



Ethnobotanical Survey of the Medicinal Plants Used by the Maranaos in Pualas, Lanao del Sur, Philippines

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ABSTRACT

This study aimed to identify the plants used as traditional medicine and widely utilized in health care practices among "Maranaos" in Pualas, Lanao del Sur, Philippines. Documentation of plants was done through interviews and group discussion with the key informants ("babaylans" or recognized local healers) and local "Maranaos" in the area. Sixty eight (68) medicinal plants belonging to thirty-four (34) families were recorded. The medicinal plants were found to treat a range of health problems, from simple wounds to diseases and even cancer. The leaves were the most utilized part and were commonly prepared by decoction. This study illustrates the importance of traditional medicine in the treatment and management of ailments in the locality. Moreover, the results showed that traditional medicine still plays an important role in meeting basic health care needs of the local communities due to its easy access and low cost. Further examination should be employed on the recorded plant species to establish their safety and efficacy.

Keywords: ailment, decoction, efficacy, health care, traditional medicine.

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INTRODUCTION

The key role of plants in the history of life is not new. In particular, medicinal plants play an important role in the development and advancement of modern studies by serving as a starting point for the development of novelties in drugs [1]. From the ancient times until the present, people have always been searching for the healing properties found in nature. The first records of the use of traditional medicine dated from 2600 B.C. in Mesopotamia on the use of *Cedrus* species and *Cupressus sempervirens*, *Glycyrrhiza glabra*, *Commiphora* species, and *Papaver somniferum* which are still in use today for the treatment of various ailments. The Egyptian medicine dated from 2900 B.C. is best known as Egyptian pharmacopeia (Ebers Papyrus dating from 1500 B.C.), the Chinese Materia Medica, and the Indian Ayurvedic system that formed the basis for the primary text of Tibetan Medicine which dated from 1000 B.C. [2].

In recent years, works on ethnobotanical knowledge have increased particularly in some parts of Europe, Asia, and Africa [3]. In the Philippines, traditional medicine is still widely practiced especially among indigenous communities. Efforts have been made to document and publish papers on the traditional use of medicinal plants because of the growing threat of losing classical knowledge in the modern era [4]. The "Isnags" in Conner, Apayao, Northern Luzon venture on herbal medicine (31 species out of 102 identified as medicine for different illnesses) that can be directly used because they are cheap and readily available [5]. In other parts of the country, 101 plant species were identified with medical purposes in Iloilo [6], 65 plant species in Surigao del Sur [4], 62 plant species in Rogongon, Iligan City [3] and 89 plant species in Lapuyan, Zamboanga del Sur [7].

Medicinal plants have significant contributions to the human health care system as the main source of medicine for the treatment of various ailments for the majority of the rural population [8, 9, 10]. However, as modernization progresses, the use of traditional medicinal plants has been threatened in many parts of the world [4]. Contributing factors mentioned by Bodeker *et al.* [11] that have threatened

medicinal plants are over-harvesting for commercial purposes, destructive harvesting practices, habitat loss resulting from forest degradation, and agricultural encroachment.

With the threats mentioned, however, there are still many parts of the country that remain poorly studied. Documentation on the practice of traditional medicine is necessary before these plants are gone. To date, only limited reports are available as to the ethnobotanical studies in certain areas in Mindanao especially in Lanao del Sur area.

The “Maranao” group is one of the many ethnic groups in the Philippines, who mostly resides in the Lanao provinces. Many traditional beliefs and rituals still persist and influence the lives of the “Maranaos”. Both semi-literate as well as those who have little exposure to modern medical practices still continue with their practice of traditional medicine [12]. Traditional medication has remained a health care practice because it is the most affordable and easily accessible source in Pualas, Lanao del Sur. However, with the increasing acceptance of the modern medicinal products, knowledge on the use of traditional medicine is gradually disappearing. Sustainability and conservation of plant resources and traditional knowledge are important in order to preserve the culture and tradition of the “Maranaos” in the area.

This study aimed to identify plants used as traditional medicine by the “Maranaos” in Pualas, Lanao del Sur, method of preparation, mode of administration, and the ailments treated.

METHODOLOGY

Study area

The municipality of Pualas is situated in the province of Lanao del Sur which comprises 23 barangays. Seven barangays chosen purposively as study areas were Basagad, Bubong, Danugan, Ingud, Porug, Talambu, and Tuka (Figure 1).

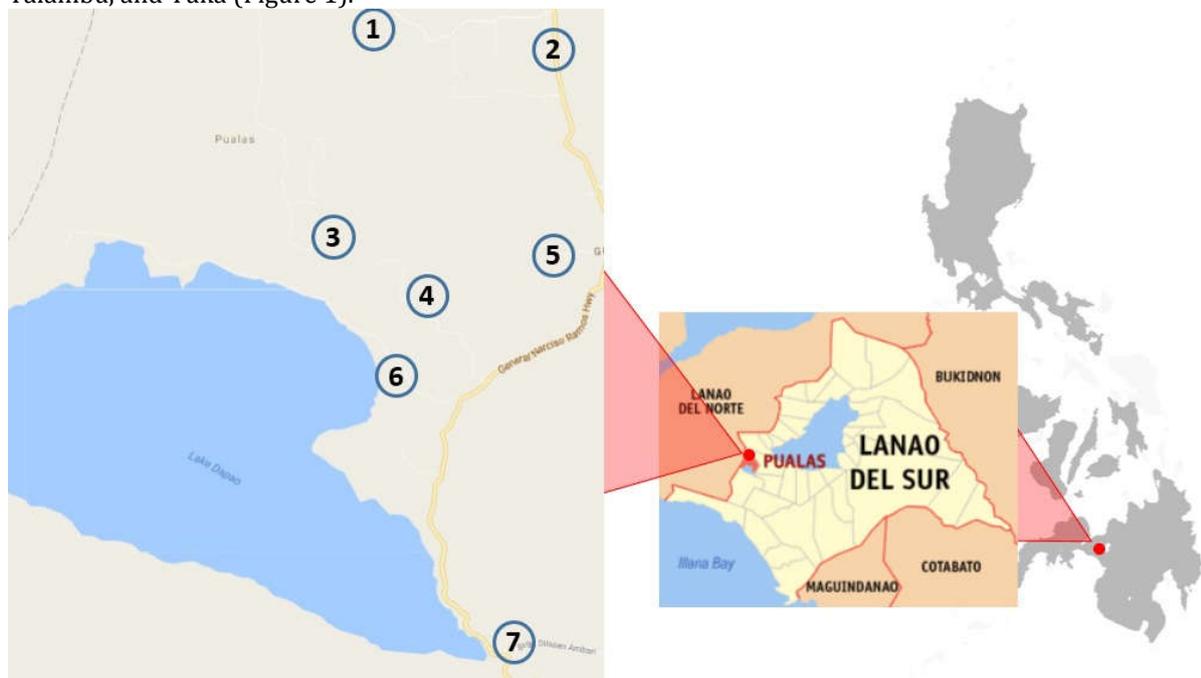


Figure 1. Map of Pualas, Lanao del Sur, Philippines showing the study areas: (1) Barangay Ingud, (2) Barangay Talambu, (3) Barangay Basagad, (4) Barangay Bubong, (5) Barangay Danugan, (6) Barangay Tuka, and (7) Barangay Porug [13].

Collection and identification of plant materials

Eighty (80) individuals (aged 30-80 years old) as informants and ten (10) local healers as key informants were selected in this study as they have wide knowledge on medicinal plants. The information gathered included plant name, part of the plant used, its preparation and mode of administration, and the ailments treated [3, 4, 7].

Photographs of plants were taken in their natural habitat and specimens were collected to help in the identification. Identification of plant samples was done with the help of available published literatures and was confirmed by Professor Edgardo Aranico of the Department of Biological Sciences, Mindanao State University – Iligan Institute of Technology, Iligan City, Philippines.

RESULTS AND DISCUSSION

Sixty eight (68) species of medicinal plants belonging to 62 genera and 34 families were documented as medicinal plants used by the Maranaos in Pualas, Lanao del Sur, Philippines (Table 1). The family Asteraceae with seven species and family Fabaceae with six species were found to be the most widely used among Maranaos. Family Asteraceae was also widely used for medicinal purposes by the Higaonon tribe of Rogongon [3] and Subanen tribe in Zamboanga del Sur [14]. Cronquist [15] reported that family Asteraceae is one of the largest and economically most important families of flowering plants and consists of 12-17 tribes, approximately 1100 genera, and 20,000 species. Most of the species of family Asteraceae contain active alkaloids that are medicinal along with their exceptional supply of nutrients [14].

Results in this study indicated that leaves (81%) are the most frequently used part of plants followed by roots (5%), stems (4%), fruits (4%), fruit skin (4%), flowers (1%), and the whole plant (1%). Similar studies conducted by previous researchers also reported that most common remedies were taken from the leaves [3, 6, 7, 14]. Leaves are described to be the site of manufacture and storage of many phytochemicals including alkaloids, tannins, coumarines, flavonoids, essential oils, and insulins which are active components of most herbal preparations in high concentration [16]. Moreover, utilization of leaves is common as it is the most abundant and easiest part to collect and can also be regenerated [14].

Results of this study further revealed that the same species of plant can treat various diseases using different plant parts. Leaves and stem of *Elephantopus scaber* have been widely used in treatment of different diseases but are prepared differently for various medical conditions. Leaves of *E. scaber* are squeezed and taken orally to cure dysmenorrhea and irregular menstruation while boiled to cure diarrhea. Its stem can either be boiled or squeezed and orally administered to treat kidney infections.

In some cases, parts from one species are mixed up with other plant species as a remedy for ailment. *Psidium guajava* for example is mixed with seven slices of *Curcuma longa* to cure wound and skin diseases or boiled together with the leaves of *Chrysophyllum cainito* and *Syzygium malaccense* to cure diarrhea which is supported by the study of Olowa *et al.* [3] which reports that mixtures of plants can be more effective in treating a particular ailment. It is also reported that *C. longa* is prepared together with other plants for various medications. Phytochemical constituents of *C. longa* have anticancer [17] and antifungal properties [18], correct defects associated with cystic fibrosis [19], and also have antiulcer potential [20]. Most common ailments treated by the documented medicinal plants are fever, diarrhea, and cough and are administered orally as decoction. Different modes of applications of the medicinal plants were identified such as: decoction (54%), squeezing (33%), infusion (2%), pounding (5%), chewing (5%), and poultice (1%). Decoction was the most popular form of preparation and administered orally.

Although the preparation and administration of the medicinal plants vary based on the type of disease treated, decoction is the most common method of preparation [3, 4]. According to locally renowned herbalists, decoction is the most effective way to get all the extracts used for medication. Decoction is a good method to extract anthocyanins, phenolic compounds, and alkaloids that are highly responsible for antimicrobial activity against *Bacillus cereus* and *Escherichia coli* [21]. Preparation of plant extracts through decoction is safe to be taken orally [22] as it will not exhibit any antimicrobial activity that may alter the normal flora in the body [23].

Easy access and cost effectiveness are some of the reasons that the locals prefer to utilize traditional medicine. Although majority of the communities especially the local healers still rely on medicinal plants, the influence of modern medicine in those communities is apparent. Thus, studying traditional knowledge on medicinal plants is important as it preserves the culture and tradition of the "Maranaos" in this area.

Table 1. Medicinal Plants used by the Maranaos in Pualas, Lanao del Sur, Philippines.

Family / Scientific name	Plant part used	Preparation and mode of application	Ailments/ conditions treated
Acoraceae			
<i>Acorus calamus</i> L.	Leaves	Decoction	arthritis
Amaranthaceae			
<i>Amaranthus spinosus</i> L.	Leaves	Decoction	allergy
<i>Cyathula geniculata</i> Lour.	Leaves	Pound the leaves and sauté in oil. Apply it to the affected area.	bruise, disabled bones
Amaryllidaceae			
<i>Crinum asiaticum</i> L.	Leaves	Squeeze and apply it to the affected area.	eliminates poison due to snake bite
Anacardiaceae			

<i>Mangifera indica</i> Linn.	fruit skin	Decoction	diarrhea
Apiaceae			
<i>Centella asiatica</i> L.	Leaves	Decoction	fever
	Leaves	Squeeze to get the extract and drink.	works as antibiotic, stomach pain, Urinary Tract Infection(UTI)
<i>Hydrocotyle vulgaris</i>	Leaves	Decoction	ulcer, kidney, cough
Apocynaceae			
<i>Asclepias curassavica</i> L.	Stem	Decoction	fever
	Leaves	Either decoction or squeeze and drink.	fever
<i>Marsdenia tinctoria</i> R Br.	Leaves	Either decoction or squeeze and drink.	fever
	Leaves	Squeeze to get the extract and rub it directly to the affected area.	"garak", arthritis
<i>Plumiera acuminata</i>	Leaves	Squeeze to get the extract and drink.	cancer
		Pound until soft and then massage it to the affected area.	hemorrhoids, rheumatism
Areaceae			
<i>Areca catechu</i> L.	Seed	Decoction	diabetes
Asteraceae			
<i>Ageratum conyzoides</i> L.	Leaves	Squeeze to get the extract and drink.	fever
	Leaves	Decoction	cough
<i>Bidens pilosa</i> Linn.	Leaves	Pound leaves until soft and then massage to the affected area.	rashes
	Leaves	Decoction and massage to affected area.	rashes
<i>Blumea balsamifera</i> L.	Leaves	Decoction	fever, ulcer, "garak" (said to have more than 40 illnesses that can be treated)
<i>Chrysanthemum sinense</i> Sabine	Leaves	Squeeze to get the extract.	skin allergies
<i>Chrysanthemum indicum</i> L.	Leaves	Squeeze to get the extract and massage to affected area.	wound, toothache, headache
<i>Elephantopus scaber</i> L.	Leaves	Squeeze to get the extract and drink.	dysmenorrhea, irregular menstruation
	Stem	Either decoction or squeeze to get the extract. Drink.	kidney infection
	Leaves	Decoction	Diarrhea
<i>Emilia sonchifolia</i> L.	Leaves	Decoction	Diarrhea
<i>Synedrella nodiflora</i> (L.) Gaertn.	Leaves	Squeeze to get the extract. Mix with the extract of 7 leaves of "ragm amo", 7 leaves of "mngiyak" and a pinch of turmeric.	Ulcer
	Leaves	Squeeze to get the extract and drink.	diabetes, internal pain

	Leaves	Decoction	Pneumonia
Balsaminaceae			
<i>Impatiens balsamina</i> L.	Leaves	Squeeze to get the extract and drink.	high fever
Caricaceae			
<i>Carica papaya</i> L.	Leaves	Squeeze to get the extract and drink.	fever, cough and colds
	Leaves	Squeeze the leaves of papaya and add lemon extract and salt. Mix and drink.	fever and colds
Caryophyllaceae			
<i>Drymaria cordata</i>	Leaves	Decoction	Diarrhea
	Leaves	Boil 7 leaves of "kisp" with another 7 leaves of "mngiyak" and drink.	Ulcer
Chenopodiaceae			
<i>Chenopodium ambrosioides</i> L.	Leaves	Leave it in a glass of water for a few minutes and drink.	Measles
Crassulaceae			
<i>Kalanchoe pinnata</i> Lam.	Leaves	Decoction	Fever
Convolvulaceae			
<i>Ipomoea batatas</i> (L.) Poir	Leaves	Decoction	Anemia
Costaceae			
<i>Costus igneus</i>	Leaves	2 leaves chewed in the morning and another 2 leaves in the evening.	Diabetes
<i>Costus sericeus</i> Blm.	Leaves	Decoction	fever, cough, and colds
Cucurbitaceae			
<i>Momordica charantia</i> L.	Fruit	Grate and then squeeze to get the extract. Drink	Diarrhea
	Fruit	Squeeze to get the extract and drink	Cough
	Leaves	Squeeze to get the extract. Mix with the extract from the leaves of <i>B. balsamifera</i> and turmeric. Drink.	Fever
Dioscoreaceae			
<i>Dioscorea alata</i> L.	Leaves	Squeeze to get the extract and then drink. Mix half of the <i>D. alata</i> extract with <i>H. suaveolens</i> then massage on the body	body pain
Euphorbiaceae			
<i>Euphorbia hirta</i> L.	Leaves	Decoction	rashes, fever, any pain
<i>Jatropha curcas</i> L.	Leaves	Decoction	Fever
	Leaves	Decoction and apply it to the affected area.	Sprains

<i>Manihot esculenta</i> Crantz	Leaves	Squeeze to get the extract and drink.	high blood pressure, diabetes
	Leaves	Decoction	high blood pressure, ulcer, wounds
Fabaceae			
<i>Cassia occidentalis</i> L.	Leaves	Decoction	stomach ache, diarrhea
<i>Cassia alata</i> L.	Leaves	Decoction	Diarrhea
<i>Cassia tora</i> L.	Leaves	Decoction	kidney diseases, arthritis
<i>Gliricidia sepium</i>	Leaves	Squeeze to get the extract and drink.	dysmenorrhea
<i>Indigofera suffruticosa</i> Mill.	Leaves	Decoction	to ease the pain of mothers during labor
<i>Mimosa pudica</i> L.	Leaves	Chew and then spit it directly to the affected area	Wound
	Leaves	Squeeze to get the extract and massage to affected area.	Wound
Gramineae			
<i>Andropogon citratus</i> DC.	Leaves	Decoction	to treat a paralyzed person and for high blood pressure
Lamiaceae			
<i>Hyptis suaveolens</i> L.	Leaves	Squeeze to get the extract and then drink. Mix with 7 leaves of <i>D. alata</i> . Massage the remaining extract on the body.	"syambar"
	Leaves	Squeeze to get the extract. Mix with the leaves of <i>A. conyzoides</i> and drink	for ease of childbirth during labor
	Leaves	Decoction	Headache
<i>Mentha arvensis</i> L.	Leaves	Squeeze to get the extract and drink.	cough and colds
<i>Plectranthus aromaticus</i> Roxb.	Leaves	Squeeze to get the extract and drink.	Cough
<i>Vitex negundo</i> L.	Leaves	Either decoction or squeeze to get the extract. Drink.	cough, fever
Lauraceae			
<i>Persea americana</i> Mill.	Seed	Decoction	Toothache
Lythraceae			
<i>Lagerstroemia speciosa</i> L.	Leaves	Decoction	kidney infections
	fruit skin	Decoction	Fever
Malvaceae			
<i>Abelmoschus esculentus</i> L.	Fruit	Slice the fruit and leave it in glass of water. Eat the fruit and drink the water.	Diabetes
<i>Durio zibethinus</i> Murr.	Leaves	Decoction and use the extract in a bath.	Nervousness
	fruit skin	Decoction	Anemia

<i>Malvastrum coromandelinum</i> L.	flowers	Chew and then spit it directly to the stomach.	stomach ache
<i>Urena lobata</i> L.	Leaves	Squeeze to get the extract and drink.	kidney infection
	Leaves	Decoction	Poison
Menispermaceae			
<i>Tinospora crispa</i> L.	Leaves	Decoction	Hepatitis
	whole plant	Decoction	cancer, myoma, diabetes
Moraceae			
<i>Ficus septica</i>	Leaves	Pound until soft and then rub to the affected area. Usually accompanied with a prayer.	Numbness
	Leaves	Squeeze to get the extract	Numbness
	Leaves	Decoction. Mix with the extract of <i>Annona muricata</i> and <i>D. alata</i> . Drink.	dentin hypersensitivity
Myrtaceae			
<i>Psidium guajava</i> L.	Leaves	Boil in water with 7 slices of turmeric. Drink.	wound, skin diseases, "bisa"
	Leaves	Decoction	body pain
	Leaves	Boil together leaf extracts of <i>C. cainito</i> , <i>P. guajava</i> and <i>S. malaccense</i> . Drink the preparation.	Diarrhea
<i>Syzygium malaccense</i> Linn.	Leaves	Boil 7 leaves of <i>S. malaccense</i> , 7 leaves of <i>M. indica</i> and 7 leaves of <i>P. guajava</i> with water, add 7 slices of turmeric and drink.	Diarrhea
Poaceae			
<i>Eleusine indica</i> L.	Stem	Decoction	for women who can't bear a child
	Leaves	Decoction	stomach ache
<i>Imperata cylindrica</i> (L.) Beauv.	Roots	Decoction	young children with 'developing teeth'
<i>Saccharum spontaneum</i> L.	Leaves	Slice the leaves and eat directly.	TB (Tuberculosis), eye irritation
Piperaceae			
<i>Peperomia pellucida</i> L.	Leaves	Squeeze to get the extract and drink.	UTI (Urinary Tract Infection)
<i>Piper betle</i> L.	Leaves	Boil 7 leaves of <i>P. betle</i> and drink.	Fever
Rosaceae			
<i>Rubus Rosifolius</i>	Leaves	decoction	Diarrhea
Solanaceae			

<i>Capsicum frutescens</i> L.	Leaves	Decoction	Fever
<i>Solanum inaequilaterale</i> Merr.	Leaves	Squeeze together with the leaves of <i>S. jamaicensis</i> and drink.	Fever
<i>Solanum lycopersicum</i> L.	Leaves	Decoction	Typhoid
<i>Solanum torvum</i>	Leaves	Decoction and drink every 3 hours.	Ulcer
	Leaves	Squeeze to get the extract and drink.	Fever
Sapotaceae			
<i>Chrysophyllum cainito</i> L.	Leaves	Boil with water and add 7 slices of turmeric.	Diarrhea
	Leaves	Boil with water together with leaves of <i>P. guajava</i> , <i>S. malaccense</i> , and <i>M. indica</i> .	Diarrhea
	Leaves	Boil with water together with leaves of <i>P. americana</i> and <i>S. malaccense</i> . Add 7 slices of turmeric and drink.	diarrhea, ulcer
Verbenaceae			
<i>Duranta</i> sp.	Leaves	Squeeze to get the extract and drink.	Diarrhea
<i>Stachytarpheta jamaicensis</i> L.	Leaves	Decoction	Diarrhea
Zingiberaceae			
<i>Curcuma longa</i> L.	Roots	Decoction	Wound
	Roots	Boil with water together with leaves of <i>P. betle</i> , garlic, <i>A. catechu</i> , salt and oild. Rub to the affected area.	Tetanus
<i>Zingiber officinale</i> Rosc.	Roots	Apply directly on the affected areas.	foot swelling, "garak"

CONCLUSION

Sixty eight (68) species of medicinal plants belonging to 34 families are commonly utilized by the "Maranaos" in Pualas, Lanao del Sur. Plants were used to treat simple wounds, various diseases, and even cancer. Preparation is through decoction, squeezing to get the extract, infusion, pounding, chewing of the plant part, and poultice. The "Maranaos" still have active traditional knowledge on the use, preparation, and application of medicinal plants as a result of continued reliance on medicinal plants. Traditional knowledge on medicinal plants and conservation of these plants are important to sustain the practice of healing using traditional medicine.

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

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