

Collection and Conservation of *Vigna nakashimae* on Nakadorijima Island, Uku Island, and Nishisonogi Peninsula

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Summary

A research survey to collect and conserve *Vigna* germplasm—mainly *Vigna nakashimae*—was conducted on Nakadorijima Island, Ukujima Island, and Nishisonogi Peninsula, Nagasaki Prefecture, Japan, in October 17–21, 2022. A total of 31 wild and weedy legume accessions were collected from 14 sites. On Nakadorijima Island, *Vigna angularis* (weedy), *Vigna angularis* var. *nipponensis*, *Glycine soja*, and *Canavalia lineata* were found at 4 of the 15 sites visited, but natural habitats for *Vigna nakashimae* were not found. On Ukujima Island, *V. nakashimae* was collected at 9 of the 10 sites visited; 6 of these sites were newly discovered native habitats. Only one site was visited in Nishisonogi Peninsula, where one accession of *Vigna angularis* (weedy) was collected. All of the collected seeds are being conserved and will undergo multiplication in the National Agriculture and Food Research Organization (NARO) Genebank. The propagated seeds will be used for research on tolerance to abiotic stresses, including salinity. These genetic resources will become available upon request for research or educational purposes.

KEY WORDS: *Vigna nakashimae*, Salt tolerance, Goto islands, Nagasaki prefecture

Introduction

The wild relatives of *Vigna* crops may prove to be useful genetic resources for the adaptability to various harsh environments (Tomooka *et al.* 2014). *Vigna nakashimae* (Ohwi) Ohwi & Ohashi is one of the wild *Vigna* spp. that has high salt tolerance (Yoshida *et al.* 2016; Noda *et al.* 2022). Elucidating the salt tolerance mechanism of this plant may provide clues for solving salt damage, which is a major problem in agriculture

worldwide. The distribution of *V. nakashimae* covers China, Korea, and Japan, but its domestic distribution was only confirmed around the Goto Islands, Iki Island, and Hirado Island in Nagasaki Prefecture as well as the Amakusa area in Kumamoto Prefecture.

The National Agriculture and Food Research Organization (NARO) Genebank has been conducting a collection survey for the conservation of legumes containing *Vigna* germplasm distributed in Japan. The

domestic collection survey for *V. nakashimae* was conducted by Tomooka *et al.* (1998, 2013, 2015) and Takahashi *et al.* (2014). In this report, a collection survey of wild leguminous species—mainly *V. nakashimae*—was conducted to further enrich the genetic resources available in the NARO Genebank.

Methods

A collection survey was conducted on Nakadorijima Island (Shinkamigoto, Minaminatsuura, Nagasaki), Ukujima Island (Sasebo, Nagasaki), and Nishisonogi Peninsula (Saikai, Nagasaki) in Nagasaki Prefecture, Japan, in October 17-21 2022 (Table 1). We used a ferry and speed boats to move between the islands and rental cars to move within each island.

We estimated the locations and topography of most collection sites on Google Maps in advance, whereas several additional sites were visited that seemed to be habitats of genus *Vigna* plants while traveling. As passport data, we recorded the names of the collection sites, the date of collection, the names of the collectors, latitude, longitude, altitude, location names, land use, soil type, habitat, associated plants, shading level, degree of disturbance, population size, state, and other ecological data. The latitude and longitude were estimated using Google Maps.

Results and Discussion

During this survey, a total of 26 sites were visited, with leguminous accessions found in 14 of them (Fig. 1). A total of 31 accessions consisting of 24 accessions of *V. nakashimae*, 3 accessions of *Vigna angularis* (weedy), 1 accession of *V. angularis* var. *nipponensis*, 2 accessions of *Glycine soja*, and 1 accession of *Canavalia lineata* were collected during this survey (Table 2). The passport information for all collected accessions is shown in Table 3. Photos of the habitats at each site can

be found in Appendix 1, while photos of the collected seeds conserved in the NARO Genebank are shown in Appendix 2.

Nakadorijima Island

We visited 15 sites along the coast of Nakadorijima Island from the northern to the central region, on October 18, 2022 (Fig. 1A). Most sites were grasslands in a park or abandoned paddy field (Photos 1-4). Wild legume species were only collected at four of the fifteen visited sites, including one accession of *V. angularis* var. *nipponensis*, one of *V. angularis* (weedy), one of *C. lineata*, and one of *G. soja* (Table 2).

V. nakashimae was not found in Nakadorijima Island in this survey. In a previous collection survey on Nakadorijima Island, only one accession of *V. nakashimae* was collected (Tomooka *et al.* 1999). Considering that we visited the same site with no success, we suggest that *V. nakashimae* cannot settle in this island, although seed migration may occur. According to the previous survey, *V. nakashimae* was distributed along coastal sunny grasslands; such grasslands in Nakadorijima Island are on steep slopes, where winds are very strong.

Ukujima Island

We visited 10 sites along the coast of Ukujima Island, finding wild legumes at 9 of them (Fig. 1B). A total of 26 accessions were collected, comprising 24 accessions of *V. nakashimae*, 1 of *V. angularis* (weedy), and 1 of *G. soja* (Tables 2 and 3). The natural habitats of *V. nakashimae* had been reported in a previous survey (Tomooka *et al.* 2013), of which we confirmed four known habitats and discovered six new natural ones. All sites were characterized by sunny and flat grasslands with high disturbance (Photos 5-13). All *V. nakashimae* plants were entwined in grassy weeds approximately

Table 1. Itinerary of the field survey in Goto Islands, Nagasaki Prefecture

Date	Itinerary	Stay
2022/10/17	Tsukuba --(Train)-- Haneda Airport --(ANA661)-- Nagasaki Airport --(Bus)-- Nagasaki Port --(Speed boat)-- Narao Port -- Exploration on Nakadori-Island --	Aoka-go, Nakadorijima Island
2022/10/18	Exploration on Nakadorijima Island	Aoka-go, Nakadorijima Island
2022/10/19	Exploration on Nakadorijima Island -- Arikawa Port --(Speed boat)-- Ukuhira Port -- Exploration on Ukujima Island	Uku-machi, Ukujima Island
2022/10/20	Exploration on Ukujima Island-- Ukuhira Port --(Ferry)-- Sasebo Port -- Exolioration in Nishisonogi Peninsula -- Nagasaki city	Nagasaki city
2022/10/21	Nagasaki city --(Bus)-- Nagasaki Airport --(ANA664)-- Haneda Airport --(Train)-- Tsukuba	

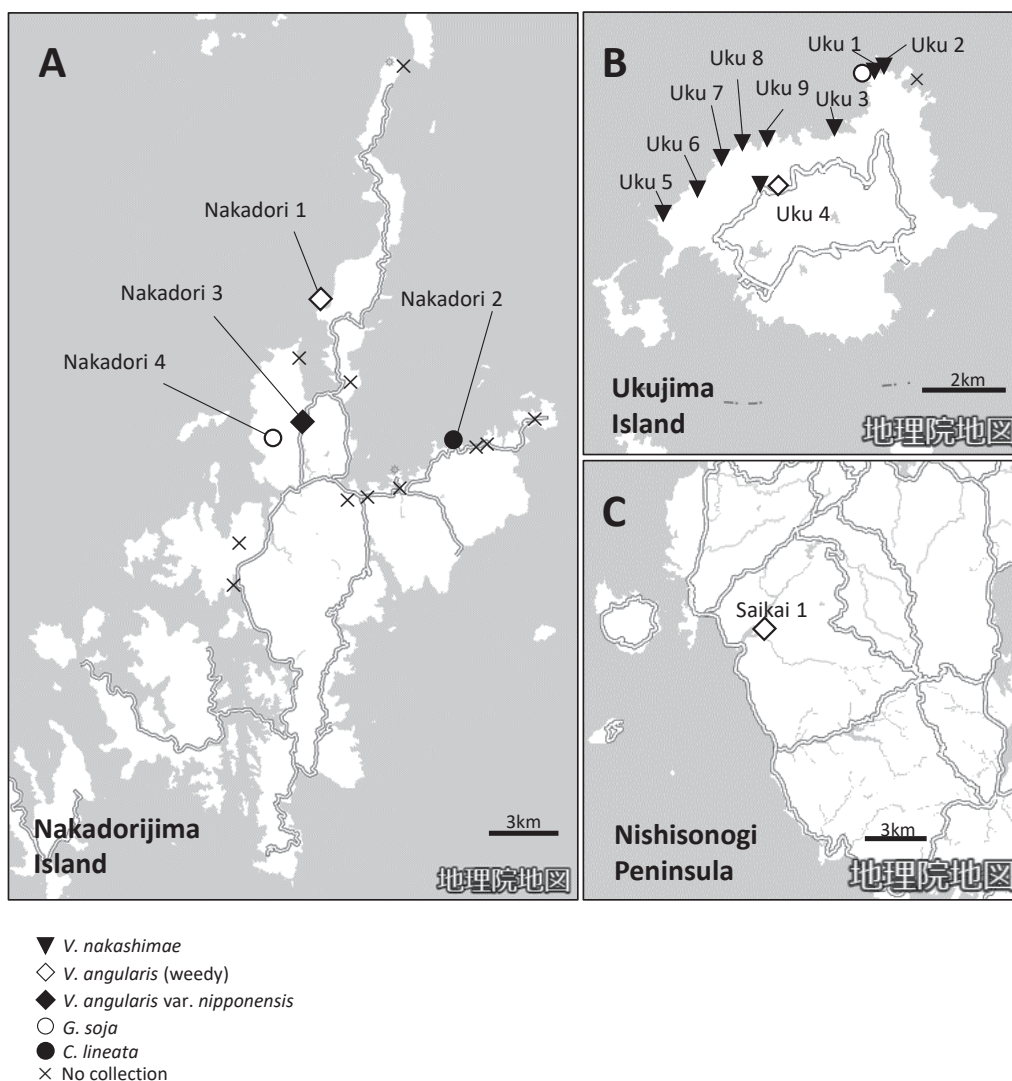


Fig. 1. Collection sites on Nakadorijima Island (A), Ukujima Island (B), and Saikai City (C), Nagasaki Prefecture.

Table 2. Summary of collected accessions on Goto Islands and Saikai city in Nagasaki Prefecture

Speices	Nakadori	Uku	Saikai	Total
<i>Vigna nakashimae</i>	0	24	0	24
<i>Vigna angularis</i> (weedy)	1	1	1	3
<i>Vigna angularis</i> var. <i>nipponensis</i>	1	0	0	1
<i>Glycine soja</i>	1	1	0	2
<i>Canavalia lineata</i>	1	0	0	1
Total	4	26	1	31

30-50 cm tall, so we had to push the grass aside to find them. Green to black pods were observed at the nine collection sites, while flowering was observed at six of them.

Nishisonogi Peninsula

Only one site was visited in Nishisonogi Peninsula (Fig. 1C), where one accession of *V. angularis* (weedy)

was collected (Tables 2 and 3). We surveyed a wide area spanning approximately 100 x 100 m around the paddy field, finally finding the accession of *V. angularis* (weedy) in a shrub on the bank beside the irrigation canal (Photo 14).

All of the collected seeds were conserved and will undergo multiplication in the NARO Genebank. The propagated seeds will be used for research on tolerance

to abiotic stresses, including salinity. These genetic resources will be available upon request for research or educational purposes.

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長崎県中通島，宇久島および西彼杵半島における ヒメツルアズキ遺伝資源の収集探索（2022年）

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和文摘要

2022年10月18~20日に長崎県五島列島の中通島，宇久島および西海市にてヒメツルアズキを中心としたマメ科野生種の遺伝資源探索収集を行った。その結果，合計31品目の野生型および雑草型のマメ科遺伝資源を収集できた。中通島では15カ所のサイトを訪れた。そのうち4カ所で雑草アズキ (*Vigna angularis*)，ヤブツルアズキ (*V. angularis* var. *nipponensis*)，ツルマメ (*Glycine soja*) およびハマナタマメ (*Canavalia lineata*) を収集できたが，ヒメツルアズキ (*V. nakashimae*) の自生地の発見には至らなかった。宇久島では10カ所のサイトを調査し，その内9カ所でヒメツルアズキを収集できた。うち6カ所は新規に発見した自生地であった。西彼杵半島では1サイトのみ調査し，雑草アズキを1系統収集できた。収集したすべての系統をジーンバンクに遺伝資源として登録・保存した。増殖した種子は今後耐塩性機構に関する研究材料として使用する計画である。また研究材料や教育資料として一般に配布可能となる予定である。

Table 3. Passport data of collected samples

ID	JP No.	Date	Scientific name	Status	Passport data	Altitude (m)	Location	Land use	Population size (m ²)	Associate plants	Habitat	Shading	Degree of disturbance	Growth stage	Special notes
Nakadori 1-1	287676	2022 Oct.18	<i>Vigna angularis</i>	Weedy	33°03'23.4"N 129°04'37.4"E	19	しんうおのめふれ愛らんど 一般駐車場, 長崎県南松浦郡新上五島町曾根郷 1176 1176 Sonogo, Shinkamigoto-cho, Minamimatsuura, Nagasaki	Abandoned farmland in Park	1x3	<i>Setaria billidis</i>	Glass land	Open	Medium	Green pod Black pod Shattered	Seed size was big.
Nakadori 2-1	287677	2022 Oct.18	<i>Canavalia lineata</i>	Wild	32°59'56.7"N 129°08'40.9"E	85	長崎県南松浦郡新上五島町青方郷 Aokatago, Shinkamigoto-cho, Minamimatsuura, Nagasaki	Road side slope	10x5	-	Bush	Open	none	Green pod Matured pod	No <i>Vigna</i>
Nakadori 3-1	287678	2022 Oct.18	<i>Vigna angularis</i> var. <i>nipponensis</i>	Wild	33°00'05.6"N 129°04'02.4"E	63	長崎県南松浦郡新上五島町青方郷 Aokatago, Shinkamigoto-cho, Minamimatsuura, Nagasaki	Abandoned paddy field	5x5	<i>Glycine soja</i> <i>Coix lacryma-jobi</i>	Bush	Open	Medium	Black pod	Small leaf Whitefly attacked
Nakadori 4-1	287679	2022 Oct.18	<i>Glycine soja</i>	Wild	32°59'40.0"N 129°03'08.7"E	12	長崎県南松浦郡新上五島町船崎郷 Funasakigo, Shinkamigoto-cho, Minamimatsuura, Nagasaki	Abandoned farmland in Park	5x10	<i>Typha latifolia</i> <i>Solidago canadensis</i>	Bush	Open	Medium	Green pod Matured pod	-
Uku 1-1	287680	2022 Oct.19	<i>Vigna nakashimae</i>	Wild	33°18'00.7"N 129°07'32.9"E	15	対馬瀬鼻灯台付近, 長崎県佐世保市宇久町野方 Tsushimasehana lighthouse, Nogata, Uku, Sasebo, Nagasaki	Park	1x1	<i>Miscanthus sinensis</i>	Glass land	Open	High	-	-
Uku 1-2	287681	2022 Oct.19	<i>Vigna nakashimae</i>	Wild	33°18'00.1"N 129°07'32.0"E	15	対馬瀬鼻灯台付近, 長崎県佐世保市宇久町野方 Tsushimasehana lighthouse, Nogata, Uku, Sasebo, Nagasaki	Park	1x1	<i>Miscanthus sinensi</i> <i>Lotus corniculatu</i> <i>Aeginetia indica</i>	Glass land	Open	High	Black pod Green pod	-
Uku 1-3	287682	2022 Oct.19	<i>Vigna nakashimae</i>	Wild	33°18'00.3"N 129°07'31.9"E	15	対馬瀬鼻灯台付近, 長崎県佐世保市宇久町野方 Tsushimasehana lighthouse, Nogata, Uku, Sasebo, Nagasaki	Park	1x1	<i>Miscanthus sinensis</i>	Glass land	Open	High	Black pod	5 m from Uku1-1
Uku 1-4	287683	2022 Oct.19	<i>Vigna nakashimae</i>	Wild	33°18'00.3"N 129°07'32.7"E	18	対馬瀬鼻灯台付近, 長崎県佐世保市宇久町野方 Tsushimasehana lighthouse, Nogata, Uku, Sasebo, Nagasaki	Park	3x3	<i>Miscanthus sinensi</i> <i>Lotus corniculatus</i>	Glass land	Open	High	-	10 m from Uku 1-1 20 m upper the slope from paddy fields
Uku 1-5	287684	2022 Oct.19	<i>Vigna nakashimae</i>	Wild	33°18'00.3"N 129°07'32.7"E	18	対馬瀬鼻灯台付近, 長崎県佐世保市宇久町野方 Tsushimasehana lighthouse, Nogata, Uku, Sasebo, Nagasaki	Park	-	<i>Miscanthus sinensis</i>	Glass land	Open	High	Flowering Green pod Black pod	-
Uku 1-S1	287685	2022 Oct.19	<i>Glycine soja</i>	Wild	33°18'00.3"N 129°07'32.7"E	18	対馬瀬鼻灯台付近, 長崎県佐世保市宇久町野方 Tsushimasehana lighthouse, Nogata, Uku, Sasebo, Nagasaki	Park	-	<i>Miscanthus sinensis</i>	Glass land	Open	High	Matured	Only one pod lefted.
Uku 2-1	287686	2022 Oct.19	<i>Vigna nakashimae</i>	Wild	33°18'09.0"N 129°07'45.0"E	20	対馬瀬鼻灯台付近, 長崎県佐世保市宇久町野方 Tsushimasehana lighthouse, Nogata, Uku, Sasebo, Nagasaki	Park	2x3	<i>Miscanthus sinensis</i>	Glass land	Open	High	-	East side of road

Table 3. (Continued).

ID	JP No.	Date	Scientific name	Status	Passport data	Altitude (m)	Location	Land use	Population size (m ²)	Associate plants	Habitat	Shading	Degree of disturbance	Growth stage	Special notes
Uku 3-1	287687	2022 Oct.19	<i>Vigna nakashimae</i>	Wild	33°17'17.9"N 129°07'00.0"E	25	乙女の鼻園地付近, 長崎県佐世保市宇久町木場 Otomenohana park, Koba, Uku, Sasebo, Nagasaki	Park	2x2	<i>Miscanthus sinensis</i> <i>Aeginetia indica</i>	Glass land	Open	High	Green pod Black pod Shattered	Pods are bigger than Uku2-1
Uku 3-2	287688	2022 Oct.19	<i>Vigna nakashimae</i>	Wild	33°17'17.8"N 129°07'00.6"E	25	乙女の鼻園地付近, 長崎県佐世保市宇久町木場 Otomenohana park, Koba, Uku, Sasebo, Nagasaki	Park	1x1	<i>Miscanthus sinensis</i> <i>Aeginetia indicaz</i> <i>Lotus corniculatus</i>	Glass land	Open	High	Black pod	Pods are few. Yellow and drying reaf
Uku 3-3	287689	2022 Oct.19	<i>Vigna nakashimae</i>	Wild	33°17'18.1"N 129°06'58.1"E	25	乙女の鼻園地付近, 長崎県佐世保市宇久町木場 Otomenohana park, Koba, Uku, Sasebo, Nagasaki	Park	6x6	<i>Miscanthus sinensis</i> <i>Aeginetia indica</i> <i>Lotus corniculatus</i>	Glass land	Open	High	Black pod Shattered	Pods are few.
Uku 4-1	287690	2022 Oct.19	<i>Vigna angularis</i>	Weedy	33°16'37.8"N 129°05'53.1"E	12	大久保公民館前, 長崎県佐世保市宇久町大久保 589 589 Okubo public hall, Okubo, Uku, Sasebo, Nagasaki	Abandoned farmland in Park	2x2	-	Glass land	Open	High	Black pod Green pod Flowering	-
Uku 5-1	287691	2022 Oct.19	<i>Vigna nakashimae</i>	Wild	33°16'11.5"N 129°04'23.4"E	19	平家盛公上陸地（火焚崎）入口, 長崎県佐世保市宇久町本飯良 Hitakizaki, Motoiira, Uku, Sasebo, Nagasaki	Park	10x10	Poaceae	Glass land	Open	High	Green pod Flowering Shattered Blackpod	Almost shattered.
Uku 5-2	287692	2022 Oct.19	<i>Vigna nakashimae</i>	Wild	33°16'12.8"N 129°04'23.4"E	13	平家盛公上陸地（火焚崎）入口, 長崎県佐世保市宇久町本飯良 Hitakizaki, Motoiira, Uku, Sasebo, Nagasaki	Park	10x10	Poaceae <i>Lotus corniculatus</i>	Glass land	Open	High	Green pod Black pod Bud	-
Uku 5-3	287693	2022 Oct.19	<i>Vigna nakashimae</i>	Wild	33°16'12.8"N 129°04'22.9"E	19	平家盛公上陸地（火焚崎）入口, 長崎県佐世保市宇久町本飯良 Hitakizaki, Motoiira, Uku, Sasebo, Nagasaki	Park	10x10	-	Glass land	Open	High	Green pod Black pod Flowering	Pods are few. One bud flowering.
Uku 6-1	287694	2022 Oct.20	<i>Vigna nakashimae</i>	Wild	33°16'33.1"N 129°04'58.4"E	54	平家盛公上陸地（火焚崎）入口, 長崎県佐世保市宇久町本飯良 Hitakizaki, Motoiira, Uku, Sasebo, Nagasaki	Park	10x10	Poaceae <i>Dunbaria villosa</i>	Glass land	Open	High	Green pod Black pod	-
Uku 6-2	287695	2022 Oct.20	<i>Vigna nakashimae</i>	Wild	33°16'33.6"N 129°04'56.5"E	45	長崎県佐世保市宇久町大久保 Okubo, Uku, Sasebo, Nagasaki	Park	2x2	Poaceae <i>Lotus corniculatus</i> <i>Aster yomena</i> <i>Artemisia indica</i> <i>Miscanthus sinensis</i>	Glass land	Open	High	Green pod Black pod Flowering	-
Uku 6-3	287696	2022 Oct.20	<i>Vigna nakashimae</i>	Wild	33°16'33.6"N 129°04'56.5"E	45	長崎県佐世保市宇久町大久保 Okubo, Uku, Sasebo, Nagasaki	Park	-	-	Glass land	Open	High	-	-
Uku 7-1	287697	2022 Oct.20	<i>Vigna nakashimae</i>	Wild	33°16'54.7"N 129°05'20.8"E	50	旭第一——部隊将兵の碑付近, 長崎県佐世保市宇久町大久保 Monument of Asahi troop 1111, Okubo, Uku, Sasebo, Nagasaki	Park	5x5	Poaceae <i>Artemisia indica</i> <i>Miscanthus sinensis</i> <i>Dunbaria villosa</i>	Glass land	Open	High	Black pod	Slope

Table 3. (Continued).

ID	JP No.	Date	Scientific name	Status	Passport data	Altitude (m)	Location	Land use	Population size (m ²)	Associate plants	Habitat	Shading	Degree of disturbance	Growth stage	Special notes
Uku 7-2	287698	2022 Oct.20	<i>Vigna nakashimae</i>	Wild	33°16'55.3"N 129°05'19.9"E	46	旭第一部隊将兵の碑付近, 長崎県佐世保市宇久町大久保 Monument of Asahi troop 1111, Okubo, Uku, Sasebo, Nagasaki	Park	10x10	<i>Miscanthus sinensis</i> <i>Aster yomena</i>	Glass land	Open	High	Black pod Green pod	Slope (45°)
Uku 7-3	287699	2022 Oct.20	<i>Vigna nakashimae</i>	Wild	33°16'58.3"N 129°05'19.6"E	31	旭第一部隊将兵の碑付近, 長崎県佐世保市宇久町大久保 Monument of Asahi troop 1111, Okubo, Uku, Sasebo, Nagasaki	Park	20x20	<i>Miscanthus sinensis</i> Poaceae <i>Pennisetum alopecuroides</i>	Glass land	Open	High	Black pod Green pod Flowering Shattered	-
Uku 8-1	287700	2022 Oct.20	<i>Vigna nakashimae</i>	Wild	33°17'06.0"N 129°05'36.0"E	33	長崎県佐世保市宇久町大久保 Okubo, Uku, Sasebo, Nagasaki	Park	2x2	<i>Miscanthus sinensis</i> Poaceae	Glass land	Open	High	-	-
Uku 8-2	287701	2022 Oct.20	<i>Vigna nakashimae</i>	Wild	33°17'06.7"N 129°05'35.6"E	35	長崎県佐世保市宇久町大久保 Okubo, Uku, Sasebo, Nagasaki	Park	5x5	<i>Miscanthus sinensis</i> <i>Aster yomena</i>	Glass land	Open	High	Black pod Green pod	-
Uku 8-3	287702	2022 Oct.20	<i>Vigna nakashimae</i>	Wild	33°17'08.3"N 129°05'35.3"E	25	長崎県佐世保市宇久町大久保 Okubo, Uku, Sasebo, Nagasaki	Park	1x1	<i>Miscanthus sinensis</i>	Glass land	Open	High	-	-
Uku 9-1	287703	2022 Oct.20	<i>Vigna nakashimae</i>	Wild	33°17'09.6"N 129°05'56.0"E	27	長崎県佐世保市宇久町木場 Koba, Uku, Sasebo, Nagasaki	Pasture	3x3	Poaceae <i>Aster yomena</i>	Glass land	Open	High	Black pod	A half part of pasture mowed
Uku 9-2	287704	2022 Oct.20	<i>Vigna nakashimae</i>	Wild	33°17'09.4"N 129°05'56.1"E	21	長崎県佐世保市宇久町木場 Koba, Uku, Sasebo, Nagasaki	Pasture	5x5	Poaceae <i>Aster yomena</i>	Glass land	Open	High	Black pod Green pod	A half part of pasture mowed
Uku 9-3	287705	2022 Oct.20	<i>Vigna nakashimae</i>	Wild	33°17'10.3"N 129°05'55.3"E	21	長崎県佐世保市宇久町木場 Koba, Uku, Sasebo, Nagasaki	Pasture	30x30	Poaceae	Glass land	Open	High	-	A half part of pasture mowed
Saikai 1-1	287706	2022 Oct.20	<i>Vigna angularis</i> var. <i>nipponensis</i>	Weedy	32°55'25.0"N 129°40'11.3"E	0	長崎県西海市大瀬戸町雪浦上郷 251 251 Yukiuranokamigo, Oseto, Saikai, Nagasaki	Irrigation canal embankment	1x1	<i>Solidago canadensis</i> <i>Miscanthus sinensis</i>	Bush	Open	High	Flowering Green pod Black pod	Drainage facility

-: No-record

Appendix 1



Photo 1. Nakadori 01 (*Vigna angularis*, weedy, JP287676)

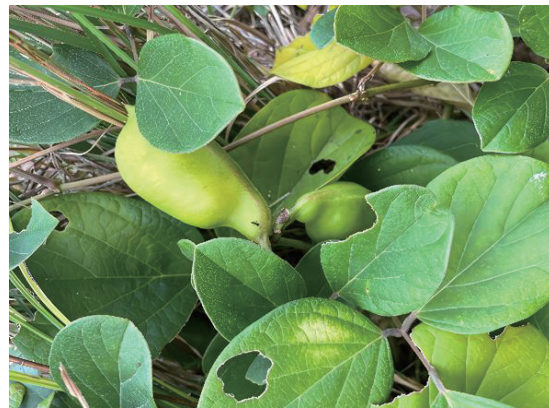


Photo 2. Nakadori 02 (*Canavalia lineata*, JP287677)



Photo 3. Nakadori 03 (*Vigna angularis* var. *nipponensis*, JP287678)



Photo 4. Nakadori 04 (*Glycine soja*, JP287679)



Photo 5. Uku 01 (*Vigna nakashimae*, JP287680-287684)



Photo 6. Uku 02 (*Vigna nakashimae*, JP287686)



Photo 7. Uku 03 (*Vigna nakashimae*, JP287687-287689)



Photo 8. Uku 04 (*Vigna angularis*, weedy, JP287690)



Photo 9. Uku 05 (*Vigna nakashimae*, JP287691-287693)



Photo 10. Uku 06 (*Vigna nakashimae*, JP287694-287696)



Photo 11. Uku 07 (*Vigna nakashimae*, JP287697-287699)



Photo 12. Uku 08 (*Vigna nakashimae*, JP287700-287702)



Photo 13. Uku 09 (*Vigna nakashimae*, JP287703-287705)



Photo 14. Saikai 01 (*Vigna angularis*, weedy, JP287706)

Appendix 2



Sample Photo 1.
JP287676 (Nakadori 1-1_2022),
Vigna angularis (weedy)



Sample Photo 2.
JP287677 (Nakadori 2-1_2022),
Canavalia lineata



Sample Photo 3.
JP287678 (Nakadori 3-1_2022),
Vigna angularis var. *nipponensis*



Sample Photo 4.
JP287679 (Nakadori 4-1_2022),
Glycine soja



Sample Photo 5.
JP287680 (Uku 1-1_2022),
Vigna nakashimae



Sample Photo 6.
JP287681 (Uku 1-2_2022),
Vigna nakashimae



Sample Photo 7.
JP287682 (Uku 1-3_2022),
Vigna nakashimae



Sample Photo 8.
JP287683 (Uku 1-4_2022),
Vigna nakashimae



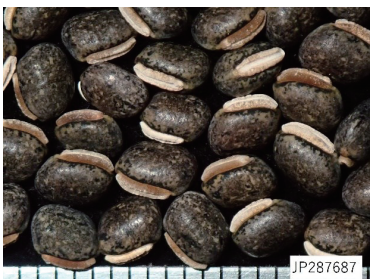
Sample Photo 9.
JP287684 (Uku 1-5_2022),
Vigna nakashimae



Sample Photo 10.
JP287685 (Uku 1-S1_2022),
Glycine soja



Sample Photo 11.
JP287686 (Uku 2-1_2022),
Vigna nakashimae



Sample Photo 12.
JP287687 (Uku 3-1_2022),
Vigna nakashimae



Sample Photo 13.
JP287688 (Uku 3-2_2022),
Vigna nakashimae



Sample Photo 14.
JP287689 (Uku 3-3_2022),
Vigna nakashimae



Sample Photo 15.
JP287690 (Uku 4-1_2022),
Vigna angularis (weedy)



Sample Photo 16.
JP287691 (Uku 5-1_2022),
Vigna nakashimae



Sample Photo 17.
JP287692 (Uku 5-2_2022),
Vigna nakashimae



Sample Photo 18.
JP287693 (Uku 5-3_2022),
Vigna nakashimae



Sample Photo 19.
JP287694 (Uku 6-1_2022),
Vigna nakashimae



Sample Photo 20.
JP287695 (Uku 6-2_2022),
Vigna nakashimae



Sample Photo 21.
JP287696 (Uku 6-3_2022),
Vigna nakashimae



Sample Photo 22.
JP287697 (Uku 7-1_2022),
Vigna nakashimae



Sample Photo 23.
JP287698 (Uku 7-2_2022),
Vigna nakashimae



Sample Photo 24.
JP287699 (Uku 7-3_2022),
Vigna nakashimae



Sample Photo 25.
JP287700 (Uku 8-1_2022),
Vigna nakashimae



Sample Photo 26.
JP287701 (Uku 8-2_2022),
Vigna nakashimae



Sample Photo 27.
JP287702 (Uku 8-3_2022),
Vigna nakashimae



Sample Photo 28.
JP287703 (Uku 9-1_2022),
Vigna nakashimae



Sample Photo 29.
JP287704 (Uku 9-2_2022),
Vigna nakashimae



Sample Photo 30.
JP287705 (Uku 9-3_2022),
Vigna nakashimae



Sample Photo 31.
JP287706 (Saikai 1-1_2022),
Vigna angularis (weedy)