

# Ethnobotanical Profiling of Commonly Utilized Plants for Hypertension and Diabetes in the Province of Laguna, Philippines

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**Abstract:** *The prevalence of hypertension and diabetes is on a steady upsurge worldwide and it has been identified as top ten leading causes of mortality in the Philippines. Plants have been prepared and evaluated for their potential as good antihypertensive and hypoglycemic drugs and provide clues for the development of new and better oral drugs for hypertension and diabetes. Descriptive method of research and purposive sampling technique were used to identify and determine the plants utilized by the people of the province of Laguna for the treatment of the two diseases. The findings of the study revealed that soursop is mostly utilized for the treatment of both hypertension and diabetes. Results also disclosed that screwpine, mangosteen, salamander tree and lemon grass besides soursop are mostly utilized for the treatment of hypertension. Further, it entails that bitter gourd, horseradish, and snakeroot are mostly utilized for the treatment of diabetes. Leaves are mostly utilized for medicinal consumption and are prepared by decoction in the form of tea that is drunk one to three times a day.*

**Keywords:** diabetes, ethnobotanical profiling, hypertension

## 1. Introduction

The prevalence of hypertension and diabetes is on a steady upsurge worldwide and it has been identified as top ten leading causes of morbidity and mortality. Around the globe it is estimated that hypertension causes 51% deaths due to stroke and 45% due to heart disease. Twenty five percent of Filipino adults 21 years old above have hypertension or high blood pressure [1]. Hypertension affects patients with diabetes [2]. There were about 415 million people in the world have diabetes and the prevalence of diabetes in Filipino adults 20 years old above was about 6.1% [3].

The treatment of different diseases using plant began long time ago [4]. Plants have been used both in the prevention and cure of different human diseases [5]. It is estimated that 60% of the world's population rely on traditional health care system derived from medicinal plants [6] and more than 70% of the third world's population depends on traditional medicinal system or alternative systems of medicine [7]. In the Philippines, many patients use medicinal plants as treatment for many ailments and serious diseases like hypertension and diabetes, for several reasons such as cultural and economic. This study aims to document important plants of the Philippines specifically in the province of Laguna, which are commonly utilized by the people of the community for the treatment of hypertension and diabetes. It examined the frequency and manner of how plants are prepared for consumption.

## 2. Materials and Method

### 2.1 Study Area

The study was carried out in Laguna. Laguna is a province in the Philippines located in the CALABARZON region in Luzon. It has an area of 1, 824 km<sup>2</sup>.

### 2.2 Ethnobotanical Survey

An interview guide was developed and the questions were focused on the names of the most commonly utilized plants, the part of the plant used, the method of preparation, the way of administration, and the dosage.

### 2.3 Study Population

A total of 378 patients coming from different municipalities were included in the study. The study population included patients with hypertension and diabetes of both sexes and age ranges from 30 to 95 years old.

### 2.4 Data Analyses

Participants were asked to present the plants utilized for the treatment of hypertension and diabetes. The species presented by the participants were collected and taxonomically identified.

## 3. Results and Discussion

The study revealed that 15 plant species are frequently used for the treatment of hypertension and diabetes in the Province of Laguna, Philippines. Five plant species are frequently used by the respondents for the treatment of both diseases (Table 1 and 2). In this study soursop was the commonly used plants for the treatment of hypertension and bitter gourd for diabetes. Information from the literature revealed that ampalaya or *Momordica charantia* are used also in different countries for the treatment of diabetes (Ayyanar et al., [8]; Shanmugam et al., [9]; Talha et al., [10]; Tsabang et al., [11]). Other plants that are also used in the study for the treatment of diabetes are makabuhay or *Tinospora cordifolia* (Azam et al., [12]) and duhat or *Syzygium cumini* (Rout et al., [13]).

**Table 1:** Plants commonly utilized for hypertension in the province of Laguna

Common Name	Scientific Name	English Name
Guyabano	<i>Annona muricata</i>	Soursop
Pandan	<i>Pandanus amaryllifolius</i>	Screwpine
Mangosteen	<i>Garcinia mangostana</i>	Mangosteen
Bignay	<i>Antidesma bunius</i>	Salamander tree
Tanglad	<i>Andropogon citratus</i>	Lemon grass
Kalamansi	<i>Citrofortunella microcarpa</i>	Calamansi
Okra	<i>Hibiscus esculentis</i>	Lady fingers
Pinya	<i>Ananas comosus</i>	Pineapple
Malunggay	<i>Moringa oleifera</i>	Horse-radish tree
Banaba	<i>Lagerstroemia speciosa</i>	Queen's flower

**Table 2:** Plants commonly utilized for diabetes in the province of Laguna

Common Name	Scientific Name	English Name
Ampalaya	<i>Momordica charantia</i>	Bitter gourd
Malunggay	<i>Moringa oleifera</i>	Horse-radish tree
Guyabano	<i>Annona muricata</i>	Soursop
Serpentina	<i>Rauwolfia serpentina</i>	Indian snakeroot
Bignay	<i>Antidesma bunius</i>	Salamander tree
Makabuhay	<i>Tinospora cordifolia</i>	Heavenly elixir
Banaba	<i>Lagerstroemia speciosa</i>	Queen's flower
Duhāt	<i>Syzygium cumini</i>	Black plum
Mangosteen	<i>Garcinia mangostana</i>	Mangosteen
Chico	<i>Achras zapota</i>	Chico

The leaves were reported to be the most utilized part of the plants. The result of the study is similar to the reports of Amel [14]; Azam et al. [12]; Olajuyigbe and Afolayan [15]. The commonest method of plant preparation was decoction similar to the report of Rachid [16]. This is made by boiling plant materials in water. Application or administration of the herbal remedies was generally drinking in the form of tea or juice, usually on daily basis similar to the report of Erasto et al. [17] (Table 3 and 4).

**Table 3:** Parts Used, Preparation, Administration and Dosage of Plants in Treating Hypertension

Name of Plant	Parts Used	Preparation	Administration	Dosage
Guyabano	Leaves	Decoction	Tea	3/D
Pandan	Leaves	Decoction	Tea	2/D
Mangosteen	Fruit	Decoction	Tea	2/D
Bignay	Leaves	Decoction	Tea	2/D
Tanglad	Leaves	Decoction	Tea	2/D
Calamansi	Fruit	Extraction	Juice	3/D
Okra	Fruit	Decoction	Tea	2/D
Pinya	Fruit	Fresh	Eaten raw	3/D
Malunggay	Leaves	Decoction Powder	Tea Tea	2/D 1/D
Banaba	Leaves	Decoction	Tea	2/D

\*3/D-three time a day; 2/D-two time a day; 1/D-once a day

**Table 4:** Parts Used, Preparation, Administration and Dosage of Plants in Treating Diabetes

Name of Plant	Parts Used	Preparation	Administration	Dosage
Ampalaya	Leaves Fruit	Decoction Cooking	Tea Viand	3/D 1/D
Malunggay	Leaves	Decoction	Tea	3/D
Guyabano	Leaves	Decoction	Tea	3/D
Serpentina	Leaves	Decoction	Tea	2/D
Bignay	Leaves	Decoction	Tea	2/D
Makabuhay	Leaves	Decoction	Tea	2/D
Banaba	Leaves	Decoction	Tea	2/D
Duhāt	Leaves	Decoction	Tea	1/D
Mangosteen	Fruit	Decoction	Tea	1/D
Chico	Leaves	Decoction	Tea	1/D

\*3/D-three time a day; 2/D-two time a day; 1/D-once a day

## 4. Conclusion and Recommendation

The study of ethnobotanical profiling of plants as therapeutic agents is importance in addressing health problems. In this study the most commonly utilized plant for the treatment of diabetes was soursop and bitter gourd for hypertension. Drinking decocted leaves once up to three times a day are the most commonly method of preparation, administration, and dosage. These ethnobotanical data may provide a base to start the search for their potential as good antihypertensive and hypoglycemic drugs and provide clues for the development of new and better oral drugs for hypertension and diabetes.

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