

Original Paper

Collaborative Exploration of Plant Genetic Resources in the Central Highlands of Vietnam, 2018

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Summary

This report describes the first collaborative expedition to collect Vietnamese plant genetic resources in the National Agriculture and Food Research Organization (NARO), Japan and the Plant Resources Center (PRC) of the Vietnamese Academy of Agricultural Science to establish an international research enterprise within the framework of the Plant Genetic Resources in Asia Phase 2 project. We conducted a field survey in the central highland of Vietnam (Gia Lai Province) between August 28 and September 4, 2018 and collected a total 113 accessions (16 of *Amaranthus* sp., 2 of *Benincasa hispida*, 33 of *Cucumis melo*, 10 of *Cucumis sativus*, 25 of *Cucurbita moschata*, 3 of *Citrullus lanatus*, 1 of *Coccinia* sp., 2 of *Momordica charantia*, 1 of *Trichosanthes* sp., 7 of *Capsicum* sp., 10 of *Solanum* sp., 1 of *Solanum lycopersicum*, 1 of *Lablab purpureus*, and 1 of *Sorghum bicolor*). All accessions were stored as seeds, and subsets were transferred to the Genetic Resources Center, NARO, Japan.

KEY WORDS: *Amaranthus* spp., *Cucumis melo*, *Cucurbita moschata*, genetic resource, Vietnam

Introduction

Breeding programs have developed a wide variety of crop cultivars through the judicious use of diverse genetic resources. Therefore, the collection and characterization of local plant genetic resources

are crucial activities for developing new crop varieties with desirable traits, such as resistance to pests or diseases, high quality, and high yield. The plant genetic resources of Southeast Asia have been explored for decades, and cucurbitaceous crops were previously collected in Vietnam (Yoshida *et al.* 1997), Myanmar (Saito *et al.* 2005), and Laos (Sakata *et al.* 2008; Saito *et al.* 2009; Matsunaga *et al.* 2010). To promote further exploration of plant genetic resources, a new research project, the Plant Genetic Resources in Asia (PGRAsia) project, funded by the Ministry of Agriculture, Forestry and Fisheries of Japan, was started in 2014. An initial field survey was conducted from 2014 to 2018 to collect cucurbitaceous crops in Vietnam (Sugiyama *et al.* 2015; Shimomura *et al.* 2016; Kawazu *et al.* 2017; Fujito *et al.* 2018).

The Plant Genetic Resources in Asia (PGRAsia) Phase 2 project was started in 2018 to evaluate and explore the plant genetic resources of Asia. There are many ethnic groups in the highland region of Vietnam, so we hypothesized that numerous local varieties might be cultivated and maintained by these diverse ethnic groups. In the past, we have collected plant genetic resources in the northern area (Sugiyama *et al.* 2015; Shimomura *et al.* 2016; Kawazu *et al.* 2017) and the central area (Fujito *et al.* 2018), but not yet in the central highland area of Vietnam. Here, we report the first expedition into the central highlands of Vietnam focusing on horticultural crops.

Methods

The travel schedule is shown in Table 1. Routes that have been moved are shown in Fig. 1. We used an automobile as a means of transportation to collect genetic resources. In 2018, we explored Gia Lai Province (the central highland of Vietnam). We surveyed Krong Pa district (southeastern part of Gia Lai province) from August 28 to 30, Kong Chro district (eastern part of Gia Lai) from August 31 to September 2, and Dak Doa district (northern part of Gia Lai) from September 3-4. Our collections were restricted to local varieties and wild plants. We collected fruit and seed samples from markets (Photo 1) and farmers (Photo 2). Associated information on each sample, such as the sowing date, harvest date, usage, and cultivation methods, was also recorded. We also checked place names, local plant names, latitudes, longitudes, altitude, and the characteristics of the exploration sites. Latitude, longitude, and altitude were determined using a handheld GPS receiver (Garmin eTrex20J; Garmin International Inc., Olathe, KS, USA). We numbered the collected samples. We used branching numbers, such as “40-1” and “40-2”, when genetic resources of the same species obtained from the same farm were likely to be the same or genetically related strains.

The sampling number of fruits and seeds were basically assigned in order by sampling date. However, some fruits did not have mature seeds, resulting in missing numbers. Since the missing numbers were not managerially preferable, we assigned those missing number to fruits and seeds that were sampled later. Although we identified species based on the characteristics of plants and fruits, if they were difficult to be identified, we only listed their genus names.

Results and Discussion

The locations of exploration sites are shown in Fig. 1. We collected seeds from heavy or rotten fruits collected at the hotel where we stayed, and other fruits were seeded in the laboratory of the Vietnamese Academy of Agricultural Science, Plant Resources Center (PRC). The collected seeds were washed and dried immediately. We collected 16 accessions of *Amaranthus* sp., 2 of *Benincasa hispida*, 33 of *Cucumis melo*, 10 of *Cucumis sativus*, 25 of *Cucurbita moschata*, 3 of *Citrullus lanatus*, 1 of *Coccinia* sp., 2 of *Momordica charantia*, 1 of *Trichosanthes* sp., 7 of *Capsicum* sp., 10 of *Solanum* sp., 1 of

Table 1. Itinerary of the field survey in Vietnam, 2018

| Date (month/day) | Day | Itinerary | Stay |
|---------------------|-----|--|-----------|
| 8/26 | Sun | Haneda airport - Noibai airport - Plant Resources Center (PRC; Hanoi) | Hanoi |
| 8/27 | Mon | Hanoi - Noibai airport - Pleiku airport - Pleiku City | Pleiku |
| 8/28 | Th | Pleiku City - Chu' Se town - Phu Can commune (Krong Pa district) - Chu' Gu commune (Krong Pa district) - la Mlah commune (Krong Pa district) | Phu Tuc |
| 8/29 | Wed | Phu Tuc town (Krong Pa district) - Krong Nang commune (Krong Pa district) - Chu' Ream commune (Krong Pa district) | Phu Tuc |
| 8/30 | Thu | Phu Tuc town - la Rsuom commune (Krong Pa district) - Chu' Ream commune (Krong Pa district) - Chu' Ngoc commune (Krong Pa district) | Phu Tuc |
| 8/31 | Fri | Phu Tuc town - Yang Trung commune (Kong Chro district) - An Trung commune (Kong Chro district) | Kong Chro |
| 9/1 | Sat | Kong Chro town (Kong Chro district) - Ya Ma commune (Kong Chro district) - Dak Ko Ning commune (Kong Chro district) | Kong Chro |
| 9/2 | Sun | Kong Chro town - Yang Nam commune (Kong Chro district) | Kong Chro |
| 9/3 | Mon | Kong Chro town - Hnol commune (Dak Doa district) - Pleiku City | Pleiku |
| 9/4 | Th | Pleiku City - Ha Dong commune (Dak Doa district) | Pleiku |
| 9/5 | Wed | Pleiku City (Harvesting seeds from rotten or big fruits, washing and drying the seeds in hotel) | Pleiku |
| 9/6 | Thu | Pleiku City - Pleiku airport - Noibai airport - PRC | Hanoi |
| 9/7 | Fri | Hanoi City - PRC (Harvesting seeds from fruits, washing and drying the seeds in hotel) | Hanoi |
| 9/8 | Sat | Hanoi City - PRC (Harvesting seeds from fruits, washing and drying the seeds in hotel) | Hanoi |
| 9/9 | Sun | Hanoi City - Noibai airport - Haneda airport | Tokyo |

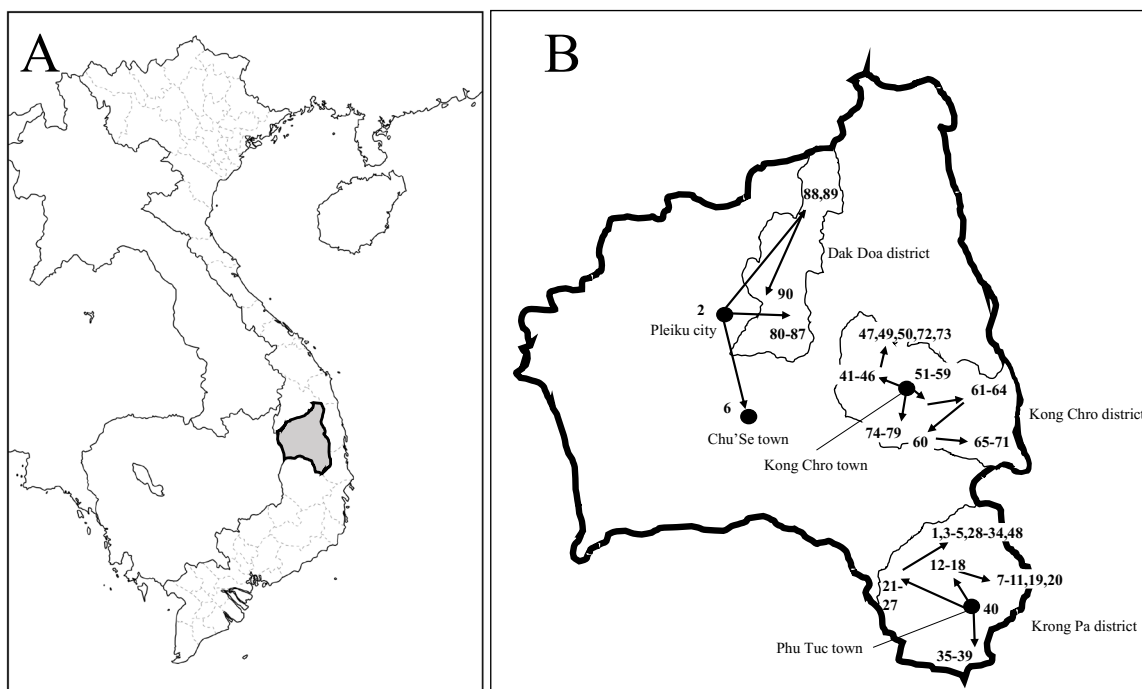


Fig. 1. The collection site, Gia Lai Province of Vietnam. A indicates the location of Gia Lai Province in Vietnam. Gia Lai Province is the gray area within A. B is an enlarged view of Gia Lai Province. In B, arrows indicate the direction of movement, and closed circles indicate the place of accommodation at the time of collection. Sampling numbers of the genetic resources are indicated at the site of their collection.

Solanum lycopersicum, 1 of *Lablab purpureus*, and 1 of *Sorghum bicolor* (Table 2). In this report, several characteristics of amaranth, melon, squash, pepper, and eggplant that were harvested during this trip are described.

Amarantaceae

Amaranthus sp.

In amaranth exploration, we decided to collect only seeds from mature plants, such as in Photo 3. Seeds of amaranths were not purchased at the market but obtained from farmers' fields and gardens (Table 3). We collected 16 samples of amaranth in Gia Lai. In Krong Pa district, we obtained eight samples as seeds; they were all wild plants. In Kong Chro district, we obtained seven samples as seeds; of those, three samples were cultivated and the other four were wild plants. In Dak Doa district, we obtained one accession that had been cultivated in a farmer's garden. Leaves of most amaranth plants collected were green, but those of one plant (No. 7) were red. In addition, many plants had thorns on the stem.

Cucurbitaceae (melon, cucumber, and squash)

Melon and cucumber

In Gia Lai province, we collected a total of 33 samples of *Cucumis melo* (Table 4). We collected 21 accessions in the Krong Pa district. In this district, we obtained three samples from farmers as seeds (Nos. 13, 19 and 26), and the other 18 samples from farmers as fruits (Photo 4). In the Kong Chro district, we collected 10 accessions. In this area, we obtained four samples from farmers as seeds, and six samples as fruits. Nos. 50-1 and 50-2 were purchased at a local market, and the others were obtained from farmers. In the Dak Doa district, we collected two melon fruits (Nos. 81-1 and 81-2) from a farmer. The fruit shapes of collected melons were globular or elliptical. The fruit skin color of many was often green or yellow with white stripes, but three melons (Nos. 76-1, 76-2 and 76-3) were white. Among the mature fruits examined in this sampling, we judged those that had no recognizable smell as cucumber, not melon.

We collected 10 samples of cucumber in Gia Lai province (Table 5). In Krong Pa district, we obtained No. 27 from a farmer as seeds. In Dak Doa district, nine samples were obtained from farmers as fruits (Photo 5). The fruit shape of collected cucumbers was oval or cylindrical, and the fruit skin color was white, green or yellow. Only No. 88 had white stripes on the fruit skin.

Table 2. A summary of collected plant samples in Vietnam, 2018

| Family | Scientific name | Plant name | Total |
|---------------|--|----------------------------|-------|
| Amarantaceae | <i>Amaranthus</i> sp. | Amaranth | 16 |
| Cucurbitaceae | <i>Benincasa hispida</i> (Thunb.) Cogn. | Winter melon (Wax gourd) | 2 |
| | <i>Cucumis melo</i> L. | Melon | 33 |
| | <i>Cucumis sativus</i> L. | Cucumber | 10 |
| | <i>Cucurbita moschata</i> Duch. | Squash | 25 |
| | <i>Citrullus lanatus</i> (Thunb.) Matsum. et Nakai | Water melon | 3 |
| | <i>Coccinia</i> sp. | | 1 |
| | <i>Momordica charantia</i> L. | Bitter melon (Balsam pear) | 2 |
| | <i>Trichosanthes</i> sp. | | 1 |
| Solanaceae | <i>Capsicum</i> sp. | Chili pepper | 7 |
| | <i>Solanum</i> sp. | Eggplant | 10 |
| | <i>Solanum lycopersicum</i> L. | Tomato | 1 |
| Fabaceae | <i>Lablab purpureus</i> (L.) Sweet | Lablab bean | 1 |
| Gramineae | <i>Sorghum bicolor</i> (L.) Moench ssp. <i>bicolor</i> | Sorghum | 1 |
| Total | | Total | 113 |

Squash

In the local markets, fruits, edible shoots (Photo 6), and flowers of squash were available in abundance. We collected 25 samples of squash. Because squash fruits are heavy, the fruits were cut as shown in Photo 7 and seeds were collected in the hotel after the exploration. We obtained No. 6 as a fruit from the local market in Chu' Se town. Additionally, we collected seeds of one accession (No. 40) and six fruits from farmers' houses in the Krong Pa district. Squash fruits (Nos. 35-37) were purchased at the local market in this district. In the Kong Chro district, five fruit samples were collected from farmers, and we obtained three plant resources (Nos. 56, 66 and 79), as seeds from a farmer. Six fruits were collected from farmers in the Dak Doa district.

As shown in Table 6, we collected many squashes regardless of the district. The collected squash fruits were mostly disk-like in shape. Besides that, we also obtained shapes like dumbbell, oval, heart-shape and cylindrical. The fruit skin colors were green or brown, and many squash samples had spots on fruit skins. Therefore, squash genetic resources were considered to be genetically diverse in Gia Lai Province. In addition, squashes were planted with cassava or rice in three districts (Photo 8).

In this exploration, we collected only *Cucurbita moschata*. Additionally, in previous exploration of Vietnam, only *C. moschata* was collected, not *C. maxima* (Sugiyama *et al.* 2015; Shimomura *et al.* 2016; Kawazu *et al.* 2017; Fujito *et al.* 2018). Generally, *C. moschata* prefers hotter areas than do other squash species (Hayase 2004). The temperature and humidity in our exploration area were higher than those in Japan. In areas where the temperature and humidity are high, plants are expected to be susceptible to different environmental stresses. Ara *et al.* (2013) showed that the roots of *C. moschata* exhibited comparatively little oxidative damage compared to those of *C. maxima* and "Maxchata" (an interspecific inbred line between *moschata* and *maxima*). In addition, *C. moschata* has been reported to have a stronger tolerance to plant diseases (e.g., powdery mildew and zucchini yellow mosaic virus) than *C. pepo* and *C. maxima* (Provvidenti *et al.* 1984; Lebeda and Křístková 1994). Therefore, since the temperature and humidity in Vietnam were higher than those in Japan, we hypothesized that *C. moschata* have been adapted because of its resistance to environmental stresses and plant diseases.

Solanaceae

***Capsicum* sp.**

As shown in Table 7, we collected seven chili pepper genetic resources as fruits in this sampling. In Pleiku City, we purchased one sample at the local market. Photo 9 shows the pepper fruits (No. 2) purchased at Ron market in Pleiku City. In these samples, fruits of various pepper species were mixed. In Krong Pa district, we obtained four accession from farmers' fields. In addition, we obtained two samples from farmers' fields in Kong Chro district. All mature pepper samples had red fruit skins and were cone-shaped regardless of the sampling sites.

***Solanum* sp. (Eggplant)**

We collected 10 samples of eggplant in Krong Pa and Kong Chro districts of Gia Lai province (Table 8). All eggplant genetic resources were obtained from farmers as fruits. In contrast, eggplants were not found in the Dak Doa district. Photo 10 is a picture of No. 14 eggplant fruits obtained from a farmer. The fruit shape of all eggplant genetic resources was globular. The skin colors of many genetic resources were yellow; however, those of Nos. 23 and 28 were purple.

Other plant resources

In addition, two accessions of winter melon (Nos. 49 and 57), three of water melon (Nos. 53, 74 and 78), one of *Coccinia* sp. (No. 59; Photo 11), one of *Trichosanthes* sp. (No. 80), two of bitter melon (Nos. 38 and 47; Photo 12), one of tomato (No. 71), one of lablab bean (No. 41), and of sorghum (No. 42) were collected (Table 9).

All accessions have been stored as seeds in the PRC, and subsets were transferred to the Genetic Resources Center, NARO, Japan.

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ベトナム中部高原における植物遺伝資源の共同探索, 2018年

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和文摘要

本報告は国立研究開発法人農業・食品産業技術総合研究機構とベトナム植物遺伝資源センターと共同で実施された農林水産省委託プロジェクト研究「海外植物遺伝資源の民間等への提供促進」における、ベトナム中部高原における園芸作物遺伝資源の探索・収集に関わる調査結果である。中部高原のザライ省において2018年8月28日～9月4日にかけて植物遺伝資源の探索・調査を行った。その結果、合計113点（アマランサス属16点、トウガン2点、メロン33点、キュウリ10点、ニホンカボチャ25点、スイカ3点、コッキニア属1点、カラスウリ属1点、ニガウリ2点、トウガラシ属7点、ナス属10点、トマト1点、フジマメ1点およびソルガム1点）を収集した。収集された遺伝資源は、ベトナム植物資源センターで保存された後、農研機構遺伝資源センター ジーンバンクに移送された。

Table 3. Genetic resources of amaranth (*Amaranthus* sp.) collected in Vietnam in 2018

| Sampling No. | JP No. | Cultivar name | Collection date (year/month/day) | Local name in Vietnam | Village or Market | Commune or Town | District | Latitude | Longitude | Altitude (m) | Type of samples | Sampling | Remark |
|--------------|--------|---------------------------|----------------------------------|-----------------------|-------------------|-----------------|-----------|--------------|---------------|--------------|-----------------|-----------------|--|
| 7 | 268573 | COL/VIETNAM/2018/HARC/013 | 2018/8/28 | Djam Hrum Hrah | Dong Hung | Phu Can | Krong Pa | N13-11-10.97 | E108-40-53.01 | 129 | Seed | Farm field | Red leaves and stems; Sown in March |
| 8 | 268574 | COL/VIETNAM/2018/HARC/014 | 2018/8/28 | Djam Hrum Seh | Dong Hung | Phu Can | Krong Pa | N13-11-10.97 | E108-40-53.01 | 129 | Seed | Farm field | Green leaves and stems; Sown in March |
| 9 | 268575 | COL/VIETNAM/2018/HARC/015 | 2018/8/28 | Djam Hrum Nge | Dong Hung | Phu Can | Krong Pa | N13-11-10.97 | E108-40-53.01 | 129 | Seed | Farm field | Green leaves and stems; Sown in March |
| 11 | 268577 | COL/VIETNAM/2018/HARC/017 | 2018/8/28 | Djam Hrum Seh | Dong Hung | Phu Can | Krong Pa | N13-11-10.97 | E108-40-53.01 | 129 | Seed | Farm field | Green leaves and stems |
| 15 | 268581 | COL/VIETNAM/2018/HARC/021 | 2018/8/28 | Djam Hrum troi | Mlah | Chu' Gu | Krong Pa | N13-15-29.22 | E108-55-29.35 | 120 | Seed | Farm field | Green leaves and stems |
| 31 | 268603 | COL/VIETNAM/2018/HARC/043 | 2018/8/29 | Djam Hrum troi | Y | Chu' Rcam | Krong Pa | N13-19-04.78 | E108-36-20.75 | 134 | Seed | Farm field | Green leaves and stems; Spains on leaves and stems |
| 32 | 268604 | COL/VIETNAM/2018/HARC/044 | 2018/8/29 | Djam Hrum troi | Y | Chu' Rcam | Krong Pa | N13-19-04.78 | E108-36-20.75 | 134 | Seed | Farm field | Green leaves and stems; Spains on stems |
| 33 | 268605 | COL/VIETNAM/2018/HARC/045 | 2018/8/29 | Djam Hrum Seh | Plang | Chu' Rcam | Krong Pa | N13-18-06.02 | E108-36-08.20 | 134 | Seed | Farm field | Green leaves, red stems |
| 44 | 268616 | COL/VIETNAM/2018/HARC/056 | 2018/8/31 | Plei | Hle Hlang | Yang Trung | Kong Chro | N13-47-48.87 | E108-30-08.17 | 346 | Seed | Farm field | Green leaves and stems; Sown in August |
| 45 | 268617 | COL/VIETNAM/2018/HARC/057 | 2018/8/31 | Plei | Hle Hlang | Yang Trung | Kong Chro | N13-47-48.87 | E108-30-08.17 | 346 | Seed | Farm field | Green leaves, red stems; Spains on the stems |
| 46 | 268618 | COL/VIETNAM/2018/HARC/058 | 2018/8/31 | Plei | Hle Hlang | Yang Trung | Kong Chro | N13-47-48.87 | E108-30-08.17 | 346 | Seed | Farm field | Green leaves, red stems |
| 62 | 268635 | COL/VIETNAM/2018/HARC/075 | 2018/9/1 | Plei | Bo Yo | Sro | Kong Chro | N13-41-02.25 | E108-39-30.18 | 342 | Seed | Farmer's garden | Green leaves, red stems |
| 63 | 268636 | COL/VIETNAM/2018/HARC/076 | 2018/9/1 | Plei | Bo Yo | Sro | Kong Chro | N13-41-02.25 | E108-39-30.18 | 342 | Seed | Farmer's garden | Green leaves, red stems; Spains on leaves and stems |
| 68 | 268641 | COL/VIETNAM/2018/HARC/081 | 2018/9/1 | Hla par | Kte | Dak Song | Kong Chro | N13-38-33.48 | E108-43-08.53 | 340 | Seed | Farmer's garden | Green leaves and stems |
| 69 | 268642 | COL/VIETNAM/2018/HARC/082 | 2018/9/1 | Hla par tla | Kte | Dak Song | Kong Chro | N13-38-33.48 | E108-43-08.53 | 340 | Seed | Farmer's garden | Green leaves, red stems |
| 90 | 268673 | COL/VIETNAM/2018/HARC/113 | 2018/9/4 | Rau den | Thon 3 | Tan Binh | Dak Doa | N13-59-39.11 | E108-07-50.57 | 761 | Seed | Farmer's garden | Green leaves, red stems |

Table 4. Genetic resources of melon (*Cucumis melo* L.) collected in Vietnam in 2018

| Sampling No. | JP No. | Cultivar name | Collection date (year/month/day) | Local name in Vietnam | Village or Market | Commune or Town | District | Latitude | Longitude | Altitude (m) | Type of samples | Sampling | Remark |
|--------------|--------|---------------------------|----------------------------------|-----------------------|-------------------|-----------------|----------|--------------|---------------|--------------|-----------------|--------------------|--|
| 1-1 | 268561 | COL/VIETNAM/2018/HARC/001 | 2018/8/30 | To mun | Y | Chu' Rcang | Krong Pa | N13-19-04.78 | E108-36-20.75 | 134 | Fruit | Farm field | Fruit has spherical shape. It has a green skin and white stripes. Sowing in April, and harvesting in August |
| 1-2 | 268562 | COL/VIETNAM/2018/HARC/002 | 2018/8/30 | To mun | Y | Chu' Rcang | Krong Pa | N13-19-04.78 | E108-36-20.75 | 134 | Fruit | Farm field | Fruit has spherical shape. It has a green skin and white stripes. Sowing in April, and harvesting in August |
| 1-3 | 268563 | COL/VIETNAM/2018/HARC/003 | 2018/8/30 | To mun | Y | Chu' Rcang | Krong Pa | N13-19-04.78 | E108-36-20.75 | 134 | Fruit | Farm field | Fruit has spherical shape. It has a green skin and white stripes. Sowing in April, and harvesting in August |
| 1-4 | 268564 | COL/VIETNAM/2018/HARC/004 | 2018/8/30 | To mun | Y | Chu' Rcang | Krong Pa | N13-19-04.78 | E108-36-20.75 | 134 | Fruit | Farm field | Fruit has spherical shape. It has a yellow skin and white stripes. Sowing in April, and harvesting in August |
| 1-5 | 268565 | COL/VIETNAM/2018/HARC/005 | 2018/8/30 | To mun | Y | Chu' Rcang | Krong Pa | N13-19-04.78 | E108-36-20.75 | 134 | Fruit | Farm field | Fruit has spherical shape. It has a yellow skin and white stripes. Sowing in April, and harvesting in August |
| 1-6 | 268566 | COL/VIETNAM/2018/HARC/006 | 2018/8/30 | To mun | Y | Chu' Rcang | Krong Pa | N13-19-04.78 | E108-36-20.75 | 134 | Fruit | Farm field | Fruit has spherical shape. It has a green skin and white stripes. Sowing in April, and harvesting in August |
| 3 | 268568 | COL/VIETNAM/2018/HARC/008 | 2018/8/30 | To mun | Y | Chu' Rcang | Krong Pa | N13-19-04.78 | E108-36-20.75 | 134 | Fruit | Farm field | Fruit is cylindrical shape. It has a green skin and white stripes. Sowing in April, and harvesting in August |
| 4-1 | 268569 | COL/VIETNAM/2018/HARC/009 | 2018/8/30 | To mun | Y | Chu' Rcang | Krong Pa | N13-19-04.78 | E108-36-20.75 | 134 | Fruit | Farm field | Fruit is cylindrical shape. It has a yellow skin and white stripes. Sowing in April, and harvesting in August |
| 4-2 | 268570 | COL/VIETNAM/2018/HARC/010 | 2018/8/30 | To mun | Y | Chu' Rcang | Krong Pa | N13-19-04.78 | E108-36-20.75 | 134 | Fruit | Farm field | Fruit is cylindrical shape. It has a yellow skin and white stripes. Sowing in April, and harvesting in August |
| 5 | 268571 | COL/VIETNAM/2018/HARC/011 | 2018/8/30 | To mun | Y | Chu' Rcang | Krong Pa | N13-19-04.78 | E108-36-20.75 | 134 | Fruit | Farm field | Fruit has spherical shape. It has a white skin. Sowing in April, and harvesting in August |
| 13 | 268579 | COL/VIETNAM/2018/HARC/019 | 2018/8/28 | To mun | Mlah | Chu' Gu | Krong Pa | N13-15-29.22 | E108-55-29.35 | 119 | Seed | Farmer's warehouse | |
| 19 | 268585 | COL/VIETNAM/2018/HARC/025 | 2018/8/28 | To mun | No 13 | la Mlah | Krong Pa | N13-13-44.31 | E108-45-00.31 | 120 | Seed | Farmer's warehouse | |
| 20-1 | 268586 | COL/VIETNAM/2018/HARC/026 | 2018/8/28 | To mun | No 13 | la Mlah | Krong Pa | N13-13-44.31 | E108-45-00.31 | 120 | Fruit | Farmer's warehouse | Fruit is conical shape. It has a yellow skin and white stripes. |
| 20-2 | 268587 | COL/VIETNAM/2018/HARC/027 | 2018/8/28 | To mun | No 13 | la Mlah | Krong Pa | N13-13-44.31 | E108-45-00.31 | 120 | Fruit | Farmer's warehouse | Fruit is conical shape. It has a green skin and white stripes. |
| 26 | 268594 | COL/VIETNAM/2018/HARC/034 | 2018/8/29 | To mun | Noo Be | la Rsuom | Krong Pa | N13-20-24.51 | E108-32-03.91 | 127 | Seed | Farmer's warehouse | |
| 29-1 | 268597 | COL/VIETNAM/2018/HARC/037 | 2018/8/29 | To mun | Y | Chu' Rcang | Krong Pa | N13-19-04.78 | E108-36-20.75 | 134 | Fruit | Farmer's warehouse | Fruit is cylindrical shape. It has a green skin and white stripes. Sowing in April, and harvesting in August |
| 29-2 | 268598 | COL/VIETNAM/2018/HARC/038 | 2018/8/29 | To mun | Y | Chu' Rcang | Krong Pa | N13-19-04.78 | E108-36-20.75 | 134 | Fruit | Farmer's warehouse | Fruit is cylindrical shape. It has a green skin and white stripes. Sowing in April, and harvesting in August |
| 29-3 | 268599 | COL/VIETNAM/2018/HARC/039 | 2018/8/29 | To mun | Y | Chu' Rcang | Krong Pa | N13-19-04.78 | E108-36-20.75 | 134 | Fruit | Farmer's warehouse | Fruit is cylindrical shape. It has a green skin and white stripes. Sowing in April, and harvesting in August |
| 29-4 | 268600 | COL/VIETNAM/2018/HARC/040 | 2018/8/29 | To mun | Y | Chu' Rcang | Krong Pa | N13-19-04.78 | E108-36-20.75 | 134 | Fruit | Farmer's warehouse | Fruit is cylindrical shape. It has a green skin and white stripes. Sowing in April, and harvesting in August |
| 30-1 | 268601 | COL/VIETNAM/2018/HARC/041 | 2018/8/29 | To mun | Y | Chu' Rcang | Krong Pa | N13-19-04.78 | E108-36-20.75 | 134 | Fruit | Farmer's warehouse | Fruit is cylindrical shape. It has a green skin and white stripes. Sowing in April, and harvesting in August |
| 30-2 | 268602 | COL/VIETNAM/2018/HARC/042 | 2018/8/29 | To mun | Y | Chu' Rcang | Krong Pa | N13-19-04.78 | E108-36-20.75 | 134 | Fruit | Farmer's warehouse | Fruit is cylindrical shape. It has a green skin and white stripes. Sowing in April, and harvesting in August |

Table 4. (Continued).

| Sampling No. | JP No. | Cultivar name | Collection date (year/month/day) | Local name in Vietnam | Village or Market | Commune or Town | District | Latitude | Longitude | Altitude (m) | Type of samples | Sampling | Remark |
|--------------|--------|---------------------------|----------------------------------|-----------------------|-------------------|-----------------|-----------|--------------|---------------|--------------|-----------------|--------------------|---|
| 48 | 268620 | COL/VIETNAM/2018/HARC/060 | 2018/8/31 | Pia | Lang T | An Trung | Kong Chro | N13-46-38.62 | E108-31-28.28 | 350 | Fruit | Farmer's warehouse | Fruit is cylindrical shape. It has a green skin and white stripes. |
| 50-1 | 268622 | COL/VIETNAM/2018/HARC/062 | 2018/8/31 | Pia | Lang T | An Trung | Kong Chro | N13-46-38.62 | E108-31-28.28 | 350 | Fruit | Local market | Fruit is cylindrical shape. It has a green skin and white stripes. Sowing in April, and harvesting in August |
| 50-2 | 268623 | COL/VIETNAM/2018/HARC/063 | 2018/8/31 | Pia | Lang T | An Trung | Kong Chro | N13-46-38.62 | E108-31-28.28 | 350 | Fruit | Local market | Fruit is cylindrical shape. It has a green skin and white stripes. Sowing in April, and harvesting in August |
| 52 | 268625 | COL/VIETNAM/2018/HARC/065 | 2018/8/31 | Pia | Mang | Ya Ma | Kong Chro | N13-46-19.50 | E108-33-12.18 | 340 | Seed | Farmer's warehouse | |
| 61 | 268634 | COL/VIETNAM/2018/HARC/074 | 2018/9/1 | Pia | Cuoc | Sro | Kong Chro | N13-41-02.25 | E108-39-30.18 | 342 | Seed | Farm field | |
| 65 | 268638 | COL/VIETNAM/2018/HARC/078 | 2018/9/1 | Pya pong | Kte | Dak Song | Kong Chro | N13-38-33.48 | E108-43-08.53 | 340 | Seed | Farmer's warehouse | |
| 75 | 268648 | COL/VIETNAM/2018/HARC/088 | 2018/9/2 | To mun | Km1 | Yang Nam | Kong Chro | N13-40-27.07 | E108-30-11.95 | 333 | Seed | Farmer's warehouse | |
| 76-1 | 268649 | COL/VIETNAM/2018/HARC/089 | 2018/9/2 | To mun | Ya ma lon | Yang Nam | Kong Chro | N13-40-27.07 | E108-30-11.95 | 333 | Fruit | Farmer's warehouse | Fruit is cylindrical shape. It has a white skin. Sowing in April, and harvesting in August |
| 76-2 | 268650 | COL/VIETNAM/2018/HARC/090 | 2018/9/2 | To mun | Ya ma lon | Yang Nam | Kong Chro | N13-40-27.07 | E108-30-11.95 | 333 | Fruit | Farmer's warehouse | Fruit is cylindrical shape. It has a white skin. Sowing in April, and harvesting in August |
| 76-3 | 268651 | COL/VIETNAM/2018/HARC/091 | 2018/9/2 | To mun | Ya ma lon | Yang Nam | Kong Chro | N13-40-27.07 | E108-30-11.95 | 333 | Fruit | Farmer's warehouse | Fruit is cylindrical shape. It has a white skin. Sowing in April, and harvesting in August |
| 81-1 | 268656 | COL/VIETNAM/2018/HARC/096 | 2018/9/3 | Pja pong | Hlang | Hnol | Dak Doa | N13-56-58.98 | E108-13-12.20 | 669 | Fruit | Farm field | Fruit has spherical shape. It has a yellow skin and white stripes. Sowing in April, and harvesting in August |
| 81-2 | 268657 | COL/VIETNAM/2018/HARC/097 | 2018/9/3 | Pja pong | Hlang | Hnol | Dak Doa | N13-56-58.98 | E108-13-12.20 | 669 | Fruit | Farm field | Fruit has spherical shape. It has a yellow skin and white stripes. Sowing in April, and harvesting in August |

Table 5. Genetic resources of cucumber (*Cucumis sativus* L.) collected in Vietnam in 2018

| Sampling No. | JP No. | Cultivar name | Collection date (year/month/day) | Local name in Vietnam | Village or Market | Commune or Town | District | Latitude | Longitude | Altitude (m) | Type of samples | Sampling | Remark |
|--------------|--------|---------------------------|----------------------------------|-----------------------|-------------------|-----------------|----------|--------------|---------------|--------------|-----------------|--------------------|---|
| 27 | 268595 | COL/VIETNAM/2018/HARC/035 | 2018/8/29 | To mun tuk | Ju | la Rsuom | Krong Pa | N13-19-06.14 | E108-35-28.89 | 130 | Seed | Farmer's warehouse | This is reported to be a cucumber |
| 87-1 | 268664 | COL/VIETNAM/2018/HARC/104 | 2018/9/3 | Ja dak | Hlang | Hnol | Dak Doa | N13-56-28.59 | E108-12-38.98 | 670 | Fruit | Farm field | Fruit is ellipsoid shape. It has a white skin. Sowing in April, and harvesting in August |
| 87-3 | 268665 | COL/VIETNAM/2018/HARC/105 | 2018/9/3 | Ja dak | Hlang | Hnol | Dak Doa | N13-56-28.59 | E108-12-38.98 | 670 | Fruit | Farm field | Fruit is ellipsoid shape. It has a green skin. Sowing in April, and harvesting in August |
| 87-4 | 268666 | COL/VIETNAM/2018/HARC/106 | 2018/9/3 | Ja dak | Hlang | Hnol | Dak Doa | N13-56-28.59 | E108-12-38.98 | 670 | Fruit | Farm field | Fruit is ellipsoid shape. It has a yellow skin. Sowing in April, and harvesting in August |
| 87-5 | 268667 | COL/VIETNAM/2018/HARC/107 | 2018/9/3 | Ja dak | Hlang | Hnol | Dak Doa | N13-56-28.59 | E108-12-38.98 | 670 | Fruit | Farm field | Fruit is ellipsoid shape. It has a yellow skin. Sowing in April, and harvesting in August |
| 87-6 | 268668 | COL/VIETNAM/2018/HARC/108 | 2018/9/3 | Ja dak | Hlang | Hnol | Dak Doa | N13-56-28.59 | E108-12-38.98 | 670 | Fruit | Farm field | Fruit is ellipsoid shape. It has a yellow skin. Sowing in April, and harvesting in August |
| 87-7 | 268669 | COL/VIETNAM/2018/HARC/109 | 2018/9/3 | Ja dak | Hlang | Hnol | Dak Doa | N13-56-28.59 | E108-12-38.98 | 670 | Fruit | Farm field | Fruit is ellipsoid shape. It has a green skin. Sowing in April, and harvesting in August |
| 88 | 268670 | COL/VIETNAM/2018/HARC/110 | 2018/9/4 | Pya dak | Kon Mah Hor | Ha Dong | Dak Doa | N14-16-34.85 | E108-14-29.03 | 886 | Fruit | Farm field | Fruit is cylindrical shape. It has a green skin and white stripes. Sowing in April, and harvesting in August |
| 89-1 | 268671 | COL/VIETNAM/2018/HARC/111 | 2018/9/4 | Pya dak | Kon Mah Hor | Ha Dong | Dak Doa | N14-16-34.85 | E108-14-29.03 | 886 | Fruit | Farm field | Fruit is cylindrical shape. It has a white skin. Sowing in April, and harvesting in August |
| 89-2 | 268672 | COL/VIETNAM/2018/HARC/112 | 2018/9/4 | Pya dak | Kon Mah Hor | Ha Dong | Dak Doa | N14-16-34.85 | E108-14-29.03 | 886 | Fruit | Farm field | Fruit is cylindrical shape. It has a white skin. Sowing in April, and harvesting in August |

Table 6. Genetic resources of squash (*Cucurbita moschata* Duch.) collected in Vietnam in 2018

| Sampling No. | JP No. | Cultivar name | Collection date (year/month/day) | Local name in Vietnam | Village or Market | Commune or Town | District | Latitude | Longitude | Altitude (m) | Type of samples | Sampling | Remark |
|--------------|--------|---------------------------|----------------------------------|-----------------------|-------------------|-----------------|-----------|--------------|---------------|--------------|-----------------|--------------------|--|
| 6 | 268572 | COL/VIETNAM/2018/HARC/012 | 2018/8/28 | Bi do | Tan O | Chu' Se town | Krong Pa | N13-41-31.37 | E108-04-41.00 | 537 | Fruit | Local market | Fruit is discoidal shape. It has a green skin. Sowing in May, and harvesting in August |
| 12 | 268578 | COL/VIETNAM/2018/HARC/018 | 2018/8/28 | Ploi | Mlah | Phu Can | Krong Pa | N13-15-29.22 | E108-55-29.35 | 119 | Fruit | Farmer's warehouse | Fruit is discoidal shape. It has a light brown skin, brown spots. Sowing in May, and harvesting in August |
| 16 | 268582 | COL/VIETNAM/2018/HARC/022 | 2018/8/28 | Ploi | No 13 | la Mlah | Krong Pa | N13-13-01.33 | E108-42-36.41 | 120 | Fruit | Farmer's warehouse | Fruit is cylindrical shape. It has a green skin and brown stripes. Sowing in May, and harvesting in August |
| 17 | 268583 | COL/VIETNAM/2018/HARC/023 | 2018/8/28 | Ploi | No 13 | la Mlah | Krong Pa | N13-13-01.33 | E108-42-36.41 | 120 | Fruit | Farmer's warehouse | Fruit shape is discoidal shape. It has a brown skin and light brown spots. Sowing in May, and harvesting in August |
| 18 | 268584 | COL/VIETNAM/2018/HARC/024 | 2018/8/28 | Ploi | No 13 | la Mlah | Krong Pa | N13-13-01.33 | E108-42-36.41 | 120 | Fruit | Farmer's warehouse | Fruit shape is discoidal shape. It has a green skin and brown spots. Sowing in May, and harvesting in August |
| 25-1 | 268592 | COL/VIETNAM/2018/HARC/032 | 2018/8/29 | Ploi | Noo Be | la RSuom | Krong Pa | N13-20-24.51 | E108-32-03.91 | 127 | Fruit | Farmer's warehouse | Fruit shape is discoidal shape. It has a green skin and brown spots. Sowing in May, and harvesting in August |
| 25-2 | 268593 | COL/VIETNAM/2018/HARC/033 | 2018/8/29 | Ploi | Noo Be | la RSuom | Krong Pa | N13-20-24.51 | E108-32-03.91 | 127 | Fruit | Farmer's warehouse | Fruit shape is discoidal shape. It has a green skin and brown spots. |
| 35 | 268607 | COL/VIETNAM/2018/HARC/047 | 2018/8/30 | Ploi | Phu Tuc market | Phu Tuc town | Krong Pa | N13-11-49.55 | E108-41-05.30 | 130 | Fruit | Local market | Fruit shape is ellipsoid. It has a brown skin and light brown spots. Sowing in May, and harvesting in August |
| 36 | 268608 | COL/VIETNAM/2018/HARC/048 | 2018/8/30 | Ploi | Phu Tuc market | Phu Tuc town | Krong Pa | N13-11-49.55 | E108-41-05.30 | 130 | Fruit | Local market | Fruit shape is ovoid. It has a dark brown skin and brown spots. Sowing in May, and harvesting in August |
| 37 | 268609 | COL/VIETNAM/2018/HARC/049 | 2018/8/30 | Ploi | Phu Tuc market | Phu Tuc town | Krong Pa | N13-11-49.55 | E108-41-05.30 | 130 | Fruit | Local market | Fruit shape is spherical. It has a dark yellow skin and brown spots. Sowing in May, and harvesting in August |
| 40 | 268612 | COL/VIETNAM/2018/HARC/052 | 2018/8/30 | Ploi | Thuc | Chu' Ngoc | Krong Pa | N13-08-24.82 | E108-46-12.52 | 135 | Seed | Farmer's warehouse | |
| 55 | 268628 | COL/VIETNAM/2018/HARC/068 | 2018/9/1 | Puol | Mang | Ya Ma | Kong Chro | N13-46-19.50 | E108-33-12.18 | 340 | Fruit | Farmer's warehouse | Fruit shape is cylindrical. It has a brown skin. Sowing in April, and harvesting in July |
| 56 | 268629 | COL/VIETNAM/2018/HARC/069 | 2018/9/1 | Puol | Mang | Ya Ma | Kong Chro | N13-45-35.21 | E108-34-36.24 | 330 | Seed | Farmer's warehouse | |
| 58 | 268631 | COL/VIETNAM/2018/HARC/071 | 2018/9/1 | Puol | Mang | Ya Ma | Kong Chro | N13-45-35.21 | E108-34-36.24 | 330 | Fruit | Farmer's warehouse | Fruit shape is ovoid. It has a green skin and brown spots. Sowing in April, and harvesting in July |
| 64 | 268637 | COL/VIETNAM/2018/HARC/077 | 2018/9/1 | Puol | Bo Yo | SRo | Kong Chro | N13-41-02.25 | E108-39-30.18 | 342 | Fruit | Farmer's warehouse | Fruit shape is heart-shape. It has a green skin and brown spots. |
| 66 | 268639 | COL/VIETNAM/2018/HARC/079 | 2018/9/1 | Puol | Kte | Dak Song | Kong Chro | N13-38-33.48 | E108-43-08.53 | 340 | Seed | Farmer's warehouse | |
| 72 | 268645 | COL/VIETNAM/2018/HARC/085 | 2018/9/1 | Puol | Pro Ba | An Trung | Kong Chro | N13-48-38.49 | E108-30-23.73 | 360 | Fruit | Farmer's warehouse | Fruit shape is discoidal. It has a brown skin and light brown spots. Sowing in May, and harvesting in August |
| 77 | 268652 | COL/VIETNAM/2018/HARC/092 | 2018/9/2 | Puol | Ya ma lon | Yang Nam | Kong Chro | N13-46-44.88 | E108-33-01.06 | 342 | Fruit | Farmer's warehouse | Fruit shape is ovoid. It has a brown skin and light brown spots. Sowing in May, and harvesting in August |
| 79 | 268654 | COL/VIETNAM/2018/HARC/094 | 2018/9/2 | Puol | Ya ma lon | Yang Nam | Kong Chro | N13-46-44.88 | E108-33-01.06 | 342 | Seed | Farmer's warehouse | |
| 82 | 268658 | COL/VIETNAM/2018/HARC/098 | 2018/9/3 | Tol | Hlang | Hnol | Dak Doa | N13-56-47.86 | E108-13-18.84 | 674 | Fruit | Farm field | Fruit shape is dumbbell. It has a green skin and brown spots. Sowing in May, and harvesting in August |
| 83-1 | 268659 | COL/VIETNAM/2018/HARC/099 | 2018/9/3 | Tol | Hlang | Hnol | Dak Doa | N13-56-47.86 | E108-13-18.84 | 674 | Fruit | Farm field | Fruit shape is ovoid. It has a green skin and brown spots. Sowing in May, and harvesting in August |
| 83-2 | 268660 | COL/VIETNAM/2018/HARC/100 | 2018/9/3 | Tol | Hlang | Hnol | Dak Doa | N13-56-47.86 | E108-13-18.84 | 674 | Fruit | Farm field | Fruit shape is ovoid. It has a brown skin and spots. Sowing in May, and harvesting in August |

Table 6. (Continued).

| Sampling No. | JP No. | Cultivar name | Collection date (year/month/day) | Local name in Vietnam | Village or Market | Commune or Town | District | Latitude | Longitude | Altitude (m) | Type of samples | Sampling | Remark |
|--------------|--------|---------------------------|----------------------------------|-----------------------|-------------------|-----------------|----------|--------------|---------------|--------------|-----------------|------------|--|
| 84 | 268661 | COL/VIETNAM/2018/HARC/101 | 2018/9/3 | Tol | Hlang | Hnol | Dak Doa | N13-56-47.86 | E108-13-18.84 | 674 | Fruit | Farm field | Fruit shape is dumbbell. It has a green skin and brown spots. Sowing in May, and harvesting in August |
| 85 | 268662 | COL/VIETNAM/2018/HARC/102 | 2018/9/3 | Tol | Hlang | Hnol | Dak Doa | N13-56-47.86 | E108-13-18.84 | 674 | Fruit | Farm field | Fruit shape is dumbbell. It has a green skin and brown spots. Sowing in May, and harvesting in August |
| 86 | 268663 | COL/VIETNAM/2018/HARC/103 | 2018/9/3 | Tol | Hlang | Hnol | Dak Doa | N13-56-47.86 | E108-13-18.84 | 674 | Fruit | Farm field | Fruit shape is discoidal. It has a green skin and brown spots. Sowing in May, and harvesting in August |

Table 7. Genetic resources of chili pepper (*Capsicum* sp.) collected in Vietnam in 2018

| Sampling No. | JP No. | Cultivar name | Collection date (year/month/day) | Local name in Vietnam | Village or Market | Commune or Town | District | Latitude | Longitude | Altitude (m) | Type of samples | Sampling | Remark |
|--------------|--------|---------------------------|----------------------------------|-----------------------|-------------------|-----------------|-------------|--------------|---------------|--------------|-----------------|--------------|---|
| 2 | 268567 | COL/VIETNAM/2018/HARC/007 | 2018/8/27 | Ot chi thien | Ron market | | Pleiku City | N13-58-40.30 | E107-59-48.2 | 779 | Fruit | Local market | Annual plant; Sowing in April, and harvesting in August |
| 10 | 268576 | COL/VIETNAM/2018/HARC/016 | 2018/8/28 | Amach tet | Dong Hung | Phu Can | Krong Pa | N13-11-10.97 | E108-40-53.01 | 129 | Fruit | Farm field | Annual plant; Sowing in April, and harvesting in August |
| 24 | 268591 | COL/VIETNAM/2018/HARC/031 | 2018/8/29 | Amach tet | Phum J | la Rsuom | Krong Pa | N13-20-24.51 | E108-32-03.91 | 127 | Fruit | Farm field | Annual plant; Sowing in April, and harvesting in August |
| 34 | 268606 | COL/VIETNAM/2018/HARC/046 | 2018/8/29 | Amach tet | Chu' Ream market | Chu' Ream | Krong Pa | N13-18-18.94 | E108-36-04.38 | 130 | Fruit | Local market | Annual plant; Sowing in April, and harvesting in August |
| 39 | 268611 | COL/VIETNAM/2018/HARC/051 | 2018/8/30 | Amach tet | Group 8 | Phu Tuc town | Krong Pa | N13-12-21.88 | E108-40-56.69 | 128 | Fruit | Farm field | Annual plant; Sowing in April, and harvesting in August |
| 70 | 268643 | COL/VIETNAM/2018/HARC/083 | 2018/9/1 | A Amre Ngeng | Kte | Dak Song | Kong Chro | N13-38-33.48 | E108-43-08.53 | 340 | Fruit | Farm field | Perennial plant |
| 73 | 268646 | COL/VIETNAM/2018/HARC/086 | 2018/9/1 | Amre | Pro Ba | An Trung | Kong Chro | N13-48-38.49 | E108-30-23.73 | 360 | Fruit | Farm field | Perennial plant |

Table 8. Genetic resources of eggplant (*Solanum* sp.) collected in Vietnam in 2018

| Sampling No. | JP No. | Cultivar name | Collection date (year/month/day) | Local name in Vietnam | Village or Market | Commune or Town | District | Latitude | Longitude | Altitude (m) | Type of samples | Sampling | Remark |
|--------------|--------|---------------------------|----------------------------------|-----------------------|-------------------|-----------------|-----------|--------------|---------------|--------------|-----------------|--------------------|---|
| 14 | 268580 | COL/VIETNAM/2018/HARC/020 | 2018/8/28 | To rong | Mlah | Phu Can | Krong Pa | N13-15-29.22 | E108-55-29.35 | 119 | Fruit | Farmer's warehouse | Fruit is spherical shape. It has a yellow skin. Sowing in March and harvesting in August |
| 21 | 268588 | COL/VIETNAM/2018/HARC/028 | 2018/8/29 | To rong | Phum J | la Rsuom | Krong Pa | N13-20-24.51 | E108-32-03.91 | 148 | Fruit | Farmer's warehouse | Fruit is spherical shape. It has a yellow skin. Sowing in March and harvesting in August |
| 22 | 268589 | COL/VIETNAM/2018/HARC/029 | 2018/8/29 | To rong | Phum J | la RSuom | Krong Pa | N13-20-24.51 | E108-32-03.91 | 148 | Fruit | Farmer's warehouse | Fruit is spherical shape. It has a has yellow skin. Sowing in March and harvesting in August |
| 23 | 268590 | COL/VIETNAM/2018/HARC/030 | 2018/8/29 | Ca nuc | Phum J | la RSuom | Krong Pa | N13-20-24.51 | E108-32-03.91 | 148 | Fruit | Farmer's warehouse | Fruit is spherical shape. It has purple skin. Sowing in March and harvesting in August |
| 28 | 268596 | COL/VIETNAM/2018/HARC/036 | 2018/8/29 | Ca nuc | Ju | Chu' Ream | Krong Pa | N13-19-14.12 | E108-36-22.94 | 139 | Fruit | Farmer's warehouse | Fruit is spherical shape. It has a purple skin. Sowing in March and harvesting in August |
| 43 | 268615 | COL/VIETNAM/2018/HARC/055 | 2018/8/31 | Pro | Hle Hlang | Yang Trung | Kong Chro | N13-47-37.58 | E108-30-08.93 | 346 | Fruit | Farmer's warehouse | Fruit is spherical shape. It has a purple skin. It has spains on the buds and stems. They are used as soup ingredients. |
| 51 | 268624 | COL/VIETNAM/2018/HARC/064 | 2018/8/31 | Pro | Mang | Ya Ma | Kong Chro | N13-46-19.50 | E108-33-12.18 | 340 | Fruit | Farmer's warehouse | Fruit is spherical shape. It has a yellow skin. Perennial plant |
| 54 | 268627 | COL/VIETNAM/2018/HARC/067 | 2018/9/1 | Pro | Mang | Ya Ma | Kong Chro | N13-46-19.50 | E108-33-12.18 | 340 | Fruit | Farmer's warehouse | Fruit is spherical shape. It has a yellow skin. Perennial plant |
| 60 | 268633 | COL/VIETNAM/2018/HARC/073 | 2018/9/1 | Pro | Nhang Lon | Dak Ko Ning | Kong Chro | N13-41-10.83 | E108-37-19.16 | 345 | Fruit | Farmer's warehouse | Fruit is spherical shape. It has a yellow skin. Perennial plant |
| 67 | 268640 | COL/VIETNAM/2018/HARC/080 | 2018/9/1 | Pro | Kte | Dak Song | Kong Chro | N13-38-33.48 | E108-43-08.53 | 340 | Fruit | Farmer's warehouse | Fruit is spherical shape. It has a yellow skin. Perennial plant |

Table 9. Genetic resources of other plant species collected in Vietnam in 2018

| Sampling number | JP number | Cultivar name | Scientific name | Plant name | Collection date (year/month/day) | Local name in Vietnam | Village | Commune or Town | District | Latitude | Longitude | Altitude (m) | Type of samples | Sampling |
|-----------------|-----------|---------------------------|---|--------------|----------------------------------|-----------------------|-----------|-----------------|-----------|--------------|---------------|--------------|-----------------|--------------------|
| 38 | 268610 | COL/VIETNAM/2018/HARC/050 | <i>Momordica charantia</i> L. | Bitter melon | 2018/8/30 | Kho qua rung | Group 8 | Phu Tuc town | Krong Pa | N13-12-21.88 | E108-40-56.69 | 128 | Fruit | Farm field |
| 41 | 268613 | COL/VIETNAM/2018/HARC/053 | <i>Sorghum bicolor</i> (L.) Moench ssp. <i>bicolor</i> | Sorghum | 2018/8/31 | Jui | Hle Hlang | Yang Trung | Krong Pa | N13-47-34.38 | E108-30-15.27 | 350 | Grain | Farm field |
| 42 | 268614 | COL/VIETNAM/2018/HARC/054 | <i>Lablab purpureus</i> (L.) Sweet | Lablab bean | 2018/8/31 | Xlak | Hle Hlang | Yang Trung | Krong Pa | N13-47-34.38 | E108-30-15.27 | 350 | Grain | Farm field |
| 47 | 268619 | COL/VIETNAM/2018/HARC/059 | <i>Momordica charantia</i> L. | Bitter melon | 2018/8/31 | Hla tang | Thon 6 | An Trung | Krong Pa | N13-48-38.49 | E108-30-23.73 | 360 | Fruit | Farm field |
| 49 | 268621 | COL/VIETNAM/2018/HARC/061 | <i>Benincasa hispida</i> Cogn. | Winter melon | 2018/8/31 | Bi dao | Lang T | An Trung | Kong Chro | N13-46-38.62 | E108-31-28.28 | 350 | Fruit | Local market |
| 53 | 268626 | COL/VIETNAM/2018/HARC/066 | <i>Citrullus lanatus</i> (Thunb.) Matsum. et Nakai | Water melon | 2018/8/31 | Mcai | Mang | Ya Ma | Krong Pa | N13-46-19.50 | E108-33-12.18 | 340 | Seed | Farmer's warehouse |
| 57 | 268630 | COL/VIETNAM/2018/HARC/070 | <i>Benincasa hispida</i> (Thunb.) Cogn. | Winter melon | 2018/9/1 | Po lang | Mang | Ya Ma | Kong Chro | N13-45-35.21 | E108-34-36.24 | 330 | Seed | Farmer's warehouse |
| 59 | 268632 | COL/VIETNAM/2018/HARC/072 | <i>Coccinia</i> sp. | | 2018/9/1 | Luc bat | Tnung 2 | Ya Ma | Kong Chro | N13-45-46.83 | E108-33-27.23 | 335 | Fruit | Farm field |
| 71 | 268644 | COL/VIETNAM/2018/HARC/084 | <i>Solanum lycopersicum</i> L. | Tomato | 2018/9/1 | Ca chua bi | Kte | Dak Song | Krong Pa | N13-39-56.22 | E108-42-27.18 | 338 | Fruit | Farmer's garden |
| 74 | 268647 | COL/VIETNAM/2018/HARC/087 | <i>Citrullus lanatus</i> (Thunb.) Matsum. et Nakai | Water melon | 2018/9/2 | Pkai | Km1 | Yang Nam | Krong Pa | N13-40-27.07 | E108-30-11.95 | 333 | Seed | Farmer's warehouse |
| 78 | 268653 | COL/VIETNAM/2018/HARC/093 | <i>Citrullus lanatus</i> (Thunb.) Matsum. et Nakai | Water melon | 2018/9/2 | Mcai Mong | Km1 | Yang Nam | Krong Pa | N13-46-44.88 | E108-33-01.06 | 342 | Seed | Farmer's warehouse |
| 80 | 268655 | COL/VIETNAM/2018/HARC/095 | <i>Trichosanthes</i> sp. | | 2018/9/3 | Rbang | Hlang | Hnoi | Dak Doa | N13-56-58.98 | E108-13-12.20 | 669 | Fruit | Farm field |



Photo 1. Ron Market in Pleiku City



Photo 2. Interviewing local people in No. 13 village, la Mlah commune, Krong Pa district



Photo 3. No. 7 amaranths plant in Dong Hung village, Phu Can commune, Krong Pa district



Photo 4. No. 1 melon fruits cultivated at a farmer's garden, Y village, Chu' Rcam commune, Krong Pa district



Photo 5. No. 88 cucumber fruit in Kon Mah Hor village, Ha Dong commune, Dak Doa district



Photo 6. Young shoots and leaves of squash (*Cucurbita moschata*) purchased at Ron market, Pleiku City



Photo 7. A cut squash fruit of No. 86 in Hlang village, Hnol commune, Dak Doa district



Photo 8. Squash plants cultivated with rice in Kon Mah Hor village, Ha Dong commune, Dak Doa district



Photo 9. No. 2 chili pepper fruits purchased at Ron market, Pleiku City



Photo 10. No. 14 eggplant fruits in Mlah village, Phu Can commune, Krong Pa district



Photo 11. No.59 fruits assumed to be *Coccinia* sp. in Tnung 2 village, Ya Ma commune, Kong Chro district



Photo 12. A mature fruit and flowers of No. 38 bitter melon in Group 8 village, Phu Tuc town, Krong Pa district