

INDIGENOUS KNOWLEDGE IN EXPLOITING AND USING MEDICINAL PLANTS OF THE H'MONG PEOPLE IN HANG KIA COMMUNE, MAI CHAU DISTRICT, HOA BINH PROVINCE IN THE DIRECTION OF SUSTAINABLE DEVELOPMENT

CONHECIMENTO INDÍGENA NA EXPLORAÇÃO E UTILIZAÇÃO DE PLANTAS MEDICINAIS DO POVO H'MONG NA COMUNIDADE DE HANG KIA, DISTRITO DE MAI CHAU, PROVÍNCIA DE HOA BINH, NA DIREÇÃO DO DESENVOLVIMENTO SUSTENTÁVEL

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Đào Thanh Thái*

*Academy of Finance, Vietnam

Orcid: <https://orcid.org/0000-0001-5894-6358>

daothanhtai@hvtc.edu.vn

Bùi Phú Mỹ**

**School of Foreign Languages and Tourism,

Hanoi University of Industry, Vietnam

buiphumy@hau.edu.vn

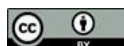
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Abstract

The article examines the indigenous knowledge of the H'Mong people in the exploitation and use of medicinal plants in Hang Kia commune, Phu Tho province, from a sustainable development perspective. In the context of declining medicinal plant resources due to overexploitation and the erosion of traditional knowledge, the study highlights the distinctive role of medicinal plants in the livelihoods, health care practices, and spiritual life of the H'Mong community. Through secondary document analysis, field observation, in-depth interviews, and group discussions with traditional healers, village elders, and elderly women, the research demonstrates that H'Mong folk medical knowledge is deeply localized, orally transmitted across generations, and closely intertwined with beliefs in the deity of medicine. Diagnosis, harvesting, and treatment are consistently accompanied by spiritual rituals, which function as a self-regulating mechanism in the use of natural resources. The findings document a list of 20 commonly used medicinal plant species, conserved primarily through two approaches: cultivation in home gardens and selective harvesting in forests. Practices such as avoiding large-scale extraction, refraining from commercial trade in medicinal materials, and differences in medicinal knowledge among ethnic groups help reduce pressure on plant

Resumo

O artigo examina o conhecimento indígena do povo H'Mong na exploração e uso de plantas medicinais na comuna de Hang Kia, província de Phu Tho, a partir de uma perspectiva de desenvolvimento sustentável. No contexto do declínio dos recursos de plantas medicinais devido à exploração excessiva e à erosão do conhecimento tradicional, o estudo destaca o papel distintivo das plantas medicinais nos meios de subsistência, práticas de cuidados de saúde e vida espiritual da comunidade H'Mong. Através da análise de documentos secundários, observação de campo, entrevistas aprofundadas e discussões em grupo com curandeiros tradicionais, anciãos da aldeia e mulheres idosas, a investigação demonstra que o conhecimento médico popular H'Mong é profundamente localizado, transmitido oralmente através das gerações e intimamente entrelaçado com as crenças na divindade da medicina. O diagnóstico, a colheita e o tratamento são consistentemente acompanhados por rituais espirituais, que funcionam como um mecanismo de autorregulação no uso dos recursos naturais. As conclusões documentam uma lista de 20 espécies de plantas medicinais comumente utilizadas, conservadas principalmente através de duas abordagens: cultivo em hortas domésticas e colheita seletiva nas florestas. Práticas como evitar a extração



resources. The article concludes that conserving medicinal plants must be inseparable from safeguarding indigenous knowledge and the communities that hold it, viewing this integration as a foundation for sustainable development and the preservation of cultural identity.

Keywords: Indigenous Knowledge. Medicinal Plants. H'mong People. Traditional Medicine. Resource Conservation. Sustainable Development. Hang Kia Commune. Phu Tho Province.

em grande escala, abster-se do comércio de materiais medicinais e as diferenças no conhecimento medicinal entre os grupos étnicos ajudam a reduzir a pressão sobre os recursos vegetais. O artigo conclui que a conservação das plantas medicinais deve ser indissociável da salvaguarda do conhecimento indígena e das comunidades que o detêm, considerando essa integração como uma base para o desenvolvimento sustentável e a preservação da identidade cultural.

Palavras-chave: Conhecimento Indígena. Plantas Mediciniais. Povo H'mong. Medicina Tradicional. Conservação de Recursos. Desenvolvimento Sustentável. Comuna de Hang Kia. Província de Phu Tho.

1 INTRODUCTION

Medicinal plant resources and knowledge treasures in the use of them in different cultures has been increasingly exploited and researched for health care and economic development. There are documents showing that medicinal plants serve four main needs: (i) pharmaceutical industry (ii) traditional health care systems (iii) individual traditional medicine practitioner and (iv) household using (Lampert J., Serivastava J., Noel Vietmeyer. 1997) (Michel J. Balick, Elaine Elisabetsky and Sarah A. Laird. 1996). Nowadays, the use of medicinal plants in industrial countries is increasing, about 40% of the population in developed industrial countries using supplemental medicines have become a threat to this resource. The overexploitation of wild medicinal plant resources is caused by population growth pressure and the need for life leading to the fact that the amount of renewable resources does not compensate for the lost. (Nirmal K. Bhattarai. 1997)

Studies show that the gradual loss of medicinal plant resources is caused by several reasons: (i) wasteful use habits (ii) destructive collecting activities, (iii) poor storage conditions. (iv) lack of suitable transportation and market, (v) increasing demand for medicinal plants (Lyn de alwis. 1997). On the other hand, there is a view that local people are those who always find ways to do maximum exploitation of the resources to serve their interests. Responding to the above threaten, a view on conserving this resource

has been introduced. Before the Chiang Mai conference (1988), conservation perspectives were developed by experts around the world but scattered and unsystematic. It is said that to conserve medicinal plants, it is necessary to have a firm grasp of their distribution and status quo to establish zones of origin and transposition. According to O Akerel, preserving medicinal plant resources in countries is recognizing and preserving their use value in traditional medicine. (Akerel O, 1991).

This study was conducted in Hang Kia commune, Phu Tho province with the majority of Hmong population. Located in Hang Kia - Pa Co natural reserve the area is known with a typical tropical forest ecosystem of Northwestern Vietnam and valuable plant area and people have a special relationship with the forest. Forest resource not only provides them with food and fuel but also provides an extremely rich source of medicinal herbs that they can use in the treatment of diseases.

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2 LITERATURE REVIEW

The term “indigenous knowledge” was first used by Robert Chambers in a publication in 1979. Since then it has appeared in many researchs and become popular nowadays. There are several terms that are synonym of “indigineous knowledge” such as “local knowledge” (Nguyễn Ngọc Thanh, 2012), “folk knowledge”, “traditional knowledge” (ISCU, 2002).

As Elleen (2004), indigenous knowledge is sourced from localities and certain sets of experiences; they are created by people living in those localities ... as a result of this practical relationship in everyday life”. More concern about the maintenancance of indigenous knowledge, Nguyen Ngoc Thanh (2012) homogenized folk knowledge, ethnic knowledge, indigenous knowledge in one definition that they are all knowledge and behavior experience responding to the natural environment and social environment of people living in specific areas, which have been accumulated, practiced, selected and empowered from this generation to another generation as well as supplemented and developed in life ... Meanwhile, local knowledge is the knowledge of ethnic communities that live together in a certain ecological or cultural region.

Using another approaching perspective, Alan, R. Emery and Associates (1997) did compare indigenous knowledge and scientific knowledge as below:

Table 1*Compare indigenous knowledge and scientific knowledge as below*

Criteria	Indigenous knowledge	Scientific knowledge
Style	Assumed to be the truth	Assumed to be a best approximation
	Sacred and secular together	Secular only
	Teaching through story-telling	Didactic
	Learning by doing and experiencing	Learning by formal education
	Oral or visual	Written
	Integrated — based on whole systems	Analytical — based on subsets of the whole
	Intuitive	Model or hypothesis-based
	Holistic	Reductionist
	Subjective	Objective
	Experiential	Positivist
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Use	Lengthy acquisition	Rapid acquisition
	Long-term wisdom	Short-term prediction
	Powerful predictability in local areas	Powerful predictability in natural principles
	Weak in predictive principles in distant areas	Weak in local areas of knowledge
	Models based on cycles	Linear modeling as first approximation
	Explanations based on examples, anecdotes, and parables	Explanations based on hypotheses, theories, laws
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Classification	a mix of ecological and use	based on phylogenetic relationships
	non-hierarchical differentiation	hierarchical differentiation
	includes everything natural and supernatural	excludes the supernatural

Source: Alan R. Emery and Associates (now KIVU Nature Inc.), 1997, Guidelines for environmental assessments with indigenous people, A Report from the Centre for Traditional Knowledge of the World Council of Indigenous People, Ottawa, 1997, p 4 - 5.

According to Alan R. Emery et al (1997), indigenous knowledge has 5 basic characteristics, including:

- “It is practical common sense based on teachings and experience passed on from generation to generation.
- It is knowing the country; it covers knowledge of the environment (snow, ice, weather, resources), and the relationship between things.
- It is holistic — it cannot be compartmentalized and cannot be separated from the people who hold it. It is rooted in the spiritual health, culture, and language of the people. It is a way of life.
- Traditional knowledge is an authority system. It sets out the rules governing the use of resources — respect; an obligation to share. It is dynamic, cumulative and stable. It is truth.
- Traditional knowledge is a way of life — wisdom is using knowledge in good ways. It is using the heart and the head together. It comes from the spirit in order to survive.
- It gives credibility to people.”

Similar to the approach of Alan R. Emery et al, Simon Brascoupe' and Howard Mann (2001) shorten the difference between Science and Indigenous Knowledge with only 4 main factors:

Table 2

The difference between Science and Indigenous Knowledge

Factor	Indigenous knowledge	Scientific knowledge
How approached	Holistic	Compartmental
How communicated	Oral	Written
How taught	Observations, experience	Lectures, theories
How explained	Spiritual, social values	Theory, “value free”

Besides, they tried to verify indigenous knowledge into 11 major areas. They are:

- Agriculture and horticulture
- Astronomy
- Forestry
- Human health, traditional medicines and healing
- Knowledge of animals, fish and ecological systems

- Sustainable use of natural resources and the environment
- Traditional classification systems for living and other resources
- Learning systems and oral traditions
- Spirituality
- Symbols
- Traditional arts and culture

No matter what point of view, all the researcher come to a common thing, it is the localism and native character of indigenous knowledge. In general, “indigenous knowledge” is referred to the knowledge of local people as a result of adapting to a specific habitat environment. And following are features of indigenous knowledge:

- Strong localism, i.e belong to a certain region;
- Associate with certain culture and development contexts ;
- Not include in formal scientific knowledge ;
- Transmit by word of mouth without text ;
- Be always active and adaptable ;
- Be spiritual;
- Mostly close to daily life of poor people in distant areas;
- Not distinguish between the three concepts of indigenous, traditional and local.

Based on that understanding, this paper aims to study indigenous knowledge of protect, preserve, and manage traditional medical plants of Hmong people in Hang Kia commune, Mai Chau district, Hoa Binh province.

3 METHODOLOGY

3.1 Method of analyzing secondary documents

- Analyze the studies that have been done on the issue of medicinal plants, manage the use of medicinal plants, manage the use of medicinal plants of the Mong people and research on the relationship between management and use of plants. Mong's herbal medicine has been designed to provide an overview of the research
- Analysis of descriptive statistics on: population, labor, occupation, employment, religion, ethnicity, land, forest and land allocation policies, regulations on

exploitation and use forest resources ... to learn about general characteristics of the study area and preliminary assessment of the management and exploitation of forest resources in the locality.

Observation method: Observe local infrastructure conditions, especially health stations, drug stores, forest resources, people's living conditions, people's livelihood activities in Hang Kia commune.

In-depth interviews: Used as a main method of gathering and exploiting specific information of research subjects. In-depth interviews cover the full content of the research and are an important source of data as the basis for making research findings.

Group discussion: Aim to better understand the research contents, to emphasize on the interaction between the participants in the discussion as well as to complement the information gained from in-depth interviews.

*** Research sample**

The study was conducted in Hang Kia , Phu Tho province. Based on the data and information provided by the local government, two villages were selected for the study. Of all herbal users in those two villages, 10 people were selected randomly to join the interview. They are mostly shaman, village chief, and elder women.

4 RESULT AND DISUSSION

4.1 The role of medicinal plant in life of Hmong people in Hang Kia commune, Phu Tho province

4.1.1 The role of medicinal plants in spiritual life

Herbal medicine has existed and developed for a long time in the forest and the Hmong in Hang Kia commune have known to use medicinal plants for common diseases in everyday life for a very long time. All herbal remedies, methods of processing and using medicinal herbs has been passed on from one person to another, generation to generation. Especially, the Hmong sanctified medicinal plants and believed that the spiritual dog resided in medicinal plants, therefore those who practiced healing in the community must set an altar for the god of herbal medicine. “About 35 - 40 years ago,

the Hmong people still had three altars: An ancestral altar, an altar of the gods and an altar of herbal medicine. However, up to now, most of the Mong people here have combined their ancestral altars and the gods' altars into one, while the altar of herbal medicine has remained the same. ” (Sung A Si, 40 years old, male)

According to the Hmong people in Hang Kia, herbal medicine practitioners can diagnose a patient's disease through observing the patient's nuances as well as the description of the patient's condition. Besides each practitioner has certain skills to examine and know the seriousness of the disease. They also have deep knowledge about medicinal plants in the forest, the use of each one and how to collect and process medicine for disease treating and maintain medicinal plants as well. One of the principles the Hmong herbal medicine practitioners must follow is that they have to conduct the act of worshiping and praying to the god and ghosts of herbal medicine whenever treatment happens. By doing that they can be confident in the diagnosis and treatment of patients. This is a special ritual that only the practitioner is allowed to represent the sick man and all the villagers to contact the supernatural powers in charge of herbal medicine.

“Every herb has life and soul, so it is the spirit of medicine that governs the whole soul of medicinal plants”.

To set up the altar, a ceremony must be made: a live rooster is brought to the altar offering to the god of medicine; they kill the rooster there, stick the feathers onto the silver paper and stick them on the altar.

Since then, there is an altar of herbal medicine in the house of practitioner. Patients coming to ask for medical treatment have to bring along a little incense (with or without money). Before the practitioner go to get the medicine, he has to burn incense and worship at the altar to wish the sick person would recover soon. When the sick person get well, they have to bring gifts to the practitioner’s house to give thanks. If not, the god of herbal medicine will make the practitioner severely ill.

Every year on the new year of the Mong people (early December of the solar calendar), herbal medicine practitioner must make a ritual to worship the god of medicine and replace the altar. Again, one rooster is sacrificed, a one new silver paper with chicken feathers is stuck on the, which means changing clothes for the new year”.

For patients seeking medical treatment, the rituals implemented by herbal medicine practitioner is a call for divine consent of the god. Only such the god will tell the practitioner the plants that can cure the sick. Without the aforementioned rituals, "no

one show the way and no one bless the sick person". Thus, it can be seen that the ritual of worshipping herbal medicine plays a particularly important role in the spiritual life, not only for the practitioner but also for the Hmong community here.

Mrs. Hang Y Vua - 68 years old, said: According to HMong's customs, when the sick person comes to the physician's house, he only needs to bring a incense bunch and a paper (paper is made from Giang tree – a kind of bamboo tree). After that, the physician will use this incense to burn up and pray the god of herbal medicine. When praying the physician clearly state the name, age, address of the patient, information about the illness such as symptom, duration. Besides, the physician will ask for the permission of the god to go to get the medicinal plant. The patient promises that when he is cured, he would give an offering or something to the physician to express his gratitude to the person who healed him. After recovering from the illness, to keep the promise, the patient will usually bring to physician's house an offering, which can be a chicken, a skirt or a shirt, etc... or a small amount of money like 100,000 VND - 200,000 VND depending on the severity and complication of disease (broken leg or arm, infertility, kidney stones, partial or total paralysis) or normal (idiopathic, insomnia, stomach ache, headache).

4.1.2 Some medicinal plants and herbal remedies are used locally

Natural medicinal plants are widely distributed in the world in general and in Vietnam in particular. Trees exist in many different forms and geographical distribution is also different: there are trees, shrubs, herbs growing on limestonem, sometimes trees, herbs, and vines grow in the hills, red soil. ... Because of the difference in geography, climate, and soil, their therapeutic uses are also very different and depend very much on the user as well as their medicine processing. There are plants that healing, tubers or stems or leaves are used for treatment, there are also some plants of which the trunk, tubers, leaves and even the sap are combined to make the medicine. In Vietnam, the existence and transmission of traditional medicinal plants and herbal remedies mainly among ethnic minorities such as HMong, Dao, Tay, Thai, Muong, Ca Tu and Van Kieu.. The remedies and medicinal plants have been handed down for many generations and now they not only gather in the forest but also bring the medicinal plants in the forest back to their home gardens. They said this would be convenient for taking medicine, sharing with their descendants and preserving gene sources of some precious medicinal plants which are dying.

Table 3*List of herb medicine used by Hmong people in Hang Kia commune*

No.	Title	Function	Part collected	Time to collect	Place	How to process	Description	Breeding
1	Chùa Mo Pang	Be combined with psyllium and some other plants to cure <i>urination, diabetes mellitus</i>	Leaves, stems, tubers	Early morning or late afternoon	Home garden	Fresh or dried plants slow-cooked with drinking water for daily use is best.	Herbaceous, sprouting in clusters, leaves growing from the base, 30-35cm long, with a pointed tip like a blade, petioles at the base then gradually green up	Propagation by tubers. Just remove the bulbs to plant in moist soil
2	Chua Cang Lua	Cure <i>allergy, skin rashes</i>	Leaves, stems, roots	Early morning	Home garden	Boil the whole fresh plant then squeeze into a tight grip on the rash, allergy. Use 2-3 times	Herbaceous, single leaf sprouting, double-sided propeller leaves, self-blooming white flowers	Propagation by seeds. Usually at the end of the summer, the seeds are stored until the following season and sometimes the ripe seeds fall to the ground next year.
3	Mâu to	Treatment of <i>uterine prolapse</i>	Leaves	Early morning	Home garden	Take 3-4 leaves that heaten on the stove then sit down on the hot leaves, do 2-3 times in the morning, noon, evening during the day (morning at 7am, 1-2pm, 8 -9 pm)	Herbaceous, single leaf sprouting, shallow lobed, 5-10cm long stalks, serrated margins, often sprouting into dust, crumbling slightly viscous.	Propagated by seeds.
4	Luá Lì	Cure <i>diabetes, rheumatism</i>	Leaves, stems, tubers	Early morning	Home garden	Fresh plants slow-cooked with drinking water for daily use is best for diabetes.	Small woody, single-feathered compound leaves, leaflets opposite, serrated edges	Propagation by seeds

No.	Title	Function	Part collected	Time to collect	Place	How to process	Description	Breeding
						Dried root soaked with rice/corn wine for daily use for rheumatism		
5	Chúa Noong	<i>Dermatitis</i>	Leaves	Early morning	Home garden	Crushed fresh leaves close to the skin, or take fresh leaves through the fire and cover the skin	Herbaceous plants, single leaves sprouting, fishbone shaped veins, crumpled to smell pungent, hands see slightly viscous water, flowers are white	Propagation by seeds however most plants grow naturally in forests and home garden
6	Tăng kỳ	Relieve <i>fever, headache, tired body</i>	Leaves, stems, tubers	Early morning or late afternoon	Home garden	Take fresh leaves to boil in water to get the steam, or pick leaves to cook with meat, soup to eat daily	Herbaceous plants, double-feathered leaves, leaves that grow from the root in clusters, the top double leaves will be deeply lobed, the leaves are purple, the leaves are slightly viscous	Propagation by tubers
7	Xăng xí	Relieve <i>back pain, joint pain</i>	Tubers	Early morning	Home garden	Dry, bury in soil, soak with drinking alcohol, drink daily	Herbaceous plants, double-feathered leaves sprouting in clusters at the base, the top double leaves will be deeply lobed, the leaf stalks are purple, the leaf surface is a little purple-purple with serrated edges	Propagation by tubers
8	Sa Nhân	Relieve <i>joint pain, insomnia</i>	Tubers	Early morning	Home garden	Dry, bury in soil, soak with drinking alcohol, drink daily	The arrowroot family, herbaceous plants, single-leaf sprouting leaves, inverted egg-shaped leaves, pointed tip heads clustered	Propagation by tubers
9	Củ Máu	Cure diarrhea, back pain	Tubers	Early morning	Home garden	Soaked with alcohol for drinking daily	Vines, single leaves grow spaced, veins floating from 1 point near the petiole,	Propagation by tubers

No.	Title	Function	Part collected	Time to collect	Place	How to process	Description	Breeding
							tubers are round to the size of a car bowl, sometimes bigger, skin slightly wrinkled and with many nodules.	
10	Củ ba tầng	Relieve <i>back pain, rheumatism</i>	Tubers	Early morning	Home garden	Dry, bury in soil, soak with drinking alcohol, drink only one small cup at a time before eating	The vines are purple, the leaves have 6 leaves, the distance of burning segment is 50-70cm, the tubers are round like the mouth of a car bowl, brown with many rough spots.	Propagation by tubers
11	Cây coong	<i>Cough, diarrhea</i>	Seed	Early morning or late afternoon	Home garden	Chew raw seeds	Galangal family, grows in clusters, single leaf grows main body, purple petiole. On the leaf, there is a large veins running along the leaf stalk to the top	Propagation by tubers
12	Nọng đũa	Treatment of <i>uterine prolapse</i> (associated with Săng Sông)	Leave	Early morning or late afternoon	Home garden	Take the leaves to boil with some other types of leaves and sit on the steam. 2-3 times per day in the morning, noon, afternoon cool for 3 days.	Herbaceous, single-leaved leaves, ovoid, succulent, crumpled and slightly green in color, with a pale white main tendon	Propagation by branches
13	Săng sông	<i>back pain, uterine prolapse</i> (associated with Nọng đũa)	Stems and leaves	Early morning	Home garden	Get fresh stems close to burning tubers or more soaked with alcohol about 1 week, then drink	Herbaceous plants, double-feathered leaves, 2 times odd, opposite, leaflets deeply shaped like a propeller, plants grow in clusters	Propagation by tubers

No.	Title	Function	Part collected	Time to collect	Place	How to process	Description	Breeding
14	Rờ A Mãng	Pain in the hand of unknown cause	Leaves	Early morning	Home garden	Take fresh crumpled leaves then apply on the wound	Herbaceous plants, single-axis, single-leaved leaves, sword-shaped, pointed-edged leaves with a white main veins running from the petioles to the tip	Propagation by seeds
15	Pịa đê (của nước)	Relieve abdominal boil, abdominal pain,	Leaves	Early morning	Home garden, stream bank	Take clean leaves and put them into boiling water, let them cool down gradually, take one dose of each pot.	Herbaceous plants, sprouting in clusters, with long, round swords shaped around them, small veins not visible, crumpled viscous in hands;	Tuber crops
16	Pịa ang (của đất)	Relieve abdominal boil, abdominal pain,	Stems and leaves	Early morning	Home garden, stream bank	Take clean leaves and put them into boiling water, let them cool down gradually, take one dose of each pot.	Herbaceous plants, in clusters, with long, oblong-shaped leaves with a main vein running along the petioles to the leaf tips	Tuber crops
17	Pàng thông	Cure <i>difficulty urinating</i>	Tubers	Morning, noon, afternoon	Home garden	Dry 3 tubers then slow cook with water, drink before eating	Herbaceous plants, without main stems, shallow leaf splinter, petiole concentrated at the base of the tree, veins concentrated on petiole, on leaves covered with light brown agarwood, concentrated on leaf margins, leaf margins saw	Tuber crops
18	Cây Chơ	<i>Urinating, blood urinating</i>	Leaves	Morning, noon, afternoon	Home garden	Take fresh leaves to boil in water for about 5 minutes then remove the water to drink daily	Herbaceous plants, without the main stem, the leaves grow from the root to spread all around, the leaves have three veins running from the petioles to the tips of the leaves.	Tuber crops

No.	Title	Function	Part collected	Time to collect	Place	How to process	Description	Breeding
19	Pia Hơ Chăng	<i>menstrual pain</i>	Leaves	Morning, afternoon	Home garden	Take dried leaves, finely chopped, then add in the kettle to add boiling water. Drink before eating	Herbaceous, round stems with many stings, single leaves sprouting away from the main stem, ovoid leaves, corrugated margins	Plant by stem
20	Trăng xông đỏ	Relieve <i>back pain, stop bleeding</i>	Leaves	Morning	Home garden	Scratch and apply it to the wound, if someone has back pain, then heat up and then apply it to the pain.	Herbaceous plants, single-feathered double-leaved leaves, clustered in main body, Leafs with serrated leaflets, shallow lobes, veins, purple petioles	Tuber/root crops

Recourse: Collected by authors

4.2 Indigenous knowledge of Hmong people in Hang Kia commune, Phu Tho province in the exploitation and use of traditional medicines

4.2.1 Experience in exploiting and protecting traditional medicines

According to the experience of herb medicine practitioner, medicinal plants are wild plants growing in the forest, there are rare plants that have to go all day to get, but also there are many species of trees that can be found easily. Most of the people do not know it is a medicinal plant but only a physician who is aware of it. It is not specified at which time of the day to pick up the medicine, but before going to collect herbal medicine in the forest, the physician has to burn incense on the altar of herbal medicine and pray to ask the god of medicine for blessing them “*get what they want so they can cure the disease*”.

While collecting medicinal herbs, if the plants are easy to grow and find, they can get the whole tree, while rare or slow-regenerating trees, they use their experience to selectively exploit, only take a part of it and leave the root or some branches left so the tree can grow then they come to get it later. HMong people do not have the habit of taking herbal medicine to store in the house, only when a patient comes, they will diagnose the disease, burn incense and go to get medicine in the forest.

According to the customs of the Mong people, herbal medicine practitioner does not usually transfer their profession to other lineages and also do not have the habit of sharing experience in using medicine with other practitioners from other ethnic groups. Each ethnic group has different experiences and remedies. If they meet each other on the way to get medicinal plants, they just do their job without discussing anything. Besides, the Hmong believe that even if other people know about medicinal plants, they cannot cure themselves effectively because of the lack of spirituality in the healing process through the worship of the traditional medicine altar. The reputation of a practitioner is due to word of mouth patients or people in the community. HMong physicians never show off to promote their image or experience, they are only confident and wholeheartedly with the patient when the patient comes and wishes to be treated completely trustfully.

HMong physicians appreciate the secrecy of medicine because they believe that keeping this secret is part of their success in treating patients. Therefore, after diagnosing

the disease, the medicinal plants that were brought from the forest are often chopped into pieces, mixed so that during the decoction, the substance will work faster as well as to make it impossible for outsiders to know the ingredient and recipe of the medicine. Follow the rule of predecessors, Hmong herb medicine practitioners never bring medicine to the market. Even if they try to sell, the medicine will no longer effective. Then a unique cultural feature of HMong people was formed. They don't go to the forest to get medicine if they have not burned incense and prayed to the altar of herbal medicine. Therefore, the preservation and conservation of medicinal plants of the Mong people are strictly followed.

4.2.2 Preserving medicinal plants in Hmong community in Hang Kia commune, Phu Tho province

4.2.2.1 Conservation in home garden

For HMong herbalist, every family has a herbal garden or grows herbal plants around the home garden area. These medicinal plants are derived from natural forests, there are medicinal plants that are passed on from generation to generation and also new medicinal plants are brought to plant. The medicinal plants in the garden such as Chan Song Do, Sa Nhan, Noong Dia, Tang Ky ... are regular used ones and for simple diseases such as abdominal pain, diarrhea, and urination. Before the physicians bring the medicinal plants back to plant, they also observe how it lives in the forest so that when they return home, they will try to create such a living environment. Most of the medicinal plants brought back to the garden are able to adapt to the growing conditions in the home garden such as intercropping under the fruit trees of Plums, Peaches or adapting to the moist, wet environment near the well area.

4.2.2.2 Conservation in forests

In the process of collecting medicinal herbs, depending on each medicinal plant and its use, the physician will take the leaves, stems or roots. Most of the available medicinal plants are collected by physicians at their root, but there are also medicinal

plants that are collected partially selectively. Therefore, during the process of collecting medicine, some plants after being harvested were taken care of and protected directly by the practitioner in the forest.

"Find out the rare medicinal plants, we do not take all but I have to mark and remember the place so 2-3 years later we come back to get it. We usually mark it with a knife bumping slightly 2-3 times into big trees next to or clearing grass, bushes, grass fields around this precious medicinal plant and mark the path next to medicinal plants or may fence around medicinal plants".

One issue of conservation of local medicinal plants today is the heterogeneity of medicine use experience. According to Ms. Lang Y Vua, naturally, the experience of using traditional medicines of the HMong, Thai and Muong ethnic groups in Mai Chau district is completely different. Even with the same illness, the way to get medicine and pick up them is completely different. HMong people do not use types of plants that Muong and Thai people use to make herbal medicines, and vice versa. The advantage of this matter is the pressure on medicinal plants has been greatly reduced because there is no coincidence of medicinal plants among ethnic groups.

5 CONCLUSION

This study contributes to the growing body of literature on indigenous knowledge and sustainable resource management by documenting and analysing the medicinal plant knowledge of the H'Mong people in Hang Kia commune, Phu Tho province. The findings confirm that H'Mong traditional medical knowledge constitutes an integrated socio-ecological system in which medicinal practices, spiritual beliefs, and customary norms collectively regulate the exploitation and conservation of plant resources. Rather than operating through formal institutions, sustainability is achieved through culturally embedded mechanisms such as ritualized harvesting, selective use of plant parts, secrecy of remedies, and strict avoidance of commercialization.

Empirical evidence from the field indicates that home-garden cultivation, controlled forest harvesting, and the differentiation of medicinal knowledge among ethnic groups effectively reduce pressure on wild medicinal plant populations. These practices

reflect a form of endogenous conservation that aligns with contemporary sustainable development principles while remaining deeply rooted in local cultural values.

Nevertheless, the study also highlights the vulnerability of this knowledge system in the context of social transformation, weakening intergenerational transmission, and limited institutional recognition. The erosion of indigenous medicinal knowledge poses not only a cultural risk but also a threat to biodiversity conservation and community-based health care systems.

Accordingly, policies aimed at conserving medicinal plant resources in upland regions should move beyond species-centered approaches and explicitly incorporate indigenous knowledge holders as key actors. Recognizing, safeguarding, and supporting indigenous knowledge systems is essential for achieving long-term sustainability, cultural continuity, and inclusive development in ethnic minority areas of Vietnam.

This study contributes to the growing body of literature on indigenous knowledge and sustainable resource management by documenting and analysing the medicinal plants knowledge of the H'Mong people in Hang Kia, Phu Tho province. The findings confirm that H'Mong traditional medical knowledge constitutes an integrated socio-ecological system in which medicinal practices, spiritual beliefs, and customary norms collectively regulate the exploitation and conservation of plants resources. Rather than operating through formal institutions, Sustainability is achieved through culturally embedded mechanisms such as ritualized harvesting, selective use of plant parts, secrecy of remedies, and strict avoidance of commercialization

Field evidence suggests that growing medicinal plants in home gardens, carefully managing forest harvesting, and the sharing of medicinal knowledge across different ethnic groups all help to reduce pressure on wild plant populations. These practices represent a form of locally driven conservation that aligns with modern ideas of sustainable development, while remaining firmly grounded in H'Mong cultural values.

At the same time, the study points to growing challenges. Social change, weakened transmission of knowledge between generations, and limited recognition from formal institutions are putting this knowledge system at risk. The loss of indigenous medicinal knowledge would not only mean a decline in cultural heritage, but also threaten biodiversity conservation and community-based health care.

For these reasons, policies aimed at conserving medicinal plant resources in upland areas should go beyond a narrow focus on species protection. They need to actively recognize and involve indigenous knowledge holders as central actors. Supporting and safeguarding indigenous knowledge systems is crucial for long-term sustainability, cultural continuity, and more inclusive development in Vietnam's ethnic minority regions.

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Authors' Contribution

All authors contributed equally to the development of this article.

Data availability

All datasets relevant to this study's findings are fully available within the article.

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