

Collaborative Exploration of Genetic Resources of Mainly Solanaceous Crops in Central Vietnam, 2019

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Collaborative Exploration of Genetic Resources of Mainly Solanaceous Crops in Central Vietnam, 2019

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Summary

The National Agriculture and Food Research Organization of Japan and the Plant Resources Center (PRC) of the Vietnamese Academy of Agricultural Sciences have collaboratively conducted the “Plant Genetic Resources in Asia” project since 2014 to survey the genetic resources available, mainly those of vegetables, in Vietnam. As part of this project, five field surveys were conducted from 2014 to 2018 in northern, central, and south-central Vietnam. In August 2019, we conducted a sixth field survey in Thua Thien Hue and Quang Binh provinces, central Vietnam. We collected 36 chili peppers (7 samples of *Capsicum annuum* and 29 of *Capsicum frutescens*), 22 eggplants (*Solanum melongena*), 11 pumpkins (*Cucurbita moschata*), 11 legumes (8 samples of *Vigna unguiculata* and 3 of *Vigna radiata*), 4 cucumbers (*Cucumis sativus*), 3 amaranths (*Amaranthus* spp.), and 1 tomato (*Solanum lycopersicum*), a total of 88 genetic resources. After seed cleaning and packaging at the PRC in Vietnam, the seeds were sent to Japan under a material transfer agreement.

KEY WORDS: Solanaceous crop, chili pepper, eggplant, pumpkin, legume, genetic resources, Vietnam

Introduction

Solanaceous crops such as chili pepper and eggplant are widely grown globally and are important ingredients of our diets. To breed new cultivars with agriculturally useful characteristics such as high yield and disease resistance, a wide assortment of genetic resources of these crops is necessary. Southeast Asia has considerable genetic resources in vegetables, such as solanaceous crops (Matsunaga *et al.* 2010). In the past, studies on plant genetic resources in Southeast Asia have been conducted in Vietnam (Yoshida *et al.* 1997), Myanmar (Saito *et al.* 2006), and Laos (Sakata *et al.* 2008; Saito

et al. 2009; Matsunaga *et al.* 2010). Although they are useful for breeding (Saito *et al.* 2006; Matsunaga *et al.* 2015), only few of the genetic resources from this area are used worldwide (Matsunaga *et al.* 2015). Therefore, it is necessary to promote the exploration, protection, and collection of genetic resources in this region.

The chili pepper (*Capsicum* spp.) landraces traditionally cultivated in this region have recently been replaced by high-quality, high-yielding lines that generate higher commodity values following improved road access and urbanization of rural areas (Sugita *et al.* 2017). As a consequence, the genetic diversity among

chili pepper crops in this region started to decrease. To preserve genetic resources and ensure effective use, the Plant Genetic Resources in Asia project was initiated in 2014. As part of this project, five surveys of plant genetic resources were completed in Vietnam. The first survey was conducted in northern Vietnam from November 9 to November 22, 2014 (Sugiyama *et al.* 2015); the second in the highlands of northwest Vietnam from October 12 to October 18, 2015 (Shimomura *et al.* 2016); the third in northern Vietnam from October 3 to October 13, 2016 (Kawazu *et al.* 2017); the fourth in Quang Nam province in central Vietnam from August 18 to August 26, 2017 (Fujito *et al.* 2018); and the fifth in south-central Vietnam from August 26 to September 9, 2018 (Kami *et al.* 2019). These five surveys collected many valuable genetic resources, including those from 123 pumpkins, 90 amaranths, 71 cucumbers, 38 melons, 19 chili peppers, 16 eggplants, 9 crucifers, 7 watermelons, and 15 other crops.

In this sixth survey, we report the results of an exploration of genetic resources conducted in August 2019 in Thua Thien Hue and Quang Binh provinces in central Vietnam.

Methods

The sixth field survey was conducted from August 17 to August 31, 2019, in Thua Thien Hue and Quang Binh provinces in central Vietnam (Table 1). On August 19, we left Hanoi for Thua Thien Hue province and collected landraces of mainly solanaceous crops in two areas: A Luoi district in Thua Thien Hue province and Tuyen Hoa district in Quang Binh province (Table 1, Fig. 1). We called at each provincial office, district office,

and commune office in the areas (Table 1, Photo 1). We visited villages as well as farmers' houses (Photo 2), traveling by car under the directions of commune staff members and visiting farmers' yards and fields (Photos 3 and 4). When collecting materials, we conducted interviews to identify the collection location, plant origins, local plant names, cultivation history, and any other relevant data (Photo 5). We collected mature fruits or seeds from the farmers' seed stocks if the interviews indicated that they represented local landraces. The samples were assigned sequential numbers, and the information obtained during interviews was recorded together with the location details (i.e., latitude, longitude, and altitude) determined using a global positioning system receiver (Garmin International Inc., Olathe, KS, USA). The samples of *Capsicum* were identified to the species level using the taxonomic key of Eshbaugh (2012). Seeds were harvested from the collected mature fruits within a few days of collection and dried indoors for 2 days in mesh bags (Photo 6).

Results

Summary of samples collected

We collected 36 chili peppers (7 *Capsicum annuum* and 29 *Capsicum frutescens*), 22 eggplants (*Solanum melongena*), 11 pumpkins (*Cucurbita moschata*), 11 legumes (8 *Vigna unguiculata* and 3 *Vigna radiata*), 4 cucumbers (*Cucumis sativus*), 3 amaranths (*Amaranthus* spp.), and 1 tomato (*Solanum lycopersicum*), a total of 88 genetic resources (Tables 2 and 3; Fig. 1). After seed cleaning and packaging by the Plant Resources Center (PRC) of the Vietnamese Academy of Agricultural Sciences, these seeds were forwarded to Japan.

Table 1. Itinerary of the field survey in central Vietnam, 2019

Date	Day	Itinerary	District	Stay
18-Aug	Sun	Chubu 10:15 (VN347) -- 13:40 Hanoi		Hanoi
19-Aug	Mon	Hanoi 08:30 (VN1543) -- 09:45 Hue, Meeting with DARD of Thua Thien Hue Province.		Hue
20-Aug	Tue	Hue -- A Luoi, Meeting with DARD of A Luoi District. Hong Bac Commune, Nham Commune	A Luoi	A Luoi
21-Aug	Wed	Son Thuy Commune, A Roang Commune, A Dot Commune, Hong Thuong Commune, Hong Thai Commune	A Luoi	A Luoi
22-Aug	Thu	Huang Nguyen Commune, Hong Ha Commune, Bac San Commune	A Luoi	A Luoi
23-Aug	Fri	A Luoi -- Dong Hoi, Meeting with DARD of Quang Binh Province.		Dong Hoi
24-Aug	Sat	Dong Hoi -- Dong Le, Meeting with DARD of Tuyen Hoa District. Cao Quang Commune,	Tuyen Hoa	Dong Le
25-Aug	Sun	Dong Le market, Collecting seeds from collected fruits.	Tuyen Hoa	Dong Le
26-Aug	Mon	La Hoa Commune, Thuan Hoa Commune, Dong Hoa Commune, Lam Hoa Commune, Thanh Hoa Commune	Tuyen Hoa	Dong Le
27-Aug	Tue	Kim Hoa Commune, Le Hoa Commune	Tuyen Hoa	Dong Le
28-Aug	Wed	Dong Le -- Vinh, Collecting seeds from collected fruits.		Vinh
29-Aug	Thu	Vinh -- Hanoi, Seeds packing.		Hanoi
30-Aug	Thu	Plant Resource Center (PRC),		on flight
31-Aug	Fri	Hanoi 00:40 (VN346) -- 6:55 Chubu		

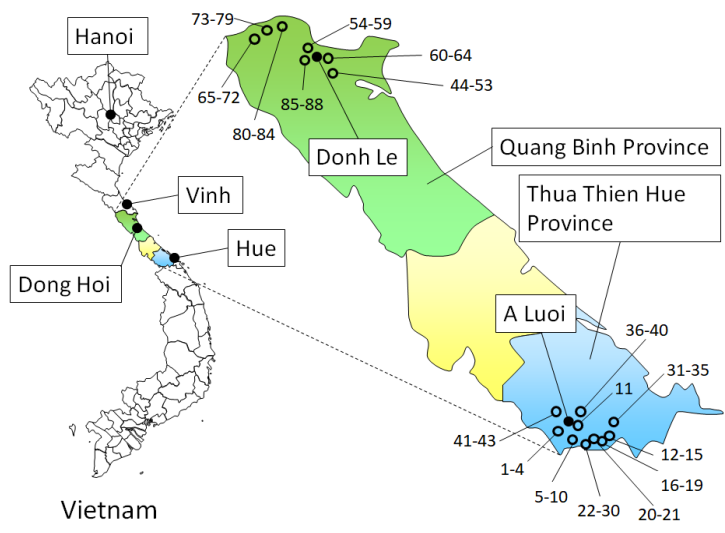


Fig. 1. The collection sites during the 2019 exploration in central Vietnam.



Photo 1. Meeting at a government office in Quang Binh province.



Photo 3. Collecting genetic resources in a farmer's yard in Chi Du Nghia village, Thua Thien Hue province.



Photo 2. Typical farmers' houses in Vietnam. This is a Co Tu farmer's house in Pa Ring San village, Thua Thien Hue province.



Photo 4. Collecting genetic resources in a farmer's field in A Huor Pa E village, Thua Thien Hue province.

Field survey daily activities

August 19: We flew from Hanoi to Hue city and visited the Thua Thien Hue provincial office, which has jurisdiction over the area.

August 20: We left Hue city and traveled southwest toward A Luoi district. We collected two eggplant fruit

samples (Nos. 1 and 3), one chili pepper fruit sample (No. 2), and one pumpkin seed sample (No. 4) from Le Loc 2 village in Hong Bac commune. Next, we traveled to A Huor Pa E village in Nham commune and collected two chili pepper fruit samples (Nos. 5 and 7) from a farmer's field and stocked seeds, two pumpkin seed samples (Nos.

Table 2. A summary of collected genetic resources in central Vietnam in 2019

	Collected samples		
	Thua Thien Hue Province	Quang Binh Province	Total
	A Luoi District	Tuyen Hoa District	
<i>Capsicum annuum</i>	2	5	7
<i>Capsicum frutescens</i>	17	12	29
<i>Solanum melongena</i>	12	10	22
<i>Solanum lycopersicum</i>	0	1	1
<i>Cucurbita moschata</i>	6	5	11
<i>Cucumis sativus</i>	3	1	4
<i>Vigna radiata</i>	3	0	3
<i>Vigna unguiculata</i>	0	8	8
<i>Amaranthus</i> spp.	0	3	3
Total	43	45	88



Photo 5. Interviewing farmers at their house regarding the samples collected.



Photo 6. Drying seeds at our lodgings.

8 and 10) from stocked seeds, one eggplant fruit sample (No. 6) from a farmer's field, and one cucumber seed sample (No. 9) from a farmer's stocked seeds.

August 21: We collected one chili pepper fruit sample (No. 11) from the yard of a coffee shop in Quang Hop village in Son Thuy commune. Next, we moved to A Roang No. 2 village in A Roang commune, where we collected three chili pepper fruit samples (Nos. 12-14) from farmers' yards and one cowpea fruit sample (No. 15) from the roadside. We then traveled to Chi

Lanh Aroh village in A Dot commune and collected two fruit samples from each eggplant (Nos. 16 and 17) and chili pepper (Nos. 18 and 19) from farmers' yards. We next visited two villages in Hong Thuong commune. In Hop Thuong village, we collected one fruit sample each of chili pepper (No. 20) and eggplant (No. 21) from a small field near a farmer's house. In A Dang village, we collected four dried chili pepper fruit samples (Nos. 22, 25, 28, and 29); two eggplant samples (one dried mature fruit, No. 23; and one fresh fruit, No. 30); and one seed sample each of cucumber (No. 24), pumpkin (No. 26), and cowpea (No. 27) from farmers' harvested fruits and stocked seeds.

August 22: First, we visited two villages in Huang Nguyen commune. In Rong village, we collected one sample each of chili pepper (No. 31) and eggplant (No. 32) from farmers' yards and samples of cucumber (No. 33) and pumpkin (No. 34) from farmers' stocked seeds. In Chi Du Nghia village, we collected one chili pepper fruit sample (No. 35) from a farmer's yard. We traveled to Hong Ha commune, where we collected one fruit sample each of chili pepper (No. 36) and eggplant (No. 37) from farmers' yards in Pa Hy village. In Pa Ring San village, we collected an eggplant fruit sample (No. 38) from a farmer's yard as well as chili pepper (No. 39) and pumpkin (No. 40) samples from farmer's harvested fruits. Next, we went to A Aeng 1 village in Bac San commune, where we collected one sample each of chili pepper (harvested fruits, No. 41), eggplant (dried fruits, No. 42), and cowpea (stocked seeds, No. 43).

August 23: We drove from A Luoi district to Dong Hoi, the capital of Quang Binh province.

August 24: We drove from Dong Hoi city to Dong Le city in the Tuyen Hoa district. After calling upon the Tuyen Hoa district office, at Chua But village in Cao Quang commune, we collected two samples each of chili pepper (Nos. 44 and 47) and pumpkin (Nos. 46 and 48)

and one sample each of eggplant (No. 45), tomato (No. 49), cowpea (No. 50), and mungbean (No. 51). In Tien Moi village, we collected one sample each of amaranth (No. 52) and chili pepper (No. 53) from a farmer's house.

August 25: We visited the Dong Le Market, in subregion No. 2 of Dong Le city, Tuyen Hoa district (Photo 7), where we collected two fresh chili pepper (*C. annuum*) fruit samples (Nos. 54 and 55).

August 26: First, we visited Halao village in Thuan Hoa commune in Tuyen Hoa district, where we collected two fruit samples each of eggplant (Nos. 56 and 58) and chili pepper (Nos. 57 and 59) from farmers' yards. Next, we traveled to Dai Son village in Dong Hoa commune, where we collected three fruit samples of chili pepper (Nos. 60 - 62) from farmers' yards, and one sample each of cowpea (No. 63) and mungbean (No. 64) from farmers' stocked seeds. We continued on to Lam Hoa commune, where in No. 2 village we collected one fruit sample each of eggplant (No. 65) and chili pepper (No. 66) from farmers' yards, and one sample of amaranth (No. 67) from a farmer's stocked seeds. In No. 1 village, we collected a fruit sample of eggplant (No. 68) from a farmer's yard as well as two seed samples of eggplant (Nos. 69 and 70) and one seed sample each of pumpkin (No. 71) and amaranth (No. 72) from farmers' stocked seeds. We traveled to Thanh Hoa commune and visited two villages. In No. 3 Xa Vong village, we collected two fruit samples of chili pepper (Nos. 73 and 74) from farmers' yards and one seed sample of pumpkin (No. 75) from a farmer's stocked seeds. In No. 5 Thanh Lang village, we collected one seed sample each of pumpkin (No. 76), cowpea (No. 77), cucumber (No. 78), and eggplant (No. 79) from farmers' stocked seeds.

August 27: We visited two villages in the Kim Hoa commune. In Kim Lu 1 village, we collected two fruit samples of chili pepper (Nos. 80 and 81) and one



Photo 7. A typical local market in Vietnam. This is a part of the Dong Le Market in the Tuyen Hoa district.

fruit sample of eggplant (No. 82) from farmers' yards. In Kim Tan village, we collected one fruit sample each of eggplant (No. 83) and chili pepper (No. 84) from farmers' yards. Finally, we moved to Le Hoa commune and visited Yen Xuan village, where we collected one fruit sample of chili pepper (No. 85) from a farmer's yard, two seed samples of cowpea (Nos. 86 and 87), and one seed sample of mungbean (No. 88) from farmers' stocked seeds.

August 28: We traveled from Dong Le city to Vinh, the capital of Nghe An province. At our lodgings, we removed the seeds from the remaining fruit samples and dried them.

August 29: After the collected seed samples were packed, we returned to Hanoi.

August 30: We reported the results of our field survey to the PRC and left the samples there.

Discussion

The A Luoi district in Thua Thien Hue province is a mountainous district in the upland region between the A Shau valley and is bordered by Laos. Located approximately 60 km southwest of Hue city, the district has an abundant intact nature. The Tuyen Hoa district in Quang Binh province is also a mountain district in the midst of a rich natural area. Located approximately 80 km northwest of Dong Hoi city, the district lies between Phong Nha and Ke Bang National Park (a UNESCO World Heritage Site) and the Ke Go nature reserve. The major industries in both provinces are agriculture and forestry. Cassava, sweet potato, and various tropical fruit and vegetable crops are grown in addition to rice. Many of the crops collected in this survey are grown on a small scale in the yard of farmer's houses. We collected both mature fruits from farmers' fields and seeds from farmers' seed stocks.

Vietnam has 54 ethnic groups that are recognized by the Vietnamese government. The largest ethnic group is Kinh, accounting for approximately 86 % of the total population (General Statistical Office of Vietnam 2010). The remaining 53 minority ethnic groups (14 %) have their own languages and traditional cultures. In the first part of this survey in A Luoi district, most farmers we visited were from minority ethnic groups, whereas in the Tuyen Hoa district, all farmers we visited were Kinh. We collected 42 samples from farmers of the Pa Co, Ta Oi, and Co Tu minority ethnic groups in the A Luoi district, including 18 chili peppers, 3 cucumbers, 6 pumpkins, 12 eggplants, and 3 cowpeas (Tables 2 and 3). These landraces have been passed down for generations within each ethnic group and are therefore valuable in the

preservation of genetic resources.

Of the 36 chili pepper samples we collected, 7 were identified as *C. annuum* and 29 as *C. frutescens* (Tables 2 and 3). The absence of other species (e.g., *C. chinense* and *C. baccatum*) is consistent with the result of previous studies in Cambodia (Matsunaga *et al.* 2015, 2018, 2019; Tanaka *et al.* 2016; Sugita *et al.* 2017). Chili peppers are used mainly as cooking spices in Vietnam (Photo 8). Bushes of *C. frutescens* were grown in many farmers' yards, but there were few *C. annuum*. Seventeen of the eighteen samples collected from ethnic minority farmers in the A Luoi district were *C. frutescens*. We presume that *C. frutescens* is the typical species that has been grown as landraces for many years.

The Pa Co, Ta Oi, and Co Tu ethnic groups call chili peppers "Prick" or "Tieu." The majority of the Kinh ethnic group calls them "Ot," which means chili pepper in Vietnamese. The 29 accessions of *C. frutescens* collected in this survey indicated very diverse fruit morphological characteristics, including dark green to ivory immature fruit color, large to small fruit size, and narrow to broad fruit shape. In one of our interviews, we were advised that small chili pepper fruits might be very pungent and thus might be sold at a high price.

The 22 eggplant samples collected in this survey had round or oval shaped fruits. The skin color of the immature fruits varied, and the skin showed white, light green, and green with white stripes. In the regions where they were collected, these eggplants are eaten fresh, pickled, boiled, or fried. Eggplants with long purple fruits, commonly found in Japan, were uncommon as landraces in the surveyed fields and yards. However, three seed samples (Nos. 69, 70, and 79) collected from farmers' stocked seeds had long purple or white immature fruits, as reported in the interviews. The Pa Co, Ta Oi, and Co Tu ethnic groups call eggplants with various terms including "A Coong", "A Cung", "A



Photo 8. Use of chili peppers as cooking spices at a restaurant in Vietnam.

Cuong" or "A Cang". The Kinh ethnic group calls them "Ca", which means eggplant in Vietnamese.

All 11 pumpkin samples collected in this survey were classified as *C. moschata*. We did not find examples of other species (*C. maxima* and *C. pepo*). This result is consistent with that of past surveys (Sugiyama *et al.* 2015; Shimomura *et al.* 2016; Kawazu *et al.* 2017; Fujito *et al.* 2018; Kami *et al.* 2019). Nine of the eleven samples were collected as seeds from farmers' seed stocks. The farmers advised us that the fruit of most of the samples ranged from 15 to 25 cm in diameter and were round (Nos. 10, 34, 46, and 71) or flat (Nos. 8, 26, and 48). These pumpkins are eaten boiled or fried in this region. We also collected a seed sample of a pumpkin landrace that bears a large fruit exceeding 60 cm in diameter and weighing 14 kg (No. 75). Another seed sample was obtained from a small-fruited pumpkin with yellow skin and red flesh (No. 76). The Co Tu and Ta Oi people call the pumpkins "A Doc", and the Pa Co people call them "Ca Duc". The Kinh people call them "Bi do", which means pumpkin in Vietnamese, except that they call sample No. 76 "Bu ro", which means red gourd in Vietnamese.

We collected 11 legume samples, as either seeds or beans in the pods. Eight were identified as cowpeas (*V. unguiculata*) and three as mungbeans (*V. radiata*). The cowpea samples were small, oval-shaped seeds approximately 1 cm long that were either black (Nos. 15, 27, 43, 50, 63, and 87), ivory (No. 77), or maroon (No. 86). The mungbeans (Nos. 51, 64, and 88) were also oval but smaller than the cowpea beans and were 0.5-1.0 cm long, with green skin. Both types of beans are consumed by boiling in soup, by cooking with sticky rice, or by making bean cakes and other sweets. Cakes made with mungbeans are often found in souvenir shops in markets and airports. One cowpea landrace (No. 43) collected from the Pa Co people was reported to be effective for treating abdominal pain. Cowpea No. 77 had long pods of approximately 50 cm in length (Photo 9). The Pa Co peoples call the cowpeas "A Toong", and Ta Oi peoples call them "A Toan Ton" and "A Toon", which mean beans. The Kinh people call them "Dau den", which means black beans; "Dau dua", which means chopstick (long) beans; and "Dau do", which means red beans in Vietnamese.

All four cucumber samples collected in this survey were identified as *C. sativus*. All samples were collected from farmers' stocked seeds. The survey period was not the usual time for growing cucumbers in this area, and thus, the number of samples collected was small, and only seeds could be obtained. These cucumbers



Photo 9. Cowpea sample with a long pod (No. 77), collected from a farmer's house in Tuyen Hoa district.



Photo 10. Boiled amaranth soup at a restaurant in Vietnam.

are consumed in salads. The Co Tu people call the cucumbers “A Kol”, and the Ta Oi people call them “A Kel” or “A Kol”. The Kinh people call them “Dua chuoat” in Vietnamese.

Three amaranth seed samples (*Amaranthus* spp.) were collected from Kinh farmers in the Tuyen Hoa district. The stems and leaves of these amaranths are boiled in soup (Photo 10) and consumed as an ingredient in cookies. There is no custom of eating amaranth seeds in Vietnam, but eating the foliage is common. The Kinh people call amaranth “Chenh” or “Rau gien”.

One tomato (*Solanum lycopersicum*) seed sample (No. 49) was collected from farmer's stocked seeds that were embedded in ash. This sample was reported to bear a small round fruit approximately 2 cm long. It was called “Ca Chua Bi”, which means small tomatoes.

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References

Eshbaugh WH (2012) The taxonomy of the genus *Capsicum*. In: Russo VM (ed.). Peppers: Botany, production and uses. CABI Publishing, New York pp. 14-28.

Fujito S, Shimomura K, Tran TTH and Nguyen VK (2018) Collaborative exploration of the vegetable genetic resources in Vietnam, 2017. AREIPGR 34: 228-244.

[\[View this article\]](#)

General Statistical Office of Vietnam (2010) The 2009 Vietnam population and housing census: complete result. Statistical Publishing House. Hanoi.

Kami D, Mitsudome K, Tran TTH and Nguyen VK (2019) Collaborative exploration of plant genetic resources in the central highlands of Vietnam, 2018. AREPGR 35: 56-70.

[\[View this article\]](#)

Kawazu Y, Kato M, Tran TTH and Nguyen VK (2017) Collaborative exploration of plant genetic resources in Vietnam, 2016. AREIPGRs 33: 89-113.

[\[View this article\]](#)

Matsunaga H, Matsushima K, Tanaka K, Theavy S, Lay Heng S, Channa T, Takahashi Y and Tomooka N (2015) Collaborative exploration of the Solanaceae and Cucurbitaceae vegetable genetic resources in Cambodia, 2014. AREIPGR 31: 169-187.

[\[View this article\]](#)

Matsunaga H, Sugiyama M, Tanaka K and Chanthanom D (2010) Collaborative exploration of vegetable genetic resources in Laos, 2009. AREIPGR 26: 65-81.

[\[View this article\]](#)

Matsunaga H, Tanaka Y, Leakhena M and Sophany S (2019) Collaborative exploration of Solanaceae vegetable genetic resources in central and mid-western Cambodia in 2018. AREIPGR 35: 106-120.

[\[View this article\]](#)

Matsunaga H, Yokota M, Leakhena M and Sophany S (2018) Collaborative exploration of Solanaceae vegetable genetic resources in southern Cambodia, 2017. AREIPGR 34: 102-117.

[\[View this article\]](#)

Sakata Y, Kato K, Saito T, Tanaka K and Deuanhaksa C (2008) Collaborative exploration of the vegetable genetic resources in Laos, 2007. AREIPGR 24:161-183 (in Japanese with English abstract).

[\[View this article\]](#)

Saito A, Tanaka K and Deuanhaksa C (2009) Collaborative exploration of the vegetable genetic resources in Laos, 2008. AREIPGR 25: 111-145.

[\[View this article\]](#)

Saito T, Matsumoto M, Than Htaik and San San Yi (2006) Collaborative exploration of vegetables genetic resources in Myanmar, 2005. AREIPGR 22: 115-133 (in Japanese with English abstract).

[View this article]

Shimomura K, Sugiyama K, Yoshioka Y, Tran TTH and Nguyen VK (2016) Collaborative exploration of plant genetic resources in Vietnam, 2015. AREIPGR 32: 159-181.

[View this article]

Sugita T, Matsunaga H, Theavy S and Sophany S (2017) Collaborative exploration of *Capsicum* genetic resources in northern Cambodia, 2016. AREIPGR 33: 207-221.

[View this article]

Sugiyama M, Ebana K, Kami D, Tran TTH and Nguyen VK (2015) Collaborative exploration of cucurbitaceous crops in Vietnam, 2014. AREIPGR 31: 189-201.

[View this article]

Tanaka Y, Matsunaga H, Theavy S, Lay Heng S and Sophany S (2016) Collaborative survey of Solanaceous genetic resources in eastern Cambodia, 2015. AREIPGR32: 139-157.

[View this article]

Yoshida T, Wako T, Thuan PV and Canh DX (1997) Collaborative exploration of the vegetable genetic resources in Vietnam. AREIPGR 13:173-187 (in Japanese with English abstract).

[View this article]

2019 年ベトナム中部地域における ナス科作物を中心とした遺伝資源の共同収集

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和文摘要

農業・食品産業技術総合研究機構（NARO）とベトナム植物遺伝資源センター（PRC）は、ベトナム国内における野菜類を中心とした遺伝資源を探索するため、PGRAsia（Plant Genetic Resource in Asia）プロジェクトのもと、2014年から共同研究を実施している。本プロジェクトの一環として、2014年から2018年にかけてベトナム北部、中部および中南部地域において、5回の探索を実施している。我々は、2019年8月にベトナム中部地域に位置する Thua Thien Hue 省および Quang Binh 省の2地域において6回目の探索を実施した。本探索において、トウガラシ36点（*Capsicum annuum* 7点と *Capsicum frutescens* 29点）、ナス12点（*Solanum melongena*）、カボチャ11点（*Cucurbita moschata*）、マメ科植物11点（*Vigna unguiculata* 8点および *Vigna radiata* 3点）、キュウリ4点（*Cucumis sativus*）、アマランサス3点（*Amaranthus* spp.）およびトマト1点（*Solanum lycopersicum*）の合計88点の遺伝資源を収集した。これらの種子は、ベトナム PRC で種子調整および包装作業の後、素材移転契約により日本に導入した。

Table 3. List of genetic resources collected in central Vietnam in 2019

Coll. No.	Passport No.	JP No.	JP Name	Date	Genus & Species	Province	District	Commune	Village	North latitude/ East longitude	Altitude (m)	Source (Market name)	Type of sample	Status	Local name	Ethnic group name	Fruit characteristics, origin, etc.
1	30079097	271323	COL/VIETNAM/2019/NIVFS-PRC/001	Aug. 20	<i>Solanum melongena</i>	Thua Thien Hue	A Luoi	Hong Bac	Le Loc 2	16-16-28-12/ 107-12-18-70	573	Farmer's House/ backyard	fruits	landrace	A Cung Clo	Pa Co	Cultivated for a long time. Small and round fruit. White immature fruit.
2	30079098	271324	COL/VIETNAM/2019/NIVFS-PRC/002	Aug. 20	<i>Capsicum frutescens</i>	Thua Thien Hue	A Luoi	Hong Bac	Le Loc 2	16-16-28-12/ 107-12-18-70	573	Farmer's House	dry fruits	landrace	Tieu	Pa Co	Cultivated for a long time.
3	30079099	271325	COL/VIETNAM/2019/NIVFS-PRC/003	Aug. 20	<i>Solanum melongena</i>	Thua Thien Hue	A Luoi	Hong Bac	Le Loc 2	16-16-28-12/ 107-12-18-70	573	Farmer's House	dry fruits	landrace	A Cung Mong	Pa Co	Cultivated for a long time. Green immature fruit.
4	30079100	271326	COL/VIETNAM/2019/NIVFS-PRC/004	Aug. 20	<i>Cucurbita moschata</i>	Thua Thien Hue	A Luoi	Hong Bac	Le Loc 2	16-16-28-12/ 107-12-18-70	573	Farmer's House	seeds	landrace	Ca Duc	Pa Co	Cultivated for a long time. Eat with boil or fly.
5	30079101	271327	COL/VIETNAM/2019/NIVFS-PRC/005	Aug. 20	<i>Capsicum frutescens</i>	Thua Thien Hue	A Luoi	Nham	A Huor Pa E	16-14-44-92/ 107-12-40-70	578	Farmer's Field	fruits	landrace	Prick	Ta Oi	Cultivated with upland rice and maize. Green immature fruit.
6	30079102	271328	COL/VIETNAM/2019/NIVFS-PRC/006	Aug. 20	<i>Solanum melongena</i>	Thua Thien Hue	A Luoi	Nham	A Huor Pa E	16-14-44-92/ 107-12-40-70	578	Farmer's Field	fruits	landrace	A Cang	Ta Oi	Cultivated with upland rice and maize. Small and round fruit. White immature fruit.
7	30079103	271329	COL/VIETNAM/2019/NIVFS-PRC/007	Aug. 20	<i>Capsicum frutescens</i>	Thua Thien Hue	A Luoi	Nham	A Huor Pa E	16-15-00-25/ 107-12-18-89	592	Farmer's House/ backyard, stock	fruits and dry fruits	landrace	Prick	Ta Oi	Light green immature fruit.
8	30079104	271330	COL/VIETNAM/2019/NIVFS-PRC/008	Aug. 20	<i>Cucurbita moschata</i>	Thua Thien Hue	A Luoi	Nham	A Huor Pa E	16-15-00-25/ 107-12-18-89	592	Farmer's House	seeds	landrace	A Doc	Ta Oi	Flat fruit.
9	30079105	271331	COL/VIETNAM/2019/NIVFS-PRC/009	Aug. 20	<i>Cucumis sativus</i>	Thua Thien Hue	A Luoi	Nham	A Huor Pa E	16-15-00-25/ 107-12-18-89	592	Farmer's House	seeds	landrace	A Kel	Ta Oi	
10	30079106	271332	COL/VIETNAM/2019/NIVFS-PRC/010	Aug. 20	<i>Cucurbita moschata</i>	Thua Thien Hue	A Luoi	Nham	A Huor Pa E	16-15-00-25/ 107-12-18-89	592	Farmer's House	seeds	landrace	A Doc	Ta Oi	Round fruit.
11	30079107	271333	COL/VIETNAM/2019/NIVFS-PRC/011	Aug. 21	<i>Capsicum annum</i>	Thua Thien Hue	A Luoi	Son Thuy	Quang Hop	16-14-11-77/ 107-16-04-95	565	coffee shop	fruits	landrace	Ot	Kinh	Obtained from a farmer. Slightly long and green immature fruit.
12	30079108	271334	COL/VIETNAM/2019/NIVFS-PRC/012	Aug. 21	<i>Capsicum frutescens</i>	Thua Thien Hue	A Luoi	A Roang	A Roang No. 2	16-06-55-88/ 107-23-42-51	470	Farmer's House/ backyard	fruits	landrace	Prick Apang	Ta Oi	Very small fruit. Green immature fruit.

Table 3. (Continued).

Coll. No.	Passport No.	JP No.	JP Name	Date	Genus & Species	Province	District	Commune	Village	North latitude/ East longitude	Altitude (m)	Source (Market name)	Type of sample	Status	Local name	Ethnic group name	Fruit characteristics, origin, etc.
13	30079109	271335	COL/VIETNAM/2019/NIVFS-PRC/013	Aug. 21	<i>Capsicum frutescens</i>	Thua Thien Hue	A Luoi	A Roang	A Roang No. 2	16-06-55-88/ 107-23-42-51	470	Farmer's House/ backyard	fruits	landrace	Prick Prat	Ta Oi	Ivory immature fruit.
14	30079110	271336	COL/VIETNAM/2019/NIVFS-PRC/014	Aug. 21	<i>Capsicum frutescens</i>	Thua Thien Hue	A Luoi	A Roang	A Roang No. 2	16-06-55-88/ 107-23-42-51	470	Farmer's House/ backyard	fruits	landrace	Prick Apang	Ta Oi	Small fruit. Green immature fruit.
15	30079111	271337	COL/VIETNAM/2019/NIVFS-PRC/015	Aug. 21	<i>Vigna unguiculata</i>	Thua Thien Hue	A Luoi	A Roang	A Roang No. 2	16-06-55-88/ 107-23-42-51	470	roadside	fruits	landrace	A Toan Ton	Ta Oi	Mix with sticky rice and eat with boil.
16	30079112	271338	COL/VIETNAM/2019/NIVFS-PRC/016	Aug. 21	<i>Solanum melongena</i>	Thua Thien Hue	A Luoi	A Dot	Chi Lanh Aroh	16-05-13-96/ 107-22-02-77	617	Farmer's House/ backyard	fruits	landrace	A Coong Arah	Ta Oi	Big fruit. Green immature fruit. Purple flower.
17	30079113	271339	COL/VIETNAM/2019/NIVFS-PRC/017	Aug. 21	<i>Solanum melongena</i>	Thua Thien Hue	A Luoi	A Dot	Chi Lanh Aroh	16-05-13-96/ 107-22-02-77	617	Farmer's House/ backyard	fruits	landrace	A Coong Cir	Ta Oi	Small and round fruit. Striped green immature fruit. Light purple flower.
18	30079114	271340	COL/VIETNAM/2019/NIVFS-PRC/018	Aug. 21	<i>Capsicum frutescens</i>	Thua Thien Hue	A Luoi	A Dot	Chi Lanh Aroh	16-05-11-61/ 107-72-03-60	613	Farmer's House/ backyard	fruits	landrace	Prick Apang	Ta Oi	Green immature fruit. Normal size fruit.
19	30079115	271341	COL/VIETNAM/2019/NIVFS-PRC/019	Aug. 21	<i>Capsicum frutescens</i>	Thua Thien Hue	A Luoi	A Dot	Chi Lanh Aroh	16-05-11-61/ 107-72-03-60	613	Farmer's House/ backyard	fruits	landrace	Prick Acor	Ta Oi	Green immature fruit. Very small fruit.
20	30079116	271342	COL/VIETNAM/2019/NIVFS-PRC/020	Aug. 21	<i>Capsicum frutescens</i>	Thua Thien Hue	A Luoi	Hong Thuong	Hop Thuong	16-14-23-15/ 107-16-50-30	579	Farmer's House/ small field	fruits	landrace	Prick	Pa Co	Light green immature fruit.
21	30079117	271343	COL/VIETNAM/2019/NIVFS-PRC/021	Aug. 21	<i>Solanum melongena</i>	Thua Thien Hue	A Luoi	Hong Thuong	Hop Thuong	16-14-23-15/ 107-16-50-30	579	Farmer's House/ small field	fruits	landrace	A Coong	Pa Co	Obtained a farmer's stocked fresh fruits mixture. Green immature fruit. Eat with fresh or boiled soup or fly.
22	30079118	271344	COL/VIETNAM/2019/NIVFS-PRC/022	Aug. 21	<i>Capsicum frutescens</i>	Thua Thien Hue	A Luoi	Hong Thai	A Dang	16-14-07-09/ 107-14-18-40	563	Farmer's House	dry fruits	landrace	Prick	Ta Oi	Obtained farmer's stocked many dry fruits.
23	30079119	271345	COL/VIETNAM/2019/NIVFS-PRC/023	Aug. 21	<i>Solanum melongena</i>	Thua Thien Hue	A Luoi	Hong Thai	A Dang	16-14-07-09/ 107-14-18-40	563	Farmer's House	dry fruits	landrace	A Coong Pool	Ta Oi	Small and round fruit.
24	30079120	271346	COL/VIETNAM/2019/NIVFS-PRC/024	Aug. 21	<i>Cucumis sativus</i>	Thua Thien Hue	A Luoi	Hong Thai	A Dang	16-14-07-09/ 107-14-18-40	563	Farmer's House	seeds	landrace	A Kol	Ta Oi	Obtained farmer's stocked seeds.
25	30079121	271347	COL/VIETNAM/2019/NIVFS-PRC/025	Aug. 21	<i>Capsicum frutescens</i>	Thua Thien Hue	A Luoi	Hong Thai	A Dang	16-14-04-12/ 107-14-17-98	564	Farmer's House	dry fruits	landrace	Prick	Ta Oi	Obtained farmer's stocked dry fruits.

Table 3. (Continued).

Coll. No.	Passport No.	JP No.	JP Name	Date	Genus & Species	Province	District	Commune	Village	North latitude/ East longitude	Altitude (m)	Source (Market name)	Type of sample	Status	Local name	Ethnic group name	Fruit characteristics, origin, etc.
26	30079122	271348	COL/VIETNAM/ 2019/NIVFS- PRC/026	Aug. 21	<i>Cucurbita moschata</i>	Thua Thien Hue	A Luoi	Hong Thai	A Dang	16-14-04-12/ 107-14-17-98	564	Farmer's House	seeds	landrace	A Doc	Ta Oi	Obtained farmer's stocked seeds. Flat fruit.
27	30079123	271349	COL/VIETNAM/ 2019/NIVFS- PRC/027	Aug. 21	<i>Vigna unguiculata</i>	Thua Thien Hue	A Luoi	Hong Thai	A Dang	16-14-04-12/ 107-14-17-98	564	Farmer's House	seeds	landrace	A Toon	Ta Oi	Obtained farmer's stocked seeds. Vietnamese beans.
28	30079124	271350	COL/VIETNAM/ 2019/NIVFS- PRC/028	Aug. 21	<i>Capsicum annuum</i>	Thua Thien Hue	A Luoi	Hong Thai	A Dang	16-14-04-12/ 107-14-17-98	564	Farmer's House	dry fruits	landrace	Prick Am Lun	Ta Oi	Small round fruit. Ivory immature fruit.
29	30079125	271351	COL/VIETNAM/ 2019/NIVFS- PRC/029	Aug. 21	<i>Capsicum frutescens</i>	Thua Thien Hue	A Luoi	Hong Thai	A Dang	16-14-04-12/ 107-14-17-98	564	Farmer's House	dry fruits	landrace	Prick Am Pang	Ta Oi	Obtained farmer's stocked small dry fruits.
30	30079126	271352	COL/VIETNAM/ 2019/NIVFS- PRC/030	Aug. 21	<i>Solanum melongena</i>	Thua Thien Hue	A Luoi	Hong Thai	A Dang	16-14-04-12/ 107-14-17-98	564	Farmer's House	fruits	landrace	A Coong Aoh	Ta Oi	Obtained farmer's stocked fresh fruits. Green immature fruit. Slightly long thin round (Cylinder shape)
31	30079127	271353	COL/VIETNAM/ 2019/NIVFS- PRC/031	Aug. 22	<i>Capsicum frutescens</i>	Thua Thien Hue	A Luoi	Huang Nguyen	Rong	16-18-08-07/ 107-23-11-76	240	Farmer's House/ backyard	fruits	landrace	Prick Am Pang	Co Tu	Growing for three years ago. A small fruit about 1 cm.
32	30079128	271354	COL/VIETNAM/ 2019/NIVFS- PRC/032	Aug. 22	<i>Solanum melongena</i>	Thua Thien Hue	A Luoi	Huang Nguyen	Rong	16-18-08-07/ 107-23-11-76	240	Farmer's House/ backyard	fruits	landrace	A Coong	Co Tu	Round fruit about 3-5 cm. Green immature fruit.
33	30079129	271355	COL/VIETNAM/ 2019/NIVFS- PRC/033	Aug. 22	<i>Cucumis sativus</i>	Thua Thien Hue	A Luoi	Huang Nguyen	Rong	16-18-08-07/ 107-23-11-76	240	Farmer's House	seeds	landrace	A Kol	Co Tu	Obtained farmer's stocked seeds. Fruit size about 30 cm length and 10 cm diameter.
34	30079130	271356	COL/VIETNAM/ 2019/NIVFS- PRC/034	Aug. 22	<i>Cucurbita moschata</i>	Thua Thien Hue	A Luoi	Huang Nguyen	Rong	16-18-08-07/ 107-23-11-76	240	Farmer's House	seeds	landrace	A Doc	Co Tu	Obtained farmer's stocked seeds. Round fruit about 20 cm diameter.
35	30079131	271357	COL/VIETNAM/ 2019/NIVFS- PRC/035	Aug. 22	<i>Capsicum frutescens</i>	Thua Thien Hue	A Luoi	Huang Nguyen	Chi Du Nghia	16-18-41-82/ 107-23-27-65	228	Farmer's House/ backyard	fruits	landrace	Pro Vol	Co Tu	Growing for three years ago. Ivory immature fruit.
36	30079132	271358	COL/VIETNAM/ 2019/NIVFS- PRC/036	Aug. 22	<i>Capsicum frutescens</i>	Thua Thien Hue	A Luoi	Hong Ha	Pa Hy	16-18-03-59/ 107-20-12-86	78	Farmer's House/ backyard	fruits	landrace	Prick Tieu	Pa Co	Growing for one and a half years ago. Ivory immature fruit about 3-4 cm.
37	30079133	271359	COL/VIETNAM/ 2019/NIVFS- PRC/037	Aug. 22	<i>Solanum melongena</i>	Thua Thien Hue	A Luoi	Hong Ha	Pa Hy	16-18-03-59/ 107-20-12-86	78	Farmer's House/ backyard	fruits	landrace	A Coong	Pa Co	Round fruit about 2-3 cm. White immature fruit and flower.
38	30079134	271360	COL/VIETNAM/ 2019/NIVFS- PRC/038	Aug. 22	<i>Solanum melongena</i>	Thua Thien Hue	A Luoi	Hong Ha	Pa Ring San	16-17-52-94/ 107-20-52-65	78	Farmer's House/ backyard	fruits	landrace	A Coong	Co Tu	Round fruit about 4-5 cm. Striped green immature fruit.

Table 3. (Continued).

Coll. No.	Passport No.	JP No.	JP Name	Date	Genus & Species	Province	District	Commune	Village	North latitude/ East longitude	Altitude (m)	Source (Market name)	Type of sample	Status	Local name	Ethnic group name	Fruit characteristics, origin, etc.
39	30079135	271361	COL/VIETNAM/ 2019/NIVFS- PRC/039	Aug. 22	<i>Capsicum frutescens</i>	Thua Thien Hue	A Luoi	Hong Ha	Pa Ring San	16-17-52-94/ 107-20-52-65	78	Farmer's House	dry fruits	landrace	Prick	Co Tu	Obtained farmer's stocked dry fruits.
40	30079136	271362	COL/VIETNAM/ 2019/NIVFS- PRC/040	Aug. 22	<i>Cucurbita moschata</i>	Thua Thien Hue	A Luoi	Hong Ha	Pa Ring San	16-17-52-94/ 107-20-52-65	78	Farmer's House	fruits	landrace	A Doc	Co Tu	Obtained farmer's stocked seeds. Fruit size about 15 cm length and 20 cm diameter.
41	30079137	271363	COL/VIETNAM/ 2019/NIVFS- PRC/041	Aug. 22	<i>Capsicum frutescens</i>	Thua Thien Hue	A Luoi	Bac San	A Aeng 1	16-18-39-61/ 107-11-37-48	605	Farmer's House	fruits	landrace	Tieu	Pa Co	Obtained farmer's stocked fresh fruits. Green immature fruit.
42	30079138	271364	COL/VIETNAM/ 2019/NIVFS- PRC/042	Aug. 22	<i>Solanum melongena</i>	Thua Thien Hue	A Luoi	Bac San	A Aeng 1	16-18-39-61/ 107-11-37-48	605	Farmer's House	dry fruits	landrace	A Cuung	Pa Co	Obtained smoked seeds stocked by a farmer.
43	30079139	271365	COL/VIETNAM/ 2019/NIVFS- PRC/043	Aug. 22	<i>Vigna unquiculata</i>	Thua Thien Hue	A Luoi	Bac San	A Aeng 1	16-18-39-61/ 107-11-37-48	605	Farmer's House	seeds	landrace	A Toong	Pa Co	Obtained farmer's stocked seeds. Oval black skin beans about 1 cm. Effective for abdominal pain. Eat with boiled soup or cooked with sticky rice.
44	30079140	271366	COL/VIETNAM/ 2019/NIVFS- PRC/044	Aug. 24	<i>Capsicum frutescens</i>	Quang Binh	Tuyen Hoa	Cao Quang	Chua But	17-46-18-93/ 106-11-01-88	42	Farmer's House/ backyard	fruits	landrace	Ot Moi	Kinh	Very small fruit about 1 cm. Green immature fruit.
45	30079141	271367	COL/VIETNAM/ 2019/NIVFS- PRC/045	Aug. 24	<i>Solanum melongena</i>	Quang Binh	Tuyen Hoa	Cao Quang	Chua But	17-46-18-93/ 106-11-01-88	42	Farmer's House/ backyard	fruits	landrace	Ca Phao	Kinh	Round fruit about 3 cm. Light green immature fruit. Purple flower.
46	30079142	271368	COL/VIETNAM/ 2019/NIVFS- PRC/046	Aug. 24	<i>Cucurbita moschata</i>	Quang Binh	Tuyen Hoa	Cao Quang	Chua But	17-46-18-93/ 106-11-01-88	42	Farmer's House	fruit	landrace	Bin Do	Kinh	Obtained farmer's stocked a fruit. Round fruit about 25 cm.
47	30079143	271369	COL/VIETNAM/ 2019/NIVFS- PRC/047	Aug. 24	<i>Capsicum frutescens</i>	Quang Binh	Tuyen Hoa	Cao Quang	Chua But	17-46-16-76/ 106-11-38-82	33	Farmer's House	fruits	landrace	Ot Moi	Kinh	Very small fruit.
48	30079144	271370	COL/VIETNAM/ 2019/NIVFS- PRC/048	Aug. 24	<i>Cucurbita moschata</i>	Quang Binh	Tuyen Hoa	Cao Quang	Chua But	17-46-16-76/ 106-11-38-82	33	Farmer's House	seeds	landrace	Bin Do	Kinh	Obtained farmer's stocked seeds. Flat fruit.
49	30079145	271371	COL/VIETNAM/ 2019/NIVFS- PRC/049	Aug. 24	<i>Solanum lycopersicum</i>	Quang Binh	Tuyen Hoa	Cao Quang	Chua But	17-46-16-76/ 106-11-38-82	33	Farmer's House	seeds	landrace	Ca Chua Bi	Kinh	Obtained farmer's stocked seeds in smoked soil. Small round fruit about 2 cm.
50	30079146	271372	COL/VIETNAM/ 2019/NIVFS- PRC/050	Aug. 24	<i>Vigna unquiculata</i>	Quang Binh	Tuyen Hoa	Cao Quang	Chua But	17-46-16-76/ 106-11-38-82	33	Farmer's House	seeds	landrace	Dau den	Kinh	Obtained farmer's stocked seeds. Oval black skin beans within 1 cm.

Table 3. (Continued).

Coll. No.	Passport No.	JP No.	JP Name	Date	Genus & Species	Province	District	Commune	Village	North latitude/ East longitude	Altitude (m)	Source (Market name)	Type of sample	Status	Local name	Ethnic group name	Fruit characteristics, origin, etc.
51	30079147	271373	COL/VIETNAM/2019/NIVFS-PRC/051	Aug. 24	<i>Vigna radiata</i>	Quang Binh	Tuyen Hoa	Cao Quang	Chua But	17-46-16-76/ 106-11-38-82	33	Farmer's House	seeds	landrace	Dau xanh	Kinh	Obtained farmer's stocked seeds. Oval green skin beans about 0.5 cm.
52	30079148	271374	COL/VIETNAM/2019/NIVFS-PRC/052	Aug. 24	<i>Amaranthus spp.</i>	Quang Binh	Tuyen Hoa	Cao Quang	Tien Moi	17-46-23-04/ 106-11-37-44	39	Farmer's House	seeds	landrace	Chenh	Kinh	Obtained from near village, Son Thuy. Farmer's stocked seeds. Eat leaves with boiled soup
53	30079149	271375	COL/VIETNAM/2019/NIVFS-PRC/053	Aug. 24	<i>Capsicum frutescens</i>	Quang Binh	Tuyen Hoa	Cao Quang	Tien Moi	17-46-23-04/ 106-11-37-44	39	Farmer's House	fruits	landrace	Ot moi	Kinh	Obtained from near village, Son Thuy.
54	30079150	271376	COL/VIETNAM/2019/NIVFS-PRC/054	Aug. 25	<i>Capsicum annuum</i>	Quang Binh	Tuyen Hoa	Dong Le	Dong Le	17-53-02-37/ 106-01-26-86	16	Market (Dong Le)	fruits	landrace	Ot	Kinh	May be inbred line of an F ₁ cultivar. Market address: subregion No. 2 Dong LE town
55	30079151	271377	COL/VIETNAM/2019/NIVFS-PRC/055	Aug. 25	<i>Capsicum annuum</i>	Quang Binh	Tuyen Hoa	Dong Le	Dong Le	17-53-02-37/ 106-01-26-86	16	Market (Dong Le)	fruits	landrace	Ot to	Kinh	Light green immature fruit.
56	30079152	271378	COL/VIETNAM/2019/NIVFS-PRC/056	Aug. 26	<i>Solanum melongena</i>	Quang Binh	Tuyen Hoa	Thuan Hoa	Halao	17-53-47-38/ 106-02-12-90	17	Farmer's House/ backyard	fruits	landrace	Ca to	Kinh	Round fruit about 5 cm. White immature fruit. Eat with fresh, salad, boil and fly.
57	30079153	271379	COL/VIETNAM/2019/NIVFS-PRC/057	Aug. 26	<i>Capsicum frutescens</i>	Quang Binh	Tuyen Hoa	Thuan Hoa	Halao	17-53-30-19/ 106-02-20-31	21	Farmer's House/ backyard	fruits	landrace	Ot moi	Kinh	Small and slightly round fruit about 1 cm. Green immature fruit.
58	30079154	271380	COL/VIETNAM/2019/NIVFS-PRC/058	Aug. 26	<i>Solanum melongena</i>	Quang Binh	Tuyen Hoa	Thuan Hoa	Halao	17-53-30-19/ 106-02-20-31	21	Farmer's House/ backyard	fruits	landrace	Ca to	Kinh	Flat and white immature fruit about 5-6 cm diameter.
59	30079155	271381	COL/VIETNAM/2019/NIVFS-PRC/059	Aug. 26	<i>Capsicum frutescens</i>	Quang Binh	Tuyen Hoa	Thuan Hoa	Halao	17-53-30-19/ 106-02-20-31	21	Farmer's House/ backyard	fruits	landrace	Ot moi	Kinh	Small fruit about 1-2 cm. Light green immature fruit.
60	30079156	271382	COL/VIETNAM/2019/NIVFS-PRC/060	Aug. 26	<i>Capsicum frutescens</i>	Quang Binh	Tuyen Hoa	Dong Hoa	Dai Son	17-52-47-76/ 106-04-28-74	22	Farmer's House/ backyard	fruits	landrace	Ot moi	Kinh	Small fruit about 1 cm. Green immature fruit.
61	30079157	271383	COL/VIETNAM/2019/NIVFS-PRC/061	Aug. 26	<i>Capsicum frutescens</i>	Quang Binh	Tuyen Hoa	Dong Hoa	Dai Son	17-52-47-76/ 106-04-28-74	22	Farmer's House/ backyard	fruits	landrace	Ot moi	Kinh	Small fruit about 2-3 cm. Green immature fruit.
62	30079158	271384	COL/VIETNAM/2019/NIVFS-PRC/062	Aug. 26	<i>Capsicum annuum</i>	Quang Binh	Tuyen Hoa	Dong Hoa	Dai Son	17-52-47-76/ 106-04-28-74	22	Farmer's House/ backyard	fruits	landrace	Ot Canh	Kinh	Ornamental pepper. Slightly round fruit about 1-2 cm. Purple immature fruit and flower. Obtained from Van Hoa commune in Tuyen Hoa district.
63	30079159	271385	COL/VIETNAM/2019/NIVFS-PRC/063	Aug. 26	<i>Vigna unguiculata</i>	Quang Binh	Tuyen Hoa	Dong Hoa	Dai Son	17-52-47-76/ 106-04-28-74	22	Farmer's House	seeds	landrace	Dau den	Kinh	Obtained farmer's stocked seeds.

Table 3. (Continued).

Coll. No.	Passport No.	JP No.	JP Name	Date	Genus & Species	Province	District	Commune	Village	North latitude/ East longitude	Altitude (m)	Source (Market name)	Type of sample	Status	Local name	Ethnic group name	Fruit characteristics, origin, etc.
64	30079160	271386	COL/VIETNAM/ 2019/NIVFS- PRC/064	Aug. 26	<i>Vigna radiata</i>	Quang Binh	Tuyen Hoa	Dong Hoa	Dai Son	17-52-47-76/ 106-04-28-74	22	Farmer's House	seeds	landrace	Dau xanh	Kinh	Obtained farmer's stocked seeds.
65	30079161	271387	COL/VIETNAM/ 2019/NIVFS- PRC/065	Aug. 26	<i>Solanum melongena</i>	Quang Binh	Tuyen Hoa	Lam Hoa	Village No. 2	17-55-43-52/ 105-49-05-61	87	Farmer's House/ backyard	fruits	landrace	Ca phao	Kinh	Round fruit about 2-3 cm. Light purple immature fruit. purple flower.
66	30079162	271388	COL/VIETNAM/ 2019/NIVFS- PRC/066	Aug. 26	<i>Capsicum frutescens</i>	Quang Binh	Tuyen Hoa	Lam Hoa	Village No. 2	17-55-42-92/ 105-49-08-09	89	Farmer's House/ backyard	fruits	landrace	Ot moi	Kinh	Small fruit about 1-1.5 cm. Green immature fruit.
67	30079163	271389	COL/VIETNAM/ 2019/NIVFS- PRC/067	Aug. 26	<i>Amaranthus</i> spp.	Quang Binh	Tuyen Hoa	Lam Hoa	Village No. 2	17-55-43-52/ 105-49-05-61	87	Farmer's House	seeds	landrace	Rau gien	Kinh	Eat leaves and stems with boiled soup and cookies.
68	30079164	271390	COL/VIETNAM/ 2019/NIVFS- PRC/068	Aug. 26	<i>Solanum melongena</i>	Quang Binh	Tuyen Hoa	Lam Hoa	Village No. 1	17-55-34-04/ 105-49-21-78	83	Farmer's House/ backyard	fruits	landrace	Ca phao	Kinh	Slightly flat fruit about 3-4 cm. White immature fruit. purple flower.
69	30079165	271391	COL/VIETNAM/ 2019/NIVFS- PRC/069	Aug. 26	<i>Solanum melongena</i>	Quang Binh	Tuyen Hoa	Lam Hoa	Village No. 1	17-55-34-04/ 105-49-21-78	83	Farmer's House	seeds	landrace	Ca dai de	Kinh	Obtained farmer's stocked seeds. Long and white immature fruit.
70	30079166	271392	COL/VIETNAM/ 2019/NIVFS- PRC/070	Aug. 26	<i>Solanum melongena</i>	Quang Binh	Tuyen Hoa	Lam Hoa	Village No. 1	17-55-34-04/ 105-49-21-78	83	Farmer's House	seeds	landrace	Ca dai de	Kinh	Obtained farmer's stocked seeds. Long and purple immature fruit.
71	30079167	271393	COL/VIETNAM/ 2019/NIVFS- PRC/071	Aug. 26	<i>Cucurbita moschata</i>	Quang Binh	Tuyen Hoa	Lam Hoa	Village No. 1	17-55-34-04/ 105-49-21-78	83	Farmer's House	seeds	landrace	Bi do	Kinh	Obtained farmer's stocked seeds. Round fruit.
72	30079168	271394	COL/VIETNAM/ 2019/NIVFS- PRC/072	Aug. 26	<i>Amaranthus</i> spp.	Quang Binh	Tuyen Hoa	Lam Hoa	Village No. 1	17-55-34-04/ 105-49-21-78	83	Farmer's House	seeds	landrace	Rau gien	Kinh	Obtained farmer's stocked seeds. Round fruit. Eat leaves and stems with boiled soup and cookies.
73	30079169	271395	COL/VIETNAM/ 2019/NIVFS- PRC/073	Aug. 26	<i>Capsicum frutescens</i>	Quang Binh	Tuyen Hoa	Thanh Hoa	No. 3 Xa Vong	17-58-11-13/ 105-48-38-80	119	Farmer's House/ backyard	fruits	landrace	Ot moi	Kinh	Small fruit about 2 cm. Green immature fruit.
74	30079170	271396	COL/VIETNAM/ 2019/NIVFS- PRC/074	Aug. 26	<i>Capsicum frutescens</i>	Quang Binh	Tuyen Hoa	Thanh Hoa	No. 3 Xa Vong	17-58-11-13/ 105-48-38-80	119	Farmer's House/ backyard	fruits	landrace	Ot moi	Kinh	Small fruit about 1 cm. Green immature fruit.
75	30079171	271397	COL/VIETNAM/ 2019/NIVFS- PRC/075	Aug. 26	<i>Cucurbita moschata</i>	Quang Binh	Tuyen Hoa	Thanh Hoa	No. 3 Xa Vong	17-58-11-13/ 105-48-38-80	119	Farmer's House	seeds	landrace	Bi do	Kinh	Obtained farmer's stocked seeds. Big fruit over 14 kg weight and 60 cm diameter. Yellow skin color. Eat fruits, flowers and stems with boiled soup and fry.
76	30079172	271398	COL/VIETNAM/ 2019/NIVFS- PRC/076	Aug. 26	<i>Cucurbita moschata</i>	Quang Binh	Tuyen Hoa	Thanh Hoa	No. 5 Thanh Lang	17-59-08-14/ 105-50-20-13	56	Farmer's House	seeds	landrace	Bu ro	Kinh	Obtained farmer's stocked seeds. Small fruit. Yellow skin color. Red flesh of fruit.

Table 3. (Continued).

Coll. No.	Passport No.	JP No.	JP Name	Date	Genus & Species	Province	District	Commune	Village	North latitude/ East longitude	Altitude (m)	Source (Market name)	Type of sample	Status	Local name	Ethnic group name	Fruit characteristics, origin, etc.
77	30079173	271399	COL/VIETNAM/2019/NIVFS-PRC/077	Aug. 26	<i>Vigna unguiculata</i>	Quang Binh	Tuyen Hoa	Thanh Hoa	No. 5 Thanh Lang	17-59-08-14/ 105-50-20-13	56	Farmer's House	seeds	landrace	Dau dua	Kinh	Obtained farmer's stocked seeds. Long bean pod about 50 cm. Eat with boiled soup.
78	30079174	271400	COL/VIETNAM/2019/NIVFS-PRC/078	Aug. 26	<i>Cucumis sativus</i>	Quang Binh	Tuyen Hoa	Thanh Hoa	No. 5 Thanh Lang	17-59-08-14/ 105-50-20-13	56	Farmer's House	seeds	landrace	Dau chuot	Kinh	Obtained farmer's stocked seeds. Eat with fresh and salad.
79	30079175	271401	COL/VIETNAM/2019/NIVFS-PRC/079	Aug. 26	<i>Solanum melongena</i>	Quang Binh	Tuyen Hoa	Thanh Hoa	No. 5 Thanh Lang	17-59-08-14/ 105-50-20-13	56	Farmer's House	seeds	landrace	Ca dai de	Kinh	Obtained farmer's stocked seeds. Long and purple immature fruit. Eat with salad, soup, fry and roasting.
80	30079176	271402	COL/VIETNAM/2019/NIVFS-PRC/080	Aug. 27	<i>Capsicum annuum</i>	Quang Binh	Tuyen Hoa	Kim Hoa	Kim Lu 1	17-57-00-70/ 105-57-25-90	38	Farmer's House/ backyard	fruits	landrace	Ot dia phuong	Kinh	Some years cultivated. Slender fruit about 3-4 cm. Green immature fruit.
81	30079177	271403	COL/VIETNAM/2019/NIVFS-PRC/081	Aug. 27	<i>Capsicum annuum</i>	Quang Binh	Tuyen Hoa	Kim Hoa	Kim Lu 1	17-57-00-70/ 105-57-25-90	38	Farmer's House/ backyard	fruits	landrace	Ot dia phuong	Kinh	Obtained farmer's stocked dry fruits. Slender fruit about 5-6 cm.
82	30079178	271404	COL/VIETNAM/2019/NIVFS-PRC/082	Aug. 27	<i>Solanum melongena</i>	Quang Binh	Tuyen Hoa	Kim Hoa	Kim Lu 1	17-57-00-70/ 105-57-25-90	38	Farmer's House/ backyard	fruits	landrace	Ca phao	Kinh	Round fruit about 2 cm. White immature fruit. purple flower.
83	30079179	271405	COL/VIETNAM/2019/NIVFS-PRC/083	Aug. 27	<i>Solanum melongena</i>	Quang Binh	Tuyen Hoa	Kim Hoa	Kim Tan	17-55-17-90/ 105-59-44-25	32	Farmer's House/ backyard	fruits	landrace	Ca	Kinh	Slightly flat fruit about 5-6 cm. White immature fruit.
84	30079180	271406	COL/VIETNAM/2019/NIVFS-PRC/084	Aug. 27	<i>Capsicum frutescens</i>	Quang Binh	Tuyen Hoa	Kim Hoa	Kim Tan	17-55-17-90/ 105-59-44-25	32	Farmer's House/ backyard	fruits	landrace	Ot lao	Kinh	Big fruit about 3-4 cm. Green immature fruit. Brought up from Laos.
85	30079181	271407	COL/VIETNAM/2019/NIVFS-PRC/085	Aug. 27	<i>Capsicum frutescens</i>	Quang Binh	Tuyen Hoa	Le Hoa	Yen Xuan	17-53-07-97/ 106-00-39-18	28	Farmer's House/ backyard	fruits	landrace	Ot moi	Kinh	Long fruit about 4-5 cm. Light green immature fruit.
86	30079182	271408	COL/VIETNAM/2019/NIVFS-PRC/086	Aug. 27	<i>Vigna unguiculata</i>	Quang Binh	Tuyen Hoa	Le Hoa	Yen Xuan	17-53-07-97/ 106-00-39-18	28	Farmer's House	seeds	landrace	Dou do	Kinh	Obtained farmer's stocked seeds.
87	30079183	271409	COL/VIETNAM/2019/NIVFS-PRC/087	Aug. 27	<i>Vigna unguiculata</i>	Quang Binh	Tuyen Hoa	Le Hoa	Yen Xuan	17-53-07-97/ 106-00-39-18	28	Farmer's House	seeds	landrace	Dou den	Kinh	Obtained farmer's stocked seeds.
88	30079184	271410	COL/VIETNAM/2019/NIVFS-PRC/088	Aug. 27	<i>Vigna radiata</i>	Quang Binh	Tuyen Hoa	Le Hoa	Yen Xuan	17-53-07-97/ 106-00-39-18	28	Farmer's House	seeds	landrace	Dou xanh	Kinh	Obtained farmer's stocked seeds.

Photos of collected Samples



Sample Photo 1.
No. 1. *Solanum melongena*



Sample Photo 2.
No. 2. *Capsicum frutescens*



Sample Photo 3.
No. 3. *Solanum melongena*



Sample Photo 4.
No. 4. *Cucurbita moschata*



Sample Photo 5.
No. 5. *Capsicum frutescens*



Sample Photo 6.
No. 6. *Solanum melongena*



Sample Photo 7.
No. 7. *Capsicum frutescens*



Sample Photo 8.
No. 8. *Cucurbita moschata*



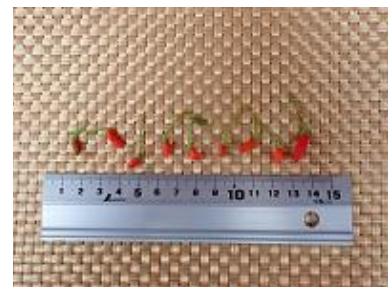
Sample Photo 9.
No. 9. *Cucumis sativus*



Sample Photo 10.
No. 10. *Cucurbita moschata*



Sample Photo 11.
No. 11. *Capsicum annuum*

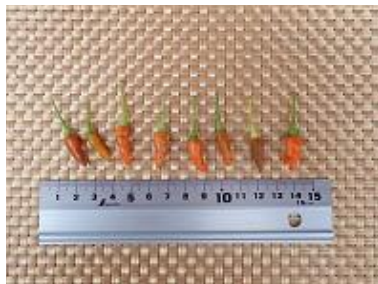


Sample Photo 12.
No. 12. *Capsicum frutescens*

Photos of collected Samples



Sample Photo 13.
No. 13. *Capsicum frutescens*



Sample Photo 14.
No. 14. *Capsicum frutescens*



Sample Photo 15.
No. 15. *Vigna unguiculata*



Sample Photo 16.
No. 16. *Solanum melongena*



Sample Photo 17.
No. 17. *Solanum melongena*



Sample Photo 18.
No. 18. *Capsicum frutescens*



Sample Photo 19.
No. 19. *Capsicum frutescens*



Sample Photo 20.
No. 20. *Capsicum frutescens*



Sample Photo 21.
No. 21. *Solanum melongena*



Sample Photo 22.
No. 22. *Capsicum frutescens*



Sample Photo 23.
No. 23. *Solanum melongena*



Sample Photo 24.
No. 24. *Cucumis sativus*

Photos of collected Samples



Sample Photo 25.
No. 25. *Capsicum frutescens*



Sample Photo 26.
No. 26. *Cucurbita moschata*



Sample Photo 27.
No. 27. *Vigna unguiculata*



Sample Photo 28.
No. 28. *Capsicum annum*



Sample Photo 29.
No. 29. *Capsicum frutescens*



Sample Photo 30.
No. 30. *Solanum melongena*



Sample Photo 31.
No. 31. *Capsicum frutescens*



Sample Photo 32.
No. 32. *Solanum melongena*



Sample Photo 33.
No. 33. *Cucumis sativus*



Sample Photo 34.
No. 34. *Cucurbita moschata*



Sample Photo 35.
No. 35. *Capsicum frutescens*



Sample Photo 36.
No. 36. *Capsicum frutescens*

Photos of collected Samples



Sample Photo 37.
No. 37. *Solanum melongena*



Sample Photo 38.
No. 38. *Solanum melongena*



Sample Photo 39.
No. 39. *Capsicum frutescens*



Sample Photo 40.
No. 40. *Cucurbita moschata*



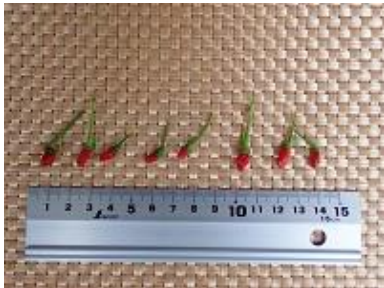
Sample Photo 41.
No. 41. *Capsicum frutescens*



Sample Photo 42.
No. 42. *Solanum melongena*



Sample Photo 43.
No. 43. *Vigna unguiculata*



Sample Photo 44.
No. 44. *Capsicum frutescens*



Sample Photo 45.
No. 45. *Solanum melongena*



Sample Photo 46.
No. 46. *Cucurbita moschata*



Sample Photo 47.
No. 47. *Capsicum frutescens*



Sample Photo 48.
No. 48. *Cucurbita moschata*

Photos of collected Samples



Sample Photo 49.
No. 49. *Solanum lycopersicum*



Sample Photo 50.
No. 50. *Vigna unguiculata*



Sample Photo 51.
No. 51. *Vigna radiata*



Sample Photo 52.
No. 52. *Amaranthus* spp.



Sample Photo 53.
No. 53. *Capsicum frutescens*



Sample Photo 54.
No. 54. *Capsicum annum*



Sample Photo 55.
No. 55. *Capsicum annum*



Sample Photo 56.
No. 56. *Solanum melongena*



Sample Photo 57.
No. 57. *Capsicum frutescens*



Sample Photo 58.
No. 58. *Solanum melongena*



Sample Photo 59.
No. 59. *Capsicum frutescens*



Sample Photo 60.
No. 60. *Capsicum frutescens*

Photos of collected Samples



Sample Photo 61.
No. 61. *Capsicum frutescens*



Sample Photo 62.
No. 62. *Capsicum annuum*



Sample Photo 63.
No. 63. *Vigna unguiculata*



Sample Photo 64.
No. 64. *Vigna radiata*



Sample Photo 65.
No. 65. *Solanum melongena*



Sample Photo 66.
No. 66. *Capsicum frutescens*



Sample Photo 67.
No. 67. *Amaranthus* spp.



Sample Photo 68.
No. 68. *Solanum melongena*



Sample Photo 69.
No. 69. *Solanum melongena*



Sample Photo 70.
No. 70. *Solanum melongena*



Sample Photo 71.
No. 71. *Cucurbita moschata*

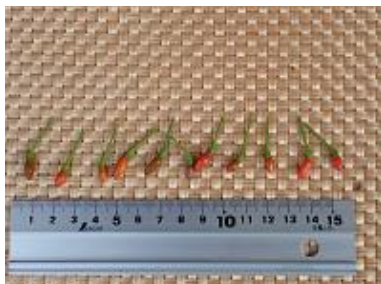


Sample Photo 72.
No. 72. *Amaranthus* spp.

Photos of collected Samples



Sample Photo 73.
No. 73. *Capsicum frutescens*



Sample Photo 74.
No. 74. *Capsicum frutescens*



Sample Photo 75.
No. 75. *Cucurbita moschata*



Sample Photo 76.
No. 76. *Cucurbita moschata*



Sample Photo 77.
No. 77. *Vigna unguiculata*



Sample Photo 78.
No. 78. *Cucumis sativus*



Sample Photo 79.
No. 79. *Solanum melongena*



Sample Photo 80.
No. 80. *Capsicum annum*



Sample Photo 81.
No. 81. *Capsicum annum*



Sample Photo 82.
No. 82. *Solanum melongena*



Sample Photo 83.
No. 83. *Solanum melongena*



Sample Photo 84.
No. 84. *Capsicum frutescens*

Photos of collected Samples



Sample Photo 85.
No. 85. *Capsicum frutescens*



Sample Photo 86.
No. 86. *Vigna unguiculata*



Sample Photo 87.
No. 87. *Vigna unguiculata*



Sample Photo 88.
No. 88. *Vigna radiata*