Apayaos in Sta. Praxedes based on interviews with them and reviews from the related literature were presented in the findings of this study. The researcher developed a semi-structured interview guide in matrix form that was used in gathering the data from the respondents as sources of sufficient ethnobotanical information.

Furthermore, it is also quantitative in nature because frequency distribution, mean and percentages were used as tools in dealing with the data as regards their profile variables and the frequency of use-report by the respondents for each medicinal plant. The latter helped the researchers to determine how many of the Y'Apayaos are knowledgeable about such plant being used as medicine. This study utilized frequency counts and percentages for the profile of the

respondents and in determining the frequency distribution of the medicinal plants according to their location, plant habit, parts used, ailments treated and their mode of preparation. These were also used to determine the frequency of respondents who have identified the different medicinal plants in which the findings were ranked as presented in the discussion of findings.

Rapid rural ethnobotanical appraisal method (Townsend, 2006) was also adopted in this study since this is only a short-term study and the method does not require expensive tools to evaluate a comprehensive view of how the community acts as a whole particularly in their use of the herbal plants.

Collected fresh plant parts were first washed with denatured alcohol and pressed using newspaper and cardboard. Then the collected plant species were identified by the experts from the University of the Philippines in Baguio City. These voucher specimens were submitted in a herbarium.

Finally, in compliance with research ethics protocol, the researchers obtained a clearance certificate from the University Ethics Review Committee which examined the gratuitous permit secured from the Department of Environment and Natural Resources (DENR) of the Philippines.

### **3. Results and Discussion**

#### *3.1 Profile of the Y'Apayao Respondents*

Figure 1 shows the data as regards the profile of the 39 Y'Apayao respondents who were interviewed. The Y'Apayaos from Sta. Praxedes has only one respondent which comprises 3.3% in the group at the age of 91. This is followed by the three or 10% who are 90 years old, while a frequency of four or 13.3 % was recorded with ages of 85 and 86 years, respectively. The youngest among the Y'Apayao respondents is 55 years old. The mean age of the Y'Apayao respondents is 75.33 which means that they are relatively old enough to have a considerable repertoire of knowledge about the different medicinal plants utilized by their communities.

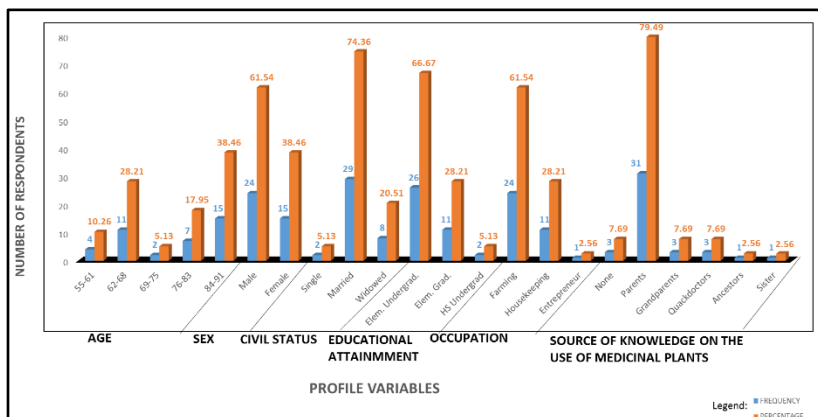


Figure 1. Distribution of respondents according to their profile

On the other hand, the majority of the Y'Apayao respondents are males with a frequency of 24 (61.5%) while 15 female respondents comprised 38.5% of the group. The survey also shows that 29 or 74.4% of the respondents are married, eight or 20.5% are widow/widower and there is two or 5.1% who are still single.

Meanwhile, 26 or 66.7% of the respondents did not finish their elementary education; 11 or 28.2% graduated in elementary; and, only two or 5.1% of them have reached high school but did not graduate. As regards the occupation of the respondents, most of the Y'Apayaos are into farming (24 or 61.5%) being their primary occupation while others are household keepers (11 or 28.2%). One of them indicated that he/she is an entrepreneur and three or 7.7% mentioned that they do not have an occupation and these are those who are already very old enough to do such occupations for income.

When asked about how they gained their knowledge about using the medicinal plants, 30 or 79.5% of the Y'Apayao respondents learned the use of medicinal plants from their parents, three or 7.7% from their grandparents, another 7.7% have learned it from quack doctors while the other two respondents mentioned that they have gained their knowledge of using medicinal plants from their ancestors or from a sister.

### 3.2 Medicinal Plants Used by the Y'Apayaos in Sta. Praxedes, Cagayan

Thirty-eight medicinal plants were identified by the Y'Apayaos which they use in treating various ailments. Most of these plants are found in the

backyards of the Y'Apayaos dwelling places while some are gathered from the forest and even from the roadsides.

The local names given to the medicinal plants utilized by the Y'Apayaos show a mix of regional dialects such as Iloko and Isnag. Probably because these are utilized in Sta. Praxedes, Cagayan province located in the boundaries of Apayao (CAR) and Ilocos Norte provinces. Some medicinal plants were given indigenous names that may seem unfamiliar at first upon hearing the name, but they are actually very common in the locality. For instance, the Galimba (*Cocos nucifera* L.) is simply the coconut, more commonly known to Filipinos as Niyog. Another is the Ag-agamoy (*Lantana camara*) which is also known as the Bangbangsit for Ilocanos or Kanturay/Coronitas in Tagalog.

To provide a description of these medicinal plants used by the Y'Apayaos, the following were ranked and arranged starting from the plant that has the highest frequency of respondents identifying it as herbal medicine down to the one that has the lowest frequency.

### 3.2.1 Subusob (*Blumea balsamifera*)

Among the 38 medicinal plants used by the Y'Apayaos, the Subusob (*Blumea balsamifera*), also known as Sambong in Tagalog, was the most frequently identified medicinal plant by 79.5% of the respondents. This is a shrub that grows wild in the tropical climate countries (PubMed, 2011) and this herbal plant is very available for the Y'Apayaos as it grows in their backyards or in the forests nearby their dwelling places.

Although the Subusob or Sambong is known for treating kidney stones, wounds and cuts, rheumatism, diarrhea, spasms, colds and coughs and hypertension, the Y'Apayaos specifically use this medicinal plant, particularly its roots and leaves, for making decoctions to treat fever and flu.

### 3.2.2 Dangla (*Vitex negundo*)

Dangla (*Vitex negundo*) mentioned by 74.4% of the respondents. It is also known as the Lagundi or the Chinese Chaste Tree. It is an erect, branched tree or shrub that grows to as much as 5 m high with a single thick, woody stem like a trunk and is usually seen in swamps. The leaves are palmate, in the form of five-pointed leaves which play out like the fingers of a hand. Lagundi leaves are 5-foliolate, rarely with 3 leaflets only. Lagundi leaves are 4-10 cm long, slightly hairy beneath and the flowers are blue to lavender, 6-7 mm long

bearing fruit globose of about 4mm in diameter that turns black when ripe (PubMed, 2011).

Stuart (2016) stated that Dangla or Lagundi has been proven to be an effective analgesic and antitussive (prepared as a pleasant tasting cough syrup) and has been considered as a replacement for dextromethorphan in the public health system. In connection to this, the Y'Apayaos confirmed that they usually prepare leaf decoctions from Dangla to treat a cough, fever and flu symptoms. They also boil Dangla leaves and use the decoction for a medicinal bath to treat patients suffering from flu. The plant can also be found in their backyards and in the forest.

### 3.2.3 Raya-raya (*Ficus septica*)

The Raya-raya, also known as Auili or Hauli fig tree (*Ficus septica*), is a small tree or a shrub which can grow to heights of 25 meters. White or yellow dots appear on the skin of the figs when they are ripe. The latex from the tree is usually yellow and this is used in traditional medicine in the Philippines for some herpes viruses.

Identified by 53.8% of the Y'Apayao respondents as a medicinal plant, the Raya-raya leaves are known for them to treat headaches. This is done by heating the Raya-raya leaves and putting it on the forehead of the patient to ease him/her from a headache.

### 3.2.4 Kubibi (*Centella asiatica* L.)

Kubibi, or Takip-Kuhol in Tagalog, has a rounded leaf with a kidney-shaped base. It can grow in different types of condition and is harvested all throughout the year.

The Y'Apayaos (46.2 %) had identified the Kubibi as a medicinal plant that can cure a cough and stomachache. They usually boil these parts to prepare decoctions for the patient. According to the respondents, sometimes they extract the fresh juice from the Kubibi leaves and have the patient drink the extract for faster relief from stomach ache.

The *Centella asiatica* (L.) has been described as a prostrate, faintly aromatic, stoloniferous, perennial, creeper herb, attains height up to 15cm (6 inches). The stem is glabrous, striated, rooting at the nodes. *C. asiatica* flourishes extensively in shady, marshy, damp and wet places such as paddy fields, river



banks forming a dense green carpet and rather than clayey soil, the sandy loam (60% sand) is found to be the most fertile soil for its regeneration (Singh *al.*, 2010).

### 3.2.5 Garem (*Zappania jamaicensis*)

Having mentioned by 38.5% of the Y'Apayaos as a medicinal plant, the Garem, also known as Kandi-kandilaan or Blue Porterweed, has been known for them to treat wounds.

The Garem is a well-branched, erect, perennial herb growing up to 1 meter tall. The stems become woody at the base. It is a common weed that can be found in disturbed soils on roadsides, waste places, especially in pastures but also in crop plantations. This makes it very available for the Y'Apayaos to use it as this plant can be found anywhere in their backyards.

With its anti-inflammatory properties, the Y'Apayaos usually crush the Garem leaves and use it as a topical treatment for wounds among children and even with adults.

### 3.2.6 Parya (*Momordica charantia*)

The bitter gourd or Ampalaya (*Momordica charantia*), known to the Y'Apayaos and Ilocanos as Parya has a long history of medical use and has a long list of folkloric health benefits for various conditions. As for the Y'Apayaos, 38.5% of them have identified Parya as an herbal remedy to lower blood sugar levels for diabetic patients. Also, the Y'Apayaos identified the same vegetable for treating respiratory ailments such as a cough by drinking a decoction of its leaves. PubMed (2011) specified that the juice from Ampalaya fruit and leaves are used to treat various respiratory problems that may include, asthma, wheezing cough, bronchitis, and pharyngitis. This is also used as the herbal remedy for infants who suffer from a cough.

### 3.2.7 Bayabas (*Psidium guajava*)

The Bayabas or more popularly known as guava has been used traditionally as a medicinal plant throughout the world for a number of illnesses.

As for the Y'Apayaos, 35.9% of the respondents identified Bayabas as the medicinal plant used for treating diarrhea, cough as well as for treating flu symptoms. This ascertains the discussion of Barbalho *et al.* (2012) and Stuart

(2016) explaining that all parts of the guava tree, including fruits, leaves, bark, and roots, have been used for treating stomachache and diarrhea in many countries. Leaves, pulp, and seeds are used to treat respiratory and gastrointestinal disorders, and as an antispasmodic, anti-inflammatory, as a cough sedative, anti-diarrheic, in the management of hypertension, obesity and in the control of diabetes mellitus. It also possesses anticancer properties. The seeds are used as antimicrobial, gastrointestinal, anti-allergic and anticarcinogenic activity (Barbalho *et al.*, 2012; Stuart, 2016). However, based on the interview made with the Y'Apayaos, they only use a boiled concoction of Bayabas leaves mixed with the leaves of Gayubana or soursop (*Anona Muricata*).

### 3.2.8 Kalamansi (*Citrus microcarpa*)

One of the most common backyard fruit trees in the Philippines is the Kalamansi also known as the Philippine lime (*Citrus microcarpa*), Calamondin. This small green citrus fruit which has a very sour taste is known for its popularity in the Filipino cuisine aside from its aromatic, antiseptic, antiphlogistic, carminative, deodorant, refrigerant properties (Stuart, 2016).

In this study, 35.9% of the Y'Apayas respondents have identified Kalamansi as one of their herbal medicines which they use to treat patients who are suffering from stomach ache and cough. The extract from a partly roasted Kalamansi fruit is given to a patient to ease him/her from such illnesses. Stuart (2016) mentioned that warm Kalamansi lemonade is drunk for a cough, colds and sore throat.

### 3.2.9 Kayanga (*Hibiscus rosa-sinensis* L.)

Kayanga is more popularly known as the Gumamela (*Hibiscus rosa-sinensis* L.). It is an ornamental plant that one can easily find beside perimeter fences or in between houses in the rural areas of the country. Aside from its ornamental purposes, the Kayanga also has medicinal benefits. In fact, 35.9% of the Y'Apayao respondents identified this plant for its medicinal uses for treating UTI as well healing wonder for some skin diseases such as boils. According to Stuart (2016), the Kayanga or Gumamela flower petals are noted for their medicinal properties such as anti-infectious, anthelmintic, anti-inflammatory, diuretic, and antipyretic.

The Y'Apayaos use both the leaves and flowers of the Kayanga plant. The flower petals are made as pastes and applied as a poultice to skin diseases such

as boils and other skin swellings. To treat UTI, they usually prepare a decoction out of the leaves and flowers of the Kayanga plant.

### 3.2.10 Abukado (*Persea americana*)

The fruit of *Persea americana*, commonly known to the Y'Apayaos as Abukado, or to many as avocado, is an edible fruit with olive-green peel and thick pale yellow pulp that is rich in fatty acids such as linoleic, oleic, palmitic, stearic, linolenic, capric, and myristic acids. Avocado is normally used for human consumption, but it also is known to provide many health benefits; thus, it is used in herbal medicine.

Abukado is a medium-sized tree reaching a height of up to 10 to 15 meters. This fruit-bearing tree can be commonly found in the backyards of the Y'Apayao homes and in the forest areas nearby their communities.

In the survey, 33.3% of the respondents mentioned Abukado as their herbal remedy in treating stomach ache and diarrhea. The concoction from leaves is prepared for consumption by the patients. Stuart (2016) included such use of the Abukado leaves because of their digestive, antibacterial, antioxidant, antifungal, pectoral, stomachic, anthelmintic, antiperiodic, antidiarrheal properties.

### 3.2.11 Laya (*Zingiber officinale* Roscoe)

For the 33.3%, Y'Apayao respondents Laya or ginger is not only a spice but a medicinal plant. Laya has been used as a spice, food, and medicine for hundreds of years, and is one of the earliest documented herbs utilized for the maintenance of health and treatment of disease (Philippine Herbal Medicine, 2016). It is claimed to have many medicinal values, from antibacterial, anti-inflammatory to anti-nausea and treatment of a sore throat. In fact, the Y'Apayaos use the concoction from Laya rootstock for sore throat prevention and treatment.

### 3.2.12 Marunggay (*Moringa oleifera*)

Now considered as a miracle tree, Malunggay (*Moringa oleifera*), with the name almost the same for the Y'Apayaos except for changing the letter "l" with "r", is one of the most commercially viable herbal medicine in many countries. This plant is commonly propagated in the backyards for easier

access as this plant is also a common vegetable ingredient in many traditional Filipino viands.

As for the Y'Apayaos, 33.3% of them have been using the Marunggay plant for treating headaches and body pains. The concoction from the bark and leaves of Marunggay is used for the patient to drink and can also be used for medical baths especially when treating body pains.

### 3.2.13 Pang-nga (*Ageratum conyzoides* L.)

*Ageratum conyzoides* L., more popularly known as the Goat weed or Bulakmanok, is an annual herb with a long history of traditional medicinal uses in many countries in the world, especially in the tropical and subtropical regions like the Philippines. The Y'Apayaos claim that this herb is abundantly found in the backyards and even in the roadsides. The Pang-nga, as the Y'Apayaos locally call it, is usually used for treating wounds by simply crushing the leaves and applying it as a poultice over the wound. They also use it for treating stomach ache by drinking decoction from Pang-nga leaves.

Okunade (2002) argues that a wide range of chemical compounds including alkaloids, flavonoids, chromenes, benzofurans, and terpenoids have been isolated from this species. Furthermore, he expounds that extracts and metabolites from this plant have been found to possess pharmacological and insecticidal activities.

### 3.2.14 Bain-bain (*Mimosa pudica*)

For the Y'Apayaos, this diffusely spreading, half-woody herb that has very sensitive leaves which fold when touched is another herbal remedy from nature. Locally known as Bain-bain or Makahiya, the *Mimosa pudica* is a common weed that grows with branched stems up to 1 meter long, sparingly prickly with numerous deflexed, bristly hairs (Stuart, 2016).

In the survey, 30.8% of the respondents have identified Bain-bain as an herbal treatment for flu. The Y'Apayaos use this by boiling the roots of the weed and consumed by the patients until the symptoms of flu subside. According to Stuart (2016), studies have suggested antibacterial, antidepressant, and anticonvulsant properties among the other medicinal properties of the Bain-bain or Makahiya.

### 3.2.15 Gayubana (*Annona muricata* L.)

Gayubana or the Guyabano (*Annona Muricata* L.) is a medicinal plant used by the Y' Apayaos for treating fever and arthritis. This is confirmed by 30.8% of the respondents during the survey. A concoction from the Gayubana leaves is prepared and drunk by patients suffering from arthritis to reduce inflammation or swollen joints. Furthermore, to reduce fever, a decoction of leaves can be taken internally or the leaves added to bathing water also has the same effect.

*A. muricata* L. is a broadleaf flowering evergreen tree which is considered as the most tropical and largest-fruited of the 60 or more species of genus *Annona* of the family Annonaceae. The fruit, which is usually eaten raw when ripe, has thin skin, and pulpy soft white fibrous flesh with an agreeable, but rather sour flavor. (Briz, 2014).

### 3.2.16 Anangka (*Artocarpus heterophyllus*)

Anangka or Langka or jackfruit (*Artocarpus heterophyllus*) is a tree cultivated throughout the Philippines for its fruit which is eaten fresh or made into preserves and other sweets. It is also a famous tree that bears the largest fruit which sometimes reaches up to 50 kg.

Among the respondents, 28.2% have identified Anangka or Langka or jackfruit (*A. heterophyllus*) as a medicinal plant used as a cure for skin diseases. The Y'Apayaos burn the leaves of Anangka and apply the ash from the burnt leaves to skin diseases such as ulcers and wounds. They usually mix the ash with coconut oil to make a paste. The ash serves as cicatrizant to promote healing through the formation of scar tissue. This is similar to the folkloric uses of jackfruit as indicated by Stuart (2016) that the fresh leaves of jackfruit are burnt to ashes and used to treat skin diseases, ulcers, wounds, and abscess.

### 3.2.17 Erba (*Artemisia vulgaris* L.)

Another widely cultivated herb around the houses, gardens and in the backyards of the Y'Apayaos is the Erba, also known as Damong Maria or Maiden Wort (*Artemisia vulgaris* L.). Stuart (2016) describes this plant as an erect perennial herb which is hairy, aromatic, often semi-woody, with leafy and branched stems, growing to a height of 1 meter bearing numerous flower

heads are spike-like, ascending, branched inflorescences and oftentimes having minute fruits.

Among the respondents, 28.2% mentioned Erba as a medicinal plant which they commonly used for treating dysmenorrhea among females. The leaves and roots of the herb are boiled for a decoction to induce menstruation and to reduce abdominal cramps experienced by female patients who suffer from dysmenorrhea.

### 3.2.18 Andadasi (*Cassia alata*)

The Y'Apayaos also identified Andadasi as a medicinal plant. This is otherwise known as the Akapulko or Ringworm Bush (*Cassia alata*). Andadasi is a shrubby legume with dark green compound leaves having 16-28 leaflets, producing an axis of golden yellow flowers that has 4-winged pods containing 50-60 flattened, triangular seeds (Philippine Herbal Medicine, 2016).

This medicinal plant has a long history of medical usage particularly in curing skin problems and diseases that include tinea infection, ringworms, eczema, scabies insect bites and all sorts of skin itchiness (Philippine Herbal Medicine, 2016). As such, 25.6% of the Y'Apayao respondents reported that they produce paste by pounding Andadasi leaves to be used as a poultice applied to various skin diseases like those that were formerly mentioned. Stuart (2016) contends that the antifungal and antibacterial properties of the Akapulko leaves lead to its healing effects on skin diseases.

### 3.2.19 Dugmon (*Citrus maxima*)

Commonly known as Suha or the pomelo (*Citrus maxima*), the Dugmon has been used by the Y'Apayaos as an herbal remedy for flu, fever, and arthritis.

According to Stuart (2016), the Dugmon or Suha is a small tree, 6 to 13 meters in height, with long, sharp, solitary spine and leaflets that are entire or nearly so, sparingly hairy beneath and on the margins, ovate-oblong to elliptic, and 8 to 12 centimeters long. Its petioles are obovate and broadly winged. The flowers of this medicinal plant are white, fragrant, and crowded in short, axillary racemes. Its fruit is large, obovoid to spherical, up to 20 centimeters in diameter; rind is very thick and spongy, easily removed from the segments of the fruit; and, pulp is pale yellow, pink or red, sweet or acrid, with large, distinct vesicles. The Y'Apayaos usually grow this fruit-bearing tree in their

backyards, hence the parts of this medicinal plant are very accessible for them to use when needed.

The Y'Apayaos explained that they prepare decoctions out of the Dugmon leaves, sometimes mixed with Galimba or coconut roots to treat patients suffering from flu, fever, and arthritis. In fact, several studies have shown that pomelo, a citrus fruit, has antimicrobial, antioxidant, free radical scavenging, anti-inflammatory, and antibacterial properties.

### 3.2.20 Kaimito (*Chrysophyllum caimito*)

The Kaimito, or star apple (*Chrysophyllum caimito*) is a tree with a spreading crown, growing to a height of 15 meters and with many branches. This is cultivated by the Y' Apayaos and in many parts of the country for its edible and round, baseball-sized fruit that when cut, it has a core that takes on a star shape.

Aside from the fruit, the Y'Apayaos also utilize the Kaimito leaves and bark for making decoctions to treat a cough and body pains.

### 3.2.21 Makabuhay (*Tinospora rumphii* Boerl.)

The Makabuhay plant is a clinging vine, and the name itself suggests the primary purpose of such a plant. Makabuhay is a Filipino translation of the English term 'pro-life or to give life'. The Makabuhay leaves are thin sheets that are heart-shaped, and its flowers look distinct as they only have three petals. The Makabuhay plant is known for its bitter nature, and the fruits of this plant are held in clusters, which can be as long as two centimeters.

This plant may be propagated by planting its stem, which contains a bitter sap. However, it is important to note that Makabuhay can be found in most forests all over the Philippines including those in Sta. Praxedes, hence this is one of the medicinal plants used by the Y'Apayaos in the place as mentioned by 25.6% of the respondents. The Y'Apayaos particularly use the stem of the Makabuhay to treat a toothache and diabetes. This is done by extracting sap from the stem and applying it directly to the aching tooth or can be gargled. On the other hand, the extracted sap from Makabuhay stem is drunk with water in order to lower blood sugar levels among diabetic patients.

### 3.2.22 Oregano (*Origanum vulgare*)

Oregano has established itself in folkloric medicine as a relaxant, antibacterial and can boost the immune system (Philippine Herbal Medicine, 2016). It is a perennial herb that is grown mostly in the backyards of the Y'Apayaos. From among the respondents, 25.6% mentioned this herb as a cure for a cough and cold. Many literature support this medicinal use of the oregano for respiratory ailments. The Y'Apayaos explained that they simply extract the juice from the leaves and given as syrup for patients suffering from a cough or cold.

### 3.2.23 Banaba (*Lagerstroemia speciosa*)

The Y'Apayaos have also included in the roster of their medicinal plants the tree called Banaba or Queen's Flower (*Lagerstroemia speciosa*). Stuart (2016) Stuart (2016) describes this plant as a deciduous tree that can grow as tall as 20 meters with grey to cream colored bark that easily peels off and has oblong to elliptical-shaped leaves. It is usually cultivated for its beautiful lilac or sometimes pink flowers and it is also useful as a timber tree.

The Y'Apayaos use the stem and leaves of the Banaba for making decoctions which they drink to cure UTI. It was mentioned by Stuart (2016) that the Banaba leaves decoction or infusion used for bladder and kidney inflammation, dysuria, and other urinary dysfunctions.

### 3.2.24 Pandan (*Pandanus odoratissimus* L.)

Pandan, also known as fragrant screwpine, is also used by the Y'Apayaos for medicinal baths to treat patients who suffered from relapse. The pandan leaves are boiled for medicinal baths. According to Stuart (2016), the essential oil from Pandan is considered a stimulant, antispasmodic and antiseptic.

### 3.2.25 Arimuran (*Calamus ornatus* Blume)

The Arimuran or commonly known as rattan (*Calamus ornatus* Blume), is a massive clustering dioecious that climbs up to 50 meters high and is widespread in primary or secondary forests like those found in the mountains near the Y'Apayao dwelling areas in Sta. Praxedes. The Y'Apayaos believe that the Arimuran has anti-venom properties as they have been using the stem extracts to treat snake bites.



### 3.2.26 Baraniw (*Cymbopogon schoenanthus*)

Lemon grass (*Cymbopogon citratus*), a native herb locally called by both Ilocanos and Y'Apayaos as Baranis and Tanglad in Tagalog, is popular for its citrus flavor with a trace of ginger. This can be usually found in the backyards as the people also use it for food flavoring.

Baraniw is not only used as a flavoring but it has been also widely used for its medical benefits. In fact, 20.5% of the Y'Apayao respondents indicated that the Baraniw has been used mainly for treating arthritis. This is achieved by drinking decoctions out of the lemongrass leaves and roots boiled in water.

### 3.2.27 Dukayang (*Chloris barbata*)

Y'Apayaos are also known for using a grass called Dukayang as a medicinal plant. This is also known as Korokorosan or Swollen Finger Grass (*Chloris barbata*) and is an annual, tufted, erect grass, growing 0.5 to 1 meter high characterized by thin, linear-lanceolate, rounded, flat and 8 to 15 centimeters long leaves, with a flowering stalk at the tip of its stem. The Y'Apayaos use the extract from Dukayang leaves and roots to prevent hair loss.

### 3.2.28 Salaysay (*Terminalia catappa* L.)

The *Terminalia catappa* L. is known to the Y'Apayaos as Salaysay. It is also known commonly as Talisay or the Indian almond. Stuart (2016) describes this plant as a large, deciduous tree, reaching a height of 20 to 25 meters, smooth or nearly so. Branches are horizontally whorled. Leaves are shiny, obovate, 10 to 25 centimeters long, tapering below to a narrow and heart-shaped base with an expanded rounded apex. Leaf stalks are short and stout. Its flowers are white, small, and borne on spikes in the axils of the leaves, 6 to 18 centimeters long. Its fruit is smooth and ellipsoid, 3 to 6 centimeters long, and prominently bi-ridged or keeled down to the sides. The pericarp is fibrous and fleshy, the endocarp hard.

For the Y'Apayaos, the Salaysay leaves are boiled to make decoction consumed by females who suffer dysmenorrhea.

### 3.2.29 Atis (*Anona squamosa* L.)

The Atis (*Anona squamosa* L.), commonly known as sugar apple, is a tree that grows between 10 to 20 feet high when fully matured with oblong leaves and

green heart-shaped fruits with polygonal tubercles. The Atis fruit has a white, sweet flesh and black seeds (Philippine Herbal Medicine, 2016).

In the survey, only 17.9% of the Y'Apayao respondents have mentioned that Atis is used as a medicinal plant. Particularly, the respondents specified that the leaves of Atis can cure skin itchiness by simply coiling the leaves for a medicinal bath.

### 3.2.30 Kawayan (*Bambusa vulgaris*)

Kawayan or the bamboo (*Bambusa vulgaris*), particularly the bamboo shoots, are found to be used to cure headaches according to the Y'Apayaos. It has been reported that the bamboo shoots are heated then placed on the forehead of the patient to ease him or her from a headache. Though the Kawayan is available in the forests, this remains to be very accessible for the Y'Apayaos as the locations are near their dwelling places and that they also gather bamboo shoots not only for medical purposes but to be cooked as food also.

### 3.2.31 Mahogany (*Swietenia macrophylla*)

Mahogany is a deciduous, erect tree growing to a height of 10 meters, with a heavy, dark-green, and dense crown that is very common in the forest and forest areas and even in the backyards of the Y'Apayaos. This tree is also utilized by the Y'Apayaos as an herbal remedy for UTI. The leaves and bark of mahogany are mixed with the leaves and stem of Kalasutsi, boiled in water to produce decoction for treating urinary tract infection. This is according to the 17.9% of the respondents who identified the mahogany tree as a medicinal plant.

### 3.2.32 Ag-agamoy (*Lantana camara*)

*Lantana camara*, also known as Coronitas or Kantutay is a species of flowering plant in the verbena family, Verbenaceae that is native to the American tropics. This is locally known to the Y'Apayaos as Ag-agamoy. In the survey, 16.4% have known it to be a medicinal plant used for treating stomachache and flu. The leaves are extracted for the juice to be taken orally by patients. The use of this medicinal plant for curing flu is relevant to the findings of Balangcod *et al.* (2011) wherein the Ifugaos in Tinoc, Ifugao, Mountain Province use the *L. camara* as an effective cure for a cough, an illness that goes along with flu.

### 3.2.33 Galimba (*Cocos nucifera* L.)

The Galimba for the Y'Apayaos simply pertain to the tree of life – the coconut (*Cocos nucifera* L.). The coconut has been known to have many uses from roots to its midribs. Aside from the many health benefits that one can get from its fruit, the coconut has served a unique medical use for the Y'Apayaos. It has been found out that the coconut roots are used by the Y'Apayaos as an herbal remedy for urinary tract infection. When asked how the respondents use the coconut as medicine, they explained that the roots are boiled for concoction together with the leaves of Parya or Ampalaya (bitter gourd) and drunk to help cure UTI. This concoction is believed to have helped them for its antibacterial properties instead of simply consuming the coconut water alone which is also claimed by many studies to be used as a diuretic and can help in the expelling kidney stones among other uses.

### 3.2.34 Kalasutsi (*Plumeria acuminata* Ait.)

The Kalasutsi or temple flower (*Plumeria acuminata* Ait) is usually grown by many households as an ornamental plant because of its flowers. But, for the Y'Apayaos, this plant is more than ornamental in purpose as they also use it for curing skin diseases. The leaves and the stem are pounded to make a paste which is applied as a poultice to skin diseases.

### 3.2.35 Kamias (*Averrhoa bilimbi* L.)

For the Y'Apayaos, leaves of the Pias or commonly known as Kamias (*Averrhoa bilimbi* L.). According to Stuart (2016), Kamias or Pias is a small tree that grows to about 12 meters in height. The leaves of Kamias are pinnate and around 20 to 60 centimeters long, with hairy rachis and leaflets. Its leaflets are opposite, 10 to 17 pairs, oblong, 5 to 10 centimeters in length. Kamias' panicles growing from the trunk and larger branches are hairy, 15 centimeters long or less. Its flowers are about 1.5 centimeters long and slightly fragrant. Kamias' fruit is green and edible, about 4 centimeters long, subcylindric, or with 5 obscure, broad, rounded, longitudinal lobes.

In the survey, it was revealed that they use this plant to relieve patients from body pains. To prepare it, the leaves of Kamias or Pias are boiled and the concoction is consumed by drinking. Stuart (2016) specified that many studies have shown that the leaves of Kamias or Pias have anti-inflammatory properties.

### 3.2.36 Madre de Cacao (*Gliricidia sepium*)

Among the respondents, only 12.8 percent said that the Madre de Cacao (*Gliricidia sepium*) is used as herbal medicine. The Y'Apayaos mentioned that the leaves of this plant, which grow abundantly in their backyards and along the roads, are crushed fresh and applied to wounds and other skin diseases.

According to Stuart (2016), studies on the medicinal properties of Madre de Cacao have suggested that the plant parts have antimicrobial, anti-scabies, nematicidal, insecticidal, antiviral, acaricidal properties.

### 3.2.37 Pinya (*Ananas comosus*)

This very common tropical fruit cultivated in the backyards of the Y'Apayaos of Sta. Praxedes is also known for 12.8% respondents as a cure for malaria. However, they particularly mentioned that they are referring to the native variety of pineapple which has reddish colored leaves and fruit. The leaves from this plant are boiled and the decoction is given to patients suffering from malaria.

### 3.2.38 Saba (*Musa balbisiana*)

The all-year-round fruit, banana, or also locally known as Saba has also been identified for its medicinal properties by 12.8% of the Y'Apayao respondents. Among all the herbal medicines mentioned, this one is believed to help cure stomach ulcers and diarrhea by simply including it in the patient's diet.

## 3.3 Plant Sources

With regard to the sources of the medicinal plants used by the Y'Apayaos in Sta. Praxedes as shown in Figure 2, it was found out that 33 or 86.8% of the medicinal plants are available in their backyards. On the other hand, 14 or 36.8% can be found in the forest, 6 or 15.8% thrive along the highway/road, and only 3 or 7.9% of the medicinal plants identified grow and can be accessed from the mountain. These results imply that most of the medicinal plants that they use are very accessible to them as they just grow around their dwelling places. Furthermore, the presence of these medicinal plants in places within their reach suggests that they have readily available cure for their ailments anytime they need it.

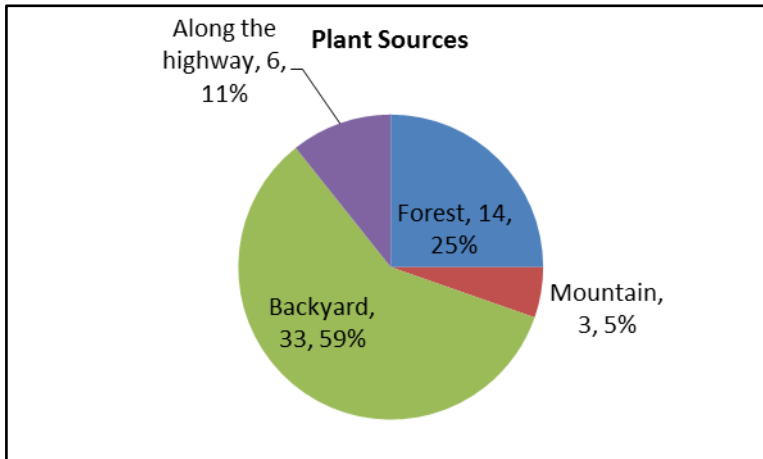


Figure 2. Sources of medicinal plants used by the Y' Apayaos

### 3.4 Plant Habit

Figure 3 shows that most of the medicinal plants used by the Y' Apayaos in Sta. Praxedes are classified as trees (17 or 49%). It was only the ginger or *Laya* that was identified to grow with underground stem (one or 3%). On the other hand, the rest of the medicinal plants grow as creepers, shrubs, and herbs.

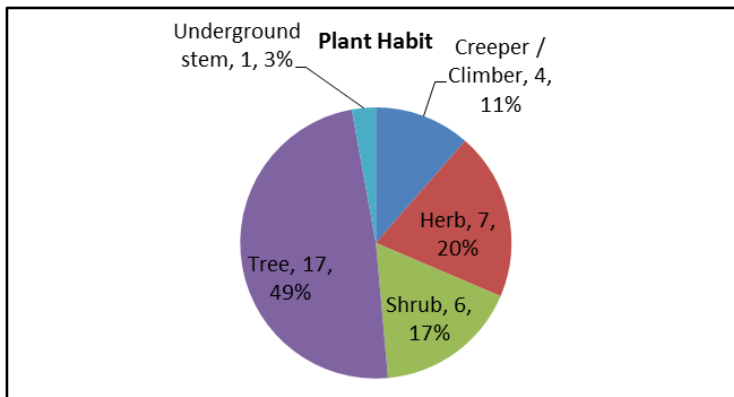


Figure 3. Plant habit of the medicinal plant used by the Y' Apayaos of Sta. Praxedes

### 3.5 Parts Used

Figure 4 shows that the leaves of the medicinal plants are the most utilized parts for medicinal purposes with 30 identified uses in curing illnesses. This is followed by the seven or 14% usage of the roots and 8% percent usage of

the stem. Among the other plant parts, the blossom, the fruit, and the shoot are the least used parts of the medicinal plants as identified by the Y'Apayaos.

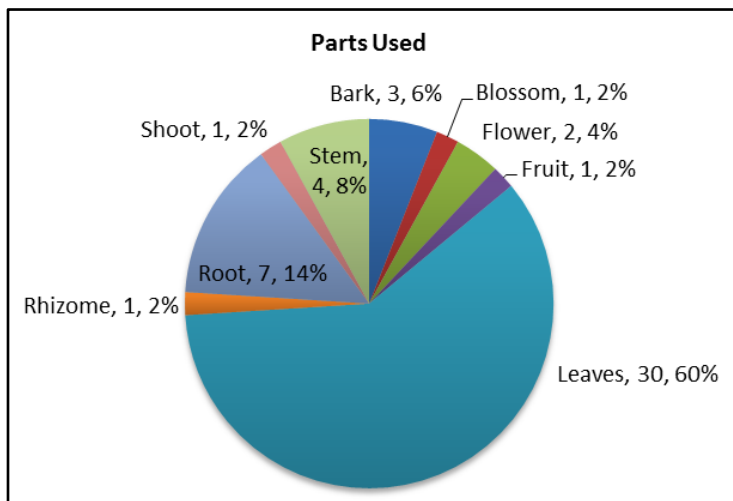


Figure 4. Parts of the medicinal plants used by the Y'Apayaos of Sta. Praxedes

### 3.6 Uses of Medicinal Plants among the Y'Apayaos and their Modes of Preparation

Most of the medicinal plants are prepared by decocting, boiling the parts in water then consumed by drinking the decoction (19 or 45%). On the other hand, heating the plant part which is used to be put on the forehead is the least frequent way (two or 5%) of preparing and using the medicinal plants mentioned by the Y'Apayaos in Sta. Praxedes.

Table 1 presents the frequency and percentage distribution of the uses of different medicinal plants which the Y'Apayaos in Sta. Praxedes have identified. It was found out through the survey that nine or 23.7% of the medicinal plants are used for treating flu, cough, and colds. These are, so far, among the most common illnesses that the Y'Apayaos commonly catch due to changes of seasons. This is followed by the frequency of 5 or 13.2% for using medicinal plants for treating various skin diseases. A frequency of 4 or 10.5% was also recorded for using medicinal plants for treating UTI, body pains and fever respectively. On the other hand, 7.9% of the medicinal plants are used for treating arthritis, body pain, diarrhea, and headache. Moreover,

two or 5.3% of the medicinal plants are used for treating dysmenorrhea and the same frequency and percentage for treating diabetes.

Table 1. Distribution of the uses of medicinal plants by the Y'Apayaos in Sta. Praxedes

Folkloric Use	No of Species Used as Herbal Medicine	Percentage
Arthritis	3	7.9
Body pain	3	7.9
Diabetes	2	5.3
Diarrhea	3	7.9
Dysmenorrhea	2	5.3
Fever	4	10.5
Flu, cough, and colds	9	23.7
Hair loss	1	2.6
Headache	3	7.9
Itchiness	1	2.6
Malaria	1	2.6
Relapse	1	2.6
Skin disease	5	13.2
Snakebite	1	2.6
Sore Throat	1	2.6
Stomach ache	4	10.5
Toothache	1	2.6
Ulcer	1	2.6
Urinary Tract Infection	4	10.5
Wounds	1	2.6

On the other hand, all other uses as indicated in Table 1 have been recorded with a frequency of one or 2.6 percent, which means that certain medicinal plants have limited uses for the Y'Apayaos in Sta. Praxedes.

#### **4. Conclusions and Recommendation**

Based on the findings, data shows that there are now only a few remaining pure Y'Apayaos in Sta. Praxedes who are now in their old age. Although they were not formally educated in schools, these Y'Apayaos have learned the use of medicinal plants, particularly from their parents and older family members.

The 38 medicinal plants used by the Y'Apayaos in Sta. Praxedes, Province of Cagayan, Northern Philippines are used to cure 20 common illnesses, most of which are utilized for treating flu, cough, and common colds. Furthermore, a decoction from plant leaves remains as the most common medicinal plant preparation among the Y'Apayaos.

Some of the medicinal plants that were identified were known only to a very few numbers of the remaining Y'Apayaos in the said area.

The researchers recommend that the Municipal Health Office or the Department of Health should prepare a program to further educate the younger Y'Apayaos with these different medicinal plants and their uses. Also, conservation initiatives must be started for the conservation and promotion of the different medicinal plants cultivated and used by the Y'Apayaos in Sta. Praxedes.

In addition, it is also recommended that in order to find out the medicinal properties of the herbal medicines used by the Y'Apayaos in Sta. Praxedes, another study must be conducted involving laboratory analysis of the properties present in the medicinal plants used by the Y'Apayaos.

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