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## Ethnobotany and physiological review on folkloric medicinal plants of the Visayans in Ipil and Siay, Zamboanga Sibugay, Philippines

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### Abstract

Medicines tend to be expensive and oftentimes inaccessible; however, local inhabitants such as the Visayans are resourceful enough to utilize plants as an alternative medicine (commonly called "*Binisayang tambal*"). *Binisayang tambal* practice serves as the local primary health care especially in rural areas and patients claimed that it is effective. Documentation of this alternative medicinal practice is necessary since this is just being passed on from generations to another orally but is never scientifically documented. Herein, an ethnobotanical study and physiological review on folkloric medicinal plants among the Visayans in Ipil and Siay, Zamboanga Sibugay were conducted. A snowball sampling method was utilized to interview 30 key informants from Siay and 1 known Visayan herbalist in Ipil, Zamboanga Sibugay, Philippines. Results revealed fifty (50) medicinal plants belonging to 32 Families which are utilized by the Visayans to treat different ailments. *Blumea balsamifera* (sambong) of the Family Asteraceae emerged as the frequently answered plant used in treating cough, colds and fever, "*panuhot*" and "*piang*" (fracture or dislocation of nerves or tissues). Other commonly treated diseases using medicinal plants include "*bughat*" (physical relapse). Culturally unique to Visayans is the practice of "*toob*" in treating diseases especially during fever which utilizes smoke from certain medicinal plants and inhaled by the patient in a closed compartment. Ethnobotanical knowledge in the municipality of Ipil and Siay is still conventional and lineages gave notable contribution for exhibiting actual records of these plants for conservation of their culture and practices for the utilization of the next generation.

**Keywords:** Ethnobotany, medicinal plants, snowball sampling, Ipil, Siay

### 1. Introduction

Medicinal plants have helped the human existence especially in the developing countries like the Philippines by providing natural remedies to common diseases such as cold, cough, flu, and skin infections <sup>[1-3]</sup>. Ethnobotany, the science of utilizing these medicinal plants by local peoples <sup>[4]</sup>, has currently led to a resurgence of scientific interest in treating diseases since it is safe, effective, and inexpensive <sup>[5]</sup>. According to World Health Organization <sup>[6]</sup>, 80% of the population in some Asian and African countries depends on traditional medicine as their primary health care due to economic and geographical constraints. The Department of Science and Technology – Philippine Council for Health Development Program <sup>[7]</sup> in the Philippines recognizes this through emphasizing it in their research priority areas by evaluating the health benefits and safety of these medicinal plants beyond its basic nutrient function and components which reduces the risk of respective disease occurrence.

Philippines is an archipelagic country where cultural and biological diversity abound with approximately 1,100 known medicinal plants <sup>[8]</sup>. The majority of the people in the Philippines are of Malay descent, consisting of different ethnic groups. These ethnic tribes despite the evolutionary development have managed to keep their cultural aspects such as ethnobotany <sup>[9]</sup>. The *Bisaya* people or Visayans are a group of Austronesian people who originate from the central and southern regions of the Philippines. The sole reason why there are also many Visayan tribe in Mindanao because some of them migrate from one place to another to look for livelihood and government-sponsored resettlement programs in Mindanao during the 1940's. Historically, due to the fluidity of migration these days, *Bisaya* term may refer to the one who comes from Mindanao – not born or raised in the Visayas but speaks any of the Visayan languages like Ilonggo, Waray or Cebuano <sup>[10]</sup>.

*Binisayang tambal* is a way of differentiating the practiced medicines of the group from the Western Medicine. This practice serves as the local primary health care especially in rural areas and patients claimed that it is effective. Even as the government gears for the implementation of the Universal Health Care Law, the Department of Health <sup>[11]</sup> is pushing for the rational and

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safe use of traditional and alternative healthcare methods. Documentation of this alternative medicinal practice is necessary since this is just being passed on from generations to another orally but is never scientifically documented [12]. Hence, this study was conceptualized which generally aimed to conduct ethnobotany and physiological review on folkloric medicinal plants among the Visayans in Ipil and Siay, Zamboanga Sibugay, Mindanao, Philippines.

## 2. Materials and Methods

### 2.1 Site Selection

The research sites are purposively chosen due to the reported widespread use of *binisayang tambal*. These are the Municipalities of Ipil and Siay, in the 2<sup>nd</sup> district and eastern part of Province of Zamboanga Sibugay. Zamboanga Sibugay is a province in the Philippines located in the Zamboanga Peninsula region in Mindanao. Its capital is Ipil while Siay is 38 kilometers away from Ipil (Fig. 1).



Fig 1: Map showing the research sites.

### 2.2 Data gathering

Data gathering was conducted in the research sites through a semi-constructed questionnaire to obtain the information regarding the ethnomedicinal plants used in the community. A snowball sampling method was used to select key informants that could help gain information and data, starting from one person to another, until it reaches the 30<sup>th</sup> respondents in Siay, Zamboanga Sibugay. A known herbalist from the nearby town of Ipil, Zamboanga Sibugay was also purposively chosen for being well-known herbalist in the nearby municipalities. Prior to the interview proper, the researchers asked permission from the barangay captain to formally conduct the data gathering from the key informants. A free, prior informed consent was also obtained from each of the key informant. An ethics clearance from the Western Mindanao State University-Research Ethics Oversight Committee (WMSU-REOC) was also obtained. A series of questions related to medicinal plants, was asked to the respondents; such as the basic information of the plants (physical characteristics, its common name) as well as its effectiveness were thoroughly asked. Inclusion criteria involved those of legal age (18 years old up) regardless of their gender and educational attainment. At least one year of utilizing herbal medicines is also required before they can be considered as key informant. Photographs of the plant habit and different parts were also taken to serve as voucher specimen for the WMSU Mini-Herbarium.

### 2.3 Physiological Review

A physiological review was conducted to further validate the data obtained from the key informants with the use of published researches related to ethnobotany, bioactivities, and active isolates of each medicinal plant.

## 3. Results and Discussion

Traditional healers are found in most societies [13]. They are often part of a local community, culture and tradition, and continue to influence on local health practices. Traditional medical knowledge of medicinal plants and their use by traditional healers are not only useful for the conservation of cultural traditions and biodiversity but also for community healthcare and drug development in the present and future [14]. Figure 2 shows the actual study site in Siay, Zamboanga Sibugay (left) and the known traditional healer from Ipil, Zamboanga Sibugay (left) and “*binisayang tambal*” ritual and practice (right).



Fig 2: The actual community in Siay, Zamboanga Sibugay (left) and the known traditional healer from Ipil, Zamboanga Sibugay during the “*binisayang tambal*” ritual and practice (right).

In terms of the demographic profile of the key respondents from Ipil and Siay, 6 are males and 25 are females with age ranging from 19-65 years old. Table 1 shows the comprehensive summary of the medicinal plants as well as the physiological review of folkloric medicinal plants among the Visayans in Ipil and Siay, Zamboanga Sibugay.

**Table 1:** Medicinal plants utilized by the Visayans of Ipil and Siay, Zamboanga Sibugay and systematic review of each folkloric medicinal plants.

| Family/<br>Scientific Name<br>(Incl. Author) | Com-mon<br>Name<br>(local +<br>English) | Indige-nous<br>name (Visa-<br>yan) | Plant part<br>used     | Mode of Prepara-tion                                                                                     | Folklo-ric Use                                                                               | Research done by institu-tion                                             | Review of Related Literature                                                                      |                                                                                                                       |
|----------------------------------------------|-----------------------------------------|------------------------------------|------------------------|----------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|---------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|
|                                              |                                         |                                    |                        |                                                                                                          |                                                                                              |                                                                           | Bio-activities                                                                                    | Active isolates                                                                                                       |
| Annonaceae                                   |                                         |                                    |                        |                                                                                                          |                                                                                              |                                                                           |                                                                                                   |                                                                                                                       |
| <i>Annona muricata</i>                       | Guya-bano                               | Guya-bano                          | Leaves                 | Heat leaves then apply directly to forehead;<br>Decoction                                                | Head-ache;<br>High blood                                                                     | University of Malaya <sup>[15]</sup>                                      | Anti-oxidant, inflam-matory, anti-diabetic, hypolipidemic, anti-cancer                            | alkaloid; annona-ceousacetogenin, flavonol, triglycosidephenoli-cyclo-peptide                                         |
| Apiaceae                                     |                                         |                                    |                        |                                                                                                          |                                                                                              |                                                                           |                                                                                                   |                                                                                                                       |
| <i>Angelica keiskei</i>                      | Ashita-ba                               | Asetaba                            | Leaves                 | Decoction                                                                                                | Use for aching of hips,<br>UTI                                                               | University of North Carolina <sup>[16]</sup>                              | Cytotoxic, anti-diabetic anti-obesity, anti-oxidant, anti-inflamma-tory                           | prenylatedchalcones, linear and angular coumarins, and flavanones.                                                    |
| <i>Centella asiatica</i>                     | Penny-worth                             | gotu kola                          | Leaves                 | Extraction                                                                                               | Wounds                                                                                       | <sup>[17]</sup>                                                           | Wound healing and vascular effects by inhibiting the production of collagen at the wound site     | saponins                                                                                                              |
| Arecaceae                                    |                                         |                                    |                        |                                                                                                          |                                                                                              |                                                                           |                                                                                                   |                                                                                                                       |
| <i>Cocos nucifera</i>                        | Coconut                                 | Butong                             | Flesh and the juice    | Direct eating and drinking                                                                               | Detoxi-fying, for UTI                                                                        | <sup>[18]</sup>                                                           | Antioxi-dant, anti-inflam-matory                                                                  | phenols, flavonoids, glycosides, tannins, alkaloids, and saponins                                                     |
| <i>Corypha umbraculi-fera</i>                | Talipot palm                            | buli                               | Roots                  | Root Juice Extraction                                                                                    | Diarrhea                                                                                     | Flora of China, <sup>[19]</sup>                                           | Antimicro-bial                                                                                    | Myristic, palmitic, oleic, linoleic, stearic, arachidic and lignoceric acids in its oils                              |
|                                              |                                         |                                    |                        | Young Stems                                                                                              | Rheuma-tism                                                                                  |                                                                           | Inflam-matory                                                                                     |                                                                                                                       |
| Asteraceae                                   |                                         |                                    |                        |                                                                                                          |                                                                                              |                                                                           |                                                                                                   |                                                                                                                       |
| <i>Artemisia vulgaris</i> Linn.              | Com-mon mug-wort / herbaka              | Hilbas                             | Leaves                 | Dried and use as a tea                                                                                   | Pain relief; fever; hypertension                                                             | <sup>[20]</sup>                                                           | Analgesic; Hyperlipi-demicActivitiy                                                               | terpenoids, flavonoids, coumarins, caffeoyl-quinic acids, sterols and acetylenes                                      |
| <i>Blumea balsamifera</i>                    | Sam-bong                                | Gabon                              | Leaves                 | Pound the leaves then drink the extract;<br>The extract is rubbed on the tummy/ aching parts of the body | High fever, cough, UTI, Stomach ache, body pain, <i>panuhot</i> , aching due to <i>piang</i> | Chinese Academy of Tropical Agricul-ture Sciences <sup>[21]</sup>         | Anti-tumor, hepato-protective, anti-oxidant, anti-microbial and anti-inflam-matory, wound healing | mono-terpenes, sesqui-terpenes, diterpenes, flavonoids, organic acids, esters, alcohols, dihydro-flavone, and sterols |
| <i>Emilia sonchifolia</i>                    | Tassel-flower                           | Pisaw-pisaw                        | Leaves                 | Decoction<br>Get the extract then drink it.                                                              | Cough, colds, kid’s fever                                                                    | Oklahoma Medical Research Foun-dation <sup>[22]</sup>                     | Anti-inflam-matory and analgesic                                                                  | Flavonoids, flavone, anthocya-nin, flavonol, isoflavone, anti-histamine, anti-inflamma-tory, analgesic                |
| <i>Pseudelephantopus spicatus</i>            | Sigang-dagat                            | Kukugbanog                         | Roots, stem and leaves | Decoction                                                                                                | Hyper-acidity                                                                                | <sup>[23]</sup>                                                           | Anti-Acne, Anti-oxidant and Cytotoxic                                                             | hydroxyl groups, phenolic compound, flavonoids and tannins                                                            |
| Bignoniaceae                                 |                                         |                                    |                        |                                                                                                          |                                                                                              |                                                                           |                                                                                                   |                                                                                                                       |
| <i>Crescentia cujete</i>                     | Com-moncala-bash tree                   | cala-bash tree                     | Fruit Leaves           | Direct Eating; Decoction; Juice Extraction<br>Decoction                                                  | diarrhea, cold, bronchitis, cough, asthma, and urethritis<br>Hyper-tension                   | Mindanao State University-Main Campus, Marawi City, Phil. <sup>[24]</sup> | anti-bacterial, anti-diabetic                                                                     | alkaloids, cardiac glycosides, flavonoids, phytosterol, reducing sugars, saponins, tannins, and triterpenes           |
| Cardiopteridaceae                            |                                         |                                    |                        |                                                                                                          |                                                                                              |                                                                           |                                                                                                   |                                                                                                                       |
| <i>Citronella mucronata</i>                  | Citro-nella                             | Citro-nella                        | Leaves                 | Get the extract and mix it with coconut oil then apply it to affected areas (use as a lotion)            | dandruff; ring-worm                                                                          | <sup>[25]</sup>                                                           | Anti-inflam-matory, anti-cancer, anti-oxidant, anti-prolifera-tive, anti-microbial                | Citral, vitro on 5-lipoxygenase, caspase-3, a- and b- unsaturated aldehyde groups; essential oils                     |
| Convolvulaceae                               |                                         |                                    |                        |                                                                                                          |                                                                                              |                                                                           |                                                                                                   |                                                                                                                       |
| <i>Ipomoea batatas</i>                       | Camote                                  | Kamote tops                        | Leaves stem            | Decoction, eat as viand                                                                                  | UTI, High blood                                                                              | Indone-sian Institute of Sciences <sup>[26]</sup>                         | Anti-oxidant                                                                                      | Flavonoids, phenols                                                                                                   |
| Costaceae                                    |                                         |                                    |                        |                                                                                                          |                                                                                              |                                                                           |                                                                                                   |                                                                                                                       |

|                             |                 |               |                        |                                                                                                                                                      |                                                                                    |                                                                                                |                                                                                                             |                                                                                                                    |
|-----------------------------|-----------------|---------------|------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|
| <i>Costus igneus</i>        | Insulin plant   | Insulin plant | Leaves and shoots      | Wash the leaves and shoots then directly consume it                                                                                                  | Diabetes, anemia, stroke, high blood                                               | Manjuna-theswara College of Ayurveda and Hospital <sup>[27]</sup>                              | Anti-oxidant, anti-diabetic, hypolipidemic, diuretic, anti-microbial                                        | triterpenoidalkaloids, tannins, saponins, flavonoids, steroid, and appreciable amounts of trace elements           |
| Cucurbitaceae               |                 |               |                        |                                                                                                                                                      |                                                                                    |                                                                                                |                                                                                                             |                                                                                                                    |
| <i>Momordica charantia</i>  | Bitter melon    | ampa-laya     | fruit                  | Cooking; part of the viand                                                                                                                           | Diabetes                                                                           | <sup>[28]</sup>                                                                                | anti-diabetic and hypogly-caemic effect                                                                     | triterpene, proteid, steroid, alkaloid, inorganic, lipid, and phenolic compounds                                   |
| Cyperaceae                  |                 |               |                        |                                                                                                                                                      |                                                                                    |                                                                                                |                                                                                                             |                                                                                                                    |
| <i>Kyllinga monocephala</i> | bosikad         | bosikad       | Stem and leaves        | Soaking in water during night time and drink the water morning time                                                                                  | Head-ache, muscle pain, fever                                                      | University of the Philip-pines <sup>[29]</sup>                                                 | Analgesic                                                                                                   | flavonoids, tannins & phenolic compounds                                                                           |
| Euphorbiaceae               |                 |               |                        |                                                                                                                                                      |                                                                                    |                                                                                                |                                                                                                             |                                                                                                                    |
| <i>Jatropha curcas</i>      | <i>Jatropha</i> | Tuba- tuba    | Leaves                 | Pound and use like a bandage or is directly applied on skin like a liniment                                                                          | Fractured bone, body ache                                                          | <sup>[30]</sup>                                                                                | anti-inflam-matory                                                                                          | flavonoids, saponins and tannins                                                                                   |
| <i>Euphorbia hirta</i>      | Tawa-tawa       | Man-gaw-ngaw  | Leaves                 | Decoction                                                                                                                                            | High fever caused by dengue                                                        | Graduate School, Polytechnic Univ. of the Philip-pines, Manila, Philip-pines <sup>[31]</sup>   | Cytotoxi-city and Antimicrobial Property                                                                    | alkaloids and tannins                                                                                              |
| Fabaceae                    |                 |               |                        |                                                                                                                                                      |                                                                                    |                                                                                                |                                                                                                             |                                                                                                                    |
| <i>Gliricidia sepium</i>    | Madre de cacao  | Kaka-wate     | Leaves Leaves          | Decoction<br>Pound the leaves, add vinegar then rub all over the body                                                                                | <i>Panuhot</i> ,<br>Con-vulsion due to high fever                                  | Post Graduate Department and Research Centre of Botany, Mahatma Gandhi College <sup>[32]</sup> | Anti-oxidants and anti-microbial properties                                                                 | glycosides, phytoste-rols, alkaloids, oils, saponins, phenols and flavanoids                                       |
| <i>Mimosa pudica</i>        | Touch-me-not    | Maka-hiya     | Leaves and roots       | Decoction                                                                                                                                            | UTI                                                                                | National Institute of Technolo-gy and Manage-ment, India <sup>[33]</sup>                       | Antiasth-matic, aphrodi-siac, analgesic, and anti-depressant                                                | alkaloids, non-protein amino acid (mimosine)flavonoids C-glycosides, sterols, terpenoids, tannins, and fatty acids |
| <i>Tamarindus indica</i>    | Tama-rind       | sambag        | Fruit & Leaves         | Extraction/direct eating                                                                                                                             | Gastro-intes-tinal system and related disorders                                    | <sup>[34]</sup>                                                                                | Anti-diabetic, anti-microbial, anti-venomic, anti-oxidant, laxative &amelio-rative                          | Essential amino acids, potassium, malic acid and tartaric acid                                                     |
| Guttiferae                  |                 |               |                        |                                                                                                                                                      |                                                                                    |                                                                                                |                                                                                                             |                                                                                                                    |
| <i>Garcinia mangostana</i>  | Mango-steen     | Mango-stan    | Pee-lings of the fruit | Decoction                                                                                                                                            | Stomach- ache                                                                      | US National Library of Medicine National Institutes of Health <sup>[35]</sup>                  | Anti-oxidant, anti-prolifera-tive, pro-apoptotic, anti-inflamma-tory, anti-carcinoge-nic and anti-microbial | xanthoness, flavonoids, triterpenoidandbenzo-phenones                                                              |
| Lamiaceae                   |                 |               |                        |                                                                                                                                                      |                                                                                    |                                                                                                |                                                                                                             |                                                                                                                    |
| <i>Gmelina arborea</i>      | Gamhar          | Gemeli-na     | Leaves Leaves          | Heat leaves then apply directly to forehead<br>Decoction                                                                                             | Head-ache<br>fractured bone and inflamed/swelling part of the body, <i>Panuhot</i> | <sup>[36]</sup>                                                                                | antibacterial, antioxidant and antidiabetic activities                                                      | ethanol, n-butanol, ethyl acetate                                                                                  |
| <i>Origanum vulgare</i>     | Orega-no        | Orega-no      | Leaves                 | Boil the leaves then add sugar to become a syrup                                                                                                     | Cough                                                                              | <sup>[37]</sup>                                                                                | Anti-microbial activity                                                                                     | methanol, dichlorme-thane and cyclo-hexane, phenolic compounds                                                     |
| <i>Coleus blumei</i>        | <i>Coleus</i>   | Mayana        | Leaves                 | Decoction                                                                                                                                            | Cough                                                                              | University of the Philippi-pines Diliman <sup>[38]</sup>                                       | analgesic, anti-inflam-matory and antimicro-bial                                                            | analgesic, anti-inflam- matory and antimicro-bial                                                                  |
| Lauraceae                   |                 |               |                        |                                                                                                                                                      |                                                                                    |                                                                                                |                                                                                                             |                                                                                                                    |
| <i>Cinnamo-mum mercadoi</i> | Cinna-mon       | Litik-litik   | Shoots                 | Get the extract and filter it, then drink<br>Cover the leaves with banana leaves, place it in a mild fire then get the extract from it;<br>Decoction | Cough for kids                                                                     | <sup>[39]</sup>                                                                                | Anti-oxidant, anti-bacterial                                                                                | 1,1-diphenyl-2-picrylhydrazyl (DPPH)- radical scavenging, phenols                                                  |
| <i>Persea americana</i>     | Avoca-do        | Avoca-do      | Leaves                 | Decoction                                                                                                                                            | LBM, Diarrhea, stomach ache                                                        | College of Agricultu-ral Sciences, USA                                                         | phenolic acids, condensed tannins, and flavonoids, antioxidant and anti-                                    | Ethanol, phenolic compounds                                                                                        |

|                                   |                    |             |                    |                                                                                                          |                                                               |                                                                                              |                                                                                                                                 |                                                                                                                                                                                         |
|-----------------------------------|--------------------|-------------|--------------------|----------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|----------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                   |                    |             |                    |                                                                                                          |                                                               | [40]                                                                                         | inflamma-tory                                                                                                                   |                                                                                                                                                                                         |
| Lecythidaceae                     |                    |             |                    |                                                                                                          |                                                               |                                                                                              |                                                                                                                                 |                                                                                                                                                                                         |
| <i>Barringtonia asiatica</i>      | Fish poison tree   | bitoon      | Leaves             | heated and externally applied                                                                            | Stomach-ache, rheumatism, wounds                              | [41]                                                                                         | Anti-microbial; Analgesic                                                                                                       | amides, alkaloids, lignans, flavones                                                                                                                                                    |
| Lythraceae                        |                    |             |                    |                                                                                                          |                                                               |                                                                                              |                                                                                                                                 |                                                                                                                                                                                         |
| <i>Lagers-troemia speciosa</i> L. | banaba             | banaba      | Leaves             | Decoction                                                                                                | Diabetes mellitus                                             | [42]                                                                                         | Anti-diabetic activity                                                                                                          | corosolic acid                                                                                                                                                                          |
| Malvaceae                         |                    |             |                    |                                                                                                          |                                                               |                                                                                              |                                                                                                                                 |                                                                                                                                                                                         |
| <i>Corchorus olitorius</i>        | Jute mallow        | Saluyot     | Leaves             | Get the leaves and dry it. After drying, pour hot water to the dried leaves like a tea                   | High blood                                                    | [43]                                                                                         | Anti-cancer, Anti-oxidant, Anti-inflam-matory, analgesic and antipyretic, Antimicrobial                                         | Polyphe-nols, butanol extract and ethyl acetate extract, coumaric acid, ferulic, vanillic, hydroxyl-benzoic, vanillic acids                                                             |
| Menispermaceae                    |                    |             |                    |                                                                                                          |                                                               |                                                                                              |                                                                                                                                 |                                                                                                                                                                                         |
| <i>Tinospora cordifolia</i>       | Maka-buhay         | Panya-wan   | Leaves             | Get the extract then mix it with candle wax to make it like an ointment, then massage the body using it. | Arthritis, skin allergies, high blood, stroke                 | [44]                                                                                         | anti-inflam-matory, anti-oxidant, immune-modula-tory, cytotoxic, anti-malarial, cardio-protective, and anti-diabetic activities | alkaloids, flavonoids, and flavone glycosides, triterpenes, diterpenes, diterpene glycosides, <i>cis</i> clero-danetype furanoditerpenoids, lactones, sterols, lignans, and nucleosides |
| Moraceae                          |                    |             |                    |                                                                                                          |                                                               |                                                                                              |                                                                                                                                 |                                                                                                                                                                                         |
| <i>Ficus septica</i>              | lagnob             | lagnob      | Leaves             | Fresh leaves bruised with oil                                                                            | Head-ache and rheuma-tism                                     | De La Salle Univer-sity [45]                                                                 | Cytotoxic                                                                                                                       | $\beta$ -Sitosteryl-3 $\alpha$ glucopyranoside-6'-O-palmitate                                                                                                                           |
| Moringaceae                       |                    |             |                    |                                                                                                          |                                                               |                                                                                              |                                                                                                                                 |                                                                                                                                                                                         |
| <i>Moringa oleifera</i>           | Horse raddish tree | malung-gay  | Leaves             | Decoction through viand                                                                                  | Hyper-choleste-rolemia, high blood pressure, diabetes, cancer | [46]                                                                                         | Anti-inflam-mation, cytotoxic                                                                                                   | vitamins, phenolic acids, flavonoids, isothiocyanates, tannins and saponins                                                                                                             |
| Myrtaceae                         |                    |             |                    |                                                                                                          |                                                               |                                                                                              |                                                                                                                                 |                                                                                                                                                                                         |
| <i>Psidium guajava</i>            | Guava              | Bayabas     | Leaves Shoots      | Decoction Pound the leaves the directly place on skin                                                    | LBM Wounds                                                    | [47]                                                                                         | Antimicro-bial, anti-bacterial                                                                                                  | tannins, triterpenes, flavonoids, resin, eugenol, malic acid, fat, cellulose, chloro-phyll, mineral, salts                                                                              |
| <i>Syzygium cumini</i>            | duhat              | lumboy      | Fruits/seeds       | Direct eating                                                                                            | Type II Diabetes                                              | [48]                                                                                         | Diastatic conversion of starch into sugar                                                                                       | Antho-cyanins, glucoside, alkaloid, jambosine, and glycoside jambolin or antimellin                                                                                                     |
| Oxalidaceae                       |                    |             |                    |                                                                                                          |                                                               |                                                                                              |                                                                                                                                 |                                                                                                                                                                                         |
| <i>Averrhoa carambola</i>         | Star fruit         | Balim-bing  | Fruits             | Direct eating; Juice extraction                                                                          | chronic head-ache, fever, cough, gastro-enteritis             | [49]                                                                                         | Anti-oxidant; anti-inflam-matory; anti-microbial                                                                                | oxalate, which is hazardous for uremic patients, and caramboxin (CBX), saponins, flavonoids, alkaloids and tannins                                                                      |
| Pandanaeae                        |                    |             |                    |                                                                                                          |                                                               |                                                                                              |                                                                                                                                 |                                                                                                                                                                                         |
| <i>Pandanus amaryllifolius</i>    | Pandan             | Pandan      | Leaves             | Decoction                                                                                                | High blood, pain reliever                                     | Kaoh-siung Medical University [50]                                                           | Anti-oxidant, anti-inflam-matory                                                                                                | Panda-marine B and pandali-zines C and D                                                                                                                                                |
| Piperaceae                        |                    |             |                    |                                                                                                          |                                                               |                                                                                              |                                                                                                                                 |                                                                                                                                                                                         |
| <i>Peperomia pellucida</i>        | Pansit-pansitan    | Sinaw-sinaw | Whole plant Leaves | Decoction; Gently pound the leaves then place directly on wounds or affected areas                       | Chafing fever, Any type of wounds                             | [51]                                                                                         | Antimicro-bial, anti-oxidant, anti-angio-genic, anti-inflam-matory, analgesic,                                                  | alkaloids, flavonoids, saponins, terpenoids, steroids and glycosides                                                                                                                    |
| Poaceae                           |                    |             |                    |                                                                                                          |                                                               |                                                                                              |                                                                                                                                 |                                                                                                                                                                                         |
| <i>Cymbopo-gon citratus</i>       | Lemon grass        | Tanglad     | Whole plant        | Decoction or mix it on vegetable soup to taste better                                                    | Joints and body aches, headache                               | Biotech-nology Engi-neering Depart-ment, Interna-tional Islamic University Malaysia [52, 53] | Anti-oxidant, anti-inflam-matory, anti-bacterial, anti-obesity, analgesic activity                                              | polyphenol rich extractants and citral isolate, lipid and essential oil and polyphenol fractions                                                                                        |
| <i>Eleusine indica</i>            | Paragis            | Bila-bila   | Whole plant        | Decoction                                                                                                | High blood and fever                                          | [54]                                                                                         | Antibiotic and anti-cancer                                                                                                      | saponins, cyanogenic glycosides,                                                                                                                                                        |

|                                   |                  |               |                  |                                                                                                        |                                                 |                                                                                           |                                                                                   |                                                                                                                           |
|-----------------------------------|------------------|---------------|------------------|--------------------------------------------------------------------------------------------------------|-------------------------------------------------|-------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|
|                                   |                  |               | Roots            | Decoction                                                                                              | Body ache and <i>bughat</i> (after child birth) |                                                                                           |                                                                                   | unsaturated lactones and glucosino-lates                                                                                  |
| <i>Saccharum officinarum</i>      | Sugar-cane       | Tubo          | Old stem         | Peel the hard part of the stem then chew and sip the fleshy juice/ extract                             | Liver condition (jaun-dice)                     | Department of Pharmacognosy, Khalsa College of Pharmacy, Amritsar, India <sup>[55]</sup>  | anti-inflammatory, analgesic, anti-hyperglycemic, diuretic, and hepato-protective | Fatty acid, alcohol, phytosterols, higher terpenoids, flavonoids, glycosides, and phenolic acids                          |
| <i>Zea mays</i>                   | Corn             | Bugas mais    | Hairs/Cobs       | Decoction and drink as a tea                                                                           | UTI                                             | <sup>[56]</sup>                                                                           | diuretic                                                                          | maizeric acid, resin; sugar                                                                                               |
| Polypodiaceae                     |                  |               |                  |                                                                                                        |                                                 |                                                                                           |                                                                                   |                                                                                                                           |
| <i>Asplenium</i> sp.              | Bird's nest fern | kabka-bon     | Frond extract    | Infusion/ Decoction                                                                                    | Labor pains; <i>bughat</i> (physical relapse)   | <sup>[57]</sup>                                                                           | Anti-cancer, Anti-oxidant, Antimicrobial                                          | Flavonoids                                                                                                                |
| Rutaceae                          |                  |               |                  |                                                                                                        |                                                 |                                                                                           |                                                                                   |                                                                                                                           |
| <i>Citrofortunella microcarpa</i> | Cala-mansi       | Lemon-sito    | Fruit            | Get the fruit extract by squeezing it and add a little bit of water then drink it                      | Cough and colds                                 | Department of Natural Sciences, San Beda College, Manila, Philip-pines <sup>[58]</sup>    | Hypo-lipidemic, hypoglycemic, and anti-oxidative                                  | ascorbic acid, citric acid, flavonoid, calamondin                                                                         |
| Sapotaceae                        |                  |               |                  |                                                                                                        |                                                 |                                                                                           |                                                                                   |                                                                                                                           |
| <i>Chrysophyllum cainito</i>      | Star apple       | Caimito       | Leaves           | Decoction                                                                                              | LBM, diarrhea                                   | Department of Biological Sciences, Lehman College and The Graduate Center <sup>[59]</sup> | Antioxidant, anti-inflammatory, hypotensive and anti-microbial                    | Polyphenolic anti-oxidants; quercetin, myricitrin, garlic acid                                                            |
| <i>Synsepalum dulcificum</i>      | Miracle fruit    | Miracle fruit | Fruits           | Eat the fruit                                                                                          | UTI, High blood, diabetes                       | Shenzhen Polytechnic <sup>[60]</sup>                                                      | Anti-oxidant, glucose-dase inhibition                                             | Acarbose, MFP-S, MFP-L, polysaccharides                                                                                   |
| Solanaceae                        |                  |               |                  |                                                                                                        |                                                 |                                                                                           |                                                                                   |                                                                                                                           |
| <i>Solanum melongena</i>          | Egg-plant        | Talong        | Shoots           | Get the extract by pounding then put some salts on the wound before placing the extract on it directly | Tetanus                                         | Jahangirnagar University <sup>[61]</sup>                                                  | Anti-bacterial activity, cytotoxicity and antioxidant                             | Carbohydrates, phenolic glycosides and weak presence of alkaloids, flavonoids, tannins, terpenoids, steroids and saponins |
| <i>Capsicum frutescens</i>        | Red pepper       | sili          | fruit            | Crush fruit, mix with oil and apply on affected part.                                                  | Pains; rheumatism; arthritis                    | <sup>[62]</sup>                                                                           | Anti-oxidant, analgesic                                                           | capsaicin, carotenoids lutein, ascorbic acid                                                                              |
| Urticaceae                        |                  |               |                  |                                                                                                        |                                                 |                                                                                           |                                                                                   |                                                                                                                           |
| <i>Urtica dioica</i>              | Stinging nettle  | Aligatong     | Leaves and roots | Decoction                                                                                              | For some cancer ailments                        | Institute of General and Physical Chemistry <sup>[63]</sup>                               | Anti-oxidant, anti-microbial, anti-inflammatory, antiviral, anti-ulcer            | essential amino acids, fatty acids, carotenoids, terpenoids, poly-phenolic compounds                                      |
| Zingiberaceae                     |                  |               |                  |                                                                                                        |                                                 |                                                                                           |                                                                                   |                                                                                                                           |
| <i>Curcuma longa</i>              | Turmeric         | Dulao         | Rhizomes Leaves  | Decoction Pound the leaves then apply directly on affected areas                                       | Diarrhea, De-toxifying Wounds                   | <sup>[64]</sup>                                                                           | Anti-microbial, anti inflammatory, antioxidant, anti-cancer activity              | Polyphenolic compounds collectively known as curcuminoids                                                                 |
| <i>Zingiber officinale</i>        | Ginger           | Luy-a         | Leaves Rhizome   | Decoction Decoction                                                                                    | Diarrhea, Hypertension, cough and stomach ache  | Hong Kong Polytechnic University <sup>[65]</sup>                                          | Anti-oxidative, anti-inflammatory and anti-cancer                                 | Phenolics and flavonoids                                                                                                  |

Results revealed fifty (50) medicinal plants belonging to 32 Families which are utilized by the Visayans to treat different ailments. *Blumeabalsamifera* from the Family Asteraceae emerged as the frequently answered plant used in treating cough, colds and fever through decoction. Most of the species are in conjunction with the study of Morilla *et al.* <sup>[66]</sup> which accordingly proven already to contain various chemical compounds and metabolites that are known to have medicinal properties. Physiological review from the different published researches reveals significant bioactivities and important bioisolates which are necessary for further researches.

Furthermore, the use of leaves were abundantly utilized by the Visayan people in making herbal medicines since it is the part of the plant that is easily collected and stored. As supported by the works of Morilla *et al.* <sup>[66]</sup>, the leaves are the sites of the production and storehouse of many chemical compounds through photosynthesis that generates important phytochemicals for effective healing ability like the tannins, alkaloids and flavonoids.

Decoction is the most common process in preparing herbal medicines. This preparation involves the boiling of the plant materials for an extended period of time so the hard material of the plants will soften and release its active components.

Other mode of preparation includes extraction, direct intake, direct application on skin such as applying as liniment and sun drying the leaves afterwards pouring hot water to it similar to the preparation of a tea drink.

The localities believed that plants have a substantial contribution to the lives of the people and it signifies a dominant role in the well-being of the global population. Most of the people are aware of the importance of plants and are constantly gaining knowledge on how to use these as a remedy to different ailments and diseases. This is supported by the World Health Organization (WHO) <sup>[6]</sup> that the practice of herbal medicines in treating diseases still poses a great impact on the health of the people across the globe.

According to Morilla *et al.* <sup>[66]</sup>, indigenous people around the world have conserved and preserved knowledge on the utilization of the different plants for ethnobotanical health practices. In the Philippines, knowledge on traditional medicine is being passed on by their forefathers through performing it visually and linguistic communication. Visayans (“*Bisaya*”) people having migrated from one place to another since 1940’s has established its unique practice of traditional healing called “*binisayang tambal*”.

*Binisayang tambal* practice serves as the local primary health care especially in rural areas and patients claimed that it is effective <sup>[12]</sup>. In this study, Visayans from the different barangays of the municipalities of Siay and Ipil used various plants to treat different kind of illness like diarrhea, high blood, severe cough, stomach ache, diabetes, UTI, fever, serious ailments like cancer and many more.

Physical relapse or termed as “*bughat*” is also the commonly cited illness cured through medicinal plants. This is usually felt by women who performed a heavy physical activity heavily after giving birth. The woman suffering from “*bughat*” feels weak, very tired, and sometimes has flue-like symptoms. According to Millondaga <sup>[67]</sup>, “*bughat*” is often perceived as a natural reaction of women to pregnancy and childbirth in some rural areas of the Philippines. However, by considering the word “*relapse*”, this refers to the recurrence of the disease that was in remission state already. It also refers to the state of deterioration of health after recovering. “*Panuhot*” is another illness reported by the Visayans which occurs when wind enters the body’s nerves and tissues,

causing pain and swelling in areas where air has consolidated <sup>[68]</sup>. “*Piang*” is a fracture or dislocation of nerves or tissues, affecting any part of the body brought about by a fall or mishandling which can accordingly result in a cough when occurred in the chest, the back, or underarm. Cold wind which could also enter the *piang* site can also cause cough; the condition is termed *gipanuhot ang piang* <sup>[68]</sup>.

Unique to the Visayans is the practice of “*toob*” especially during fever which utilizes smoke from certain medicinal plants and inhaled by the patient in a closed compartment. In the works of Bucol <sup>[69]</sup>, “*toob*” is practiced by a folk healers or herbolarios in Siquijor Island in Central Philippines as a means of curing toothache by utilizing the smoke and the medical ailments. However, the healing effect of “*toob*” is not yet scientifically explored.

#### 4. Conclusion and Recommendation

Ethnobotanical knowledge of medicinal plant species among the community of Visayans residing in the municipality of Siay and Ipil, Zamboanga Sibugay is still practiced and is passed on from generations to generations. Documentation of this ethnobotanical practice records fifty (50) important plant species belonging to thirty-two (32) Families. *Blumea balsamifera* (sambong) of the Family Asteraceae emerged as the frequently answered plant used in treating cough, colds and fever through decoction. All of the species exhibits significant bioactivities and active bioisolates based on the systematic review, which may lead for further researches.

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