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## Indigenous knowledge on using medicinal plant of Cho Ro ethnic group in Vietnam: A case study at dong Nai culture nature reserve

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### Abstract

The folk and indigenous knowledge system about medicinal plants of the Cho Ro community at Dong Nai Cultural Nature Reserve was reported by this paper. A total of 76 species, 74 genera, belonging to 52 families of 3 phyla were used for health care and disease treatment by the local people. Ten species are threatened, listed in the Vietnam Red Data Book (2007), Decree 32/2006/ND-CP of the Vietnamese government, and listed in the Vietnam Red List of medicinal plants. There were 10 plant life-forms, most frequently used are shrubs (26.32%), followed by the vines (19.74%), and the lowest is palm-plant (1.32%). The plant part that was used most frequently are the stems (27.63%), followed by the whole plant (26.32%), leaves (17.11%), and lowest are flowers (1.32%). A total of 7 methods of processing, in which the highest is dry and minced (35.53%), followed by washing and use fresh (26.32%), the lowest is extracting, separating (5.26%). There were 8 methods of using medicinal plants to treat 14 different disease groups in this community. The research also introduced some medicinal plants and prescriptions traditional are often used by Cho Ro people to treat the disease. These are significant "ecological-cultural" materials that can help scientists for further research those plants whose medicinal properties may be useful in the development of new drugs and a basis for the conservation and sustainable development of this knowledge.

**Keywords:** Cho Ro ethnic, Dong Nai province, indigenous knowledge, medicinal plants, nature reserve

### Introduction

Traditional medicine as identified by the World Health Organization (WHO) "Total of knowledge, skills, and practices based on the theories, beliefs, and experiences indigenous to different cultures, whether explicable or not, used in the maintenance of health as well as in the prevention, diagnosis, improvement of treatment of physical and mental illness" [13].

The fact has proved that the ethnic communities around the world owning their own culture based on that they developed their system of medical practices, which are being addressed as folk and ethno-medicines. There are numerous medicinal plants available in their surroundings and those herbs are being used by the tribal community as medicine for curing their diseases. The local people lived in a forest environment for many generations and developed their knowledge of the flora and fauna of the forest that is known as folk or indigenous knowledge. At the same time, they have developed folk beliefs based on traditional practices that helped them in curing various forms of diseases. The beliefs and practices related to curing disease which are based on unwritten knowledge are carried from generation to generation through the practitioners [7].

In Vietnam, there are 3948 medicinal plants found by indigenous knowledge of 54 ethnic groups [10]. In which, much unique knowledge about medicinal plants used to treat and care for the Cho Ro ethnic in Dong Nai Culture Nature Reserve, Dong Nai Province.

Cho Ro is one of the 54 ethnic groups in Vietnam, mainly living in low mountainous areas in the southeast of Dong Nai province with a population of about 15,174 people, accounting for 56.5% of the total number of Cho Ro people in our country. In Dong Nai culture Nature Reserve now has 136 households of Cho Ro people with 608 people who have been living and sticking to the mountains for a long time. After each crop, local people often go to the forest to hunt animals, catch fish in streams or collect NTFPs such as bamboo shoots, forest vegetables, honey, medicinal plant, etc. Knowledge of using forest plants to make medicine of the Cho Ro ethnic group, is a product of cultural crystallization and experience through generations stick together with forests and nature.

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However, these experiences are gradually fading over time due to various objective and subjective causes<sup>[9]</sup>. Population pressure is a good example, agricultural cultivation, shifting cultivation, illegal exploitation of forest resources. On the other hand, knowledge and experience about medicinal plants are mainly preserved by the "word of mouth" method, without specific records. Moreover, the number of households who know about the use of medicinal plants small and limited, while the younger generation is less interested in the knowledge tradition, etc.

Up to now, there has not been any research on medicinal plants used by the Cho Ro ethnic group in Vietnam in general and Dong Nai Cultural and Natural Reserve in particular. Therefore, this is the first time the study was carried out. This study aims to: (1) Determine the composition of medicinal plants used by the Cho Ro ethnic group; (2) Experience in processing and using medicinal plants; (3) Introduce some ways to use some common medicinal plants were used by Cho Ro people to treat diseases.

## Materials and Methods

### Study area

The study was conducted in Dong Nai Culture Nature Reserve, Dong Nai Province, in Southern Vietnam from 2019-2020. Nature Reserve was established in 2004, with a role in the conservation of natural resources, biodiversity, water regulation, erosion control, preserving traditional historical values. The total natural area of Nature Reserve is 100,303 hectares, including 67,903 hectares of forestry land and 32,400 hectares of water surface (Tri An lake). Dong Nai Culture Nature Reserve in the North of Dong Nai Province, the West borders Binh Duong province, the north borders Binh Phuoc province. The typical topography is low mountains and hills, the peak of highest about 600 m above the level sea. The climate has two seasons, the rainy season from May to October, the dry season from November to April next year. The average annual rainfall is 2572 (most of the rainy season), the average annual temperature is 26.4 (the dry more than 35), the average annual humidity is 80% (most of the rainy season). Forest vegetation includes tropical evergreen broad-leaved forest, tropical evergreen broad-leaved semi-deciduous forest, tropical broad-leaved deciduous forest, and plantation forest. A total of 1,552 species of vascular plants, of which, 43 species are on the Red List IUCN (2015), 36 species in the Vietnam Red Data Book (2007), 11 endangered and rare species according to Decree No. 32/2006/ND-CP, 6 endemic plant species of Dong Nai. In addition to the biodiversity value of the ecosystem of native natural forests, this place also contains many cultural, historical, ecological values, especially indigenous knowledge of the Cho Ro ethnic about their use of medicinal plants to

treat diseases<sup>[3,4]</sup>.

## Methodology

### Methods of inheritance

The experience of local healers and physicians about medicinal plants were used to provide the necessary information for the study. Besides, research papers related to medicinal plants were also used, selected, and evaluated.

### Field investigation method

After the preliminary survey, 15 transects were established to collect samples by the instructions of the indigenous physicians. Samples were collected and processed by method Thin NN (1997)<sup>[15]</sup>. The method of ethnographic botanical of Gary JM (2002)<sup>[6]</sup> was used to interview the Cho Ro villagers, especially the healers, physicians, and village elders about their experience in using medicinal plants and traditional medicine remedies. The information was collected including on medicinal plant's scientific, common and local names; distribution; life-forms; habitat; parts-used.

### Data analysis

The name of medicinal plant species was identified by comparison morphological method combined with the experience of experts. The documents were used to identify such as Dictionary of Medicinal Plants<sup>[2]</sup>, An Illustrated Flora of Vietnam<sup>[8]</sup>, Vietnamese Medicinal Plants and Medicine<sup>[11,15]</sup>. The local name of the medicinal plant (Cho Ro's name) was determined through household interviews and on the survey. The scientific name was checked according to theplantlist.org. The list of medicinal plants was arranged according to the method of Brummit RK (1992). Species diversity and life-forms were assessed by the method of Thin NN (1997). The parts of medicinal plants were identified through interviews with local people and survey transects. Threatened medicinal plants were identified based on the Vietnam Red Data Book<sup>[12]</sup>, the Red List of Vietnamese medicinal plants<sup>[14]</sup>, Decree 32/2006/ND-CP of the Government of Vietnam<sup>[5]</sup>.

## Results

### The composition, life-forms, parts-used of medicinal plants are used by the experience of the Cho Ro ethnic group.

#### The medicinal plant species composition

A total of 76 medicinal plant species, 74 genera, 52 families of 3 phyla were used by the K'ho ethnic group to treat diseases and take care of health. Among them, Asteraceae and Euphorbiaceae are the most diverse families (the same 6 species), followed by Verbenaceae, Zingiberaceae, Rubiaceae (the same 3 species), the remaining families from one to two species.

**Table 1:** Composition of medicinal plants were used by the Cho Ro ethnic group

No.	Taxon	Family		Genera		Species	
		Number	Percentage %	Number	Percentage %	Number	Percentage %
1.	Polypodiophyta	1	1.92	1	1.35	1	1.32
2.	Pinophyta	1	1.92	1	1.35	1	1.32
3.	Magnoliophyta	50	96.15	72	97.30	74	97.37
4.	<i>Magnoliopsida</i>	40	76.92	58	78.38	60	78.95
5.	<i>Liliopsida</i>	10	19.23	14	18.92	14	18.42
	Total	52	100	74	100	76	100

A distinctive feature of the medicinal plant composition was used by the Cho Ro ethnic is the uneven distribution at taxon levels. Among them, most taxons belong to Magnoliophyta (97.37% of species, 97.30% of genera, and 96.15% of families). Further analysis in Magnoliophyta showed that

Magnoliopsida predominates with 40 families (76.92%), 58 genera (78.38%), and 60 species (78.95%). Liliopsida only accounted for a small proportion with 10 families (19.23%); 14 genera (18.92%); 14 species (18.42%). However, they include many high value-uses species such as *Pinanga*

*cochinchinensis* Blume treatment of liver disease; *Amomum villosum* Lour cure skin ulcers; *Pothos repens* (Lour.) Druce cure snakebites, centipedes bite, food poisoning. Liliopsida species were also used to treat common diseases: Skin treatment, pimples using *Euodia lepta* (Spreng.) Merr; *Clerodendrum cyrtophyllum* Turcz.; *Tetracera scandens* (L.)

Merr. was used to treat liver and kidney disease, postpartum women.

### The composition of medicinal plants is threatened

A total of 10 species of medicinal plants were identified for conservation priority (Table 2).

**Table 2:** The composition of medicinal plants is threatened

No.	Scientific name	Vietnamese name	Vietnam red data book (2007)	Decree 06/2019 ND-CP (2019)	Vietnam Red List of medicinal plants (2006)
1	<i>Tacca integrifolia</i> Ker Gawl.	Râu hùm	VU		VU
2	<i>Curculigo orchioides</i> Gaertn.	Sâm cau	VU		VU
3	<i>Fibraurea tinctoria</i> Lour.	Hoàng đằng		IIA	
4	<i>Coscinium fenestratum</i> (Gaertn.) Colebr.	Vàng đằng		IIA	
5	<i>Ardisia silvestris</i> Pit.	Khôi nhung	VU		VU
6	<i>Fagerlindia depauperata</i> (Drake) Tirveng.	Găng nghèo	VU		
7	<i>Homalomena gigantea</i> Engl.	Thiên niên kiện lá to	VU		EN
8	<i>Homalomena pierreana</i> Engl.	Thần phục	VU		VU
9	<i>Aeginetia indica</i> L.	Lê dương	VU		VU
10	<i>Drynaria fortunei</i> (Kunze ex Mett.) J. Sm.	Cốt toái bộ	EN		EN

Note: EN: Endangered; VU: Vulnerable; IIA: Forest plants are limited to commercial exploitation and use.

In which, eight species listed in the Vietnam Red Data Book (2007): 7 species at VU level such as *Tacca integrifolia* Ker Gawl stomach ache, *Homalomena gigantea* Engl cures osteoarthritis, gastrointestinal pain, etc; one species at EN levels is *Drynaria fortunei* (Kunze ex Mett.) J. Sm cure back pain, aching joints; Two species listed in group IIA of Decree 32/2006/ND-CP are *Fibraurea tinctoria* Lour cure eye pain, hepatitis boils in children and *Coscinium fenestratum* (Gaertn.) Colebr cure malaria, jaundice; 7 species listed in the Vietnam Red List of medicinal plants (2006) such as *Aeginetia indica* L cure snake bites, fevers, sore throat, *Ardisia silvestris* Pit cure stomach pain, *Curculigo orchioides* Gaertn make a tonic, etc.

### The life-form of medicinal plants

The life-forms of medicinal plants were classified into many different groups (Table 3).

**Table 3:** The life-forms of medicinal plants

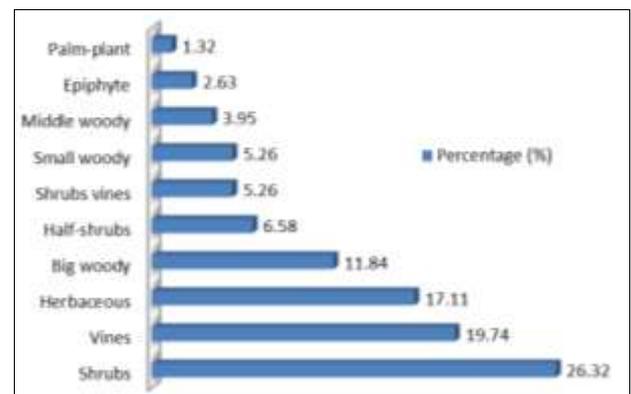
No.	Life-forms	No. of species	Percentage (%)
1	Shrubs	20	26.32
2	Vines	15	19.74
3	Herbaceous	13	17.11
4	Big woody	9	11.84
5	Half-shrubs	5	6.58
6	Shrubs vines	4	5.26
7	Small woody	4	5.26
8	Middle woody	3	3.95
9	Epiphyte	2	2.63
10	Palm-plant	1	1.32
	Total	76	100

Experience of using medicinal plants of traditional healers and physicians of Cho Ro ethnic group indicated that there were 10 different life-forms were used to treat diseases. Among them, the highest is a shrub (26.32%), the lowest is palm-plant (1.32%). Besides, the Cho Ro people knew how to make use of woody plants (21.05%) to make medicines, etc.

### Parts-used of medicinal plants

Experience of using parts of medicinal plants to treat diseases

of Cho Ro people not only shows the abundance and diversity of healing ability of those parts but also has important makes sense in management and conservation. From another perspective, it also assesses the sustainability of the use of medicinal plant resources of the Cho Ro ethnic group in the study area. The parts-used of the plant can use as a medicine, but depending on the treatment of the diseases that the part used uses as medicine may vary (Figure 1).



**Fig 1:** Chart of the percentage of parts-used of medicinal plant

The stems and whole plants were most used by Cho Ro people. This was explained by the fact that they belong to shrubs and herbaceous, small in size, easy to harvest, and have a year's life cycle. Moreover, most of these species are distributed under the forest canopy, so it has little effect on forest composition and structure. The bark (13.16%) was usually harvested from woody plants. The use of fruit, sap, and flowers at a low ratio will allow seeds to be stored under the forest canopy to promote higher regeneration. This showed that the sustainability of the exploitation of medicinal plant resources of Cho Ro people.

### Experience in processing and using medicinal plants of the Cho Ro ethnic group

**Experience in processing medicinal plants:** The research showed that Cho Ro's experience in the processing of medicinal plants is quite diverse including 7 groups (Table 4).

**Table 4:** Experience in processing medicinal plants of the Cho Ro ethnic group

No.	Processing method	Number of species	Percentage (%)
1	Dry and minced	27	35.53
2	Washing, use fresh (crushed, chewed, added with rice water, etc)	20	26.32
3	Minced and dried	11	14.47
4	Cut thinly and then dry	5	6.58
5	Crushed (when fresh) then dry	5	6.58
6	Burning or baking (then crushed, dried, added with rice water)	4	5.26
7	Extracting, separating (for water, latex, sap)	4	5.26
	Total	76	100

The most common processing method is dried, chopped (35.53%): *Eucommia ulmoides* Oliv using dried stalks, chopped then boiled with water to drink to treat liver disease; *Brucea javanica* (L.) Merr chopped stems, roots, and leaves, followed by dried then boiled with water to drink to cool down the liver; *Gonocaryum lobbianum* (Miers.) Kurz dried leaves, chopped then boiled with water to drink to treat spleen pain; *Morinda citrifolia* L uses chopped fruit, drying, and then soaking with alcohol to massage to treat high blood pressure and bone aches. After harvesting, the medicinal plant is dried and then chopped for use, or if used, can be stored in plastic bags or put on the kitchen counter.

The next method is to clean and then use fresh (26.32%), most of which use roots, shells, tubers, a few use the whole plant. After harvesting, they are washed for fresh use, soaked in wine, pounded for water, or chopped, dried. Some species as *Lygodium auriculatum* Alston uses the whole plant then rinse and apply to wounds to treat rheumatism; *Celtis Sinensis* Pers rinse the bark then crushed take water to drink to cure fertility problems in women, *Homalomena gigantea* Engl uses tubers washed and chopped, dried then boiled with water to drink to treat aching joints.

The lowest is the extraction or separation group to get resin, latex, and burning or baking group (5.26%). Some species: *Scaphium macropodum* (Miq.) Beumée ex K. Heyne burns seeds, crushes and then mixes with water to treat toothache, abdominal pain, and gallstones; *Alstonia scholaris* (L.) R. Br removes the latex and then cook drinking water to treat clogged milk in nursing women; *Oroxylum Indicum* (L.) Kurz burns stem into charcoal and mix it with rice water then drinks to treat hand, foot, and mouth disease in children.

#### Experience in using medicinal plants

Cho Ro's knowledge of using medicinal plants is diverse, the same medicinal plant but there are many different ways to treat the disease. There is complimentary support among medicinal plants through experiences. Through interviews with local people showed that the experience of treatment and pharmacological effects. There are many ways to use medicinal plants: cooking water to drink, applying directly to

wounds, cooking water to bath, soak alcohol to drink, burn, and smell (Table 5).

**Table 5:** Experience in using medicinal plants of the Cho Ro ethnic group

No.	Methods used	No. of species	Percentage(%)
1	Cook drinking water	51	67.11
2	Apply on wound	9	11.84
3	Soak in drinking alcohol	9	11.84
4	Cook the bathwater	3	3.95
5	Eat fresh	1	1.32
6	Drink fresh	1	1.32
7	Use with rice water	1	1.32
8	Burning and smelling	1	1.32
	Total	76	100

Highest is method of cook drinking water (67.11%): *Curculigo orchoides* Gaertn use tuber to cooks drinking water with the effect of blood tonic; *Scoparia dulcis* L use leaves, roots, and stems to cook drinking water to improve health; *Antidesma ghaesembilla* Gaertn use roots and stems to cook help stop bleeding after birth; *Cassia alata* L leaves to cook drinking water to stimulate digestion and treat water pipe disease, etc. Following the method of soaking and drinking (11.84%) including *Musa acuminata* Colla take root and drink soaked fruit to treat diabetes, kidney stones, abdominal pain, diarrhea; *Streptocaulon juvenas* (Lour.) Merr take alcohol-soaked tubers to help with black hair, dialysis. Cover of wounds (11.84%), some species as the bark of *Ceiba pentandra* (L.) Gaertn cures broke arms and legs; *Ageratum conyzoides* (L.) L help stop bleeding, etc. The lowest (1.32%) is the method of smelling; drink fresh; shared with rice water and eaten fresh, the representative *Datura metel* L uses leaves to smelling help treat sinusitis.

#### The disease groups use medicinal plants to treat diseases by Cho Ro ethnic group experience

Through community knowledge, the medicinal plants were used to treat 14 different disease groups (Table 6).

**Table 6:** Disease groups that use medicinal plants to treat diseases by Cho Ro people

No.	Disease groups	Number of species	Percentage (%)
1	Liver diseases ( <i>Jaundice, ascites liver, hepatitis</i> )	13	17.11
2	Skin diseases ( <i>ulcers, rash, urticaria, sores, boils, scabies</i> )	10	13.16
3	Neurological diseases ( <i>nerve, pain, chronic headache, sciatica</i> )	9	11.84
4	Gastrointestinal disease ( <i>Abdominal pain, constipation, diarrhea, abdominal distention, diarrhea</i> )	8	10.53
5	Whether diseases ( <i>Sore throat, cough, malaria, flu, headache, sickness, fever</i> )	8	10.53
6	Kidney disease ( <i>Diabetes, glomerulonephritis, nephrolithiasis</i> )	8	10.53
7	Improve health ( <i>Blood, tonic</i> )	7	9.21
8	Diseases of women ( <i>Childbirth, difficulty in birth, clogged milk, after birth</i> )	7	9.21
9	Osteoarthritis ( <i>Pain, fatigue, bone pain</i> )	7	9.21
10	Blood disease ( <i>Blood tonic, dialysis, hemostasis after birth</i> )	6	7.89
11	Illness in children ( <i>Hand, foot and mouth, tongue cleaning</i> )	4	5.26
12	Animal bites ( <i>Centipedes bite, snake bite</i> )	4	5.26

13	Eye disease ( <i>Pinkeye, eye swelling</i> )	2	2.63
14	Diabetes	2	2.63

**Note:** One species can treat one or many different disease groups.

The remedies handed down and used to treat in the community from simple to complex. Many common and less serious disease groups will be many people who know many of treatments, even many different plants used to treat the same sickness. The most are liver disease (17.11%), the skin disease ranked second (13.16%), the lowest in the eye and diabetes treatment group (2.63%) including *Calamus rudentum* Lour, *Vitex pinnata* L, *Chrysanthemum maximum* L, *Cymbopogon citratus* (DC.) Stapf.

### Some common medicinal plants are used by Cho Ro people to treat diseases

A total of 16 different popular diseases used medicinal plants for curing by Cho Ro people. Besides, the necessary

information including the name of the disease, scientific name, Cho Ro name (local name), Vietnamese name, part-used, and method of use also identified (Table 7).

The analysis of Table 7 showed that the indigenous knowledge about the use of medicinal plants of the Cho Ro ethnic group is very unique. Each medicinal plant not only treats one disease but also treat many different diseases, it depends on the understanding of each person in the community. The understanding of the Cho Ro people about the function and use of medicinal plants depends on their age. These insights accumulated daily from practical experience and the ability to observe the subtly of each individual in the community.

**Table 7:** Medicinal plants were used by Cho Ro people for different diseases

No.	Disease name	Scientific name	Vietnamese name	Cho Ro name	Parts used	Method of using
1	Healing of women	<i>Ageratum conyzoides</i> (L.) L.	Cò lào	Ca di ngang	Whole plant	30g-50g <i>Ageratum conyzoides</i> (L.) L fresh, washed, crushed, added water, squeezed for water to drink (Menstrual cure for postpartum women)
		<i>Dracaena elliptica</i> Thunb. & Dalm.	Phất dụ lá hẹp	Xơ keng a	Stems, roots	<i>Dracaena elliptica</i> Thunb. & Dalm in combination with <i>Epimedium sp</i> , <i>Morinda officinalis</i> F C How, <i>Angelica sinensis</i> (Oliv.) Diels of 12gr each kind cooked with 1 liter of water until 250 ml was divided into 2 doses (This remedy is used to treat high blood-related diseases pressure, women in menopause)
2	Cure insomnia, sedation	<i>Passiflora foetida</i> L.	Lạc tiên	Sơ nhan long	Whole	A little of each kind, boil water to drink daily, especially with <i>Passiflora foetida</i> L also used as a vegetable eats with rice to help sleep well.
		<i>Mimosa pudica</i> L.	Trình nữ	Mắc cỡ	Leaves, roots	
3	Cure liver disease	<i>Imperata cylindrica</i> (L.) Raeusch.	Cỏ tranh	Ca da	Roots	Rinse 200g of the bark, cook with 900ml of water, then let cool to drink during the day, drinking time 10-15 days. <i>Note: Women are suffering from a nervous breakdown, pregnant women should not be used.</i>
		<i>Pandanus tectorius</i> Parkinson ex Du Roi	Dứa gai	Bay chít	Fruits	Dried fruits of <i>Pandanus tectorius</i> Parkinson ex Du Roi 12g, <i>Phyllanthus urinaria</i> L 8g, <i>Adenosma glutinosum</i> (L.) Druce 12g, <i>Citrus reticulata</i> Blanco 8g, <i>Scoparia dulcis</i> L 4g. All cooked with 1 liter of water, cook until there is 450ml left, divided drink 3 times a day, drink on an empty stomach (Treatment of hepatitis)
		<i>Helicteres hirsuta</i> Lour.	An xoa	Cha ây cô	Stems, leaves	- Liver cancer: Dry, roast until appears yellow then use cloth placed on the ground and pour on the cloth for 30-40 minutes, take 100g <i>Helicteres hirsuta</i> Lour cook with 2 liters of water, cook with 2 liters of water, cook until 1 liter remains, drink during the day. Drink after eating 20 minutes. - Hepatitis B: Dry, roast until appear yellow, then use cloth placed on the ground and pour on cloth for 30-40 minutes, take 30g <i>Helicteres hirsuta</i> Lour combined 30g <i>Solanum procumbens</i> Lour cooked with 1250ml of water, cook until 750ml, drink after eating.
		<i>Momordica charantia</i> L.	Khô qua rừng	Ma thô	Whole plant	- Use fresh: Use leaves, stems or fruit to cook soup to eat daily. - Use dry: dried leaves and fruits to use. Dosage: 20g/day, cook with drinking water daily.
		<i>Eurycoma longifolia</i> Jack	Mật nhân	Sơ bá chúng	Stems, roots	Everyday 15g, cook with 1.5 liters of water, boil a little fire for 15 minutes, filtered drinking water daily to treat hepatitis. <i>Note: Women are suffering from a nervous breakdown, pregnant women should not be used.</i>
		<i>Gonocaryum lobbianum</i> (Miers) Kurz	Cuống vàng	Sơ bay thục ho	Roots	Dry roots then cook with 750ml of water until there is 250ml left, drink after eating.
		<i>Phyllanthus urinaria</i> L.	Chó đê	Ca di to ca top	Whole plant	<i>Phyllanthus urinaria</i> L 40g dry, <i>Embelia ribes</i> Burm.f 15g, <i>Eclipta prostrata</i> (L.) L 15g, cooked with 750ml until 250ml left. Drink 3 times a day, drink until cured.
4	Cure knee pain	<i>Homalomena gigantea</i> Engl.	Thiên niên kiện	Cột vum vi	Stems, roots	Crush the fresh roots of <i>Homalomena gigantea</i> Engl. Then soak with alcohol to massage the knees 2-3 times daily. Everyday use 6-12g <i>Homalomena gigantea</i> Engl, cook with drinking water. After 2-3 weeks, the knee pain will reduce clearly.

		<i>Mimosa pudica</i> L.	Trinh nữ	Mắc cỡ	Roots	The roots are thinly cut, soaked in white wine, then cooked with drinking water, divided into 2 and drinks a day. Use 7-10 days for osteoarthritis pain.
5	Cure stomach ulcers	<i>Scoparia dulcis</i> L.	Cam thảo nam	Cam thảo	Whole plant	Each time drink 15ml liquid, 4 times a day, drink for 6 weeks to treat stomach and duodenal ulcers.
6	Cure fever, headache	<i>Imperata cylindrica</i> (L.) Raeusch.	Cỏ tranh	Ca da	Roots	Dried roots, cooked with 750ml until the remaining 250 ml, drink daily for 1 week, drink after eating. <i>Note: Women are suffering from a nervous breakdown, pregnant women should not be used.</i>
		<i>Eurycoma longifolia</i> Jack	Mật nhân	Sơ bá chứng	Roots, tubers	Cut thin roots or stems, roast until yellow appears, then soak in drinking wine or cook with drinking water like tea.
		<i>Momordica charantia</i> L.	Mướp đắng	Ma thô	Fruit, leaves	Use the fruit then remove the intestines, cook with the leaves to get drinking water, help with the fever.
7	Used for women after giving birth	<i>Ancistrocladus tectorius</i> (Lour.) Merr.	Trung quân	Xe ba thôn	Whole plant	Cook with 750ml of water until 250ml left to drink or soak with drinking alcohol.
		<i>Uncaria rhynchophylla</i> (Miq.) Miq. ex Havil.	Câu đằng	Móc câu	Stems, roots	Cook with water to shower for postpartum women.
		<i>Mimosa pudica</i> L.	Trinh nữ	Mắc cỡ	Leaves, roots	
8	Cure kidney stones, yellow urine	<i>Pandanus tectorius</i> Parkinson ex Du Roi	Dứa gai	Bay chít	Roots	Take 12g-20g of <i>Pandanus tectorius</i> Parkinson ex Du Roi root, 10g-12g <i>Musa balbisiana</i> Colla, 10-12g of <i>Imperata cylindrica</i> (L.) Raeusch, 8g-10g of <i>Plantago major</i> L flower, 15g-20g <i>Desmodium styracifolium</i> (Osbeck) Merr, 10-12g <i>Saccharum arundinaceum</i> Retz. root, divided into 2-3 times a day, taken before meals, about 100-150ml each time.
9	Cure diuretic	<i>Imperata cylindrica</i> (L.) Raeusch.	Cỏ tranh	Ca da	Whole plant	Fresh plants (bark removed) cooked with lean pork to eat. Treating urinary incontinence.
		<i>Pandanus tectorius</i> Parkinson ex Du Roi	Dứa rừng	Bay chít	Leaves, roots, fruits	Dried leaves and roots cooked with water (from 15-30g/day). Fruit or seeds used (30g-60g) cooked with drinking water every day. Cook with 750ml of water until the remaining 250ml, drink before eating.
10	Cure pimples, painful swelling	<i>Rhamnus crenatus</i> Sieb. and Zucc. var. <i>cambodianus</i> Tard.	Táo rừng	Ba tâu vi	Leaves, roots	- Rustic dark disease: Bark of dried roots crushed, soaked with alcohol 40% at the rate of 1 root-3 alcohol, or with vinegar in the proportion of 1 bark of roots-2 vinegar. Apply on where the water pipe has rinsed off. - Cure ulcers, itching: Fresh leaves cooked with water to bathe. Once a day, continuously for 5 days.
		<i>Curculigo orchioides</i> Gaertn.	Sâm cau	Xơ keng a	Roots	Crush and then apply on the wound to treat the sores.
		<i>Ageratum conyzoides</i> (L.) L.	Cỏ lào	Ca di ngang	Whole plant	15g-30g dry cooked with water to drink, or fresh tree crushed then squeeze water and apply to the wound. Besides, they can use crushed fresh plants and then cover up bleeding wounds, pimples, eczema or cook with water to bath treat scabies, impetigo in children.
		<i>Phyllanthus urinaria</i> L.	Cây chó đê	Ca di to ca top	Whole plant	Crush with salt to cure pimples. <i>Note: Pregnant women should not use it.</i>
		<i>Ardisia silvestris</i> Pit.	Khôi nhung	Cham chấp	Leaves	Leaves of <i>Ardisia silvestris</i> Pit combined with leaves of <i>Syzygium nervosum</i> A. Cunn. ex DC, leaves of <i>Styphnolobium japonicum</i> (L.) Schott cooked with water to bathe scabies or pound with leaves of <i>Syzygium nervosum</i> A.Cunn. ex DC with sesame oil cure pimples in children.
11	Cure stomach pain	<i>Scoparia dulcis</i> L.	Cam thảo nam	Cam thảo	Whole plant	Cook into a liquid, drink 15ml each time, 4 times a day, drink 6 weeks to treat peptic ulcer.
		<i>Homalomena gigantea</i> Engl.	Thiên niên kiện	Cột vum vi	Stems, roots	Use 10g daily, cook drinking water, drink 2 times a day before eating.
12	Cure snake bites	<i>Scoparia dulcis</i> L.	Cam thảo	Cam thảo	Whole plant	Use 100g of fresh plants, washed, cooked with water to drink.
13	Sinusitis treatment	<i>Ageratum conyzoides</i> (L.) L.	Cỏ lào	Ca di ngang	Whole plant	Leaves, fresh flowers crushed, squeezed water, smeared on the nose or swabbed in the ear. You can also use a dry leafy branch to the nasal steam and drink.
14	Cure toothache	<i>Derris elliptica</i> (Wall.) Benth.	Thuốc cá	Ca tanh	Leaves, stems	Crushed and then applied to the pain for about 5 minutes (do not swallow).
15	Cure male physiology	<i>Eurycoma longifolia</i> Jack	Mật nhân	Sơ bá chứng	Roots, tubers	Soaking with alcohol to drink enhances male physiology
		<i>Curculigo orchioides</i> Gaertn.	Sâm cau	Xơ keng a	Roots	
16	Treatment of jaundice, yellow eyes	<i>Flagellaria indica</i> L.	Mây nước	Ren ta	Roots	90g-120g, estimate enough water to bathe, boil, then cool and bathe your baby. Bathe once a day ( <i>Note: Do not mix with cold water</i> ).

## Discussion

Cho Ro community is one of the oldest communities in the study area. They are specialists in traditional herbal medicine and healing practices. The Cho Ro people do not follow a matrilineal or patrilineal system but respect both of them equally. Therefore, women and men, practice traditional healing systems they treat several new-age diseases with a high success rate. Cho Ro's natural products are made from medicinal plants take in the nature environment, no pesticides, no fertilizers. Their products are a culmination of the powerhouse of knowledge of medicinal herbs, which forms a part of their rich heritage. The Cho Ro the names of trees and also where seeds could be collected, and also turned out to be good at locating species which nobody else knew grew in the region. They possess a vast knowledge bank, diversity, and abundance related to medicinal plants such as life-forms, parts used, method of processing, method of use, cures, and preventives are widely sought and used. Many species have become increasingly rare and are no longer available locally and sometimes this makes local people have to travel deep into the forest for a collection of herbs. This study indicated that species of endangered medicinal plants were found by local people. They were listed in Vietnam Red Data Book (2007), Vietnam Red List of Medicinal Plants (2006), Decree 32/2006/ND-CP of Vietnamese Government.

Plant-based traditional knowledge has become a recognized tool in the search for new sources of drugs and nutraceuticals. The traditional use of plants has declined due to the scarcity of species, which is caused by human activities overgrazing, therefore, it has become essential and needs of the hour to focus on conservation of these plants this ethnic population has good knowledge about the use of many plants. They believe that all afflictions are caused by supernatural forces traditional healers use their eyes, ear, nose, and hands to diagnose the diseases, this way of diagnosing is interesting because they live in interior areas and lack the use of modern scientific equipment for treatment. Herbal medicines prescribed by community healers are either preparation based on a single plant part or a combination of several plant parts. One disease may only need to use one medicinal plant to treat it, but others can be treated with many different plants or combined with multiple medicinal plants used in the same prescription. Even a medicinal plant can use to treat many different diseases. This depends very much on the understanding of the healers in the community. The forests of Nature Reserve are rich in medicinal plants, many are still not known to us. Our effort helped identify commonly used plants. Further, studies have to be carried out to identify the numerous medicinal plants and the most important thing would be to conserve these plants.

This study highlights the medicinal knowledge of Cho Ro ethnic group and their medicinal plants which are used for the greater benefit of the community. This article is based on the field exploration conducted at Dong Nai culture Nature Reserve of Dong Nai province and documented the process of finding the medicinal plants, preparing medicines, and using the medicines. There are numerous herbs available in their surroundings and are being used by the communities as medicine some of the medicinal plants obtained through the process of trial and error experiences and that herbs are used for curing their diseases, the indigenous knowledge of local people may throw light on the modern plural medicinal systems and it may help the modern society to make use of that knowledge to address their medical problems. Dissemination of the knowledge of medicinal property would

improve the socioeconomic status of the Cho Ro ethnic, traditional healers are on the decline because the younger members of the tribe have started moving towards the towns and cities and are not willing to practice this form of medicine. There is a danger that the knowledge of these medicinal plants will also die with them. It is, therefore, necessary to document the plants and take efficient steps to conserve them.

## Conclusion

The Cho Ro ethnic group in Dong Nai Cultural Nature Reserve not only a rich understanding of the medicinal plant species composition but also has a unique and diverse knowledge about the processing and use of medicinal plants. Besides, the abundance of life-forms, parts used of medicinal plants, and threatened medicinal plants in nature also were recorded. A total of 14 disease groups used medicinal plants to treat common diseases to incurable diseases. The study also documented common medicinal plants and how to use them to care for and treat diseases.

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