Techinal Report of the Project

A Survey of Medicinal Plants of Ta Kou Mountain, Ta Kou Nature Reserve, Vietnam

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Submitted to

Rufford Small Grants for Biodiversity Conservation

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Hochiminh City, 18 July 2006.
The project team: Dr. Luu Hong Truong
MSc. Nguyễn Phi Ngà
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1. Background of the project

In May 2005, the trustees of The Rufford Maurice Laing Foundation have approved a *Rufford Small Grants* grant to implement this project, which is entitled "*A survey of medicinal plants of Ta Kou Mountain, Ta Kou Nature Reserve, Vietnam*", in the duration of from July 2005 to June 2006. The project is to make an inventory and to assess the status of exploitation and trade of medicinal plants of 1.104 *ha* and 694 *m* Ta Kou Mountain (Figure 1) in Ta Kou Nature Reserve, Vietnam (within $10^0$41'28" to $10^0$53'01" N latitude and $107^0$52'14" to $108^0$01'34" E longitude).

The idea of this project was based on our former surveys that indicated medicinal plants as one of the most important resources of Ta Kou Mountain, accounting for 23% of 689 species of vascular plants recorded. Medicinal plants of Ta Kou Mountain are important for the income and health care of local people. Medicinal plants were consumed not only within the bufferzone of the reserve but also traded far away. Additionally, many in thousands of pilgrims annually visiting pagodas on the mountain contributed to the consumption of medicinal plants harvested by local people. The over-exploitation of wood and medicinal plants has reduced many plants in the nature reserve. Many medicinal species have become very rare nowadays.

Figure 1. A view of 694 *m* Ta Kou Mountain located in Ta Kou Nature Reserve.

Exploitation and trade activities were determined by conducting participatory rural appraisal (PRA) surveys with stakeholders. Furthermore, we hoped to evaluate the role of medicinal plants in the livelihood of local people and to document traditional uses of medicinal plants.

By providing a thorough inventory of medicinal plants and a quantitative evaluation of the exploitation status, the project would contribute to a better understanding of the biodiversity, help identifying management problems and recommend suitable solutions for the conservation of medicinal plants of the study area. In addition, the project is hoped to raise the awareness among responsible authorities and local people about the status of

rare medicinal plants which are currently harvested without control and to call for effective efforts in the conservation of medicinal plant resource.

This report is prepared to submit to the sponsor in order to inform prove that we have used up the whole grant for the purposes of the project. Any more information on the project, please contact Dr. Luu Hong Truong at his contact address as shown at the cover of this report!

2. Implementation of the project

The implementation of the project was started in July 2005 with contacts between researchers and local managers/authorities in Ham Thuan Nam District, Binh Thuan Province where the reserve is located. In our proposal, we planned to make five trips: four for forest inventories and then one for PRA surveys. However, after having contacted with local partners, we decided to change the plan. Therefore, the PRA surveys were indeed carried out before forest inventories because (i) we wanted to firstly know (again) the current working context in the field and during interviews with local people/organizations to look for local assistants for forest inventories and (ii) local people did not want to work with us in the forest during the rainy season (from May to October) to avoid malaria.

Figure 2. Dr. Luu Hong Truong is interviewing a local harvester (wearing dark blue T-shirt).

The first trip for PRA surveys (Figure 2) was carried out in August 2005 in the communes of Tan Thuan, Tan Thanh and Thuan Quy and Ham Minh Township – the capital town of Ham Thuan Nam District where Ta Kou Nature Reserve is located, to investigate activities and techniques in harvesting, processing and trading medicinal plants, harvested and traded species, uses, amounts of harvested, traded and locally used plants, phenology, collection time and roles of medicinal plants on local economy and health care based on PRA interviews with total 29 stakeholders including local users, healers/traders and local

governments in the bufferzone (Table 1). The rest two "bufferzone" communes (Ham Cuong and Tan Lap) were excluded from our PRA surveys because of their non-involvement or too minor involvement in issues related to medicinal plants on Ta Kou Mountain.

The other four trips in November 2005 to March 2006 were to conduct the forest inventories to measure/record/sample trees (BDH ≥ 10 cm) and medicinal plants in four transects of total 100 plots of 20 m x 20 m in size each, which were established across the mountain (see
Figure 3). Mr. Phạm Hữu Thủy, the most experienced local collector of medicinal plants was chosen as one of two assistants for our surveys on the mountain. The other assistant was Mr. Ân (Nguyễn Hoài Vũ), a forest ranger who very well knows the relief of and working conditions on the mountain. He also assisted in sampling.

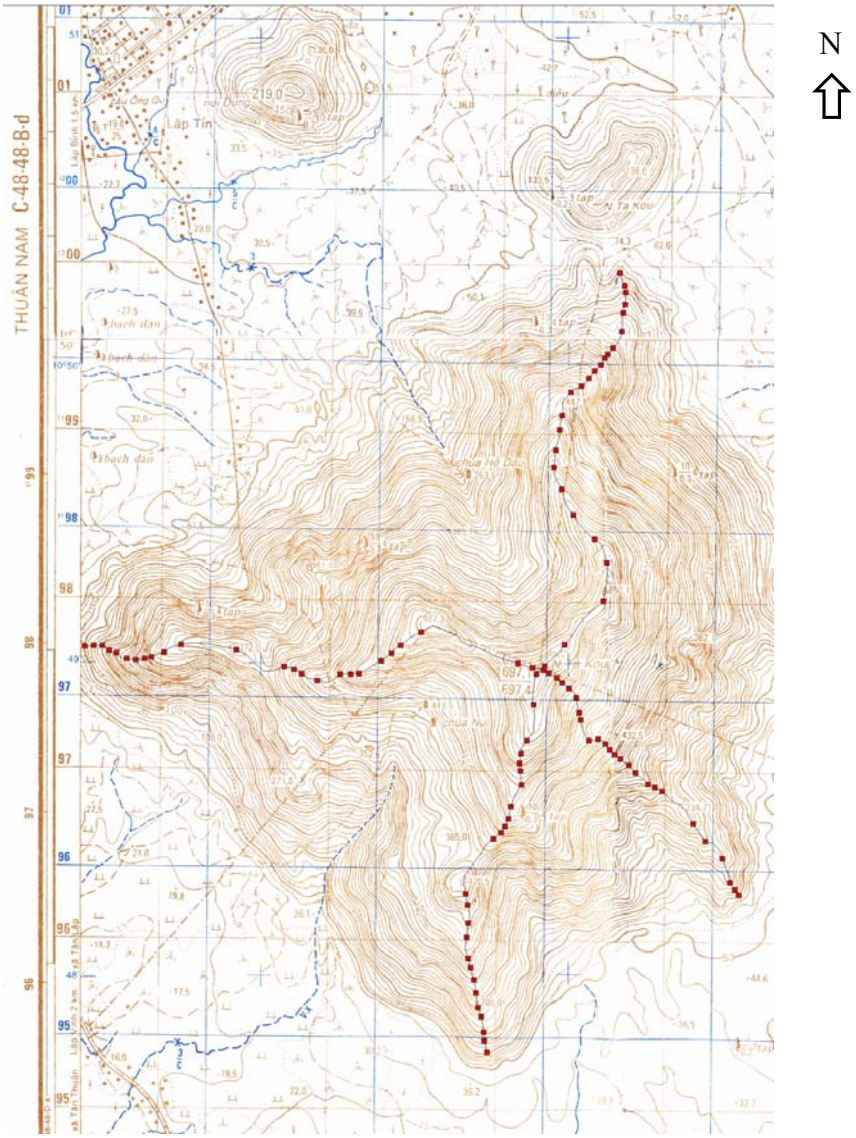

Figure 3. Scheme of inventory plots (20 m x 20 m) across Ta Kou Mountain.

Table 1: List of stakeholders interviewed

Number	Local stakeholders	Address
1	Mr. Vo Thanh Liem	Head of Technical Dept., Ta Kou Nature Reserve
2	Mr. Tran Kim Thach	Director of Ta Kou Nature Reserve
3	Mr. Pham Huu Thuy	Experienced local collector of medicinal plants
4	Mr. Pham Kim Toan	Local traditional healer/collector, Ham Minh Township
5	Mr. Nguyen Hung	Head of Association of Traditional Medicine of Ham Thuan Nam District
6	Mr. Thong Cheo, 88 years old	Most experienced tribal traditional healer/collector, Tan Thuan Commune
7	Mr. Thong Huong, 70 years old	Tribal traditional healer/collector, Tan Thuan Commune
8	Mr. Kieu Van Nghia, 49 years old	Traditional healer/collector, Tan Thuan Commune
9	Mr. Nguyen Ngoc Thanh, 68 years old	Traditional healer/collector, Tan Thuan Commune
10	Mr. Dao Van Hong, 48 years old	Traditional healer/collector, Tan Thanh Commune
11	Mr. Bui Huy Dat, 76 years old	Traditional healer/collector, Tan Thanh Commune
12	Mr. Nguyen Quang Trieu	Traditional healer/collector, Tan Thuan Commune
13	Mr. Dinh Cong Ly, 71 years old	Traditional healer/collector, Tan Thuan Commune
14	Mr. Vo Van Phuoc, 47 years old	Traditional healer/collector, Thuan Qui Commune
15	Mr. Nguyen Nung, 51 years old	User of medicinal plants, Thuan Qui Commune
16	Mr. Bui Van Binh, 34 years old	Collector of medicinal plants, Ham Minh Township
17	Mr. Quang	Traditional healer/collector, Ham Minh Township
18	Mr. Tran Van Hoa, 52 years old	Collector of medicinal plants, Ham Minh Township
19	Mr. Pham Trung Thanh	Collector of medicinal plants, Ham Minh Township
20	Mr. Diep Ha, 42 years old	Monk, traditional healer/collector, Ham Minh Township
21	Mr. Tang Man, 48 years old	Collector of medicinal plants, Ham Minh Township
22	Mr. Pham Van Bich, 72 years old	Traditional healer/collector, Ham Minh Township
23	Mr. Duong Huu Thua, 65 years old	Traditional healer/collector, Ham Minh Township
24	Mr. Ba Chua (Hung)	Monk, traditional healer/collector, Ham Minh Township
25	Mr. Chau Ba Linh	Doctor, head of Medicine Dept. of district
26	Mr. Trinh Quang Lieu	Doctor, head of district hospital
27	Mr. Tran Dung	Doctor, district hospital
28	Mr. Tran Van On, 71 years old	Master of kungfu, traditional healer/collector, Ham Minh Township
29	Mr. Huynh Van Tanh	User/collector of medicinal plants, Ham Minh Township

Each trip to inventory the medicinal plants in the forest lasted 20-24 days (Figure 4). On average, 25 plots were surveyed in one trip. During the trip, we stay mainly on the mountain (Figure 5). All foods are brought from the communes around the mountain at the first day with us onto the mountain. We have measured ecological traits of trees

within the plots including diameter at breast height (DBH), total and branch heights, crown size, sunlight shade and level of health (Figure 6). For medicinal herbs, we count their repetitive of occurrence within the plots. Plants with good fruits and/or flowers were taken photo (Figure 7) and sampled. All the samples were pre-processed (Figure 8) with alcohol right in the field and transferred, at the end of each trip, to the national herbarium at our institute for further processing to make specimens. In total, 302 sets of specimens were made; each set represents for a plant/species and consists of on average 5 samples.

Figure 4. The team on a field trip in December 2005.

Figure 5. A lunch in a field trip on the mountain.

Figure 6. Recording ecological parameters in an inventoried plot.

Figure 7. Mr. Do Thanh Phu – a team member taking photo before sampling.

Figure 8. Pre-processing samples at the highest peak of Ta Kou Mountain.

We are facing difficulties in identifying many specimens. Some botanical experts were invited to help us in this matter. We hope to finish the identification soon in order to complete analyzing the collected data for publications.

3. Results from the project

Due to the not-finished identification of the specimens collected, the data we collected from the project are not yet finally analyzed. However, an article resulted from our surveys in the project was published in the Newsletter of NTFP Vol. 3, No. 6, 2006 (pp 24-25) in Vietnamese (see full article attached with this report). In this article, the publisher made a mistake that they did not mention that the article was acknowledged to a Rufford Small Grant. After this, we are writing a second article to discuss about the socio-economic aspects of medicinal plants of Ta Kou Mountain. More publications will be submitted when the data analysis has been finished to indicate the richness of medicinal plants and their forest environment. All publications resulted from the project will be informed/sent to the managers of the Rufford Small Grants.

We would like, in this report, to emphasize on key findings from the project in accordance with the objectives of the project.

- **Status of exploitation, use and trade of medicinal plants collected from Ta Kou Mountain**. At present, harvesting medicinal plants from the mountain is illegal. Although harvesters will be fined if arrested, harvesting medicinal plants can be seen in many places on the mountain. In our forest inventories, many times we saw or sounded harvesting activities; but harvesters always run away or hided themselves leaving their harvested (fresh and already dried) products when they heard about our talks/walking in certain distance (Figure 9 and Figure 10). The illegality of this kind

of harvesting made local harvesters worried when they were interviewed about their activities. They normally refused to talk about harvesting activities. The information needed for the purposes of the project could be gathered only some time after we really made them believe that we were neither forest rangers nor made their harvesting activities threatened.

Figure 9. Harvesters left fresh *Dendrobium* cf. *crumenatum* Sw. left away in the forest after having heard about our arrival.

The exploitation of medicinal plants takes place mainly in the dry season rather than in the rainy season. There are several reasons to explain this. During the rainy season, walking on the rock of the mountain, where many harvested plants occur in high density, is very dangerous. Mosquito is abundant in the rainy season so that it is easier for harvesters to get malaria. In addition, it needs strong sunlight to dry up the harvested medicinal plants on the mountain in order to reduce their weight before they are carried to the villages. Many traditional healers believe that the efficacy of medicinal plants in their treatment is high if the plants are harvested in the dry season. Medicinal plants are thought to contain highly accumulated active substances some time after the rainy season. However, some interviewed healers stated that they did not care for the season when harvesting medicinal plants. Harvesters also confirmed three plants including Thần xạ (*Luvunga scandens* (Roxb.) Ham.), Trung quân (*Ancistrocladalus* ssp.) and Bá bịnh (*Eurycoma longifolia* Jack subsp. *longifolia*) being harvested and traded in both the seasons. The price of these plants is even about VND 3,000 per kg or trunk higher in the dry season than in the other.

The most frequently traded medicinal plants being harvested in large volumes from Ta Kou Mountain are *Luvunga scandens* (Roxb.) Ham., *Drynaria* spp., *Dendrobium*

cf. *crumenatum* Sw., *Schefflera elliptica* (Bl.) Harms., and *Parameria laevigata* (Juss.) Mold..

Figure 10. Dried bark of *Schefflera elliptica* (Bl.) Harms. harvested and hidden in a rocky cave.

It is important to note that medicinal plants are harvested not only from Ta Kou Mountain but also the flat areas within the nature reserve. It is estimated by local harvesters that the number and volume of medicinal species from both mountainous and flat areas are equal. The source of medicinal plants from the mountainous area is more important for Tan Thuan commune and Ham Minh Town, which are located adjacent to the mountain, while that from flat areas is more important for Tan Thanh and Tan Lap communes, which are located near the coast and several kilometers from the mountain. Household use of medicinal plants is very common in the later communes.

Although the methods that interviewed local harvesters pre-process and prepare for harvested medicinal plants before selling complies well with those required in professional literature (

Figure 11), some interesting traditional procedures also apply. Old healers remain harvesting some plants at a specific time. For plants whose roots are used, the whole plant is harvested and let dry outdoor and on the ground overnight without washing. In the next morning, the root is cut away from the trunk for medicinal use. The root is then believed to accumulate most organic substances from the whole plant to prepare

for spouting. For plants whose trunk above the ground is used, the whole harvested plant is washed clean and hang (to avoid touching the soil so that organic substances do not accumulate into the root) overnight. In the next morning, the trunk is cut away from the root for medicinal use. In many cases, plants are distinguished into two categories: yang and yin efficacies. Plants having yang efficacy are considered to normally climb or creep on the ground or hosting pillars, in a shaded area or/and near water courses. Plants of this kind are thought to be warm and used in treating yin diseases and in improve heath, stimulating power and making bodies solid. On contrast, yin plants normally grow straight up on a dry and open ground and are used as diuretic and cooling factors in treating yang diseases such as fever, inflammation, etc. Plants that indicate their intermediate attitude in between the two categories are considered semi-yang and semi-yin. Plants of this kind should be harvested at noon to treat semi-yang and semi-yin diseases. An example of such plants is the Pois d'Angole (*Cajanus indicus* Spreng. of the Fabaceae; *Đậu chiều* in Vietnamese and *Samdek day* in Khmer) which is preferred to be harvested from mountainous areas to treat children's measles.

Figure 11. Mr. Tran Van Hoa - a local harvester and the well known manual guide (*Medicinal Plants and Materials of Vietnam by Prof. Do Tat Loi*). Only some harvesters have such a guidebook.

Nowadays, young harvesters (including the tribal Cham) of medicinal plants tend not to follow their traditional customs. In the past, before going to the forest, they have to prepare an offering which normally includes one chicken egg, one small bottle of wine, one handful of cooked rice and three incense sticks. They bring the offering in the forest until they find out the plants to be harvested. Then worship is hold so that the harvesters pray and thank their ancestors for training them and orienting them to the plant and the God of forests for preserving the plant for their harvesting. They start harvesting the plant only after the incense sticks have smoldered totally. It is now

that harvesters go directly to the forest to look for and harvest the plants without offering and worship. They find it very complicated to follow the tradition. In addition, they want to save the time to do other things that may generate additional income. However, some traditional knowledge is still followed. For some specific plants (for example: *Nauclea orientalis* (L.) L. of the Rubiaceae), their bark should be harvested at the side which is not currently sunshined in order to get the highest medicinal efficacy.

Figure 12. Mr. Thong Cheo, an experienced 78 years old Cham healer and his successor/son Thong Ken. No more worship for harvesting medicinal plants is done by the successor.

Figure 13. Medicinal plants (*Luvunga scandens* (Roxb.) Ham. and *Selaginella tamariscina* (Beauv.) Spring) are advertised to tourists/pilgrims at Ta Kou Pagoda.

Table 2: Medicinal plants harvested from Ta Kou Nature Reserve and frequently used by a local healer. The species marked with asterisk (*) are most frequently traded to other regions.

No.	Scientific name	Vietnamese name	Parts of plant used
1	*Abelmoschus moschatus* ssp. *tuberosus* (Span.) Borss.	Sâm bố chính	Tuberous root
2	*Abrus precatorius* L. (*)	Cam thảo dây	Trunk and leaf
3	*Abutilon indicum* (L.) Sweet (*)	Cối xay	Whole
4	*Acronychia pedunculata* Miq.	Bưởi bung	Bark and leaf
5	*Andrographis paniculata* Nees in Wall.	Xuyên tâm liên	Leaf
6	*Argyreia acuta* Lour. (*)	Bạc thau	Leaf
7	*Asparagus cochinchinensis* (Lour.) Merr.	Thiên môn	Whole
8	*Blumea balsamifera* (L.) DC. (*)	Từ bi xanh	Whole
9	*Bombax albidum* Gagn. (*)	Gòn rừng	Bark
10	*Clematis similacifolia* Wall.	Mộc thông	Whole
11	*Croton delpyi* Gagn. (*)	Cù đèn	Root
12	*Dendrobium* cf. *crumenatum* Sw.	Thạch hộc	Whole
13	*Dracaena cambodiana* Pierre ex Gagn. (*)	Huyết giác	Resinated wood
14	*Drynaria bonii* Christ. (*)	Thằn lằn	Rhizome
15	*Drynaria fortunei* (Mett.) J. Sm. (*)	Cốt toái bổ	Rhizome
16	*Drynaria quercifolia* (L.) J. Smith. (*)	Ráng bay	Rhizome
17	*Eurycoma longifolia* Jack subsp. *longifolia* (*)	Mật nhân	Root
18	*Ficus religiosa* L.	Bồ đề	Root and bark
19	*Flacourtia indica* (Burm.f.) Merr.	Chùm quân	Root and bark
20	*Gnetum montanum* Marhgr.	Dây gắm	Root
21	*Hibiscus squamosus* Gagn.	Giấy dâm bụt	Root
22	*Homalomena occulta* (Lour.) Schott. (*)	Thiên niên kiện	Root
23	*Luvunga scandens* (Roxb.) Ham. (*)	Thần xạ	Trunk and root
24	*Milletia* sp.	Huyết đằng	Latex
25	*Mussaenda dehiscens* Craib. (*)	Bướm bạc	Whole
26	*Parameria laevigata* (Juss.) Mold. (*)	Đỗ trọng dây	Bark
27	*Passiflora foetida* L. (*)	Nhãn lồng	Whole
28	*Plumbago zeylanica* L.	Bạch hoa xà	Root bark
29	*Schefflera eliptica* (Bl.) Harms. (*)	Ngũ gia bì	Bark
30	*Smilax* ssp. (*)	Thổ phục linh	Root
31	*Stephania rotunda* Lour. (*)	Thần thông	Tuberous root
32	*Streblus asper* Lour.	Duối	Root and bark
33	*Streptocaulon juventas* Merr. (*)	Hà thủ ô	Whole
34	*Tetracera indica* (Chr. & Panz.) Merr. (*)	Dây chiều	Root
35	*Tinospora crispa* (L.) Hook. (*)	Kí ninh	Trunk

Most of harvested medicinal plants are sold to Phan Thiet Town, 20 km from the mountain, an unpredictable amount of which is then traded to Hochiminh City. The rest part is consumed in the local market, including the Traditional Medicine Association of Ham Thuan Nam District. Traditional healers/physicians living around the mountain and in Phan Thiet Town appreciate medicinal plants from Ta Kou Mountain better in terms of efficacy in treating diseases than those from other regions and therefore they pay harvesters from Ta Kou Mountain at higher prices than those from other regions. The high appreciation of Ta Kou medicinal plants indeed lead to a dupery in which medicinal plants harvested from other regions have been transferred to tourist sites at Ta Kou Mountain and then declared to be harvested from this mountain to sell to tourists. Such a dupery is well known for the case of *Thần xạ* (*Luvunga scandens* (Roxb.) Ham.) which is one of medicinal plants most favoured by

tourists/pilgrims at famous Ta Kou Pagoda to treat joint and sinus inflammations (Figure 13).

Table 2 indicates the minimum number of more than 35 frequently used medicinal plants brainstormed by a local healer and harvested from Ta Kou Nature Reserve. More than 23 medicinal plants of this number are known to be harvested from Ta Kou Mountain and traded to other regions.

- **Socio-economic roles of medicinal plants collected from Ta Kou Mountain on local people**. Our PRA surveys indicate that a few local professional healers believe that they can earn living from healing activities while the other (non-professional) traditional healers do healing because they want to help poor farmers and be helpful for their neighbours in emergent cases. The Traditional Medicine Association of Ham Thuan Nam District was found in 1984 and presently includes 117 traditional healers, about 18 of that are professional. Professional healers are those who can earn their living based on healing activities. They work (nearly) full-time at their own medicine services or at a commune health station (. They were responsible for 34,079 times of treatment for 11.454 patients in the last five years (2000-2005). The total value of the treatment is around VND 450 millions. Mr. Nguyen Hung, Head of the Association of Traditional Medicine of Ham Thuan Nam District, estimated that only less than 10% of medicinal plants used in treatments by professional healers of his association are harvested from Ta Kou Mountain. They normally use medicinal plants harvested from other regions in Vietnam and China.

Figure 14. A medicinal service of a professional traditional healer.

The non-professional healers play very important role in emergent cases such as unconsciousness, snake bites (Figure 15), stomachache and light common diseases

(cold, sunstroke, headache, etc.). Some more serious diseases treated by non-professional healers are muscle pain, joint and sinus inflammations. Some reported that they have successfully treated liver and stomach cancer but this information could not be confirmed. The number of their treatments is estimated t be at least equal to that made by the professional healers. It is not possible to estimate the value of these treatments, but one can see a considerable amount of medicinal plants is reserved for long term use at their home (Figure 16). In the future, the information on the times of treatment and patients can be tracked because non-professional healers start noting their treatments as guided by the above association. It is noticeable that medicinal plants used in treatments by non-professional healers are mostly harvested locally, i.e. including those harvested from Ta Kou Nature Reserve. It is very interesting that they do not request any fee for their treatment. It is no matter that patients pay or not. However, patients usually give their healers a small amount of money in order to refund the labour to collect medicinal plants. In some special cases, this volunteer giving may be up to several hundreds of thousand VND. In general, such "fees" account for less than 10% of the total income of non-professional healers. Obviously, non-professional healers are one of the major stakeholders for further research and development related to medicinal plants from Ta Kou Mountain.

Figure 15. A snake-bitten patient being cured by Mr. Thong Cheo, a well-known Cham healer.

The most important stakeholder of medicinal plants on Ta Kou Mountain may be harvesters. Their income becomes very much dependent on harvesting activities in the dry season when they cannot cultivate agricultural crops. For households without

agricultural land, their dependence may be up to 100%. In recent years, the successful cultivation of the dragon fruit plant provide jobs with good income for local people and thus the number of *frequent harvesting* households is decreased to be presently less than 30 in the dry season. The number is more reduced to be several in the rainy season. We cannot estimate the number of those who harvest medicinal plants for their own use or relatives/neighbours.

Figure 16. Medicinal plants are stored ready-for-use at the home of a non-professional healer.

- **Difficulties of local harvesters**. Increased disadvantages of harvesting medicinal plants on Ta Kou Mountain make harvesters worry about their future.

    - The illegality of harvesting is the most feared by harvesters. They are always worried about possible arrests by forest rangers. This partially made our interviews with them difficult because harvesters talked about their activities with strict caution. In Vietnam, a protected area is normally divided into buffer and core zones. The core zone covered with good forests is strictly protected. No access is allowed in this zone. In principle, non-timber forest products (NTFP) including medicinal plants are only allowed to harvest in the buffer zone which consists of resident land. However, the core zone is where forest products, especially NTFP, can be found the most available. Therefore, almost activities of harvesting medicinal plants are illegal and subject for fining. In reality, medicinal plants harvested from Ta Kou Mountain are, if arrested, kept by forest rangers and harvesters are not arrested. It is because medicinal plants are considered as minor forest products by forest rangers. That is why no statistical data are reported up to now for Ta Kou Nature Reserve. Meanwhile, 20 cases of exploiting wood from the reserve are recorded in the first six

months 2006. The fine of these cases is worth VND 18,216,000, VND 2,000,000 of which is already collected by authorities.

- The reduced stock of medicinal plants on the mountain. Harvesters presently have to go further in the mountainous forest to find out medicinal plants. It is now we see the traces of their harvesting in very difficultly accessible areas on the mountain, including dangerously steep rocky habitats. To get the same amount of medicinal plants, they spend as much time at least two times in the forest as before. Exchanged information on the places where medicinal plants occurs abundant is now very strict between local harvesters. Many experienced harvesters keep this information for themselves only to avoid harvesting by others.

- Middle men still take an important role on trading medicinal plants. Most of medicinal plants are sold to Phan Thiet Town, about 20 km from Ta Kou Mountain. But the final market is known to be Hochiminh City although the Traditional Medicine Hospital and traditional healers in the town consume a considerable amount of medicinal plants collected from Ta Kou Mountain. Some local harvesters tried to bring their products to Hochiminh City in order to sell at higher prices but traditional healers in the city refused to buy them or agreed to buy at very low prices. The lacks of contact with end-users and thus of market information lead to low prices of medicinal plants that are harvested from Ta Kou Nature Reserve. Local harvesters indeed do not take any part in deciding the price of their products which is unstable and determined by traders. In recent time, harvesters must face more difficulty that they sell their medicinal plants to traders and get the money of that selling at the next deal.

- Inadequate knowledge of medicinal plants. Many harvesters just know the medicinal plants that are ordered and guided by healers and traders although there many others. The identification of medicinal plants is another problem. Some medicinal plants are easily confused with each other, including those non-medicinal or toxic. Harvesters would have got more earning from more plants that they do not recognize presently.

- **The present stock of medicinal plants on Ta Kou Mountain under human impacts**. Interviews with local harvesters indicate that the stock of most medicinal plants on Ta Kou Mountain is reduced very much compared with about 5 years ago; consequently the number of harvesters of medicinal plants is decreased. Mr. Tran Van On, an experienced healer/harvester, estimates a reduction of 90% in the general stock of medicinal plants on the mountain compared with that at the time of 1972 when he came to live at Ta Kou Mountain. It is now difficult to find some medicinal plants which are used as major items in traditional medicine recipes. *Luvunga scandens* (Roxb.) Ham. becomes difficult to harvest since two years ago.

  Our forest inventories which include a system of 100 inventory plots placed in four directions (namely northern, eastern, southern and western plots) and across all forest types on the mountain. Forty nine medicinal herbs/lianas known to be harvested from Ta Kou Mountain are recorded in our inventory plots (Table 3). There are sixteen medicinal herbs/lianas recorded with on average more than one individual per plot. However, many of these species are occasionally used and thus not frequently

harvested, for example: *Canthium parvifolium* Roxb., *Leea* cf. *rubra* Bl., *Capparis micrantha* DC. subsp. *micrantha*, *Hibiscus squamosus* Gagn., *Cissus adnata* Roxb.. Some are commonly used and harvested in small volumes, such as *Mussaenda dehiscens* Craib., *Smilax ovalifolia* Roxb., *Croton delpyi* Gagn., *Stemona tuberosa* Lour., and *Tetracera indica* (Chr. & Panz.) Merr. The most traded medicinal herds/lianas which still exist dense and abundant on the mountain are *Drynaria bonii* Christ., *Drynaria fortunei* (Mett.) J. Sm. and *Drynaria quercifolia* (L.) J. Smith.. *Eurycoma longifolia* Jack subsp. *longifolia* appears to be still harvestable because it exists in high density and its large individuals are still abundant.

The fact that traded medicinal plants were recorded in high density (Table 3) but they are in low abundance indicates that they are clustered in certain plots or, in other words, they exist in limited areas on the mountain. This is because they are naturally distributed in their limited habitats (forest types; for example: *Hibiscus squamosus* Gagn., *Capparis micrantha* DC. subsp. *micrantha*) and/or overexploited (for example: *Parameria laevigata* (Juss.) Mold.). The level of overexploitation cannot be quantified because no formerly inventoried data are available to compare. It is obvious that continued harvest of these species may make endanger them endangered. On the other hand, those which are harvested and recorded abundant but in very low density should be subject for conservation concerns.

No individuals of several frequently used species (Table 2) were found in the inventoried plots although some individuals were observed during our field on the mountain, including *Abrus precatorius* L., *Argyreia acuta* Lour., *Clematis similacifolia* Wall. and the Dragon's blood (*Dracaena cambodiana* Pierre ex Gagn.). This fact indicates that they are presently very rare on the mountain. Such comments also apply to other and less frequently used species; for example: *Ficus heterophyllus* L.. Meanwhile, *Plumbago zeylanica* L. was known to be found on the mountain but we have never seen any of its individuals in our surveys so far.

On the other hand, some medicinal plants whose existence we used to record in 1999 and that are not mentioned above become indeed endangered. For instance, *Lan gấm* (*Ludisia discolor* (Ker.-Gawl.) A. Rich) was not found in our inventory plots and observations in this project. This medicinal orchid used to be found in high-altitude rocky areas on Ta Kou Mountain and warned to be extinct in our former report due to overexploitation to trade to Hochiminh City and China in the 1990s. Another example for this case is *Chìa vôi* (locally named *Thần thông*; *Stephania rotunda* Lour. of the Menispermaceae), whose tuberous root is possibly 80 kg in weight and used for recovering one's health and treating malaria and rheumatism. It should be noticed that another species of the same genus (*Stephania brachyandra*) has been used traditionally for many purposes, including as a relaxant and sleep aid in Northern Vietnam and was recently found to have anti-melanoma properties promising a life changer for the poor tribes (*FAO's NWFP-Digest-L number 11/2005*). For *Trường sinh* (*Selaginella tamariscina* (Beauv.) Spring), we found only a few populations remaining at the western bases of Ta Kou Mountain (Figure 17).

In general, the reduction in stock of medicinal plants revealed in our PRA surveys appears to be confirmed in our forest inventories. This general conclusion applies to those species which are shown to be abundant and dense in the inventoried plots. Table 3 indicates *Luvunga scandens* (Roxb.) Ham. as one of the highest-density

species but nearly 100% of the recorded individuals are young, small and thus not qualified for harvesting. It may take longer than 10 years for these juveniles to get the harvesting size (Figure 18).

Figure 17. *Selaginella tamariscina* (Beauv.) Spring – one of overexploited medicinal plants.

Figure 18. Most of individuals of *Luvunga scandens* (Roxb.) Ham. existing on Ta Kou Mountain are not large enough to harvest for medicinal use.

Table 3: Density (individual/ha) of locally-known medicinal herbs/lianas recorded in our total 100 plots of horizontal 20m x 20m across Ta Kou Mountain.

No.	Scientific name	Family	Vietnamese name	Northern plots	Eastern plots	Southern plots	Western plots	Average
1	*Canthium parvifolium* Roxb.	Rubiaceae	Cứt cu	0	176	158	192	131.50
2	*Eurycoma longifolia* Jack subsp. *longifolia* (*)	Simaroubaceae	Bá bệnh	13	41	27	308	97.25
3	*Luvunga scandens* (Roxb.) Ham. (*)	Rutaceae	Thần xạ	26	101	65	192	96.00
4	*Mussaenda dehiscens* Craib. (*)	Rubiaceae	Bướm bạc	3	129	118	103	88.25
5	*Drynaria bonii* Christ. (*)	Polypodiaceae	Thằn lằn	41	74	117	117	87.25
6	*Smilax ovalifolia* Roxb. (*)	Smilacaceae	Kim cang	62	58	49	112	70.25
7	*Parameria laevigata* (Juss.) Mold. (*)	Apocynaceae	Đỗ trọng dây	104	54	32	81	67.75
8	*Leea* cf. *rubra* Bl.	Leeaceae	Đơn gối hạc	249	1	5	0	63.75
9	*Capparis micrantha* DC. subsp. *micrantha*	Capparaceae	Mắm rừng	5	70	54	99	57.00
10	*Drynaria fortunei* (Mett.) J. Sm. & *Drynaria quercifolia* (L.) J. Smith. (*)	Polypodiaceae	Cốt toái bổ, Ráng bay	155	55	13	3	56.50
11	*Hibiscus squamosus* Gagn.	Malvaceae	Giấy dâm bụt	73	0	142	0	53.75
12	*Stemona tuberosa* Lour.	Stemonaceae	Bách bộ	59	89	33	33	53.50
13	*Croton delpyi* Gagn.	Euphorbiaceae	Cù đèn (Ngù đèn)	0	17	45	109	42.75
15	*Tetracera indica* (Chr. & Panz.) Merr. (*)	Dilleniaceae	Dây chiều	13	29	16	101	39.75
16	*Cissus adnata* Roxb.	Vitaceae	Dây dác, Dây nôi	45	49	12	12	39.50
17	*Harisonia perforata* (Bl.) Merr.	Simaroubaceae	Đa đa	19	31	20	11	20.25
18	*Dioscorea persimilis* Prain & Burkill.	Dioscoreaceae	Hoài sơn	0	0	78	0	19.50
19	*Cyclea peltata* (Lamk.) Hook. & Thomps.	Menispermaceae	Sâm nam	13	15	17	22	16.75
20	*Solanum ferox* L.	Solanaceae	Cà dừ	65	0	0	0	16.25
21	*Dendrobium* cf. *crumenatum* Sw.	Orchidaceae	Thạch hộc	13	49	0	0	15.50
22	sp.	Anonaceae	Vú bò dây	11	13	9	27	15.00
23	*Zanthoxylum* aff. *avicennae* (Lamk.) DC.	Rutaceae	Luồn tuốn	0	14	21	19	13.50
24	*Erythrina variegata* L.	Fabaceae	Vông nem	18	1	14	20	13.25
25	*Schefflera elliptica* (Bl.) Harms. (*)	Araliaceae	Ngũ gia bì	0	33	4	10	11.75
26	*Bombax albidum* Gagn. (*)	Bombacaceae	Gòn (Vông đồng)	0	13	4	25	10.50
28	*Kaempferia galanga* L.	Zingiberaceae	Địa liền	39	0	0	0	9.75
29	*Ixora* sp.	Rubiaceae	Trang trắng	2	15	8	12	9.25
30	*Uvaria* sp.	Annonaceae	Vú dê dây	0	34	0	3	9.25
31	*Costus speciosus* (Koenig) Smith.	Zingiberaceae	Nghễ	36	0	0	0	9.00
32	*Mecopus nidulans* Benth.	Fabaceae	Cánh bướm	0	0	28	2	7.50
33	sp.	Zingiberaceae	Ngải nghệ	5	4	2	19	7.50
34	*Flacourtia indica* (Burm.f.) Merr.	Flacourtiaceae	Chùm quân	9	0	19	1	7.25
35	*Sauporus androgynus* (L.) Merr.	Euphorbiaceae	Bồ ngót	2	11	6	6	6.25
36	*Tinospora crispa* (L.) Hook. (*)	Menispermaceae	Kí ninh	0	12	3	0	3.75
37	*Homalomena occulta* (Lour.) Schott. (*)	Araceae	Thiên niên kiện	13	0	0	0	3.25
38	*Strychnos* aff. *axillaris* Colebr.	Loganiaceae	Củ chi	13	0	0	0	3.25
39	*Sida rhombifolia* L.	Malvaceae	Ké hoa vàng	4	0	6	0	2.50
40	*Streptocaulon juventas* Merr. (*)	Asclepediaceae	Hà thủ ô trắng	0	1	9	0	2.50
41	*Azadirachta indica* Juss.f.	Meliaceae	Sầu đâu	0	8	0	0	2.00
42	*Achyranthes aspera* L.	Amaranthaceae	Cỏ xước	0	0	7	0	1.75
43	*Hibiscus surattensis* L.	Malvaceae	Khế rừng	3	0	4	0	1.75
44	*Streblus asper* Lour.	Moraceae	Duối	5	0	2	0	1.75
45	*Pandanus* sp.	Pandanaceae	Dứa rừng	6	0	0	0	1.50
46	*Fomes japonicus* Fr.	Ganodermaceae	Nấm linh chi	3	1	0	0	1.00
47	*Uncaria sessilifructus* Roxb.	Rubiaceae	Câu đằng	4	0	0	0	1.00
48	*Dioscorea* aff. *tokoro* Makino	Dioscoreaceae	Tỳ giải	2	0	0	0	0.50
49	*Asparagus cochinchinensis* (Lour.) Merr.	Liliaceae	Thiên môn	1	0	0	0	0.25

- **Medicinal plants recorded in this project.** Medicinal plants locally used are part of those existing on Ta Kou Mountain. Many species known as medicinal plants are neither used nor harvested at the mountain, for example: *Neuropeltis racemosa* Wall. (Convolvulaceae) known as muscle-relaxing medicine. At least 60 species of medicinal plants are recorded in addition to the 159 species in our reported study (http://www.lamdong.gov.vn/KyyeuHNMD/Moitruong/Thucvat-Takou.htm), increasing the total number of medicinal plants recorded on Ta Kou Mountain to be 219. Although the identification of specimens collected in this project is still not yet finished, it is estimated that we would have collected at least 100 plant species new to the reported flora of Ta Kou Mountain. The list of all medicinal plants recorded on the mountain will be published after we have finished identifying the collected specimens.

- **Reasons of reduction of medicinal plants and Possibility of regenerate medicinal plants**. Most interviewed harvesters agreed that medicinal plants from Ta Kou Mountain would not be endangered if they are harvested for local demands (not sold to other regions) and if forests are not logged. Their basis for this argument is that medicinal plants on Ta Kou Mountain have been exploited and still available for exploitation for years and they only become endangered after the trade of medicinal plants occurs popular in the past 10 years. Questioned about how to regenerate medicinal plants in the region, most of interviewed traditional healers included that this could be possible in case dipterocarps are used to reforest the flat areas to provide hosting vegetation. However, they also expressed their disappointing about this possibility because exotic eucalypts and acacias rather than native dipterocarps are popularly planted in aforestation programmes. The exotic trees appear to hamper the regeneration of native plants including those medicinal. Exploiting medicinal plants on the mountain should be limited or better, based on their experience, stopped for at least ten years for them to recover naturally. However, exploiting activities are presently not under control.

  In this context, efforts by the Traditional Medicinal Association of Ham Thuan Nam District appear to show promising possibilities. With support from the district Health Department, they are establishing gardens of basic medicinal plants at commune health stations. Each garden is designed to include 100 medicinal plants, 40 of which are locally commonly used. In the buffer zone of Ta Kou Nature Reserve, only one garden has been established at Tan Thuan Commune. But our visit in 2005 observed that it was not in good maintaining conditions. Only around ten species were seen to remain living. This is because there is no financial support from the State budget for the garden. All expenditure for establishing the medicinal plant gardens must be covered by the commune health stations, which are always running out of their limited budgets. But the most difficulty raising is watering source in the dry season. In the past years, strong drought occurred in the region and water was a big problem for local people. It is possible to make a well at the station to provide enough water for both medicinal activities and plants but the health stations did not have enough budgets for this. It turned out to be that it is not so complicated to establish and maintain the gardens of medicinal plants if they are planned and facilitated in a suitable manner. Our interview with Mr. Nguyen Ngoc Thanh, traditional healer responsible for the above mentioned garden, noted the following requirements for one garden which

were later confirmed by our other interviewees. A garden requires a minimum land of 100 m^2 which is always available at the commune health station. Seeds of some medicinal plants can be collected by volunteer healers; other seeds can be bought. Fencing the garden costs about VND 4 millions. Digging a well cost about VND 4-5 millions. The commune health station is responsible for planting and maintaining the garden. Then round VND ten millions can cover a garden to meet demands of basic medicinal plants for a commune.

In fact, many commonly used medicinal plants were observed in all traditional healers and some harvesters we visited (Figure 19). These healers have experienced planting local and exotic medicinal plants. It is reasonable to promote planting medicinal plants at private gardens/farms of non-professional healers which indeed play an important role to react in emergent cases and common light diseases.

Figure 19. Tuberous *Tinospora crispa* (L.) Hook. is planted at the home garden of Mr. Pham Trung Thanh, a 32 years old harvester whose five-head family relies totally on NTFP (mainly medicinal plants) harvested from Ta Kou Mountain in the dry season.

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- **Other natural resources recorded in the project**. A number of non-timber forest products other than medicinal plants were recorded to be used and harvested at Ta Kou Mountain. Some of them are potential for commercial consumption and thus subject for both conservation and development. For example, the Elephant Banana (*Ensete glaucum* (Roxb.) Cheesm.) was reported as a valuable NTFP which was first found in Southern Vietnam in our above publication. Bark of several plants (*Colona* sp., *Stereospermum acerifolium*, *Pterospermum diversifolium*, *Schoutenia ovata*) are newly known to be harvested from Ta Kou Mountain for betel chewing – a popular custom formed in Vietnam since time immemorial (Figure 20). Bamboos and bamboo shoots provide significant income sources for many households (Figure 21). Leaves of wild bananas, including the snow banana, are also important for the livelihood of poor farmers. Trapping animals occured quite often (Figure 22). Many plants from the mountain can be used for various purposes, such as street side trees, ornaments, medicine, resins/gums, handy craft, etc. These findings will be commented in our writings in the near future.

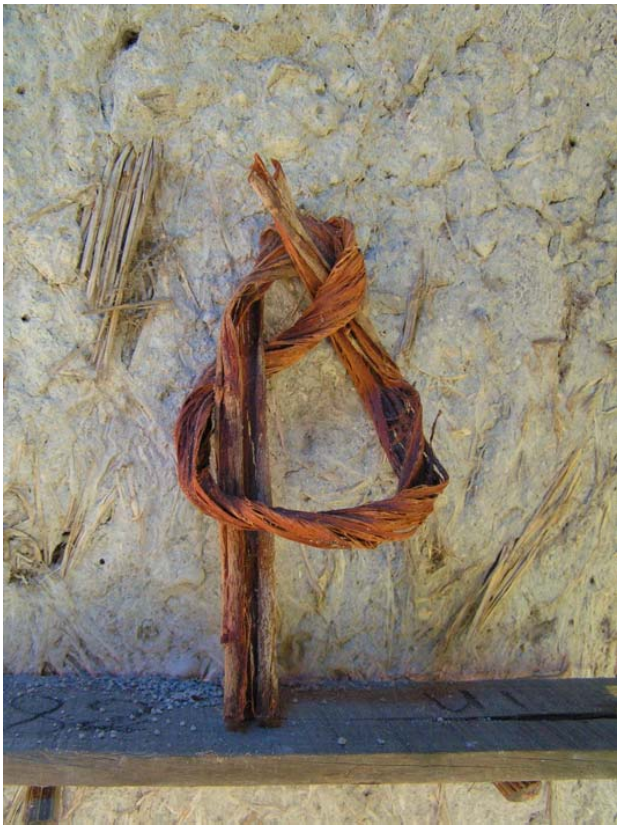

Figure 20. Bark of *Pterospermum diversifolium* Bl. harvested for betel chewing.

Figure 21. Bamboo shoots harvested for home-use foods and trading at Ta Kou Nature Reserve.

Figure 22. The project team trying to destroy a cage to trap monkeys on Ta Kou Mountain (January 2006).

4. Lessons learned from the project

Here are some lessons we have learned from this project. They may be useful for junior researchers to consider in planning field surveys in ethnobotany.

- **Forest fire and timing the project**. Because local harvesters did not want to work with us on the mountain in the dry season, our field trips took place during the dry season. In January 2006, a forest fire occurred at a forest that we inventoried just one day before. This indicates that risks of forest fire should be considered to plan forest inventories in dry areas.

- **Traditional healers are open to talk about their experience**. Traditional healers we interviewed expressed their willingness to share with us their traditional knowledge and even recommended that chemists of modern medicine should cooperate with them to test and confirm the treatment efficacy of their traditional medicine recipes. This not only suggests further cooperation between modern and traditional medicine but also indicates advantages in disseminating their knowledge of traditional medicine. Our opinion is that there is obvious opportunities to further explore and research the recipes of traditional medicine which are commonly used by local healers to treat many diseases.

- **Working with harvesters**. Harvesters of medicinal plants from the forest are not always available for our visit. In the dry season, interviewers should better plan their visits at nights because harvesters are working in the forest during the day-light time. In addition, because harvesters may stay several days in the forest, information from his family is very helpful to be sure about the time he is available at home for interviews. Travelling together in the forest rather than at-home interviewing with harvesters is necessarily helpful for researchers to determine botanical aspects of medicinal plants. Local names and harvester-described traits of medicinal plants can easily be confused.

- **About endangered species**. Although local knowledge of the distribution and availability sites of medicinal plants is generally correct, the whole distribution of the species in the region given by local harvesters (even by experienced ones) should be confirmed by field surveys. This is because a harvester is experienced only in a certain area where he can access to; this experienced area may be considerably smaller than the whole area that researchers want to know. Therefore, a species with limited distribution according to a local harvester may be broader distributed. Interviews with different harvesters may make such information more believable. Similarly, the information that a species believed to be “overexploited to be endangered” may means that the species does not provide individuals/products in size desirable for harvesting and its smaller-sized individuals are in fact still abundant.

5. Publications and writings

The data gathered from this project very much complement our former research on the biodiversity of Ta Kou Mountain. They are useful to publish/disseminate

information on not only the medicinal plants but also the plant biodiversity, resources and forest structure of the mountain. Although data gathered from the project are still under analysis, publications/writings resulted partially or fully from this project may be planned as follows:

1. Nguyen, V.H. & Luu, H.T., 2006. *Chuoi bac ha* (*Ensete cf. glaucum (Roxb.) Cheesm.) – an NTFP newly recorded in Ninh Thuan Province*. NTFP Newsletter, Vol. 3, No 6. Hanoi, Vietnam. pp. 24-25. In Vietnamese.
2. Luu, H.T., Nguyen, V.H., Nguyen, P.N and Do, T.P. (in prep.). *Updated Plant Biodiversity of Ta Kou Mountain*.
3. Luu, H.T. (in prep.). *Useful Plants Selected from Mt. Tà Kóu, Tà Kóu Nature Reserve*. Booklet. This publication is to introduce 20 typical plants found on the mountain which are sources for non-timber forest products. These economically potential plants can be used in producing traditional medicine or for various other purposes. We divide them into five groups based on their using purposes/potential (food, medicine, ornament, street side trees and special cultural use). Each species is described with botanical characteristics and using purposes and illustrated with colorful photos. The information on their conservation status and distribution in the reserve is also provided. The publication is in the hope of the author that the bioresources of the 3-Phan region – which covers a coastal mountainous and flat area in Southern Central Vietnam, including Mt. Tà Kóu, will get more attention/support for research, conservation and development.
4. Luu, H.T. (to be prepared next year). Plant Resources of Ta Kou Mountain. This is a higher version of the above booklet in order to introduce all plants of the mountain we have recorded so far.

6. Conclusion

In general, the data collected are useful to understand the present status, habitat and ecological importance of medicinal plants and related human impacts. They are also important for further planning on external cultivation and management. Findings from the study will help identifying management problems and to recommend suitable solutions for the conservation of medicinal plants of the study area. The exploitation of natural resources of Ta Kou Nature Reserve seems to be unavoidable due to the high demand of local people and the limited capacity of forest rangers. It is difficult to suggest a clear vision in this context. However, different approaches may be applied in order to reach a certain solution which aims to preserve the reserve and reduce human impacts.

- Effectively controlling the exploitation of medicinal plants on Ta Kou Mountain. The capacity of forest rangers should be improved. They need to be trained more to work professionally and effectively. Biodiversity, conservation and regulations are of the topics for such training.
- Carefully documenting and disseminating indigenous knowledge on using and planting medicinal plants. The healers can do this themselves with additional facilitating inputs by outsiders. We may help them by typing, structuring and printing their documents. Old healers may need helping to document their knowledge. Exchange workshops within and among local/outside healers d be a possible practice.

- Disseminating the practical documents on identification, use and planting techniques of medicinal plants which are necessary for local healers and people. Simple practical guidelines should be very helpful in this. Higher training courses by professionals should be held to upgrade the capacity of local healers. Simple posters related to the issues should be disseminated to local healers/people. Some healers expressed that they need posters/pictures on acupuncture.
- Support to build up gardens of medicinal plants at commune health stations and private gardens/farms. Some seed funds should help initiate and promote this matter./.

Appendix: 2-page article resulted from the project.

Chuối Bạc hà - một LSNG mới ghi nhận tại tỉnh Bình Thuận

Nguyễn Vinh Hiển - Lưu Hồng Trường

Summary: The paper introduces a wild banana species newly found around Ta Kou mountain in Ta Kou Nature Reserve of Binh Thuan province. This species is temporarily given the scientific name of Ensete cf. glaucum (Roxb.) *Cheesm, and hasn't been found in any locality of Southern Vietnam other than Ta Kou moutainous area. More details on this NTFP species can be found in the full paper at www.ntfp.org.vn.*

Chuối Bạc hà là tên địa phương mà người dân huyện Hàm Thuận Nam (tỉnh Bình Thuận) đặt cho một loài chuối hoang có tên khoa học tạm định là *Ensete cf. glaucum* (Roxb.) *Cheesm*. Loài này được tìm thấy ở núi Tà Kóu thuộc Khu bảo tồn thiên nhiên Tà Kóu, Tỉnh Bình Thuận. Sự định danh chính xác loài này đang được tiến hành trong khuôn khổ một nghiên cứu về tài nguyên cây thuốc ở núi Tà Kóu của Viện sinh học nhiệt đới (2005-2006).

Trên thế giới, loài chuối *Ensete glaucum* (Roxb.) *Cheesm*. được gọi là Chuối tuyết (snow banana) hay Chuối voi (elephant banana), là một loài cây kiểng đẹp, có giá trị, được mua bán khá nhiều ở phương Tây, mà nguồn gốc là từ tỉnh Vân Nam, Trung Quốc. Loài này có khu phân bố rộng ở châu Á, từ Ấn Độ đến Papua New Guinea, trên độ cao từ ngang mực nước biển đến 2700 m; thường gặp ở vùng núi có khí hậu lạnh do cây có khả năng sống qua mùa đông (rụng lá). Vì hình dáng thân giả phình to ở gốc và thót dần ở ngọn mà ở vùng núi Xishuangbanna, tỉnh Vân Nam, loài cây được gọi là cây *eo voi*. Ở Trung Quốc, người ta sử dụng thân giả loài chuối này làm thức ăn nuôi heo. Theo giáo sư Phạm Hoàng Hộ *(2000),* loài *Ensete glaucum* có tên là Chuối cô đơn và phân bố ở tỉnh Hà Sơn Bình trước đây.

Chuối bạc hà có đặc điểm tương đối đặc trưng, dễ nhận biết như: thân giả đơn độc, cao đến 3m, đường kính có thể đến 60cm, có gốc phình to rồi thót dần về phía ngọn, tạo cho thân cây có hình dáng đặc biệt giống như một cái chai hình tháp nhọn. Thân có nhiều nhựa trong, nhanh chóng ngả sang màu vàng sau khi bị chặt (xem ảnh 3). Phía ngoài thân màu xanh và có phủ một lớp sáp trắng. Lá to, kích thước 3m x 0.5 m, màu xanh, khô đi vào cuối mùa khô và ra lá lại vào mùa mưa. Buồng nghiêng, có thể dài tới 1m (xem ảnh 1). Bắp chuối rất to. Mo (lá hoa) kích thước 40cm x 17cm, màu xanh, không rụng khỏi cuống sau khi khô. Trong mỗi mo là hai hàng hoa màu trắng, trong và chia thùy. Hoa ở cuối buồng có 3 hay (phần lớn) 5 nhị đực (xem ảnh 2). Vòi nhụy chẻ hai. Theo người dân địa phương, loài chuối này ít ra hoa và rất ít khi có trái. Thường mỗi buồng chỉ có vài trái với nhiều hạt. Khảo sát của chúng tôi (tháng 2/2006) chỉ ghi nhận được một cây Chuối bạc hà có hoa, nhưng không có trái.

Ở núi Tà Kóu, Chuối bạc hà mọc thành đám ở nơi đất trống, mỗi đám có vài chục cá thể, và có thể chia thành các nhóm cây có kích thước tương đối bằng nhau. Do trong một nhóm thỉnh thoảng mới có một cá thể ra hoa và trái, nên nhiều khả năng, mỗi nhóm cá thể có kích thước bằng nhau được mọc từ hạt của một (hay một số) trái của cùng một buồng chuối. Chuối bạc hà phân bố từ cao độ 100m cho tới khoảng 600m trên mực nước biển và cũng thường thấy mọc xen lẫn với Chuối hột (*Musa balbisiana Colla*). Mức độ thường gặp của Chuối bạc hà trên núi Tà Kóu rất thấp: không một ô mẫu nào trong khảo sát của chúng tôi - bao gồm 100 ô mẫu có kích thước 20m x 20m phân bố đều từ đỉnh núi (697m) xuống chân núi (100m) theo bốn hướng - ghi nhận được sự hiện diện của một cây Chuối bạc hà nào trong các ô mẫu đó.

Trong vùng phân bố, Chuối bạc hà được sử dụng chủ yếu như một loại rau ăn. Người dân chặt lấy thân chuối (non hay già đều được) hoặc bắp chuối (hoa chuối) để ăn sống hay làm gỏi, xào hay luộc. Điểm độc đáo là thân chuối ăn rất ngon, không chát, vị mát, gần giống rau Bạc hà (miền Bắc gọi là Dọc mùng, tên khoa học là *Alocasia odora C. Koch*, họ Araceae), do đó người dân địa phương gọi là Chuối bạc hà. Ngoài ra, cũng có người bứng lấy cây Chuối bạc hà từ rừng về để trồng như một loại cây kiểng. Với hình dáng thân và hoa (bắp chuối) đẹp, hoa có thể tồn tại nhiều tháng, Chuối bạc hà hứa hẹn là một loại cây kiểng có giá trị.

Hiện tại, chưa có nguồn thông tin nào khẳng định loài này có phân bố ở nơi khác tại miền Nam ngoài núi Tà Kóu, vì vậy Chuối bạc hà cần được quan tâm đặc biệt trong công tác bảo tồn và nghiên cứu, nhất là nghiên cứu về phân loại học

và kỹ thuật nhân giống, gieo trồng.

Do Chuối bạc hà không tái sinh dinh dưỡng theo hình thức mọc cây con từ gốc như nhiều loài chuối khác, mà chỉ tái sinh bằng hạt, nên số lượng và khu phân bố của chúng đang bị suy giảm. Vì vậy việc khai thác loài này để làm thức ăn hay trồng kiểng cần được đặt dưới sự kiểm soát đặc biệt của Ban Quản lý khu BTTN. Nuôi cấy mô có thể sẽ là một biện pháp hiệu quả nhằm nhân giống loài cây này với số lượng lớn và do đó cần được nghiên cứu và ứng dụng thành công trước khi việc khai thác loài này trở nên phổ biến và được thương mại hóa, nhất là trong bối cảnh phát triển du lịch xung quanh núi Tà Kóu đang ở tốc độ cao sau khi có hệ thống cáp treo lên núi. Chúng tôi hoan nghênh mọi sự quan tâm, phối hợp để nghiên cứu, bảo tồn và phát triển loài cây LSNG tiềm năng này ■

Tác giả hiện công tác tại Viện Sinh học nhiệt đới TP HCM. Email: hongtruongluu@yahoo.com

(Tiếp theo trang 5)

10. Hoạt động quảng bá tiếp thị bằng tờ rơi và bảng biểu, mô hình mẫu đã được thực hiện tại Lâm viên, Bãi Cháy.

b. Các hoạt động chưa thực hiện:

- Hoạt động quảng bá trên truyền thông báo đài dự kiến sẽ được thực hiện vào quí I - 2006.

- Việc cung cấp vật liệu và hướng dẫn 15 hộ dân tham gia nuôi trồng nấm tại phường Hà trung sẽ được thực hiện trong năm 2006. Tiếp tục hướng dẫn các hộ dân 3 phường Hà tu, Hà phong, Hà khẩu sản xuất nấm đợt II.

II. Trở ngại, nguyên nhân và bài học kinh nghiệm

Trở ngại và nguyên nhân:

- Tiến độ tổ chức hội thảo, tập huấn kỹ thuật sản xuất nuôi trồng nấm của 1 phường còn chậm do người dân ở phường dự kiến ban đầu(Hà khánh) không nhiệt tình tham gia, phải đổi sang phường khác (Hà trung);

- Người dân rất ngại phải ghi nhật ký kết quả công việc hàng ngày, nên khó khăn cho việc đánh giá chất lượng hiệu quả công việc.

Bài học kinh nghiệm:

- Việc tổ chức hội thảo có đông đảo cán bộ phường tham gia đã có ảnh hưởng tích cực. Các cấp chính quyền tổ chức đã quan tâm giúp đỡ, tạo điều kiện cho các hộ dân và Ban chỉ đạo thực hiện đề tài.

- Đặc điểm sinh lý của các loài nấm là rất nhạy cảm với môi trường nên nguy cơ xảy ra rủi ro rất cao so với các loại cây trồng khác. Vì vậy yêu cầu người sản xuất phải có kinh nghiệm trong xác định thời vụ, thời tiết, phải kiên trì cẩn thận và chịu khó. Do đó việc lựa chọn dung lượng mẫu(các hộ dân) tham gia đề tài nhiều (60hộ) là đúng đắn. Trong giai đoạn đầu không tránh khỏi một số hộ không đủ kiên trì và điều kiện để tiếp tục tham gia. Ban chỉ đạo đề tài đã chủ động giảm dung lượng mẫu xuống 40 hộ, đầu tư thêm vật liệu sản xuất để sản lượng nấm tập trung hơn, có thể trở thành hàng hóa, để động viên người dân sản xuất. Tuy nhiên, có hạn chế là đầu tư dàn trải, nên sản lượng nấm thu được của các hộ dân còn ít. Bù lại, ngoài cung cấp cho gia đình, số nấm còn lại các hộ dân chia sẻ cho họ hàng lối xóm cùng ăn đã góp phần quảng bá, tiếp thị cho sản phẩm trong cộng đồng sở tại.

- Tâm lý người dân rất lo ngại khi sản xuất mà không có thị trường tiêu thụ. Trước khi xây dựng xong kênh thị trường, đề tài sẽ thu mua sản phẩm và tiếp thị, giúp người dân yên tâm sản xuất.

- Đầu tư sản xuất nấm mất nhiều thời gian, rủi ro lớn dẫn đến sự thiếu kiên nhẫn của một số hộ dân. Có hộ đã nhận vật liệu lại xin thôi không sản xuất, nhất là các hộ có thu nhập thấp đang phải bươn trải kiếm tiền chi tiêu hàng ngày, không có thời gian và tiền đầu tư. Do đó để phát triển sản xuất nấm lâu dài cần xác định thêm một thành phần tiềm năng nữa, là các công ty TNHH có tâm huyết với việc sản xuất nấm. Đây sẽ là chỗ dựa tạo việc làm, tăng thu nhập cho các hộ nghèo.

Mặc dù còn một số hạn chế nhưng nhìn chung việc thực hiện đề tài vẫn đang tiến triển thuận lợi và dự kiến sẽ đạt những kết quả mong đợi ■

Tác giả hiện công tác tại Lâm trường Hòn Gai, 171 Lê Lợi, thành phố Hạ Long. Tel: 033-825537

Financial Report of the Project

A Survey of Medicinal Plants of Ta Kou Mountain, Ta Kou Nature Reserve, Vietnam

(reference number: 107.01.05)

Submitted to

Rufford Small Grants for Biodiversity Conservation

by Dr. Luu Hong Truong

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July 2006

Financial report

The RSG grant has been used up for this project. Although we followed the budget proposed in the proposal of the project in using the grant, the total expenditure to implement the project is upto **£ 5,726.84** – more than the granted £ **5,000.00** budget. The exceeding expenditure is mainly caused by logistics goods that we could not estimate to take into account when establishing the proposed budget. This exceeding amount is considered as a matching contribution of the project team to the project.

Financial balance (Exchange rate VND 29,190 = £ 1)

Component	Items	Days/trip	Daily rate (£)	Total (VND)	Total (£)	Date of bill	Bill code	RSG fund (£)
PRA surveys	**Researchers**	**10**	**9**	**7,881,378**	**270.00**			**270**
	Luu Hong Truong	10	9	2,627,126	90.00	18-Aug-05	1	90
	Do Thanh Phu	10	9	2,627,126	90.00	18-Aug-05	1	90
	Nguyen Phi Nga	10	9	2,627,126	90.00	18-Aug-05	1	90
	Car rent (to & back)			**2,400,000**	**82.22**	18-Aug-05	2	**80**
	3 motobikes rent	**10**	**5**	**4,200,000**	**143.88**	18-Aug-05	3	**150**
Forest inventory	**Exp for researchers**	**20**	**9**	**63,051,026**	**2,160.00**			**2,160**
	Luu Hong Truong	20	9	5,254,252	180.00	24-Dec-05	1	180
	Do Thanh Phu	20	9	5,254,252	180.00	24-Dec-05	1	180
	Nguyen Phi Nga	20	9	5,254,252	180.00	24-Dec-05	1	180
	Luu Hong Truong	20	9	5,254,252	180.00	23-Jan-06	1	180
	Do Thanh Phu	20	9	5,254,252	180.00	23-Jan-06	1	180
	Nguyen Phi Nga	20	9	5,254,252	180.00	23-Jan-06	1	180
	Luu Hong Truong	20	9	5,254,252	180.00	28-Feb-06	1	180
	Do Thanh Phu	20	9	5,254,252	180.00	28-Feb-06	1	180
	Nguyen Phi Nga	20	9	5,254,252	180.00	28-Feb-06	1	180
	Luu Hong Truong	20	9	5,254,252	180.00	23-Mar-06	1	180

Financial balance (Exchange rate VND 29,190 = £ 1) (cont.)

Component	Items	Days/trip	Daily rate (£)	Total (VND)	Total (£)	Date of bill	Bill code	RSG fund (£)
Forest inventory	Do Thanh Phu	20	9	5,254,252	180.00	23-Mar-06	1	180
	Nguyen Phi Nga	20	9	5,254,252	180.00	23-Mar-06	1	180
	Exp for assistants	**20**	**5**	**46,704,464**	**1,600.00**			**1,600**
	Pham Huu Thuy	20	5	5,838,058	200.00	24-Dec-05	4	200
	Nguyen Hoai Vu	20	5	5,838,058	200.00	24-Dec-05	5	200
	Pham Huu Thuy	20	5	5,838,058	200.00	23-Jan-06	6	200
	Nguyen Hoai Vu	20	5	5,838,058	200.00	23-Jan-06	7	200
	Pham Huu Thuy	20	5	5,838,058	200.00	28-Feb-06	8	200
	Nguyen Hoai Vu	20	5	5,838,058	200.00	28-Feb-06	9	200
	Pham Huu Thuy	20	5	5,838,058	200.00	23-Mar-06	10	200
	Nguyen Hoai Vu	20	5	5,838,058	200.00	23-Mar-06	11	200
	Identifying and Processing 302 specimens			**26,271,261**	**900.00**		1	**900**
	Car rent		**40**	**9,600,000**	**328.88**			**300**
	Car rent (to & back)			2,400,000	82.22	4-Dec-05	12	75
	Car rent (to & back)			2,400,000	82.22	1-Jan-06	13	75
	Car rent (to & back)			2,400,000	82.22	4-Feb-06	14	75
	Car rent (to & back)			2,400,000	82.22	1-Mar-06	15	
Logistics				**2,681,400**	**91.86**			**190**
	Sampling alcohol			150,000	5.14	1-Dec-05	16	
	Sampling alcohol			70,000	2.40	13-Feb-06	17	
	Bags			400,000	13.70	27-Nov-05	18	
	Battery			161,800	5.54	11-Feb-06	19	
	Books			144,000	4.93	12-Oct-05	20	

Financial balance (Exchange rate VND 29,190 = £ 1) (cont.)

Component	Items	Days/trip	Daily rate (£)	Total (VND)	Total (£)	Date of bill	Bill code	RSG fund (£)
	Books			79,000	2.71	30-Nov-05	21	
	Books			130,000	4.45	2-Dec-05	22	
	Internet card			120,000	4.11	31-Oct-05	23	
	Internet card			50,000	1.71	5-Nov-05	24	
	Nylon bag			24,000	0.82	1-Dec-05	25	
	Nylon bag			45,000	1.54	1-Dec-05	26	
	Phone card			200,000	6.85	13-Feb-06	27	
	Photocopy			99,600	3.41	17-Aug-05	28	
	Photocopy			13,000	0.45	24-Oct-05	29	
	Photocopy			15,000	0.51	2-Dec-05	30	
	Sampling ticket			170,000	5.82	1-Dec-05	31	
	Stationary			47,000	1.61	2-Dec-05	32	
	Stationary			63,000	2.16	2-Dec-05	33	
	Tool box			700,000	23.98	7-Aug-05	34	
Processing data and Writing report				**4,378,544**	**150.00**	12-Jul-06	1	**150**
SUM				**167,168,073**	**5,726.84**			**5,000**