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Ethnobotanical Survey of Medicinal Plants Used by Indigenous Communities in Nabuclod, Floridablanca, Pampanga

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Abstract — This study conducted an ethnobotanical survey for documenting of the medicinal plants that the Ayta Mag-indi community uses within Nabuclod, Floridablanca, Pampanga, and for comprehension of how they transmit this customary knowledge during modernization. Using a qualitative descriptive research design with an ethnobotanical approach, we gathered data from local healers, elders, and knowledgeable community members via plant collection, field observations, and semi-structured interviews. Ayta Mag-indi depend greatly on several medicinal plants like Lagundi, Buyo, Orosip, Anonas, Lunas-bagon, Malatungaw, Halagati, Oliba, and Tanglad to address frequent diseases like respiratory illnesses, skin conditions, digestive issues, hypertension, and irregular menstruation according to the data. Families mainly pass down the knowledge for these plants by word of mouth. They also teach the preparation methods (e.g., boiling leaves for tea, direct application of crushed material) via hands-on practice. However, the study also highlights important concerns that younger generations become less interested since they are exposed to modern education and pharmaceuticals, besides medicinal plants become less available because deforestation, climate change, and overharvesting occur. This valuable ethnobotanical heritage is one that requires the urgent documentation, the cultural preservation, and the biodiversity conservation. Future people will find it is safe because of actions like those.

I. Introduction

Medicinal plants have been used by many communities around the world as a natural way of treating illnesses and maintaining good health. In the Philippines, especially in rural and mountainous areas, many indigenous people still practice traditional medicine using plants found in their environment. These plants are important not only for healing but also as part of their culture and way of life.

In Nabuclod, Floridablanca, Pampanga, the indigenous communities continue to rely on medicinal plants for treating common health problems such as fever, cough, stomachache, wounds, and other minor illnesses. Their knowledge about these plants is usually passed down from

generation to generation through oral tradition. However, due to the influence of modernization, this valuable knowledge may soon be forgotten if not documented properly.

This study aims to conduct an ethnobotanical survey to identify and document the different medicinal plants used by the indigenous people of Nabuclod. It also seeks to understand how these plants are prepared and used for healing purposes. Through this research, the importance of preserving their traditional knowledge and protecting their natural resources will be emphasized for future generations.

Medicinal plants may be considered central to traditional healthcare systems in most places around the world, not only in terms of their role in treating illness and disease but also as cultural objects representing an important social bond with the natural environment and the generations-long experiences about how to use and interpret that connection. Medicinal plants remain widely used for traditional treatment and medicine in many remote or rural areas, especially in regions where access to modern treatments is limited. This abundant weed knowledge passed down through generations (often verbally between elders and younger members of the community) has considerable meaning to these people and their culture, as well as to the way they think and function. In fact, it has been found to be under threat in many places, due not only to the accelerating pace of modernization, industrial agriculture, and environmental degradation, but also to the erosion of traditional medical practices between generations that supported by literature ("Review on the Importance of Documenting Ethnopharmacological Information on Medicinal Plants,")

There are several indigenous communities in the Philippines, such as those of the Aetas (Philippines), the Lumads (Philippines), and the Mangyans (Guatemala), that are said to have had an extensive ethnobotanical heritage and have used a variety of plant species to maintain health. Many reports have documented the use of medicinal plants in the native peoples. (Tantengco et al., 2018) reported on 118 medicinal plants which were used by the Ayta communities in Dinalupihan, Bataan. This study shows the holistic approach Indigenous peoples use as they not only use pharmacological agents for their physical well-being but also incorporate those plants in their cultural and spiritual practices. (Cordero et al., 2022) reported on 131 medicinal plant species which are used by the Panay Bukidnon of Iloilo.

But in recent years, the traditional knowledge of medicinal plants in indigenous communities such as those in Nabuclod is also at risk of disappearing. The emergence of modern medicine (largely replaced by non-traditional herbal medicines), the increasing importance of urbanization, and the increase in the use of synthetic drugs has made younger members less interested in and disengaged from the practice. The exodus of young members to city settlements for education and employment further isolates them from the local ecosystems and the knowledge systems that have nurtured their communities for centuries. For this reason, the preservation of these traditions has become an urgent concern of anthropologists, ethnobotanists, and conservationists alike (Ocampo et al., 2023).

Ethnobotanical research is crucial in recording and conserving traditional ecological knowledge and medicinal knowledge. It helps to understand the cultural importance of plants, and also to identify species with potential medicinal properties that can be useful for modern pharmacology. For example, many plant species traditionally used by indigenous communities have shown promising results in laboratory tests for their antimicrobial, anti-inflammatory and anticancer properties. Drawing on this scientific information can lead to novel natural products for research aimed at synthesizing and integrating into new pharmaceuticals (Santos et al., 2023).

The overall purpose of this study is to conduct an ethnobotanical survey of the medicinal plants being used by the Ayta Mag-indi community (Nabuclod, Floridablanca, Pampanga). The researchers here wish to document the species of medicinal plants being used by the community and how they are used, their preparation method, socio-cultural context where the communities use the plants and to examine the way knowledge is passed down through the generations and whether the effects of modernization and globalization is having a adverse effect on the traditional practices of the Ayta Mag-indi.

Statement of the Problem

The Ayta Mag-indi people of Nabuclod, Floridablanca, Pampanga, have been using medicinal herbs to treat a variety of ailments for ages. However, the transfer of traditional knowledge has decreased, particularly among younger generations, as a result of rising urbanization, modernization, and reliance on modern healthcare.

The main issues this study attempts to solve are as follows:

1. What medicinal plants are used by the Ayta Mag-indi community, and for what purposes?
2. How has modernization affected the transmission of traditional medicinal plant knowledge within the community?
3. What are the sustainability challenges related to the medicinal plant resources in the Ayta Mag-indi's local environment?

Significance of the Study

This study has a great importance in various dimensions-cultural, scientific, environmental, and educational. Recording the indigenous plant species by the Ayta Mag-indi living in *Nabuclod, Floridablanca, Pampanga,* helps in preserving local knowledge that might disappear with modernization and changing generations. It emphasizes the value in ancient healing practices and the close relationship with the environment that indigenous people have.

Scientifically, this research serves as baseline information for future ethnobotanical and pharmacological investigations. The plant species identified and their traditional management can

be a source of leads for the discovery of new phytotherapy and help in the fusion between traditional and modern health policies.

Environmentally, this research may increase the perceived importance of biodiversity preservation in indigenous lands. Safeguarding the local flora does not only support the existing ecological workload of the area but also helps to stockpile intact and adequate medicinal supplies for the next generations.

Academically, this research can become a valuable academic resource on ethnobotany, cultural conservation, and sustainable health for scholars, learners, and policymakers. In addition, the study may aid in elevating the level

Scope and Delimitation

This study focuses on the ethnobotanical practices of the Ayta Mag-indi community in Nabuclod, Floridablanca, Pampanga, specifically concerning the use of medicinal plants. The research covers the identification, documentation, and traditional uses of plant species used by the community to treat various ailments such as fever, cough, stomachache, wounds, and other common illnesses.

The study involves qualitative methods including interviews, field visits, and direct observations with local healers, elders, and knowledgeable community members. It also explores how traditional knowledge is passed down through generations and how modernization may be affecting this transmission.

The scope of this study is limited to:

- Medicinal plants currently in use by the Ayta Mag-indi community in Nabuclod.
- Traditional methods of preparation and application of these plants.
- Perspectives of key informants such as traditional healers, elders, and adult community members.

Delimitations of the study include:

- The study does not test the pharmacological effectiveness or chemical properties of the plants mentioned.
- It does not cover the entire Ayta Mag-indi population in Pampanga or other indigenous groups in the Philippines.
- Data collection is limited to information voluntarily shared by participants during the research period.

- limitations may have affected the availability or visibility of certain plant species during fieldwork.

Definition of terms

Ethnobotany – The scientific study of the relationships between people and plants, especially how indigenous communities use local plant species for medicinal, cultural, and survival purposes.

Medicinal Plants – Plants used by the Ayta Mag-indi community for therapeutic purposes, such as treating illnesses like fever, cough, stomachache, wounds, and infections.

Ayta Mag-indi – An indigenous ethnolinguistic group residing in Nabuclod, Floridablanca, Pampanga, known for their traditional healing practices and deep connection with nature.

Traditional Knowledge – Information and practices related to health, healing, and the environment that are passed down orally from one generation to another within the indigenous community.

II. Methodology

This chapter demonstrates and discusses the strategy and procedure for gathering the necessary data to meet the primary goal of the study. Specifically, this chapter discusses research design, setting and participants, instruments, data gathering procedure and ethical considerations.

Research Design

This study employed a **qualitative descriptive research design** with an **ethnobotanical approach** to document and analyze the traditional medicinal plant knowledge of the Ayta Mag-indi community in Nabuclod, Floridablanca, Pampanga. The design was chosen to gain an in-depth understanding of the community's practices, beliefs, and experiences related to the use of medicinal plants.

Ethnobotanical methods were utilized to gather information on the types of medicinal plants used, their purposes, preparation methods, and the socio-cultural contexts in which they are applied. The study also examined how this knowledge is transmitted across generations and how it is being affected by modernization.

Key data collection methods included:

- **Semi-structured interviews** with local healers, elders, and knowledgeable community members.

- **Field observations and plant collection** during visits to local areas where medicinal plants are found and used.

Setting and Participants

The study took place in Nabuclod, Floridablanca, Pampanga, a rural and mountainous area inhabited by the Ayta Mag-indi community. The location was chosen for its rich biodiversity and the community's continued use of traditional medicinal plants. Purposive sampling was used to select participants, including local healers, elders, and knowledgeable adults with expertise in traditional healing practices.

Instrumentation

A semi-structured interview was used by the researcher. In semi-structured interviews, a list of board questions must be answered throughout the interview. The goal is to learn more about the participants' responses and to understand and collect more information. During the interviews, further questions will be asked for clarity and to convey more opinions and concerns regarding the situation.

Sampling Method

This study used purposive sampling, a non-probability sampling technique, to select participants who possess specific knowledge about the use of medicinal plants within the Ayta Mag-indi community in Nabuclod, Floridablanca, Pampanga.

Participants were selected based on their reputation within the community as knowledgeable individuals in traditional medicine, such as local healers (Albolaryo), elders, and adults who have experience using or preparing medicinal plants. The researchers worked closely with community leaders and guides to identify suitable informants who could provide rich, relevant, and accurate ethnobotanical information.

The sample size was determined by data saturation, meaning interviews continued until no new significant information was being gathered. This approach ensured that the study captured a comprehensive understanding of the community's traditional medicinal practices while respecting cultural boundaries and ethical considerations.

This method allowed the researchers to gather detailed, first-hand insights from individuals with deep cultural and medicinal plant knowledge, which was essential to achieving the study's objectives.

Data Gathering Procedures

To collect data, the researcher will seek consent from the participants and validate the questionnaire before interviewing them.The researcher will outline the process, discuss the

objective, importance and benefits they will receive before completing the interview. After the interview, the researcher will express their gratitude to the participants who helped them with their research and assure them of their privacy and confidentiality.

Data Collection

To acquire detailed information on the traditional medical practices of the Ayta Mag-indi community in Nabuclod, Floridablanca, Pampanga, this study used qualitative data collection techniques suitable for ethnobotanical research.

The following were the main techniques used to gather data:

Semi-structured Interview, A flexible question guide was used to interview a selection of local healers, elders, and knowledgeable community members. Participants were able to freely exchange information about medicinal plants, including their local names, applications, methods of preparation, and the ailments they cure. To ensure comfort and clarity, interviews were conducted in the participants' native tongue or dialect when needed.

Plant Walks and Field Visits, Key informants were taken on guided walks by researchers to locations where medicinal plants are frequently found. Informants identified particular plants, described their applications, and gave examples of how to harvest and prepare them during these field trips.

Observation of Participants, In order to gain a better understanding of the practical and cultural contexts of plant use, observations were made during the plant preparation and application processes. The methods, customs, and equipment used in traditional healing were noted.

Thematic Analysis

An acknowledged qualitative technique for finding, examining, and summarizing patterns or themes in data, was used to examine the information gathered from semi-structured interviews, field observations, and documentation (Braun & Clarke, 2006). This method was selected due to its adaptability and capacity to offer a comprehensive, intricate, and nuanced explanation of the data based on the experiences and cultural backgrounds of the participants.

According to Braun and Clarke (2006), there were six stages in the thematic analysis process:

Familiarization of data, To become fully immersed in the data, field journals, observation notes, and interview transcripts were examined several times. To maintain the veracity of the participants' stories, audio recordings were verbatim transcribed.

Producing First Codes/Generating initial Codes, Significant data segments pertaining to the use, preparation, and cultural significance of medicinal plants were identified through a manual coding process. Important subjects like "plant use," "healing techniques," "intergenerational knowledge," and "cultural beliefs" were given codes.

Looking for Themes, Preliminary themes were created by grouping the original codes into more general patterns. Among these were recurrent themes in the data, like:

-Knowledge and Practices in Traditional Medicine

-Uses and Applications of Medicinal Plants

-Indigenous Knowledge Transmission

-Modernization and Knowledge Erosion Challenges

Examining the Themes, To guarantee coherence and relevance, each theme was refined and compared to the dataset. Overlapping themes were either combined or further differentiated, and thematic boundaries were made clear.

Identifying and Labeling Themes, The final themes' scope and content were reflected in their clear definitions and names. Both the usefulness of using plants and the sociocultural values ingrained in conventional healing methods were described.

In order to emphasize indigenous voices and provide meaningful illustrations for each theme, the findings were written and backed up by direct quotes from informants. The conversation ties the thematic findings to previously published works in indigenous studies and ethnobotany (e.g., Santos et al., 2023; Ocampo et al., 2023).

Ethical Consideration

As working with indigenous communities and their traditional knowledge can be delicate, this study closely followed ethical guidelines at every turn. Following ethical guidelines for qualitative and ethnobotanical research, the following actions were taken to guarantee the rights, dignity, and protection of each participant (International Society of Ethnobiology, 2006; Creswell & Poth, 2018):

Informed Consent, Participants were fully informed about the goal, parameters, and methods of the study before any interviews or data collection took place. To guarantee that participation was completely voluntary, informed consent was acquired either orally or in writing. Additionally, participants were told that they could leave the study at any moment without facing consequences.

Respect for Indigenous Knowledge and Cultural Sensitivity, The Ayta Mag-indi community's indigenous knowledge systems are their intellectual property, according to the study.

In order to ensure that traditional beliefs, practices, and rituals were handled with caution and consideration, researchers approached every interaction with humility and cultural respect. No private or holy data was captured or disseminated without express consent.

Confidentiality and Anonymity, Unless participants specifically consented to be identified, all of their personal information and identities were kept private. When necessary, pseudonyms were used in reporting and documentation to preserve participant privacy. Only authorized researchers had access to the safely stored data (such as transcripts and interview recordings)

III. Results and Discussion

This chapter presents the results of the ethnobotanical survey and discusses the findings in light of existing research and cultural contexts. The results are organized according to the study's main research questions and supported by thematic analysis of interview transcripts.

1. **Medicinal Plants Used by the Ayta Mag-indi Community**

Theme 1: Traditional Plant-Based Healthcare Practices

Theme 2: Practical Use of Ethnomedicinal Knowledge

The Ayta Mag-indi community in Nabuclod continues to rely on a wide array of medicinal plants for the treatment of common illnesses. Based on the interviews, frequently mentioned plants include Lagundi, Buyo, Orosip, Anonas, Lunas-bagon, Malatungaw, Halagati, Oliba, and Tanglad.

Participants reported that these plants are used to treat respiratory illnesses (ecough, asthma), skin conditions (wounds, fungal infections), digestive issues (stomachache, diarrhea), and hypertension or irregular menstruation. For instance, one healer shared:

"*Ginagamit ko ang Lagundi kapag inuubo ang pasyente ko, minsan pinapainom ko ng Tanglad kapag mataas ang presyon ng dugo nila." (P1)*

This finding is consistent with previous ethnobotanical studies (Cordero et al., 2022), who found similar usage of Lagundi and Tanglad among other Aeta communities in Central Luzon.

Preparation methods include boiling leaves for tea, direct application of crushed plant material, or using decoctions for washing infected areas. These practices highlight a continued reliance on folk pharmacology, shaped by generations of cultural practice and experiential knowledge.

2. Transmission of Traditional Knowledge

Theme 3: Intergenerational Knowledge Transfer

Theme 4: Cultural Continuity and Knowledge Preservation

Participants indicated that knowledge of medicinal plants is predominantly passed down orally and through hands-on practice, usually within families. Most respondents learned from their parents or grandparents, often through observation or direct involvement in healing processes:

"Natutunan ko ito sa magulang ko. Ngayon kapag ako'y naggagamot, sinasabi ko rin sa pasyente para malaman nila." (P2)

However, many participants also expressed concern about the decline in interest among younger generations, who are more exposed to modern education and pharmaceuticals. This trend has been documented in similar studies (Andalan et al., 2024)), which note that urban migration, modernization, and loss of forest access threaten the sustainability of traditional knowledge.

Despite this, there remains a core group of elders and traditional healers actively preserving this information. This reflects what Creswell & Poth (2018) describe as a "knowledge ecosystem"—dependent on intergenerational relationships and active use within the community.

3. Sustainability and Environmental Concerns

Theme 5: Loss of Medicinal Plant Resources

Theme 6: Cultural Shift and Knowledge Erosion

A major concern raised by the participants is the decreasing availability of medicinal plants. Several informants noted that certain species have become harder to find due to deforestation, climate change (e.g., typhoons, droughts), and overharvesting by outsiders:

"Nababawasan na ang mga halaman lalo na pag tag-ulan o tag-init. Yung iba, kinukuha ng mga dayo pero hindi pinapalitan." (P2)

This aligns with the findings of Gapar M et al. (2020), who emphasized how environmental degradation and resource exploitation directly affect ethnobotanical heritage. Moreover, modernization has also led to a shift in treatment preferences, with more community members opting to buy medicine from pharmacies, weakening the practical transmission of plant-based knowledge.

Nevertheless, some respondents stressed the importance of planting and protecting native species to support continuity. This supports calls in literature for community-based conservation initiatives "An ethnobotanical survey of medicinal plants used in Papantla, Veracruz, Mexico. *Plants"*, which integrate indigenous knowledge with environmental preservation.

Synthesis of Findings

The study reveals a dynamic and complex relationship between traditional medicine, culture, and the environment. While the Ayta Mag-indi community remains deeply connected to their ethnobotanical heritage, external pressures threaten its survival. The findings underscore:

- The rich diversity and practical utility of medicinal plants in indigenous health system
- The fragility of traditional knowledge without formal documentation and intergenerational transfer
- The urgent need for biodiversity conservation and cultural preservation in the face of modernization

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