

## Collaborative Exploration of Plant Genetic Resources in the Central Highland of Vietnam, January 7 to 16, 2022

TRAN Thi Thu Hoai<sup>1)</sup>, Hiroshi MATSUNAGA<sup>2)</sup>, NGUYEN Thi Bich Thuy<sup>1)</sup>

1) *Plant Resources Center (PRC), Vietnamese Academy of Agricultural Science, Ankhanh, Hoaiduc, Hanoi, Vietnam*

2) *Institute of Vegetable and Floriculture Science, National Agriculture and Food Research Organization (NARO), 360 Kusawa, Ano, Tsu, Mie 514-2392, Japan*

Communicated by K. MIYATAKE (Institute of Vegetable and Floriculture Science, NARO)

Received Aug. 30, 2022, Accepted Dec. 16, 2022

Corresponding author: H. MATSUNAGA (e-mail: pep@affrc.go.jp)

### Summary

In 2021, the collaborative exploration was delayed because of the COVID-19 pandemic and was then carried out only by the Vietnamese scientists from January 7 to 16, 2022, in the Central Highland of Vietnam. The exploration was conducted in three districts of Kon Tum province: Dak Glei, Sa Thay, and Kon Plong. A total of 77 samples were collected, including 20 accessions of chili pepper (*Capsicum frutescens* and *Capsicum* sp.), 25 of eggplant (*Solanum melongena*, *Solanum torvum*, and *Solanum* sp.), 15 of pumpkin (*Cucurbita moschata*), 1 of amaranth (*Amaranthus* sp.), four of white gourd (*Benincasa hispida*), three of mustard (*Brassica juncea*), one of watermelon (*Citrullus lanatus*), two of melon (*Cucumis melo*), 2 of cucumber (*Cucumis sativus*), 1 of cowpea (*Vigna unguiculata* cv-gr. *Unguiculata*) and 3 of yard-long bean (*Vigna unguiculata* cv-gr. *Sesquipedalis*). The collected samples were divided into two sets for both the PRC and NARO sides to implement in-depth and detailed research of descriptions, assessments of agro-biological features, and markers of genetic diversity.

KEY WORDS: Chili pepper, Eggplant, Pumpkin, Cucumber, Melon, Watermelon, *Brassica*, Legume, Vegetable genetic resources, Vietnam

### Introduction

Vietnam is considered to be one of the centers of vegetable diversity. Among the 403 plant species used as vegetables in Vietnam, 293 (of 84 families) are indigenous, of which 252 are conventional vegetables and 41 are spices (Sen and Trinh 2008). Eggplant is the fifth most economically important solanaceous crop after potato, tomato, pepper, and tobacco (Taher *et al.* 2017). In the Solanaceae family, pepper (*Capsicum* spp.) is one of the most globally important vegetable crops because of its pungency and high nutritional value (Zhang *et al.* 2016). Accessions with important traits, such as good quality, high yield, and resistance to biotic stresses, pests,

and diseases of vegetable germplasm, play a key role in breeding. Cooperation on the collection and assessment of local vegetable resources between the NARO and PRC has been carried out since 2014. In 2019, the project started focusing on collecting and evaluating chili pepper and eggplant crops. The vegetable resources of the project in the north in 2014 (Sugiyama *et al.* 2015), 2015 (Shimomura *et al.* 2016), and 2020 (Tran *et al.* 2021); in the central region in 2016 (Kawazu *et al.* 2017) and 2019 (Sugita *et al.* 2020); and the Central Highlands in 2018 (Kami *et al.* 2019) have shown that Vietnam has a high diversity of cucurbit, amaranth, eggplant, and chili pepper crops.

The Central Highland is strategically located on the socioeconomic, security, and defense hotspots of Vietnam. Kon Tum is a mountainous province located in the north of the Central Highland in geographical coordinates from N13-55-10 to N15-27-15 latitude and from E107-20-15 to E108-32-30 longitude. Most of the Kon Tum province is located in the west of the Truong Son range, and the terrain is lower from north to south and from east to west. The topography of Kon Tum province is quite diverse, with alternating hills, plateaus, and lowlands. Regarding the three main topographical regions in Kon Tum, three representative districts were selected for the exploration of vegetable resources, including Dak Glei, Sa Thay, and Kon Plong.

The Kon Tum region has a tropical monsoon climate. The average temperature fluctuated between 22 °C and 23 °C, and the amplitude fluctuated from 8 °C to 9 °C. Kon Tum has two distinct seasons: the rainy season, mainly from April to November, and the dry season, from December to March.

This report describes the results of vegetable resource collection in Kon Tum province, which belongs

to the Central Highland of Vietnam.

## Methods

The survey was carried out from January 7 to 16, 2022, in Kon Tum province in the Central Highland of Vietnam (Table 1). Three districts—Dak Glei, Sa Thay, and Kon Plong were selected to explore vegetable resources (Fig. 1). Dak Glei is a mountainous district located in the north of Kon Tum province, a border highland district, and the northernmost gateway of the Central Highlands. The Sa Thay district is located in the southernmost part of Kon Tum province. The Sa Thay Valley is formed between mountain ranges extending to the east, running along the Vietnam–Cambodia border. The Kon Plong district, located between An Khe and Ngoc Linh, ranges from 1,100 to 1,300 m in altitude; this is a small plateau that runs in northwest–southeast direction.

In each district the collection sites were selected after discussing with colleagues from the Department of Agriculture (Photo 1). The communes were chosen based on the differences between ecology and ethnobotany.

Table 1. Itinerary of the exploration of vegetable landraces in Kon Tum province in January 7–16, 2022

Time	Day	Activities	Place
2022/1/7	Friday	Arrived Dak Glei district, Kon Tum province; Meet Department of Agriculture and Rural Development (DARD) of Dak Glei district	Ha Noi - Pleiku - Dak Glei
2022/1/8	Saturday	Survey, interview and collect in Dak Blo, Dak Nhoong and Dak Pek communes	Dak Glei district, Kon Tum province
2022/1/9	Sunday	Survey, interview and collect in Dak Man, Xa Xop, Dak Choong and Muong Hoong communes; Move to Kon Tum city	Dak Glei district, Kon Tum province
2022/1/10	Monday	Test RT-PCR COVID-19; Sample cleaning	Kon Tum city, Kon Tum province
2022/1/11	Tuesday	Move to Sa Thay; Meet Department of Agriculture and Rural Development (DARD) of Sa Thay; Survey, interview and collect in Ro Koi and Ya Tang communes	Sa Thay district, Kon Tum province
2022/1/12	Wednesday	Survey, interview and collect in Mo Rai commune; Move to Kon Tum city; Sample cleaning	Sa Thay district, Kon Tum province
2022/1/13	Thursday	Test RT-PCR COVID-19; Move to Kon Plong district, Kon Tum province	Kon Tum city - Kon Plong district
2022/1/14	Friday	Meet Department of Agriculture and Rural Development (DARD) of Kon Plong district; Survey, interview and collect in Ngoc Tem and Mang Canh communes	Kon Plong district, Kon Tum province
2022/1/15	Saturday	Survey, interview and collect in Mang Den town; Move to Pleiku city; Seed cleaning and seed packing	Kon Plong - Plei Ku
2022/1/16	Sunday	Move to Ha Noi	Pleiku - Ha Noi



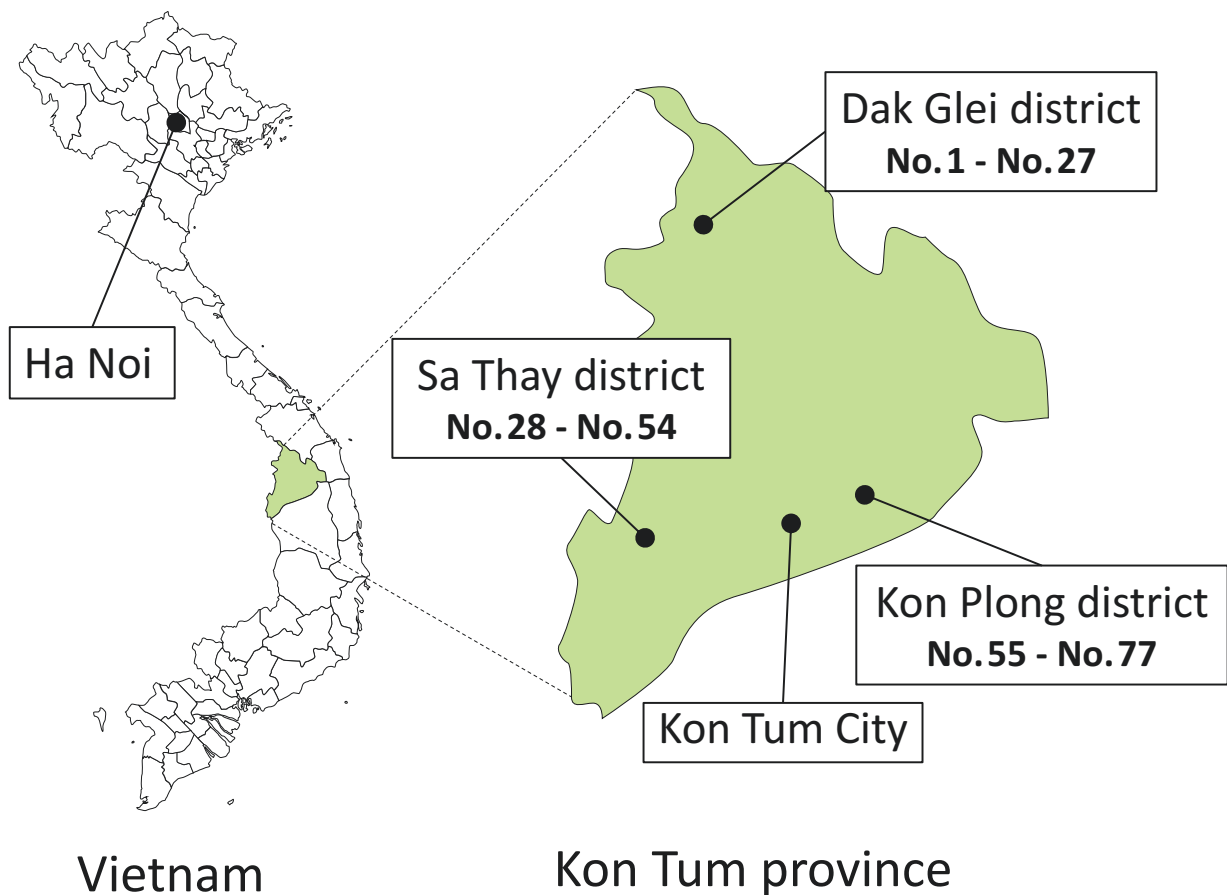


Fig. 1. Collection sites of the 2022 exploration in Kon Tum province, Central Highland of Vietnam.

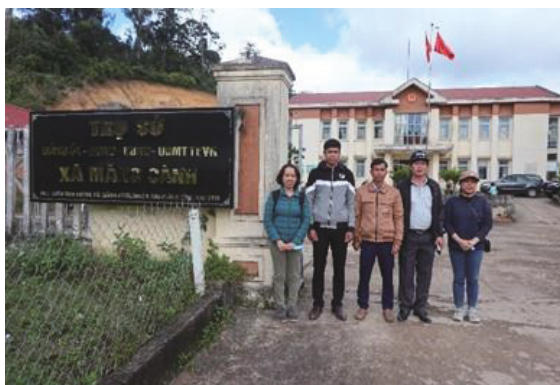


Photo 1. Visit to the Department of Agriculture in Mang Canh commune, Kon Plong district



Photo 3. Interviewing of farmers in Dak Nhoong village, Dak Nhoong commune, Dak Glei district



Photo 2. Interviewing of farmer in Dak Nhoong commune, Dak Glei district



Photo 4. Storage of pumpkin seeds in bamboo stem, Mo Rai commune, Sa Thay district



Photo 5. Vegetables in home garden, Lang Le village, Mo Rai commune, Sa Thay district



Photo 6. Seed extraction in farmer house, Kon Vong Kia village, Mang Den town, Kon Plong district

All collected information was documented as “passport data” (place name, latitude and longitude, elevation, and characteristics of each collection site, local names, sowing date, harvest date, usage, and information from farmers), which were collected through interviewing the farmers (Table 3, Photos 2 and 3). Samples were collected from farmers’ houses, fields, backyards, and roadsides (Photo 4). Vegetable germplasms were collected as dried seeds (Photo 5), dried fruits, or mature fruits. After collection, the seeds were extracted (Photo 6), cleaned, dried, and divided into two parts. One was sent to Genebank for NARO.

## Results

The itinerary of this study is presented in Table 1. The collection explorations were carried out in the three districts of Dak Glei, Sa Thay, and Kon Plong of Kon Tum province (Fig. 1). From January 7 to 9, 2022, we visited Dak Glei district. Then, from January 11 to 12, we collected vegetable resources from the Sa Thay district. We explored vegetables grown in Kon Plong from January 13 to 15. The number of samples collected is listed in Table 2. A total of 77 samples were collected, including 20 accessions of chili pepper (*Capsicum frutescens* and *Capsicum* sp.), 25 of eggplant (*Solanum melongena*, *Solanum torvum*, and *Solanum* sp.), 15 of pumpkin (*Cucurbita moschata*), 1 of amaranth (*Amaranthus* sp.), 4 of white gourd (*Benincasa hispida*), 3 of mustard (*Brassica juncea*), 1 of watermelon (*Citrullus lanatus*), 2 of melon (*Cucumis melo*), 2 of cucumber (*Cucumis sativus*), 1 of cowpea (*Vigna unguiculata* cv-gr. *Unguiculata*), and 3 yard-long bean (*Vigna unguiculata* cv-gr. *Sesquipedalis*).

## Discussion

### Chili pepper

Twenty chili pepper samples were collected. Based on the characteristics of the flowers and fruits,

we separated the two species. A total of 13 samples of *Capsicum frutescens* were collected from Dak Glei (Nos. 01, 06, 07, 11, 19, and 26), Sa Thay (Nos. 28, 31, and 37), and Kon Plong (Nos. 58, 71, 72, and 73). Seven samples of chili pepper (Nos. 09, 10, 24, 30, 52, 53, and 66) have not yet been classified. The color of the young fruit changed from light green (No. 30) to green. The mature fruit was red in color, except for No. 09, which was white in color. Fruit size varied among the collected samples.

Previous studies (Sugita *et al.* 2020; Tran *et al.* 2021) have shown that *Capsicum frutescens* species are widely distributed in Vietnam.

In the Dak Glei and Kon Plong districts, the time for sowing chili pepper is from May to July, and the harvesting time is from November to December. In the Sa Thay district, the sowing time for chili pepper is from March to April, and the harvesting time is from July to October. Chili peppers are mainly grown separately or intercropped with coffee in upland fields. In the Kon Plong district, we observed that chili peppers are cultivated in home gardens.

Chili pepper is considered as one of the most important spices in Central Highlands cuisine in general and in Kon Tum in particular. In the three surveyed districts, chili peppers were mainly used fresh, pounded with salt, dried, and ground into powder.

### Eggplant

A total of 25 samples of eggplant were collected. Among 20 samples of *Solanum melongena* collected in three districts, 3 samples were found in Dak Glei, 12 samples in Sa Thay, and 5 samples in Kon Plong.

A high diversity of morphological characteristics was observed among the collected samples of *Solanum melongena*. A small globular fruit shape was found in 10 samples (Nos. 20, 21, 40, 41, 44, 48, 49, 50, 51, and 65). Numbers 14 and 35 had club-shaped fruits, whereas

Table 2. Summary of collected crop genetic resources in Vietnam in 2022

Scientific Name	Number of collected samples			Total
	Dak Glei district	Sa Thay district	Kon Plong district	
<i>Amaranthus</i> sp.	0	1	0	1
<i>Benincasa hispida</i>	2	0	2	4
<i>Brassica juncea</i>	3	0	0	3
<i>Capsicum frutescens</i>	6	3	4	13
<i>Capsicum</i> sp.	3	3	1	7
<i>Citrullus lanatus</i>	0	0	1	1
<i>Cucumis melo</i>	1	0	1	2
<i>Cucumis sativus</i>	1	0	1	2
<i>Cucurbita moschata</i>	6	2	7	15
<i>Solanum melongena</i>	3	12	5	20
<i>Solanum torvum</i>	2	0	0	2
<i>Solanum</i> sp.	0	2	1	3
<i>Vigna unguiculata</i> cv-gr. Sesquipedalis	0	3	0	3
<i>Vigna unguiculata</i> cv-gr. Unguiculata	0	1	0	1
<b>Total</b>	<b>27</b>	<b>27</b>	<b>23</b>	<b>77</b>

Nos. 29 and 38 had ellipsoidal-shaped fruits. Ovoid fruit shape was found in Nos. 47, 57, and 74. The diversity in the color of the flowers and young fruits was noted among the collected samples. White petals were recorded in some samples (Nos. 20, 40, 44, and 49), while purple petals were abundant in the remaining samples (Nos. 14, 35, 41, 48, 50, and 51). Some samples had a white young fruit color (Nos. 49 and 51), purple color (Nos. 35 and 48), green skin with white spots (No. 14), or white skin with green stripes (Nos. 40 and 41). Number 32 was collected from the Sa Thay district. This cultivar has purple stems and petals. The young fruit had a white to purple skin color and turned yellow at maturity.

Five samples were classified as not belonging to *Solanum melongena* L. Two wild eggplants (Nos. 13 and 23) were collected along the road in Dak Glei district. These wild eggplants were shrub plants, with plant height ranging from 1.7 to 1.8 m, with thorns on the stem. Its fruit had a globose shape, was green when young, and yellow during ripening. Their botanical characteristics were classified as *Solanum torvum*. The mature fruit of No. 13 was eaten fresh, and the young fruit was fermented. Fruit of No. 23 was cooked with fish.

The numbers 36 and 42 were collected from the Sa Thay district. They are perennial plants with purple petals and globular fruit. Their young fruit had a green skin color and turned orange at maturity. It is assumed that the two samples may be *Solanum violaceum*.

Number 63, collected in the Kon Plong district, had a plant height of 1.15 m, prickles on the stem and leaves, globular fruit shape, and turned orange at maturity. Local people enjoy the bitter taste of young fruit. The young fruits are grinded, cooked, or mixed with bamboo or pork.

In the Dak Glei and Sa Thay districts, the time for sowing eggplant (*Solanum melongena* L.) is from March to April, and harvesting time is from June to July or from July to August. In Kon Plong, the sowing time for eggplant is from January to March, and the harvesting time starts from June to September or September to November.

These young fruits of eggplant are eaten by boiling and then grinded with salt, cooked with fish or pork, fried, or fermented. Except for wild eggplants, local varieties were cultivated in upland fields or home gardens.

The results of this study showed the high diversity of eggplant germplasm in the Kon Tum province. In an exploration in Gia Lai province (Kami *et al.* 2019), the diversity of eggplant was recorded.

### Pumpkin

We collected 15 pumpkin samples, including 6 samples in Dak Glei, 7 samples in Kon Plong, and 2 samples in Sa Thay. Similar to the results from past surveys (Sugiyama *et al.* 2015; Shimomura *et al.* 2016; Kawazu *et al.* 2017; Fujito *et al.* 2018; Kami *et al.* 2019;



Sugita *et al.* 2020; Tran *et al.* 2021), all of 15 pumpkin samples were *Cucurbita moschata*. A high diversity of fruit shapes was observed among the collected samples, such as cylindrical (Nos. 04 and 76), oval (Nos. 12, 18, and 69), globular (Nos. 08, 33, and 77), and flattened (Nos. 16, 55, 64, and 68) fruit shapes. The flesh fruit color varied from orange (Nos. 55, 76, and 77) to yellow (Nos. 68 and 69).

In the Dak Glei and Sa Thay districts, the time for sowing pumpkin is from March to April, and the harvesting time is from August to December. In the Kon Plong district, pumpkin is sown from February to March, and harvesting is from July to September. Pumpkin is cultivated around upland rice fields or mixed with other crops, such as cassava. Local people use young shoots and flowers as vegetables. The mature fruit was cooked in soup, stir-fried in garlic, and boiled.

### **Cucumber**

Two samples of *Cucumis sativus* were collected from Dak Glei (No. 03) and Kon Plong (No. 56). Cucumbers were cultivated together with rice in upland fields. Cucumber seeds were mixed with rice and sowed in the field simultaneously. Young fruits were eaten fresh or salted and fried.

### **Melon and Watermelon**

Two melon samples were collected in Dak Glei (No. 17) and Kon Plong (No. 59), identified as *Cucumis melo*. The sowing period is from April to May, and the harvesting period is from July to October. The cultivars were cultivated in upland fields. One sample (No. 62) of *Citrullus lanatus* was collected from the Kon Plong district.

### **White gourd**

Four samples of *Benincasa hispida* were collected from Dak Glei (Nos. 05 and 27) and Kon Plong (Nos. 61 and 70). The fruit weight varied from 3 kg to 6 kg. Numbers 05 and 27 had cylindrical fruit shape and were more than 20 cm in diameter. Fruit No. 05 had green skin color at maturity, whereas No. 27 had wax on the skin at maturity. Mature fruits were boiled, fried, cooked in soup, or salted. Approximately seven to eight fruits per single plant were recorded. White gourd is cultivated with other crops such as cassava or maize in upland fields or planted in home gardens. The sowing period is from March to April, and the harvesting period is from September to October.

### **Mustard**

Three mustard samples (Nos. 02, 22, and 25) were collected from the Dak Glei district. The young leaves were boiled, cooked in soup, or fried. Farmers use bamboo stems to ferment old leaves. After fermentation, leaves are dried and powdered for cooking. Mustard is cultivated in home gardens or upland fields. The sowing period is from March to April, and the harvesting period was from July to August.

### **Amaranth**

We collected one wild amaranth sample (No. 43) from the Sa Thay District. This sample had a plant length of 74 cm and a pink stem. Young shoots and leaves are cooked in either soup or boiled.

### **Legume**

One sample of *Vigna unguiculata* cv-gr. Unguiculata (No. 39) and 3 samples of *Vigna unguiculata* cv-gr. Sesquipedalis (Nos. 34, 45, and 54) were collected from the Sa Thay district. They were cultivated in upland rice fields. The sowing times were March and April, and the harvesting times were July (Nos. 34 and 39) and September–October (Nos. 45 and 54). Young fruits can be boiled as vegetables and mature seeds cooked with rice or made into sweet soups.

### **Acknowledgments**

This work was supported by MAFF commissioned project study on “A Collaborative Research Project on Characterization and Evaluation of Plant Genetic Resources for Food and Agriculture (PGRAsia)” Grant Number JPJ009843.

### **References**

- Fujito S, Shimomura K, Tran TTH and Nguyen VK (2018) Collaborative exploration of the vegetable genetic resources in Vietnam, 2017. AREIPGR 34: 228-244.  
[Genebank, NARO], [JaLC]
- 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.  
[Genebank, NARO], [JaLC]
- Kawazu Y, Kato M, Tran TTH and Nguyen VK (2017) Collaborative exploration of plant genetic resources in Vietnam, 2016. AREIPGR 33: 89-113.  
[Genebank, NARO], [JaLC]

- Sen PT and Trinh LN (2009) Vietnam second country report on the state of nation's plant genetic resources for food and agriculture. Food and Agriculture Organization of the United Nations, Rome, p. 34. [<https://www.fao.org/3/i1500e/VietNam.pdf>], [Accessed January 30, 2023].
- 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. [Genebank, NARO], [JaLC]
- Sugita T, Matsunaga H, Tran TTH and Nguyen VK (2020) Collaborative exploration of genetic resources of mainly Solanaceous crops in central Vietnam, 2019. AREIPGR 36: 33-56. [Genebank, NARO], [JaLC]
- Sugiyama M, Ebana K, Kami D, Tran TTH and Nguyen VK (2015) Collaborative exploration of cucurbitaceous crops in Vietnam, 2014. AREIPGR 31: 189-201. [Genebank, NARO], [JaLC]
- Taher D, Solberg SØ, Prohens J, Chou Y, Rakha M and Wu T (2017) World vegetable center eggplant collection: origin, composition, seed dissemination and utilization in breeding. *Front Plant Sci* 8: 1484. [CrossRef]
- Tran TTH, Matsunaga H, Nguyen VK, Nguyen TBT and Ha ML (2021) Collaborative exploration of plant genetic resources in Northern Vietnam, 2020. AREIPGR 37: 14-36. [Genebank, NARO], [JaLC]
- Zhang XM, Zhang ZH, Gu XZ, Mao SL, Li XX, Joël C, Alain P, Wang LH and Zhang BX (2016) Genetic diversity of pepper (*Capsicum* spp.) germplasm resources in China reflects selection for cultivar types and spatial distribution. *J Integr Agric* 15(9): 1991-2001. [CrossRef]



# ベトナム中部地域における 植物遺伝資源の収集, 2022年1月7日～16日

TRAN Thi Thu Hoai<sup>1)</sup>・松永 啓<sup>2)</sup>・NGUYEN Thi Bich Thuy<sup>1)</sup>

1) ベトナム植物遺伝資源センター

2) 国立研究開発法人 農業・食品産業技術総合研究機構 野菜花き研究部門

## 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 Resources 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2019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、植物遺伝資源の探索・調査をベトナムと日本共同で実施してきた。しかし、2020年はコロナ禍の影響を受け、探索・調査はベトナムの研究員のみで実施した。2021年の探索・調査もコロナ禍の影響を受けたため、2022年1月に延期し、ベトナムの研究員のみで2022年1月7日～16日にベトナム中部地域に位置するKon Tum省のDak Glei郡、Sa Thay郡およびKon Plong郡において実施した。本探索において、トウガラシ20点 (*Capsicum frutescens* 13点, *Capsicum* sp. 7点), ナス25点 (*Solanum melongena* 20点, *Solanum torvum* 2点および *Solanum* sp. 3点), カボチャ15点 (*Cucurbita moschata*), アマランサス1点 (*Amaranthus* sp.), トウガン4点 (*Benincasa hispida*), カラシナ3点 (*Brassica juncea*), スイカ1点 (*Citrullus lanatus*), メロン2点 (*Cucumis melo*), キュウリ2点 (*Cucumis sativus*) およびマメ科植物4点 (*Vigna unguiculata* cv-gr. *Sesquipedalis* 3点, および *Vigna unguiculata* cv-gr. *Unguiculata* 1点) の合計77点の遺伝資源を収集した。これらの種子は、ベトナム PRC での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. Crop genetic resources collected in Vietnam in 2022

JP. No.	Collection Date	Collection No.	Scientific Name	Crop Name	Local Name	Status of Plant	Collection Site	Latitude	Longitude	Altitude (m)	Collecting Source	Sample	Sampling method
278060	2022/1/8	01	<i>Capsicum frutescens</i>	Chili pepper	Vot	2. Landrace	Bung Ton village, Dak Blo commune, Glei district, Kon Tum province	N15-14-54-8	E107-40-17-5	1,217	3. Farmer's storage	2. Fruits	2. From Bulk plants
278061	2022/1/8	02	<i>Brassica juncea</i>	Mustard	Sbi	2. Landrace	Bung Ton village, Dak Blo commune, Dak Glei district, Kon Tum province	N15-14-54-8	E107-40-17-5	1,217	3. Farmer's storage	1. Seeds	2. From Bulk plants
278062	2022/1/8	03	<i>Cucumis sativus</i>	Cucumber	Pook	2. Landrace	Bung Koong village, Dak Blo commune, Dak Glei district, Kon Tum province	N15-14-54-8	E107-40-17-5	1,217	3. Farmer's storage	1. Seeds	2. From Bulk plants
278063	2022/1/8	04	<i>Cucurbita moschata</i>	Pumkin	U'	2. Landrace	Bung Koong village, Dak Blo commune, Dak Glei district, Kon Tum province	N15-14-54-8	E107-40-17-5	1,217	3. Farmer's storage	1. Seeds	2. From Bulk plants
278064	2022/1/8	05	<i>Benincasa hispida</i>	White gourd	Thuoc	2. Landrace	Bung Koong village, Dak Blo commune, Dak Glei district, Kon Tum province	N15-14-54-8	E107-40-17-5	1,217	3. Farmer's storage	1. Seeds	2. From Bulk plants
278065	2022/1/8	06	<i>Capsicum frutescens</i>	Chili pepper	Vot	2. Landrace	Bung Koong village, Dak Blo commune, Dak Glei district, Kon Tum province	N15-14-54-8	E107-40-17-5	1,217	3. Farmer's storage	2. Fruits	2. From Bulk plants
278066	2022/1/8	07	<i>Capsicum frutescens</i>	Chili pepper	Pek	2. Landrace	Rook Nam village, Dak Nhoong commune, Dak Glei district, Kon Tum province	N15-14-54-8	E107-40-53-6	1,011	3. Farmer's storage	1. Seeds	2. From Bulk plants
278067	2022/1/8	08	<i>Cucurbita moschata</i>	Pumkin	Mo	2. Landrace	Rook Nam village, Dak Nhoong commune, Dak Glei district, Kon Tum province	N15-14-54-8	E107-40-53-6	1,011	3. Farmer's storage	1. Seeds	2. From Bulk plants
278068	2022/1/8	09	<i>Capsicum sp.</i>	Chili pepper	Dak	2. Landrace	Rook Met village, Dak Nhoong commune, Dak Glei district, Kon Tum province	N15-08-12-5	E107-40-04-2	1,005	3. Farmer's storage	1. Seeds	2. From Bulk plants
278069	2022/1/8	10	<i>Capsicum sp.</i>	Chili pepper	Vet rook (ot bo)	2. Landrace	Dak Nhoong village, Dak Nhoong commune, Dak Glei district, Kon Tum province	N15-03-33-2	E107-40-58-1	846	3. Farmer's storage	2. Fruits	2. From Bulk plants
278070	2022/1/8	11	<i>Capsicum frutescens</i>	Chili pepper	Vet pooc	2. Landrace	Dak Nhoong village, Dak Nhoong commune, Dak Glei district, Kon Tum province	N15-03-33-2	E107-40-58-1	846	3. Farmer's storage	2. Fruits	2. From Bulk plants
278071	2022/1/8	12	<i>Cucurbita moschata</i>	Pumkin	Uc	2. Landrace	Dak Nhoong village, Dak Nhoong commune, Dak Glei district, Kon Tum province	N15-03-33-2	E107-40-58-1	846	3. Farmer's storage	2. Fruits	2. From Bulk plants
278072	2022/1/8	13	<i>Solanum torvum</i>	Wild eggplant	Ca	1. Wild	Peng Pa Peng village, Dak Pek commune, Dak Glei district, Kon Tum province	N15-03-33-2	E107-43-31-5	711	4. Backyard garden	2. Fruits	1. From Single plant
278073	2022/1/8	14	<i>Solanum melongena</i>	Eggplant	Ca dai	2. Landrace	Along the road, 2 km from the headquarter of Dak Pek commune, Dak Glei district, Kon Tum province	N15-02-50-2	E107-40-58-1	719	7. Others (Along the road, 2 km from the headquarter of Dak Pe commune)	2. Fruits	1. From Single plant
278074	2022/1/9	15	<i>Cucurbita moschata</i>	Pumkin	Mo	2. Landrace	Dong Loc village, Dak Man commune, Dak Glei district, Kon Tum province	N15-09-28-5	E107-45-01-1	974	3. Farmer's storage	1. Seeds	2. From Bulk plants
278075	2022/1/9	16	<i>Cucurbita moschata</i>	Pumkin	Mo	2. Landrace	Dong Loc village, Dak Man commune, Dak Glei district, Kon Tum province	N15-09-27-0	E107-45-00-9	969	3. Farmer's storage	2. Fruits	1. From Single plant
278076	2022/1/9	17	<i>Cucumis melo</i>	Melon	Poc	2. Landrace	Dong Loc village, Dak Man commune, Dak Glei district, Kon Tum province	N15-09-27-0	E107-45-00-9	969	3. Farmer's storage	1. Seeds	2. From Bulk plants
278077	2022/1/9	18	<i>Cucurbita moschata</i>	Pumkin	Mo	2. Landrace	Dong Loc village, Dak Man commune, Dak Glei district, Kon Tum province	N15-09-27-0	E107-45-00-9	969	3. Farmer's storage	2. Fruits	2. From Bulk plants
278078	2022/1/9	19	<i>Capsicum frutescens</i>	Chili pepper	Prek	2. Landrace	Dong Loc village, Dak Man commune, Dak Glei district, Kon Tum province	N15-09-27-0	E107-45-00-9	969	3. Farmer's storage	2. Fruits	2. From Bulk plants
278079	2022/1/9	20	<i>Solanum melongena</i>	Eggplant	Troc	2. Landrace	Dong Loc village, Dak Man commune, Dak Glei district, Kon Tum province	N15-09-50-9	E107-45-02-1	981	7. Others (specify)	2. Fruits	1. From Single plant
278080	2022/1/9	21	<i>Solanum melongena</i>	Eggplant	Trong	2. Landrace	Kon Liem village, Xa Xop commune, Dak Glei district, Kon Tum province	N15-08-07-7	E107-48-37-4	939	3. Farmer's storage	2. Fruits	1. From Single plant

Table 3. (Continued).

JP. No.	Collection Date	Collection No.	Scientific Name	Crop Name	Local Name	Status of Plant	Collection Site	Latitude	Longitude	Altitude (m)	Collecting Source	Sample	Sampling method
278081	2022/1/9	22	<i>Brassica juncea</i>	Mustard	Choy pri	2. Landrace	Kon Liem village, Xa Xop commune, Dak Glei district, Kon Tum province	N15-08-07-7	E107-48-37-4	939	3. Farmer's storage	2. Fruits	1. From Single plant
278082	2022/1/9	23	<i>Solanum torvum</i>	Wild eggplant	Ca dai	1. Wild	Along the road, 2 km from the headquarter of Dak Choong commune, Dak Glei district, Kon Tum province	N15-09-65-6	E107-47-13-5	893	7. Others (Along the road, 2 km from the headquarter of Dak Choong commune)	2. Fruits	1. From Single plant
278083	2022/1/9	24	<i>Capsicum sp.</i>	Chili pepper	Vot	2. Landrace	Dak Mi village, Dak Choong commune, Dak Glei district, Kon Tum province	N15-10-62-5	E107-48-16-6	938	3. Farmer's storage	2. Fruits	2. From Bulk plants
278084	2022/1/9	25	<i>Brassica juncea</i>	Mustard	Pay	2. Landrace	Lang Moi village, Muong Hoong commune, Dak Glei district, Kon Tum province	N15-07-06-1	E107-56-12-5	991	3. Farmer's storage	1. Seeds	2. From Bulk plants
278085	2022/1/9	26	<i>Capsicum frutescens</i>	Chili pepper	Vat	2. Landrace	Lang Moi village, Muong Hoong commune, Dak Glei district, Kon Tum province	N15-07-06-1	E107-56-12-5	991	3. Farmer's storage	2. Fruits	2. From Bulk plants
278086	2022/1/9	27	<i>Benincasa hispida</i>	White gourd	Bi xanh	2. Landrace	Dak Re village, Muong Hoong commune, Dak Glei district, Kon Tum province	N15-06-58-7	E107-56-01-0	990	4. Backyard garden	2. Fruits	1. From Single plant
278087	2022/1/11	28	<i>Capsicum frutescens</i>	Chili pepper	Bhang	2. Landrace	Ca Ram village, Ro Koi commune, Sa Thay district, Kon Tum province	N14-31-34-9	E107-44-58-8	623	4. Backyard garden	2. Fruits	1. From Single plant
278088	2022/1/11	29	<i>Solanum melongena</i>	Eggplant	Kroong to	2. Landrace	Lang Lut village, Ya Tang commune, Sa Thay district, Kon Tum province	N14-20-35-8	E107-49-11-8	537	2. Farmer's field	2. Fruits	1. From Single plant
278089	2022/1/11	30	<i>Capsicum sp.</i>	Chili pepper	Hang bo ru	2. Landrace	Lang Lut village, Ya Tang commune, Sa Thay district, Kon Tum province	N14-20-35-8	E107-49-11-8	537	2. Farmer's field	2. Fruits	1. From Single plant
278090	2022/1/11	31	<i>Capsicum frutescens</i>	Chili pepper	Hang krich	2. Landrace	Lang Lut village, Ya Tang commune, Sa Thay district, Kon Tum province	N14-20-35-8	E107-49-11-8	537	2. Farmer's field	2. Fruits	1. From Single plant
278091	2022/1/11	32	<i>Solanum melongena</i>	Eggplant	Ca	2. Landrace	Garden nearby the headquarter of Ya Tang commune, Sa Thay district, Kon Tum province	N14-20-35-9	E107-49-15-3	548	4. Backyard garden	2. Fruits	1. From Single plant
278092	2022/1/11	33	<i>Cucurbita moschata</i>	Pumkin	Tol	2. Landrace	Lang Trap village, Ya Tang commune, Sa Thay district, Kon Tum province	N14-19-30-3	E107-48-14-8	539	3. Farmer's storage	1. Seeds	2. From Bulk plants
278093	2022/1/11	34	<i>Vigna unguiculata</i> cv-gr. Sesquipedalis	Yard-long bean	Tac	2. Landrace	Lang Trap village, Ya Tang commune, Sa Thay district, Kon Tum province	N14-19-30-3	E107-48-14-8	539	4. Backyard garden	2. Fruits	1. From Single plant
278094	2022/1/11	35	<i>Solanum melongena</i>	Eggplant	Trong	2. Landrace	Lang Trap village, Ya Tang commune, Sa Thay district, Kon Tum province	N14-19-30-3	E107-48-14-8	539	4. Backyard garden	2. Fruits	2. From Bulk plants
278095	2022/1/11	36	<i>Solanum sp.</i>	Wild eggplant	Trong phet	2. Landrace	Lang Trap village, Ya Tang commune, Sa Thay district, Kon Tum province	N14-19-30-3	E107-48-14-8	539	4. Backyard garden	2. Fruits	1. From Single plant
278096	2022/1/11	37	<i>Capsicum frutescens</i>	Chili pepper	Hang	2. Landrace	Lang Trap village, Ya Tang commune, Sa Thay district, Kon Tum province	N14-19-30-3	E107-48-14-8	539	4. Backyard garden	2. Fruits	1. From Single plant
278097	2022/1/11	38	<i>Solanum melongena</i>	Eggplant	Trong	2. Landrace	Lang Trap village, Ya Tang commune, Sa Thay district, Kon Tum province	N14-19-30-3	E107-48-14-8	539	4. Backyard garden	2. Fruits	1. From Single plant
278098	2022/1/11	39	<i>Vigna unguiculata</i> cv-gr. Unguiculata	Cowpea	Ta	2. Landrace	Lang Trap village, Ya Tang commune, Sa Thay district, Kon Tum province	N14-19-30-3	E107-48-14-8	539	3. Farmer's storage	2. Fruits	2. From Bulk plants
278099	2022/1/11	40	<i>Solanum melongena</i>	Eggplant	Trong	2. Landrace	Lang Trap village, Ya Tang commune, Sa Thay district, Kon Tum province	N14-19-31-0	E107-48-14-1	446	4. Backyard garden	2. Fruits	1. From Single plant
278100	2022/1/11	41	<i>Solanum melongena</i>	Eggplant	Trong	2. Landrace	Dak De village, Ro Koi commune, Sa Thay district, Kon Tum province	N14-31-04-7	E107-44-11-7	628	4. Backyard garden	2. Fruits	1. From Single plant

Table 3. (Continued).

JP. No.	Collection Date	Collection No.	Scientific Name	Crop Name	Local Name	Status of Plant	Collection Site	Latitude	Longitude	Altitude (m)	Collecting Source	Sample	Sampling method
278101	2022/1/11	42	<i>Solanum</i> sp.	Wild eggplant	Trong bay	1. Wild	Ca Ram village, Ro Koi commune, Sa Thay district, Kon Tum province	N14-31-36-9	E107-44-55-5	628	4. Backyard garden	2. Fruits	1. From Single plant
278102	2022/1/11	43	<i>Amaranthus</i> sp.	Wild amaranth	Cachi ho rum	1. Wild	Ca Ram village, Ro Koi commune, Sa Thay district, Kon Tum province	N14-31-38-1	E107-44-57-3	617	4. Backyard garden	1. Seeds	1. From Single plant
278103	2022/1/11	44	<i>Solanum melongena</i>	Eggplant	Trong	2. Landrace	Ca Ram village, Ro Koi commune, Sa Thay district, Kon Tum province	N14-31-38-1	E107-44-57-3	617	4. Backyard garden	1. Seeds	1. From Single plant
278104	2022/1/12	45	<i>Vigna unguiculata</i> cv-gr. <i>Sesquipedalis</i>	Yard-long bean	Koto gbuoc	2. Landrace	Lang Le village, Mo Rai commune, Sa Thay district, Kon Tum province	N14-22-54-7	E107-32-28-8	246	3. Farmer's storage	2. Fruits	2. From Bulk plants
278105	2022/1/12	46	<i>Cucurbita moschata</i>	Pumkin	Tre	2. Landrace	Lang Le village, Mo Rai commune, Sa Thay district, Kon Tum province	N14-22-54-7	E107-32-28-8	246	3. Farmer's storage	1. Seeds	2. From Bulk plants
278106	2022/1/12	47	<i>Solanum melongena</i>	Eggplant	Trong phi	2. Landrace	Lang Tang village, Mo Rai commune, Sa Thay district, Kon Tum province	N14-23-23-8	E107-34-57-2	274	4. Backyard garden	2. Fruits	1. From Single plant
278107	2022/1/12	48	<i>Solanum melongena</i>	Eggplant	Trong phui	2. Landrace	Lang Tang village, Mo Rai commune, Sa Thay district, Kon Tum province	N14-23-23-8	E107-34-57-2	274	4. Backyard garden	2. Fruits	1. From Single plant
278108	2022/1/12	49	<i>Solanum melongena</i>	Eggplant	Trong ty	2. Landrace	Lang Tang village, Mo Rai commune, Sa Thay district, Kon Tum province	N14-23-23-8	E107-34-57-2	273	4. Backyard garden	2. Fruits	1. From Single plant
278109	2022/1/12	50	<i>Solanum melongena</i>	Eggplant	Trong tu	2. Landrace	Lang Tang village, Mo Rai commune, Sa Thay district, Kon Tum province	N14-23-23-8	E107-34-57-2	273	4. Backyard garden	2. Fruits	1. From Single plant
278110	2022/1/12	51	<i>Solanum melongena</i>	Eggplant	Trong ty	2. Landrace	Lang Tang village, Mo Rai commune, Sa Thay district, Kon Tum province	N14-23-23-8	E107-34-57-2	273	4. Backyard garden	2. Fruits	1. From Single plant
278111	2022/1/12	52	<i>Capsicum</i> sp.	Chili pepper	Mecg puoc	2. Landrace	Lang Le village, Mo Rai commune, Sa Thay district, Kon Tum province	N14-22-54-7	E107-32-28-8	246	3. Farmer's storage	2. Fruits	2. From Bulk plants
278112	2022/1/12	53	<i>Capsicum</i> sp.	Chili pepper	Mec khon	2. Landrace	Lang Le village, Mo Rai commune, Sa Thay district, Kon Tum province	N14-22-54-7	E107-32-28-8	246	3. Farmer's storage	2. Fruits	2. From Bulk plants
278113	2022/1/12	54	<i>Vigna unguiculata</i> cv-gr. <i>Sesquipedalis</i>	Yard-long bean	Koto khon	2. Landrace	Lang Le village, Mo Rai commune, Sa Thay district, Kon Tum province	N14-22-54-7	E107-32-28-8	246	3. Farmer's storage	2. Fruits	2. From Bulk plants
278114	2022/1/14	55	<i>Cucurbita moschata</i>	Pumkin	A po pek	2. Landrace	Kon Vong Kia village, Mang Den town, Kon Plong district, Kon Tum province	N14-37-11-0	E108-19-28-4	1,089	3. Farmer's storage	2. Fruits	1. From Single plant
278115	2022/1/14	56	<i>Cucumis sativus</i>	Cucumber	Pong	2. Landrace	Kon Vong Kia village, Mang Den town, Kon Plong district, Kon Tum province	N14-37-11-0	E108-19-28-4	1,089	3. Farmer's storage	2. Fruits	1. From Single plant
278116	2022/1/14	57	<i>Solanum melongena</i>	Eggplant	Trong sang	2. Landrace	Dek Lo village, Ngoc Tem commune, Kon Plong district, Kon Tum province	N14-48-05-4	E108-23-25-7	334	3. Farmer's storage	2. Fruits	2. From Bulk plants
278117	2022/1/14	58	<i>Capsicum frutescens</i>	Chili pepper	Oat lang	2. Landrace	Dek Lo village, Ngoc Tem commune, Kon Plong district, Kon Tum province	N14-48-05-4	E108-23-25-7	334	3. Farmer's storage	1. Seeds	1. From Single plant
278118	2022/1/14	59	<i>Cucumis melo</i>	Melon	Gang	2. Landrace	Dek Lo village, Ngoc Tem commune, Kon Plong district, Kon Tum province	N14-48-05-4	E108-23-25-7	334	3. Farmer's storage	1. Seeds	1. From Single plant
278119	2022/1/14	60	<i>Cucurbita moschata</i>	Pumkin	Bi	2. Landrace	Dek Lo village, Ngoc Tem commune, Kon Plong district, Kon Tum province	N14-48-05-4	E108-23-25-7	334	3. Farmer's storage	1. Seeds	1. From Single plant
278120	2022/1/14	61	<i>Benincasa hispida</i>	Whiter gourd	Po	2. Landrace	Dek Lo village, Ngoc Tem commune, Kon Plong district, Kon Tum province	N14-48-05-4	E108-23-25-7	334	3. Farmer's storage	1. Seeds	1. From Single plant
278121	2022/1/14	62	<i>Citrullus lanatus</i>	Watermelon	Pa kai	2. Landrace	Dek Lo village, Ngoc Tem commune, Kon Plong district, Kon Tum province	N14-48-05-4	E108-23-25-7	334	3. Farmer's storage	1. Seeds	1. From Single plant

Table 3. (Continued).

JP. No.	Collection Date	Collection No.	Scientific Name	Crop Name	Local Name	Status of Plant	Collection Site	Latitude	Longitude	Altitude (m)	Collecting Source	Sample	Sampling method
278122	2022/1/14	63	<i>Solanum</i> sp.	Wild eggplant	Pro	1. Wild	Kon Chenh village, Mang Canh commune, Kon Plong district, Kon Tum province	N14-39-50-8	E108-17-45-5	1,208	4. Backyard garden	2. Fruits	2. From Bulk plants
278123	2022/1/14	64	<i>Cucurbita moschata</i>	Pumkin	Ply po	2. Landrace	Kon Chenh village, Mang Canh commune, Kon Plong district, Kon Tum province	N14-39-50-8	E108-17-44-5	1,208	3. Farmer's storage	2. Fruits	1. From Single plant
278124	2022/1/14	65	<i>Solanum melongena</i>	Eggplant	Trong sang	2. Landrace	Kon Chenh village, Mang Canh commune, Kon Plong district, Kon Tum province	N14-39-50-8	E108-17-44-5	1,208	3. Farmer's storage	2. Fruits	1. From Single plant
278125	2022/1/14	66	<i>Capsicum</i> sp.	Chili pepper	Imry hlong	2. Landrace	Kon Chenh village, Mang Canh commune, Kon Plong district, Kon Tum province	N14-39-50-8	E108-17-44-5	1,201	3. Farmer's storage	2. Fruits	2. From Bulk plants
278126	2022/1/14	67	<i>Solanum melongena</i>	Eggplant	Trong sang	2. Landrace	Kon Chenh village, Mang Canh commune, Kon Plong district, Kon Tum province	N14-39-59-5	E108-17-55-0	1,219	3. Farmer's storage	1. Seeds	2. From Bulk plants
278127	2022/1/14	68	<i>Cucurbita moschata</i>	Pumkin	Ply po	2. Landrace	Kon Chenh village, Mang Canh commune, Kon Plong district, Kon Tum province	N14-39-59-5	E108-17-55-0	1,219	3. Farmer's storage	2. Fruits	1. From Single plant
278128	2022/1/14	69	<i>Cucurbita moschata</i>	Pumkin	Ply po	2. Landrace	Kon Chenh village, Mang Canh commune, Kon Plong district, Kon Tum province	N14-39-59-5	E108-17-55-0	1,219	3. Farmer's storage	2. Fruits	1. From Single plant
278129	2022/1/14	70	<i>Benincasa hispida</i>	White gourd	Pleo	2. Landrace	Kon Chenh village, Mang Canh commune, Kon Plong district, Kon Tum province	N14-39-59-5	E108-17-55-0	1,219	3. Farmer's storage	1. Seeds	2. From Bulk plants
278130	2022/1/14	71	<i>Capsicum frutescens</i>	Chili pepper	Imry	2. Landrace	Kon Chenh village, Mang Canh commune, Kon Plong district, Kon Tum province	N14-39-59-5	E108-17-55-0	1,219	3. Farmer's storage	2. Fruits	2. From Bulk plants
278131	2022/1/15	72	<i>Capsicum frutescens</i>	Chili pepper	Imry hrong	2. Landrace	Kon Vong Kia village, Mang Den town, Kon Plong district, Kon Tum province	N14-37-11-0	E108-19-28-4	1,089	3. Farmer's storage	2. Fruits	2. From Bulk plants
278132	2022/1/15	73	<i>Capsicum frutescens</i>	Chili pepper	Imry mo	2. Landrace	Kon Vong Kia village, Mang Den town, Kon Plong district, Kon Tum province	N14-37-11-0	E108-19-28-4	1,089	3. Farmer's storage	2. Fruits	2. From Bulk plants
278133	2022/1/15	74	<i>Solanum melongena</i>	Eggplant	Trong sang	2. Landrace	Kon Vong Kia village, Mang Den town, Kon Plong district, Kon Tum province	N14-37-11-0	E108-19-28-4	1,089	4. Backyard garden	2. Fruits	1. From Single plant
278134	2022/1/15	75	<i>Solanum melongena</i>	Eggplant	Trong sang	2. Landrace	Kon Vong Kia village, Mang Den town, Kon Plong district, Kon Tum province	N14-37-11-0	E108-19-28-4	1,089	3. Farmer's storage	1. Seeds	1. From Single plant
278135	2022/1/15	76	<i>Cucurbita moschata</i>	Pumkin	A po ka linh	2. Landrace	Kon Vong Kia village, Mang Den town, Kon Plong district, Kon Tum province	N14-37-11-0	E108-19-28-4	1,089	4. Backyard garden	2. Fruits	1. From Single plant
278136	2022/1/15	77	<i>Cucurbita moschata</i>	Pumkin	A po gang	2. Landrace	Kon Vong Kia village, Mang Den town, Kon Plong district, Kon Tum province	N14-37-11-0	E108-19-28-4	1,089	3. Farmer's storage	1. Seeds	1. From Single plant



Photos of collected Samples

Chili pepper



Sample Photo 1.  
JP278060, VN01,  
*Capsicum frutescens*



Sample Photo 2.  
JP278065, VN06,  
*Capsicum frutescens*



Sample Photo 3.  
JP278066, VN07,  
*Capsicum frutescens*



Sample Photo 4.  
JP278068, VN09,  
*Capsicum sp.*



Sample Photo 5.  
JP278069, VN10,  
*Capsicum sp.*



Sample Photo 6.  
JP278070, VN11,  
*Capsicum frutescens*



Sample Photo 7.  
JP278078, VN19,  
*Capsicum frutescens*



Sample Photo 8.  
JP278083, VN24,  
*Capsicum sp.*



## Chili pepper



Sample Photo 9.  
JP278085, VN26,  
*Capsicum frutescens*



Sample Photo 10.  
JP278087, VN28,  
*Capsicum frutescens*



Sample Photo 11.  
JP278089, VN30,  
*Capsicum sp.*



Sample Photo 12  
JP278090, VN31,  
*Capsicum frutescens*



Sample Photo 13.  
JP278096, VN37,  
*Capsicum frutescens*



Sample Photo 14.  
JP278111, VN52,  
*Capsicum sp.*



Chili pepper



Sample Photo 15.  
JP278112, VN53,  
*Capsicum* sp.



Sample Photo 16.  
JP278117, VN58,  
*Capsicum frutescens*



Sample Photo 17.  
JP 278125, VN66,  
*Capsicum* sp.



Sample Photo 18.  
JP278130, VN71,  
*Capsicum frutescens*



Sample Photo 19.  
JP278131, VN72,  
*Capsicum frutescens*



Sample Photo 20.  
JP278132, VN73,  
*Capsicum frutescens*



**Eggplant**



Sample Photo 21.  
JP278072, VN13,  
*Solanum torvum*



Sample Photo 22.  
JP278073, VN14,  
*Solanum melongena*



Sample Photo 23.  
JP278079, VN20,  
*Solanum melongena*



Sample Photo 24.  
JP278080, VN21,  
*Solanum melongena*



Sample Photo 25.  
JP278082, VN23,  
*Solanum torvum*



Sample Photo 26.  
JP278088, VN29,  
*Solanum melongena*



## Eggplant



Sample Photo 27.  
JP278091, VN32,  
*Solanum melongena*



Sample Photo 28.  
JP278094, VN35,  
*Solanum melongena*



Sample Photo 29.  
JP278095, VN36,  
*Solanum* sp.



Sample Photo 30.  
JP278097, VN38,  
*Solanum melongena*



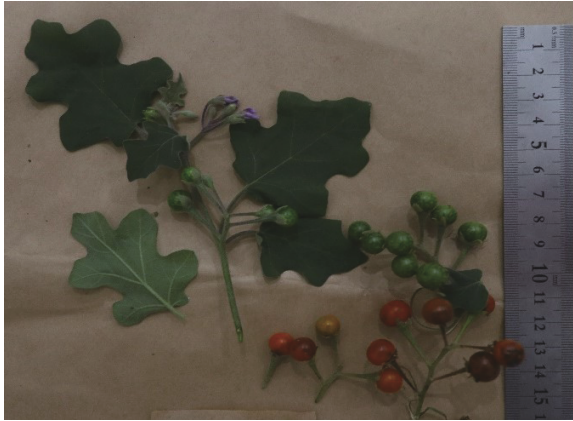
Sample Photo 31.  
JP278099, VN40,  
*Solanum melongena*



Sample Photo 32.  
JP278100, VN41,  
*Solanum melongena*



**Eggplant**



Sample Photo 33.  
JP278101, VN42,  
*Solanum* sp.



Sample Photo 34.  
JP278103, VN44,  
*Solanum melongena*



Sample Photo 35.  
JP278106, VN47,  
*Solanum melongena*



Sample Photo 36.  
JP278107, VN48,  
*Solanum melongena*



Sample Photo 37.  
JP278108, VN49,  
*Solanum melongena*



Sample Photo 38.  
JP278109, VN50,  
*Solanum melongena*



**Eggplant**



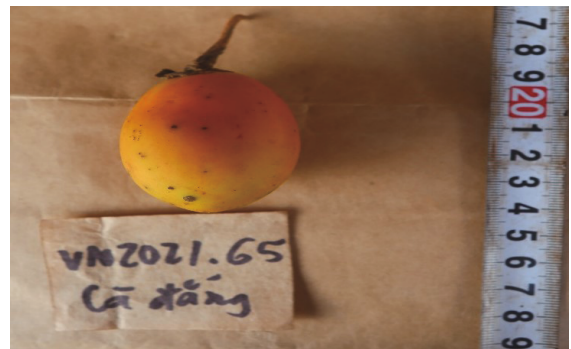
Sample Photo 39.  
JP278110, VN51,  
*Solanum melongena*



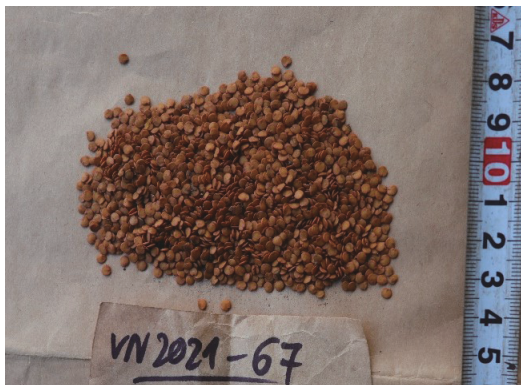
Sample Photo 40.  
JP278116, VN57,  
*Solanum melongena*



Sample Photo 41.  
JP278122, VN63,  
*Solanum* sp.



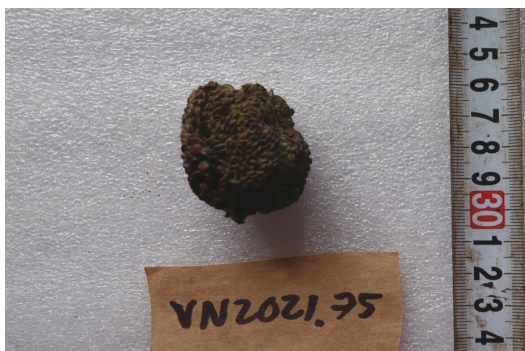
Sample Photo 42.  
JP278124, VN65,  
*Solanum melongena*



Sample Photo 43.  
JP278126, VN67,  
*Solanum melongena*



Sample Photo 44.  
JP278133, VN74,  
*Solanum melongena*



Sample Photo 45.  
JP278134, VN75,  
*Solanum melongena*

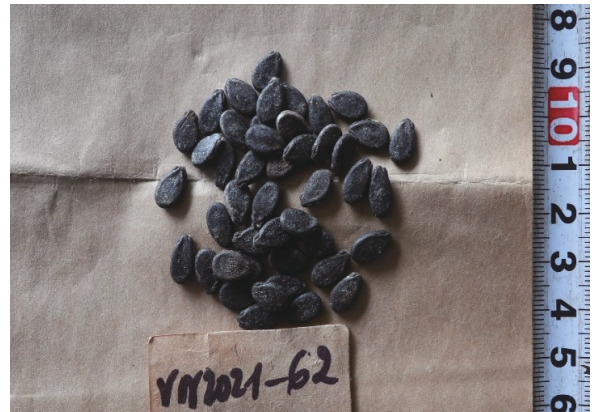


**Amaranth**



Sample Photo 46.  
JP278102, VN43,  
*Amaranthus* sp.

**Watermelon**



Sample Photo 47.  
JP278121, VN62,  
*Citrullus lanatus*

**Cucumber**

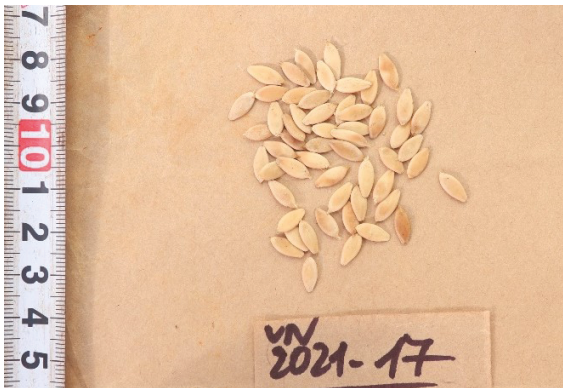


Sample Photo 48.  
JP278062, VN03,  
*Cucumis sativus*

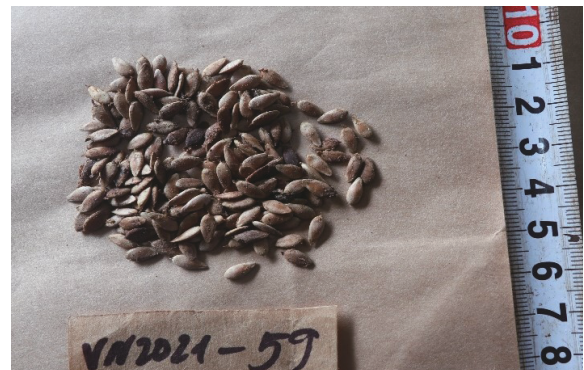


Sample Photo 49.  
JP278115, VN56,  
*Cucumis sativus*

**Melon**



Sample Photo 50.  
JP278076, VN17,  
*Cucumis melo*



Sample Photo 51.  
JP278118, VN59,  
*Cucumis melo*



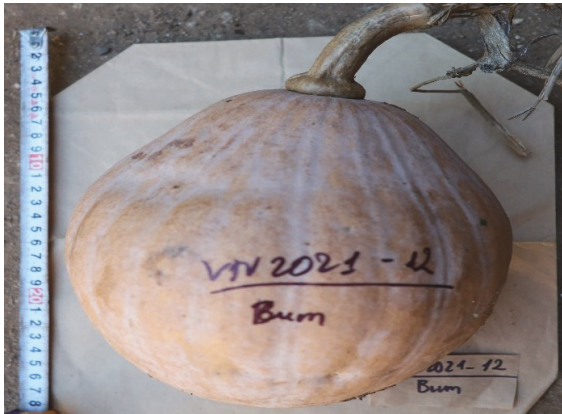
## Pumpkin



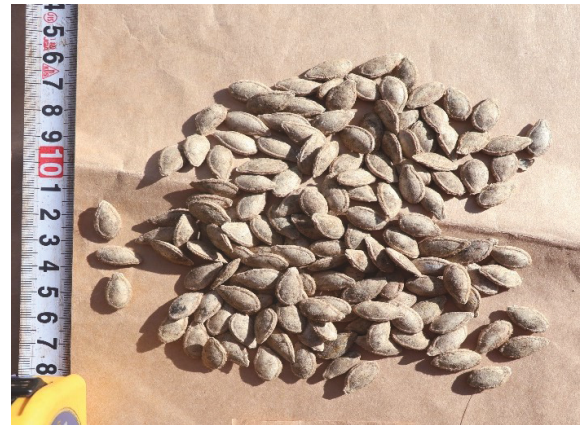
Sample Photo 52.  
JP278063, VN04,  
*Cucurbita moschata*



Sample Photo 53.  
JP278067, VN08,  
*Cucurbita moschata*



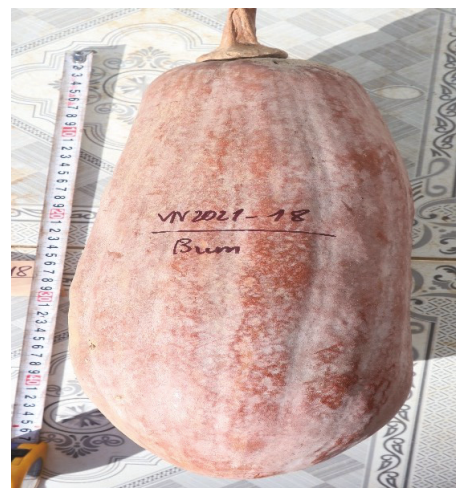
Sample Photo 54.  
JP278071, VN12,  
*Cucurbita moschata*



Sample Photo 55.  
JP278074, VN15,  
*Cucurbita moschata*



Sample Photo 56.  
JP278075, VN16,  
*Cucurbita moschata*



Sample Photo 57.  
JP278077, VN18,  
*Cucurbita moschata*



## Pumpkin



Sample Photo 58.  
JP278092, VN33,  
*Cucurbita moschata*



Sample Photo 59.  
JP278105, VN46,  
*Cucurbita moschata*



Sample Photo 60.  
JP278114, VN55,  
*Cucurbita moschata*



Sample Photo 61.  
JP278119, VN60,  
*Cucurbita moschata*



Sample Photo 62.  
JP278123, VN64,  
*Cucurbita moschata*



Sample Photo 63.  
JP278127, VN68,  
*Cucurbita moschata*



## Pumpkin



Sample Photo 64.  
JP278128, VN69,  
*Cucurbita moschata*



Sample Photo 65.  
JP278135, VN76,  
*Cucurbita moschata*



Sample Photo 66.  
JP278136, VN77,  
*Cucurbita moschata*

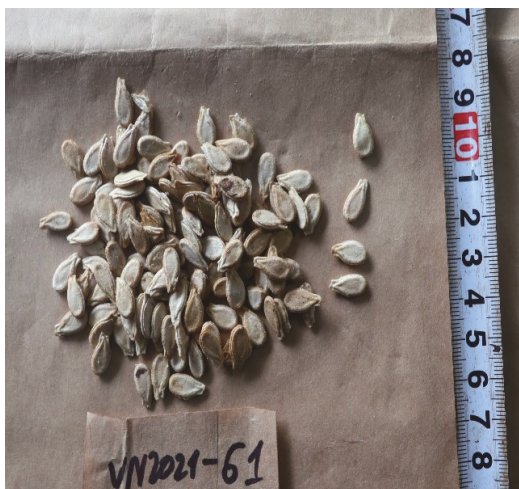
White gourd



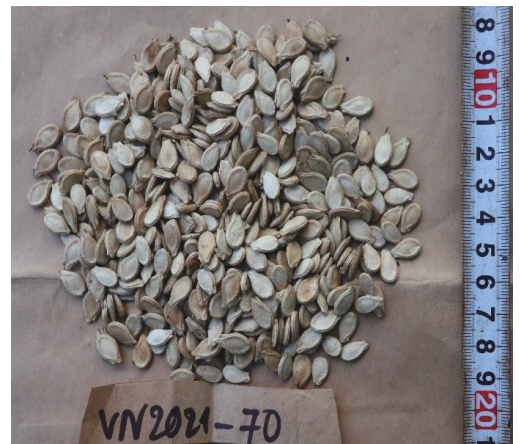
Sample Photo 67.  
JP278064, VN05,  
*Benincasa hispida*



Sample Photo 68.  
JP278086, VN27,  
*Benincasa hispida*



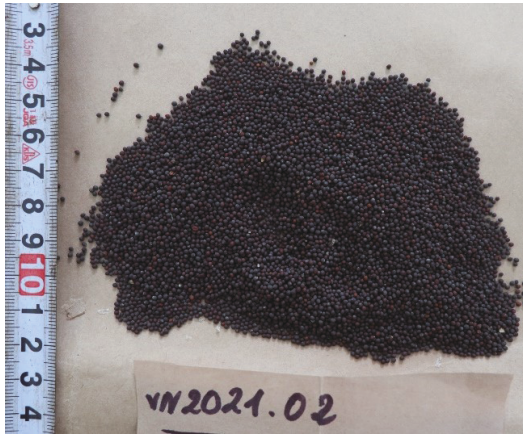
Sample Photo 69.  
JP278120, VN61,  
*Benincasa hispida*



Sample Photo 70.  
JP278129, VN70,  
*Benincasa hispida*



## Mustard



Sample Photo 71.  
JP278061, VN02,  
*Brassica juncea*



Sample Photo 72.  
JP278081, VN22,  
*Brassica juncea*



Sample Photo 73.  
JP278084, VN25,  
*Brassica juncea*

**Cowpea**



Sample Photo 74.  
JP278098, VN39,  
*Vigna unguiculata* cv-gr. Unguiculata

**Yard-long bean**



Sample Photo 75.  
JP278093, VN34,  
*Vigna unguiculata* cv-gr. Sesquipedalis



Sample Photo 76.  
JP278104, VN45,  
*Vigna unguiculata* cv-gr. Sesquipedalis



Sample Photo 77.  
JP278113, VN54,  
*Vigna unguiculata* cv-gr. Sesquipedalis