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## Awareness, utilization and diversity of medicinal plants at Palanan, Isabela, Philippines

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### Abstract

A survey on the awareness, utilization and diversity of medicinal plants was conducted at Palanan, Isabela through floating of questionnaires to 10 households respondents per Barangay or 90 households respondent in the municipality. Results showed that all of the respondents are aware of the medicinal plants which they have learned from their ancestors. A total of 52 plant species were documented and used at the study area. The respondents uses herbals not only for curing some diseases or substitute for synthetic drugs but also, for first aid, tonic drinks, as well as for crop protection from pests. Leaves are more preferred by the respondents for ailment remedies and being prepared by boiling or decoction. Herbals are acquired frequently by them in their backyards. Majority of the respondents using the medicinal plants claimed that it is effective in the purposes they may serve.

**Keywords:** Medicinal plants, diversity and abundance, utilization, palanan, Philippines

### 1. Introduction

Philippines is bounded by many medicinal plants which are rarely used as herbal medicines, with the expensive cost of pharmaceutical drugs today there is a need to explore the potentials of medicinal plants for ailments remedies. The effectiveness of modern herbal practice suggests that we begin our search by understanding the complete meaning of herbalism. Herbs are grown and collected from all over the world and effective medicinal herbs can be found everywhere that plants grow. The important and advantages claimed for therapeutic uses of medicinal plants in various ailments are their safely besides being economical, effective and their easy availability [1]. Therefore, there is indeed a necessity in making life better by introducing natural herbal dietary supplements in the country. Within the past decade, herbal medicine has gained increasing importance, with both medical and economic implications. In developing countries particularly, as much as 80 percent of the indigenous population still depends on traditional systems of medicine and medicinal plants for healthcare (Bennerman *et al.*, 1983) [2].

Medicinal plants and corresponding preparations have been used for a wide range of purposes and for many centuries people have been trying to treat diseases as well as alleviate symptoms by using different plant extracts and formulations (Cowan, 1999) [3]. Moreover, The use of medicinal plants or herbs has been gaining popularity this past few years in the Philippines as more clinical proof emerge that validates many of old age alternative medicines used by Filipino folks has/been in from generation to generation. It is hoped that in the future that the medicinal plants may play an increasingly important role in sustainable development and biodiversity concervation (Rajasekaran and Warren, 1994) [16]. Conservation of biological resources and their justifiable use is important in the preservation of traditional knowledge (Payyappallimana and Fadeeva, 2013) [14]. Furthermore, instance research has been carried out and documented the uses the various medicinal plants from the different parts of the Philippines such as Samar Island Natural Park (Pinarok *et al.*, 2015) [15], Northern Surigao del Sur (Gruyal *et al.*, 2014) [8], and Iligan City, Mindanao (Olowa *et al.*, 2012) [13] and Dumingag, Zamboanga del Sur (Morilla *et al.*, 2014) [11]. This papers was study is to determine the awareness, utilization and diversity of medicinal and pesticidal plants in Palanan, Isabela.

### 2. Materials and Methods

#### 2.1 Study Area

Palanan is a first class municipality in the province of Isabela, Philippines lying between 17° 3' 32" North latitude and 122° 25' 47" East longitude, Palanan Isabela has a total area of 1,220.01

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Sq. Kms. The town is one of the remote and isolated communities at Isabela separated from the rest of the province by the Sierra Madre Mountains. No roads connect the municipality to the rest of Isabela. It can only be reached by a plane or boat ride, or a multi-day hike from San Mariano town.

**2.3 Data Collection**

The field study was carried out in nine (9) selected barangays at Palanan, Isabela as a sampling site namely: Alomanay, Bisag, Dialawyo, Dimalicu-licu, Dimatican, Dimasari, Marikit, Sta. Jacinta and Villa Robles from November 2012 to January 2013. The respondents were randomly chosen from among the folks of the barangay and a total of ten (10) respondents per Barangay or 90 households respondent in the municipality were interviewed. A prior informed permission was done through thier Barangay chairman and some local administrator before the study was conducted. Information and on demographic profile such as civil status, gender, souces of livelihood, barangay were they belong etc. and thier knowledge on ethanobotanical plants and its uses were also gathered through a series of interviews with the help of floating of questionnaires. Interviewed were conducted through informal conversation in order to let them speak spontaneously to minimized feeling pressure (Olowa *et al.*,

2012) [13]. Ethnobotanical information and feild description about the all collected medicinal plants were in listed and photograph of every specimen were taken during the field survey. Botanical identification of the species was carried out with the help of the literature (De Guzman-Ladion, 1985) [4].

**2.4 Statistical analysis**

Answers in each question were tabulated and calculated using frequency distribution method. Graphical presentations of data were made based on the percentage of response in each questions. Descriptive analysis was used for the interpretation of all the data gathered in the study.

**3. Results and Discussion**

**3.1 General information about the respondents**

The general information about the respondents in the nine selected barangays at Palanan, Isabela (Table 1). Results showed that all the respondents are married and most of the respondents are farmers and housekeeper. Among of 90 interviewees, major informants are male. Male villagers are more knowledgeable than female in term of medicinal knowledge (Dey *et al.*, 2014) [6]. In developing countries, society is, in general, male dominated in terms of participation in household decision making (Ikhtiar Alam, 1998) [9].

**Table 1:** General information about the respondents

Name of Barangay where the respondents came from	Sex		Civil Status		Occupation	
	Male	Female	Single	Married	Housekeeper	Farmer
Alomanay	20	80	0	100	80	20
Bisag	30	70	0	100	70	30
Dialawyo	100	0	0	100	10	90
Dimaliculicu	20	80	0	100	80	20
Dimasari	100	0	0	100	10	90
Dimatican	40	60	0	100	60	40
Marikit	30	70	0	100	70	30
Sta. Jacinta	100	0	0	100	0	100
Villa Robles	20	80	0	100	80	20

**3.2 Awareness on herbal medicine**

Among the nine selected barangays surveyed, all the respondents are aware and knowledgeable in medicinal plants (Table 2). Based from the verbal inquiries to the respondents, they are willing to attend seminars on the proper way of using medicinal plants if there is one to attend to.

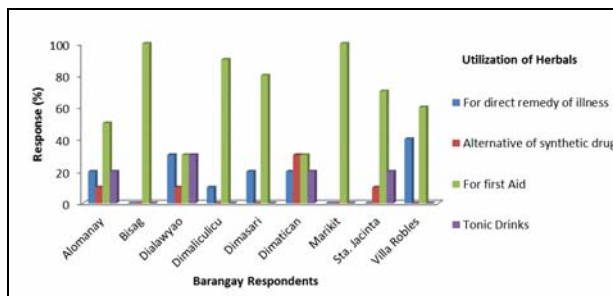
**Table 2:** Total number of respondents who knows about plants with medicinal or pesticidal properties in nine selected barangay of Palanan.

List of Barangays where the respondents came from	Response (%)	
	YES	NO
1. Alomanay	100	0
2. Bisag	100	0
3. Dialawyo	100	0
4. Dimaliculicu	100	0
5. Dimasari	100	0
6. Dimatican	100	0
7. Marikit	100	0
8. Sta. Jacinta	100	0
9. Villa Robles	100	0

**3.3 Utilization of Herbs**

Respondents in nine barangays of Palanan utilize the herbs in different ways (Fig 1.1). All respondents from Bisag and Marikit while majority from Dimaliculicu (90%), Dimasari (80%), Sta. Jacinta (70%) and Villa Robles (60%) uses plants primarily for first aid. On the other hand, respondents from

Villa Robles (40%), Dialawyo (30%) Dimasari, Dimatican, Alomanay (20%) and Dimaliculicu (10%) stated that they use herbal for direct remedy of illness. Respondents from Dialawyo (30%), Alomanay, Dimatican Sta. Jacinta (all 10%) revealed that they use herbals as tonic drinks. The respondents who said that they used herbal as alternative to synthetic drugs are from Dimatican (20%), Alomanay, Dialawyo, and Sta. Jacinta (10%).



**Fig 1.1:** Utilization of herbals in nine selected barangays of Palanan

**3.4 Plant species commonly used as source of medicine**

In the present study, a total of 52 plant species were documented as commonly used and their purposes (Table 3). Each plant species may have one or more uses report of researches, herbalist and scientist similar with the information given by the respondents are the uses of medicinal herbs, to

mention a few, for instance in the Philippines Oregano (*Colous ambornicus*) is mostly known for its medicinal value particularly in relieving children's cough as claimed by early generations through indigenous knowledge. In fact oregano by product is now available in drug store in syrup formulation with brand name *Herbycin* syrup. It is the safe and effective expectorant for the relief of coughs of various causes. Recently, modern herbalist have discovered oregano as a treatment for fungal infections, warts, psoriasis, and even the

common cold. It is also a natural anti-inflammatory, which help promote healing of skin wounds and muscle strains (Mindell, 1999) [10]. The information given by the respondents would help individuals with ailment especially those that are far from town proper where hospital is located. However precautionary measures should be done especially in the dosages, at this point in time, researchers in the chemical components of the herbs are still on their way.

**Table 3:** Medicinal plants commonly used in nine selected Barangay and their purposes of use.

Scientific Name	Local Name	Parts Used	Purpose/s of Use
<i>Blumea balsamifera</i>	Sambong	Leaves	Stomach ache, Kidney Trouble, Cold "Pasma" Headache
<i>Zingiber officinale</i> Roscoe	Laya	Rhizomes	Stomach-ache, Rheumatism
<i>Allium sativum</i> L.	Bawang	Stem, Fruits	Lower hypertension
<i>Vitex negundo</i> L.	Lagundi	Leaves	Cold, Fever, Cough
<i>Piper beetle</i> L.	Ikmu	Leaves	Cold, Cough
<i>Mentha cordifolia</i> Ofiz	Herba-Buena	Leaves	Cold, Pain full Menstruation
<i>Euphorbia hirta</i> L.	Tawa tawa	Leaves, Stem	Tiredness
<i>Chrysantheman Indicum</i>	Mansanilya	Leaves	Cough, Wounds, Stomach ache, Menstruation problem
<i>Colous ambornicus</i>	Oregano	Leaves	Asthma cough
<i>Premna odorata</i> Blanco	Alagaw	Leaves, Fruits	Urinary Tract Infection
<i>Imperata cylindrical</i> L. Beauv	Kugon	Roots	Headache
<i>Colocasia esculenta</i>	Gabi	Stem	Athletes foots
<i>Zea mays</i> L.	Mais	Young Hair	Kidney trouble
<i>Kaempferia galangal</i> Linn.	Gisol	Leaves, Fruits	Loss Bowel Movement
<i>Psidium guajava</i> L	Bayabas	Leaves, Fruits	Body odor, Cough/ Cold
<i>Citrus microcarpa</i> Bunge	Kalamansi	Leaves, Fruits	Stomach ache, Cough
<i>Curcuma domestica</i> Valet	Kilaw	Leaves, Fruits	Rheumatism
<i>Momordica charantia</i>	Ampalaya	Leaves Fruits	Stomach ache, Urinary Tract Infection
<i>Capsicum flutescens</i> L.	Sili	Sili	Asthma
<i>Luffa acutangula</i> Linn.	Patola	Seeds	Malaria
<i>Andropogon ciratus</i> DC Stapf	Tanglad	Stems	Fever, Lower hypertension
<i>Kalanchoe pinnata</i> Lam.	Katakataka	Leaves	Ceased boil
<i>Centella asiatica</i> L	Takip Kohol	Leaves	Stomach ache
<i>Jatropha podagrica</i>	Ginseng	Stem, Roots	Cough, Cold, stomach ache
<i>Plumeria obtuse</i> L.	Kalatsutsi	Leaves	Herpes simplex
<i>Nicotiana tabacom</i>	Tabako	Leaves	Wounds, Toothache
<i>Premna cumingiana</i> Schauer	Banaba	Barks	Kidney, Urinary Tract Infection, Diabetes
<i>Citrus microcarpa</i> Bunge	Limon	Leaves, Fruits	Lower hypertension
<i>Musa paradisiaca</i>	Saba	Young leaves	Abate bleeding wound, Induce normal urination
<i>Moringa oleifera</i> Lam.	Mallungay	Fruit/Leaves	High Blood, Antibiotic for wounds
<i>Cococ nucifera</i> L.	Niyog	Husk	Heal wound on novel
<i>Hibiscus rosa-sinensis</i> Linn	Gumamela	Flower	Ceased boil
<i>Mimosa pudica</i> L	Makahiya	Leaves, Barks, Flower	Intestinal cleanser insomnia
<i>Areca catechu</i> L.	Bunga	Fruits	Healing measles
<i>Mahinot esculenta</i> Crantz	Kamoting kahoy	Leaves	Malaria, Stomach ache
<i>Plumeria acuminata</i> Ait.	Kalsutsi	Leaves	Asthma
<i>Mentha arvensis</i>	Helba buena	Leaves	Stomach discomfort
<i>Cassia alata</i> L.	Akapulko	Leaves	Skin disease
<i>Jatropha curcas</i>	Tuba tuba	Leaves	Sprain, Flatulence
<i>Pandanus odorata</i>	Pandan	Leaves	Hypertension, High blood, Coough, Induce urine
<i>Carica papaya</i>	Papaya	Fruit	Cleanser
<i>Swietenia mahogani</i> Jacq.	Mahogani	Seeds	Stomach Ache, Epigastric pain
<i>Leucaena luecocephala</i> Lam	Ipil-ipil	Seeds	Expel intestinal parasites
<i>Psidium guajava</i>	Bayabas	Leaves	Diarrhea, Disinfect the wound
<i>Mangifera indica</i> Lin.	Mangga	Leaves	Diarrhea
<i>Annoma squamosa</i> L.	Atis	Leaves	Diarrhea, Diabetes
<i>Artocarpus heterophyllus</i> Lam.	Langka	Leaves	Diarrhea
<i>Chrysophyllum cainito</i> L.	Kaymito	Bark	Diarrhea
<i>Persia americana</i> Mill	Avokado	Leaves	Cough
<i>Tagetes erecta</i> Linn	Amarillo	Leaves	Over fatigue
<i>Cordia dichotoma</i>	Anonang	Leaves	Fever, Tuberculosis
<i>Basella rubra</i> L.	Alugbati	Leaves	Boils

### 3.5 Source of medicinal plants

Respondent in nine selected barangay in Palanan acquire herbs in different places (Fig 1.2). Most of respondents acquired

herbs in backyard/garden with 90% in Dialawyo, Villa Robles (70%), Bisag (60%) Dimalicilicu (60%), Dimatican (60%), Marikit( 50%), and Alomanay (40%). Respondents in

Alomanay (60%), then Bisag (40%), Dimasari (30%), stated that they obtain medicinal plants in the forest. These might be due to the reasons that residential area of the respondents in nine selected barangay in Palanan is near forest and was not opened for agricultural crops. Respondents from Dimatican (40%), Marikit (40%) and Villa Robles (30%) obtain medicinal plants from the market while respondents from Dimaliculicu (40%), Dimasari (20%) and Dialawyo (10%) obtain medicinal plants from their neighbors and friends.

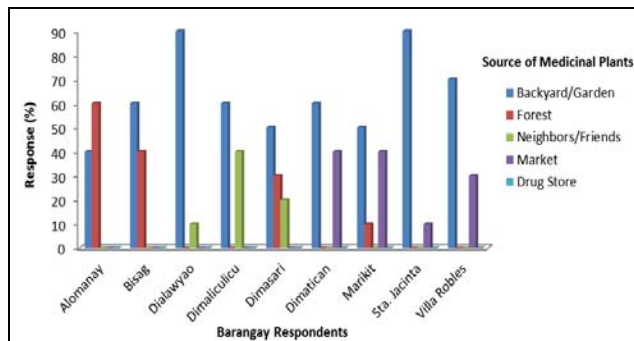


Fig 1.2: Source of medicinal plants used by the respondents.

### 3.6 Methods used by respondents in preparing the herbal as medicine

The most preferred among the method is decoction, boiling, followed by juice extraction and chopping of the leaves in their decreasing order: the method on how the respondents prepare medicinal plants in nine selected barangays may be accounted on the case of doing the preparation likewise the part of the plants being used like the leaves majority of the respondents used the leaf part of the plants (Fig 1.3). However, in the studies of Del Fierro and Nolasco (2013) [5] among traditional healers in Southwest Cebu, Philippines and by Olowa *et al.*, (2012) [13] on the Higaonon Tribe of Iligan City, Philippines wherein leaves were commonly prepared by boiling water (decoction) and administered orally. 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 (Gruyal *et al.*, 2014) [8].

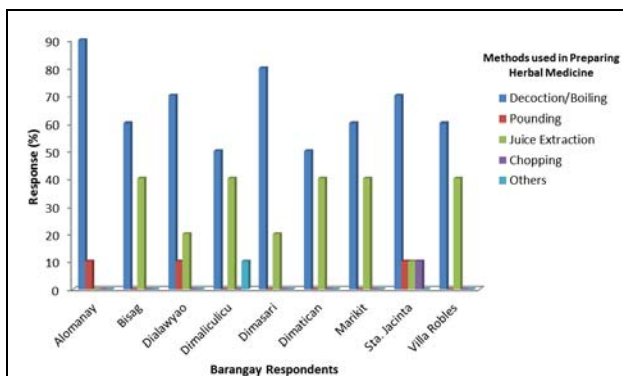


Fig 1.3: Methods used by respondents in preparing the herbal as medicine.

### 3.7 Plant parts used for ailment remedies and crop protection

The plant parts that they are utilized as for ailment remedies and crop protection (Fig 1.4). The most commonly used part are the leaves in nine selected Barangay because the leaves of plants is the most abundant, easier to utilize, and believed that

it is where the chemical makeup of plants (Table 3). The use of the leaves provide conservation for the plants compare to those remedies that requires roots or whole plants in which the plant should be uprooted. Similar studies conducted reported that most of the common remedies were taken from the leaves which also include modified leaves and young shoot of the plants (Morilla *et al.*, 2014; Olowa *et al.*, 2012) [11, 13]. The leaves are the site of manufacture and storage of many chemical compounds through photosynthesis including alkaloids, tannins, coumarines, flavonoids, essential oils and inulins which are active component of best herbal preparation in high concentration (Okoewale and Omefezi, 2001) [12]. In addition, the leaves are the main photosynthetic organs containing photosynthates which might be responsible for medicinal values (Balick and Cox, 1996; Ghorbani, 2005) [1, 7]. The Stems, barks, seeds, flowers, and roots are likewise utilized, but the preparation may vary in the different barangays, preparation sometimes depends on the plant part to be utilized and what plant part has the medicinal properties like for example in the case of the manakat where the bark of the plant has medicinal use, the same as with the seeds of the patola that has the medicinal effect for Malaria.

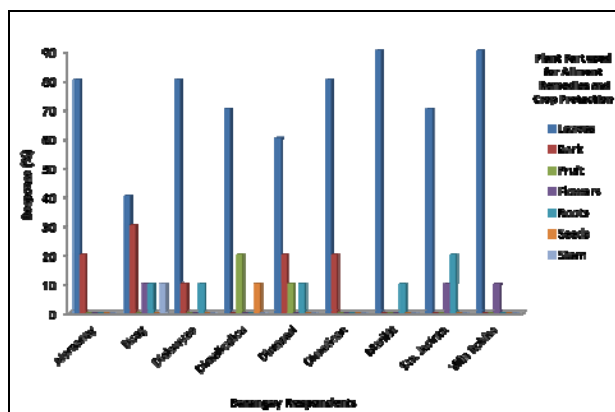


Fig 1.4: Plant part being used for ailment remedies and crop protection

### 3.8 Diversity and abundance of medicinal plants abounding in the forest

Most of the plants species with medicinal properties are found in the backyard. Among the nine selected Barangays Alomanay was found to be the most diversified for having 6 (17.64%) species followed by Dialawyo, Dimaliculicu, Bisag and Marikit having obtained the same percentage of diversity with 4 (11.76%) and the remaining Barangay were the least diversified 3(8.82%) (Table 3). Because the Barangay is far from the city proper and limited access to modern healthcare service, therefore most of the residents still option to use traditional medicine (Gruyal *et al.*, 2014) [8]. This could have been the reason why the results indicated that the Barangay Alomahan has a diversity of plants species of medicinal value. However, in terms of abundance the situation is reversed because Barangay Sta. Jacinta ranked 1 for having 62 (20.19%) count followed by Dimaliculicu 59 (19.29%) followed by remaining (7) Barangays in descending order up to the least abundant Barangay which is Dimasari with 9 (2.93%) (Table 3). This could be counted to the reason that most of known herbal plants in Barangay Sta. Jacinta served as medicinal and food for the people in the barangay. Plant assessment is important when ethnobotanical studies are done simultaneously since species richness and diversity may influence the use values of certain plants for certain ailment,

category of a disease, or multiple indications for multiple disease states (Ikhtiar Alam, 1998) [15].

**Table 3:** Diversity and abundance of medicinal plants abounding in the forest of nine selected Barangay at Palanan, Isabela.

Barangay	Diversity Of Plant Species		Abundance	
	Frequency	%	Frequency	%
Alomanay	6	17.64	32	10.42
Bisag	4	11.76	26	8.46
Dialaoyaw	4	11.76	19	6.18
Dimaliculicu	4	11.76	59	19.2
Dimasari	3	8.82	9	2.93
Dimatican	4	11.76	47	15.30
Marikit	3	8.82	24	7.81
Sta. Jacinta	3	8.82	62	20.19
Villa Robles	3	8.82	29	9.44
Grand Total	34	99.96	307	99.93

#### 4. Conclusion

Our study reveals that plants are still a major source of medicine for the local communities of most of the portions of our surveyed area and majority of the respondents of the nine selected Barangays are knowledgeable about medicinal plants which they have learned from their ancestors. Among the nine selected Barangays at Palanan, respondents from Alomanay are the most knowledgeable about medicinal plants and their uses. Leaves are more preferred by the respondents for ailment remedies and being prepared by boiling or decoction. For crop protection the respondents prepare the herbs by chopping or pounding then apply through broadcasting. Herbals are acquired frequently by them in their backyards. Dialawyao has the most abundant medicinal species in their backyards and Alomanay as the most diversified in terms of medicinal plants species in the forest.

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