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Original Paper

Collaborative Exploration of *Capsicum* and *Solanum* Genetic Resources in Northern Vietnam

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Summary

Several explorations from the Plant Genetic Resources in Asia project have been implemented in Vietnam since 2014, through a collaborative effort between the National Agriculture and Food Research Organization (NARO) and the Vietnamese Academy of Agricultural Plant Resources Center (PRC). As part of the project, we mainly explored and collected Capsicum and Solanum plant genetic resources in Northern Vietnam from November 22 to December 4, 2022. We visited the Bat Xat district in the Lao Cai province and Van Chan district in Yen Bai province, where we encountered eight distinct ethnic groups, such as the H' Mong and Thai groups. Consequently, we collected a total of 95 accessions from the storage, backyards, and fields of farmers or local markets. These accessions included 71 Solanaceae (58 *Capsicum* spp. and 13 *Solanum* spp.), 12 Fabaceae, 8 Cucurbitaceae, and 4 others. Focusing on the collected *Capsicum* accessions, we observed that *Capsicum frutescens* L. was the most dominant species in Northern Vietnam, regardless of differences in the ethnic groups present. This species was mainly utilized as a pungent spice for self-consumption, although several commercial fields were also observed. Regarding the *Solanum* accessions, local people were revealed to not only eat *Solanum melongena* L. but also its relatives, such as *Solanum nigrum* L. and *Solanum trilobatum* L. In contrast, they hardly utilized *Solanum torvum* Sw. Regarding the collected plant genetic resources, half of the seeds were preserved in PRC, while the subsets will be transferred to the Gene Bank in NARO under a material transfer agreement.

KEY WORDS: Plant genetic resources, Vietnam, Chili pepper, Eggplant

Introduction

Because plant genetic resources (PGRs) are crucial for further breeding and genetic analysis progress, their genetic diversity must be preserved and maintained. Unfortunately, several crises, including modernization, variety standardization, and global warming, have led to the disappearance of PGRs. The Plant Genetic Resources in Asia (PGRAsia) project, an attempt for PGR conservation, was launched in 2014 through a collaborative effort between the National Agriculture and Food Research Organization (NARO) and gene banks in several Southeast Asian countries. The primary objective of the PGRAsia project is to facilitate the utilization of PGRs, resulting in numerous collaborative explorations and collections in countries such as Vietnam, Laos, Cambodia, Nepal, Myanmar, and Kirghiz. In Vietnam, PGRs have been explored since 2014, with over 500 accessions having been collected in its northern and central areas (Fujito *et al*. 2018; Kami *et al*. 2019; Kawazu *et al*. 2017; Shimomura *et al*. 2016; Sugita *et al*. 2020; Sugiyama *et al.* 2015; Tran *et al*. 2021). In Northern Vietnam, two explorations were respectively conducted in 2014 and 2015 (Sugiyama *et al*. 2015; Shimomura *et al*. 2016), mainly focused on amaranths (*Amaranthus* spp.) and Cucurbitaceae plants, such as pumpkin (*Cucurbita moschata* Duchesne ex Poir.), cucumber (*Cucumis sativus* L.), and melon (*Cucumis melo* L.). Furthermore, Tran *et al*. (2021) conducted the first exploration in this area focused on Solanaceae plants such as chili peppers (*Capsicum* spp.) and eggplant (*Solanum* spp.). The authors remarkably also collected a chili pepper accession belonging to *Capsicum baccatum* L., which is rarely observed in Southeast Asian countries. This finding highlighted the area's potential for diverse utilization of Solanaceae plants, raising expectations of encountering and collecting various kinds of PGRs. Thus, in the present study, we aimed to further investigate and collect *Capsicum* and *Solanum* PGRs in Northern Vietnam by exploring the Bat Xat district in Lao Cai province and Van Chan district in Yen Bai province in 2022.

Methods

The main focus of the present survey was exploring *Capsicum* and *Solanum* PGRs in Northern Vietnam, from November 22 to December 11, 2022 (Table 1). We utilized two cars for transportation, visiting two specific regions: the Bat Xat district in Lao Cai province and Van Chan district in Yen Bai province. During the survey, we diligently collected both seed and fruit samples from various sources, including the storage, backyards, and commercial fields of farmers as well as local markets. To identify the species of each accession, we initially relied on the morphological characteristics of the plants, corollas, fruits, and seeds. The identification of *Capsicum* spp. was conducted based on their corollas. *Capsicum annuum* L. and *Capsicum frutescens* L. were distinguished by their white and light green colored corollas, respectively. Furthermore, *C. baccatum* was differentiated from other species owing to the presence of yellow spots on its white corolla. To accurately identify *Solanum* spp. and Cucurbitaceae plants, we primarily relied on the overall appearance of the plants and traits exhibited by their fruits. In contrast, Fabaceae accessions were identified based on the distinctive traits of their seeds. To complement our

Table 1. Itinerary plan followed during the 2022 survey in Northern Vietnam

Date	Day	Itinerary	Stay
22-Nov	Tue	Nagoya 10:15 (VN347) -- 13:55 Hanoi	Hanoi
23-Nov	Wed	Hanoi -- Lao Cai	Lao Cai
24-Nov	Thu	Lao Cai -- Bat Xat (Ban Vuoc commune -- Phin Ngan commune)	Bat Xat
25-Nov	Fri	Bat Xat (Trinh Tuong commune -- Y Ty commune)	Y Ty
26-Nov	Sat	Visit local morning market in Y Ty commune -- Lao Cai	Lao Cai
27-Nov	Sun	Lao Cai	Lao Cai
28-Nov	Mon	Lao Cai -- Yen Bai -- Van Chan (Suoi Giang commune)	Van Chan
29-Nov	Tue	Van Chan (Tu Le commune -- Nam Lanh commune)	Van Chan
30-Nov	Wed	Van Chan (Cat Thinh commune)	Van Chan
1-Dec	Thu	Van Chan (Binh Thuan commune -- An Luong commune)	Van Chan
2-Dec	Fri	Van Chan -- Hanoi	Hanoi
3-Dec	Sat	Visit Plant Resources Center (PRC) in Hanoi	Hanoi
4-Dec	Sun	Hanoi 25:50 (VN346) -- 7:00 Nagoya (Next morning)	

findings, we conducted interviews with local farmers to gather valuable information regarding the local names, utilization, and cultivation practices corresponding to each accession. Additionally, we meticulously recorded the details of each collection site, including place name, latitude, longitude, and altitude. To ensure precise measurements were taken, we employed Garmin eTrex20J GPS technology (Garmin International Inc., Olathe, KS, USA).

Results

From our exploration of the Bat Xat district in Lao Cai province and Van Chan district in Yen Bai province, both located in Northern Vietnam, we collected a total of 95 accessions. These accessions comprised 58 chili peppers (*Capsicum* spp.), 13 eggplants (*Solanum* spp.), 12 Fabaceae crops, 8 Cucurbitaceae crops, and 4 others (Table 2). Half of the collected seeds were transferred to the PRC in Vietnam; the remaining half of the seeds will be introduced to the Gene Bank in NARO under a material transfer agreement. The complete list of collected accessions is available in Table 3, while the pictures of all samples are provided at the end of this paper.

Exploration sites

Fig. 1 illustrates the routes taken during the present exploration, along with the collection sites. Our journey commenced in the Bat Xat district, located in Lao Cai province, which shares a border with Yunnan province in China. On November 24‐26, we explored four communes: Ban Vuoc, Phin Ngan, Trinh Tuong, and Y Ty. On November 28, we proceeded to Van Chan district in Yen Bai province, visiting six communes—Suoi Giang, Tu Le, Nam Lanh, Cat Thinh, Binh Thuan, and An Luong—concluding our exploration on December 1. The regions we explored primarily had a tropical monsoon climate and mountainous areas (Photo 1). The altitudes in these areas varied significantly, ranging from 87 to 1,524 m above sea level. Particularly, the Y Ty commune stood at an elevation exceeding 1,000 m, where dense fog was occasionally observed. Numerous

Table 2. Samples collected during the 2022 survey in Northern Vietnam

Family	Genus	Species	The number of collected samples		
			Bat Xat	Van Chan	Total
Solanaceae	*Capsicum*	*annuum*	1	4	5
		baccatum		3	3
		frutescens	22	28	50
	Solanum	*melongena*	3	7	10
		nigrum		1	1
		torvum	1		1
		trilobatum	1		1
Fabaceae	*Arachis*	*hypogaea*	2		2
	Glycine	*max*	2		2
	Phaseolus	*vulgaris*	1		1
	Vigna	*angularis*	2		2
		umbellata		2	2
		unguiculata cv-gr. Unguiculata	1		1
		unguiculata cv-gr. Sesquipedalis	2		2
Cucurbitaceae	*Cucumis*	*sativus*		1	1
	Benincasa	*hispida*		1	1
	Cucurbita	*moschata*		3	3
	Luffa	*cylindrica*	1		1
	Momordica	*charantia*	1	1	2
Other	*Brassica*	spp.	1	1	2
	Fagopyrum	*cymosum*	1		1
	Lactuca	*indica*	1		1

paddy rice fields were observed on the basin and slope of the mountains, while maize and banana cultivations were present on the steep slopes.

During our exploration, we encountered eight distinct ethnic groups, each residing in the communes shown in Fig. 1. These ethnic groups dressed in their traditional attire (Photo 2) and sometimes communicated in their native language. As a result, the local names assigned to the collected accessions varied significantly, as listed in Table 3. We mainly gathered samples from

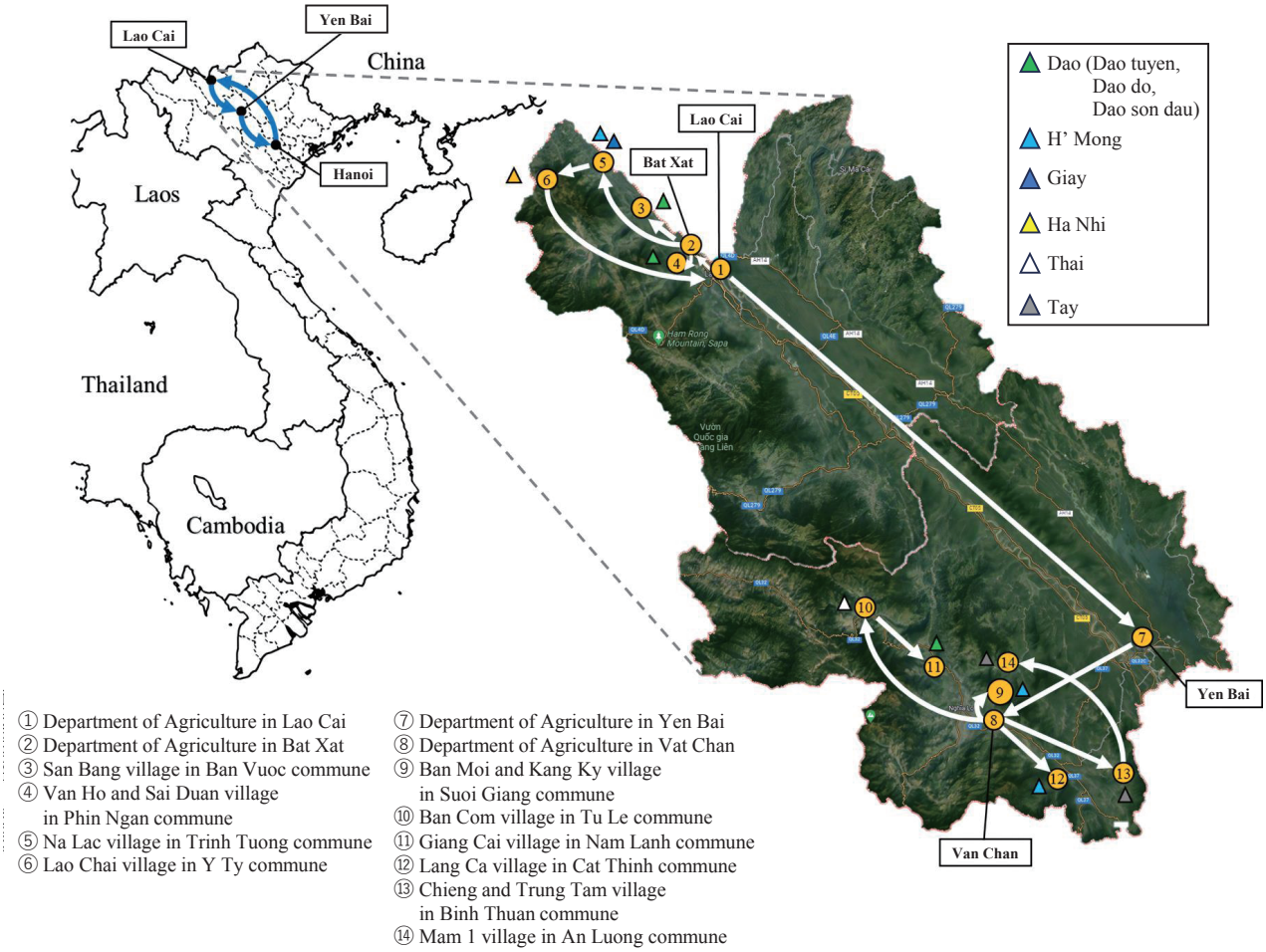

Fig. 1. Exploration routes and sites (Lao Cai and Yen Bai provinces) in Northern Vietnam. White arrows and yellow circles represent exploration routes and visited sites, respectively. Numeral characters inside yellow circles correspond to legend numbers. Colored triangles represent the ethnic groups who live in each collection site.

Photo 1. Mountainous area in Van Chan.

Photo 2. Traditional clothes of H' Mong group (left) and Dao son dau group (right).

backyards as we observed variations in the scale and layout of these gardens among the ethnic groups. For example, the Dao Tuyen, Dao son dau, H' Mong, Giay, Thai, and Tay groups tended to have medium to large home gardens that were directly connected to their houses. These were cultivated with a wide array of leafy, fruit, and root vegetables (Photo 3). Particularly, some Thai farmers also maintained commercial farms adjacent to their homes. Conversely, the Dao do and Ha Nhi groups hardly had such gardens and instead typically had small yards around their houses. These yards were mainly used for cultivating a limited selection of fruit vegetables, such as chili peppers, eggplants, and bitter gourds, for personal consumption. However, both groups engaged in agriculture on larger fields located on the mountain slopes, away from their residences (Photo 4). Additionally, we visited the local morning market conducted by the Ha Nhi group in Y Ty commune (Photo 5), where local women sold landraces of vegetables, beans, mushrooms, and edible insects mainly derived from the Y ty commune. Interestingly, *Balanophora* spp., a type of parasitic plant, and medicinal plants such as *Angelica* spp. were also sold there.

Photo 3. Large home garden observed in Tay group living region (An Luong in Van Chan).

Photo 4. Upland commercial field on the mountain slope in the Dao du group living region (Phin Ngan in Bat Xat).

Collected plant genetic resources

1. Chili peppers

The 58 accessions of chili peppers were morphologically classified into *C. annuum* (5), *C. baccatum* (3), and *C. frutescens* (50). *C. frutescens* was the major species in Northern Vietnam, with three types of fruit morphology broadly observed. The first type had small (under 2-cm long) and spindle-shaped fruits, represented by Nos. 44, 72, and 73. Most of them showed light or deep green colors at immature stages and red or orange colors at mature stages. The second type had elongated fruits (3- to 4-cm long), as shown in No. 48, with a similar fruit color to that of the first type. Conversely, the third type had stocky and spindle-shaped fruits, such as Nos. 7, 20, and 54. The fruits in this category were larger than those of the first type, and their immature stages showed white or light green coloration. Moreover, we observed three unique accessions (Nos. 80, 81, and 83) in the Binh Thuan commune, which showed cluster-like flowering habits due to a short internode length (Photo 6). While this trait resembles the fasciculate trait observed in *C. annuum* (Elitzur *et al.* 2009), the shortening level of the internodes observed in the present study was relatively lower.

C. frutescens accessions were mainly cultivated in backyards (Photo 7) for self-consumption and sometimes commercially cultivated in farm fields on the mountain slopes (Photo 4). According to local farmers, their seeds were directly sown on the ground of backyards or farm fields from February to March (dry season). Afterward, the seedling was transplanted and the fruits were harvested from June onwards (rainy season), after which the plants remained planted for two or three years.

Photo 5. Local morning market of the Ha Nhi group in Y ty.

Hardly any of the local farmers applied pesticides or fertilizers in their personal cultivations, but chemical or organic fertilizers did seem to be utilized in commercial cultivation. Simultaneously, we also observed that *C. frutescens* plants grew naturally in the back of houses, with local farmers not actively recognizing them. Regarding their utilization, dried and fresh fruits were widely sold and used as pungent spices (Photo 8). At the local market in the Y Ty commune, they were priced at 10,000 VND/kg (≒ 0.42 USD/kg). Additionally, fresh fruits were commonly preserved as salted pickles, sometimes combined with bamboo shoots and garlic.

Photo 6. Cluster-like flowering habits observed in No. 80 (*Capsicum frutescens*).

Photo 7. *Capsicum frutescens* plant cultivated in farmer's backyard.

Photo 8. Dried fruits (left) and pickles (right) of chili peppers (*Capsicum frutescens*) utilized in Northern Vietnam.

These pickles were used as seasoning for the popular Vietnamese rice noodle "Pho" (Photo 8).

In contrast with the abundance of *C. frutescens*, *C. annuum* was rarely observed in Northern Vietnam. Our interviews with local farmers revealed that they occasionally cultivated and utilized these plants like *C. frutescens*, and we confirmed their presence in some backyards. However, there was a preference for *C. frutescens* over *C. annuum* owing to its strong pungency and flavorful characteristics. This tendency was consistently observed in all the explored sites, regardless of the differences among the ethnic groups residing in those areas. We were further able to collect *C. baccatum* in the Nam Lanh and Binh Thuan communes. The three accessions (Nos. 63, 85, and 86) showed round shapes, with purple over white surfaces in immature fruits and red mature fruits. Local farmers cultivated them in their backyards as ornamental plants, even though they did not know where they derived from.

2. Eggplant

The 13 eggplant accessions included *Solanum melongena* L. (10), *Solanum nigrum* L. (1), *Solanum torvum* Sw. (1), and *Solanum trilobatum* L. (1). *S. melongena* with a rounded fruit shape was the predominant type observed in Northern Vietnam. These eggplants typically displayed green stripes on light green or white-colored pericarps during their immature stages, as exemplified by accessions No. 23 and 61. Later, these accessions showed white or purple flowers. However, we exceptionally collected one accession (No. 62) characterized by large ellipse-shaped fruits and light green skin with no stripes at the immature stage. Simultaneously, we also observed a unique accession (No. 30) in the Y Ty commune, with a light green fruit surface at immature stages and red color at mature stages. This accession was identified as a landrace of which similar types of eggplant were sold at the local market. *S. melongena* plants were mainly cultivated in backyards for self-consumption only (Photo 9); their cultivation method was highly similar to that of chili peppers, as described above. Local people consumed young eggplant fruits as pickles (Photo 10), in addition to using them for various culinary preparations such as fried dishes and soups.

Other than *S. melongena*, we observed *S. torvum* plants growing in the wild, reaching heights exceeding 4 m; however, these were never utilized in Northern Vietnam. Conversely, *S. nigrum* (No. 58) and *S. trilobatum* (No. 32) plants were cultivated in the farmer's backyards for self-consumption only. Locals utilized

the young leaves and shoots of *S. nigrum* as vegetables, while they used the mature fruits of *S. trilobatum* as soup ingredients, often served along with fermented soybeans.

3. Others

Regarding the Fabaceae accessions, we collected seed samples of two peanuts (*Arachis hypogaea* L.), two soybeans (*Glycine max* L.), one common bean (*Phaseolus vulgaris* L.), and seven *Vigna* spp. accessions, including adzuki beans (*V. angularis* Wild.), rice beans (*V. umbellata* Thunb.), and cowpeas (*V. unguiculata* L.). The interviews revealed that several *Vigna* spp. accessions were not cultivated in the backyards but instead in the upland field on the mountain slope. They were planted as companions to maize and then utilized as soup ingredients. As for Cucurbitaceae accessions, we collected three pumpkins (*Cucurbita moschata*), two bitter guards (*Momordica charantia* L.), and three others (cucumber, wax gourd, sponge gourd). The young fruits of these plants were mainly eaten after boiling; however, the mature fruits, flowers, young leaves, and stems of pumpkins were also utilized as soup ingredients.

In addition to these accessions, we also collected two *Brassica* spp., one Indian lettuce (*Lactuca indica* L.), and one perennial buckwheat (*Fagopyrum cymosum* Meisn.). The Indian lettuce was carelessly planted in the corner of farmer's home gardens in the Ban Vuoc commune only (No. 4); their young leaves were consumed either raw or boiled by local people. Conversely, the perennial buckwheat accession (No. 31) was collected from a farmer's backyard in the Y Ty commune, where their young leaves and stems were used as soup ingredients, but their seeds were not consumed. Perennial buckwheat was also observed in the Ban Vuoc, Trinh Tuong, Tu Le, Binh Thuan, and An Luong communes, although we did not collect these samples. In these locations, they were also planted in farmer's backyards, and their uses were the same as those described above.

Photo 9. *Solanum melongena* plant cultivated in farmer's backyard.

Photo 10. Eggplant pickles (*Solanum melongena*) utilized in Northern Vietnam.

Discussion

The field survey in Northern Vietnam allowed us to collect three different species of chili peppers: *C. annuum*, *C. frutescens*, and *C. baccatum*. *C. frutescens* was recorded as the major species in Northern Vietnam, regardless of the differences among the ethnic groups. Notably, the landrace of the *C. annuum* accession was particularly difficult to find, a trend consistent with previous PGR explorations in Central and Northern Vietnam (Sugita *et al*. 2020; Tran *et al*. 2021). Globally, five species of chili pepper are domesticated: *C. annuum*, *C. frutescens*, *Capsicum chinense* Jacq., *C. baccatum*, and *Capsicum pubescens* Ruiz & Pav. (Andrews 1995). *C. frutescens* is mainly cultivated in Southeast Asian countries (Yamamoto and Nawata 2005). Nevertheless, in these countries, such as Cambodia and Thailand, *C. annuum* is also frequently utilized. Thus, the distinct pattern of utilization limited to *C. frutescens* seems to be characteristic of Vietnam, which is ethnobotanically interesting. As mentioned in the results, the local people in Northern Vietnam appeared to prefer *C. frutescens* to *C. annuum*, which may be one reason for its specific utilization. A similar phenomenon was also observed in Northwest Myanmar, where the Naga ethnic group showed a specific preference for the *C. chinense* chili pepper because of its strong pungency and aroma (Kondo *et al*. 2020). Therefore, topical utilization of specific *Capsicum* spp. could be commonly observed in Southeast Asian countries. Furthermore, during the exploration, we collected unique *C. frutescens* accessions (Nos. 80, 81, and 83) that exhibited cluster-like flowering habits. This trait was previously reported in *C. annuum* only, making these accessions valuable PGRs for future breeding and genetic research. Cluster-like flowering is advantageous

for fruit harvesting because it leads to intensive fruit setting. Understanding the genetic factors underlying this trait may allow its introduction into *C. frutescens* cultivars like "Tabasco" and "Bird's eye."

Regarding other chili pepper species, we observed *C. baccatum* cultivations, which is consistent with previous findings (Tran *et al*. 2021) that also reported its cultivation in Northern Vietnam. Interestingly, the collected *C. baccatum* accessions were primarily utilized as ornamental plants in this region. *C. baccatum* is not commonly cultivated in most South Asian countries (Andrews 1995), which renders its propagation and cultivation in Northern Vietnam a matter of interest. The origin of these *C. baccatum* accessions could not be definitively determined during the exploration. However, these accessions may not be traditional varieties. The explored area in Bat Xat is near the border with Yunnan province in China, which has frequent foreign trade with Vietnam. As a result, it is plausible that commercial plant seeds of *C. baccatum* may have been distributed from this area, leading to their cultivation in Northern Vietnam. Similarly, when *C. baccatum* plants were observed during a previous exploration in Nepal, they were not traditional to the region and appeared to have been introduced from other countries by non-governmental organizations (Nemoto *et al*. 2016).

Regarding the *Solanum* accessions, we found that the most commonly utilized eggplants in Northern Vietnam were round-shaped, with white or light green surfaces. This shape and color are prevalent both in Vietnam and other Asian countries such as Cambodia, Thailand, and Laos, as reported by Matsunaga *et al*. (2015) and Miyatake *et al*. (2020). Contrary to the findings of Sugita *et al*. (2020) in Central Vietnam, we did not observe oval-shaped eggplants during our exploration. However, we did make an exceptional discovery during our collection, coming across a unique accession (No. 30) with a red-colored fruit surface. This phenotype is rarely seen in *S. melongena*, being more commonly observed in eggplant relatives *Solanum aethiopicum* L. and *Solanum amotapense* Svenson (Hilgenhof *et al*. 2023; Miyatake *et al*. 2020; Saito *et al*. 2017). This finding suggests that the accession we collected could represent novel pigmentation mechanisms; further genetic research should be conducted to better understand these.

Moreover, our survey revealed eggplant relatives such as *S. nigrum* and *S. trilobatum* are also eaten in Northern Vietnam. *S. nigrum* is known to contain toxic alkaloids and is traditionally utilized for medicinal purposes in China (Chen *et al*. 2022). Thus, the dietary habit of shoots and leaves as vegetables in Northern Vietnam may be crucial information regarding its utilization. Furthermore, a point of ethnobotanical interest is that *S. torvum* was neither cultivated nor utilized in this area, even though its fruits are usually used as vegetables in Cambodia and Laos (Kondo *et al*. 2019; Miyatake *et al*. 2020).

In conclusion, the present exploration in Northern Vietnam resulted in the collection of numerous *Capsicum* and *Solanum* PGRs. The mountainous terrain of the region, along with the variations in altitude and climate, creates diverse environmental conditions. As a consequence, the collected PGRs from this region are likely to possess a wide range of genetic potential for adaptation to these different environments. Hence, we expect them to be useful plant materials for further breeding programs and genetic analyses.

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北ベトナムにおけるトウガラシ・ナス属等植物遺伝資源の共同探索，2022 年

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和文摘要

本報告は農林水産省委託プロジェクト研究「海外植物遺伝資源の民間等への提供促進」において実施された，北ベトナムにおけるトウガラシ・ナス属等植物遺伝資源の共同探索・収集に関するものである．本探索は国立研究開発法人農業・食品産業技術総合研究機構（NARO）とベトナム農業科学アカデミー植物資源センター（PRC）との間で締結された共同研究協定に基づいて，2022 年 11 月 22 ～ 12 月 4 日に行われた．本探索では，北ベトナムのラオカイ省バサットおよびイェンバイ省バンチャンの山岳地域において，トウガラシ属・ナス属植物を主とする植物遺伝資源の探索を行った．当該地域はザオ族，モン族，タイ族等の少数民族が居住する地域であり，現地農家の生産圃場，裏庭，地元市場から，成熟果実および種子を収集した．収集の結果，ナス科 71 点（トウガラシ属 58 点，ナス属 13 点），マメ科 12 点，ウリ科 8 点，その他 4 点を合わせた合計 95 点の植物遺伝資源が収集された．トウガラシ属植物については，居住民族の差異によらず，*Capsicum frutescens* L. が最も多く栽培・利用されていた．一方、ナス属遺伝資源については、ナス（*Solanum melongena* L.）の他、近縁野生種であるイヌホオズキ（*S. nigrum* L.）と *S. trilobatum* L. の食用利用がみられたものの、スズメノナスビ（*S. torvum* Sw.）は利用されていなかった．ベトナム北部には収集された種子は NARO と PRC のジーンバンクに保存され，利用可能な遺伝資源として利用される．

Table 3. List of collected plant genetic resources in Northern Vietnam, 2022

JP No.	Individual No.	Date	Province	District	Commune	Village	Latitude	Longitude	Altitude (m)	Name	Local name	Collection place	Sample source	Tribe
288164	1	24-Nov	Lao Cai	Bat Xat	Ban Vuoc	San Bang	N22-35-49.6	E103-48-18.9	176	*Capsicum frutescens*	Mong mat	Backyard	Fresh fruit	Dao tuyen
288165	2	24-Nov	Lao Cai	Bat Xat	Ban Vuoc	San Bang	N22-35-49.6	E103-48-18.9	176	*Capsicum frutescens*	Mong mat	Backyard	Fresh fruit	Dao tuyen
288166	3	24-Nov	Lao Cai	Bat Xat	Ban Vuoc	San Bang	N22-35-49.6	E103-48-18.9	176	*Capsicum frutescens*	Mong mat	Backyard	Fresh fruit	Dao tuyen
288167	4	24-Nov	Lao Cai	Bat Xat	Ban Vuoc	San Bang	N22-35-49.6	E103-48-18.9	176	*Lactuca indica*	Giay tung pan	Backyard	Seed	Dao tuyen
288168	5	24-Nov	Lao Cai	Bat Xat	Ban Vuoc	San Bang	N22-35-49.6	E103-48-18.9	176	*Solanum melongena*	Ca dang	Backyard	Fresh fruit	Dao tuyen
288169	6	24-Nov	Lao Cai	Bat Xat	Phin Ngan	Van Ho	N22-29-25.8	E103-53-38.5	170	*Capsicum frutescens*	Pac chiu	Farm field	Fresh fruit	Dao do
288170	7	24-Nov	Lao Cai	Bat Xat	Phin Ngan	Van Ho	N22-29-25.8	E103-53-38.5	170	*Capsicum frutescens*	Pac chiu	Farm field	Fresh fruit	Dao do
288171	8	24-Nov	Lao Cai	Bat Xat	Phin Ngan	Van Ho	N22-29-25.8	E103-53-38.5	170	*Vigna unguiculata* cv-gr. Sesquipedalis	Top lai	Storage	Seed	Dao do
288172	9	24-Nov	Lao Cai	Bat Xat	Phin Ngan	Van Ho	N22-29-25.8	E103-53-38.5	170	*Brassica* spp.	Lay chai	Storage	Seed	Dao do
288173	10	24-Nov	Lao Cai	Bat Xat	Phin Ngan	Sai Duan	N22-29-10.4	E103-52-42.7	383	*Solanum torvum*	Gim pieu	Backyard	Fresh fruit	Dao do
288174	11	24-Nov	Lao Cai	Bat Xat	Phin Ngan	Sai Duan	N22-29-10.4	E103-52-42.7	383	*Capsicum frutescens*	Phan chiu	Backyard	Fresh fruit	Dao do
288175	12	24-Nov	Lao Cai	Bat Xat	Phin Ngan	Sai Duan	N22-29-10.6	E103-52-44.4	495	*Capsicum frutescens*	Phan chiu	Backyard	Fresh fruit	Dao do
288176	13	24-Nov	Lao Cai	Bat Xat	Phin Ngan	Sai Duan	N22-29-10.6	E103-52-44.4	495	*Capsicum frutescens*	Phan chiu	Backyard	Fresh fruit	Dao do
288177	14	24-Nov	Lao Cai	Bat Xat	Phin Ngan	Sai Duan	N22-29-10.6	E103-52-44.4	495	*Capsicum frutescens*	Phan chiu	Backyard	Fresh fruit	Dao do
288178	15	24-Nov	Lao Cai	Bat Xat	Phin Ngan	Sai Duan	N22-29-10.6	E103-52-44.4	495	*Capsicum frutescens*	Phan chiu	Backyard	Fresh fruit	Dao do
288179	16	24-Nov	Lao Cai	Bat Xat	Phin Ngan	Sai Duan	N22-29-10.6	E103-52-44.4	495	*Momordica charantia*	Peu tat nhai	Backyard	Fresh fruit	Dao do
288180	17	24-Nov	Lao Cai	Bat Xat	Phin Ngan	Sai Duan	N22-29-9.5	E103-52-42.2	466	*Capsicum frutescens*	Phan chiu	Backyard	Fresh fruit	Dao do
288181	18	24-Nov	Lao Cai	Bat Xat	Phin Ngan	Sai Duan	N22-29-9.5	E103-52-42.2	466	*Luffa cylindrica*	Lai ray	Backyard	Dry fruit	Dao do
288182	19	25-Nov	Lao Cai	Bat Xat	Trinh Tuong	Na Lac	N22-41-18.7	E103-43-30.8	170	*Vigna unguiculata* cv-gr. Sesquipedaris	To chac	Storage	Seed	H' Mong
288183	20	25-Nov	Lao Cai	Bat Xat	Trinh Tuong	Na Lac	N22-41-18.7	E103-43-30.8	170	*Capsicum frutescens*	Cua cho	Backyard	Fresh fruit	H' Mong
288184	21	25-Nov	Lao Cai	Bat Xat	Trinh Tuong	Na Lac	N22-41-18.7	E103-43-30.8	170	*Capsicum frutescens*	Cua cho	Backyard	Fresh fruit	H' Mong
288185	22	25-Nov	Lao Cai	Bat Xat	Trinh Tuong	Na Lac	N22-41-18.7	E103-43-30.8	170	*Capsicum frutescens*	Cua cho	Backyard	Fresh fruit	H' Mong
288186	23	25-Nov	Lao Cai	Bat Xat	Trinh Tuong	Na Lac	N22-41-25.4	E103-43-29	192	*Solanum melongena*	Lu	Backyard	Fresh fruit	H' Mong
288187	24	25-Nov	Lao Cai	Bat Xat	Trinh Tuong	Na Lac	N22-41-25.4	E103-43-29	192	*Capsicum frutescens*	Cua cho	Backyard	Fresh fruit	H' Mong
288188	25	25-Nov	Lao Cai	Bat Xat	Trinh Tuong	Na Lac	N22-40-58.7	E103-44-27.5	115	*Capsicum frutescens*	Mac man	Backyard	Fresh fruit	Giay
288189	26	25-Nov	Lao Cai	Bat Xat	Trinh Tuong	Na Lac	N22-40-58.7	E103-44-27.5	115	*Capsicum frutescens*	Mac man	Storage	Seed	Giay
288190	27	25-Nov	Lao Cai	Bat Xat	Trinh Tuong	Na Lac	N22-40-58.7	E103-44-27.5	115	*Glycine max*	Tua na	Storage	Seed	Giay
288191	28	25-Nov	Lao Cai	Bat Xat	Trinh Tuong	Na Lac	N22-40-58.7	E103-44-27.5	115	*Arachis hypogaea*	Tua nam	Storage	Seed	Giay
288192	29	25-Nov	Lao Cai	Bat Xat	Y Ty	Lao Chai	N22-39-36.1	E103-36-7.7	1,308	*Capsicum frutescens*	Lap pia	Farm field	Fresh fruit	Ha Nhi
288193	30	25-Nov	Lao Cai	Bat Xat	Y Ty	Lao Chai	N22-39-36.1	E103-36-7.7	1,308	*Solanum melongena*	Ghe do	Farm field	Fresh fruit	Ha Nhi
288194	31	25-Nov	Lao Cai	Bat Xat	Y Ty	Lao Chai	N22-39-29.6	E103-36-13.3	1,304	*Fagopyrum cymosum*	Che ma pa	Backyard	Seed	Ha Nhi
288195	32	25-Nov	Lao Cai	Bat Xat	Y Ty	Lao Chai	N22-39-29.6	E103-36-13.3	1,304	*Solanum trilobatum*	Xi ha	Backyard	Fresh fruit	Ha Nhi
288196	33	25-Nov	Lao Cai	Bat Xat	Y Ty	Lao Chai	N22-39-26.0	E103-36-13.2	1,319	*Vigna angularis*	No chuy	Backyard	Seed	Ha Nhi
288197	34	25-Nov	Lao Cai	Bat Xat	Y Ty	Lao Chai	N22-39-26.0	E103-36-13.2	1,319	*Vigna unguiculata* cv-gr. Unguiculata	No chuy	Backyard	Seed	Ha Nhi
288198	35	25-Nov	Lao Cai	Bat Xat	Y Ty	Lao Chai	N22-39-26.0	E103-36-13.2	1,319	*Arachis hypogaea*	Lo tu xu	Backyard	Seed	Ha Nhi
288199	36	25-Nov	Lao Cai	Bat Xat	Y Ty	Lao Chai	N22-39-26.0	E103-36-13.2	1,319	*Glycine max*	No xu	Backyard	Seed	Ha Nhi
288200	37	26-Nov	Lao Cai	Bat Xat	Y Ty	Y Ty market	N22-39-26.8	E103-36-45.1	1,524	*Capsicum frutescens*	Ot	Market	Fresh fruit	Kinh
288201	38	26-Nov	Lao Cai	Bat Xat	Y Ty	Y Ty market	N22-39-26.8	E103-36-45.1	1,524	*Capsicum frutescens*	Cua cho	Market	Dry fruit	Ha Nhi
288202	39	26-Nov	Lao Cai	Bat Xat	Y Ty	Y Ty market	N22-39-26.8	E103-36-45.1	1,524	*Capsicum frutescens*	Cua cho	Market	Fresh fruit	Ha Nhi
288203	40	26-Nov	Lao Cai	Bat Xat	Y Ty	Y Ty market	N22-39-26.8	E103-36-45.1	1,524	*Capsicum annuum*	Cua cho	Market	Fresh fruit	Ha Nhi
288204	41	26-Nov	Lao Cai	Bat Xat	Y Ty	Y Ty market	N22-39-26.8	E103-36-45.1	1,524	*Capsicum frutescens*	Cua cho	Market	Fresh fruit	Ha Nhi
288205	42	26-Nov	Lao Cai	Bat Xat	Y Ty	Y Ty market	N22-39-26.8	E103-36-45.1	1,524	*Vigna angularis*	No chuy	Market	Seed	Ha Nhi

Table 3. (Continued).

JP No.	Individual No.	Date	Province	District	Commune	Village	Latitude	Longitude	Altitude (m)	Name	Local name	Collection place	Sample source	Tribe
288206	43	26-Nov	Lao Cai	Bat Xat	Y Ty	Y Ty market	N22-39-26.8	E103-36-45.1	1,524	*Phaseolus vulgaris*	No pe	Market	Seed	Ha Nhi
288207	44	28-Nov	Yen Bai	Van Chan	Suoi Giang	Ban Moi	N21-37-49.5	E104-35-38.7	1,016	*Capsicum frutescens*	Ho cho	Backyard	Fresh fruit	H' Mong
288208	45	28-Nov	Yen Bai	Van Chan	Suoi Giang	Ban Moi	N21-37-55.7	E104-35-46.9	1,042	*Capsicum frutescens*	Ho cho	Backyard	Fresh fruit	H' Mong
288209	46	28-Nov	Yen Bai	Van Chan	Suoi Giang	Ban Moi	N21-37-55.7	E104-35-46.9	1,042	*Capsicum frutescens*	Ho cho	Backyard	Fresh fruit	H' Mong
288210	47	28-Nov	Yen Bai	Van Chan	Suoi Giang	Kang Ky	N21-36-36.9	E104-35-14.0	867	*Capsicum frutescens*	Ho cho	Backyard	Fresh fruit	H' Mong
288211	48	28-Nov	Yen Bai	Van Chan	Suoi Giang	Kang Ky	N21-36-36.9	E104-35-14.0	867	*Capsicum frutescens*	Ho cho	Backyard	Fresh fruit	H' Mong
288212	49	28-Nov	Yen Bai	Van Chan	Suoi Giang	Kang Ky	N21-36-36.9	E104-35-14.0	867	*Vigna umbellata*	Tau	Storage	Seed	H' Mong
288213	50	28-Nov	Yen Bai	Van Chan	Suoi Giang	Kang Ky	N21-36-36.9	E104-35-14.0	867	*Cucurbita moschata*	Tau plang	Storage	Seed	H' Mong
288214	51	29-Nov	Yen Bai	Van Chan	Tu Le	Ban Com	N21-47-41.9	E104-18-2.9	671	*Momordica charantia*	Ma boi kbum	Backyard	Fresh fruit	Thai
288215	52	29-Nov	Yen Bai	Van Chan	Tu Le	Ban Com	N21-47-41.9	E104-18-2.9	671	*Capsicum annuum*	Mac ot	Backyard	Fresh fruit	Thai
288216	53	29-Nov	Yen Bai	Van Chan	Tu Le	Ban Com	N21-47-41.9	E104-18-2.9	671	*Capsicum frutescens*	Mac ot	Backyard	Fresh fruit	Thai
288217	54	29-Nov	Yen Bai	Van Chan	Tu Le	Ban Com	N21-47-41.9	E104-18-2.9	671	*Capsicum frutescens*	Mac ot	Backyard	Fresh fruit	Thai
288218	55	29-Nov	Yen Bai	Van Chan	Tu Le	Ban Com	N21-47-36.5	E104-18-11.0	635	*Capsicum frutescens*	Mac ot	Backyard	Fresh fruit	Thai
288219	56	29-Nov	Yen Bai	Van Chan	Tu Le	Ban Com	N21-47-36.5	E104-18-11.0	635	*Capsicum frutescens*	Mac ot	Backyard	Fresh fruit	Thai
288220	57	29-Nov	Yen Bai	Van Chan	Tu Le	Ban Com	N21-47-36.5	E104-18-11.0	635	*Capsicum frutescens*	Mac ot	Backyard	Fresh fruit	Thai
288221	58	29-Nov	Yen Bai	Van Chan	Tu Le	Ban Com	N21-47-36.5	E104-18-11.0	635	*Solanum nigrum*	Phac tanh	Backyard	Fresh fruit	Thai
288222	59	29-Nov	Yen Bai	Van Chan	Tu Le	Ban Com	N21-47-36.5	E104-18-10.3	631	*Solanum melongena*	Ma khua noi	Backyard	Fresh fruit	Thai
288223	60	29-Nov	Yen Bai	Van Chan	Tu Le	Ban Com	N21-47-36.5	E104-18-10.3	631	*Capsicum frutescens*	Ma ot	Backyard	Fresh fruit	Thai
288224	61	29-Nov	Yen Bai	Van Chan	Tu Le	Ban Com	N21-47-42.4	E104-18-5.1	640	*Solanum melongena*	Mac khua lao	Backyard	Fresh fruit	Thai
288225	62	29-Nov	Yen Bai	Van Chan	Tu Le	Ban Com	N21-47-42.4	E104-18-5.1	640	*Solanum melongena*	Mac khua luong	Storage	Seed	Thai
288226	63	29-Nov	Yen Bai	Van Chan	Nam Lanh	Giang Cai	N21-40-31.4	E104-27-4.9	416	*Capsicum baccatum*	Phan chiu	Backyard	Fresh fruit	Dao son dau
288227	64	29-Nov	Yen Bai	Van Chan	Nam Lanh	Giang Cai	N21-40-31.4	E104-27-4.9	416	*Capsicum annuum*	Phan chiu	Backyard	Fresh fruit	Dao son dau
288228	65	29-Nov	Yen Bai	Van Chan	Nam Lanh	Giang Cai	N21-40-31.4	E104-27-4.9	416	*Capsicum frutescens*	Phan chiu	Backyard	Fresh fruit	Dao son dau
288229	66	29-Nov	Yen Bai	Van Chan	Nam Lanh	Giang Cai	N21-40-31.4	E104-27-4.9	416	*Capsicum frutescens*	Phan chiu	Backyard	Fresh fruit	Dao son dau
288230	67	29-Nov	Yen Bai	Van Chan	Nam Lanh	Giang Cai	N21-40-31.4	E104-27-4.9	416	*Cucurbita moschata*	Phan nhung	Storage	Seed	Dao son dau
288231	68	29-Nov	Yen Bai	Van Chan	Nam Lanh	Giang Cai	N21-40-31.4	E104-27-4.9	416	*Solanum melongena*	Kia	Backyard	Seed	Dao son dau
288232	69	29-Nov	Yen Bai	Van Chan	Nam Lanh	Giang Cai	N21-40-32.3	E104-27-9.4	418	*Capsicum frutescens*	Phan nhung	Backyard	Fresh fruit	Dao son dau
288233	70	29-Nov	Yen Bai	Van Chan	Nam Lanh	Giang Cai	N21-40-32.3	E104-27-9.4	418	*Capsicum frutescens*	Phan nhung	Backyard	Fresh fruit	Dao son dau
288234	71	29-Nov	Yen Bai	Van Chan	Nam Lanh	Giang Cai	N21-40-32.3	E104-27-9.4	418	*Cucumis sativus*	Qua	Storage	Seed	Dao son dau
288235	72	30-Nov	Yen Bai	Van Chan	Cat Thinh	Lang Ca	N21-26-19.7	E104-43-7.1	335	*Capsicum frutescens*	Ho cho	Backyard	Fresh fruit	H' Mong
288236	73	30-Nov	Yen Bai	Van Chan	Cat Thinh	Lang Ca	N21-26-12.5	E104-43-3.2	332	*Capsicum frutescens*	Ho cho	Backyard	Fresh fruit	H' Mong
288237	74	30-Nov	Yen Bai	Van Chan	Cat Thinh	Lang Ca	N21-26-23.8	E104-43-12.6	333	*Capsicum frutescens*	Ho cho	Backyard	Fresh fruit	H' Mong
288238	75	30-Nov	Yen Bai	Van Chan	Cat Thinh	Lang Ca	N21-26-23.8	E104-43-12.6	333	*Solanum melongena*	Lu	Storage	Seed	H' Mong
288239	76	30-Nov	Yen Bai	Van Chan	Cat Thinh	Lang Ca	N21-26-23.8	E104-43-12.6	333	*Cucurbita moschata*	Tau dang	Storage	Seed	H' Mong
288240	77	30-Nov	Yen Bai	Van Chan	Cat Thinh	Lang Ca	N21-26-23.8	E104-43-12.6	333	*Brassica* spp.	Rau rua	Storage	Seed	H' Mong
288241	78	30-Nov	Yen Bai	Van Chan	Cat Thinh	Lang Ca	N21-26-15.4	E104-43-6.1	362	*Vigna umbellata*	Tau	Storage	Seed	H' Mong
288242	79	1-Dec	Yen Bai	Van Chan	Binh Thuan	Chieng	N21-27-26.6	E104-51-54.6	142	*Capsicum frutescens*	Mac ot	Backyard	Fresh fruit	Tay
288243	80	1-Dec	Yen Bai	Van Chan	Binh Thuan	Trung Tam	N21-27-0.5	E104-51-45.3	102	*Capsicum frutescens*	Mac ot	Backyard	Fresh fruit	Tay
288244	81	1-Dec	Yen Bai	Van Chan	Binh Thuan	Trung Tam	N21-27-0.5	E104-51-45.3	102	*Capsicum frutescens*	Mac ot	Backyard	Fresh fruit	Tay
288245	82	1-Dec	Yen Bai	Van Chan	Binh Thuan	Trung Tam	N21-27-0.5	E104-51-45.3	102	*Capsicum frutescens*	Mac ot	Backyard	Fresh fruit	Tay
288246	83	1-Dec	Yen Bai	Van Chan	Binh Thuan	Trung Tam	N21-26-59.8	E104-51-44.3	92	*Capsicum frutescens*	Mac ot	Backyard	Fresh fruit	Tay

Table 3. (Continued).

JP No.	Individual No.	Date	Province	District	Commune	Village	Latitude	Longitude	Altitude (m)	Name	Local name	Collection place	Sample source	Tribe
288247	84	1-Dec	Yen Bai	Van Chan	Binh Thuan	Trung Tam	N21-27-0.9	E104-51-46.0	93	*Capsicum frutescens*	Mac ot	Backyard	Fresh fruit	Tay
288248	85	1-Dec	Yen Bai	Van Chan	Binh Thuan	Trung Tam	N21-26-47.4	E104-51-28.4	87	*Capsicum baccatum*	Mac ot	Backyard	Fresh fruit	Tay
288249	86	1-Dec	Yen Bai	Van Chan	Binh Thuan	Trung Tam	N21-26-47.4	E104-51-28.4	87	*Capsicum baccatum*	Mac ot	Backyard	Fresh fruit	Tay
288250	87	1-Dec	Yen Bai	Van Chan	Binh Thuan	Trung Tam	N21-26-47.4	E104-51-28.4	87	*Capsicum frutescens*	Mac ot	Backyard	Fresh fruit	Tay
288251	88	1-Dec	Yen Bai	Van Chan	An Luong	Mam 1	N21-40-49.3	E104-36-32.0	124	*Capsicum frutescens*	Mac ot	Backyard	Fresh fruit	Tay
288252	89	1-Dec	Yen Bai	Van Chan	An Luong	Mam 1	N21-40-49.3	E104-36-32.0	124	*Capsicum frutescens*	Mac ot	Backyard	Fresh fruit	Tay
288253	90	1-Dec	Yen Bai	Van Chan	An Luong	Mam 1	N21-40-49.3	E104-36-32.0	124	*Capsicum annuum*	Mac ot	Backyard	Fresh fruit	Tay
288254	91	1-Dec	Yen Bai	Van Chan	An Luong	Mam 1	N21-40-49.3	E104-36-32.0	124	*Solanum melongena*	Mac khua khao	Backyard	Fresh fruit	Tay
288255	92	1-Dec	Yen Bai	Van Chan	An Luong	Mam 1	N21-40-46.2	E104-36-33.5	125	*Capsicum annuum*	Mac ot	Backyard	Fresh fruit	Tay
288256	93	1-Dec	Yen Bai	Van Chan	An Luong	Mam 1	N21-40-46.2	E104-36-33.5	125	*Capsicum frutescens*	Mac ot	Backyard	Fresh fruit	Tay
288257	94	1-Dec	Yen Bai	Van Chan	An Luong	Mam 1	N21-40-46.2	E104-36-33.5	125	*Solanum melongena*	Mac khua khao	Backyard	Fresh fruit	Tay
288258	95	1-Dec	Yen Bai	Van Chan	An Luong	Mam 1	N21-40-46.2	E104-36-33.5	125	*Benincasa hispida*	Mac phac	Storage	Fresh fruit	Tay

Photo of collected genetic resources samples

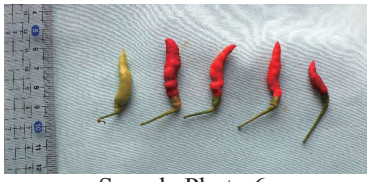
Sample Photo 1.
JP288164 (No. 1),
Capsicum frutescens

Sample Photo 2.
JP288165 (No. 2),
Capsicum frutescens

Sample Photo 3.
JP288166 (No. 3),
Capsicum frutescens

Sample Photo 4.
JP288167 (No. 4),
Lactuca indica

Sample Photo 5.
JP288168 (No. 5),
Solanum melongena



Sample Photo 6.
JP288169 (No. 6),
Capsicum frutescens

Sample Photo 7.
JP288170 (No. 7),
Capsicum frutescens

Sample Photo 8.
JP288171 (No. 8),
Vigna unguiculata cv-gr. Sesquipedalis

Sample Photo 9.
JP288172 (No. 9),
Brassica spp.

Sample Photo 10.
JP288173 (No. 10),
Solanum torvum

Sample Photo 11.
JP288174 (No. 11),
Capsicum frutescens

Sample Photo 12.
JP288175 (No. 12),
Capsicum frutescens

Sample Photo 13.
JP288176 (No. 13),
Capsicum frutescens

Sample Photo 14.
JP288177 (No. 14),
Capsicum frutescens

Sample Photo 15.
JP288178 (No. 15),
Capsicum frutescens

Sample Photo 16.
JP288179 (No. 16),
Momordica charantia

Sample Photo 17.
JP288180 (No. 17),
Capsicum frutescens

Sample Photo 18.
JP288181 (No. 18),
Luffa cylindrica

Sample Photo 19.
JP288182 (No. 19),
Vigna unguiculata cv-gr. Sesquipedalis

Sample Photo 20.
JP28818 (No. 20),
Capsicum frutescens

Sample Photo 21.
JP288184 (No. 21),
Capsicum frutescens

Sample Photo 22.
JP288185 (No. 22),
Capsicum frutescens

Sample Photo 23.
JP288186 (No. 23),
Solanum melongena

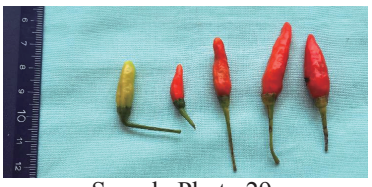
Sample Photo 24.
JP288187 (No. 24),
Capsicum frutescens

Sample Photo 25.
JP288188 (No. 25),
Capsicum frutescens

Sample Photo 26.
JP288189 (No. 26),
Capsicum frutescens

Sample Photo 27.
JP288190 (No. 27),
Glycine max

Sample Photo 28.
JP288191 (No. 28),
Arachis hypogaea



Sample Photo 29.
JP288192 (No. 29),
Capsicum frutescens

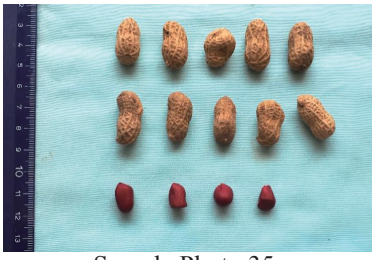
Sample Photo 30.
JP288193 (No. 30),
Solanum melongena

Sample Photo 31.
JP288194 (No. 31),
Fagopyrum cymosum

Sample Photo 32.
JP288195 (No. 32),
Solanum trilobatum

Sample Photo 33.
JP288196 (No. 33),
Vigna angularis

Sample Photo 34.
JP288197 (No. 34),
Vigna unguiculata cv-gr. Unguiculata



Sample Photo 35.
JP288198 (No. 35),
Arachis hypogaea

Sample Photo 36.
JP288199 (No. 36),
Glycine max

Sample Photo 37.
JP288200 (No. 37),
Capsicum frutescens

Sample Photo 38.
JP288201 (No. 38),
Capsicum frutescens

Sample Photo 39.
JP288202 (No. 39),
Capsicum frutescens

Sample Photo 40.
JP288203 (No. 40),
Capsicum annuum

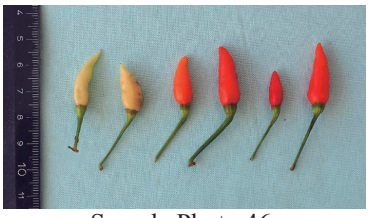
Sample Photo 41.
JP288204 (No. 41),
Capsicum frutescens

Sample Photo 42.
JP288205 (No. 42),
Vigna angularis

Sample Photo 43.
JP288206 (No. 43),
Phaseolus vulgaris

Sample Photo 44.
JP288207 (No. 44),
Capsicum frutescens

Sample Photo 45.
JP288208 (No. 45),
Capsicum frutescens

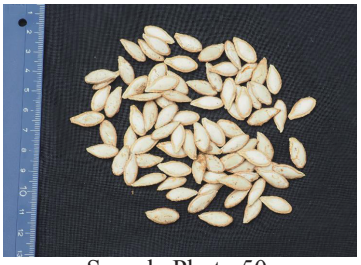


Sample Photo 46.
JP288209 (No. 46),
Capsicum frutescens

Sample Photo 47
JP288210 (No. 47),
Capsicum frutescens

Sample Photo 48.
JP288211 (No. 48),
Capsicum frutescens

Sample Photo 49.
JP288212 (No. 49),
Vigna umbellata



Sample Photo 50.
JP288213 (No. 50),
Cucurubita moschata

Sample Photo 51.
JP288215 (No. 52),
Capsicum annuum

Sample Photo 52.
JP288216 (No. 53),
Capsicum frutescens

Sample Photo 53.
JP288217 (No. 54),
Capsicum frutescens

Sample Photo 54.
JP288218 (No. 55),
Capsicum frutescens

Sample Photo 55.
JP288219 (No. 56),
Capsicum frutescens

Sample Photo 56.
JP288220 (No. 57),
Capsicum frutescens

Sample Photo 57.
JP288221 (No. 58),
Solanum nigrum

Sample Photo 58
JP288222 (No. 59),
Solanum melongena

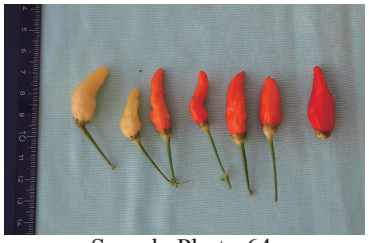
Sample Photo 59.
JP288223 (No. 60),
Capsicum frutescens

Sample Photo 60.
JP288224 (No. 61),
Solanum melongena

Sample Photo 61.
JP288225 (No. 62),
Solanum melongena

Sample Photo 62.
JP288226 (No. 63),
Capsicum baccatum

Sample Photo 63.
JP288227 (No. 64),
Capsicum annuum



Sample Photo 64.
JP288228 (No. 65),
Capsicum frutescens

Sample Photo 65.
JP288229 (No. 66),
Capsicum frutescens

Sample Photo 66.
JP288230 (No. 67),
Cucurbita moschata

Sample Photo 67.
JP288231 (No. 68),
Solanum melongena

Sample Photo 68.
JP288232 (No. 69),
Capsicum frutescens

Sample Photo 69.
JP288233 (No. 70),
Capsicum frutescens

Sample Photo 70.
JP288234 (No. 71),
Cucumis sativus

Sample Photo 71.
JP288235 (No. 72),
Capsicum frutescens

Sample Photo 72.
JP288236 (No. 73),
Capsicum frutescens

Sample Photo 73.
JP288237 (No. 74),
Capsicum frutescens

Sample Photo 74.
JP288238 (No. 75),
Solanum melongena

Sample Photo 75.
JP288239 (No. 76),
Cucurbita moschata

Sample Photo 76.
JP288240 (No. 77),
Brassica spp.

Sample Photo 77.
JP288241 (No. 78),
Vigna umbellata

Sample Photo 78.
JP288242 (No. 79),
Capsicum frutescens

Sample Photo 79.
JP288243 (No. 80),
Capsicum frutescens

Sample Photo 80.
JP288244 (No. 81),
Capsicum frutescens

Sample Photo 81.
JP288245 (No. 82),
Capsicum frutescens

Sample Photo 82.
JP288246 (No. 83),
Capsicum frutescens

Sample Photo 83.
JP288247 (No. 84),
Capsicum frutescens

Sample Photo 84.
JP288248 (No. 85),
Capsicum baccatum

Sample Photo 85.
JP288249 (No. 86),
Capsicum baccatum

Sample Photo 86.
JP288250 (No. 87),
Capsicum frutescens

Sample Photo 87.
JP288251 (No. 88),
Capsicum frutescens

Sample Photo 88.
JP288252 (No. 89),
Capsicum frutescens

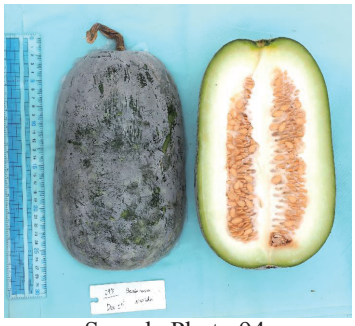
Sample Photo 89.
JP288253 (No. 90),
Capsicum annuum

Sample Photo 90.
JP288254 (No. 91),
Solanum melongena

Sample Photo 91.
JP288255 (No. 92),
Capsicum annuum

Sample Photo 92.
JP288256 (No. 93),
Capsicum frutescens

Sample Photo 93.
JP288257 (No. 94),
Solanum melongena



Sample Photo 94.
JP288258 (No. 95),
Benincasa hispida