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RESEARCH ARTICLE

INDIGENOUS PLANTS: AN ETHNOBOTANICAL DOCUMENTATION AND CORROBORATION OF HERBAL MEDICINAL PLANTS USED BY LOCAL INHABITANTS OF BARANGAY BERSEBA, BAYUGAN CITY, AGUSAN DEL SUR, PHILIPPINES

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ABSTRACT

The uses of medicinal plants are influenced by the culture and perceptions of the local community. The plant resources found around community settlements living in remote areas also play an important role in providing materials for traditional medicine. The study reveals the diversity of medicinal plants in communities living in remote areas with limited access to the market is important as an effort in documenting the traditional knowledge. The documentation of ethnobotanical information is not as it were for the reason of creating the potential of these plants, but may have an effect on the preservation of nature. This study aimed to document the traditional knowledge on the diversity of medicinal plants used in Brgy. Berseba, Bayugan City, Agusan del Sur, Philippines. The research was conducted by the researchers through interviews using a semi-structured questionnaire. The researchers used the data on medicinal plant diversity from the 15 key informants, with an age range from 40-65 years old. Ethno medicinal data were consolidated from the interviews, information was documented about plants local; name, scientific, their useful parts, and their medicinal uses. After the data collection, the results showed that there were 9 plant species used by local healers. These plant species were distributed to 9 genera in 8 families. The family of Ateraceae has 2 plant species and the remaining 7 families namely Poaceae, Myrateae, Menispermaceae, Rutaceae, Lauracea, and Piperacea. The local people and traditional healers in Brgy. Berseba, Bayugan City use different plants in their surroundings, utilizing various parts of them including leaves, stems, roots, fruits, and rhizome, which are also found to be similar practices observed in this study. Based on the responses and observations, the common ailments that are treated using medicinal plants are stomachache, fever, cough, diarrhea, hypertension, and arthritis. As the access to modern healthcare is limited, the majority of the people in Brgy. Berseba, Bayugan City still resorts to traditional healthcare practices although some use both traditional and modern medicine. The diversity of medicinal plants for health care documented in this study showed the valuable role of plant resources in supporting the daily needs and health care of the communities living in the fringe of forest areas. The documentation of the diversity of traditional medicinal plants in this study contributes to the preservation of traditional knowledge, as well as provides information on the potential of these plants for further development.

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INTRODUCTION

Ethnobotanical studies look at the intricate relationship that exists between local people and local plants, including the activities and cultural beliefs that are associated with various forms of use. These studies are critical in emphasizing the importance of native plant species in the discovery of new medications (Ahmad *et al.,* 2012).

Medicinal plants are critical to the survival of underdeveloped communities all over the world. According to the World Health Organization, due to economic and geographical constraints, 80% of some Asian and African countries rely on traditional herbal therapy as their primary health treatment. It is popular in both developed and developing countries due to its effectiveness, diversity, low cost, and few adverse effects compared to current synthetic medications (Balangcod, 2011). The traditional knowledge of medicinal plants is held by many rural communities even in our times.

This type of knowledge is passed down from generation to generation (Fiscal, 2017). Traditional knowledge of plant species, on the other hand, is gradually declining over the world, and there is a severe risk of knowledge loss as a result of advances in modern health care, growing urbanization, and strained ties between the young and the old (Gruyal *et al.,* 2014). The documentation of traditional ethnomedicinal knowledge is of high importance and may contribute to the development of new drugs. Furthermore, this may also contribute to the maintenance of indigenous culture and natural resource management (Olowa *et al.,* 2017). Despite the fact that many ethnomedicinal investigations were conducted, and are performed all over the world, only a small number of people are aware of medicinal plant documentation that has been conducted in the Philippines (Morilla *et al.,* 2014).

In recent years, work on ethnobotanical knowledge in the Philippines has increased. But most ethnobotanical studies conducted across the country, ethnobotanical documentation in Mindanao are relatively few, with some focusing on well-known indigenous groups such as the Pinatubo Negritoes, Tasadays in Mindanao, Itawes in Cagayan, Ibaloi in Benguet province, Kalanguya in Ifugao, and Subanens in Zamboanga del Sur(Stuart, 2018). Furthermore, given the rapid destruction of forests and loss of traditional knowledge, several undiscovered or poorly known plant species are likely to become extinct before their medicinal or other benefits are completely studied (Giday, 2003). Traditional culture and natural resources in the Philippines are rapidly disappearing as the country's economy develops. To maintain traditional medical knowledge, research on the variety of plants having therapeutic value, and knowledge about their use is necessary (Gruyal *et al.,* 2014). The share of medicinal plants, as well as the value of associated traditional knowledge and practices in Barangay Berseba of Bayugan City, Agusan Del Sur, Philippines, is projected to be significant. However, no extensive research of local residents' medical knowledge and practices has been done in the area. The goal of this research was to uncover and document traditional medicinal plant knowledge and practices of local inhabitants in the area. The data acquired was used to guide future pharmacological research as well as the preservation of medicinal plants and local knowledge.

Objectives of the Study: This study tries to investigate the medicinal uses of indigenous plants to human and to document native medicinal plants available at Brgy. Berseba, Prosperidad, Agusan del Sur. Specifically, the study sought to shed light on the following research objectives:

- To collect native medicinal plants that is local to the area for their use and benefits;
- To document traditional practices and knowledge by the local inhabitants of Barangay Berseba, Bayugan City in using the herbal medicinal plants to treat health problems;
- To explore the traditional utilization and collect native medicinal plant in the area for proper identification and future references; and
- To interview and collect data from the traditional healers on how to prepare final herbal medicine products.

Expected Output of the Study

- Lower the cases of chronic diseases as major causes of morbidity and mortality by further studies on ethnomedicinal plants.
- Prevention and treatment of major diseases have led to the use of herbal medicinal plants.
- Therapeutic solutions and herbal medicines indicated in this study plays a significant role and lead to efficient and safe prevention and treatment.

Significance of the Study: This special project was conducted to uncover and document traditional medicinal plants knowledge and practices of local inhabitants in the area. The data acquired was used to guide future pharmacological research as well as the preservation of medicinal plants and local knowledge.

Benefitting the study are the various sectors as follows:

Medical Practitioners: This study benefits the health professionals as they play important role in disease prevention and promotion of the usefulness of medicinal plants in the treatment of certain diseases and enhance general health and well-being.

Local Community: The result of the study benefits the local residents to the maintenance and preservation of indigenous culture in using herbal plants having therapeutic value and assist the local farmers to cultivate medicinal plants in profitable agribusiness.

Educators: This study will be beneficial to the teachers as it will assist them in improving and developing research studies to give better learning experience as well as learning outcomes.

Future Researchers: The outcome of the study is beneficial to future researchers who would want to undertake in the same field of topics.

MATERIALS AND METHODS

Study Area Description: The fieldwork was undertaken in Barangay Berseba, Bayugan City, Agusan del Sur, Philippines as shown in Figure 1. It is one of the upland barangays of the city, situated at 8.8552ºN, 125.8007 ºE, on the island of Mindanao. Elevation at these coordinates is estimated at 450.7 meters or 1,478.7 feet above mean sea level and is partly comprised of forestland areas. The population as determined by the 2020 Census was 1,808, this represented 1.65% of the total population of Bayugan and comprised of 360 households. The type of its climate was identified as having no dry season but a very pronounced wet season with heavy precipitation since Bayugan City is geographically situated below the typhoon belt near or alongside the eastern coast of Mindanao, which is typically affected by tropical depression and typhoon passing the province of Surigao del Norte and Visayas regions. Therewere three hospitals in the downtown city, which is distant from the barangay, therefore, with poor access to the city healthcare.

Ethnobotanical Data Collection: A field survey was carried out starting 20 May 2022 to 30 June 2022 through semi-structured interviews and field observations with selected knowledgeable elder, herbalists. The work was consisted of the acquisition of the Barangay Local Government Unit (BLGU) consent and permit before the actual interview and field survey. The community health workers used the vernacular (Visayan Language). Information regarding plant part used, preparation administration routes and its efficacy were documented.

A total of 15 purposively and snowball-sampled key informants of the barangay comprising locals and traditional healers was interviewed using semi-structured questionnaires. Key informants were composed of 10 females and 5 males with an age range from 40-65 years old. Ethnomedicinal data was consolidated from the interviews, information was documented about plant's local name, scientific name, their useful parts, how it is prepared, and their medicinal uses. Photographs of plants was also be taken in the area.

Plant Documentation Procedure: Photographs were taken for plants found on their home gardens and available in the nearby places during the visit. For plants found in the jungle, local names were identified and characteristics were given by the informants.

Ethnobotanical Data Analysis: With descriptive statistical methods using percentage, the study tried to analyze and summarize data on the reported medicinal and wild edible plants and associated indigenous knowledge.

RESULTS AND DISCUSSION

In this study, a total of 9 plant species were used by local healers in Brgy. Berseba, Bayugan City were recorded.

Figure 1. Location Map of (A) Berseba, Bayugan City, Agusan del Sur by Google Earth, (B) Map of the Barangay

Table 1. List of Medicinal Plants Used by the Local Inhabitants in Brgy. Berseba, Bayugan City, Agusan Del Sur Philippines to treat Various Ailments and Diseases

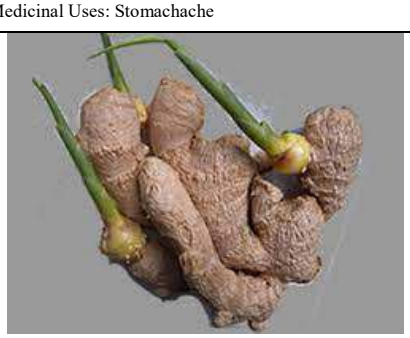
Family/Species Name	Local Names	Plant Parts Used	Mode of Preparation	Medicinal Uses
Asteraceae *Blumea balsamifera*	Gabon	Leaves	Soak leaves, concoction	Fever, cough
Asteraceae *Artemisia vulgaris*	Helbas/ Hilbas	Leaves/stem	Decoction and infusion	Stomachache
Poaceae *Cymbopogon citratus*	Tanglad	Leaves	Extraction Decoction, extraction	Fever, hypertension, anti-inflammatory, cancer
Myrtaceae *Psidium guajava*	Bayabas	Leaves	Decoction	Dengue fever, diarrhea
Zingiberaceae *Zingiber officinale*	Luy-a	Rhizome/root	Crushed, extracted, and Apply directly all over the body	Cough, anti-fungal
Menispermaceae *Tinospora rumphii*	Panyawan	Leaves/stem	Extraction	Diabetes, scabies, arthritis
Rutaceae/Citrus *Citrofortunella microcarpa*	Lemonsito	Top leaves	Extraction	Cough
Lauraceae *Persea americana*	Avocado leaves	Leaves and fruit	Decoction and drink directly	Diarrhea
Piperaceae *Piper betle*	Buyo	Leaves	Poultice-harvest a handful of leaves	Cough

Common Name: Gabon
Family Name: Asteraceae
Scientific Name: *Blumea balsamifera L.*
Part Used: Leaves
Medicinal Uses: Fever, cough

Common Name: Helbas/hilbas
Family Name: Asteraceae
Scientific Name: *Artemisia vulgaris*
Part Used: Leaves /Stem
Medicinal Uses: Stomachache

Common Name: Tanglad
Family Name: Poaceae
Scientific Name: *Cymbopogon citratus*
Part Used: Leaves /stem
Medicinal Uses: hypertension, cancer

Common Name:Bayabas
Family Name: Myrtaceae
Scientific Name: Psidium guajava
Part Used: Leaves
Medicinal Uses: Dengue fever, diarrhea



Common Name: Luy-a
Family Name:Zingeberaceae
Scientific Name: Zingiber officinale
Part Used: Rhizome/root
Medicinal Uses: Cough, anti fungal

Common Name:Panyawan
Family Name: Menispermaceae
Scientific Name:
Tinospora rumphii
Part Used: Leaves /stem
Medicinal Uses: Diabetes, scabies, arthritis

Continue …

Common Name: Lemonsito
Family Name: Rutaceae /Citrus
Scientific Name:
Citrofortunella microcarpa
Part Used: top Leaves
Medicinal Uses: Cough

Common Name: Avocado
Family Name: : Lauraceae
Scientific Name
Persea americana
Part Used: Leaves /fruit
Medicinal Uses: Diarrhea

Common Name:Buyo
Family Name: Piperaceae
Scientific Name: Piper betle
Part Used: Leaves
Medicinal Uses: Cough

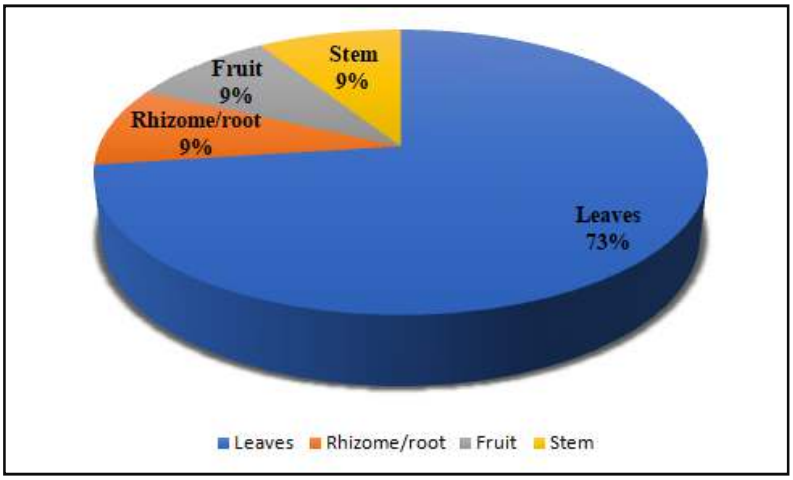


Figure 2. Plant part used for medicinal purposes

These plant species were distributed to 9 genera in 8 families. The plants were also classified as to the local names, plant parts used, mode of preparation, and their medicinal uses. The family of Asteraceae has 2 plant species and the remaining 7 families, namely Poaceae, Myrtaceae, Zingiberaceae, Menispermaceae, Rutaceae, Lauraceae, and Piperaceae, each had one species (Table 1). The local people and traditional healers in Brgy. Berseba, Bayugan City use different plants in their surroundings, utilizing various parts of them including leaves (73%), stems (9%), roots (9%), and fruits (9%), which are also found to be of similar practices observed in this study. The most commonly used part of the plants was the leaves including the newly-sprouted and young leaves with 8 species. The stem was utilized in 2 species of plants; roots in 1 species; fruit in 1 species; and rhizome in 1 species. There are plant species with more than one part that was used in treating diseases (Table 1).Based on the responses and observations, the common ailments in Brgy. Berseba, Bayugan City that is treated using the medicinal plants are stomachache, fever, cough, diarrhea, hypertension, and arthritis. As access to modern healthcare is limited, the majority of the people in Brgy. Berseba, Bayugan City still resorts to traditional healthcare practices although some use both traditional and modern medicine. The family of Asteraceae, also known as Compositae, provided a large number of medicinal plant species in this study. This family contributes foods, dye, oil and medicine-yielding plants. It also includes a large number of ornamental plants. A study on ethnobotany, pharmacology, and phytochemistry Asteraceae showed that some species have been used as folk medicine in the treatment of several disorders like cardiovascular diseases (Michel *et al.,*2020). For family Poaceae, some of its plant species are used in treating hypertension, antidiabetic, anti-inflammatory, anthelmintic, antiulcer, diuretic, and antioxidant (Fatima *et al.,*2018). The family Myrtaceae, several of its species are useful as spices and it has long been used in folk medicine in treating different diseases, with different studies demonstrating its antimicrobial, anti-inflammatory, and antioxidant activities.

For the family Zingiberaceae, almost all parts of these plants are used as a source of food, natural dyes, and traditional medicine. Their rhizomes are known for their medicinal, pharmacological, and nutritional properties (Rachkeeree *et al.,*2018) Some plant species of the Menispermaceae family are known to be medicinal alkaloids. Family Rutaceae is a medicinal plant used to treat pain, dermatitis, rheumatism, and other inflammatory diseases but its use is limited by its potential toxicity. The family Lauraceae is used as flavoring agent in the food industry. It is also used in folk medicine in the treatment of acne elimination, childbirth recovery, toothache relief, stomach pain, and erysipelas symptoms. It was observed in the study that the leaves were the most widely used plant part. From the interview with the respondents, it was also indicated the use of stem, root, rhizome, and fruit in the treatment. According to Kumar and Chaturverdi (2011),leaves are the site of manufacture and storage of many chemical compounds through photosynthesis including alkaloids, tannins, coumarins, flavonoids, essential oils, and inulin's which are an active component of most herbal preparation in high concentrations. The use of leaves also provides conservation for the plants compared to those remedies that require roots or whole plants in which the plant should be uprooted. Besides, leaves are the most abundant plant part that is easier to collect and can also be regenerated.Based also on the results of the study, there are some plant parts that are used to cure more than one illness. For example, the leaves of *Blumea balsamifera* which is used in the treatment of fever and cough. The leaves of *Cymbopogon citratus* are used to treat fever, hypertension, and anti-inflammatory. The leaves also of *Psidium guajava* are known in the area for treating dengue, fever, and diarrhea. The mode of preparation for the identified medicinal plants in Brgy. Berseba, Bayugan City is by using different parts of the plants through concoction, decoction, extraction, infusion, crushing, and soaking the leaves. The most common method of preparation is decoction or boiling and extraction of the part of the plants which consists 4% of the total plants documented. These processes demonstrate both external and internal administration.

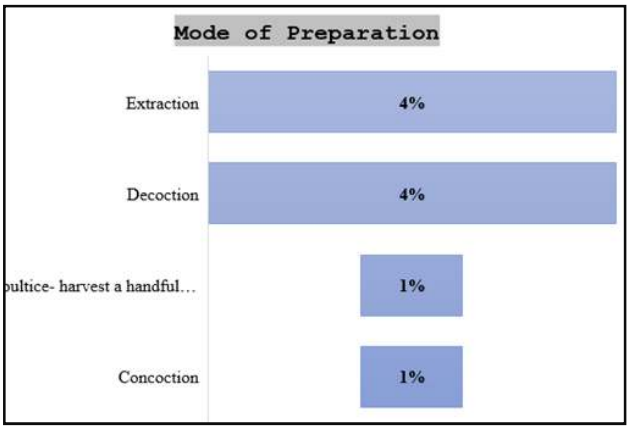


Figure 3. Mode of preparation

Conclusion and Recommendation

There are nine medicinal plants documented that can largely treat stomachache, fever, cough, diarrhea, hypertension, and arthritis. Leaves are the prepared for decoction, extraction, and concoction, and mostly being administered orally.Local users strongly believed that herbal plants are so effective that in two to three days ailments are cured. There was no uniformity in the preparation and dosage. Their uses are most beneficial since hospitals and modern facilities are non-accessible for immediate treatment. Overall, the present study provides additional knowledge on the existing medicinal plants used by the local inhabitants of Brgy. Berseba, Bayugan City Agusan Del Sur. Based on the findings of the study, it showed that most of the medicinal plants documented have many medicinal uses. Some plants listed in this study also have similarities in terms of usage and mode of application. Therefore, the present findings serve as baseline data for future studies that may lead to future pharmacological research as well as preservation of medicinal plants and local knowledge because of its risk of extinction. This research will also serve as a reference to other researchers that may have the interest to conduct further studies on ethnomedicinal plants. The data obtained will help the local management to make policy for conservation, reproduction, advocacy on their uses for sustainability. For the future researchers, the phytochemical screening and other laboratory tests will be conducted to selected medicinal and wild edible plants; develop strategic plan for conservation, and to strengthen dissemination and information campaign on their uses.

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