Review

# Medicinal plants of the Mien (Yao) in Northern Thailand and their potential value in the primary healthcare of postpartum women

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## ABSTRACT

Aim of the study: To study the use of medicinal plants by the Mien in Nan Province and their potential value in the primary healthcare of postpartum women. Also, to survey the medicinal plant resources present there.

Materials and methods: Free listing and interviews were used with four key informants (herbalists and collectors) to collect all qualitative and quantitative plant data. Semi-structured questionnaires were used to obtain information on the knowledge, attitude and practices of fifty-eight non-specialist informants. Transect walks of forest plots were carried out with herbalists to get more information on the status of the medicinal plants with regard to their habitat.

Results and conclusion: More than 168 species of medicinal plants were surveyed. These plants belonged to 80 families and 145 genera, of which 131 were wild plants and 37 species have been cultivated in home gardens. The interview data from four herbalists and fifty-eight non-specialist informants indicated that the majority of non-specialist informants who used medicinal plants were women and the most common usage categories were for birth related conditions (44 species, 26.2%). The most common method of preparation was decoction for both oral consumption and bathing uses (134 species, 79.8%). The most common species of medicinal plants were used in a postpartum herbal bath formulae and in food supplement formulas. These were Anredera cordifolia (Ten.) Steenis, Basella alba L., Ricinus communis L., Poikilospermum suaveolens (L.) Merr., Gouania leptostachya DC. Var. leptostachya, Schefflera sp. cf. Schefflera bengalensis Gamb., Blumea balsamifera (L.) DC., Chromolaena odoratum (L.) King et Robin and Cymbopogon citratus (DC.) Stapf.

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# Contents

## 1. Introduction

Medicinal plant use in healthcare is a common practice. During the 20th century, 80% of the world's population depended on traditional medicine for their primary healthcare needs (Azaizeh et al., 2003). Medicinal plants continue to play an important role in healthcare, i.e. new drugs, herbal supplements and food supplements. However, many ethnic groups are failing to retain their collective knowledge of such medicinal plant use. Younger generations are migrating to lucrative jobs in more developed urban areas (Subramanyam et al., 1986). The disappearance of traditional cultural and natural resources due to population growth, urbanization, and the erosion of botanical knowledge in developing countries suggests that unrecorded knowledge (information) may be lost forever (Dawn et al., 2008).

The Chinese have abundant knowledge of medicinal plants, particularly the ethnic group known as the Mien (Yao). The Mien originated in middle to southern China, but migrated to Vietnam, Laos and northern Thailand during the 15th–19th centuries. The Mien first migrated into Thailand in 1854, and are now residing in nine provinces with a population about 45,000 (Perve, 2006).

The Mien brought their knowledge of medicinal plants with them, along with some important species of medicinal plants. Such knowledge was primarily held by Mien herbalists and shamans. Their accumulated knowledge has been conveyed to successive generations and has been a vital resource in healthcare practices.

Recently, the Mien in Sancharurn Village have begun to engage in commerce. Their lifestyle depends on trade, thus bringing them in closer contact with the outside world. So almost all of the people are willing to communicate and exchange knowledge with people from outside their village. Furthermore, assistance and collaboration was received from the village leaders, who want to develop their community using scientific knowledge. Therefore, it was decided to allow scientific research, study and development of medicinal plants in Sancharurn Village and its immediate environs.

This paper is a study of the ethno-medicinal plant knowledge of the Mien in the Nan Province of Thailand. Similar studies have been previously conducted in southern China, Vietnam and elsewhere in northern Thailand. Long and Li (2004) studied knowledge of the Red Headed Yao in Jinping, SW China. They determined that the Red Headed Yao's medicine has been learned through experience and its development was profoundly influenced by religious culture and feudal superstition. This study found that 66 medicinal plant species were traditionally used in the preparation of herbal baths, while a later study indicated the use of more than 110 species (Li et al., 2006). In Vietnam, On et al. discussed a survey on the use of medicinal plants in Tam Dao National Park and in a buffer zone where 224 species were used by the Dzao. A survey of medicinal plants in the Ba Vi National Park, Vietnam found that over 200 medicinal plant species were used by the Dzao people; and that more than 40 species were economically important medicinal species (On et al., 2001).

The medicine of the Mien in Thailand also developed under the influences of feudal superstition and animism. Religious rites, combined with or involving the use of medicinal plants, have been used in treating pain, to increase blood circulation, and to rid the body of toxic substances. Diet, including the consumption of medicinal plants cooked with chicken, is also encouraged to promote good health, especially among pregnant and postpartum women, children and the elderly (Thaoprasert, 1996; Chamlong, 1999). However, knowledge of medicinal plants in Thailand has been reduced. A study by Sutthi (1986) found that 149 species were used for food and medicine while Srithi et al. (2009) found only 50 species were used this way. Moreover, all of Srithi's informants never actually used their plants.

Previous literature on the medicinal plant knowledge of the Mien did not report on the potential value of such plants. This paper will focus on important popular formulae and their potential value in the Mien community. Particular emphasis will be upon the herbal baths used by postpartum women. A comparison will be made of the medicinal plants used in herbal baths among the Mien in different parts of Thailand and will also compare preparations among the different ethnic groups in northern Thailand.

## 2. Methods

### 2.1. Regional context

The project area is in Sancharurn Village, Nan Province, 19°17′N latitude and 100°3′E longitude (Royal Thai Survey Department, 1969). The climate is tropical with three seasons: cool-dry, hot-dry, and rainy. The lowest temperature during the cool-dry season (November–January) is 9 °C. The highest temperature in the hot-dry season (February–April) is 41 °C, the average temperature there about 30 °C and nights average around 14 °C. The mean annual rainfall is 1400–1500 mm (Sancharurn Community Center, 2007).

The Mien people in Sancharurn Village migrated from Laos to Thailand in 1854. Originally, they lived in high areas more than 1300 m above sea level (referred to as "tom in de"). They cultivated opium in slash and burn farming and then traded agricultural products with Chinese merchants. The deterioration of the soil combined with the political disturbance of communism in Laos forced them to migrate to Sancharurn Village at 450 m above sea level. Presently, the population has 141 households and nearly 600 people. Most people (80%) are Buddhist/Animist, while some are Christians. Villagers below 30 years of age have completed primary levels of education in public village schools. Some of them continued studying in more advanced schools. Almost all the elderly are illiterate. Their economic status is poor. Most people grow coffee, fruit, rice and corn. Their income is obtained from selling coffee and cash crops (Sancharurn Community Center, 2007).

## 2.2. Research procedures

### 2.2.1. Survey and herbalist interviews

The initial contacts were the primary school director and the village leader. An observation of the village surroundings and situation was conducted, and permission to conduct the study was obtained. Subsequent meeting were held with primary school teachers, the village leader, herbalists and primary school students in order to inform them about the objectives of the study, the research process, and the benefits to the community. Community data was gathered by touring and mapping the village environs. Free listing and interviews were used with four key informants (herbalists and collectors) to collect all qualitative and quantitative plant data. Recorded data included the use of the plant, any vernacular names of the plant, description of the plant, the part/parts used, method of preparation and route of administration. Transect walks of forest plots were carried out with herbalists, primary school teachers and students to get more information on the status of the medicinal plants. Voucher specimens were obtained to aide in botanical identification. Discussions and photographs were recorded throughout every process. Herbarium specimens were identified by Queen Sirikit Botanic Garden (QSBG), CMU Herbarium, Chiang Mai University in Thailand, and Hanoi University of Pharmacy in Vietnam. Specimens are deposited at the herbarium of the Faculty of Pharmacy, Chiang Mai University and The herbarium of Queen Sirikit Botanic Garden, Thailand.

### 2.2.2. Questionnaires and non-herbalist interviews

Questionnaires were prepared in line with our research objectives, and were used to obtain information on the knowledge, attitude and practices of non-specialist informants. Semi-structured interviews were conducted with fifty-eight non-specialist informants, aged 15–73 years. To avoid possible overlapping or doubling of the data, interviews were conducted individually with only one person in each household. During interviews, assistance was received from young Mien to translate the Mien to Thai language, and photos were shown to the informant in order to confirm identification of the plant species.

## 2.3. Data analysis

### 2.3.1. Statistical analysis

Descriptive statistics were used with descriptive data. Data was analyzed regarding the medicinal plants themselves (i.e., description of diversity, number of families/species present, etc.), and the usage of the plants (i.e. part/parts used, method of preparation, etc.). Important and popular preparations actually in use were qualitatively and quantitatively analyzed and described. The Kolmogorov–Smirnov test was used for normality testing of quantitative data then a paired *t*-test was used to determine the difference in the number of medicinal plants known by herbalists and those actually used, and the number of medicinal plants used between males and females. The correlation between the sex, the level of education of the informants and the number of medicinal plants used and the correlation between the age of the informants and the number of medicinal plants used were tested with Spearman's rank correlation coefficient. All of the analyses were conducted with the SPSS 17.0 software package for Windows.

### 2.3.2. Use categories

Each time a plant was mentioned as "used", it was considered as a single "use-report" (Cook, 1995). If an informant used a plant to treat more than one disease in the same category, it was considered as a single use-report (Treyvaud et al., 2005).

### 2.3.3. Relative cultural importance (RCT)

These indices are applied in ethnobotany to calculate a value per folk or biological plant taxon (Hoffman and Gallaher, 2007).

#### 2.3.3.1. Use value (UV).
Informant Consensus index is used for testing the relative importance of locally known species (Phillips et al., 1994):

$$UV = \frac{Ui}{N}$$

where Ui is the number of use-reports cited by each informant for a given species and $N$ is the total number of informants.

*Data interpretation*: UVs are low (Near 0) when there are few use-reports related to its use. UVs are high (Near 1) when there are many use-reports for a plant, implying that the plant is important.

#### 2.3.3.2. Fidelity level (FL).
This is the index to test for the most preferred species used in the treatment of a particular ailment (Friedman et al., 1986). The informant consensus method calculates a ratio between the number of informants who cite the use of a species for the same major purpose (Np) and the total number of informants who mentioned any use for the species ($N$) (Hoffman and Gallaher, 2007):

$$FL \ (\%) = \frac{Np \times 100}{N}$$

*Data interpretation*: FLs are low (Near 0) when plants are used for many different purposes. FLs are high (Near 100) when plants are used for the same purpose.

#### 2.3.3.3. Informant agreement ratio (IAR).
This is an index for test homogeneity of knowledge (Trotter and Logan, 1986):

$$IAR(ICF) = \frac{Nur - Nt}{(Nur - 1)}$$

where Nur refers to the number of use-reports for a particular use category and Nt refers to the number of taxa used for a particular use category by all informants.

*Data interpretation* (Gazzaneo et al., 2005): IAR values are low (Near 0) if plants are chosen randomly or if there is no exchange of information about their use among informants. IAR values are high (Near 1) when there is a well-defined selection criterion in the community and/or if information is exchanged between informants.

## 3. Results

### 3.1. Medicinal plants

#### 3.1.1. Medicinal plants and their diversity

More than 168 species of medicinal plants were surveyed. These plants belonged to 80 families and 145 genera, including 131 species were wild plants and 37 species of cultivated plants. Details of these species are shown in Table 1.

### 3.2. Knowledge of the use of medicinal plants

#### 3.2.1. Interview data from the Mien herbalists

Almost all the herbalists said that they had learned about medicinal plants from their ancestors. The knowledge was conveyed by the oral tradition. However, traditional use of medicinal plants by the Mien in Sancharurn Village has decreased. Much of the knowledge of the use of medicinal plants has been forgotten or neglected by later generations. Now such knowledge is mainly held by herbalists and some of the older women who have collected medicinal plants for postpartum use.

**Table 1**
Medicinal plants used by the Mien at Sancharurn Village in Nan Province, Thailand.

| ID | Family | Scientific name | Mien name | Part used | Method of preparation | Medicinal use/indication for postpartum women (bold letter)/(food) | Route of admin. | Habitat |
|---|---|---|---|---|---|---|---|---|
| 1 | Acanthaceae | *Rhinacanthus narsutus* (L.) Kurz. | Ap Cho Nor Mia | LV, ST | C&C | Pain, inflammation, broken bone | PT | SF |
| 2 | Acanthaceae | *Strobilanthes cusia* (Nees.) Kuntze. | Yam Si | ST, LV | DC | Diarrhea | OR | SF |
| 3 | Acoraceae | *Acorus gramineus* Sol. ex W. Ait. | San Poe | LV | DC | Flu, common cold, congestion, **cervical pain** | BT | HG |
| 4 | Agavaceae | *Dracaena elliptica* Thumb. | Ha Dia Doi | TB | DC | Cough | OR | SF |
| 5 | Agavaceae | *Sansevieria trifasciata* Prain | Nang Biad | LV | DC | Cough | OR | HG |
| 6 | Amaranthaceae | *Alternanthera dentofor* (Moench.) Scheygr. | – | LV, ST | SK | Tonic, **eliminate waste matter**, **improve blood flow** | OR | SF |
| 7 | Amaryllidaceae | *Crinum asiaticum* L. | Tom Tou Bot | LV, ST | C&C | **Pain**, **inflammation** | PT | HG |
| 8 | Anacardiaceae | *Pegia sarmentosa* (Lecomte) Hand.-Mazz | Chan Town Loe | RT | DC | **Convulsion**, **eliminate waste matter**, **improve blood flow** | OR | HG |
| 9 | Ancistrocladaceae | *Ancistrocladus tectorius* (Lour.) Merr. | Con Tow Len Bor Town | LV, ST | DC | Pain, inflammation | OR | SF |
| 10 | Annonaceae | *Fissistigma oblongum* (Craib) Merr. | Ho Sa Pai Kwai | LV, ST | NP, DC | General tonic | OR | SF |
| 11 | Apocynaceae | *Alstonia* sp. | Fan Tor Diang | LV | DC | Anti-itching | BT | SF |
| 12 | Araceae | *Aglaonema simplex* Blume. | Hoe Hap Doe | LV, ST | C&C | Pain, inflammation | PT | RP |
| 13 | Araceae | *Alocasia cucullata* (Lour.) G. Don. | Hap Chouy | LV, ST | C&C, CWC | Pain, inflammation, tonic | PT, OR | RP |
| 14 | Araceae | *Homalomena occulta* (Lour.) Schott | Hoe Hap Souw | LV, ST | DC | Tonic | OR | RP |
| 15 | Araceae | *Pothos chinensis* (Raf.) Merr. | Ha Dia Ngang2 | ST, LV | DC | Common cold, asthma, **clear airway** | OR, BT | RP |
| 16 | Araceae | *Pothos scandens* L. | Ha dia Ngang1 | WP | DC | Common cold, **clear airway** | OR | RP |
| 17 | Araceae | *Rhaphidophora decursiva* (Roxb.) Schott | Dia Pam Kong | LV, ST | C&C | Centipede bite | PT | HG |
| 18 | Araliaceae | *Macropanax dispermus* (Bl.) Kuntze | Toe Fim Diang | LV | DC | **Postpartum bathing**, **eliminate waste matter**, **improve blood flow** | BT | SF |
| 19 | Araliaceae | *Schefflera* sp. cf *Schefflera bengalensis* Gamb. | Au Cha Pee | LV, ST | DC | **Bone**, **joint pain**, **antispasmodic** | OR, BT | HG |
| 20 | Asteraceae | *Ageratina adenophora* (Spreng.) R.M. king & H. Rob. | Good Sa Kong | LV, ST | DC | Cancer | OR | SF |
| 21 | Asteraceae | *Blumea balsamifera* (L.) DC. | Ma Im Bouy | LV, RT | C&C | Stop bleeding; epistaxis, cool down body temperature, **itching**, **bone and joint pain**, **refreshing** | PT, OR | HG |
| 22 | Asteraceae | *Chromolaena odoratum* (L.) King et Robin | Koo Ja | RT, LV, ST | DC, C&C | Peptic ulcer, **stop bleeding**, **accelerates healing**, **refreshing** | OR, PT | SF |
| 23 | Asteraceae | *Dichrocephala integrifolia* (L.f.) O.K. | Mi Im You, Mia Bua | LV, ST | DC | Cough | OR | SF |
| 24 | Asteraceae | *Elephantopus scaber* L. var *scaber* | Hang Sai Mia | ST, LV | DC | Anemia | OR | SF |
| 25 | Asteraceae | *Eupatorium adenophorum* Spreng. | Goog sa Kong | LV, ST | DC | Cancer | OR | SF |
| 26 | Asteraceae | *Galinsoga parviflora* Cav. | Mi Im You | ST, LV | DC | Fever | OR | SF |
| 27 | Asteraceae | *Gynura divaricata* (L.) DC. | Chae Or Mia | LV, ST | CWC | **Lactagogue**, **postpartum tonic** | OR | SF |
| 28 | Basellaceae | *Anredera cordifolia* (Ten.) steenis. | Dear Chun | LV, ST | CWC | **Lactagogue**, **postpartum tonic**, **increase blood corpuscles** | OR | HG |
| 29 | Basellaceae | *Basella alba* L. | Dia Chun | LV, ST | CWC | **Lactagogue**, **postpartum tonic** | OR | HG |
| 30 | Bignoniaceae | *Oroxylum indicum* (L.) Bth. ex Kurz. | Diang Dang | SD, BK | SK, NP | Tonic, parasiticide in cattle | OR | SF |
| 31 | Burseraceae | *Garuga pinata* Roxb. | Mua Chao Diang | RT | DC | Peptic ulcer | OR | SF |

Table 1 (*Continued*)

| ID | Family | Scientific name | Mien name | Part used | Method of preparation | Medicinal use/indication for postpartum women (bold letter)/(food) | Route of admin. | Habitat |
|----|--------|-----------------|-----------|-----------|----------------------|-------------------------------------------------------------------|-----------------|---------|
| 32 | Caesalpinioideae | *Caesalpinia sappan* L. | Sa Moon Diang | BK | DC | Diarrhea, **eliminate waste matter, improve blood flow** | OR | HG |
| 33 | Caesalpinioideae | *Caesalpinia* sp. | Lom Ched yim | RT | DC | Peptic ulcer, **eliminate waste matter, improve blood flow** | OR | SF |
| 34 | Campanulaceae | *Lobelia angulata* Forst. | Kor Fuw | LV, ST | C&C | Pain, inflammation | PT | RP |
| 35 | Campanulaceae | *Pratia begonifolia* (Wall. ex Roxb.) Lindl. | Kor Fui | WP | C&C | Pain, anti-inflammation | PT | RP |
| 36 | Caprifoliaceae | *Sambucus javanica* Reinw. ex Bl. Ssp. *javanica* | Tom Yai Diang | LV, ST | DC | Bone, joint pain | OR | SF |
| 37 | Chloranthaceae | *Chloranthus erectus* (B.-H.) Verd. | Tang Souw Ngang | ST, LV | DC, SK | Pain, inflammation | OR | SF |
| 38 | Chloranthaceae | *Sarcandra glabra* (Thunb.) Na k. ssp. Brachystachys verd. var. *brachystachys* | Peng Bong Mia | WP | DC, C&C | Pain, inflammation | OR, PT | HG |
| 39 | Combretaceae | *Quisqualis indica* L. var. *indica* | Huy Yang | WP | DC | Anti-itching from insect bite | BT | SF |
| 40 | Commelinaceae | *Commelina diffusa* Burm. F. | Sop pan1 | LV, ST | DC | General tonic, **eliminate waste matter, improve blood flow** | OR | SF |
| 41 | Commelinaceae | *Pollia secundiflora* (Bl.) Bakh. f. | Sop Pan2 | ST, LV | DC | Tonic, **eliminate waste matter, improve blood flow** | OR | SF |
| 42 | Connaraceae | *Cnestis palala* (Lour.) Merr. ssp. *palala* | Kan Yam Dia | LV, ST | DC | **Anemia in postpartum** | OR, BT | SF |
| 43 | Convallariaceae | *Polygonatum* sp. | Yud Si Mia | RZ | DC | Pain, inflammation | OR | HG |
| 44 | Convalvulaceae | *Cuscuta chinensis* Lam. | Meor Pan Tang | LV, ST | DC | Jaundice | OR | SF |
| 45 | Convolvulaceae | *Argyreia splendens* (Hornem.) Sweet. | Mai Yan | LV, ST | DC | Convulsion, body edema | BT, OR | SF |
| 46 | Crassulaceae | *Kalanchoe pinnata* (Lam.) Pers. | Ta Poo Soo | LV, ST | C&C | Pain, inflammation | PT | HG |
| 47 | Crassulaceae | *Kalanchoe* sp. | Song Ying | WP | DC | **Eliminate waste matter, improve blood flow** | BT | SF |
| 48 | Cyperaceae | *Cyperus brevifolius* (Rottb.) Hassk. var. *brevifolius* | Tung Kai chad | LV, ST | DC | Antifungus | BT | SF |
| 49 | Dioscoreaceae | *Dioscorea bulbifera* L. | Kaeng Sin Doi | RZ | NP | Eczema, chloasma | PT | SF |
| 50 | Dipterocarpaceae | *Hopea odorata* Roxb. | Ma Hao | BK | DC | Toothache | OR | SF |
| 51 | Euphorbiaceae | *Bischofia javanica* Bl. | Diang Sui | BK | DC | Diarrhea | OR | SF |
| 52 | Euphorbiaceae | *Breynia retusa* (Dennst.) Alst. | Dia Mia | RT | DC | Fever | OR | SF |
| 53 | Euphorbiaceae | *Breynia* sp. | Fu choung dia | WP | DC | Fever | OR | SF |
| 54 | Euphorbiaceae | *Cleidion spiciflorum* (Burm.f.) Merr. | Toe Fim | RT | DC | Convulsion, **eliminate waste matter, improve blood flow** | OR | HG |
| 55 | Euphorbiaceae | *Euphorbia heterophylla* Linn. | – | ST, LV | NP, DC | Parasiticide | OR | SF |
| 56 | Euphorbiaceae | *Jatropha multifida* L. | Diang Doi Kong | LT | NP | Acute wound | PT | SF |
| 57 | Euphorbiaceae | *Ricinus communis* L. | Ma puang Si | LV, RT, OL | DC, NP | Anti-convulsion, induced vomit, **prevention of numbness, itchy skin, wind Dz.** | BT, OR | SF |
| 58 | Euphorbiaceae | *Securinega leucopyrus* Muell. Arg. | Put Chuang Dia | RT | DC | Cough | OR | SF |
| 59 | Eurphorbiaceae | *Macaranga denticulate* (Bl.) M.-A. | Tom Paeng Mao | LV, ST | DC | General tonic | BT | SF |
| 60 | Fabaceae | *Flemingia macrophylla* (Willd.) Prain | Yaing Paeng | RT | DC | Fatigue | OR | SF |
| 61 | Flacourtiaceae | *Hydnocarpus Kurzii* (King) Warb. ssp. Australis Sleum. | Dia Chan Mao | ST, LV | DC | Increase blood circulation | BT | SF |
| 62 | Gesneriaceae | *Aeschynanthus* sp. | Dia Chom | RT | DC | Urinary calculus, warm up body temperature | OR | HG |
| 63 | Gramineae | *Cymbopogon citratus* (DC.) Stapf. | Sa Kan | LV, ST | DC | **Relief of bone and joint pain; refreshing** | BT | HG |
| 64 | Gramineae | *Saccharum arundinaceum* Retz. | Ba Dao Yak | WP | DC | Severe cough; TB | OR | RP |

Table 1 (*Continued*)

| ID | Family | Scientific name | Mien name | Part used | Method of preparation | Medicinal use/indication for postpartum women (bold letter)/(food) | Route of admin. | Habitat |
|---|---|---|---|---|---|---|---|---|
| 65 | Hernandiaceae | *Illigera rhodantha* Hence | Puang dia yao2 | WP | DC | **Eliminate waste matter**, **improve blood flow**, **convulsion** | BT | SF |
| 66 | Icacinaceae | *Gonocaryum lobbianum* (Miers) Kurz | Ching Tang Diang | FR | NP | Peptic ulcer | OR | SF |
| 67 | Icacinaceae | *Pittosporopsis kerrii* Craib | Diang Tom Im | LV, ST | NP | Aphthous ulcer | OR | SF |
| 68 | Illicaceae | *Illicium verum* Hook. | Pak Kor | FR | DC | Heart tonic | OR | – |
| 69 | Iridaceae | *Iresine herbstii* Hook.f. | Cha Hung Kun | LV, ST | CWC | **Increase blood corpuscles**, **improve muscle tone of the uterus** | OR | HG |
| 70 | Lamiaceae | *Eurysolen gracilis* Prain | Moay moang fil3 | ST, LV | DC | Itching, **eliminate waste matter**, **improve blood flow** | BT | SF |
| 71 | Lamiaceae | *Gmelina arborea* Roxb. | Chung Kong | BK | C&C, DC | Rotten wound, peptic ulcer | OR, BT | HG |
| 72 | Lamiaceae | *Hyptis rhomboidea*. M. Martens & Galeotti | Mouw Muang Fil | LV, ST | C&C | Anti-itching, **eliminate waste matter**, **improve blood flow** | PT | SF |
| 73 | Lamiaceae | *Leonotis nepetifolia* (L.) R. Br. | Sa Kong | WP | DC | Skin disease, Allergy | OR, BT | SF |
| 74 | Lamiaceae | *Leonurus sibiricus* L. | Cha No Tao | RT | DC | Stomach-ache | OR, BT | SF |
| 75 | Lamiaceae | *Pogoston* sp. | Mouw Meung Fil | ST, LV | C&C | Tooth pain, **eliminate waste matter**, **improve blood flow** | PT | SF |
| 76 | Lauraceae | *Cinnamomum iners* Bl. | Chi Lo Diang | BK | C&C | Common cold | IH | SF |
| 77 | Leeaceae | *Leea indica* (Burm. f.) Merr. | Tom Yae Mia | LV | DC | **Eliminate waste matter**, **improve blood flow** | BT | SF |
| 78 | Leguminosae | *Flemingia sootepensis* Craib. | Fam Cha Top | RZ, LV | DC | Urinary calculus | OR | SF |
| 79 | Liliaceae | *Aspidistra longgifolia* Hk. F. | Yay soe | LV | DC | Eczema, chloasma | BT | RP |
| 80 | Liliaceae | *Dianella ensifolia* (L.) Red. | Ha Dia Sua | LV, ST | DC | Common cold, Flu, **aide in the secretion of waste products from the vagina**, **prevention of cervical cancer** | BT | HG |
| 81 | Liliaceae | *Disporum caltaratum* Wall. ex D. Don. | Yay Soe | LV, ST | DC | Eczema, chloasma | BT | SF |
| 82 | Loganiaceae | *Buddleja asiatica* Lour. | Pin Pia Mia | ST, FW | NP | Poisoning | OR | SF |
| 83 | Loganiaceae | *Buddleja* sp. | Hang sang yang Piang | FW | SK | Dizziness, nausea-vomiting | OR | HG |
| 84 | Loranthaceae | *Scurrula parasitica* L. | Diang Sang Sa | LV, ST | DC, SK | Pain, inflammation, tonic in man | OR | SF |
| 85 | Lycopodiaceae | *Lycopodiam cernuum* L. | A Kong Sing | LV, ST | DC | Cough, common cold | OR | RP |
| 86 | Malvaceae | *Urena lobata* L. ssp. *Lobata* var. *lobata* | Kon Chian | RT | DC | Prevent abortion | OR | SF |
| 87 | Marattiaceae | *Angiopteris evecta* (Forst.) Hoffm. | Ma Te Doi | RZ | SK | Diarrhea | OR | SF |
| 88 | Melastomataceae | *Dissochaeta divaricata* (Willd.) G. Don. | Deang So | BK | DC | Eczema or chloasma, diarrhea | BT | SF |
| 89 | Meliaceae | *Heynea trijuga* Roxb. ex Sims | Diang Ton Im | RT | DC | Fever | OR | SF |
| 90 | Menispermaceae | *Cyclea barbata* Miers. | Puang Dia Tom1 | LV, ST | DC | **Convulsion** | BT | SF |
| 91 | Menispermaceae | *Stephania oblate* Craib | Hung Mao Doi | TB | DC | Cancer | OR | SF |
| 92 | Menispermaceae | *Stephania pierrei* Diels | Ma Hi Si | ST | NP | Abscess | PT | SF |
| 93 | Mimosoideae | *Archidendron clypearia* (Jack.) Niels. ssp. Clypearia var. clypearia | Sing Suow | ST, LV | DC | Eye pain | BT | SF |
| 94 | Mimosoideae | *Mimosa invisa* Mart. | Yin Yom | LV, ST | DC | Hypertension | OR | SF |
| 95 | Moraceae | *Ficus auriculata* Lour. | Dia Hong Si | RT | DC | Urinary infection | OR | SF |
| 96 | Moraceae | *Ficus fistulosa* Reinw. ex Bl. Var. fistulosa | Sa Kow Thong | RT | DC | Urinary calculus | OR | SF |
| 97 | Moraceae | *Ficus hirta* Vahl. | Chak king | RT | DC | Urinary infection | OR | SF |
| 98 | Moraceae | *Ficus* sp. | Mien Dia Diang | RT | DC | Pain, inflammation | OR | SF |
| 99 | Musaceae | *Musa superba* Roxb. | Num Su Eye | ST | NP | Diuretic drug, **eliminate waste matter**, **improve blood flow** | OR | HG |
| 100 | Myrsinaceae | *Ardisia corymbifera* Mez var. *corymbifera* | Tong Long | | DC | Sore throat, **eliminate waste matter**, **improve blood flow** | OR | SF |

Table 1 (*Continued*)

| ID | Family | Scientific name | Mien name | Part used | Method of preparation | Medicinal use/indication for postpartum women (bold letter)/(food) | Route of admin. | Habitat |
|----|--------|-----------------|-----------|-----------|----------------------|-------------------------------------------------------------------|-----------------|---------|
| 101 | Myrsinaceae | *Embelia subcoriaceae* (Cl.) Mez | Toe Poe Tow Sui | LV, ST | DC | Chicken-pox | BT | SF |
| 102 | Myrsinaceae | *Maesa ramentacea* (Roxb.) A. DC. | Chan Tai Sa | LV, ST | NP | Pain, inflammation, skin diseases | BT | SF |
| 103 | Olacaceae | *Olex imbricate* Roxb. | Dia Djan | LV, ST | DC | **Postpartum tonic, eliminate waste matter, improve blood flow** | OR, BT | SF |
| 104 | Papilionoideae | *Crotalaria assamica* Bth. var *assamica* | Dia Oh | WP | DC | **Eliminate waste matter, improve blood flow** | BT | SF |
| 105 | Papilionoideae | *Dalbergia cultrata* Grah. ex Bth. | Bai im, Ma im | LV, ST | DC | Fever | OR | SF |
| 106 | Papilionoideae | *Milletia glaucescens* Kurz var. *glaucescens* | Ho Sa Pai Kwai2 | LV, ST | NP, DC | General tonic | OR | SF |
| 107 | Papilionoideae | *Moghania linneata* Ktze. | Yang Tang | WP | DC | Edema | OR, BT | SF |
| 108 | Papilionoideae | *Phylacium majus* Coll. & Hemsl. | Piang Kap | LV | DC | Dismenorrhea | OR | SF |
| 109 | Papilionoideae | *Tadehagi triquetrum* Ohashi | Diang Top | ST | DC | Urinary infection | OR | SF |
| 110 | Piperaceae | *Piper boehmaeriaefolium* (Miq.) C. DC. var. *boehmaeriaefolium* | Cha Lao Diang | LV, ST | C&C, DC | Tonic | OR | SF |
| 111 | Piperaceae | *Piper interruptum* Opiz. | Cha Loun | LV | SK | Treatment of dog bite | OR | SF |
| 112 | Plumbaginaceae | *Plumbago indica* L. | Paa Lin | LV, ST | C&C, DC | Urinary infection, **pain, inflammation** | PT, OR | HG |
| 113 | Plumbaginaceae | *Plumbago zeylanica* L. | Deaw Dor | LV | DC | Refreshment | BT | SF |
| 114 | Polygalaceae | *Securegada mulliflora* | Thaeng Taang Diang | WP | DC | Urticaria | BT | SF |
| 115 | Polygonaceae | *Fagopyrum cymosum* (Trevir.) Meisn. | Chaw Souy | RT | DC | Urinary calculus | OR | SF |
| 116 | Polygonaceae | *Fagopyrum esculentum* Moen. | Hong Lin | RT | DC | Urinary calculus | OR | |
| | DC | | OR | SF | | | | |
| 117 | Polygonaceae | *Polygonum malaicum* | Tan Suow | LV, ST | DC | Allergy | OR | HG |
| 118 | Polygonaceae | *Polygonum dissitiflorum* | Chaw Suow | LV, ST | DC | **Tonic in postpartum** | OR | SF |
| 119 | Polypodiaceae | *Aglaomorpha coronans* (Wall. Ex Mett.) Copel | Chuy kang | LV, ST | C&C | Herpes zoster | PT | HG |
| 120 | Polypodiaceae | *Microsorum punctatum* (L.) Copel. | Thong Chang Louw | LV | DC | **Convulsion**, herpes zoster | OR, BT | SF |
| 121 | Polypodiaceae | *Platycerium wallichii* Haak. | Tom Chang Puang | WP | DC | Convulsion | OR | HG |
| 122 | Portulacaceae | *Talinum triandulare* (Jacq.) Willd. | Kou Lee Sun | LV, ST | CWC | **Tonic for postpartum** | OR | HG |
| 123 | Rhamnaceae | *Berchemia floribunda* (Wall.) Wall. ex Brongn. | Ched Hi Yang | WP | DC | Improve vision | OR | SF |
| 124 | Rhamnaceae | *Gouania leptostachya* DC. var. *leptostachya* | Pwang Dia Yao1 | LV, ST | DC | **Antispasmodic, convulsion in postpartum and new born, numbness, fainting** | BT, OR | SF |
| 125 | Rhamnaceae | *Ziziphus oenoplia* (L.) Mill var *oenoplia* | Lom Yim | ST, LV | DC | **Pelvic pain in postpartum** | OR, BT | SF |
| 126 | Rosaceae | *Rubus ellipticus* J.E. Sm. forma *obcordatus* Franch. | Ha Dia Kang | LV, ST | DC | Severe cough; TB | OR | RP |
| 127 | Rosaceae | *Rubus leucanthus* Hance | Yim Mang | RT | DC | Kidney calculus | OR | SF |
| 128 | Rosaceae | *Rubus sorbifolius* Maxim. | Ha Dia Yeaw | LV, ST | DC | Severe cough; TB | OR | RP |
| 129 | Rubiaceae | *Hedyotis auriculata* L. | Yang Meaw Kung | LV, ST | NP | Poisoning | OR | SF |
| 130 | Rubiaceae | *Morinda angustifilia* Roxb. var. *scabridula* Craib | Kwang Kern | RT, LV | DC | Peptic ulcer, wound | OR, BT | SF |
| 131 | Rubiaceae | *Mussaenda sanderiana* Ridl. | Chag King Hi | LV, ST | DC | Urinary calculus, fatigue | OR | SF |
| 132 | Rubiaceae | *Mussaenda parva* Wall. ex G. Don | Chag king Mia | RT | DC | Urinary infection | OR | SF |
| 133 | Rubiaceae | *Paederia* sp. | Loe Si | LV | DC | Flatulant | OR | SF |
| 134 | Rubiaceae | *Psychotria siamica* (Craib) Hutch. | Hao Sa Dia | RT | DC, SK | Tonic | OR | SF |

Table 1 (*Continued*)

| ID | Family | Scientific name | Mien name | Part used | Method of preparation | Medicinal use/indication for postpartum women (bold letter)/(food) | Route of admin. | Habitat |
|---|---|---|---|---|---|---|---|---|
| 135 | Rubiaceae | *Psychotria* sp. | Hung Tia Yang | LV | DC | **Aide in the secretion of waste products from the vagina** | BT | HG |
| 136 | Rubiaceae | *Psychotria* sp. | Saeng Mien | RT | DC, SK | Tonic | OR | SF |
| 137 | Rubiaceae | *Rotannia wittii* (Craib) Berm. | Cha Kai Chiad | RZ, LV | DC | Peptic ulcer, urinary calculus | OR | SF |
| 138 | Rubiaceae | *Wendlandia paniculata* (Roxb.) DC. | Pong Year Ying | WP | DC | Urinary infection | OR | SF |
| 139 | Rutaceae | *Melicope pteleifolia* (Champ. ex Bth.) T. Hari | San Shine Year | RZ, LV | DC | Common cold, tonic for cattle | OR | SF |
| 140 | Saliaceae | *Salix tetrasperma* Roxb. | Fin Mien Ta Cho | RT | DC | Aphthous ulcer | OR | SF |
| 141 | Saurauiaceae | *Saurauia roxburghii* Wall. | Diang Uom | LV, ST | DC | Urinary calculus | OR | SF |
| 142 | Schisandraceae | *Kadsura heteroclite* (Roxb.) Craib | Hung Mow Hi | LV, ST | DC | Peptic ulcer | OR | SF |
| 143 | Schophulariaceae | *Torenia fournieri* Lindl. | Ha Dia Yoe | LV, ST | DC | Cough | OR | SF |
| 144 | Scrophulariaceae | *Scoparia dulcis* L. | Han Choe Mia, Mia Kam | LV, ST | DC | Allergy | BT |
| 145 | Simaroubaceae | *Picrasma javanica* Bl. | Chung Im | LV, RT | DC | Fever | OR | SF |
| 146 | Smilacaceae | *Smilax lanceifolia* Roxb. var *lanceifolia* | Sa Doi | RT | DC | Peptic ulcer | OR | HG |
| 147 | Solanaceae | *Solanum spirale* Roxb. | Chan Dia | ST | NP | Peptic ulcer, Fever, pain, cough, Parasiticide | OR | HG |
| 148 | Staphyleaceae | *Turpinia pomifera* (Roxb.) DC. | Piaw Bung | RZ | C&C | Pain, inflammation | PT | SF |
| 149 | Sterculiaceae | *Sterculia lanceolata* Cav. var. *lanceolata* | Diang Ton Top1 | LV, ST | DC | Pain, inflammation | OR | RP |
| 150 | Sterculiaceae | *Sterculia lanceolata* Cav. var. *principis* (Gagnep.) | Diang Ton Top2 | LV, ST | DC | Pain, inflammation | OR | RP |
| 151 | Sterculiaceae | *Sterculia villosa* Roxb. | Chun Tae Pwong | LV, ST | C&C | Pain, inflammation, **eliminate waste matter**, **improve blood flow**, epilepsy | AP | SF |
| 152 | Taccaceae | *Tacca chantrieri* Andre | San Ta Wang | RZ | DC, SK | Parasiticide for cattle, tonic | OR | RP |
| 153 | Torricelliaceae | *Torricellia angulata* | Dia Chung | LV, ST | C&C | Pain, inflammation | PT | SF |
| 154 | Urticaceae | *Boehgeria clidemioides* Miq. Var. *clidemioides* | Tao Poey Chung Si | ST, LV | C&C | Burn | PT | SF |
| 155 | Urticaceae | *Boehgeria nivea* (L.) Gaud. var. *tenacissina* (Roxb.) Miq. | Doe | RT | C&C | Abscess | PT | SF |
| 156 | Urticaceae | *Dendrocnide stimulans* (L. f.) Chew | Diang Tan Mien | RT | DC | Cough | OR | SF |
| 157 | Urticaceae | *Poikilospermum suaveolens* Merr. | Puang Dia Tom2 | LV, ST | DC | **Aide in the secretion of waste products from the vagina**, **pain**, **numbness** | BT | RP |
| 158 | Verbenaceae | *Clerodendrum infortunatum* L. | Lai Ko Diang | FR | DC | Laxative | OR | SF |
| 159 | Verbenaceae | *Clerodendrum Serratum* (L.) Moon var. *wallichii* Cl. | Fang Ha Mang | RT | DC | Fever | OR | SF |
| 160 | Vitaceae | *Cissus Javanica* | Chom Long | ST, LV | C&C | Stop bleeding | PT | SF |
| 161 | Vitaceae | *Cissus repens* Lmk. | Kang | LV, ST | C&C | Abscess | PT | SF |
| 162 | Vitaceae | *Tetrastigma cruciatum* Craib & Gagnep. | Kaeng Pew mia | LV, ST | DC | Anti-itching | BT | SF |
| 163 | Vitaceae | *Tetrastigma laoticum* Gagnep. | Ma Hi Kai | LV, ST | DC | Skin disease | BT | SF |
| 164 | Zingiberaceae | *Achasma macrocheilos* Griff. | La Kor Bam | RT | DC | Allergy | OR | SF |
| 165 | Zingiberaceae | *Alpinia zerumbet* (Pers.) Burtt & R.M. Smith | La Kor Bua | RZ | DC | Peptic ulcer | OR | SF |
| 166 | Zingiberaceae | *Costus speciosus* (Koeh.) J.E. Sm. var. *speciosus* | Chain Kuan Diaw | ST | C&C | Abscess, **eliminate waste matter**, **improve blood flow** | PT | SF |
| 167 | Zingiberaceae | *Curcuma zerumbet* Roxb. | Fam Chiad | RZ | NP | Peptic ulcer | OR | SF |
| 168 | Zingiberaceae | *Kaempferia parviflora* Wall.ex Bak. | Sung | TB | SK | Peptic ulcer | OR | HG |

LV = leaves, ST = stem, RT = root, RZ = rhizome, WP = whole plant, TB = tuber, OL = oil, FR = fruit, BK = bark, DC = decoction, C&C = crushed and compressed, NP = non-prepare, CWC = cooked with chicken, SK = soaked with alcohol or water, OR = oral, BT = bathing, PT = poultices, HG = home garden, RP = riparian, SF = secondary forest.

**Table 2**
Medicinal plant data from herbalists.

| Data | Frequency (species/person) | Percent (%) |
|---|---|---|
| Most common usage category | | |
| Birth related conditions | 44 | 26.3 |
| Infections/infestations | 27 | 16.2 |
| Pain | 24 | 14.4 |
| Digestive system disorders | 23 | 13.8 |
| Inflammation | 18 | 10.8 |
| Respiratory system disorders | 18 | 10.8 |
| Skin/subcutaneous cellular tissue care | 13 | 7.8 |
| Genitourinary system disorders | 13 | 7.8 |
| Injuries | 13 | 7.8 |
| Most common family | | |
| Euphorbiaceae | 9 | 11.4 |
| Rubiaceae | 8 | 10.1 |
| Asteraceae | 7 | 8.9 |
| Compositae (Lamiaceae) | 7 | 8.9 |
| Labiatae (Araceae) | 6 | 7.6 |
| Most common plant part used | | |
| Leaf | 92 | 55.1 |
| Stem (including bark and latex) | 89 | 53.3 |
| Root | 34 | 20.4 |
| Most common method of preparation | | |
| Decoction | 127 | 76 |
| Crushed | 28 | 16.8 |
| Non-prepared | 17 | 10.2 |
| Most common means of administration | | |
| Oral | 120 | 71.6 |
| Herbal bath | 50 | 29.9 |
| Poultices | 30 | 18.0 |
| Derivation of name from | | |
| Plant characteristics | 109 | 53.2 |
| Indications | 54 | 26.3 |
| Administration and part/parts used | 10 | 4.9 |

**Table 3**
Demographic data of the informants.

| Demographic data | Frequency | Percent (%) |
|---|---|---|
| Gender | | |
| Male (3 herbalists) | 30 | 48.4 |
| Female (1 herbalist) | 32 | 51.6 |
| Occupation | | |
| Farmer (4 herbalists) | 61 | 98.4 |
| Other | 1 | 1.6 |
| Religion | | |
| Buddhist (3 herbalists) | 53 | 85.5 |
| Christian (1 herbalist) | 9 | 14.5 |
| Education | | |
| Illiterate (4 herbalists) | 51 | 82.3 |
| Primary school | 5 | 8.1 |
| Secondary school | 4 | 6.5 |
| More advanced | 2 | 3.1 |
| Use of medicinal plants | | |
| Never used | 3 | 5.2 |
| Always used | 55 | 94.8 |
| Reason for use ($N = 55$) | | |
| Traditional use | 35 | 60.3 |
| Easy to find | 10 | 17.2 |
| Recommended by another | 5 | 8.6 |
| Trial and error | 5 | 8.6 |
| Outcome of treatment ($N = 55$) | | |
| Cure | 45 | 81.8 |
| Improvement | 10 | 18.2 |
| Number of MPs known by non-specialist informants ($N = 56$) | $6.3 \pm 5.8$ (species) | |
| Age of informants (average) $\pm$ SD (years) | $49.9 \pm 14.6$ (years) | |

*3.2.2. Use, part/parts used, method of preparation, means of administration and derivation of the vernacular name*

The interview data from the four herbalists indicated that medicinal plants could be classified in 19 categories (Cook, 1995). Three of the most common usage categories were for birth related conditions (44 species, 26.2%), infections/infestations (27 species, 16.1%) and pain (24 species, 14.3%).

The most commonly used families were Rubiaceae (10 species, 6.0%), and Euphorbiaceae (9 species, 5.4%). Of the part/parts used, the leaves were the most common part used (103 species, 61.3%), followed by the stem, including bark and latex (91 species, 54.2%).

The most common method of preparation was decoction for both oral and bathing uses (134 species, 79.8%). However, the route of administration by oral consumption was as a tea or food (119 species, 70.8%). Herbal baths (40 species, 23.8%) and poultices (25 species, 14.9%) were also common routes of administration. Only 1 species (0.6%) was inhaled. The interview data is shown in Table 2.

*3.2.3. Interview data from the non-specialist informants*

Fifty-eight non-specialist informants were interviewed about their experience in the use of medicinal plants. Their demographic data is shown in Table 3.

*3.2.4. Non-specialist informants' knowledge of the use of medicinal plants*

The majority of non-specialist informants who used medicinal plants were women. These women learned of these plants and their uses, particularly those used for postpartum women, from their parents. Villagers have learned little of medicinal plants use knowledge from herbalists because this knowledge has been conveyed within the family only.

The most common species of medicinal plants were used in the postpartum herbal bath formulae and in food supplement preparations. Various species have been used in the formulation of postpartum herbal baths. Each herbal bath formulae may contain from five to nine of the most commonly used species. The differences in formulas were due to villagers being unable to find some of the species that are believed to be more efficacious than others, such as *Ricinus communis* L., *Poikilospermum suaveolens* (L.) Merr., *Gouania leptostachya* DC. Var. *leptostachya*, *Schefflera* sp. cf. *Schefflera bengalensis* Gamb., *Blumea balsamifera* (L.) DC., *Chromolaena odoratum* (L.) King et Robin, *Cymbopogon citratus* (DC.) Stapf., and *Psychotria* sp. Replacement of species of medicinal plants changed the odor and indication because each of these plants have a specific odor and are used for different purposes. Medicinal plants used in postpartum preparations are also shown in Table 1.

Traditionally, after labor and delivery the new mothers have a rest period of one month. They are not to do any work, but are to recover their health through bed rest, food supplements and herbal medicines, which act as health tonics. It is believed that postpartum women are able to increase their blood circulation and regain their health by bathing with medicinal herbs and inhaling the vapors. Medicinal plants are used to treat and prevent some diseases relating to delivery. Mien mothers will become vigorous and healthy a short time after delivery. Later, they are not threatened by gynaeco-obstetric diseases such as cervical cancer or other ailments like fatigue, dizziness, bone pain and numbness. When a woman in the family gives birth her mother or her mother-in-law will collect the needed medicinal plants and prepare them.

Decoction is the method of preparing herbal medicines for postpartum baths. All the required medicinal plants are boiled together in a big container. The leaves and stems of the plants are the most commonly used parts. The Mien usually boil the herbs until the extract becomes a dark color. Once it has cooled, they will bathe or immerse their body into a bathtub containing the herbal water for ten to thirty minutes, once or twice daily. The residue will be boiled with water again for use the next time. It will be used repeatedly until its color and the odor have diminished.

There are specific beliefs regarding dietary practices after giving birth. Some foods are regarded as poisonous and are avoided alto-

gether such as pumpkin, sticky rice, eggs and bamboo shoots. Other foods are considered to be supplemental foods, such as medicinal plants cooked with chicken. Pepper, black ginger and sticky rice wine are used to improve health, supplement vital energy, increase blood corpuscles and increase lactation.

The Mien informants in Sancharurn Village who used postpartum herbal baths along with supplemental foods after delivery reported that it was a positive and beneficial experience. They stated that the herbal baths refreshed them, cleared their airways, relaxed the body and accelerated healing. All the informants said that they were never threatened with any gynaeco-obstetric diseases. However, there have been young women who have given birth by caesarean section. Three of them never bathed with medicinal plants because they were afraid to get their wound wet. However, their general recovery and prognosis regarding gynaeco-obstetric illnesses were also good.

We found that ninety-eight species (58% of medicinal plants) were not mentioned by non- specialist informants because they never known and used them.

We can conclude that there was a significant difference between knowledge and the use of medicinal plants of non-specialist informants and herbalists (Independent paired $t$-test, $p < 0.001$).

### 3.2.5. Quantitative data analysis (relative cultural importance; RCI)

Correlations between sex, age and education of non-key informants and the number of medicinal plants used showed that there was a significant correlation between sex and the number of medicinal plants used (Spearman's rank correlation coefficient: $r = 0.585$, $p < 0.01$). The correlation between education and the number of medicinal plants used was negative ($r = -0.438$, $p < 0.05$). There was a slight correlation between the age of the informants and the number of medicinal plants used (Spearman's rank correlation coefficient: $r = 0.221$, $p > 0.05$).

The data from interviews with 58 non-specialist informants showed that the most commonly used species was *Anredera cordifolia* (Ten.) Steenis with 25 use-reports, giving a value of 0.43. It was

**Table 4**
Use-values of medicinal plants commonly used by the Mien of Sancharurn Village.

| Values | Use | |
|---|---|---|
| | Male | Female |
| *Leonotis nepetifolia* (L.) R. Br | 0.11 | – |
| *Kalanchoe pinnata* (Lank.) Pers | 0.18 | – |
| *Strobilanthes cusia* (Nees) Kuntze. | 0.21 | – |
| *Piper interruptum* Opiz. | 0.25 | – |
| *Blumea balsamifera* (L.) DC. | 0.29 | – |
| *Schefflera* sp.cf. *Schefflera bengalensis* Gamb. | – | 0.53 |
| *Talinum triangulare* (Jacq.) Willd. | – | 0.57 |
| *Basella alba* L. | – | 0.67 |
| *Gouania leptostachya* Var. *leptostachya* | – | 0.67 |
| *Poikilospermum suaveolens* Merr. | – | 0.70 |
| *Ricinus communis* L. | – | 0.70 |
| *Anredera cordifolia* (Ten.) steenis | – | 0.73 |

followed by *Basella alba* L. (24 use-reports/use-value 0.41); *Poikilospermum suaveolens* (L.) Merr. (23 use-reports/use value 0.40); *Ricinus communis* L. (22 use-reports/use-value 0.38) and *Blumea balsamifera* (L.) DC. (21 use-reports/use-value 0.36). There were 98 species which had no use-reports (use-value = 0) from the 58 non-specialist informants.

Comparison of the use-values of medicinal plants between males and females found that the women had more experience in using medicinal plants than men. The species most commonly used by women was *Anredera cordifolia* (Ten.) Steenis with 22 use-reports by 30 informants, giving a use-value of 0.73. This was followed by *Poikilospermum suaveolens* (L.) Merr. (21 use-reports/use-value 0.70), *Ricinus communis* L. (21 use-reports/use-value 0.70), *Basella alba* L. (20 use-reports/use-value 0.67), *Gouania leptostachya* Var. *leptostachya* (20 use-reports/use-value 0.67), *Talinum triangulare* (Jacq.) Willd. (17 use-reports/use-value 0.57) and *Schefflera* sp. cf. *Scheffllera bengalensis* Gamb. (16 use-reports/use-value 0.53). The species most commonly used by men was *Blumea balsamifera* (L.) DC., with 8 use-reports by 28 informants, giving a use-value of 0.29. This was followed by *Piper interruptum* Opiz. (7 use-reports/use-value 0.25), *Strobilanthes cusia* (Nees) Kuntze.

**Table 5**
Use category, informant agreement ratio and fidelity level of medicinal plants used by the Mien in Sancharurn Village.

| Use | No. of | | IAR | Preferred species | Application | FL (%) |
|---|---|---|---|---|---|---|
| | Taxa | Uses | | | | |
| Unspecified medicinal disorders | 13 | 10 | 0.33 | *Pollia secundiflora* (Bl.) Bakh.f | Tonic | 20 |
| | | | | *Scurrula parasitica* (L.) | Tonic | 30 |
| Blood system disorders | 2 | 1 | 0.00 | *Entada* sp. | Anemia | 100 |
| Digestive system | 23 | 50 | 0.55 | *Chromolaena odoratum* (L.) King et Robin | Peptic ulcer | 40.9 |
| | | | | *Strobilanthes cusia* (Nees) Kuntz. | Diarrhea | 77.8 |
| | | | | *Zingiber officinale* | Peptic ulcer | 31.8 |
| Genitourinary system disorders | 13 | 7 | −1.00 | *Mussaenda sanderiana* Roxb. | Urinary calculus | 25 |
| Defined symptoms | 4 | 7 | 0.50 | *Mussaenda sanderiana* Roxb. | Fatigue | 100 |
| Infections/infestations | 27 | 12 | −0.58 | *Breynia* sp. | Fever | 100 |
| | | | | *Microsorum punctatum* Linn. | Herpes zoster | 100 |
| Inflammation | 18 | 11 | −0.70 | *Crinum asiaticum* L. | Inflammation | 72.2 |
| | | | | *Rhinacanthus narsutus* (L.) Kurz. | Inflammation | 9.1 |
| Injuries | 13 | 13 | 0.00 | *Chromolaena odoratum* (L.) King et Robin | Acute wound | 30.8 |
| | | | | *Blumea balsamifera* (L.) DC. | Epitaxis | 61.5 |
| Muscular-skeletal system disorders | 5 | 10 | 0.56 | *Kalanchoe pinnata* (Lank.) Pers | Broken bone | 66.7 |
| Neoplasms | 1 | 1 | 0.00 | *Ageratina adenophora* (Spreng.) R.M. King & H. Rob. | Cancer | 100 |
| Nervous System Disorders | 11 | 37 | 0.72 | *Cleidion spiciflorium* (Burm.f.) Merr. | Convulsion | 18.9 |
| | | | | *Gouania leptostachya* Var. *leptostachya* | Convulsion | 54.1 |
| Pain | 24 | 18 | −0.35 | *Crinum asiaticum* L. | Pain | 44.4 |
| | | | | *Kalanchoe pinnata* (Lank.)Pers | Bone pain | 33.3 |
| Pregnancy/births/puerperium disorders | 44 | 258 | 0.83 | *Poikilospermum suaveolens* Merr. | Cervical cancer | 56.1 |
| | | | | *Ricinus communis* L. | Numbness | 100.0 |
| | | | | *Gouania leptostachya* Var. *leptostachya* | Convulsion | 52.6 |
| | | | | *Schefflera* sp. cf. *bengalensis* Gamb. | Antispasmodic | 43.9 |
| Respiratory system disorders | 18 | 11 | −0.70 | *Pothos angustifolius*/*Pothos chinensis* (Raf.) Merr. | Common cold | 50.0 |
| | | | | *Dianella ensifolia* (L.) DC. | Common cold | 36.4 |
| Skin/subcutaneous cellular tissue | 13 | 16 | 0.20 | *Tetrastigma quadrangulum* Gagnep. & Craib | Skin disease | 54.5 |

**Table 6**
Medicinal plants commonly used in herbal bath preparations by five groups in Thailand.

| Scientific name | Mien* | Yunnanese** | Lisu** | Thai** | Lahu*** |
|---|---|---|---|---|---|
| *Ageratum conyzoides* L. | – | X | X | – | – |
| *Blumea balsamifera* (L.) DC. | X | X | – | X | X |
| *Clerodendrum fragrans* (Vent.) Willd. | – | X | – | – | – |
| *Clerodendrum inerme* (L.) Gaertn. | – | – | – | X | – |
| *Cleodendrum paniculatum* L. | – | X | – | – | – |
| *Clerodendrum serratum* (L.) Moon | – | – | X | – | – |
| *Clerodendrum urticaefolium* (Roxb.) Wall. ex Schauer | – | X | – | – | – |
| *Clerodendrum* cf. *Clerodendrum vellosum* Blume | – | – | – | – | – |
| *Cymbopogon citratus* (DC.) Stapf. | X | – | X | X | – |
| *Cymbopogon nardus* Rendle | – | X | – | – | – |
| *Elsholtzia* sp. | X | X | – | – | X |
| *Elsholtzia kachinensis* Prain. | – | – | – | – | – |
| *Morus alba* L. | – | X | X | – | – |
| *Morus macroura* Miq. | – | – | – | – | – |
| *Rhinacanthus nasutus* (L.) Kurz. | – | X | – | X | – |
| *Ricinus communis* L. | X | X | – | X | – |
| *Vitrex* spp. | X | X | X | – | – |

*Source*: *Sutthi (1986), Towaranon (1988), Srithi et al. (2009); **Chuakul et al. (1997); ***Birkenberg et al. (2009).

(6 use-reports/use-value 0.21), *Kalanchoe pinnata* (Lam.) Pers. (5 use-reports/use-value 0.18) and *Leonotis nepetifolia* (L.) R. Br. (3 use-reports/use-value 0.11). The details of the use-values of medicinal plants are shown in Table 4.

The usage category with the most use-reports was that of plants used for birth-related conditions with an IAR value of 0.83 (258 use-reports, 44 species) which showed the highest degree of consensus. This was followed by the nervous system category with an IAR value of 0.72 (37 use-reports, 11 species); the muscular-skeletal system category with an IAR value of 0.56 (10 use-reports, 5 species) and the digestive system category with an IAR value of 0.55 (50 use-reports, 23 species).

There was a high degree of consensus of medicinal plants used. The highest degree of consensus was 100% of fidelity level with *Entada* sp., *Mussaenda sanderiana* Roxb., *Breynia* sp., *Microsorum punctatum* (L.) Copel., and *Ageratina adenophora* (Spreng.) R.M. King & H. Rob. These species were used to treat anemia, fatigue, fever, herpes zoster, and cancer, respectively. Two medicinal plants used for birth-related conditions that also had 100% consensus were *Ricinus communis* L. and *Chromolaena odoratum* (L.) King et Robin. The details of use informant agreement ratio and fidelity level are shown in Table 5.

## 4. Discussions and conclusions

### 4.1. Medicinal plant use knowledge and its current value

There are many medicinal plants used in Sancharurn Village and traditional knowledge of plant use is abundant. The role of these medicinal plants in the primary healthcare of the villagers has been reduced because of easier access to modern medicines and changes in their lifestyle from their close contact with Thai society. It is a similar situation with Huai Labaoya and Samoon Mai Village in Nan Province (Srithi et al., 2009). It has had an erosion of medicinal plant knowledge and villagers know little about plants. Nevertheless, the non-specialist informants in Huai Labaoya and Samoon Mai Village never used their plants, while in this study we found the herbalists who held most of knowledge and still play the role for some ailments, such as pain and convulsion while villagers, are women. This knowledge is especially rich in older women who know and use medicinal plants for postpartum treatment.

Medicinal plants are also threatened by habitat destruction and the change from subsistence farming to cash crops, coffee planting and orchards. The medicinal plants and the knowledge of their uses are currently endangered. Medicinal plants used by postpartum women are also threatened by the same issues. In order to raise awareness, more education and training on the protection, conservation and sustainable use of medicinal plant resources are needed. Home gardens can play a pivotal role in the conservation of rare and/or endangered medicinal plant species. Books or inventories of medicinal plants can be important educational media in the village schools. In a case of conservation and sustainable use of medicinal plants, Khanh et al. (1999) explained that their process included an inventory of these plants, developing a one-hectare garden of useful plants, educating and training the community and a trial cultivation of useful native plants in local communities. The cultivation of useful native plants was implemented by 70 farmers in Tam Dao Town. The development of nurseries for the propagation of plants by seeds and stem cuttings on a community level was also successfully practiced in Vietnam (Trung and On, 2000).

In China, Long and Li have cited Vagelos's report that the government should provide some preferential policy to encourage the Red Headed Yao herbalists to convey their medicinal knowledge from generation to generation (Long and Li, 2004).

### 4.2. Use value (UV), informant agreement ratio (IAR) and fidelity level (FL)

The use value, informant agreement ratio and fidelity level showed similar trends with informant consensus. Medicinal plants used in pregnancy/birth/puerperium disorders were the first priorities for conservation and development.

### 4.3. Medicinal plants and their potential

This study, based upon the use value, informant agreement ratio and fidelity level, indicates that plants used in the treatment of birth-related conditions have high potential value for research and development. The popular species were *Anredera cordifolia* (Ten.) Steenis, *Basella alba* L., *Poikilospermum suaveolens* (L.) Merr., *Ricinus communis* L., *Blumea balsamifera* (L.) DC., *Gouania leptostachya* Var. *leptostachya*, *Schefflera* sp. cf. *Schefflera bengalensis* Gamb., *Chromolaena odoratum* (L.) King et Robin, *Talinum triangulare* (Jacq.) Willd., and *Zingiber officinale* Rosc.. These were analyzed phytochemically and for biological activity (Ruangrungsi et al., 1981; Ke et al., 1999; Barua and Sharma, 2001; Fazilatun et al., 2003; Raju et al., 2005; Yaolan et al., 2005, 2008).

Other plants with high potential as medicinal plants are *Gmelina arborea* Roxb., used for treating peptic ulcers and wounds, and *Millettia* sp. Or (Or Lun Hi) which is used for wounds. These plants were not mentioned by the non-specialist informants, but herbalists have used them on their patients.

A comparison of postpartum herbal bath preparations among the Mien in China and from various reports in Thailand found that plants in the genera *Acorus*, *Ficus*, *Smilax* and *Schefflera* were commonly used. *Basella* sp. is the most popular tonic plant in China and Thailand (Sutthi, 1986; Towaranon, 1988; Long and Li, 2004; Srithi et al., 2009).

A comparison was made of the postpartum herbal bath preparations used among ethnic groups originating from China, and those used by Thai people. The results were that other ethnic groups such as the Lisu, Yunnanese, Lahu and Karen also take herbal baths after delivery (Liulan et al., 2004). Medicinal plants commonly used by the Yunnanese, Lisu, Thai, Lahu (Chuakul et al., 1997; Birkenberg et al., 2009) and the Mien (Sutthi, 1986; Towaranon, 1988; Srithi et al., 2009) are listed in Table 6.

There are many useful or high potential medicinal plants which the Mien use at Sancharurn Village, especially in the pregnancy/birth/puerperium categories. The erosion of medicinal plant knowledge in this community suggests that most young people know little about medicinal plants. Some of them know the names of the plants, but not their uses. The young women only know of some of the plants used for postpartum treatment. It is vital to conserve these medicinal plants while protecting their habitats. They must also be managed in sustainable ways to promote their use. Knowledge of medicinal plants should be recorded and conveyed to the entire village for their sustainable use.

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