



## CONSERVATION OF ETHNOMEDICINAL PRACTICES AND BELIEFS IN THE PHILIPPINES THROUGH SCIENCE EDUCATION

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### ABSTRACT

*The introduction of modernization and urbanization in the Philippines has imperiled ethnomedicinal practices and beliefs. It has drawn the carrier generation to the mainstream society, putting the transfer of this indigenous traditional knowledge at risk. Among studies documenting such knowledge, the relationship of the documentation of these practices and beliefs to science education has not yet been fully established. To fill in this gap, locally administered and decade-old published works were reviewed and thematically analyzed using an open coding procedure to identify the ethnomedicinal practices and beliefs in the main islands in the Philippines. The emerging themes for the ethnomedicinal practices are Mechanical, Thermal, and Chemical Preparations. Meanwhile, the derived themes for the ethnomedicinal beliefs are Psychological, Spiritual, and Ritual Beliefs. The educational brochure is titled "EthnoMediko" consists of curriculum alignment, activities, and guides to teachers to embed these practices and beliefs into their science instruction. Findings unveiled that the country's intangible heritage, such as these practices and beliefs, can be preserved by maximizing education as a propitious platform for the future generation.*

*Keywords: Ethnoscience, IPs, Luzon, Mindanao, traditional knowledge, Visayas*

### INTRODUCTION

One's health determines the roles and responsibilities that a human being can perform in day-to-day living. It is the aspect of humans that envelopes its adaptability to the fast-changing surroundings they belong. However, similar to other facets of a human being, it is vulnerable to reaching its feeblest point demanding health care. Embodied in the Sustainable Development Goal (SDG) #3, "Ensure healthy lives and promote well-being for all at all ages" (UN DESA, 2012), it is envisioned for every country to provide equitable health care and assistance regardless of condition (Barredo et al., 2014). This SDG includes the 476 million indigenous peoples (IPs) in over 90

countries worldwide who were reported to lack acknowledgment of their fundamental necessities and assistance (The World Bank, 2020). The prevalence of contemporary medicine and healthcare sets the limit to attain such assistance for IPs (Balangcod & Balangcod, 2011). Consequently, access to an adequate healthcare system among IPs remains a challenge brought about by proximity and economic concerns. In the Philippines, this results in IPs settling to the convenience in their ethnomedicinal beliefs and practices to attend to their medical needs (Ducusin, 2017).

Ethnomedicinal practices manifest their culture and tradition entwined with their connection with the natural environment (Balangcod &

Balangcod, 2018). The IPs optimize their access to these medicinal plants from the wilds and fields as their alternative medicinal system for their ethnographic groups for a long time (Balangcod & Balangcod, 2011, 2018; Cordero & Grecebio, 2021; Ducusin, 2017; Fiscal, 2017). The plant's leaves and roots are the most commonly used parts for ethnomedicinal practices, among others (Balangcod & Balangcod, 2011) aside from the stem, flowers, and fruits. These plant parts are prepared in various ways such as decoction, prepared as a poultice, bathing wash, pounding or crushing, and infusion, further themed as for internal and external administration (Balinado & Chan, 2017). These preparations can be done by the patient's family or by a traditional healer (Fiscal, 2017). Commonly, ethnomedicinal plants are used to cure respiratory and stomach ailments (Balangcod & Balangcod, 2011). The uses and verification of reported plants have been considered, and the Department of Health identified and approved ten herbal medicines with their corresponding preparation practices (Philippine Herbal Medicine, 2020).

Additionally, IPs resort to their ethnographic beliefs to cure other ailments. These beliefs were strongly influenced by their culture and traditions relevant to the supernatural beings (Balangcod & Balangcod, 2011). Rituals, ceremonials, sacrifices, and the use of body accessories are commonly the emerging beliefs that vary per ethnic group in the archipelago (Alduhisa & Demayo, 2019; Balangcod & Balangcod, 2011, 2018; Cordero & Grecebio, 2021; M. Dapar & Alejandro, 2020; M. L. G. Dapar et al., 2020b, 2020a).

The accumulated accounts of these ethnomedicinal practices and beliefs comprise the indigenous traditional knowledge of these ethnic groups (Balangcod & Balangcod, 2011). These reflect the diversity of the culture and the identity of the local communities they belong which were developed into an affluent set of knowledge (The World Bank, 2020; UN DESA, 2016). These beliefs and practices are ceded from the forefathers to the current generation through verbal communication (Balangcod & Balangcod, 2011, 2018; Balinado & Chan, 2017). However, the introduction of various indicators of modernization and urbanization in a

developing country as the Philippines has drawn the carrier generation to the mainstream society putting the transferring of this indigenous knowledge at risk (Ong & Kim, 2014). This traditional knowledge is nearly coming to its end from generation to generation (Fiscal, 2017). Numerous studies were done to address this concern, aiming to document these ethnomedicinal practices and beliefs across the country's diverse IPs. However, among these studies, the relationship of the documentation of these practices and beliefs to science education has not yet been established. The researchers envision the preservation of this indigenous knowledge to be supplemented by linking the relationship of these practices and beliefs to the Philippine science curriculum.

In the absence of such a knowledge source, this study aims to provide a literature review of ethnomedicinal studies on beliefs and practices of IPs in the Philippines and develop education infographics that contemporary educators can use. This target is in alignment to contribute to the country's interagency plan to preserve the culture of the Philippines, in general, through educational platforms for a more comprehensive action embedded in *The National Environmental Education Action Plan 2018-2040* (DENR, 2017).

To attain this goal, the researchers followed the conceptual framework shown in Figure 1. The study used the preservation of ethnomedicinal practices and beliefs as the precedent to provide a scientific concept explanation behind these. The latter was used to develop information graphics as a supplementary tool in the science teaching and learning process.

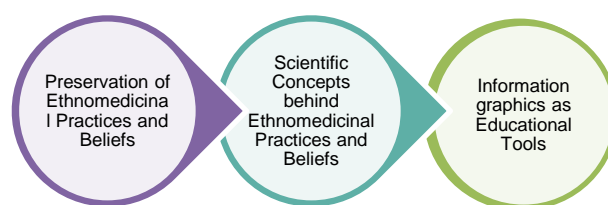


Figure 1. Conceptual framework of the study



## OBJECTIVES OF THE STUDY

The ultimate goal of the study was to provide a literature review of ethnomedicinal studies on beliefs and practices of IPs in the Philippines and develop education infographics that contemporary educators can use. Specifically, this study aimed to 1) provide a critical review of ethnomedicinal beliefs and practices among IPs from the main islands of the Philippines, 2) discuss scientific concepts behind ethnomedicinal beliefs and practices among IPs from the main islands of the Philippines, and 3) develop an information graphics of the ethnomedicinal beliefs and practices among IPs from the main islands of the Philippines.

## METHODOLOGY

The study followed a qualitative research design for a critical review. The research procedure was divided into two (2) significant sections: *Collating Studies* and *Classifying Studies*.

### Collating Studies

From the dearth of studies linking the preservation of ethnomedicinal practices and beliefs educational means, the researchers critically reviewed published works relevant to it. The implementation of quarantine has immobilized access to the public libraries in the country. Hence, the researchers resort to gathering published studies in online databases such as Research Gate, Education Resources Information Center,

and Google Scholar Databases. The primary keywords for the search are Ethnomedicinal studies in Luzon, Ethnomedicinal studies in Visayas, Ethnomedicinal studies in Mindanao, Traditional Medicines in the Philippines, and Ethnomedicinal Practices and Beliefs in the Philippines. The studies offered in these databases were filtered to those (1) performed in the Philippines aimed to document these ethnomedicinal beliefs and practices in the main islands of the country, and (2) published within the year range from 2011 to 2021 to accentuate updated studies on the IPs by at most decade-old studies (Rodriguez, 2020).

### Classifying Studies

The authors reviewed twelve (12) published works that suit the criteria mentioned above. It consists of four (4) studies each for Luzon, Visayas, and Mindanao to represent each accordingly in the study at hand. Then, the researchers identified the ethnomedicinal practices and beliefs as the categories that are documented in each study to list the codes of the data using an open coding procedure (Strauss & Corbin, 1990, as cited in Yang & Baldwin, 2020). The codes for each category were lumped into themes. For the ethnomedicinal practices, the emerging themes are *Mechanical Preparation*, *Thermal Preparation*, and *Chemical Preparation*. On the other hand, the following derived themes are *Psychological*, *Spiritual*, and *Ritual* for the ethnomedicinal beliefs. These themes were summarized in Table 1

**Table 1**  
*Emerging themes in ethnomedicinal beliefs and practices in the Philippines.*

Category	Theme	Theme Description	Example
Ethnomedicinal Practices	Mechanical Preparation	Practices that change the physical characteristics of the raw resource resulting in a solid or liquid product	Pounding Extraction
	Thermal Preparation	Practices in which the application of heat is the key procedure	Infusion Concoction
	Chemical Preparation	Practices that involve changes in chemical characteristics of the raw resource	Concoction to wine
Ethnomedicinal Beliefs	Psychological	Beliefs focused on healing psychological illnesses	Bathing boiled leaves for <i>bati</i>
	Spiritual	Beliefs focused on healing attending to spiritual causes	Offering foods to the spirits
	Ritual	Beliefs focused on healings through rituals and/or ceremonies	Combined healing and prayers of the <i>Babaylans</i>



In the development of the information graphics, the researchers created per theme via Canva. For each theme, the researchers seek for parallelism of the scientific concept behind the practices and beliefs with the Science Basic Education Curriculum in the Country (DepEd, 2016). It is not the intention of this paper to evaluate the infographics by the experts in the field yet.

## RESULTS AND DISCUSSION

### 1. Ethnomedicinal Beliefs of IPs in Major Islands of the Philippines

The ethnomedicinal beliefs of the di 107 indigenous people in the Philippines can be divided into three categories: *spiritual, psychological, and ritual*. These categories emerged after the researchers' in-depth analysis from different published articles and journals in the Philippines. These beliefs are considered traditional knowledge of each indigenous people across the major islands of the Philippines, which also include the use of a particular plant or groups of plants to deliver an infected or affected person from any disease or illness.

#### Spiritual Beliefs

The spiritual aspect focuses on beliefs about healing with spiritual or divine interventions such as the presence of good and evil spirits (*anito*). Across the Philippine archipelago, indigenous people still believe in the spiritual manifestations of certain diseases or illnesses. It was also established that this ethnomedicinal belief is anchored on the IPs socio-cultural perspective and the parallel world/spirit (del Castillo, 2016). According to del Castillo, the early Filipinos or tribal communities have strong belief and devotion to spirits or *anito* that affects their everyday lives even before the Spanish colonial period. Sickness in an Aeta society is a social experience. A sick person is not alone and the community shares in an individual's suffering, collectively seeking a cure. The curing ritual involves the "manganito," the sick person, family, friends, relatives, as well as the unseen spirit

(Yabut, 2014). One of the ethnomedicinal beliefs concerning spiritual aspect is burning of leaves or stem of a plant as incense to deliver a diseased person from the works of evil ones or pinning a plant stem on the child's cloth to eradicate the mischievous act of the spirits. They believe that above all else, a Supreme Being that can hear and grant their prayers and petitions, especially while dealing with sickness or diseases.

This aspect of ethnomedicinal beliefs is said to be a well-established traditional knowledge that is passed from one generation to another through oral traditions (myths, legends, or poem) that was preserved and being exercised by the indigenous people in the major islands of the Philippines. It is considered to be an intangible cultural heritage of the Philippines that this kind of beliefs be continuously enriched and preserved by including in the school curricula for basic and tertiary education specially to inculcate one of the Filipino core values- being *Maka-Diyos*.

#### Psychological Beliefs

Ethnomedicinal beliefs in terms of indigenous people's psychological aspects deal with mental or perceptual aspects in healing diseases or disorders. The indigenous healer is the primary provider of psychological and psychiatry therapy to the vast majority of Filipinos who are geographically and culturally remote from the psychiatric or psychological treatment administered by the physician (Shakman, 1971). It was found that the psychological beliefs of some indigenous people in the Philippines are deeply rooted in the country's cultures, traditions, and folk practices that are under the so-called ethnic psychology or *katutubong sikolohiya*. One of the ethnomedicinal beliefs concerning the psychological aspect of indigenous people on the island of Luzon is about treating shyness. The affected person (especially a child) will be asked to take a bath using the water from the boiled plant. Another is to treat nervousness by drinking the decocted leaves of a specific plant. It is clearly observed that some indigenous people from different tribal communities still believe in the old but unique way of treating disorders or illness from the psychological perspective. It is irrefutable to



say that Filipino indigenous people have rich culture on the spiritual dimension and the psychological and psychiatry aspect.

This observation on IPs' psychological beliefs is vital in addressing their concerns about medicinal plants and how are these plants are being utilized based on their psychological perspectives. Deeply rooted in their immediate culture and society, this traditional knowledge can also be considered cultural heritage and should be preserved for generations to come. Including this aspect in school curricula can lead us to a more diverse and well-presented culture about the indigenous people from different parts of the Philippines.

### Ritual Beliefs

The last category of ethnomedicinal beliefs focuses on tribal rituals, including traditional practices performed by a specific person like the babaylans, shamans, and *manggagamot*. According to del Castillo (2016), the rites and rituals of the early Filipinos reflect Tylor's animistic theory of the origin of religion. These rites or rituals initiated by the worshippers or *nagaanito* involve sacrificing food or animals and conducting tribal ceremonies, including different kinds of plants. In some of the articles, indigenous people from Luzon and Mindanao believe that the combined healing gifts and prayers of the *Babaylans* or *Shamans* can enhance the efficacy of the ethnomedicinal plants after performing the specific ritual or ceremony. On the other hand, indigenous people from Visayas perform their rituals directly to prevent omens or deliver the affected person from any sickness. These records show that indigenous people in the Philippines are still practicing some of their tribal rites or rituals in dealing with sick or affected persons caused by a natural or supernatural being. They have shared knowledge and beliefs on the plant species and its propagation, preparation, and ethnomedicinal utilization and application. However, authors of the cited journals delved into what beliefs and how these (ethnomedicinal beliefs) are being addressed and considered. They also showed how this aspect varies from one place to another concerning their socio-cultural perspectives.

With this observation, the researchers believe that plant utilization by indigenous people through different rituals or ceremonies together with spiritual and psychological aspects be also included in basic education context specifically in science education and social sciences to promote the values of *maka-kalikasan* as well as the appreciation and respect to our socio-cultural uniqueness and environmental biodiversity. In general, throughout the cited articles and journals, it is clearly manifested that traditional knowledge about ethnomedicinal beliefs of different indigenous people or groups all over the Philippines are well preserved and being enriched over time. These established beliefs are also well presented through the generation through oral traditions and practices, as mentioned and showed by respondents (tribal leaders, babaylans, and shamans).

### 2. Ethnomedicinal Practices of IPs in Major Islands of the Philippines

The indigenous people's ethnomedicinal practices in the Philippines' major islands were categorized based on their preparation and utilization. In terms of ethnomedicinal preparation of the plant (or parts of the plant), IPs from different tribes across the archipelago perform common ways or techniques such as decoction, concoction, infusion, extraction, and pounding. The *babaylans*, *shamans*, *manganito*, *manggagamot* (albularyo) are considered the IPs general practitioners because of chronic economic constraints in the tribal communities (Apostol, 2007). As mentioned earlier, the modes were clearly stated and manifested through in-depth interviews and observation by the authors from the different respondents of each tribe, respectively. It was cited that ethnomedicinal practices from different tribes of indigenous people play a significant role in treating various diseases and illnesses within the tribal communities with respect to their cultural beliefs. Though different authors and articles explain the ethnomedicinal beliefs and practices of indigenous people here in the Philippines, it is evident that their ideas concerning ethnomedicines as related to ethnobotany are explicit and unifying.



## Mechanical Preparation

Different parts of plants (*such as leaves, stems, roots, flowers, etc*) are subjected to pounding and extracting, and these methods are considered mechanical in nature to produce whether solid or liquid products respectively before the application (internally and externally). Most of the ethnomedicinal plants considered by the indigenous people for healing sickness or diseases are subjected to these kinds of mechanical preparation. Example of a plant that is being pounded to produce a solid poultice is the leaves *Lansium domesticum* (lanzones) to treat the gastrointestinal problem; on the other hand, *Tinospora rumphii* (Makahiya) leaves are being macerated to produce liquid extract for dental problem and wounds. It is said that *albularyo*, a practitioner who uses a combination of modalities: herbalism, prayers, incantations, and mysticism, similar to a shaman are the ones who perform such practices. They believe that doing such methods will elucidate the active components of the plants for effective utilization. It also observed that the leave is widely used to treat common diseases like cough, cold, diarrhea, and skin allergies among the plant parts. Second to the most utilized parts are the stem and fruits, followed by the flowers and roots used by taking internally or topically. It was found that that this kind of ethnomedicinal practice is culturally inspired before the Spanish colonization centuries ago but no records of the primary origin. As to medicinal preparation is concerned, most of the tribes mentioned in the cited articles rely on this kind of practice because of its availability and traditional knowledge. It was also found that most medicinal plants used per tribe or group of indigenous people across the Philippines are common to all, and some are endemic.

## Thermal Preparation

The thermal preparation for ethnomedicinal practices of the different IPs involves infusion and concoction, which involves heating processes such as boiling or, by means hot water. The concept of infusion and concoction as being practiced by the

tribal communities was based on the idea that “healing” components such as oils and flavors from the plants can be absorbed by hot water. Almost all parts of the plants can be subjected to infusion and concoction, but the most widely used parts are the leaves, followed by the roots and flowers. This traditional practice of plant sample preparation is shared among the indigenous people cited in the gathered and analyzed articles. Examples of concocted and infused leaves were from *Annona muricata* (Guyabano), *Euphorbia hirta* (Tawatawa), *Blumea balsamifera* (Sambong), *Garcinia mangostana* (Mangosteen), and *Vitex negundo* (Lagundi), which is one of the 10 approved medicinal plants by the Department of Health. Aside from this observation, thermal preparation is commonly used if the concocted and infused part of plants will be taken orally by the sick person. In other words, this type of ethnomedicinal practice is being performed by the *manggagamot* and will be taken for oral consumption.

## Chemical Preparation

Chemical preparation of the ethnomedicinal plants involves wine or vinegar instead of water as a solvent. The basic process of soaking plant parts using liquor (with high alcohol content) or vinegar is being practiced by the Ati Tribe in Visayan islands (Cordero & Alejandro, 2021). This tribe soaks the flower of *Cocos nucifera* L. (Coconut) in vinegar or gin to treat edema. Among the cited indigenous people, only this tribe performs this kind of preparation involving high liquor content or vinegar. This practice is rooted in the traditional knowledge of native Filipinos about fermentation and distillation even before the Spanish colonization most especially those tribes that can be found in Visayan and Mindanao islands. One of the reasons for this manifestation is that these major Philippine islands are rich in palm trees where the fermented palm saps are harvested (Bersales, 2018). Also, there is a huge number of mangrove trees on these islands which is believed to enhance the fermentation process of the *tuba*.

Generally, these ethnomedicinal practices are still being recognized and exercised by most of our indigenous people here in the Philippines



because of their health and economic implications. With these manifestations, it is very important to address the concerns of tribal communities and to meet the needs of the IPs most especially on the availability of medical support and other health-related issues.

### 3. Ethnomedicinal Beliefs and Practices of IPs in Major Islands of the Philippines: A Scientific Context

From all the assertions cited above with regard to the ethnomedicinal beliefs and practices of the indigenous people in the Philippines, this section will look into the scientific context or concepts that are involved in the abovementioned socio-cultural customs and practices.

As far as the ethnomedicinal beliefs and practices of the IPs are concerned, records show that some of the ethnomedicinal practices involved scientific explanation or concept, especially when dealing with plant propagation and preparation. For example, the collection of medicinal plants in the wild during seasonal times or in case of needed treatment was highly recommended for efficacy as the locals believed that the plants should grow in their natural setting rather than cultivation (Dapar et al, 2020). As a support to this claim which is also cited as one of the ethnomedicinal beliefs of the Manobo tribe, scientific studies show that harvesting or collecting medicinal plants in the wild are more effective because the secondary metabolites are mostly expressed in the plant's natural setting or environment, whereby, plant species under monoculture conditions hardly expressed their phytochemicals (Schippman et al, 2006). Higher levels of secondary metabolites were also reported in wild populations where plants grow slowly, unlike in much faster-growing monocultures (Dapar et al, 2020). These scientific claims only proved that this preserved ethnomedicinal belief of the Manobo tribe in Mindanao in terms of medicinal propagation involves scientific concept, whether known to the IPs or not, it is a good manifestation that their traditional knowledge somehow meets scientific standards. In contrary to the above claims, most of the ethnomedicinal beliefs of the IPs will fall under pseudoscience because of its lack of scientific

support and somehow incompatible with the scientific method. Examples of such beliefs that are said to be pseudoscience are: performing rituals to reduce nervousness and shyness, wearing of plant part/s to eliminate omen or bad spirits, and using a certain plant as an amulet.

In terms of ethnomedicinal practices (mechanical, thermal, and chemical) in plant preparation, some records will verify and falsify some of the aforementioned claims. It is clearly reported that most of the IPs in the Philippines rely on the mechanical, thermal, and chemical way of preparing medicinal plants. There are reported studies that present the use of traditional plants and their natural products (phytochemicals such as secondary metabolites) for the treatment of oral diseases. Many medicines derived from plants used in traditional medicinal systems have been recorded in pharmacopeias as agents used to treat oral infections and a number of these have been recently investigated for their efficacy against oral microbial pathogens. Even up to this date, most of the tribal communities across the country are practicing such techniques. One of the health concerns that Filipino IPs are trying to address is oral diseases such as toothaches, canker sore, and sore throat. Plant poultice and extract from the mechanical preparation done by the *manggagamot* are being used as an ethnomedicinal remedy to treat oral problems. According to Palombo (2011) plant extracts from certain plants can be used against bacteria that can cause oral problems. Though it is limited to plant crude extract, this claim shows that IPs mechanical way of plant (leaves, stem, and roots) extraction can be further utilized in preparing medicinal plants against oral bacteria. In addition, boiling of medicinal plants (thermal preparation) whether, by water, oil, liquor, and/or vinegar (chemical preparation) as part of plant extraction and as being practiced by most of the tribes in Luzon and Mindanao follows the scientific concept on chemical polarity and solubility. Given that secondary metabolites may be polar or nonpolar, different solvents are needed for further extraction as chemical solubility is concerned. The researchers also observed that indigenous people have this traditional idea similar to a pharmacokinetics concept- synergism. Surprisingly, this idea is not as simple as what



others think; it is a technical idea in the pharmacy field concerning the effect of one chemical on another that may result in an adverse effect. Generally, these ethnomedicinal practices, whether known to Filipino indigenous people or not, are scientifically inclined and verified with further scientific studies concerning plant propagation and medicinal preparation.

In all the observations from the different articles and journal concerning the ethnomedicinal beliefs and practices of the indigenous people or tribal communities here in the Philippines, it is imperative this traditional knowledge from our indigenous brothers and sisters must be preserved and enriched, knowing that this stands through the test of time even before the colonization and is being practiced throughout the archipelago. Aside from including this in the school curricula, IPs concerns, especially in terms of medical or health status, must be addressed and resolved by agencies tasked to promote and preserve our cultural heritage.

#### 4. EthnoMediko: An Infographics of Indigenous People's Ethnomedicinal Beliefs and Practices

The last objective of this study is to develop an infographic (brochure) containing the ethnomedicinal beliefs and practices of selected indigenous people in the Philippines. This infographic serves as supplementary material for the teachers and students to learn more about the IP's traditional knowledge and participate in the sustenance of this particular intangible cultural heritage of the Philippines. According to Matrix and Hudson (2014), developing and utilizing infographics will help educators promote visual literacy skills to the students and make them realize the importance of evaluating visual information. In addition, involving them in infographics will enhance their skills in retaining and understanding essential ideas.

As 21<sup>st</sup> Century Skills demand a higher level of understanding not only on the traditional way of teaching and learning but also in using the modern technologies, the educators and educational leaders should immerse themselves and the students with the current technologies and

strategies such as using infographics and computer-assisted activities to help students understand the lessons in an engaging yet competent manner. In general, using infographics about indigenous people's ethnomedicinal beliefs and practices is a practical way to promote awareness in sustaining this kind of traditional knowledge and intangible cultural heritage of the Philippines.

#### CONCLUSIONS

As presented by the different scientific articles and journals and through the thorough analysis of the researchers, there is considerable evidence that ethnomedicinal beliefs and practices of the indigenous people in the Philippines are rich and well-established and are considered one of our tangible cultural heritages. Ethnomedicinal beliefs can be categorized as *spiritual, ritual, and psychological* and are rooted in their socio-cultural status. Meanwhile, ethnomedicinal practices such as plant propagation medicinal plant preparation can be classified into *mechanical, thermal, and chemical*. These are also rooted in their cultural perspective and verified to have a scientific basis.

#### RECOMMENDATIONS

In connection to the study, the researchers recommend the following actions to further knowledge on the preservation of ethnomedicinal practices and beliefs:

1. In-depth interviews and observations through immersion with the indigenous people are said to be a better source of primary data, hence, it is highly recommended.
2. For further validation, seek the help of experts in studying Filipino culture and indigenous people.
3. For scientific basis, analyze different Filipino scientific journals concerning ethnomedicine and ethnobotany.

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