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## Ethnomedicinal Study of Plants in Ilocos Sur

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### ABSTRACT

*The documentation of indigenous knowledge on medicinal plants provides information on wider local use and future pharmaceutical applications. This study documented the ethnomedicinal uses of plants in selected communities in the first district of Ilocos Sur. Through surveys and interviews, 192 respondents aged 16 and above were asked to identify ethnomedicinal plants and their ethnomedicinal practices. A total of 66 ethnomedicinal plants were documented and used to treat 22 human ailments/diseases. The most widely employed mode of preparation is decoction and the most frequently employed mode of administration was the conventional way, followed by ethno-modern; and ethnomagico-religious. The age, education, and source of ethnomedicinal information of respondents significantly correlate with their ethnomedicinal practices. The study demonstrates that the selected communities of District 1, Ilocos Sur have a wide variety of plant species of medicinal significance. As evidenced by the respondents' source of ethnomedicinal information, their indigenous practice on the production and use of herbal medicine is still vast and diversified and is passed down through generations. Some of the plants on the list have already undergone testing for pharmaceutical applications and received recognition for their therapeutic advantages. The other plants on the list still have therapeutic potential that can be investigated. The findings can also be used as a basis for the creation of IEC materials on ethnomedicinal plants.*

**Keywords:** Ethnobotany, herbal plants, indigenous practices

### INTRODUCTION

Ethnomedicinal information is an essential tool in drug discovery. The indigenous traditional knowledge of medicinal plants of various communities, where it has been transmitted orally for centuries, is fast disappearing from the face of the earth due to the advancement of modern technology and the transformation of traditional culture.

Raj et al. (2018) mentioned that traditional knowledge on ethnomedicinal plant is slowly eroding and that the exploration, identification, and documentation of utilization of ethnobotanical resources are essential for restoration and preservation of ethnomedicinal knowledge about the plants and conservation of these species for the greater interest of human society. Similarly, it was mentioned in Agapin (2020), that documented information on the medicinal use of plants is an essential baseline for possible extraction, isolation, characterization, and chemical modification of important chemical compounds.

The field of ethnomedicine plays a very important role in understanding traditional subsistence, medical knowledge, and practice. Ethnomedicine has been defined as the study of traditional medical practice, which is concerned with the cultural

interpretation of health, diseases, and illness and also addresses the healthcare-seeking process and healing practices. It is a complex multi-disciplinary system constituting plants, spirituality, and the natural environment, which has been the source of healing for people for centuries. It is sometimes interlinked with traditional medicine, which applies the methods of ethnobotany and medical anthropology. The traditional medicine practices of the people are often preserved only by oral tradition.

In Agapin (2020), among the modes of preparation used by the traditional healers in Pagadian, Zamboanga del Norte include chewing, decoction, poultice, concoction, infusion, pounding/crushing/pulverizing, steaming, and squeezing for extraction.

In the Philippines, plant-based products such as herbal teas and capsules used as feed supplements or dietary medicines are now locally available. These are formulated using extracts from different plants such as lagundi (*Vitex negundo*) ampalaya (*Momordica* sp), malunggay (*Moringa oleifera*), kalamansi (*Citrus microcarpa*), and papaya (*Carica papaya*). These are all products of ethnomedicine as these plants can be found in the literature on medicinal plants. Medicinal plants serve as important raw materials in the development of new drugs (Corpuz, A. 2021). Additionally, as cited by Corpuz et al. (2021), Bidlack et al. (2000) mentioned that many plants are used in medicine because of their antibacterial properties, which are brought about by chemicals created in the plant's secondary metabolism.

Many local communities in the province of Ilocos Sur possess unique customs, traditions, and beliefs distinct from other people. These communities have their indigenous folkloric knowledge and concepts on herbal healing in relation to their beliefs and traditions. Considering the richness of Ilocos Sur in plant diversity, the researcher believes that the practice of herbal healing has been sustained in many parts of the province, particularly upland municipalities. They have a vast store of information and knowledge of potentially useful medicinal plants. To further investigate the medicinal potential of these plants, this vast store of knowledge needs to be documented.

This study made an inventory of medicinal plants and their ethnomedicinal uses. It also documented the ethnomedicinal practices of the local communities in the first district of Ilocos Sur concerning their distinct ways of herbal healing. Results of this study provide additional information on a wide range of medicinal plants that can further be tested for safety and efficacy for wider local use and future pharmaceutical applications.

## METHODOLOGY

### Research Design

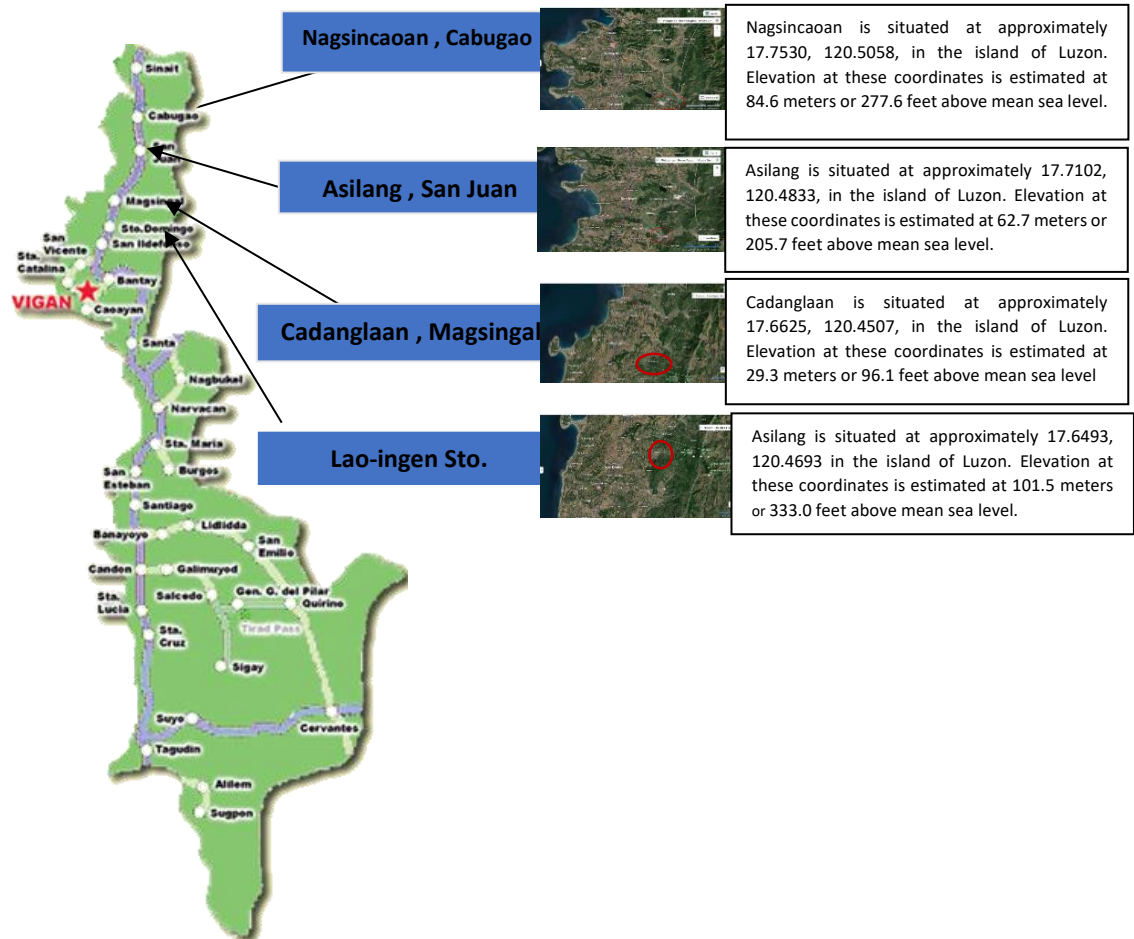
The study utilized the descriptive correlational research design (Navarro and Gorospe, 2014) to determine the correlation between the profile of the respondents and their ethnomedicinal practices.

**Study Area**

The study areas were chosen randomly from 11 municipalities in the first district of Ilocos Sur. Four communities that were selected as research locations are Nagsincaosan, Cabugao; Asilang, San Juan; Cadanglaan, Magsingal; and Lao-ingen, Sto. arts of the said

**Figure 1**

*Map of Ilocos Sur showing the areas of study*



**Population and Sample**

This study included 192 respondents in total from four barangays. At the time of the study, they were at least 16 years old and were using medicinal herbs. Respondents from Laoingen, Sto. Domingo and Cadanglaan, Magsingal account for 53% and 52%, respectively while those from Nagsincaosan, Cabugao and Asilang, San Juan account for 43% and 42%, respectively.

### **Ethical Consideration**

Free and prior informed consents were obtained from all the respondents. The local leaders and community elders were asked to identify the respondents/key participants for the study. The objectives and importance of the study were also explained. The data gathered will be treated with utmost confidentiality. The data will be placed in an envelope and be kept in a locked cabinet. The transcribed data is also stored in the researchers' personal computer which can only be accessed by a password.

### **Data Gathering**

The semi-structured interview consisted of questions on the demographic profile of respondents, their practice on ethnomedicinal use of medicinal plants, including modes of preparation and administration. The local or common name of the ethnomedicinal plants were provided by the respondents. Initial identification of the plants was done by the researcher and respondents with the aid of botanical books and manuals. Verification of the identity of plants was also requested from an expert.

### **Data Analysis**

The data on the respondents' profile, the ethnomedicinal uses of plants, and ethnomedicinal practices of the respondents were tabulated using frequency. A bivariate correlation analysis between the respondents' profile and their ethnomedicinal practices was also done.

## **RESULTS AND DISCUSSION**

### **Profile of the Respondents**

Out of 192 respondents, 51% (98) are male and 49% (94) are female. The highest number of respondents belong to the age group 31-45 and reached elementary level. The majority (85.4%) of those who responded learned about ethnomedicinal information through their ancestors.

### **Ethnomedicinal Uses of Plants**

There were 66 plants identified by the respondents based on their knowledge and practice of using them to treat different ailments including those attributed to supernatural beings or "anito" as well as human interference. The various parts used are leaves, flowers, branches, seeds, fruits, bark, roots, rhizomes, and even the whole plant. This result manifests that the selected communities in the first district of Ilocos Sur have rich knowledge of herbal medicine. This result conforms to Molina, et.al (2015) that Ilocos Sur has plenty of medicinal plants used to treat a wide spectrum of human ailments of the world.

The ethnomedicinal uses of the 66 plants (presented in Table 1) are categorized in terms of diseases/ailments treated. Among the 22 mentioned diseases/ailments, animal bites and wounds; and cough and colds have the highest number of ethnomedicinal plants used (11 and 10, respectively). This result differs from the

findings in Raj et al. (2018), wherein in Northern Bengal, India, stomach-related problems were treated by a maximum number of plants (40 species), followed by cuts and wounds with 27 plant species and at least with one species each for other 17 diseases or ailments.

**Table 1**

*Ethnomedicinal uses of plants in selected communities of district 1, Ilocos sur categorized in diseases/ailments treated.*

<b>Ailments/ Diseases Treated</b>	<b>Botanical/ Scientific Name</b>	<b>Local Name/ Common Name</b>
1. Abdominal Discomfort	<i>Momordica charantia</i>	Ampalaya, Parya
	<i>Persea americana</i>	Avocado
	<i>Psidium guajava</i>	Guava/Bayabas
	<i>Tamarindus indicus</i>	Salamagui/ Sampaloc/ Tamarind
	<i>*Unidentified</i>	Labintanos
2. Animal Bite and Wounds	<i>Allium sativum</i>	Garlic/ Bawang
	<i>Artemisia vulgaris</i>	Erbaka/mayana
	<i>Bancales grandifolius</i>	Bulala
	<i>Capsicum sp.</i>	Sili
	<i>Coleus blumei</i>	Dara-Dara/Mayana
	<i>Cyperus rotundus</i>	Barsanga
	<i>Moringa oleifera</i>	Horseraddish/marunggay
	<i>Psidium guajava</i>	Guava/Bayabas
	<i>Tabernaemontana sp.</i>	Kuribetbet/ pandakaki
	<i>Zanthoxylum sp.</i>	Kasabang
	<i>*Unidentified</i>	Paypayokpok
3. Arthritis	<i>*Unidentified</i>	Rasrasi
	<i>Capsicum sp.</i>	Sili
	<i>Moringa oleifera</i>	Marunggay/Horseradish
4. Boils/Pimple	<i>Ocimum basilicum</i>	Biday
	<i>Allium sp.</i>	Kutsay
5. Colds and Cough	<i>Kalanchoe pinnata</i>	Kataka-taka
	<i>Abrus sp.</i>	Bugbugayong
	<i>Bancales grandifolius</i>	Bulala
	<i>Cassia occidentalis</i>	Andadasi
	<i>Chrysanthemum indicum</i>	Mansanilya
	<i>Citrus grandis</i>	Suha/Sua
	<i>Citrus macrocarpa</i>	Calamansi
	<i>Coleus aromaticus</i>	Oregano
	<i>Eucalyptus sp.</i>	Eucalyptus
	<i>Morinda citrifolia</i>	Apatot/Noni
	<i>Punica granatum</i>	Granada
<i>*unidentified</i>	Barsik	

<b>Ailments/ Diseases Treated</b>	<b>Botanical/ Scientific Name</b>	<b>Local Name/ Common Name</b>
6. Diabetes	<i>Antidesma bunius</i>	Bugnay
7. Flatulence/Hyperacidity	<i>Allium cepa</i>	Onion
	<i>Oryza sativa</i>	Rice
8. Fever and flu	<i>Annona muricata</i>	Guyabano
	<i>Antidesma bunius</i>	Bugnay
	<i>Averrhoa bilimbi</i>	Pias/Kamias
	<i>Bixa Orellana</i>	Atsuete
	<i>Blumea balsamifera</i>	Subusob/Sambong
	<i>Coleus aromaticus</i>	Oregano
	<i>Euphorbia hirta</i>	Tawwa-tawwa
	<i>Imperata cylindrica</i>	Pan-aw/Cogon
	<i>Morinda citrifolia</i>	Apaot/Noni
	<i>Musa spp.</i>	Saba/Banana
9. Headache	<i>Blumea balsamifera</i>	Subusob/Sambong
	<i>Cordia sp.</i>	Anonag-Bakir
10. Hypertension	<i>Allium sativum</i>	Bawang/Garlic
11. Kidney Problems	<i>Andropogon citratus</i>	Baraniw
	<i>Citrus grandis</i>	Sua/Suha
	<i>Cocos nucifera</i>	Niyog.coconut
	<i>Diospyros discolor</i>	Mabolo
	<i>Lagerstroemia sp.</i>	Banaba
12. Low Blood Pressure	<i>Ceiba pentandra</i>	Kapasanglay/Cotton tree
13. Malaise/Body Pain	<i>Ocimum basilicum</i>	Biday
14. Menstrual and Post-pregnancy Disorders	<i>Ananas comosus</i>	Pinya
	<i>Rhoeo spathacea</i>	Penpenyarubia
	<i>Tamarindus indicus</i>	Salamagu/sampalok
15. Mumps	<i>Hibiscus sp.</i>	Kayanga/Gumamela
16. Obesity	<i>Panax ginseng</i>	Ginseng
17. Ringworm	<i>Phyllanthus amarus</i>	Taltalikod
18. Rheumatism	<i>Zingiber officinale</i>	Ginger/Luya
19. Sprain	<i>Euphorbia hirta</i>	Tawwa-tawwa
	<i>Leucaena leucocephala</i>	Ipil-ipil/Samsamping
20. Toothache	<i>Cyperus rotundus</i>	Barsanga
	<i>Phyllanthus amarus</i>	Taltalikod
	<i>Syzigium cumini</i>	Lungboy/Duhat
	<i>Zanthoxylum sp.</i>	Kasabang
21. Urinary Disorders	<i>Cocos nucifera</i>	Niyog/coconut
	<i>Corypha utan</i>	Silag

<b>Ailments/ Diseases Treated</b>	<b>Botanical/ Scientific Name</b>	<b>Local Name/ Common Name</b>
	<i>Lagerstroemia sp</i>	Banaba
	<i>Zea mays</i>	Mais
	*Unidentified	Kupkupyas
22. Illnesses and Discomfort attributed to supernatural beings and human interference	<i>Annona muricata</i>	Guyabano
	<i>Annona reticulata</i>	Anonas
	<i>Annona squamosa</i>	Atis
	<i>Cordia sp.</i>	Anonang-bakir
	*Unidentified	Kiltat

The above data conform with various studies on the use of medicinal plants as treatments for various ailments. Balberona et al. (2018) documented 65 plants as treatments for various conditions and are categorized into different areas: respiratory, circulatory, gastrointestinal, obstetrics-gynecology, genitourinary, dermatology, musculoskeletal, diseases of the eyes, nose, ears, and throat; and other categories such as antidiabetic, antioxidant, anticancer, antiviral antifungal/antibacterial/anti-infections, antiparasitic, fever, immunostimulant/ immunity issues, anti-inflammatory and snake and dog bites. Similarly, in Raj et al. (2018), the documented 140 ethnomedicinal plant species in India treated 58 human diseases/ailments, including nine species used for eight diseases/ailments of domestic animals.

Five (5) of the identified plants namely, ampalaya/parya (*Momordica charantia*), andadasi/Acapulco (*Cassia occidentalis*), bawang/garlic (*Allium sativum*), dangla or lagundi (*Vitex negundo*), and guava/bayabas (*Psidium guajava*) were among the ten (10) medicinal plants that the Department of Health (DOH) through its "Traditional Health Program" has endorsed as a source of natural products.

### **On Ethnomedicinal Practices**

The modes of preparation include decoction, poultice, infusion, extraction, infusion, and oil. Some are also eaten raw or roasted. There was a similar finding in Agapin (2020) that among the modes of preparation used by the traditional healers in Pagadian, Zamboanga del Norte include chewing, decoction, poultice, concoction, infusion, pounding/crushing/pulverizing, steaming, and squeezing for extraction.

Among the different modes of preparation, single plant decoction ranked first, which means that most of the identified plant species of the respondents are prepared as decoctions of single plant species. Poultice and cataplasm for single/sole plant ranked second, followed by those eaten raw (single species), while extraction of sole plant species ranked fourth. Decoctions, poultice, and extraction of two or more species of plants were also among the preparations being practiced by the respondents (Table 2). In Agapin (2020), the most employed method of preparing the plants for medicinal applications is a decoction, which is done by boiling the materials in sufficient amounts of water to extract water-soluble compounds in plants with medicinal values.

**Table 2**

*Ethnomedicinal practices of respondents in terms of mode of preparation and administration*

Ethnomedicinal Practices		Overall Rank
Mode of preparation		
Sole/Single Plant		
	Raw	3
	Extract	4
	Decoction	1
	Infusion	7
	Poultice and Cataplasm	2
	Oil	8
Mixed		
	Decoction	5
	Poultice and Cataplasm	6
Mode of Administration		
	Conventional practice	2
	Magico-religious	3
	Ethno-modern	1

The respondents use the ethno-modern (ranked 1) and conventional modes (ranked 2) more than ethnomagico-religious practice. The respondents are using the medicinal plants mostly naturally or in combination with modern or commercial medicine or drugs. On the other hand, the ethnomagico-religious practice of treatment, that is, administering the herbal medicine with prayers and rituals, is least preferred or practiced by the respondents. However, the respondents said that rituals and prayers are being practiced by the "albularyos" or "mangngagas," known as the traditional healers in the community.

**Table 3**

*Correlation analysis of ethnomedicinal practices and respondents' profile*

Respondent's Profile	Ethnomedicinal Practices			
	Mode of Preparation		Mode of Administration	
	<i>r</i>	<i>P</i>	<i>R</i>	<i>p</i>
Age	.267*	.000 (<.05)	.146*	.043(<.05)
Educational Attainment	-.150*	.037 (<.05)	-.028	.699 (>.05)
Source of Information	.179*	.013 (<.05)	-.088	.224 (>.05)

\* Correlation is significant at the 0.05 level (2-tailed)

The ethnomedicinal practices of the respondents, along with the mode of preparation, had a significant relationship with their age, educational attainment, and source of ethnomedicinal information (Table 3). The respondents' practice in preparing



the herbal medicines can be attributed to their age, educational attainment, and source of ethnomedicinal information. Similar findings were also obtained in Rahayu, et al. (2020), wherein herbal medicine use was significantly associated with residence, age, education level, and occupation and was not correlated to gender or health insurance possession.

Age and source of information had a significant positive correlation with the ethnomedicinal practice of the respondents. This can be supported by the result in Weckmuller et al. (2019) that medicinal plant knowledge and age had a significant positive correlation, which means that elders tend to know more about medicinal plants than their younger counterparts. It was also claimed that it might be logical that with advanced age, people have more time to accumulate knowledge and, therefore, show more excellent medicinal plant knowledge than the younger generation.

On the other hand, education had a significant negative correlation with their ethnomedicinal practice. It also conforms with Weckmuller et al. (2019) findings, which showed that the number of years in school had a significant negative correlation with ethnobotanical knowledge about medicinal plants.

## CONCLUSIONS

This study documented the ethnomedicinal uses of plants in selected communities of the First District of Ilocos Sur. The study revealed a wide variety of plant species of medicinal significance, as evident by the reported 66 plant species used traditionally in treating 22 ailments. The study also showed that the community has various ways of preparing and administering medicinal plants. Furthermore, the respondents' ethnomedicinal practices can also be linked to factors like age, educational level, and the source of their ethnomedicinal knowledge.

## RECOMMENDATIONS

The richness in plant ethnomedicinal knowledge and practices of the communities should be well documented, preserved, and sustained through collaborative efforts of the government, academic institutions, and other concerned agencies. Using the findings of this findings, additional research should be done to further explore the medicinal benefits of these plants for potential pharmaceutical uses. It is also recommended to develop IEC materials on these ethnomedicinal plants.

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