
Status, Utilization, Management and Development of -Medicinal Plants in the Lao PDR

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1. Institute of Traditional Medicine (ITM):

The Institute of traditional Medicine under the Ministry of Health was established in 27 April 1976. The Institute has four main duties, (1) Research on medicinal plants and traditional medicine, (2) Preservation: traditional medical knowledge, medicinal plants, (3) Education, human resource development, and (4) Service: collection, plantation, production and treatment.

The Institute has two divisions and four centers:

- Administrative bureau division
- Pharmacognosy division
- Research and Development center
- Medicinal plants cultivation and animal breeding center
- Traditional medicine development center
- Traditional medicine treatment center

Most of the offices are in Vientiane Capital, only the Medicinal plants cultivation and animal breeding center is located in Veunekham village, which is about 25 km from Vientiane Capital.

There are 49 people working in the institute, with the following qualifications/level :

-PhD: 1, - MSc: 6 - BSc: 19 - Assistants: 23

2. ITM Projects dealing with traditional medicine from plants

2.1. Studies on Biodiversity of Vietnam and Laos: the UIC-based ICBG Program.

In the previous years ITM had the opportunity to join the above mentioned project. The specific aims of this project covers the following points:

- (i) To conduct a biotic survey and to implement biodiversity conservation effort at Cuc Phuong National Park , in Vietnam, and to carry out multifaceted studies on the medicinal plants of Laos.
- (ii) To discover natural product molecules from plants of Cuc Phuong National Park, targeting, primary, the seed plants and from medicinal plants of Laos, as possible candidates for drug development for the treatment of malaria, viral diseases (including AIDS), cancer, and tuberculosis. At the outset, CNS diseases were targeted, to be performed by Glaxo SmithKline, but these were dropped when Glaxo pulled out from our ICBG cooperation due to company's change of R & D focus in 2001.
- (iii) To strengthen the standard of living of members of the communities who participate in the ICBG studies and to strengthen the human resources and the scientific infrastructure of the host country institutions of the UIC-based Vietnam-Laos ICBG, in Vietnam and Laos. From this project we collected 904 samples for biological analysis at the University of Illinois at Chicago, United States of America in the last 10 years (1998-

2008). At the same time, the collected information of all activities were put into the NAPIS database.

2.2. Surveys and inventories of medicinal plants.

2.2.1. Government budget:

In the previous 10 years the ITM carried out the surveys and inventories in many provinces, such as Luangnamtha, Oudomxay, Bokeo, Luangprabang, Xiengkhuang, Vientiane Capital, Bolikhamxay, Savvannakhet, Champassak and Xekong. Most of the activities were supported by government budget. The details of the recorded medicinal plant species in various localities of Lao PDR are appeared as Annex 1.



Surveys of medicinal plants in Oudomxay province

2.2.2. Joint activities with National University of Lao PDR.

The Institute of Traditional Medicine sent the technical staff to join the survey and inventory of medicinal plants used by Hmong ethnic group in Nonghed district, Xiengkhuang province. We recorded 110 medicinal plant species.

2.2.2. Joint activities with foreign institutions.

Besides the above mentioned project, ITM had the opportunities to collaborate with other institutions for a short time period.

(a) Kunming Institute of Botany:

During the flash fieldtrips carried out with Chinese scientists from this Institute we collected the herbarium specimens of ferns and flowering plants totaling 3,515 numbers. We are now in the process of identifying the species.

(b) Korean Research Institute on Bioscience and Biotechnology (KRIBB):

In parallel with the collection of herbarium specimens we also collected flowering samples for analysis. During the last five years, about 1,106 samples were collected for analysis.

(c) International Cooperation Unit for Biodiversity and Environments Conservation (ICUBEC).

This Korean institution partly supported the inventory of medicinal plants in Luangprabang, Xayabouly and Vientiane Capital. We recorded 568 species.

2.3. TABI

In 2011, we were invited by TABI to carry out survey's of medicinal plants in the medicinal plant preserve of Ban Houay Khing, Phon xay district, Luangprabang province. During that short fieldtrip we recorded 197 medicinal plant species.

In July 2013, the technical staff of ITM made the inventory of medicinal plants in Phoukout district, Xiengkhuang Province. From this fieldtrip 247 medicinal plants were recorded.

In March 2014, the technical staff of ITM made the inventory of medicinal plants in Chomphet district, Luangprabang province. From this fieldtrip 121 medicinal plants were recorded.

2.4. Centre for Human Ecology Study of Highland (CHESH).

CHESH is one organization under the umbrella of the Social Policy Ecology Research Institute (SPERI) which has the Head Quarter office in Vietnam. In Lao PDR, CHESH-Lao performs its activities in Long Lan village, Luangprabang district, Luangprabang province. One of the activities of CHESH-Lao in Long Lan village is to preserve medicinal plants. This organization carried out the investigation and found 485 plants that can be use for food, medicines and technical.



2.5. Pha Tad Ke Botanical Garden

The Pha tad Ke Botanical Garden in Luangprabang has started its activities on the conservation of plants by planting endemic and introduced plants in general. It also contributes to the publication of books on the use of medicinal plants for school and communities.

2.6 Summary

From the above mentioned activities of ITM, including the activities with foreign institutions we had some interesting results as follows:

1. Collected 10,200 collection of herbarium specimens.
2. Establishment of the NAPIS database of (1,698 species).
3. Isolated many new compounds from plants of Laos:
 - Antimalarial constituents from *Nauclea orientalis* (L.) L
 - Bioactive constituents from *Asparagus cochinchionensis*
4. Found new anti-TB compound in the genus *Marsypopetalum modestum* (Pierre) B.Xue & R.M.K.Saunders (Annonaceae) from a traditional herbal remedy of Laos.

5. Found *Girardinia diversifolia* (Link) Friis as the first collection record for both the species and the genus to Laos.
6. Found Genus *Bolbitis* (Dryopteridaceae) from various provinces of Laos. Some of them are new records for Laos.
7. Found Genus *Pteris* L. (Pteridaceae) from various provinces of Laos. Some of them are new records for Laos.
8. The establishment of medicinal Plant Preserves in many provinces. The details of the preserves are shown in **Annex 2**.



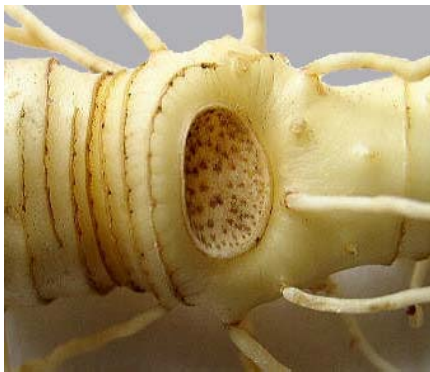
Oudomxay province



Xiengkhuang province

Medicinal Plant Preserves

9. Found that some species are in the critical situation. Some rare and endangered species are presented in the **Annex 3**.



Vane Hoa Tor *Disporopsis longifolia* Craib.



Pom Bi Ka Thing *Panax vietnamensis* Ha et Grushv

3. List of companies producing medicines from plants

There are small number of companies producing traditional medicines from plants:

1. Pharmaceutical factory No. 2. This factory is under the ministry of health. Its main products are conventional medicines. But the factory also produce traditional medicines from plants. There are 25 traditional medicines products from medicinal plants.
2. Pharmaceutical Development Center (the common name is Factory No. 3). This factory issimilar to factory No. 2, they also produce traditional medicines. This factory produce 13 traditional medicines from plants.
3. Factory No. 104, under the Ministry of Defense. This factory also produce some traditional medicines from plants. They produce 13 traditional medicines, of which 7 are in liquid form, 3 in capsules and 3 in pills.
4. Institute of Traditional Medicine produce some traditional medicines from plants as well. The institute produce 35 traditional medicines from plants, but the commonly used is about 15 products.

The traditional medicine products are in the form of capsules, pills, tablets, tea, ointment, mixed of plants and liquid.

In private sector, there are some home based factories:

1. Ka Nou Kham factory: produce 22 traditional medicines from plants.
2. Ka pha Ya Nak factory: produce 13 traditional medicines from plants.
3. One Tiger brand factory: produce 20 traditional medicines from plants.
4. Thipsavang factory: produce 3 health supplements and 5 traditional medicines from plants.
5. Lao Organic Products Promotion Center: produce 5 products from plants and mushrooms.
6. Viengthong Trading: produce 5 traditional medicines from natural sources.

In Luangnamtha province there is a company from China (Chin Xieng) to run the extraction of active compounds from *Draceana cambodiana* Pierre and Gagnepain. In 2013, the factory received quotation from the government for buying raw material for its extraction 500 tons.

4. Recommendations on how this production of medicines from TMPs should be improved.

In order to improve the production of traditional medicines from plants the following points should be considered:

1. The selection of raw materials, application of GACP;
2. Quality control of raw materials;
3. The methods of processing of raw materials;
4. The methods of production of finished products, application of GMP;
5. Quality control of finished products;

6. Transportation and Storage of finished products; and
7. Post marketing surveillance.

All of the above mentioned points are critical for ensuring the quality, efficacy and safety of traditional medicines from plants. At the same time, we have to make use of scientific researches for providing safe and effective traditional medicine services and products in good quality.

5. A synopsis of all TMP species in Lao

Referring to the Prime Minister Decree No. 155, we group the medicinal plants into three categories:

- (1) Category I encompasses rare and endangered species;
- (2) Category II includes species that have a high commercial value and can be used for domestic consumption and for exportation; and
- (3) Category III covers plant species that are available in abundance throughout the country.
 - For harvesting and collection of medicinal plants in category I, approval of the Ministry of Health and other competent authorities is required. In this category we listed 56 species of plants and animals.
 - For category II, harvesting and exploitation are also to be certified by the Ministry of Health and concerned authorities, but can be obtained by providing a management plan for harvesting and replanting. In this category we have 60 species of plants and animals.
 - For category III, the exploitation is not restricted since they are abundantly available in nature. This category listed 63 species of plants and animals.

However, the classification is not static. The plants in categories II and III may be put in category I in the future if the management is inadequate.

In addition, for the routine work we also used to group the medicinal plants into (1) tree (2) liana, (3) shrub, and (4) ferns.

6. Summary of all publication related to TMPs over the last 10 years

There are many articles that were published nationally and internationally during the last 10 years:

- (1) Southvong, B. H.; **Sydara, K.**; SOULIYA, O.; Phonlavong, Kh.; Xayvue, M. **Medicinal and Herbs in the Lao People's Democratic Republic. Volume II** (In English). (2014). *In Press*.
- (2) Elkington, BG.; Phiapalath, Ph.; **Sydara, K.**; Somsamouth, V.; Goodsmith, NI.; and Soejarto, DD. **"Assessment on the Importance of medicinal plants among communities around Khat Ngong of Southern Laos."** *Journal of Environmental Biology* 35 (2014a).
- (3) Elkington, BG.; **Sydara, K.**; Newsome, A.; Hwang, CH.; Lankin, DC.; Simmler, C.; Napolitano, JG.; Ree, R.; Graham, JG.; Gyllenhaal, C.; Bouamanivong, S.; Souliya, O.; Pauli,

- GF.; Franzblau, SG.; and Soejarto, DD. **“New finding of an anti-TB compound in the genus *Marsypopetalum* (Annonaceae) from a traditional herbal remedy of Laos.”** *Journal of Ethnopharmacology*. 151.2 (2014b): 903-911
- (4) Elkington, BG.; **Sydara, K.**; Newsome, A.; Hwang, CH.; Lankin, DC.; Simmler, C.; Napolitano, JG.; Ree, R.; Graham, JG.; Gyllenhaal, C.; Bouamanivong, S.; Souliya, O.; Pauli, GF.; Franzblau, SG.; and Soejarto, DD. **“New finding of an anti-TB compound in the genus *Marsypopetalum* (Annonaceae) from a traditional herbal remedy of Laos.”** *Journal of Ethnopharmacology*. Available online 11 Dec (2013)
 - (5) Southvong, B. H.; Sydara, K.; SOULIYA, O.; Phonlavong, Kh.; Xayvue, M. **Medicinal and Herbs in the Lao People’s Democratic Republic. Volume I.** Naxaithong Printing House. (2013) (In English)
 - (6) Elkington, BG.; **Sydara, K.**; Hartmann, JF.; Southavong, B.; and Soejarto, DD. **“Folk Epidemiology Recorded in Palm Leaf Manuscripts of Laos”**. *Journal of Lao Studies* 4 (2012)
 - (7) Gyllenhaal, C.; Kaddushin, MR.; Soejarto, DD.; Southavong, B.; **Sydara, K.**; Bouamanivong, S.; Xayvue, M.; Xuan, L.; Hiep, N.; Hung, N.; Loc, P.; Dac, L.; Binh, L.; Hai, N.; Bich, T.; Cuong, N.; Zhang, H.; Franzblau, SG.; Xie, H.; Riley, MC.; Elkington, BG.; Nguyen, TH.; Waller, DP.; Tamez, P.; Tan, G.; and Pezzuto, J. **“Ethnobotanical approach versus random approach in the search for new bioactive compounds: support f hypothesis.”** *Pharmaceutical biology* 50.1 (2012): 30-41
 - (8) Elkington, BG.; Southavong, B.H.; **Sydara, K.**; Bouamanivong, S.; Souliya, O.; Xayvue, M.; Vanthanouvong, M.; Riley, M.; Panyachit, B.; Thammachack, B.; and Soejarto, DD. **“The Search for Anti-Malarial Plants in Lao Palm-Leaf Manuscripts. Multidisciplinary erspectives on Lao Studies.”** *Multidisciplinary Perspectives on Lao Studies*. Eds. Adams, K and TJ. Hudak. Tempe, AZ: *Southeast Asia Council, Center for Asian research. Arizona State University.2010. 277-287.*
 - (9) Elkington, BG.; Southavong, B.H.; **Sydara, K.**; Souliya, O.; Vanthanouvong, M.; Nettavong, K.; Thammachack, B.; Dennis, H.P.; Mary, R.; Franzbrau, S.G.; Soejarto, D.D. (2009). **“Biological Evaluation of plants of Laos used in the treatment of Tuberculosis in Lao traditional medicine.”** *Pharm Biol.* 2009 January: 47(1):26-33.
 - (10) Libman, AC.; Southavong, B.H.; **Sydara K.**; Bouamanivong, S.; Gyllenhaal, C.; Mary, R.;and Soejarto, DD. (2009). **“The Influence of Cultural Tradition and Geographic Location on the Level of Medicinal Plant Knowledge Held by Various Cultural Groups in Laos.”** *Contemporary Lao Studies: Research on Development, Language and Culture, and Traditional Medicine*. Eds. Compton, CJ.; TF. Hartmann; and V. Sysamouth. DeKalb, San Francisco: *Southeast Asia Publications,2009. 277-291.*
 - (11) Somsanith et al. **Selected medicinal plants for community Volume 1.** (2009).
 - (12) Michiho Ito, Gisho Honda, **Kongmany Sydara.** **“*Perilla frutescens* var. *frutescens* in northern Laos.”** *J Nat Med* (2008) 62:251-258.
 - (13) **K. Sydara.** **“Rapid Trade Environment Assessment (RTEA).”** Background Research Papers. December 2007. International Institute for Sustainable Development. www.iisd.org
 - (14) Libman, A.; Bouamanivong, S; Southavong, B.H.; **Sydara K.**; (2006). **“Medicinal plants: An important Asset to Health Care in a Region of Central Laos.”** *Journal of Ethnopharmacology* 106:303-311.

- (15) **K.Sydara, S.** Gneunphonsavath, R.Wahlstrom, S.Freudenthal, K.Houamboun, G.Tomson, T.Falkenberg. "Use of traditional medicine in Lao PDR ."Journal of Ethnopharmacology 13 (2005) 199-205. Available on line at www.sciencedirect.com
- (16) He, Z. D.; Ma, C. Y.; Zhang, H. J; Tan, G. T.; Tamez, P. A.; **Sydara, K.**; Bouamanivong, S.; Southavong, B.; Soejarto, D. D.; Pezzuto, J. M.; Fong, H. H. S. "Antimalarial constituents from *Nauclea orientalis (L.) L.*" *Chemistry and Biodiversity- Vol. 2 (2005)*.
- (17) Zhang H. J.,; **Sydara K.**, Tan, G.T.; Ma, C.Y.; Southavong, B.; Soejarto D. D.; Puezzuto, J. M.; Fong H. H. S. (2004) "Bioactive constituents from *Asapragus cochinchionensis.*" *Journal of Natural Products* 67 (2), 194-200.

7. TMPs that are exported to other countries.

Most of the medicinal plants exported to other countries are in the form of raw materials or extracts. The well known two extracts that are exported to China are

- (1) berberine from *Coscinium franestratum* (Gaertn.) Colectooke, and
- (2) *Dracaena cambodiana* Pierre nd Gagnepain.

Other medicinal plants that are exported to other countries are listed in **Annex 4**. Luckily, some exported medicinal plants are from plantations. The list of planted species is given in **Annex 5**.

8. TMPs that are becoming difficult to find, or extinct, and why.

Annex 3 provides a list of rare and endangered medicinal plant species. The main reasons that medicinal plants are becoming difficult to find or extinct are as follows:

1. The awareness of local people on the sustainable use of natural resources;
2. Weakness of the implementation of the rules and regulations;
3. Lose cooperation among regulatory authorities;
4. No appropriate measures for the collection of raw materials.

9: Summary of the Laws and Regulations regarding medicinal plants

Under the Ministry of Health, the following law and regulations are applied:

- 1: **Decree No. 155** of the Prime Minister on Medicinal Natural Resources, dated 30 September 2003, defines measures related to the promotion, management, exploitation, production, growth and use of natural resources to protect the country's medicinal resources and rich biodiversity, and to ensure the sustainable use of medicinal natural resources.

The Decree classifies medicinal plants in three categories:

- Category I encompasses rare and endangered species. For harvesting and collection of the plants in this Category, approval of the Ministry of Health and other competent authorities is required.

- Category II includes species that have a high commercial value and can be used for domestic consumption and for exportation. Harvesting and exploitation of the medicinal plants in this Category are also to be certified by the Ministry of Health and other concerned authorities, but can be obtained by providing a management plan for harvesting and replanting.
- Category III covers plant species that are available in abundance throughout the country. The exploitation of the plants in this category is not restricted since they are abundantly available in nature.

However, the classification is not static. The plants in Categories II and III may be put in category I in the future if management is inadequate.

2: Ministerial order No. 252 (2007), defines measures for the implementation of the Prime Minister Decree No. 155.

The main provisions of this Order can be summarized as follows:

- The Provincial Health Offices should collaborate with Provincial Division of Agriculture and Forestry, Provincial Industry and Commerce Division and concerned authorities at all level to disseminate, implement, monitor and evaluate the implementation of the Prime minister Decree No. 155.
- The Provincial Health Offices should collaborate with Provincial Division of Agriculture and Forestry to separate the Non Timber Forest Products and medicinal Plants in different lists.
- Exportation of raw materials should be prohibited, but the exportation of processed materials in the form of intermediate products is encouraged, and if possible in the form of finished products.

(note: 1 and 2 above are available as handout.)

3: Law on Drugs and Medical products (amended in 2011), defines principles, rules and measures relating to the use, management, monitor and inspection of drugs and medical products with the aims to ensure the supply of drugs and medical products of good quality, efficacy, safety with appropriate prices in order to prevent diseases and to provide treatment to all people for their good health, contributing to the national protection and development.

4: The Forestry Law (amended in 2005), defines basic principles, rules and measures relating to the management, protection and use of natural resources and forestry land; promotes the forestation, plantation and propagation of natural resources in order to ensure the richness of the forest and its sustainable use.

10: National Strategy re. Traditional Medicine

This strategy was developed in 2011 following the development of Regional Strategy for Traditional Medicine in the western Pacific (2011-2020) which was published in 2012 by WHO. The national strategy was approved by the Minister of Health on the 20 March 2013.

The goal of the Strategy is to promote proper use of traditional medicine available in the country for its contribution to maintain the good health of Lao people and its potential value for economic gains of the country. The main financial supporter of the Strategy is WHO. In addition, we had technical support from the Hong Kong University of Science and Technology, and the Ministry of Food and Drug Safety of the Republic of Korea.

Under the last strategic direction ***“To conserve natural resources of medicinal plants and to protect intellectual knowledge on traditional medicines of the Lao ethnic groups”*** there are some activities relating to medicinal plants and forest, for instance:

- ❖ To develop and or revise policies, regulations concerning the protection and conservation of medicinal natural resource by Food and Drug Department/Ministry of Health
- ❖ To develop the procedure for providing the quota of harvesting of natural medicinal resources.
- ❖ To manage and promote the cultivation/raising, exploration, production and use of medicinal natural resources effectively and sustainably,
- ❖ To discuss with other government ministries concerned and related local government on this topic,
- ❖ To educate public on importance of conservation of medicinal plants resource for future generation,
- ❖ To set up Medicinal Plant Preserve in selected provinces.

11: Recommendations regarding Laws and Policy

11.1: Stricter Enforcement of laws and regulations:

- Local people (Community education)
- Industries
- Regulatory Authorities (Regulation of industries and products)

11.2: Update the old and not relevant laws and regulations

So far, we have only one law for conventional and Traditional Medicine. In the future we should develop law on traditional medicine and conventional medicine separately. In neighboring countries there are special laws for traditional medicine.

11.3: Draft new laws and regulations

Due to lack of experiences, in the previous years we used some regulations of conventional medicines for traditional medicines as well. Since Lao PDR will join the AEC by the end of 2015, we have to draft laws and regulations such as law on traditional medicine and health supplement, the regulation on the establishment of traditional medicine factory, that can ensure the full contribution of our country to the interest of the ASEAN Community in the field of traditional medicine and health supplement.

Annex 1: List of recorded medicinal plant species in various localities of Lao PDR

No.	Provinces	Number of collected species	TOTAL
1	Luangnamtha	70	
2	Oudomxay - Phou Ly phi - Ban Houay Hok	226 120	346
3	Bokeo	200	
4	Luangprabang - Phonxay district - Chomphet district	197 121	318
5	Xiengkhuang - Phoukout - Nong hed	274 110	384
6	Champasack - Dong ka long - Mounlapamok district	119 128	247
7	Bolikhamxay - Viengthong district	82	
8	Savannakhet - Dong na tad	150	
9	Xekong	125	
10	Vientiane capital - Xaythany district - Naxaythong district - Thaxang village	127 172 192	419
	TOTAL		2,468

Annex 2: List of Medicinal Plant Preserves (MPP) in Lao PDR

No.	Location	Area [ha]	Year established	Remarks
1	Oudomxay province	15	2009	In situ
2	Luangnamtha province	10	2010	In situ
3	Bokeo province	100	2013	In situ
4	Luangprabang province	2,300	2012	In situ
5	Xiengkhuang province	500	2010	In situ
6	Vientiane Capital	6	2009	Ex situ
7	Bolikhamxay province	13,13	2004	In situ
8	Champasak province	4	2009	In situ
9	Savannakhet province	15	2010	In situ
10	Xekong province	30	2010	In situ

Annex 3: List of rare and endangered medicinal plant species

No.	Local names	Scientific names
1	Koud Tin Houg	<i>Helminthostachys zeylanica</i> Hook.f.
2	Khing Pha	<i>Polygonatum kingianum</i> Coll. et Hemsl.
3	Kha Yom Phou	<i>Rauvolfia serpentina</i> (L.) Benth. ex Kurz.
4	Hoa Tom Ngeune	<i>Stephania rotunda</i> Lour.
5	Man Onh Ling	<i>Polygonum multiflorum</i> Thunb
6	Man Kha Kai	<i>Codonopsis pilosa</i> (Franch.) Nannf
7	Kheua Haem	<i>Cosciniium fenestratum</i> (Gaertn.) Colebrooke
8	Vane Hoa Tor	<i>Disporopsis longifolia</i> Craib.
9	Tin Houg	<i>Paris marmorata</i> Stearn
10	Pom Bi Ka Thing	<i>Panax vietnamensis</i> Ha et Grushv
11	Mak Chong Ban	<i>Sterculia lychnophora</i> Hance
12	Leu Lang Lai	<i>Aeschynanthus marmoratus</i> F. Moore.
13	I Tu Ton	<i>Cinnamomum camphora</i> (L.) Priesl.
14	Mai Tha Lo	<i>Cinnamomum pathenoxylon</i> (Jack) Ness
15	Hat Mee	<i>Artocarpus lakoocha</i> Roxb.
16	Lep Meu Nang	<i>Schefflera elliptica</i> Harms.
17	Ien Don	<i>Eurycoma harmandiana</i> Pierre
18	Khao Kai	<i>Curculigo orchidoides</i> Gaertn
19	Chan Dai Deng	<i>Dracaena cambodiana</i> Pierre ex Gagnepain
20	Seng Beua	<i>Strychnos nux-vomica</i> L.
21	Yang Bong	<i>Litsea monopetala</i> (Roxb.) Pers.
22	Ien Done	<i>Eurycoma harmandiana</i> Pierre

Annex 4: List of exported medicinal plant species

No.	Local names	Scientific names	Remarks
1	Dok pheung	<i>Dendrobium</i> spp.	Wild, cultivated
2	Hua tom ngeuene	<i>Stephania rotunda</i> Lour.	Wild
3	Hoa Sam Sib	<i>Stemona tuberosa</i> Lour.	Wild
4	Vane Bai Lai	<i>Anoetochilus formosus</i> Hayata.	Wild
5	Kheua Haem	<i>Cosciniium fenestratum</i> (Gaertn.) Colebrooke	Wild
6	Hoa Sam Phanh Hou	<i>Hydnophytum formicarum</i> Jack	Wild
7	Vane Hang Xang	<i>Grammatophyllum speciosum</i> Bl.	Wild
8	Chan Dai Deng	<i>Dracaena cambodiana</i> Pierre ex Gagnepain	Wild
9	Khing	<i>Zingiber officinale</i> Roscoe	Cultivated
10	Khæ	<i>Cinnamomum cassia</i> Blume	Wild
11	Man Kha Kai	<i>Codonopsis pilosa</i> (Franch.) Nannf	Wild
12	Nhane	<i>Styrax tonkinensis</i> P.	Cultivated

No.	Local names	Scientific names	Remarks
13	Nha nuat meo	<i>Orthosiphon stamineus</i> Benth.	Cultivated
14	Hed lin cheu	<i>Ganoderma lucidum</i> (Leyss, ex Fr.) Karst	Wild
15	Tin Ped	<i>Alstonia scholaris</i> (L.) R. Br	Wild
16	Mak Chong Ban	<i>Sterculia lychnophora</i> Hance	Wild
17	Mak Naeng	<i>Amomum</i> spp.	Wild, cultivated
18	Hua Duk Deua	<i>Amorphophalus</i> spp.	Wild
19	Ien Done	<i>Eurycoma harmandiana</i> Pierre	Wild

Annex 5: List of some cultivated medicinal plants

No.	Local names	Scientific names	Remarks
1	Khing	<i>Zingiber officinale</i> Roscoe	Foreign company
2	Khi min kheun	<i>Curcuma longa</i> L.	Commonly grow
3	Mone	<i>Morus alba</i> L.	Commonly grow
4	Nha nuat meo	<i>Orthosiphon stamineus</i> Benth.	Commonly
5	Nhane	<i>Styrax tonkinensis</i> P.	Foreign company
6	Phak nok	<i>Centella asiatica</i> Urban	Commonly grow
7	Phak bua leuat	<i>Eleutherine subaphylla</i> Gagnep.	Commonly grow
8	Ra sa bi, sam phan bi	<i>Andrographis paniculata</i> (Burm. F.) Wall. Ex	Commonly grow
9	Van hua deo	<i>Curcuma xanthorrhiza</i> Roxb.	In some provinces
10	Van phai	<i>Zingiber cassumunar</i> Roxb.	Commonly grow
11	Kao bok	<i>Catharanthus roseus</i> G. Don	Commonly grow
12	Khae	<i>Cinnamomum cassia</i> Blume	Foreign company
13	Nhor ban	<i>Morinda citrifolia</i> L.	Wild plant
14	Phak i houm	<i>Moringa oleifera</i> Lam.	Commonly grow
15	Fang daeng	<i>Caesalpinia sappan</i> L.	Wild plant
16	Nam khor	<i>Uncaria rhynchophylla</i> (Miq.) Jacks	Foreign company
17	Hed pek	<i>Poria cocos</i> F.A. Wolf	Foreign company
18	Mak Kieng	<i>Citrus aurantium</i> Linne var. <i>daidai</i> Makino	Foreign company
19	Dok pheung	<i>Dendrobium</i> spp.	Foreign company
