ETHNOBOTANICAL KNOWLEDGE AND PRACTICES OF HIGAONON TRIBE FROM MAT-I, CLAVERIA, PHILIPPINES

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Abstract

The indigenous tribe of Higaonons can only be found in Mindanao Island's northern and central regions. Like other indigenous groups, plants have always been part of the Higaonon culture. They use the plant for food, shelter, treatment of wounds and certain illnesses, and as offerings during rituals. Knowledge of the utilization and efficacy of plants is an integral part of the culture and is generally the basis for further pharmaceutical research and advancement. This study aimed to explore and document the ethnobotanical knowledge and practices orally transmitted by Higaonons. Interviews and direct observation were the research methods utilized to collect data, which were analyzed thematically based on the plant parts used and diseases or ailments treated. Results show that this tribal group has a vibrant system of knowledge and practices that are orally transmitted from one generation to the next. Specifically, they have rich ethnobotanical knowledge and practices on using and preparing different endemic plants to treat various common ailments and disorders. Philippine endemic plants were also used for treating common ailments and disorders ranging from relapse to diarrhea, stomach problems, fever, flatulence, body pains, and wounds. This study highlights the importance of documenting the rich knowledge and practice systems of indigenous tribes, as these are not documented and are only transmitted orally. Moreover, the results also show promising baseline data for further ethnopharmacology studies.

Keywords: *cultural studies, ethnobotany, indigenous knowledge, natural products research, traditional knowledge*

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1.0 Introduction

Mindanao is home to 18 major Aboriginal groups. Higaonon is one of those Lumad groups that still live in their ancestral areas, preserving their culture. They are found in the provinces of Bukidnon, Misamis Oriental, Agusan del Sur, Agusan del Norte, and Lanao del Norte. Higaonon is derived from the root words "*Higa"* which means to "live or lay in bed", "*gaon*," which means mountain, and "*onon*," which means people, and is described as the "people of the living mountains" and "people of the wilderness" (Cajetas-Saranza, 2016; Dapar, Alejandro, *et al*., 2020). Most Higaonons rely on agriculture as their main economic activity.

The Higaonon culture is vibrant in terms of literature, tribal dances, customs, values, and rules; they have their own dialect, perform rituals and ceremonies for different occasions and purposes, and have a vast knowledge of using plants as a treatment for certain wounds and illnesses (Cajetas-Saranza, 2016). This tribe has continually conserved and protected their ancestral domain to sustain their traditions, practices, and values up to the present time (Dapar, Alejandro, *et al.*, 2020). However, most cultural practices and traditional knowledge have been passed orally, challenging the preservation of cultural knowledge and traditions.

Plants have always been part of the culture of the Higaonon. They use the plant for food, shelter, treatment of wounds and certain illnesses, and as offerings during rituals. Their vast knowledge of the medicinal use of plants has helped them during an emergency, especially since most of them live in areas where access to hospitals and commercial medicines is limited. Using herbal medicines to treat wounds and diseases has been practiced for centuries (Dela Cruz & Ramos, 2011).

The use of medicinal plants for health and well-being has existed throughout human history and is used by various cultures and ethnicities worldwide (Mtewa *et al.,* 2021; Petrovska, 2012). In the Philippines, ethnomedicinal plants have been advocated for healthcare and the treatment of various ailments (Lee Mendoza, 2009). The medicinal value of plants is due to the substances that they contain (Olowa & Nuneza, 2013; Walag *et al.,* 2017). Plants contain many active components and essential oils that have a physiological effect on the human body. Essential oils in plants play an important role in their biological activity (Judzentien & Buzelyte, 2006). Amounts of different plant-derived bioactive compounds offer various health benefits (Hossain, 2018; Walag *et al.*, 2020) and are used to treat illnesses (Morilla *et al.*, 2014). Knowledge of the utilization and efficacy of plants is an integral part of the culture and is the basis of pharmaceutical research and advancement (Dapar, Meve, *et al.*, 2020). Due to the growing recognition of the medical importance of herbal medicines (Baleta *et al.*, 2016) and their affordability, the demand for herbal medicines is increasing (Hossain, 2018).

Documenting the ethnobotanical knowledge and practices of indigenous people will serve as baseline information for further development and identification of medicinal plants for treating health-related problems in the locality. Endemic plant species have been threatened by anthropogenic activities and global warming (IPBES, 2018). Moreover, the same report noted that indigenous communities have significantly lower reduction rates, highlighting the essential role of indigenous people as stewards of their natural environment. As such, this study aims to explore the orally transmitted ethnobotanical practices of Higaonons on select Philippine Endemic Plants. Furthermore, the study aims to identify the plants utilized by Higaonons to treat common ailments and disorders and document the procedures for preparing such treatments.

The exploratory nature of the study is anchored on the tenets and arguments of the Availability Hypothesis (de Albuquerque, 2006). The hypothesis is used to guide the study in answering the question of how and why local people select plants for use to treat common ailments, diseases, and disorders. This hypothesis argues that local people use plants for medicine because they are more accessible or locally abundant (Voeks, 2004). In this hypothesis, availability is conceptualized as a physical distance from a home or community to the location where a plant grows in the wild, but it is sometimes considered in terms of seasonality, abundance, price, and access. This hypothesis examines the location where people collect plants in relation to their local abundance and dominance. As such, this study banks on the premise that indigenous people use locally available, abundant, and endemic plants to treat common ailments.

2.0 Methodology

Research Design

The present study utilizes qualitative ethnobotanical

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research to explore the knowledge and practices of Higaonons to treat common ailments and disorders using locally available plants. A qualitative ethnobotanical study is used to gain an understanding of underlying reasons, opinions, and motivations. It provides insights into the problem or helps to develop ideas or hypotheses for potential quantitative research. Qualitative ethnobotany is also used to uncover trends in thought and opinions about local plant species diversity and dive deeper into the problem. In this method of ethnobotany, the target or sample size of the participant is typically small (Ashebo, 2019).

Research Setting

The study was conducted in Mat-i, Claveria, Misamis Oriental. The municipality of Claveria is located in the second district of Misamis Oriental, Region X. It is a first-class municipality with a total land area of 579.63 km^2, composed of 24 barangays, and is the largest municipality of Misamis Oriental. The municipality is bounded by several municipalities, including Villanueva, Jasaan, Balingasag, Lagonglong, Salay, Binoangan, Sugbongcogon, Kinoguitan, Balingoan, Talisayan, Medina, Gingoog City, and Magsaysay and is located along the provinces of Bukidnon and Agusan del Norte. The town's topography is mostly mountains and hills, and it is the only town in the province surrounded by land with no coastline. The municipality has a total population of 48,906 people (Balangiao & Walag, 2022) and is home to the Higaonon Tribe. Barangay Mat-I, the sampling site, is situated at approximately 8°38' North and 124°59' East on the island of Mindanao. The elevation at these coordinates is estimated at 892.0 meters, or 2,926.5 feet, above mean sea level. This site was primarily selected due to the increasing tourism activities that may threaten the survival of indigenous tribes in the Municipality, highlighting the importance and urgent need to document their ethnobotanical knowledge.

Sampling Scheme and Ethical Considerations

A non-random purposive sampling method was utilized in this study to document the ethnobotanical practices of the Higaonon tribe. The participants were deliberately chosen based on criteria defined within the objectives of the present study. The participants were chosen, with the help of the tribe leader, based on their knowledge and role in the oral transmission of ethnobotanical knowledge in their tribe. The interview was halted when data saturation was reached. About six participants were interviewed in total.

The necessary permits and free and prior informed consent from the Local Government Unit of Mat-I, Claveria, Philippines, were acquired prior to the conduct of data collection. Consultation meetings were also conducted with tribal leaders. The methods were also reviewed based on the approved Manual of Standard Operating Procedures of the University of Science and Technology of the Southern Philippines Research Ethics Review Committee (USTP RERC). Prior to the conduct of the research, various meetings were held with tribe leaders to discuss the proposed research and ensure the smooth flow of data collection. Tribe leaders were also present during the interview sessions to ensure that no IP rights were violated. Before the interview, a sociologist and ethnobotanical expert were also asked to validate the questions to ensure neutrality and depth of data acquisition. Interview questions were also reviewed ahead of time by the tribe leaders and the USTP RERC with respect to the National Ethical Guidelines of 2020.

Interview Protocol

The ethnobotanical documentation component of the study utilized an in-depth interview. An in-depth interview is a research technique involving a vigorous individual discussion with a small number of participants (Boyce & Neale, 2006). In addition, an in-depth interview enables the researchers to provide a wide variety of rich knowledge on the phenomenon. In establishing an effective interaction with the participants, the interviewer must show an acceptable attitude relevant to the goals and the interviewee. In conducting this component, the purpose of the interviewer is to collect information while listening and enabling the subject to speak. The participants in the study were assured of informed consent. The participants in the study were chosen based on their active role in orally passing on their tribal traditions.

All participants in the interview answered the same set of questions. Every interview with the participants was done through consultation about their vacant time and readiness to undergo the interview process. Each interview was scheduled ahead of time. The proceedings of each interview ran smoothly, using the local dialect of the participants to ensure that they were comfortable giving out their answers. In addition, the setting of the interview was kept informal to ensure that everything would be captured naturally. Pictures of commonly available plants were also prepared ahead of time by the interviewers and used to verify the plants mentioned by the participants. This allowed the researcher to validate the taxonomic identity of the plants used by the participants. There were also plants that researchers were not able to prepare ahead of time. Researchers used a simple Google Search of their local names, and the participants were asked to confirm based on morphology. These pictures were used to validate the species' identity.

The participants' responses were then recorded and sorted to identify issues, insights, and perceptions related to the study's objective. The documentation was kept confidential and safe by storing the gathered data on the researcher's laptop, protected by a password. Member-checking was employed to validate the interview responses.

Data Analysis

The qualitative analysis started right after all the interviews were conducted. This was done using a trial version of NVivo 12 Software. The researcher then transcribed all the recorded interviews. Transcription involves translation, or the transformation of sound or image into text. The first phase of the analysis began with reading and rereading the transcripts several times to obtain a general sense of the data. This was done to familiarize myself with the relevant ideas from the participant's account. Second, essential statements containing ethnobotanical practices found in the transcripts were extracted. These statements have been exported on a separate sheet with their page and line numbers. Further, the formulated meanings have been categorized into groups and clusters of subjects. These clusters were based on the different plants used, the parts used, the treatment for ailments, and the process of preparing the plant parts.

3.0 Results and Discussion

Plants and ailments treated

In the present study, 55 plants were documented as remedies for common ailments. Some of the plants reported have also been documented in the study of Olowa & Nuneza (2013) and claimed by the Higaonon of Rogongon, Iligan City, to have

cured illnesses. These medicinal plants include hilbas, Kadagum, Gabon, Tawa-tawa, Katakataka, Tuba-tuba, Banggat, Kalabo, Mayana, Avocado, Panyawan, kamunggay, abaca, bayabas, limon, kaimito, sili, dulaw, and luy-a. Most medicinal plants claimed by the respondents in this study have been proven to possess medicinal value. Literature reported that yahong-yahong is found to have good scavenging and antioxidant activities (Ureta *et al.,* 2018), bananas have analgesic action (Suvarna *et al.*, 2009), wound healing properties (Agarwal *et al.*, 2009), and anti-ulcer activity (Goel & Sairam, 2002), alingatong is found toxic and has high antioxidant activity (Peteros & Uy, 2010), blue ternate has an anti-diabetic effect (Gunjan *et al.,* 2010), orchids have antibacterial activity (Parekh & Chanda, 2010), and nephroprotective activity (Prusty *et al.,* 2012). Meanwhile, oregano was reported to have anti-helmintic and antibacterial activities (Jimmy, 2021). Other plant practices orally transmitted by the Higaonons have all been scientifically verified based on various experimental studies.

The number and uses of medicinal plants in the community demonstrate the depth of the local knowledge of indigenous medicinal plants and their applications (Tantiado, 2012). In most regions of the Philippines, using plants to treat illnesses has long been practiced and has played a significant role in providing primary healthcare (Tantengco *et al.*, 2018). The significance and benefits of medicinal usage are that, in addition to being affordable, effective, and readily available, medicinal plants are safe for treating various conditions (Baleta *et al.,* 2016; Morilla *et al.,* 2014). However, the number of indigenous communities with extensive traditional and botanical knowledge is declining as time goes on (Tantengco *et al.*, 2018). Furthermore, it is undeniable that introducing modern medicine to remote areas has contributed to a decline in traditional knowledge among younger generations (Garcia *et al.,* 2018).

Ethnobotanical practices

The methods of utilization were dependent on the type of ailment (Baleta *et al.,* 2016) and the parts of the plants used. Based on the data, the part of the medicinal plants commonly used by the respondents is the leaves. According to Tantengco *et al.* (2018), the leaves of medicinal plants are commonly used as they are more abundant and easier to collect (Egbuna *et al.,* 2020). The leaves are also believed to contain most of the secondary metabolites of the plants as they manufacture and store chemical compounds through photosynthesis (Baleta *et al.,* 2016; Walag *et al.,* 2017). These secondary metabolites include alkaloids, saponins, and phenolic compounds, demonstrating antimicrobial and antifungal activities that may be responsible for the plant's pharmacological effects (Dillard & Bruce German, 2000). Plant leaves are also used to protect the plants and ensure that their use is sustainable, as collecting the leaves is less destructive and promotes better conservation of the plant species (Ezzat *et al.,* 2020).

The way the plants are being prepared for treatment involves extracting their medicinal properties. Decoction, expression, and infusion were the usual methods of utilizing medicinal plants. Decoction involves boiling the plant material in water, while expression involves extracting the medicinal properties of the plant by pounding or squeezing it and applying it to the affected part. Infusion involves immersion of the plant material in water for some time before administering it orally (Del Fierro & Nolasco, 2013). In the study on the Higaonon tribe of Iligan City, medicinal plant leaves were commonly prepared by decoction (boiling in water) and administered orally (Olowa & Nuneza, 2013). Boiling the parts of the plant until the desired concentration is achieved is a prevalent method of using medicinal plants (Gruyal, 2014).

Table 1. Common ethnobotanical practices of Higaonon Tribe orally transmitted.

Common Ailments	Plant/parts used for treatment	Procedure
High blood pressure (Hayblad)	Almaciga (Salumayag)	Drink decoction
	Stinging nettle roots (gamot sa alinggatong)	Drink decoction
	Banana roots (gamot sa saging)	Drip extracted juice into the eyes
	Blue ternate (Blue pea)	Soak in lukewarm water then drink
	Chayote fruit (unod sa sayote)	Extract the fruit juice and drink
	Betel nut (Bonga)	Drink decoction
Diabetes (Dayabetes)	Banana roots (gamot sa saging)	Drink extracted juice
	Almaciga resin (Salumayag)	Drink decoction
	Wormwood (Panyawan)	Extract the juice or soak in water then drink
Heart problems (Sakit sa kasing kasing)	Stinging nettle roots (gamot sa alinggatong)	Drink decoction
	Orchids	Soak in water then drink
	Blue ternate (Blue pea)	Soak in water then drink
Cough (Ubo)	Oregano (dahon sa kalabo)	Boil in water and inhale steam
		Soak in lukewarm water then drink
		roast or heat, squeeze to extract juice, then drink
	Coleus (Mayana)	Drink decoction
		roast, extract juice with liniment oil and apply to the whole body
	Blumea camphor (leaf of gabon)	soak in water then drink
	Red pepper (Leaf of sili)	Roast, extract juice with liniment oil and apply to the whole body
	Betel pepper (Leaf of buyo)	place on the back
	Angelica (leaf of angelica)	place on the back, heat or roast then inhale
	Resurrection Lily (Kisol)	soak in lukewarm water, then drink
	Caricature plant (atay-atay)	Roast, extract juice with liniment oil and apply to the whole body
	Pennyworth (yahong yahong)	Roast, extract juice with liniment oil and apply to the whole body
	Peppermint (herba buena)	Roast, extract juice with liniment oil and apply to the whole body
	Goose grass (bangat)	heat then inhale steam
	Chives (Ganda)	Roast, extract juice with liniment oil and apply to the whole body
	Annatto (dahon atsuete)	place on the back
	Lime Berry (Lemonsito)	roast then extract juice and placed on the head
	Chaste Tree (lagundi)	The lagundi was decocted and then drank
Fever (Hilanat)	abaca shoot (buds of abaca)	place on the forehead and back
	banana shoot (buds of saging)	place on the forehead and back
	wild banana shoot (buds of agutay)	place on the forehead and back

Table 1. cont. Common ethnobotanical practices of Higaonon Tribe orally transmitted.

Common Ailments	Plant/parts used for treatment	Procedure
Fever (Hilanat)	Leaf of ugapong	place on the forehead and back
	Hog plum tree bark (bark of abihid)	scrape, squeeze to extract juice, then drink
	Asthma weed (tawa-tawa)	Drink decoction
Wound (Samad)	Abaca (Juice of abaca)	extract the juice and put directly on the wound.
	Horseradish tree (leaf of malungay)	extract the juice and put directly on the wound
	Guava Leaves (leaf of bayabas)	boil with water and use to bathe or wash the wound
	Heartleaf hempvine (moti-moti)	extract the juice and put directly on the wound
	False elephant's foot (kuko sa banog)	extract the juice and put directly on the wound
	Burnweed (Linggagapas)	extract the juice and put directly on the wound
	Leaf of tongao	pound and extract juice and put directly on the wound
Acid reflux (kabuhi)	Leaf of kahugas	Drink decoction
Headache (Sakit sa ulo)	Balete tree (leaf of balete)	place on the forehead
Stomachache (Sakit sa tiyan)	Avocado bark (bark of avocado)	Drink decoction
	Guava roots (gamot sa bayabas)	Drink decoction
	Sunflower leaves (dahon as sunflower)	heat and place on the stomach
	Leaf of dunggano	heat and place on the stomach
	Leaf of salapanti	heat and place on the stomach
	Bark of manumbilan	Drink decoction
Rheumatoid (Rayuma)	Goose grass (bangat)	Drink decoction
	Turmeric (unod sa kalawag)	pound and extract juice and apply to the affected area
Diarrhea (Kalibanga)	Abaca core (ubod sa abaca)	extract juice, then drink
	Crape myrtle (manaba)	Drink decoction
	Star apple bark (panit kaymito)	dry, heat or boil, then drink
	Latundan banana (saging tundan)	scrape and mix with porridge
Relapse (Bughat)	Kalingag tree (Kalingag)	Drink decoction
	Almaciga bark and resin (Panit ug duga sa Salumayag)	Drink decoction
	gamot sa kahugas	Drink decoction
	Indian patchouli roots (gamot sa kadlum)	Drink decoction
	Balalawan	Drink decoction
	Almaciga (gamot ug panit sa salong)	Drink decoction
	Beggar ticks leaves and roots (dahon ug ugat karagum)	Drink decoction
	Abaca roots (gamot sa abaca)	Drink decoction
	Goose grass (bangat)	Drink decoction
	False elephant's foot root (gamot sa kuko sa banog)	Drink decoction
Toothache (Sakit sa ngipon)	Angelica (Dahon sa angelika	pound then place on affected area
	Tobacco (Tabako)	chew, put on the decaying teeth
	Wormwood (pangyawan)	extract juice and drip on the eyes
Inflammation/ swelling (Hubaghubag)	Angelica (Dahon sa angelika)	place on the affected area
	China rose leaves (dahon sa gumamela)	place on the affected area
Caterpillar rash (Halagpi)	anunutong	roast and expose the affected area to the smoke
sakit sa mata	Beggar ticks leaves and roots (dahon ug ugat karagum)	Drink decoction
UTI (Urinary Tract Infections)	orchids	soak in water then drink
	Stinging nettle (alinggatong)	drink decoction
	Goose grass (bangat)	Drink decoction
Burns (Paso)	Aloe vera	extract juice and apply on the affected area
Warts (kalugo)	Crepe ginger (unod sa tamusi)	brush on the warts
Cold (sip-on)	Peppermint (herba buena)	roast, extract juice with liniment oil and apply to the whole body
	Lime Berry (lemonsito)	roast, extract juice and apply on the head
	Chives (Ganda)	boil then inhale steam
Mouth sore (luas)	Poison nut (dahon tubatuba)	extract juice and put on white fabric and brush on the affected area
Flatulence (panuhot)	Bark of Kalingag tree (panit kalingag)	Drink decoction
	Ginger (Luy-a)	Drink decoction
	Poison nut's core (Kahoy ug dahon sa tubatuba)	roast, extract juice with liniment oil and apply to the whole body
	Chives (Ganda)	roast, extract juice with liniment oil and apply to the whole body
	Annatto (dahoon sa atsuete	heat and place on the back
	beechwood (dahon sa gemilina)	heat and place on the back
Rashes (Pilas)	Pennyworth (yahong-yahong)	boil with water, then use to soak or wash on the affected area

Ethnobotanical practices of select Philippine endemic plants that Higaonons utilize are summarized in Table 2. It has been reported that all the plants understudied are used as remedies for certain ailments. Data showed that *M. textilis* roots and leaves were used to treat "bughat" or relapse, while the juice of its stem is used to remedy a sore in the gums and to wounds to induce blood clots. And the leaves of abaca are used to treat diarrhea. It was claimed that the Matigsalug tribe of Davao, Philippines use the plant for relapse (Guevara & Garcia, 2018). The study of Olowa and Nuneza (2013) in Iligan City also showed that the Higaonon people of Rogongon also use abaca to treat diarrhea.

Higaonons also claim that Almaciga is used to cure relapse, muscle pain, asthma, headache, and colic. This is confirmed in a study that documented folkloric use of almaciga resins and bark, including arthritis, asthma, headache, and myalgia (Noor Rain *et al.*, 2007). The same authors also found that leaves possess anti-plasmodial activity. Further, this claim is also supported by experimental studies of Chen *et al.* (2015), where essential oils from fresh leaves yielded chemical

Table 2. Ethnobotanical practices of Higaonon Tribe on select Philippine endemic plants

Plant	Part	Treatment for	Procedure
	Root	Relapse (bughat)	Drink decoction
	Stem	Wounds (samad)	Extract juice and apply to the wound
		Mouth sore (luas)	Extract juice and brush on the mouth sore
	Leaves	Diarrhea Kalibanga)	Drink decoction
		Relapse (bughat)	Boil and inhale steam
Abaca *(M. textilis)*			Boil, extract juice and apply on the whole body
		Relapse (bughat)	Roast and squeeze to extract the juice and apply on the head
		Fever (Hilanat)	Place on the back and forehead
		Stop the bleeding (talinugo)	Drink decoction
		Flatulence (Panuhot)	Roast, extract juice with liniment oil and apply to the whole body
		Relapse (bughat)	Drink decoction
		Relapse (bughat)	Roast and fumigate
		Asthma	
Almaciga (*A. philippinensis*)	Resin	Headache (sakit sa ulo)	Drink decoction
		Muscle/Body pain (sakit sa tiyan)	Boil and inhale steam
	Bark	Colic (Butod)	Drink decoction
	Roots	Appetite stimulant (pampagana kaon)	Drink decoction
		Stomach ache (sakit sa tiyan)	Drink decoction
		Relapse (bughat)	Drink decoction
Kalingag *(C. mercadoi)*	bark	Appetite stimulant (pampagana kaon)	Drink decoction
		Stomach ache (sakit sa tiyan)	Drink decoction
		Relapse (bughat)	Drink decoction
		Colic (Butod)	Drink decoction
		Flatulence (panuhot)	Drink decoction

compounds including ß-bisabolene (33.43%), ß-myrcene (25.48%), and limonene (35.61%) exhibited significant antibacterial activity against *Staphylococcus aureus* and *Pseudomonas aeruginosa*.

Kalingag is used to treat relapse, stomachache, and colic based on the orally transmitted indigenous knowledge of Higaonons. The parts of the plants utilized are the bark and roots. This result is consistent with the findings of Gorgonio and Fuentes (2011), where kalingag is used to treat various diseases, including relapses, bloating, loss of appetite, flatulence, diarrhea, indigestion, vomiting, rheumatism, colds, fever, headache, sinusitis, asthma, injuries. Scientific studies also show that the bark extract of kalingag demonstrated a reduction of diarrheal feces that is comparable to the standard drug (Torres *et al.,* 2003). The decoction or infusion of the bark of kalingag is used to cure bloating, loss of appetite, vomiting, flatulence, toothache, headaches, rheumatism, dysentery, colds, fevers, sinus infections, bronchitis, cough, nausea, vomiting and hypertension (Fiscal, 2017), indigestion, diarrhea and flatulence(Arquion *et al.,* 2015). Several scientific and experimental studies also support the indigenous knowledge and practice of Higaonons (Dapar, Alejandro, *et al.,* 2020; Torres *et al.,* 2003).

4.0 Conclusion

This qualitative study explored the ethnobotanical knowledge practices orally transmitted by Higaonons of Mat-I, Claveria, Philippines and documented their use of Philippine endemic plants. Various plants and plant parts were used to treat multiple ailments using different preparation techniques. Several endemic plants were also identified to treat common ailments, and their preparation techniques were also compared. These plants utilized by the Higaonons were also found to have been well-studied, as shown in the literature, regarding their secondary metabolite presence and bioactivities both in vitro and in vivo. This study further demonstrates the vast knowledge and resources we can get from studying and documenting indigenous knowledge and practices. This also further highlights that Higaonon knowledge systems, practices that help promote sustainability has remained intact even with the threat of modernization.

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