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Original Paper

Collaborative Exploration of Vegetable Genetic Resources in Laos, 2014

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Summary

Under a Memorandum of Understanding, the National Institute of Agrobiological Sciences, Japan and the National Agriculture and Forestry Research Institute, Lao People's Democratic Republic (Laos), have collaborated since 2006 to survey plant genetic resources in Laos. The main objectives of the current survey were to collect accessions of eggplant (*Solanum melongena* L.) and other target Solanaceae (crop species) in the Houaphan and Xiengkhouang provinces of northern Laos. The survey was conducted from 24 November to 10 December 2014. A total of 134 accessions were collected: 112 of *S. melongena*, 9 of other *Solanum* spp., and 3 of *Capsicum* spp. We discovered large eggplant diversity in the northern part of Laos: the landraces had diverse fruit characteristics such as shape (elongated, round, or slightly flattened), size, and color (purple, green, white, orange or yellow). Moreover, it was very interesting that spineless landraces were popular in this area. Seeds of these genetic resources will be produced by self-pollination, and the HRC staff will evaluate the characteristics of materials collected in this survey in the next season. Seeds produced in the HRC will be shared between Laos and Japan. We plan to evaluate morphological characteristics and resistance to soil-borne diseases, Verticillium wilt, bacterial wilt, Fusarium wilt, and nematodes in Japan.

KEY WORDS: *Solanum*, vegetable, Laos, NAFRI, HRC, NIAS, NIVTS

Introduction

The National Institute of Agrobiological Sciences (NIAS), Japan and the Horticulture Research Center (HRC) of the National Agriculture and Forestry Research Institute (NAFRI), Lao People's Democratic Republic (Laos) have collaborated since 2006 under a Memorandum of Agreement to survey plant genetic resources in Laos. This report describes the fourth survey under this Memorandum of Agreement, and the first survey in the PGRAsia project to collect vegetable accessions. Reports for the 2007, 2008 and 2009 surveys have been published previously[1), 2), 3)]. In the previous missions, 120 accessions of eggplant (*Solanum* spp., including wild relatives), 71 accessions of chili pepper (*Capsicum* spp., including wild relatives), 77 accessions of cucumber (*Cucumis sativus* L.), 154 accessions of melon (*Cucumis melo* L.), and 69 accessions of other crops were collected. In these 3 surveys, eggplant accessions were collected across the country. Though we collected representatively for each region surveyed, there may be other eggplant genetic resources in Laos, especially in the northern mountainous area where many ethnic minorities live and keep their own culture and heritage including landraces of vegetables. In this survey, we limited the collection area to the Houaphan and Xiengkhouang provinces in northern Laos; we surveyed many villages in detail and collected primarily eggplant genetic resources, but also some *Capsicum* genetic resources.

Methods

Before the current survey, Dr. Okuizumi visited Laos to collect *Sorghum* genetic resources and information on vegetable genetic resources [4), 5), 6)]. Based on this information, we looked for new accessions of *Solanum* spp. and *Capsicum* spp. within these provinces from 26 November to 7 December 2014 (Table 1, Fig. 1). We rented a car to travel to survey all sites, where we visited local markets, farmers' stores, and houses and fields to obtain samples of fruits or seeds of Solanaceae spp. After confirming the site location

Table 1. Itinerary followed during the 2014 survey in northern Laos.

Date	Day	Itinerary	Stay
24-Nov	Mon	Chubu 11:00 (TG645) -- 15:40 Bangkok 19:45 (TG574) -- 20:55 Vientiane Fukuoka 11:40 (TG649) -- 15:35 Bangkok	Vientiane
25-Nov	Tue	Markets in Vientiane, visit Horticultural Research Center (HRC), explain and discuss the survey	Vientiane
26-Nov	Wed	Vientiane -- Paksan -- Muang Khoun -- Phon Savan	Phon Savan
27-Nov	Thu	Phone Savan -- Muang Kham -- Haumeuang -- Sam Neua	Sam Neua
28-Nov	Fri	Sam Neua -- Viengsai -- Sopbao	Sopbao
29-Nov	Sat	Sopbao -- Xiengkor -- Et -- Sam Neua	Sam Neua
30-Nov	Sun	Sam Neua -- Haumeuang	Haumeuang
1-Dec	Mon	Haumeuang	Haumeuang
2-Dec	Tue	Haumeuang -- Kham -- Phon Savan, Data arrangement	Phon Savan
3-Dec	Wed	Phon Savan -- Pak -- Khoun -- Phon Savan	Phon Savan
4-Dec	Thu	Phon Savan -- Poukoud -- Parsai -- Phon Savan	Phon Savan
5-Dec	Fri	Phon Savan -- Nonghet	Nonghet
6-Dec	Sat	Nonghet -- Kham -- Phon Savan	Phon Savan
7-Dec	Sun	Phon Savan -- Muang Khoun -- Paksan -- Vientiane	Vientiane
8-Dec	Mon	Vientiane, Data arrangement, visit HRC and report the preliminary results of survey	Vientiane
9-Dec	Tue	Vientiane 21:40 (TG575) -- 22:45	on flight
10-Dec	Wed	Bangkok 00:05 (TG644) -- 07:30 Chubu Bangkok 01:00 (TG648) -- 08:00 Fukuoka	

Fig. 1. Main sites visited during the 2014 survey in northern Laos (black circles). A free map provided by the GMS Sustainable Tourism Development Project in Lao PDR was used. Place-names shown in map are subjected to minor change after publication, such as from Muang Khoune to Muang Khoun, from Xam Neua to Sam Neua and from Vieng Xai to Viengsai.

by using a global positioning system, we gathered samples and interviewed people to collect information about the samples such as the local name, usage, and area of cultivation. We primarily collected landraces and did not collect commercial cultivars as far as possible.

On 25 November, we visited the HRC and explained the objectives and plan of our survey to staff members. On 8 December, we visited the HRC again, extracted seeds from collected accessions and reported our preliminary results.

Results

We collected a total of 134 accessions from 12 districts (total of 44 villages) in 2 provinces in northern Laos (Table 2): 112 of *Solanum melongena*, 5 of *Solanum aethiopicum* L, 3 of *Solanum gilo* Raddi, 3 of *Solanum macrocarpon* L, 2 of *Solanum sanitwongsei* Craib, 1 of *Solanum viarum* Dural, 5 of uncharacterized *Solanum* spp., and 3 of *Capsicum* spp. Table 3 provides details of these accessions (Nos. 1 to 134). Following the survey, the seeds were kept at the HRC. After propagation of the seeds and characterization of the accessions in the collection, seed collection is expected to be shared equally between the Japanese gene bank and the HRC. The remainder of this section presents day-to-day details of our survey. All the accessions collected were of *S. melongena* unless stated otherwise and we collected mature fruit unless stated otherwise.

26 November: We traveled to Phon Savan via Paksan and Muang Khoun by taking Routes 13S, 03, 01 and 1D. The road conditions along Routes 03 and 01 between Paksan and Muang Khoun were very bad: asphalt was missing in places and most parts of the road were uneven and bumpy. Though we visited several small markets along the way, we collected nothing because only commercial eggplant cultivars were available in Vientiane, the capital city of Laos, were sold. It took about 9 h to travel from Vientiane to Phon Savan.

Table 2. Accessions collected during the 2014 survey in northern Laos.

Province	District	No. of villages	*Solanum melongena*	*S. aethio-picum*	*S. gilo*	*S. macro-carpon*	*S. sanito-wongsei*	*S. viarum*	*Solanum* spp.	*Capsicum* spp.	Total
Houaphan	Et	2	7	0	0	0	0	0	0	0	7
Houaphan	Haumeuang	7	24	0	0	0	0	0	1	1	26
Houaphan	Sam Neua	5	8	0	0	0	0	0	0	0	8
Houaphan	Sopbao	5	11	0	0	0	0	0	2	0	13
Houaphan	Viegnsai	3	9	0	1	0	1	0	0	1	12
Houaphan	Xiengkor	2	4	0	0	0	0	0	0	0	4
Xiengkhouang	Kham	6	17	0	0	1	0	0	0	0	18
Xiengkhouang	Khoun	3	6	1	1	0	1	0	0	0	9
Xiengkhouang	Nonghet	3	8	0	1	0	0	0	0	1	10
Xiengkhouang	Pak	4	5	1	0	0	0	1	1	0	8
Xiengkhouang	Parsai	2	5	2	0	2	0	0	0	0	9
Xiengkhouang	Poukoud	2	8	1	0	0	0	0	1	0	10
Total		44	112	5	3	3	2	1	5	3	134

27 November: We traveled to Sam Neua via Muang Kham by taking Routes 7, 1C, and 6. On the way around Haumeuang district, we collected one eggplant accession (No. 1) at a village market and one Capsicum accession (No. 2) at a restaurant in Soploa village. Then, we visited a small market in Longmark village, and collected one eggplant accession (No. 3). It took about 7 h to travel from Phon Savan to Sam Neua.

28 November: We visited the Department of Agriculture and Forestry (DOA) of Houaphan province and explained the objectives and plan of our survey to the director, Mr. Maiphiang (Photo 1). We could obtain their cooperation easily because a member of our team, Dr. T. Sisaphaithong, had obtained prior permission for the survey from the DOA of Houaphan. The director decided that a staff member of the DOA, Mr. Sang Vi Sai, would assist our survey of the Houaphan province and that various staff members of the District Agriculture and Forestry Office (DAFO) would assist with the surveys of individual districts. After the discussion, we visited a farmer who lived next to the DAFO and observed 4 types of eggplant in her backyard: the first type was spineless with white flowers; the second one was spineless with purple flowers; the third one was spiny with purple flowers and round fruit; and the last one was spiny with purple flowers and oblong fruit. We collected the fruit of the third one (No. 4, Photo 2). We then visited the Viengsai DAFO, located on Route 6, and explained the objectives and plan of our survey to staff members. The director of this DAFO joined us in conducting the survey. We visited Buck village, and collected one eggplant accession of landrace that was spineless on the stems and leaves, spiny on the calyx, and bore purple flowers and round fruit (No. 5). In the northern regions of Laos, people eat the flesh and skin of immature eggplant fruits (Photo 3) and the skin of mature fruits; they usually don't use chemical fertilizer, pesticide, fungicide, or herbicide because organically-grown products are preferred by consumers in Laos. One accession (No. 8) of a *Solanum* sp., probably *S. sanitwongsei*, which produces fruit that is very bitter and is used for cough medicine for old people, was collected. Subsequently we visited Natan village, and collected 4 accessions (Nos. 9 to 12). No. 9 plant had white flowers and few spines with a high yield of fruit. The fruit of No. 10 was a little larger than those of No. 9. No. 11 was collected as fruit which was preserved above fireplace and smoked (designated as 'smoked fruit' in this report). No. 12 was probably *S. gilo*, which is eaten in Laos but not in Japan. We moved to the next village named Longkhou, and collected 4 eggplant accessions (Nos. 13 to 16). After lunch, the DAFO director went back to his office. We continued on to Sopbao village via Routes 6 and 6A along the Ma River. The road conditions were very bad, asphalt was missing in places, and most parts of the road were uneven. There were large terraced rice fields on the way. It took about 4 h to travel from Viengsai to Sopbao. We stayed at a small guest house that

was the only one in the village.

29 November: We visited a market in Meuanghang village, and collected 4 eggplant accessions (Nos. 17 to 20), which were sold in the same package. No. 18 plant bore large ribbed fruit might be a commercial F_1 cultivar, which is available in Vientiane. A staff member of the Sopbao DAFO joined us on the way to the next village, Sopbao. We collected smoked fruit of one eggplant accession (No. 21). Then we moved to Hardsan village, which is populated by the Kham and Lao tribes. Four eggplant accessions were collected (Nos. 22 to 25). No. 22 plant might be a commercial F_1 cultivar imported from Thailand. No. 23 plant was spineless and bore purple flowers. The only skin of No. 24 was used by the local population because the flesh was reportedly very bitter. No. 25 plant was mix-planted in the upland rice field. In the next village, Meunanghom, No. 26, of which plant bore bitter fruit, was collected; however, we could not collect a sample of a plant that bore white small fruit because mature fruit were not present at the time and there were no farmers to help us locate a better specimen. We collected 3 accessions in Piangshai village (Nos. 27 to 29). One (No. 27) was *S. melongena* and 2 (Nos. 28 and 29) were uncharacterized *Solanum* spp. No. 28 plant was spineless and bore pale green fruit, which was not so bitter. No. 29 plant was almost spineless and perennial and bore larger fruit than those of No. 28. After lunch, the staff member from the Sopbao DAFO went back to his office and we traveled to Hup village in Xiengkor, where we collected 2 eggplant accessions (Nos. 30 and 31). No. 31 plant bore small, green and round fruit that the farmer said produced in higher yield, and were more delicious than the fruit of No. 30. Purple and long fruits were said to be not preferred in this area. On the way to the next village, we collected No. 32, of which plant bore green round fruit. We moved to Sopshan village, and collected one eggplant accession that was spiny and bore green round fruit infested with many spider mites (No. 33). A staff member of the Et DAFO joined our survey team on the way to the next village. We traveled to Meuang Et village by taking Route 6A along the Ma river, and collected 3 eggplant accessions (Nos. 34 to 36) from a farmer whose house was located on a hill to avoid water damage. The farmer grew various vegetables and fruits on the slope, and ducks and chickens were found roaming freely on the slope. No. 34 plant was spineless and bore white flowers and green round fruit. No. 35 plant was spiny on the calyx and bore purple flowers and large dark purple and round fruit. No. 36 plant bore dark green fruit that was delicious for the farmer. We then traveled to Nakham village, and collected 4 eggplant accessions (Nos. 37 to 40). We had to walk a long distance in a terraced rice field because the eggplant field was far (about 1 km) from the road. No. 37 plant was spineless and bore purple flowers and small green fruit. No. 38 plant was also spineless and bore purple flowers with a long peduncle and small green fruit. No. 39 plant was spiny and bore purple flowers and small green fruit. No. 40 plant was spineless and bore purple flowers and large green fruit. The Et DAFO staff member went back to his office and we went back to the hotel in Sam Neua.

30 November: We visited a market in Pork village (Photo 4) and collected one eggplant accession that bore oblong fruit (No. 41). We then visited several villages of the Hmong tribe by taking Route 6. The farmers said that they usually selected one fruit with good characteristics at the end of the culture period, and then collected the seeds of the fruit after it had matured and dropped naturally. We collected 2 eggplant accessions (Nos. 42 and 43) from different farmers in Haukhang village. No. 42 plant bore large fruit. No. 43 plant was spiny on the calyx and bore purple long fruit. An eggplant that was spiny on the calyx and bore purple flowers and white fruit was observed; however, we could not collect seeds and mature fruit because there were no farmers. In Nasakang village, we collected one eggplant sample that was a mixture of 3 types of eggplant (No. 44): the first type was spiny and bore purple flowers, the second one was spiny

on the calyx and bore white flowers and green fruit, and the third one was a little spiny and bore pale purple fruit. One eggplant accession with strong and purple spines was collected from a different farmer in the same village (No. 45); the spines of eggplants are usually green, and this was one of the few plants with purple spines in this survey. One eggplant accession that bore oblong fruit was collected from another farmer in the same village (No. 46). A large diversity in eggplants was observed in this area because each eggplant line was produced by the farmers themselves. The DOA staff member, Mr. Sang Vi Sai, went back to his office after lunch. We went to Buamngam, Haumeuang district via Route 6 and stayed at a guest house (Photo 5). Two eggplant accessions were collected at a restaurant (Nos. 47 and 48) when we had dinner. Both were a little bitter.

1 December: We visited the Haumeuang DAFO and explained the objectives and plan of our survey to the director. A staff member of the Haumeuang DAFO was allocated to our survey team. We visited a market in Soplao village (Photo 6), and collected 4 eggplant accessions from one farmer (Nos. 49 to 52). No. 49 plant bore white fruit that was delicious for the farmer, and No. 50 plant bore green fruit. The farmer in this village said that eggplant fruits in the season of the survey were smaller than those in the earlier season when plants were more vigorous. In this area, vegetables including eggplant were usually mix-planted with upland rice. The eggplant seeds were stored in warehouses in the upland rice field, not in the farmer's houses. Two accessions were collected (Nos. 53 and 54) in the backyard of another farmer in the village. No. 53 was an uncharacterized *Solanum* sp. whose fruit cluster shape was different from those of accessions already collected. No. 54 was a variety of *S. melongena* that bore fruit with a hard skin. In the same backyard, there was an uncharacterized *Solanum* sp. that had leaves with a bad smell, but no seeds or mature fruits were available for collection. The local populations produce *sake* by fermenting rice with the leaves of this plant. The resultant sake is considered a little sweet because of this plant. *S. torvum* plants that bore large fruits were observed; however, seeds and mature fruits could not be collected. We collected 4 eggplant accessions from yet another farmer in the same village (Nos. 55 to 58). No. 55 plant was spineless and bore white flowers and green fruit. When the local populations eat immature fruit of eggplant, they use the entire fruit in cooking; when they eat mature fruit, only the skin is used for cooking. The farmer said that the fruit of No. 56 was not delicious. There was a spineless eggplant that bore purple flowers and long fruit, but we could not collect seeds or mature fruit. No. 57, of which plant was spineless and bore purple and long fruit, was used for cooking. No. 58 plant bore large white fruit. We went to Korhing village after lunch, and collected 3 eggplant accessions at a village market (Nos. 59 to 61). No. 59 plant was spineless and bore egg-shaped fruit. No. 60 plant was also spineless and bore round fruit. No. 61 plant was spiny and bore round fruit. We then traveled to Kangkao village of the Hmong tribe, and collected 6 eggplant accessions as smoked fruits (Nos. 62 to 67, Photo 7). We collected the very large, long and green fruit of No. 68 at Parnang village, and 2 accessions of seeds at Longang village (Nos. 69 and 70, Photo 8). The staff member of the Haumeuang DAFO went back to her office and we returned via Route 6 to the guest house at Buamngam.

2 December: We went back to Phon Savan via Routes 6, 1C, and 7. We collected one eggplant accession in front of the reception office at the Tham Piu Cave (No. 71). No. 71 plant bore white flowers, and small oblong and green fruit. We stayed in the same hotel as before. It took about 7 h to travel from Buamngam to Phon Savan.

3 December: We visited the DOA of Xiengkhouang province and explained the objectives and plan of our survey to the deputy of the crop section, Mr. Bounlith Thummavong, and the director, Mr. Bouapha

(Photo 9). We accepted the suggestion of the director that it would be difficult to survey the Mok district because of its long distance (~130 km) from the office and the poor road conditions. A staff member of the DOA, Mr. Serd Savhan, joined the survey team. We visited the Pak DAFO and explained the objectives and plan of our survey to the director. In the office, there was a *S. mammosum* plant, which is not usually eaten in Japan; a local person said that the fruit of this plant was edible but not delicious. A staff member of the DAFO joined the survey team. We visited several villages along the road to Muang Khoun. First we visited Tern village, and collected 3 accessions (Nos. 72 to 74). No. 72 was most probably *S. viarum*; it grew as a weed on a ranch. The farmer said that the skin of the fruit was edible but bitter. No. 73 was probably *S. aethiopicum*; both the immature and mature fruit were edible (Photo 10). Some related species were observed; however, seeds and mature fruits could not be collected. Many kinds of vegetables were grown organically in the same field as the eggplants (Photo 11). We collected the seeds of No. 74, of which plant was spineless and bore purple flowers and long green fruit. The farmer was growing another eggplant line that bore green round fruit, but seeds and mature fruit could not be collected. We collected 2 eggplant accessions in Yeuan village (Nos. 75 and 76). No. 75 plant had white spines and bore purple flowers and green round fruit. The farmer said that the fruit of No. 75 was more delicious than that of No. 76; the whole of the immature fruit of No. 75 was edible though only the skin of the mature fruit was edible. No. 76 plant had weak spines and bore green round fruit. We collected 2 accessions in Yon village. No. 77 plant was spiny on the calyx and bore green round fruit (Photo 12). No. 78 was an uncharacterized *Solanum* sp. whose leaves and fruit were edible, but bitter. The local populations usually eat them with chicken soup or larb. In Mon village, we collected No. 79, of which plant bore white round fruit (Photo 13). We traveled to Nongnam village of Khoun district after lunch, and collected 3 accessions (Nos. 80 to 82). No. 80 was probably *S. gilo*; it bore white flowers and large oblong fruit. No. 81 was probably *S. aethiopicum*; it bore white flowers and flattened fruit. No. 82 plant was spiny and bore purple flowers and large flattened fruit. The farmer gave us a traditional Lao dish cooked with banana flowers and the skin of eggplant fruits (Photos 14 and 15). In Na ou village, we collected the seeds of No. 83, of which plant bore large white fruit. We visited Chang village and collected accessions No. 84 to 88. No. 84 plant was spiny and bore purple flowers and green fruit; No. 85 plant was spineless; and No. 86 was an uncharacterized *Solanum* sp., probably *S. sanitowangsei*, of which plant was spiny. We collected 2 eggplant accessions of seeds (Nos. 87 and 88) from another farmer in the same village; the farmer said that the fruit characteristics of Nos. 87 and 88 were similar to each other. We tried to enter some eggplant fields near a fish breeding farm, but abandoned our attempt because many leeches attacked us. The staff member of the DAFO went back to his office, and we returned to the hotel in Phon Savan.

4 December: We visited the Poukoud DAFO by taking Route 7 and explained the objectives and plan of our survey to the director. A staff member of the DAFO joined us to help with the survey. In Kerng village, we collected 2 eggplant accessions (Nos. 89 and 90) from the one farmer; both accessions were spineless, but No. 89 plant bore green round fruit and No. 90 plant bore green oblong fruit. We collected an uncharacterized *Solanum* sp. accession (No. 91) at the primary school in the same village. No. 91 plant was spiny and bore red fruit, which the farmer said that they were preferred by cows and were not edible for people (Photo 17). In this area, it was difficult to grow vegetables because the soil was acidic. A teacher at the primary school guided us to a farmer from whom we could collect various accessions (Nos. 92 to 96). No. 92 plant was spineless and bore purple flowers and purple oblong fruit. No. 93 plant was spiny and bore green round fruit. We collected the seeds of No. 94 (Photo 18), which was spineless and bore purple

flowers and pale purple fruit, and No. 95, which was spineless and bore large green fruit; No. 95 was called Vientiane Eggplant because it was similar to an eggplant popular in Vientiane. No. 96, which was probably *S. aethiopicum*, was spineless and bore large fruit, which the farmer said that it was a little bit sweet in the mature stage. We collected No. 97 from another farmer; it was spiny on the calyx and bore purple flowers and green round fruit. We traveled to Pienglouang village, and collected one eggplant accession from a farmer of the Hmong tribe. No. 98 plant was spineless and bore white large fruit. In the field of the farmer, several medicinal plants were observed; for example, there was a plant like a pokeweed whose roots were used for medicine. Dried cassava was used as feed for chickens and pigs. The staff member of the DAFO went back to his office after lunch. We visited the Parsai DAFO and explained the objectives and plan of our survey to the director. A staff member of the DAFO was temporarily allocated to our team. We visited Navhan village, and collected 4 accessions (Nos. 99 to 102). We collected the seeds of No. 99, which was spineless and bore purple flowers and large green and round fruit. The seeds were also collected for No. 100, which was spineless and bore small purple fruit. No. 101 plant was spiny on the calyx and bore green round fruit. No. 102 was probably *S. macrocarpon* (Photo 19). We traveled to Nonghoy village, and collected 5 accessions (Nos. 103 to 107). No. 103 was also probably *S. macrocarpon*. The color of stem of No. 103 was dark purple. No. 104 plant was spineless and bore purple flowers and green flattened fruit. No. 105, which was collected from another farmer in the same village, was spineless and bore green round fruit. Two spiny *Solanum* spp. that were probably *S. aethiopicum* were collected in the village market (Nos. 106 and 107). The staff member of the DAFO went back to his office, and we returned to the same hotel at Phon Savan.

5 December: We visited the Nonghet DAFO by taking Route 7 and explained the objectives and plan of our survey to the director. It took about 3 h to travel from Phon Savan to the office. A staff member of the DAFO joined us in the survey. We visited Sandone village, inhabited by the Hmong tribe, after lunch. Some eggplants were observed in the village, but it was difficult to collect seeds and mature fruits from farmers because they were working in upland rice field. We did collect No. 108, of which plant was spineless and bore black long fruit; the farmer said that it was a popular type of eggplant in this area. We traveled to Namkouang village, and collected 4 accessions (Nos. 109 to No. 112) from 4 different farmers. No. 109 plant was spineless and bore green long fruit; No. 110 plant was spiny and bore purple flowers and green slightly flattened fruit; No. 111 plant was spineless and bore white flowers and green flattened fruit, and No. 112 plant was spineless and bore purple flowers and green round fruit. We visited the upland rice field of a staff member of the DAFO in Nonghet tai village. One eggplant accession that bore dark purple long fruit (No. 113) and a Capsicum accession (No. 134) that bore small fruit with very hot taste were collected. A spineless eggplant that bore purple flowers and dark purple long fruit was observed, but seeds and mature fruit could not be collected. A Solanum sp. accession (probably *S. gilo*) (No. 114) that bore orange fruit was collected from another farmer in the same village. The staff member of the DAFO went back to her home and we stayed at a guesthouse. We visited the house of the DAFO staff member in the evening, and collected 2 eggplant accessions as seed (Nos. 115 and 116). The farmer said that No. 116 plant bore pale purple and long fruit.

6 December: It was very cold and the fog was thick. The morning market had already finished by the time we arrived, 7:00 AM, because it had opened at 4:00 AM. We visited Partang village of Kham district via Route 7, and collected various eggplant accessions (Nos. 117 to 121). No. 117 plant was spiny on the calyx and bore purple flowers and white long fruit; only immature fruit were used for cooking and mature

fruit were not used. In this region, eggplant lines that bore green round fruits were preferred to No.117 because the green round fruits could be used in both immature and mature stages. No. 118 plant was spiny on the calyx and bore purple flowers and green long fruit (Photo 20). No. 119 plant was also spiny on the calyx and bore purple flowers and green round fruit and its taste was a little bitter. No. 120 plant bore green round fruit, with a softer skin than that of No. 119, and the flesh of the fruit was green and thick. No. 121 plant bore large, green, flattened fruit infested with many scale insects. No. 122, collected on the way to the next village, was spineless and bore purple flowers and purple round fruit. No. 123 plant bore green round fruit with weak stripes; the striped part of the skin tasted bitter. The plant had been growing for 2 years, and the farmer said that the harvested fruits were delicious in the first but not the second year. We traveled to Kauy village, and collected 2 eggplant accessions (Nos. 124 and 125). No. 124 plant was spiny on the calyx and bore purple flowers and green long fruit without stripes. No. 125 plant bore purple flowers and green long fruit with strong stripes. We moved to Lao village after lunch, and collected one eggplant accession, which had weak spines on the calyx and bore white flowers and green flattened fruit (No. 126). We observed 4 types of eggplant in Dantong village, and collected one that was spineless and bore green oblong fruit (No. 127). On the way to Phonesa village, we observed green long fruits of eggplant but we did not collect samples. A mixture of 3 types of eggplant seed was collected in Phonesa village (No. 128, Photo 21). At a shop in the same village, we collected No. 129, of which plant bore green, large and flattened fruit. We visited a field of upland rice with the shop owner, and collected 4 accessions (Nos. 130 to 133, Photo 22). We could observe various types of eggplants in the field. The shop owner grew many eggplant varieties for his family rather than for sale. Nos. 130 and 131 bore green, flattened and large fruit. No. 132 was probably *S. macrocarpon*; both its fruit and leaves were edible. No. 133 plant bore small, white, round fruit. We went back to Phon Savan and stayed at a hotel. The staff member of the DOA, Mr. Serd Savhan, went back to his home.

7 December: We left Phon Savan after shopping at a market in the early morning (Photo 23). We traveled to Vientiane via Muang Khoun and Man by taking Routes 1D, 01, 03, and 13S. It took about 7 to 8 h to travel from Phon Savan to Vientiane. After checking into the hotel, we spent the day arranging our samples and data.

8 December: We arranged the data and photos in the morning, and visited to HRC in the afternoon to report our preliminary results (Photo 24). The HRC members of our team extracted seeds from our collection of fruits and dried them.

Discussion

We easily collected eggplant seeds of numerous landraces during this survey because mature fruits of eggplant were cultivated in backyards and fields, and sold in markets. We could not communicate directly with the Hmong tribe because we did not speak their language; however, the staff from the DOA and the DAFO acted as translators, and we could get useful information. Internationally, it was generally the flesh and skin of immature eggplant fruits that were eaten; however, we found that people in the northern part of Laos also ate the skin, but not the flesh, of mature fruits. We discovered large eggplant diversity in the northern part of Laos: the landraces had diverse fruit characteristics such as shape (elongated, round, or slightly flattened), size, and color (purple, green, white, orange or yellow). Moreover, it was very interesting that spineless landraces were popular in this area.

Although we focused on surveying *S. melongena*, we also observed its relatives including *S.*

aethiopicum, *S. gilo*, *S. macrocarpon*, *S. sanitwongsei* and *S. viarum* throughout northern Laos. These species are used for medicine but are also edible. The people of Laos sometimes eat the raw fruits of these relatives, but they were too bitter for the palates of the Japanese members of the team. These *Solanum* spp. may be useful for breeding materials and rootstocks because the resistance to several diseases are reported in many *Solanum* spp.[7].

We discussed and planned future cooperation with the staff of the HRC. Our plan is that HRC staff will be trained in how to evaluate the characteristics of eggplant genetic resources. Seeds will be produced by self-pollination, and the HRC staff will evaluate the characteristics of materials collected in this survey in the next season. Seeds produced in the HRC will be shared between Laos and Japan. We plan to evaluate morphological characteristics and resistance to soil-borne diseases, Verticillium wilt, bacterial wilt, Fusarium wilt, and nematodes in Japan.

Acknowledgments

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ラオスにおける野菜遺伝資源の共同探索 , 2014 年

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和文摘要

本報告は，独立行政法人農業生物資源研究所とラオス農林省との間で 2006 年に締結した共同研究協定（MOU）に基づいて行われたラオス国における 2014 年の野菜遺伝資源の調査報告である．調査は，2014 年 11 月 24 日～ 12 月 10 日にかけ，ナスを主な調査対象とした．今回は，ラオス国北部地域であるフアパン県およびシェンクワン県を調査した．ナス栽培種 *Solanum melongena* を 122 点，ナス近縁種を 9 点およびトウガラシ属を 3 点の合計 134 点の種子サンプルを収集した．当該地域におけるナスの多様性は高く，果形や果色に広い変異が観察され，とげなし性の在来種が多かったことは興味深い．これら遺伝資源の種子は自殖によって増殖し，ラオス園芸研究センター（HRC）で特性調査が行われる予定である．将来的には，種子は日本とラオスの両国が保有し，日本でも土壌伝染性病害虫への抵抗性を含む諸特性を調査する予定である．

Table 3. List of materials collected in northern Laos during the 2014 survey.

Coll. No.	JP No.	Passport No.	Local name	JP Name	Date	Genus and species	Province/ State	District	Village	North latitude	East longitude	Altitude (m)	Source (Market name)	Status
1	253363	30062721	Kueaporyai	COL/LAOS/2014/NIVTS/001	27-Nov	*Solanum melongena*	Houaphan	Haumeuang	Soploa	20.01.53.40	103.42.59.14	525	village market	landrace
2	253364	30062722		COL/LAOS/2014/NIVTS/002	27-Nov	*Capsicum* sp.	Houaphan	Haumeuang	Soploa	20.01.53.40	103.42.59.14	525	restaurant	
3	253365	30062723	Keuaporm	COL/LAOS/2014/NIVTS/003	27-Nov	*Solanum melongena*	Houaphan	Sam Neua	Longmark	20.25.02.70	104.03.00.13	929	village market	landrace
4	253366	30062724	Keuakeun	COL/LAOS/2014/NIVTS/004	28-Nov	*Solanum melongena*	Houaphan	Sam Neua	Sam Neua	20.25.20.80	104.02.09.23	960	backyard	landrace
5	253367	30062725	Keurpor	COL/LAOS/2014/NIVTS/005	28-Nov	*Solanum melongena*	Houaphan	Viegnsai	Buck	20.25.19.56	104.12.30.21	872	backyard	landrace
6	253368	30062726	Keursane	COL/LAOS/2014/NIVTS/006	28-Nov	*Solanum melongena*	Houaphan	Viegnsai	Buck	20.25.19.29	104.12.30.70	872	backyard	landrace
7	253369	30062727	Mowkpetcifa	COL/LAOS/2014/NIVTS/007	28-Nov	*Capsicum* sp.	Houaphan	Viegnsai	Buck	20.25.19.29	104.12.30.70	872	backyard	landrace
8	253370	30062728	Kengkome	COL/LAOS/2014/NIVTS/008	28-Nov	*Solanum sanitowangsei*	Houaphan	Viegnsai	Buck	20.25.19.29	104.12.30.70	872	backyard	landrace
9	253371	30062729	Keurpor	COL/LAOS/2014/NIVTS/009	28-Nov	*Solanum melongena*	Houaphan	Viegnsai	Natan	20.26.22.54	104.11.28.79	823	backyard	landrace
10	253372	30062730	Keurtao	COL/LAOS/2014/NIVTS/010	28-Nov	*Solanum melongena*	Houaphan	Viegnsai	Natan	20.26.22.54	104.11.28.79	823	backyard	landrace
11	253373	30062731	Keurkomkeng	COL/LAOS/2014/NIVTS/011	28-Nov	*Solanum melongena*	Houaphan	Viegnsai	Natan	20.26.22.54	104.11.28.79	823	backyard	landrace
12	253374	30062732	Keurphan	COL/LAOS/2014/NIVTS/012	28-Nov	*Solanum gilo*	Houaphan	Viegnsai	Natan	20.26.22.54	104.11.28.79	823	backyard	landrace
13	253375	30062733	Keuakeun	COL/LAOS/2014/NIVTS/013	28-Nov	*Solanum melongena*	Houaphan	Viegnsai	Longkhou	20.25.15.16	104.13.45.01	903	backyard	landrace
14	253376	30062734	Keurpor	COL/LAOS/2014/NIVTS/014	28-Nov	*Solanum melongena*	Houaphan	Viegnsai	Longkhou	20.25.15.16	104.13.45.01	903	backyard	landrace
15	253377	30062735	Khomkheng	COL/LAOS/2014/NIVTS/015	28-Nov	*Solanum melongena*	Houaphan	Viegnsai	Longkhou	20.25.15.16	104.13.45.01	903	backyard	landrace
16	253378	30062736	Keun	COL/LAOS/2014/NIVTS/016	28-Nov	*Solanum melongena*	Houaphan	Viegnsai	Longkhou	20.25.15.16	104.13.45.01	903	backyard	landrace
17	253379	30062737	Keuasan	COL/LAOS/2014/NIVTS/017	29-Nov	*Solanum melongena*	Houaphan	Sopbao	Meuanghang	20.42.39.62	104.23.06.45	224	village market	landrace
18	253380	30062738	Keurkonyone	COL/LAOS/2014/NIVTS/018	29-Nov	*Solanum melongena*	Houaphan	Sopbao	Meuanghang	20.42.39.62	104.23.06.45	224	village market	cultivar
19	253381	30062739	Keuakeng	COL/LAOS/2014/NIVTS/019	29-Nov	*Solanum melongena*	Houaphan	Sopbao	Meuanghang	20.42.39.62	104.23.06.45	224	village market	landrace
20	253382	30062740	Keuasan	COL/LAOS/2014/NIVTS/020	29-Nov	*Solanum melongena*	Houaphan	Sopbao	Meuanghang	20.42.39.62	104.23.06.45	224	village market	landrace
21	253383	30062741	Keualaikiew	COL/LAOS/2014/NIVTS/021	29-Nov	*Solanum melongena*	Houaphan	Sopbao	Sopbao	20.42.42.12	104.23.08.16	222	backyard	landrace
22	253384	30062742	Keuakhom	COL/LAOS/2014/NIVTS/022	29-Nov	*Solanum melongena*	Houaphan	Sopbao	Hardsan	20.40.05.91	104.23.34.65	227	backyard	cultivar
23	253385	30062743	Keuapoy	COL/LAOS/2014/NIVTS/023	29-Nov	*Solanum melongena*	Houaphan	Sopbao	Hardsan	20.40.05.91	104.23.34.65	227	backyard	landrace
24	253386	30062744	Keuakhomkeng	COL/LAOS/2014/NIVTS/024	29-Nov	*Solanum melongena*	Houaphan	Sopbao	Hardsan	20.40.05.91	104.23.34.65	227	backyard	landrace
25	253387	30062745	Keuashan	COL/LAOS/2014/NIVTS/025	29-Nov	*Solanum melongena*	Houaphan	Sopbao	Hardsan	20.40.05.91	104.23.34.65	227	backyard	landrace
26	253388	30062746	Keuakenn	COL/LAOS/2014/NIVTS/026	29-Nov	*Solanum melongena*	Houaphan	Sopbao	Meuanghom	20.40.43.53	104.23.24.80	232	backyard	landrace
27	253389	30062747	Keuakao	COL/LAOS/2014/NIVTS/027	29-Nov	*Solanum melongena*	Houaphan	Sopbao	Piangshai	20.43.22.83	104.21.12.11	216	farmland	landrace
28	253390	30062748	Kengkhomkao	COL/LAOS/2014/NIVTS/028	29-Nov	*Solanum* sp.	Houaphan	Sopbao	Piangshai	20.43.22.83	104.21.12.11	216	backyard	landrace

Table 3 (Continued).

Coll. No.	JP No.	Passport No.	Local name	JP Name	Date	Genus and species	Province/ State	District	Village	North latitude	East longitude	Altitude (m)	Source (Market name)	Status
29	253391	30062749	Kengfah	COL/LAOS/2014/NIVTS/029	29-Nov	*Solanum* sp.	Houaphan	Sopbao	Piangshai	20.43.22.83	104.21.12.11	216	backyard	landrace
30	253392	30062750	Keualai	COL/LAOS/2014/NIVTS/030	29-Nov	*Solanum melongena*	Houaphan	Xiengkor	Hup	20.50.14.87	104.07.51.84	256	backyard	landrace
31	253393	30062751	Keuapor	COL/LAOS/2014/NIVTS/031	29-Nov	*Solanum melongena*	Houaphan	Xiengkor	Hup	20.50.14.83	104.07.51.17	256	backyard	landrace
32	253394	30062752	Keuakhomkeng	COL/LAOS/2014/NIVTS/032	29-Nov	*Solanum melongena*	Houaphan	Xiengkor	Hup	20.50.21.85	104.07.31.52	257	backyard	landrace
33	253395	30062753	Keuakeun	COL/LAOS/2014/NIVTS/033	29-Nov	*Solanum melongena*	Houaphan	Xiengkor	Sopshan	20.50.50.97	104.05.15.22	262	backyard	landrace
34	253396	30062754	Keuakeun	COL/LAOS/2014/NIVTS/034	29-Nov	*Solanum melongena*	Houaphan	Et	Meuang Et	20.49.21.17	104.01.26.61	261	farmland	landrace
35	253397	30062755	Keua id	COL/LAOS/2014/NIVTS/035	29-Nov	*Solanum melongena*	Houaphan	Et	Meuang Et	20.49.21.17	104.01.26.61	261	farmland	landrace
36	253398	30062756	Keua kiew	COL/LAOS/2014/NIVTS/036	29-Nov	*Solanum melongena*	Houaphan	Et	Meuang Et	20.49.21.17	104.01.26.61	261	farmland	landrace
37	253399	30062757	Keuapor	COL/LAOS/2014/NIVTS/037	29-Nov	*Solanum melongena*	Houaphan	Et	Nakham	20.46.44.41	104.00.13.91	265	farmland	landrace
38	253400	30062758	Keuakeun	COL/LAOS/2014/NIVTS/038	29-Nov	*Solanum melongena*	Houaphan	Et	Nakham	20.46.44.35	104.00.13.87	270	farmland	landrace
39	253401	30062759	Keuakeunnam	COL/LAOS/2014/NIVTS/039	29-Nov	*Solanum melongena*	Houaphan	Et	Nakham	20.46.44.41	104.00.13.91	265	farmland	landrace
40	253402	30062760	Keuakeunnam	COL/LAOS/2014/NIVTS/040	29-Nov	*Solanum melongena*	Houaphan	Et	Nakham	20.46.44.41	104.00.13.91	265	farmland	landrace
41	253403	30062761	Keuauhan	COL/LAOS/2014/NIVTS/041	30-Nov	*Solanum melongena*	Houaphan	Sam Neua	Pork	20.25.02.68	104.02.58.51	949	village market	landrace
42	253404	30062762	Keuaporm	COL/LAOS/2014/NIVTS/042	30-Nov	*Solanum melongena*	Houaphan	Sam Neua	Haukhang	20.27.37.52	104.06.44.81	1076	backyard	landrace
43	253405	30062763	Keuadeng	COL/LAOS/2014/NIVTS/043	30-Nov	*Solanum melongena*	Houaphan	Sam Neua	Haukhang	20.27.34.63	104.06.48.55	1086	backyard	landrace
44	253406	30062764	Keuavhan	COL/LAOS/2014/NIVTS/044	30-Nov	*Solanum melongena*	Houaphan	Sam Neua	Nasakang	20.24.32.12	104.02.50.78	968	backyard	landrace
45	253407	30062765	Keuakeun	COL/LAOS/2014/NIVTS/045	30-Nov	*Solanum melongena*	Houaphan	Sam Neua	Nasakang	20.24.14.33	104.02.45.45	957	backyard	landrace
46	253408	30062766	Keuakeun	COL/LAOS/2014/NIVTS/046	30-Nov	*Solanum melongena*	Houaphan	Sam Neua	Nasakang	20.24.14.33	104.02.45.45	957	backyard	landrace
47	253409	30062767	Keuakhom	COL/LAOS/2014/NIVTS/047	30-Nov	*Solanum melongena*	Houaphan	Haumeuang	Buemgam	20.11.54.42	103.52.56.49	1139	village market	landrace
48	253410	30062768	Keuakom	COL/LAOS/2014/NIVTS/048	30-Nov	*Solanum melongena*	Houaphan	Haumeuang	Buemgam	20.11.54.42	103.52.56.49	1139	village market	landrace
49	253411	30062769	Keuakompoy	COL/LAOS/2014/NIVTS/049	1-Dec	*Solanum melongena*	Houaphan	Haumeuang	Soplao	20.01.54.72	103.43.00.19	529	village market	landrace
50	253412	30062770	Keuakompoy	COL/LAOS/2014/NIVTS/050	1-Dec	*Solanum melongena*	Houaphan	Haumeuang	Soplao	20.01.54.87	103.43.00.22	528	village market	landrace
51	253413	30062771	Keuakompoy	COL/LAOS/2014/NIVTS/051	1-Dec	*Solanum melongena*	Houaphan	Haumeuang	Soplao	20.01.54.78	103.43.00.27	514	village market	landrace
52	253414	30062772	Keuakompoy	COL/LAOS/2014/NIVTS/052	1-Dec	*Solanum melongena*	Houaphan	Haumeuang	Soplao	20.01.54.78	103.43.00.27	514	village market	landrace
53	253415	30062773	Kengkom	COL/LAOS/2014/NIVTS/053	1-Dec	*Solanum* sp.	Houaphan	Haumeuang	Soplao	20.01.54.78	103.43.00.27	514	backyard	landrace
54	253416	30062774	Keuakom	COL/LAOS/2014/NIVTS/054	1-Dec	*Solanum melongena*	Houaphan	Haumeuang	Soplao	20.01.54.78	103.43.00.27	514	backyard	landrace
55	253417	30062775	Keuakompoy	COL/LAOS/2014/NIVTS/055	1-Dec	*Solanum melongena*	Houaphan	Haumeuang	Soplao	20.01.54.78	103.43.00.27	514	backyard	landrace
56	253418	30062776	Keuakeun	COL/LAOS/2014/NIVTS/056	1-Dec	*Solanum melongena*	Houaphan	Haumeuang	Soplao	20.01.54.78	103.43.00.27	514	backyard	landrace

Table 3 (Continued).

Coll. No.	JP No.	Passport No.	Local name	JP Name	Date	Genus and species	Province/ State	District	Village	North latitude	East longitude	Altitude (m)	Source (Market name)	Status
57	253419	30062777	Hamboar	COL/LAOS/2014/NIVTS/057	1-Dec	*Solanum melongena*	Houaphan	Haumeuang	Soplao	20.01.54.78	103.43.00.27	514	backyard	landrace
58	253420	30062778	Keuapoy	COL/LAOS/2014/NIVTS/058	1-Dec	*Solanum melongena*	Houaphan	Haumeuang	Soplao	20.01.54.78	103.43.00.27	514	farmland	landrace
59	253421	30062779	Keuapoy	COL/LAOS/2014/NIVTS/059	1-Dec	*Solanum melongena*	Houaphan	Haumeuang	Korhing	20.03.58.91	103.42.42.37	965	village market	landrace
60	253422	30062780	Keuapoy	COL/LAOS/2014/NIVTS/060	1-Dec	*Solanum melongena*	Houaphan	Haumeuang	Korhing	20.03.58.91	103.42.42.37	965	village market	landrace
61	253423	30062781	Keuapoy	COL/LAOS/2014/NIVTS/061	1-Dec	*Solanum melongena*	Houaphan	Haumeuang	Korhing	20.03.58.91	103.42.42.37	965	village market	landrace
62	253424	30062782	Keuakao	COL/LAOS/2014/NIVTS/062	1-Dec	*Solanum melongena*	Houaphan	Haumeuang	Kangkao	20.10.04.65	103.48.53.11	1277	backyard	landrace
63	253425	30062783	Keualeuang	COL/LAOS/2014/NIVTS/063	1-Dec	*Solanum melongena*	Houaphan	Haumeuang	Kangkao	20.10.04.65	103.48.53.11	1277	backyard	landrace
64	253426	30062784	Keualeuang	COL/LAOS/2014/NIVTS/064	1-Dec	*Solanum melongena*	Houaphan	Haumeuang	Kangkao	20.10.04.65	103.48.53.11	1277	backyard	landrace
65	253427	30062785	Keualaiyai	COL/LAOS/2014/NIVTS/065	1-Dec	*Solanum melongena*	Houaphan	Haumeuang	Kangkao	20.10.04.65	103.48.53.11	1277	backyard	landrace
66	253428	30062786	Keuahamgouu	COL/LAOS/2014/NIVTS/066	1-Dec	*Solanum melongena*	Houaphan	Haumeuang	Kangkao	20.10.04.65	103.48.53.11	1277	backyard	landrace
67	253429	30062787	Keuavhankao	COL/LAOS/2014/NIVTS/067	1-Dec	*Solanum melongena*	Houaphan	Haumeuang	Kangkao	20.10.04.65	103.48.53.11	1277	backyard	landrace
68	253430	30062788	Keuayao	COL/LAOS/2014/NIVTS/068	1-Dec	*Solanum melongena*	Houaphan	Haumeuang	Parnang	20.10.41.46	103.49.39.48	1428	backyard	landrace
69	253431	30062789	Keuakeun	COL/LAOS/2014/NIVTS/069	1-Dec	*Solanum melongena*	Houaphan	Haumeuang	Longang	20.09.55.83	103.50.53.79	1337	backyard	landrace
70	253432	30062790	Keuavhan	COL/LAOS/2014/NIVTS/070	1-Dec	*Solanum melongena*	Houaphan	Haumeuang	Longang	20.09.55.83	103.50.53.79	1337	backyard	landrace
71	253433	30062791		COL/LAOS/2014/NIVTS/071	2-Dec	*Solanum melongena*	Xiengkhouang	Kham	Thampiu				backyard	landrace
72	253434	30062792	Keuajear	COL/LAOS/2014/NIVTS/072	3-Dec	*Solanum viarum*	Xiengkhouang	Pak	Tern	19.27.13.21	103.12.16.87	1098	backyard	landrace
73	253435	30062793	Komgim	COL/LAOS/2014/NIVTS/073	3-Dec	*Solanum aethiopicum*	Xiengkhouang	Pak	Tern	19.27.13.21	103.12.16.87	1098	backyard	landrace
74	253436	30062794	Keuayas	COL/LAOS/2014/NIVTS/074	3-Dec	*Solanum melongena*	Xiengkhouang	Pak	Tern	19.27.13.21	103.12.16.87	1098	backyard	landrace
75	253437	30062795	Keuakeun	COL/LAOS/2014/NIVTS/075	3-Dec	*Solanum melongena*	Xiengkhouang	Pak	Yeuan	19.27.35.01	103.11.59.67	1087	backyard	landrace
76	253438	30062796	Keuakeun	COL/LAOS/2014/NIVTS/076	3-Dec	*Solanum melongena*	Xiengkhouang	Pak	Yeuan	19.27.35.01	103.11.59.67	1087	backyard	landrace
77	253439	30062797	Keuakeun	COL/LAOS/2014/NIVTS/077	3-Dec	*Solanum melongena*	Xiengkhouang	Pak	Yon	19.26.09.80	103.12.38.53	1114	backyard	landrace
78	253440	30062798	Yakaodai	COL/LAOS/2014/NIVTS/078	3-Dec	*Solanum* sp.	Xiengkhouang	Pak	Yon	19.25.58.45	103.12.53.85	1131	backyard	landrace
79	253441	30062799	Keurpor	COL/LAOS/2014/NIVTS/079	3-Dec	*Solanum melongena*	Xiengkhouang	Pak	Mon	19.26.51.97	103.14.14.58	1152	backyard	landrace
80	253442	30062800	Kengkom	COL/LAOS/2014/NIVTS/080	3-Dec	*Solanum gilo*	Xiengkhouang	Khoun	Nongnam	19.21.14.10	103.19.04.32	1104	backyard	landrace
81	253443	30062801	Keuakom	COL/LAOS/2014/NIVTS/081	3-Dec	*Solanum aethiopicum*	Xiengkhouang	Khoun	Nongnam	19.21.14.10	103.19.04.32	1104	backyard	landrace
82	253444	30062802	Keuakangkop	COL/LAOS/2014/NIVTS/082	3-Dec	*Solanum melongena*	Xiengkhouang	Khoun	Nongnam	19.21.14.10	103.19.04.32	1104	backyard	landrace
83	253445	30062803	Keuakao	COL/LAOS/2014/NIVTS/083	3-Dec	*Solanum melongena*	Xiengkhouang	Khoun	Na ou	19.21.06.59	103.19.39.55	1084	backyard	landrace
84	253446	30062804	Keuakeun	COL/LAOS/2014/NIVTS/084	3-Dec	*Solanum melongena*	Xiengkhouang	Khoun	Chang	19.20.50.60	103.20.47.16	1083	backyard	landrace

Table 3 (Continued).

Coll. No.	JP No.	Passport No.	Local name	JP Name	Date	Genus and species	Province/ State	District	Village	North latitude	East longitude	Altitude (m)	Source (Market name)	Status
85	253447	30062805	Keuakeun	COL/LAOS/2014/NIVTS/085	3-Dec	*Solanum melongena*	Xiengkhouang	Khoun	Chang	19.20.50.60	103.20.47.16	1083	backyard	landrace
86	253448	30062806	Kengkom	COL/LAOS/2014/NIVTS/086	3-Dec	*Solanum sanitowangsei*	Xiengkhouang	Khoun	Chang	19.20.50.60	103.20.47.16	1083	backyard	landrace
87	253449	30062807	Keuakangkob	COL/LAOS/2014/NIVTS/087	3-Dec	*Solanum melongena*	Xiengkhouang	Khoun	Chang	19.20.50.60	103.20.47.16	1083	farmland	landrace
88	253450	30062808	Kueakiw	COL/LAOS/2014/NIVTS/088	3-Dec	*Solanum melongena*	Xiengkhouang	Khoun	Chang	19.20.50.60	103.20.47.16	1083	farmland	landrace
89	253451	30062809	Keualai	COL/LAOS/2014/NIVTS/089	4-Dec	*Solanum melongena*	Xiengkhouang	Poukoud	Kerng	19.40.05.53	103.05.38.73	1108	backyard	landrace
90	253452	30062810	Keuapom	COL/LAOS/2014/NIVTS/090	4-Dec	*Solanum melongena*	Xiengkhouang	Poukoud	Kerng	19.40.05.53	103.05.38.73	1108	backyard	landrace
91	253453	30062811	Keuabar	COL/LAOS/2014/NIVTS/091	4-Dec	*Solanum* sp.	Xiengkhouang	Poukoud	Kerng	19.40.05.53	103.05.38.73	1108	backyard	landrace
92	253454	30062812	Keuakob	COL/LAOS/2014/NIVTS/092	4-Dec	*Solanum melongena*	Xiengkhouang	Poukoud	Kerng	19.40.05.53	103.05.38.73	1108	backyard	landrace
93	253455	30062813	Keuahambear	COL/LAOS/2014/NIVTS/093	4-Dec	*Solanum melongena*	Xiengkhouang	Poukoud	Kerng	19.40.05.53	103.05.38.73	1108	backyard	landrace
94	253456	30062814	Keuapor	COL/LAOS/2014/NIVTS/094	4-Dec	*Solanum melongena*	Xiengkhouang	Poukoud	Kerng	19.40.05.53	103.05.38.73	1108	backyard	landrace
95	253457	30062815	Keuaviangchan	COL/LAOS/2014/NIVTS/095	4-Dec	*Solanum melongena*	Xiengkhouang	Poukoud	Kerng	19.40.05.53	103.05.38.73	1108	backyard	landrace
96	253458	30062816	Keuakhom	COL/LAOS/2014/NIVTS/096	4-Dec	*Solanum aethiopicum*	Xiengkhouang	Poukoud	Kerng	19.40.05.53	103.05.38.73	1108	backyard	landrace
97	253459	30062817	Keuayarb	COL/LAOS/2014/NIVTS/097	4-Dec	*Solanum melongena*	Xiengkhouang	Poukoud	Kerng	19.40.05.53	103.05.38.73	1108	backyard	landrace
98	253460	30062818	Keuakaopom	COL/LAOS/2014/NIVTS/098	4-Dec	*Solanum melongena*	Xiengkhouang	Poukoud	Pienglouang	19.32.36.83	103.04.54.88	1102	backyard	landrace
99	253461	30062819	Keuakarp	COL/LAOS/2014/NIVTS/099	4-Dec	*Solanum melongena*	Xiengkhouang	Parsai	Navhan	19.18.13.05	103.06.36.78	1116	backyard	landrace
100	253462	30062820	Keuapao	COL/LAOS/2014/NIVTS/100	4-Dec	*Solanum melongena*	Xiengkhouang	Parsai	Navhan	19.18.12.98	103.06.36.74	1116	backyard	landrace
101	253463	30062821	Keuakom	COL/LAOS/2014/NIVTS/101	4-Dec	*Solanum melongena*	Xiengkhouang	Parsai	Navhan	19.18.13.05	103.06.36.78	1116	backyard	landrace
102	253464	30062822	Keuakom	COL/LAOS/2014/NIVTS/102	4-Dec	*Solanum macrocarpon*	Xiengkhouang	Parsai	Navhan	19.18.13.05	103.06.36.78	1116	backyard	landrace
103	253465	30062823	Keuakom	COL/LAOS/2014/NIVTS/103	4-Dec	*Solanum macrocarpon*	Xiengkhouang	Parsai	Nonghoy	19.17.37.19	103.07.33.43	1104	backyard	landrace
104	253466	30062824	Keuavham	COL/LAOS/2014/NIVTS/104	4-Dec	*Solanum melongena*	Xiengkhouang	Parsai	Nonghoy	19.17.37.19	103.07.33.43	1104	backyard	landrace
105	253467	30062825	Keuasifar	COL/LAOS/2014/NIVTS/105	4-Dec	*Solanum melongena*	Xiengkhouang	Parsai	Nonghoy	19.17.37.19	103.07.33.43	1104	backyard	landrace
106	253468	30062826	Keuakop	COL/LAOS/2014/NIVTS/106	4-Dec	*Solanum aethiopicum*	Xiengkhouang	Parsai	Nonghoy				village market	landrace
107	253469	30062827	Keuakop	COL/LAOS/2014/NIVTS/107	4-Dec	*Solanum aethiopicum*	Xiengkhouang	Parsai	Nonghoy				village market	landrace
108	253470	30062828	Keuakaobear	COL/LAOS/2014/NIVTS/108	5-Dec	*Solanum melongena*	Xiengkhouang	Nonghet	Sandone	19.34.29.18	103.57.29.75	1349	farmland	landrace
109	253471	30062829	Keuakaobear	COL/LAOS/2014/NIVTS/109	5-Dec	*Solanum melongena*	Xiengkhouang	Nonghet	Namkouang	19.30.04.28	103.58.31.43	1387	backyard	landrace
110	253472	30062830	Keuaheun	COL/LAOS/2014/NIVTS/110	5-Dec	*Solanum melongena*	Xiengkhouang	Nonghet	Namkouang	19.30.04.28	103.58.31.43	1387	backyard	landrace
111	253473	30062831	Keuakop	COL/LAOS/2014/NIVTS/111	5-Dec	*Solanum melongena*	Xiengkhouang	Nonghet	Namkouang	19.30.04.28	103.58.31.43	1387	backyard	landrace
112	253474	30062832	Keuakeun	COL/LAOS/2014/NIVTS/112	5-Dec	*Solanum melongena*	Xiengkhouang	Nonghet	Namkouang	19.30.04.28	103.58.31.43	1387	backyard	landrace

Table 3 (Continued).

Coll. No.	JP No.	Passport No.	Local name	JP Name	Date	*Genus and species*	Province/ State	District	Village	North latitude	East longitude	Altitude (m)	Source (Market name)	Status
113	253475	30062833	Keuakaobear	COL/LAOS/2014/NIVTS/113	5-Dec	*Solanum melongena*	Xiengkhouang	Nonghet	Nonghet tai	19.29.19.05	103.59.55.53	1354	backyard	landrace
114	253476	30062834	Keuakom	COL/LAOS/2014/NIVTS/114	5-Dec	*Solanum gilo*	Xiengkhouang	Nonghet	Nonghet tai	19.29.19.05	103.59.55.53	1354	backyard	landrace
115	253477	30062835	Keuakaobear	COL/LAOS/2014/NIVTS/115	5-Dec	*Solanum melongena*	Xiengkhouang	Nonghet	Nonghet tai	19.29.19.05	103.59.55.53	1354	farmland	landrace
116	253478	30062836	Keuakaobear	COL/LAOS/2014/NIVTS/116	5-Dec	*Solanum melongena*	Xiengkhouang	Nonghet	Nonghet tai	19.29.19.05	103.59.55.53	1354	backyard	landrace
117	253479	30062837	Keuayao	COL/LAOS/2014/NIVTS/117	6-Dec	*Solanum melongena*	Xiengkhouang	Kham	Partang	19.36.09.73	103.41.41.79	524	backyard	landrace
118	253480	30062838	Keuayao	COL/LAOS/2014/NIVTS/118	6-Dec	*Solanum melongena*	Xiengkhouang	Kham	Partang	19.36.09.73	103.41.41.79	524	backyard	landrace
119	253481	30062839	Keuaporm	COL/LAOS/2014/NIVTS/119	6-Dec	*Solanum melongena*	Xiengkhouang	Kham	Partang	19.36.09.73	103.41.41.79	524	backyard	landrace
120	253482	30062840	Keuakop	COL/LAOS/2014/NIVTS/120	6-Dec	*Solanum melongena*	Xiengkhouang	Kham	Partang	19.36.09.73	103.41.41.79	524	backyard	landrace
121	253483	30062841	Keua	COL/LAOS/2014/NIVTS/121	6-Dec	*Solanum melongena*	Xiengkhouang	Kham	Partang	19.36.09.73	103.41.41.79	524	backyard	landrace
122	253484	30062842	Keuapor	COL/LAOS/2014/NIVTS/122	6-Dec	*Solanum melongena*	Xiengkhouang	Kham	Partang	19.35.39.45	103.41.06.57	523	backyard	landrace
123	253485	30062843	Keualai	COL/LAOS/2014/NIVTS/123	6-Dec	*Solanum melongena*	Xiengkhouang	Kham	Partang	19.35.39.45	103.41.06.57	523	backyard	landrace
124	253486	30062844	Keuakiewyao	COL/LAOS/2014/NIVTS/124	6-Dec	*Solanum melongena*	Xiengkhouang	Kham	Kauy	19.37.15.80	103.34.03.04	603	backyard	landrace
125	253487	30062845	Keuayaolai	COL/LAOS/2014/NIVTS/125	6-Dec	*Solanum melongena*	Xiengkhouang	Kham	Kauy	19.37.15.80	103.34.03.04	603	backyard	landrace
126	253488	30062846	Keuavham	COL/LAOS/2014/NIVTS/126	6-Dec	*Solanum melongena*	Xiengkhouang	Kham	Lao	19.18.18.97	103.28.38.10	757	backyard	landrace
127	253489	30062847	Keuavham	COL/LAOS/2014/NIVTS/127	6-Dec	*Solanum melongena*	Xiengkhouang	Kham	Dantong	19.38.17.37	103.28.32.99	760	backyard	landrace
128	253490	30062848	Keua	COL/LAOS/2014/NIVTS/128	6-Dec	*Solanum melongena*	Xiengkhouang	Kham	Phonesa	19.35.43.35	103.26.17.18	1062	backyard	landrace
129	253491	30062849	Keuavham	COL/LAOS/2014/NIVTS/129	6-Dec	*Solanum melongena*	Xiengkhouang	Kham	Phonesa	19.35.43.35	103.26.17.18	1062	backyard	landrace
130	253492	30062850	Keuavham	COL/LAOS/2014/NIVTS/130	6-Dec	*Solanum melongena*	Xiengkhouang	Kham	Phonesa	19.36.26.55	103.26.40.20	1008	farmland	landrace
131	253493	30062851	Keua	COL/LAOS/2014/NIVTS/131	6-Dec	*Solanum melongena*	Xiengkhouang	Kham	Phonesa	19.36.26.55	103.26.40.20	1008	farmland	landrace
132	253494	30062852	Keuakom	COL/LAOS/2014/NIVTS/132	6-Dec	*Solanum macrocarpon*	Xiengkhouang	Kham	Phonesa	19.36.26.55	103.26.40.20	1008	farmland	landrace
133	253495	30062853	Keuakao	COL/LAOS/2014/NIVTS/133	6-Dec	*Solanum melongena*	Xiengkhouang	Kham	Phonesa	19.36.26.55	103.26.40.20	1008	farmland	landrace
134	253496	30062854		COL/LAOS/2014/NIVTS/134	5-Dec	*Capsicum* sp.	Xiengkhouang	Nonghet	Nonghet tai	19.29.19.05	103.59.55.53	1354	farmland	landrace

Photo 1. Discussion about the survey with the director of the Department of Agriculture and Forestry (DOA) of Houaphan.

Photo 2. Eggplant growing in a backyard in Sam Neua village (Collection No. 4).

Photo 3. Raw vegetables, including eggplant fruits on a dish.

Photo 4. Various vegetables, including eggplant fruits in a market at Pork village.

Photo 5. Car rented during the survey and guesthouse at Houamung village.

Photo 6. Mature fruits of eggplant sold in a market at Soplao village.

Photo 7. Smoked eggplant fruits for preservation of seeds at Kangkao village (Nos. 65 to 67).

Photo 8. Interviewing local people to learn about the presence of eggplant at Longang village.

Photo 9. Discussion about the survey with the deputy of crop section of the DOA of Xiengkhouang.

Photo 10. Fruit of *S. aethiopicum* collected at Tern village (No. 73).

Photo 11. Organic cultivation of leafy vegetables at Tern village.

Photo 12. Spineless eggplant growing at Yon village (No. 77).

Photo 13. Fruit of eggplant collected at Mon village (No. 79).

Photo 14. Regional cuisine using skin of mature eggplant and flower of banana in farmer's house at Nongnam village.

Photo 15. Interviewing local people to learn about the presence of eggplants in farmer's house at Nongnam village.

Photo 16. Women of Hmong tribe dressed up in ceremonial robes because of a New Year celebration for the tribe at Nongnam village.

Photo 17. Wild species related to *S. melongena* at Kerng village (No. 91).

Photo 18. Fruit and flower of eggplant collected at Kerng village (No. 94).

Photo 19. Fruit of *S. macrocarpon* collected at Navhan village (No. 102).

Photo 20. Fruit of eggplant collected at Partang village (Nos. 118 & 119).

Photo 21. Using photos in interviews to learn about the presence of eggplants at Phonesa village.

Photo 22. Survey of eggplants in an upland rice field at Phonesa village.

Photo 23. A morning market at Phon Savan.

Photo 24. Brief report of the survey to the director of the HRC.