



## Journal of Medicinal Plants Studies

# Medicinal plants used by the Hre community in the Ba to district of central Vietnam

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Ethnobotanical studies on traditional medicinal plants were conducted in Ba To district and documented different types of traditional medicinal plants used by the indigenous peoples. The study was focused on identifying medicinal plants, distribution, disease treated, part of the plant used, and methods of preparation... A total 45 species of medicinal plants (belonging to 26 families) were collected. Of them, 2 species of medicinal plants were found in the Red List medicines Vietnam, 6 species were assumed as precious ones, according to local knowledge of the people. Medicinal plants are mined primarily from nature (84.44 %). Based on indigenous knowledge, such plants expressed to treat 12 different diseases, the most medicinal plants used to treat osteoarthritis, kidney, endocrine and liver.

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**Keyword:** Ba to district, Diversity of medicinal plants, ethno botany, Hre Ethnic, Traditional knowledge.

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### 1. Introduction

Ethnobotany is the scientific study of plants and how they are used by man and different cultures for various reasons. This is important for the purpose of making advancements in modern medicine, the manufacturing industry and the agricultural industry. According to the World Health Organization (WHO) about 65-80% of the world's population in developing countries depends essentially on plants for their primary healthcare due to poverty and lack of access to modern medicine <sup>[1]</sup>.

The traditional use of plants by indigenous communities reflects the cultural aspects as well as biodynamic elements that have immense pharmacological potential to cure many diseases. The cultural and biological diversity of Vietnam offers immense opportunities for ethno-botanical studies. In Vietnam traditional medicine, more than 3948 plant species are used by 54 ethnic communities <sup>[4]</sup>.

In addition to documenting the traditional knowledge related to medicinal plants, scientific

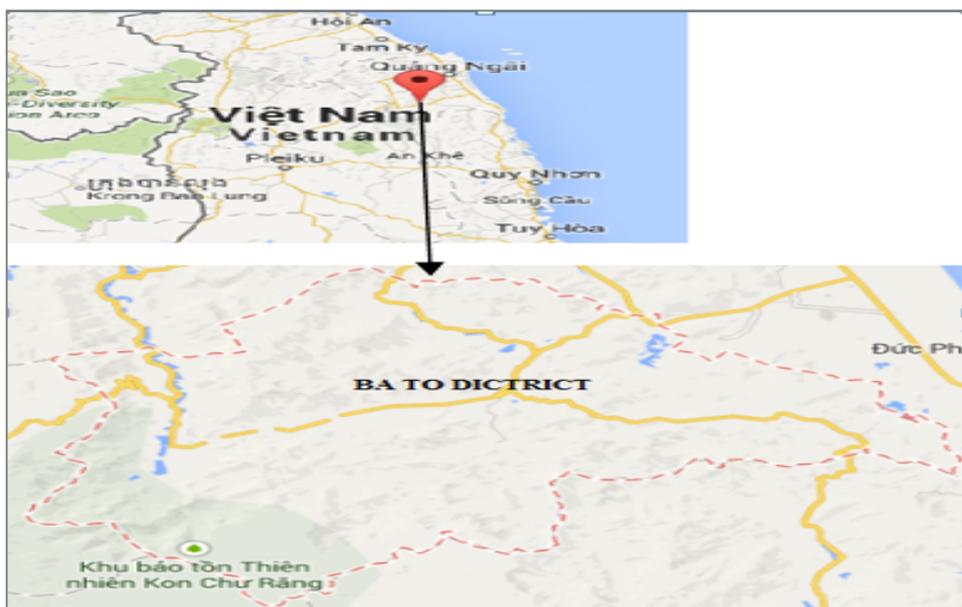
validation of traditional medicinal plants has been an important path of recent research <sup>[7]</sup>. *Coptosapelta tomentosa* (Blume) Vahl. Heyne ex var. Dongnaiensis (Pit.) Phamh is Hre ethnic medicinal plant used for a long time. It has considerable effects as rheumatoid arthritis therapy, wound wash software, avoids infection and used as a tonic. Based on traditional knowledge and chemical constituents in anti-inflammatory extracts of *Coptosapelta tomentosa*, produce anti-inflammatory drugs effective, safety <sup>[6]</sup>.

The current plant use trend shows that the environment is facing problems of resource depletion and loss of indigenous knowledge. Ethno pharmacological studies specifically targeting the Hre community of the Ba To district are lacking, as are the validation of traditional uses. Threats to medicinal plants and conservation practices in the study area Medicinal plants are at increasing risk from destruction of their habitats (agricultural activities, fire wood collection, collecting plants for construction,

overgrazing by domestic animals...) and over-harvesting of known medicinal species. Such individuals are also highly prone to fatal systemic fusariosis during chemotherapy [6]. *Fusarium oxysporum* is a soil-borne fungus which causes vascular wilt in large variety of economically important crop plants [7]. *F. oxysporum* strain 4287 was reported to infect both plants and mammalian hosts [8]. Besides its well-studied activity as a plant pathogen for vascular wilt in important crop plants, soil-borne

fungus *Fusarium oxysporum* is reported as a serious emerging pathogen of humans due to the increasing number of severe cases reported and to its ability to resist broad variety of currently available antifungal drugs [9, 10]. The diseases caused by most species of *Fusarium* are generally resistant to most of the available antifungal drugs [11].

## 2. Survey Site and Method



**Fig 1:** Map of the case study area

The study was conducted in Ba to district, which is found in the west zone of Quang Ngai province, in the South Central Coast region of Vietnam. The study area is located 50 km far from the southwest of Quang Ngai city which is the capital city of Quang Ngai province. The Ba To district is located in an area that is rich in biodiversity

Ethnic composition: Even though they have more experience in the use of medicinal plants for health care but has not been fully studied statistically. In Quang Ngai, the Hre community is the largest community, with 83, 82% of the

total population of the district. The major activity of the local people depends on agriculture.

Object of study: medicinal plants are used by indigenous people of Ba to district, central Vietnam

### Method

A range of participatory rural appraisal (PRA) techniques (Chambers 1997), The first step is collecting detailed knowledge about the local and indigenous people. The patient and the local healer are asked about the types of plants used to treat the disease state. Those plants that appear

interesting are also collected for later analysis. Ethno botanical data were collected on 11 individual healers, 4 healers were interviewed using semi-structured interviews and observations. The information collected includes the local name of the traditional medicinal plant, type (cultivated or wild), diseases treated, parts used, condition of the plant used, method of preparation, route of administration, ingredients added, other uses of the plant and existing threats to medicinal species. Finally, the data were analysis using descriptive statistics.

Samples were collected at the local medicinal plants to identify scientific name, local name.

Samples were determined based on

morphological characteristics comparison with documents of the authors follows: + *Vietnam plants*, Pham Hoang Ho (1999) <sup>[5]</sup> + *Medicinal plants and medicine of Vietnam*, Do Tat Loi (2006) <sup>[2]</sup>.

### 3. Results and Discussion

#### Medicinal plants diversity of Hre ethnic in Ba to district, Quang Ngai province

Medicinal plant diversity: Results of the investigation a total of 45 medicinal plant species belonging to 26 families were collected and identified by the researchers from the study area (Table 1)

**Table 1:** List of medicinal Plants (local name, scientific name, family) disease treated, parts used and Condition of medicinal plant used in the study area.

S. No	Local name of medicinal plants	Scientific name of medicinal plants	Family	Plant life form	Condition of the medicinal plants	Parts used	Disease treated
1	Cỏ Xước	<i>Ahyranthes aspera</i> L.	Amaranthaceae	Herbs	Fresh	Leaf	Diuretic, kidney disease, antiinflammatory
2	Dây xù	<i>Uvaria</i> sp.	Annonaceae	Lianas	Dry	Whole plant	Treat back pain, Osteoarthritis
3	Cau	<i>Areca catechu</i> L.	Areaceae	Trees	Fresh	Fruit	Retained placenta
4	Bồ công anh	<i>Lactuca indica</i> L.	Asteraceae	Herbs	Fresh/dry	Leaf, Stem	skin diseases
5	Ngãi cứu	<i>Artemisia vulgaris</i> L.	Asteraceae	Herbs	Fresh	Whole plant	Menstrual Pain, irregular menstruation.
6	Nhọ nôi	<i>Eclipta prostrata</i> L.	Asteraceae	Herbs	Fresh	Leaf	Sinusitis treatment, kidney disease, hemostasis ...
7	Bồ hôi	<i>Ageratum conyzoides</i> L.	Asteraceae	Herbs	Fresh	Leaf	sinusitis, urinary tract infections
8	Đậu ma	<i>Cassia tora</i> L.	Caesalpiniaceae	Herbs	Dry	Seed, stem	cooling agents, Sedation, dysuria treatment ...
9	Cây Y hít	<i>Tetracera scandens</i> (L) Mess.	Dilleniaceae	Lianas	Dry	stem, leaf	Osteoarthritis, back pain.

10	Sâm rừng*	<i>Dracaena angustifolia</i> Roxb	Dracaenaceae	Shrubs	Fresh	Tuber	kidney stones, cooling agents
11	Cây trụ	<i>Carmona microphylla</i> (Lam)	Ehretiaceae	Shrubs	Dry	Root, stem	Treat back pain, numb hands and feet
12	Cỏ Hui ra za*	<i>Equisetum debile</i> Roxb. Ex Vauch	Equisetacea	Herbs	Dry	Stem, leaf	Eye pain, back pain, diabetes ...
13	Rau ngót	<i>Sauropus androgynus</i> Merr	Euphorbiaceae	Shrubs	Fresh	Leaf	Retained placenta treatment
14	Cây Toicló	<i>Bischofia trifoliata</i> (Rixb) Hook. F	Euphorbiaceae	Trees	Fresh/dry	Leaf	Treatment for kidney stones, hemorrhoids.
15	Cây Vẩy ốc	<i>Acalypha siamensis</i> Oliv. ex Gage	Euphorbiaceae	Shrubs	Fresh	Leaf	Abdominal pain, digestive stimulation
16	Cây Chó đẽ	<i>Phyllanthus urinaria</i> L.	Euphorbiaceae	Herbs	Fresh/dry	Whole plant	liver disease, jaundice ...
17	Cây Tra cúng	<i>Jatropha curcas</i>	Euphorbiaceae	Trees	Fresh	Leaf	Retained placenta treatment
18	Cây Y liêu	<i>Mimosa pudica</i> L.	Fabaceae	Herbs	Fresh	Whole plant	Aching back, antidotal, sedation.
19	Ría rắc	<i>Cassia alata</i> L.	Fabaceae	Tall shrubs	Fresh	Leaf	Treatment of skin diseases
20	Quế	<i>Cinnamomum cassia</i>	Lauraceae	Trees	Dry	Bark	digestive stimulatior, abdominal pain.
21	Cây không rễ	<i>Loranthus parasiticus</i> (L.) Merr.	Loranthaceae	Mistletoe	Dry	Whole plant	Back pain, osteoarthritis pain, diabetes,
22	Dâu rừng	<i>Morus alba</i>	Moraceae	Trees	Dry	Root, stem	Sedation, blood tonic, diseases in children
23	Chua đất	<i>Oxalis corniculata</i> L.	Oxalidaceae	Herbs	Fresh	Leaf	detoxification, diuretic, kidney, gynecological diseases ..
24	Dây Lùm búp	<i>Passiflora foetida</i>	Passifloraceae	Lianas	Dry/fresh	Whole plant	Sedation, insomnia.
25	Trầu không	<i>Piper bettle</i> L.	Piperaceae	Lianas	Fresh	Leaf	Skin diseases, urinary
26	Lá Lột	<i>Piper lolot</i> C. DC.	Piperaceae	Herbs	Fresh	Leaf	backache
27	Cỏ Mần trầu	<i>Eleusine indica</i> (L.) Gaertn.	Poaceae	Herbs	Fresh	Whole plant	skin diseases
28	Cỏ Tranh	<i>Imperata</i>	Poaceae	Herbs	Fresh	Root,	Diuretic, kidney

		<i>cylindrica</i> (L.) P. Beauv. Var. <i>Cylindrica</i>				Leaf	stones ...
29	Cây rậm dại	<i>Polygonum hydropiper</i>	Polygonaceae	Herbs	Fresh	leaf	Snakebite Treatment
30	Cây Chí kên	<i>Rubus alceaefolius</i> Poir	Rosaceae	Lianas	Dry	Stem, leaf	Treat muscle aches, backache.
31	Trang rừng	<i>Ixora coccinea</i> L.	Rubiaceae	Shrubs	Dry	Root	backache.
32	Mơ rừng	<i>Paederia microcephala</i> Pierre	Rubiaceae	Lianas	Fresh	Leaf	backache, abdominal pain, dyspepsia,
33	Dây róc *	<i>Morinda officinalis</i> How	Rubiaceae	Lianas	Dry	Root, tuber	Treatment of men, kidney stones, gallstones, diabetes, liver.
34	Dây khai	<i>Coptosapelta tomentosa</i> (Blume) Vahl. ex Heyne var. <i>dongnaiensis</i> (Pit.) Phamh	Rubiaceae	Lianas	Dry/fresh	Whole plant	anti-inflammatory, tonic
35	Cây Bông núi	<i>Citrus grandis</i> Osbeck	Rutaceae	Trees	Fresh	Fruit	Goiter, digestive stimulation
36	Cam thảo đất	<i>Scoparia dulcis</i> L.	Scrophulariaceae	Herbs	Fresh/dry	Whole plant	liver disease, skin diseases
37	Tri uông	<i>Lindernia crustacea</i> (L.) F. Müller	Scrophulariaceae	Herbs	Fresh	Leaf	Postpartum women
38	Củ Kun mềm *	<i>Smilax glabra</i>	Smilacaceae	Lianas	Dry	Tuber	Intervertebral discs, antidotal, sedation, diabetes, liver.
39	Củ Kun cứng*	<i>Smilax adhaerens</i> Gagnep	Smilacaceae	Lianas	Dry	Tuber	Intervertebral discs, antidotal, sedation., diabetes, liver.
40	Cây chè	<i>Camellia sinensis</i>	Theaceae	Shrubs	Fresh	Leaf	Diabetes, liver disease ..
41	Cây Xí ngầu	<i>Clerodendron paniculatum</i>	Verbenaceae	Shrubs	Dry	Root	Back pain, gynecological diseases.
42	Sa nhân	<i>Amomum longiligulare</i> T.L. Wu.	Zingiberaceae	Shrubs	Dry	Fruit	Stomach diseases, digestive stimulation
43	Gừng	<i>Zingiber</i>	Zingiberaceae	Bulb	Fresh/dry	Rhizome	Warm lungs,

		officinale Rosc		forming herbs			cough, digestive stimulation
44	Nghê	Curcuma longa L.	Zingiberaceae	Bulb forming herbs	Fresh/dry	Rhizome	stomach diseases, cough.
45	Man gan*	Curcuma zedoaria Berg. Rosc	Zingiberaceae	Bulb forming herbs	Fresh/dry	Rhizome	Stomach, coughing up blood

Notes \*: medicinal plants precious according to traditional knowledge of local people.

**Diversity life form of medicinal plants**

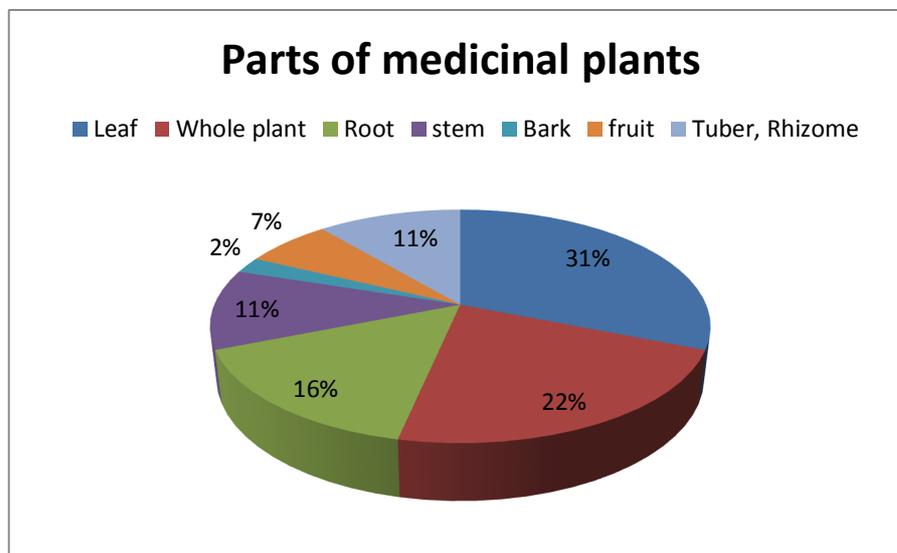
Analysis of the diversity of life forms of medicinal plants will help orientation harvesting and sustainable utilization. The life form of plants cited as the most used was herb (46.67%), mainly

in family such as: Asteraceae, Poaceae, Scrophulariaceae. The preference for herbs over other forms may be because herbs were more abundant and more easily collected.

**Table 2:** Diversity life form of medicinal plants

Life form	Herbs	Trees	Shrubs	Lianas
The number of species	21	7	6	11
Percentage (%)	46,67	15,56	13,33	24,44

**In terms of plant parts used in treatment**



**Fig 2:** parts of medicinal plants used in treatment

The above pie chart indicated that 31% part of the medicinal plant species used to treat was leaf. Such wide harvesting of leaves for traditional medicine compared to roots in the study area which are important for survival of the plants has

a less negative influence on the survival and continuity of useful medicinal plants and hence does not affect sustainable utilization of the plants. However, in the study area root was the second most part used to treat different human

ailment. Comparatively utilization of the root part highly affects the survival and ecological aspect of the plant.

### Source of medicinal plants in the study area

**Table 3:** Source of medicinal plants

Habitats	The number of species	Percentage (%)
Wild (forests, hills, swiddens scrublands, streams ...)	38	84,44
Cultivation	4	8,89
Wild and cultivated	3	6,67

Medicinal plants are mostly harvested from the wild sources either for local use or trade purposes (84, 44%). and only a few species were cultivated (8, 89%) (Table 3). Plants were generally collected as per local needs without any rules, and regulations. Utilization of medicinal plants entirely dependent on nature.

### Modes of use of traditional medicinal plant in the study area

The plants were used in various forms for different ailments. Medicinal plants used fresh such as: *Oxalis corniculata* L., *Sauropus*

*androgynus* Merr ..., chewed of plant parts: *Lindernia Crustacea* (L.) F. Muller, dried as: *Smilax glabra*, *Morinda officinalis* How, *Annonaceae Carabao*..., heated such as: *Citrus grandis* Osbeck, crushed as: *Polygonum hydropiper*, boiled as *Passiflora foetida*, *Imperata cylindrica* (L.) P. Beauv. Var. *cylindrica*... The present finding indicated that decoction was the most widely used mode of preparation.

### The therapeutic value of medicinal plants in medicine

**Table 4:** Plants used against disease

S. No	Disease treated	The number of species used to treat	Percentage (%)
1	Body aches, Osteoarthritis	12	26,67
2	Kidney disease – urinary	7	15,56
3	Tumor disease – Endocrine	6	13,33
4	Liver disease	5	11,11
5	Skin diseases	5	11,11
6	Gynecological diseases – maternity	3	6,67
7	Physical weakness disease	3	6,67
8	Digestive diseases	2	4,44
9	Children diseases	2	4,44
10	Ear - nose – throat diseases	1	2,22
11	Botulism	1	2,22
12	Biting insect diseases, poisonous snakes	1	2,22

The plants cited were used to treat 12 illnesses, The highest number of plant species was used for muscle -bone-joint diseases-related, followed by kidney-urological treatment, tumor - Endocrine Most of all medication is a combination of many medicinal plants, or one medicinal plant can treat many diseases.

Plants used against osteoarthritis diseases: using combination of many medicinal plants such as: *Uvaria sp*, *Tetracera scandens* (L) Mess, *Carmona microphylla* (Lam), *Mimosa pudica* L., *Loranthus parasiticus* (L)Merr., *Rubus alceaefolius* Poir and *Ixora coccinea* L. Condition of the medicinal plants were dry, used mode of preparation by decoction.

Plants used against diabetes: *Equisetum debile* Roxb. Ex Vauch, *Loranthus parasiticus* (L) Merr, *Morinda officinalis* How, *Smilax glabra*, *Camellia sinensis*.

Plant used against kidney stones: fresh roots of *Dracaena angustifolia* Roxb were cut, boiled in water for one hour.

#### 4. Conclusion

Traditional use of medicinal plants by Hre people in Ba to district: In the present study, we reported 45 plants species that were used by Hre people in Ba To district as medicine. They have extensive knowledge of how to use medicinal plants against 12 diseases. The most frequently cured disease category was Osteoarthritis. The leaves were the most used plant parts (31%), thus plant reproduction was not endangered due to the gathering methods and plant parts used. Herb was the most used in the life form of plants (46, 67%). Modes of use of traditional medicinal plant was decoction.

#### 5. Acknowledgements

The authors are thankful to the traditional healers of the study area for sharing their accumulative indigenous knowledge.

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