

A survey of traditional medicinal plants used by K'ho people in the buffer zone of Chu Yang Sin national park, Vietnam

Nghiên cứu cây thuốc truyền thống của người K'ho ở vùng đệm Vườn quốc gia Chư Yang Sin, Việt Nam

Research article

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This paper shows the results of a survey on use of traditional medicinal plants of K'ho people who living in the buffer zone of Chu Yang Sin National Park, Central Highlands, Vietnam. Total of 66 medicinal plant species belonging to 61 genera, 40 families were recorded through semi-structured interviews, group discussions and from guides of field trips who are knowledgeable about medicinal plants. These medicinal plants used by K'ho people are documented with latin name, family, local name, parts used and medicinal uses. In generally, fresh medicinal plants are mainly boiled or decocted for drinking and leaves are parts most commonly used. The results of this study showed that K'ho people still depend heavily on medicinal plants to treat diseases such as headache, fever, malaria, diarrhea, fractures, sprains and arthritis.

Bài báo này đề cập kết quả khảo sát cách sử dụng cây thuốc truyền thống của người K'ho sống ở vùng đệm Vườn quốc gia Chư Yang Sin, Việt Nam. Tổng số 66 loài cây thuốc thuộc 61 chi, 40 họ đã được ghi nhận thông qua quá trình phỏng vấn bán cấu trúc, thảo luận nhóm và từ những người dẫn đường đi thu mẫu có am hiểu về cây thuốc. Những cây thuốc truyền thống của dân tộc K'ho được tư liệu hóa gồm tên latin, tên phổ thông, bộ phận sử dụng và công dụng. Nhìn chung, được liệu tươi được dùng đun hoặc sắc để uống là chủ yếu và lá là bộ phận được sử dụng phổ biến nhất. Kết quả nghiên cứu cho thấy cộng đồng K'ho vẫn phụ thuộc vào cây thuốc để chữa trị một số bệnh như đau đầu, sốt, sốt rét, ỉa chảy, lỵ, gãy xương, bong gân và thấp khớp.

Keywords: K'ho, medicinal plants, Indigenous knowledge, Highland Vietnam

1. Introduction

Medicinal plants have important contributions in the healthcare system of local communities as the main source of medicine for the majority of the rural population. According to World Health Organization (WHO), at present, about 80% of the population in developing countries rely largely on medicinal plants for primary health care needs, and the WHO has estimated that in coming decades a similar percentage of the world population may well rely on plant-based medicines, but more 90% medicinal plants are still harvested from the wild.

Viet Nam is one of mega-biodiversity of the world. It is estimated that the flora of Vietnam consists of 12,000 species of flowering plants, in which approximately 4,000 medicinal plants.

The Chư Yang Sin national park is located in Krong Bong and Lak Districts in southern Dak Lak province in the central Highlands of Vietnam, within the largest remaining block of broad-leaved mountain evergreen forest in the central highlands. Perhaps, it is one of the last pristine wilderness areas in Vietnam. But now, it faces escalating threats from infrastructure development, logging, hunting and climate change, free migration.

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K'ho people population is one of the indigenous people populations living in the southern buffer zone of the national park for a long- standing that has built a precious knowledge base about the use of the rich bio-resources, specially, about medicinal plants of the region. They mostly depend on plant resources for their livelihood. These resources are harvested and used in many ways, for example, as food plants, fodder plants, wild vegetables, and medicine. Plants are their main source of treatment for the various diseases, especial economically poor people. But now, changing forestland to agriculture may leads to a loss of important medicinal plants resulting from ecosystem imbalance. In recent years, due to both of the environmental impact of landscape changes on biodiversity and the younger generation, they are unable to recognize the traditional medicines and possess very little knowledge on traditional medicinal plants. In many cases, this knowledge is transmitted orally, from generation to generation, and remains confined to a limited group of people, not documentation. Thus, the knowledge of their usage of plants is rapidly eroded and even disappeared. For these reasons, survey on the medicinal plants diversity and the documentations of the traditional uses of medicinal plants, which are commonly used among the K'ho people are important to preserve their knowledge.

2. Materials and methods

Field trips of ethno-medicinal survey were carried out by the K'ho people living in buffer zone of Chu Yang Sin National Park, Central Highlands, Vietnam. The assessment of medicinal plants diversity was based on Nguyen Nghia Thin (2007). All information on medicinal plants was obtained by semi structured oral interviews, group discussions and individual conversation, as well as from the guides of field trips who are knowledgeable about medicinal plants of the K'ho people (format following the approach of Martin, 1995). The local name, useful plant parts, ailment treatment, and medicinal uses were record-

ed. The collected specimens were identified by using taxonomic literature (Pham Hoang Ho, 2000). The voucher specimens were stored in Vietnam National Museum of Nature.

3. Results

3.1 Ingredients of medicinal plants

Medicinal plants of K'ho people were mainly distributed in two divisions: Lycopodiophyta and Magnoliophyta. Lycopodiophyta division has only one family with two genera and two species (each genus has a species). Most of the taxa were represented in Magnoliophyta (showed in fig 1). This division is the most diverse with 64 species, 59 genera and 39 families (Figure 1).

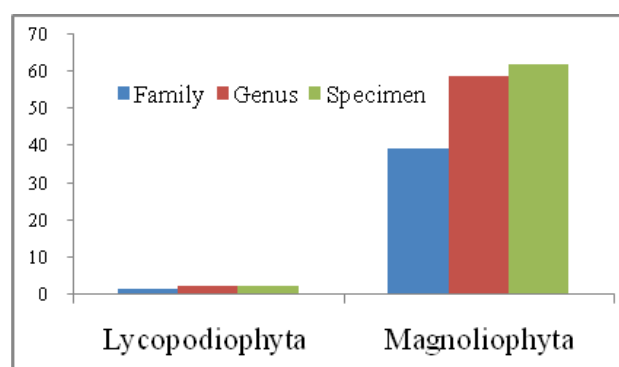


Figure 1. Distribution of taxa in 2 divisions

The differences are shown not only in divisions but also in classes of Magnoliophyta. Therefore, we focus on the medicinal plants in Magnoliophyta division as follows: This division consists of 2 classes: Magnoliopsida and Liliopsida (Table 1). The approximate ratio of species of Magnoliopsida/Liliopsida is 2:1.

Table 1: Distribution of taxa in two classes of Magnoliophyta.

No.	Class	Families		Genera		Species	
		No.	%	No.	%	No.	%
1	Magnoliopsida	26	65.00	39	63.93	43	65.18
2	Liliopsida.	13	32.50	20	32.78	21	31.82
Sum		39	97.50	59	96.71	64	96.97

Table 1 shows that in Magnoliophyta, the class Magnoliopsida has 43 species representing 65.18%; 39 genera representing 63.93%; 26 families representing 65.0% of the total species, genera and families, respectively in the medicinal plants of K'ho people. While the number of taxa in the class Liliopsida is less than that in the Magnoliopsida (21 species representing 31.82%; 20 genera representing 32.78%; 13 families representing 32.5% of the total species, genera and families, respectively in the medicinal plants of K'ho people).

In Magnoliophyta, most of the families (26) were represented by single species (Monospecific family). Asteraceae had the highest number of medicinal plants (five species), followed by Rutaceae and Solanaceae, each consists of four species. Each of three families (Moraceae, Poaceae and Zingiberaceae) had three species. Seven families (Anacardiaceae, Gentianaceae, Melastomataceae, Myrsinaceae, Rosaceae, Convallariaceae and Orchidaceae) had two species each (Figure 2).

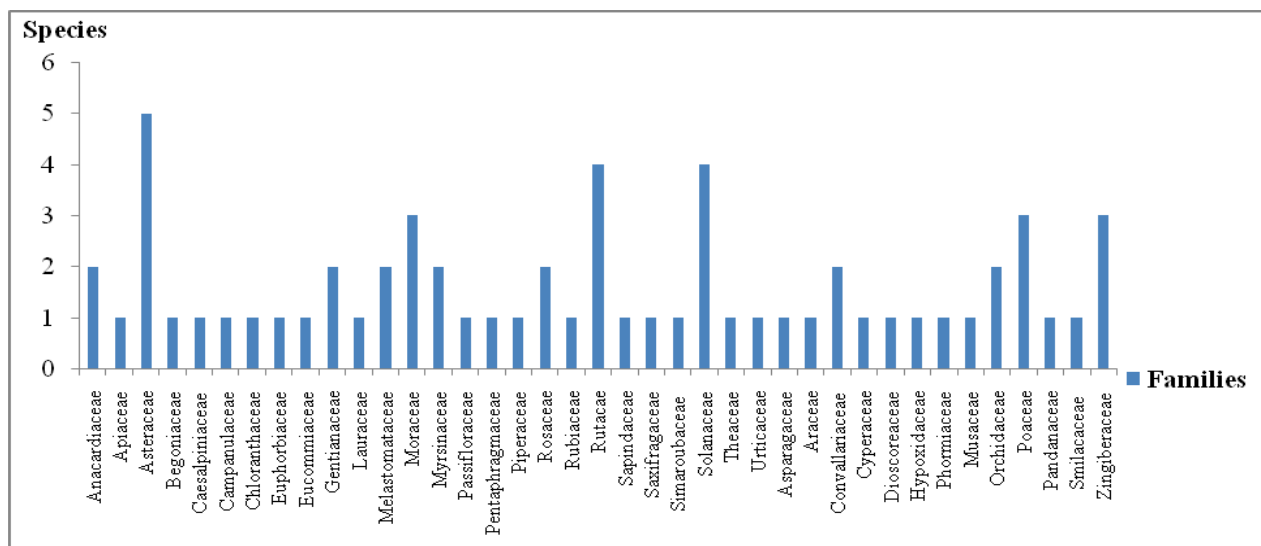


Figure 2. Number of medicinal plant species in families belonging to Magnoliophyta

3.2 Habit and distribution of medicinal plants

Results showed that, of the total species, herbaceous plants are the main sources of medicines (51.5%), most likely because herbaceous plants are more abundant, followed by shrubs (21.2 %), trees (15.2) and climbers (12.1%) (Figure 3).

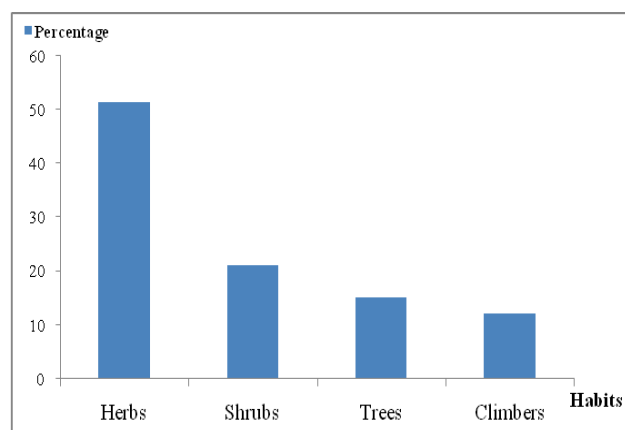


Figure 3. Habit of medicinal plants

The great majority of medicinal plants recorded in our survey were harvested in nature (more than 95%) These plants grow mainly in forestlands; from low to high mountain. Only a few ones were cultivated or collected from home gardens. These plants were grown primarily for other purposes (food, dyed, and aromatic species). Amongst these were *Zingiber officinale* Ross.; *Allium fistulosum* L.; *Curcuma longa* L. etc So far, medicinal plants are cultivated in the garden more and more, which are not only convenient for collecting and making people proactive about materials sources but also ensuring biodiversity conservation

3.3. Parts used of medicinal plants

For traditional medicinal plants of K’ho people, different parts of the same medicinal plant are used for the treat-

ment of various ailments. In our survey, the most frequently used parts were leaves, accounting for 33.1%; followed by roots (30.3%), fruits and seeds (15.1%), whole plants and stem (7.6% each), and tuber (6.3%) (Figure 4). Depending on the ailment, leaves were used alone or in combination with other plant parts. This is a plant part harvested without affecting the plant life (plants still survive). Therefore, local vegetation structure is not altered and medicinal plants will not fall in threatened status.

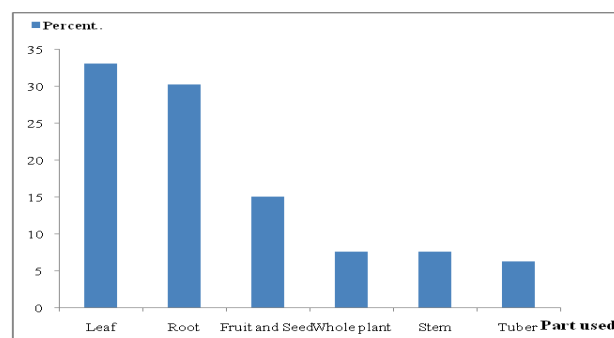


Figure 4: Parts used of medicinal plants

Noting that harvest of any part of the plants must ensure sustainable. In fact, unsustainable harvesting and habitat degradation were two of the reasons causing many medicinal plants to fall in threatened status even extinct in wild, such as *Huperzia serrata* (Thunb. ex Murray) Trev.; *Codonopsis javanica* (Blume) Hook.f. & Thoms.; *Asparagus filicinus* Ham.ex D.Don.; *Disporopsis longifolia* Craib.; *Anoectochilus* spp.

3.4. Modes of preparation of medicinal plant

The medicinal plant species recorded here were prepared in a variety of ways before they are used. Concoctions normally consist of mixtures of more than one species or including also animal and mineral materials, such as pieces of elephant, rhinoceros, chameleon, lion, monkey, horse, or cow.

The fresh medicinal plants were mainly used, after being cleaned with the tap water. But, to reserve them for later use, commonly methods were dried or roasted.

Preparation methods included making paste (fresh plant parts are crushed with stone pestle and mortar), juice (obtained by squeezing or crushing plant parts and filtering through cloth, sometimes it requires addition of freshwater or other liquid for dilution), decoction (plant parts are boiled in water and the extract (crude drug) is used), boiling (plant parts boiled in water are used) and chewing (fresh plant parts are chewed before being used).

Most preparation methods are made with water and the decoction or boiling method for drinking is generally chosen, accounting for 88% of the recorded species. Other less common ways of preparation (22%) include soak in local wine, making paste, juices, and rarely glue (plants use as medicine). Juices are usually extracted from fresh plants. One of the other ways of preparation is making powder that is obtained by crushing the plant parts to be used, after drying; charred material is obtained by a non-complete burning of plant parts; Fresh dregs obtained by chewing or pounding medicinal plants were used to treat abdominal collywobbles, haemostasis and wound bitten by insect. The plant species that had those functions were *Elephantopus mollis* HBK.; *Ageratum conyzoides* L.; *Galingsoga parviflora* Cav.; *Crawfurdia pasquieri* Merr.

According to traditional knowledge of K'ho people, the treatment effect depends on choosing and time harvesting medicinal plants or mixing ratio of different kinds of medicinal plants. For example: flowers should be collected in the early morning (fresh flowers), dry weather (not rain); or mix *Passiflora edulis* Sims and *Morus alba* L. with ratio 1:1 for the treatment of insomnia is very effective.

The majority of medicinal plants recorded in our survey could be used for more than one types of disease. A single plant part may be used to treat more than one ailment, such as *Elephantopus mollis* HBK.: leaves not only used to treat hemostatic, but also treat dysentery; *Rubus palmatifolius* N. V. Thuan: whole plants used to treat malaria or leaves used to treat oedema. Depending on the ailment, medicinal plants were used alone or in combination with other plants.

3.5. Therapeutic uses of medicinal plants

A high proportion of medicinal plants (16.7%) is used to treat digestive system (including stomachache, flatulence, diarrhea,..) . Some plants are used to treat digestion disease by the K'ho people such as *Acorus tatarimowi* Schon.; *Malus doumeri* (Bois.) A.Chev.; *Melastoma sanguineum* Sims.; *Amomum villosum* Lour.; *Kaempferia galangal* L.

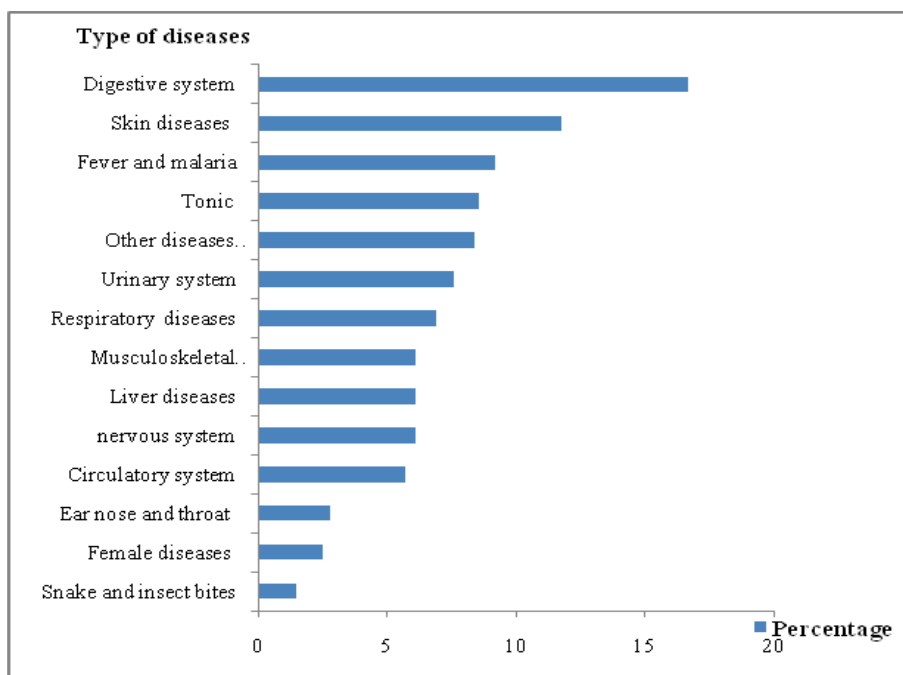


Figure 4. Percentage of medicinal plants used for different kinds of disease

Followed by the proportion of medicinal plants (11.8%) that were used to treat skin diseases (scabies, ringworm, eczema); fever and malaria diseases (9.2%); tonic (8.6%). Besides 7.6% of recorded medicinal plants were used to treat urinary system (urinary retention, strangury, dysuria, kidney disease, 6.9% for respiratory diseases including sore throat, cough, pneumonia,.., %;6.1% for musculoskeletal system (fractures, arthritis, sprains, 6.1% for liver diseases (jaundice, hepatitis), and 6.1% for nervous system The lowest proportions of medicinal plants were used

for female diseases like vaginitis (2.5%), and for wound bitten by snake and insect (1.5%) (Figure 5).

A large number of medicinal plants were used to treat digestive system because digestive infections are common in rural people. Especially K'ho people who are living in poor conditions such as the toilet does not reach standards (no septic tank) and drinking water is not boiled (no tap water).

4. Conclusions

In this study, 66 species of plants were recorded which can contribute to preserve knowledge on the use of medicinal plants of K'ho people, and transfer it to future generations. They have abundant knowledge of medicinal plants and rely on them for treatment of common diseases. Of the total species, herbaceous plants are the main sources of medicines as compared to shrubs, trees and climbers and a large number of medicinal plants is used to treat digestive system. Leaves constituted the major plant part used. Taking medicine orally is the most common way to apply.

This study could be a starting point to create a link between scientists and local traditional healers that can serve as a basis for further medicinal research.

5. Acknowledgements

This study is funded by project TN3/T13 belonging to program Tay Nguyen 3.

6. References

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