

Collection of *Glycine* and *Vigna* Plant Genetic Resources in Hirado and Shimabara areas of Nagasaki Prefecture and Amakusa area of Kumamoto Prefecture in Japan, from 20th to 24th October, 2014

Norihiko TOMOOKA, Kohtaro ISEKI, Ken NAITO,
Mitsunori AKIBA, Toshikatsu IIZUMI

National Institute of Agrobiological Sciences, Kannondai 2-1-2, Tsukuba, Ibaraki 305-8602, Japan

Corresponding author : N. TOMOOKA (e-mail : tomooka@affrc.go.jp)

Summary

We have conducted a field survey for collecting *Glycine* and *Vigna* genetic resources in Nagasaki and Kumamoto prefectures, Japan, from 20th to 24th October, 2014. A total of 91 accessions, consist of 51 wild soybean (*Glycine soja* Sieb. & Zucc., Japanese name : tsurumame), 3 naturally growing intermediate azuki bean (*Vigna angularis* (Willd.) Ohwi & H. Ohashi, zassou azuki), 21 wild azuki bean (*Vigna angularis* (Willd.) Ohwi & H. Ohashi var. *nipponensis* (Ohwi) Ohwi & H. Ohashi, yabutsuru azuki), 6 *Vigna nakashimae* (Ohwi) Ohwi & H. Ohashi (himetsuru azuki), 6 *Vigna radiata* (L.) Wilczek (ryokutou), 2 *Vigna umbellata* (Thunb.) Ohwi & H. Ohashi (tsuru azuki) and 2 *Vigna unguiculata* (L.) Walp. (sasage), was collected. The collected seeds were conserved in the National Institute of Agrobiological Sciences (NIAS) genebank. We plan to multiply the seeds and to evaluate their growth traits in 2015. The multiplied seeds will become available upon request from NIAS genebank for research and educational purposes.

KEY WORDS : *Glycine*, *Vigna*, genetic resources, Japan

Introduction

The genus *Glycine* and *Vigna* belong to the legume family (Leguminosae), and include crops such as soybean (*Glycine max* (L.) Merr., Japanese name: daizu), cowpea (*Vigna unguiculata* (L.) Walp., sasage), mungbean (*Vigna radiata* (L.) Wilczek, ryokutou), rice bean (*Vigna umbellata* (Thunb.) Ohwi & H. Ohashi, tsuru azuki), and azuki bean (*Vigna angularis* (Willd.) Ohwi & H. Ohashi, azuki). The NIAS genebank has been conducting collecting trips for the conservation of *Glycine* and *Vigna* germplasm distributed in Japan (Vaughan *et al.*, 2010, Tomooka *et al.*, 2010, see also Annual Report on Exploration and Introduction of Plant Genetic Resources, NIAS, https://www.gene.affrc.go.jp/publications.php#plant_report). We are recently focusing mainly on the collection of wild species and naturally growing genetic resources probably escaped from old cultivation. Wild species and naturally growing plants might have favorable characters for breeding biotic and abiotic stress tolerant crops. This is a report of the field survey for collecting *Glycine* and *Vigna*

genetic resources plants in Nagasaki and Kumamoto prefectures in Kyushu District, Japan.

Methods

A field survey was conducted by car in Nagasaki and Kumamoto prefectures, Japan from 20th to 24th October, 2014 (Table 1). When we saw naturally growing *Glycine* or *Vigna* plants from the car or saw the environment where these legumes seemed to grow, we stopped our car and searched the area in order to collect seeds from natural populations. Bulk seeds were collected from naturally growing plants. If a population contained plants with different traits, the seeds were separated according to these traits. Naturally growing plants (not cultivated by farmers) were classified visually either as wild form or intermediate form. Wild form shows typical wild characteristics, such as mottled black small seeds, shattering pods and twining slender stems. Intermediate form shows some of the characteristics of the domesticated form, generally having light-colored larger seeds, weak-shattering pods and non or less twinning stems. As a passport data, the collection site name, latitude, longitude, altitude, sketch map of the collection sites and special characteristics of the habitats and plants we noticed were recorded. The latitude and longitude were measured by WGS84 world geodetic system using Garmin GPSmap 60CSx.

Table 1. Itinerary of Exploration in Nagasaki and Kumamoto prefectures (Oct. 20 - 24, 2014)

Date	Itinerary	Stay
10/20	NIAS (Ibaraki) → (railway) → Haneda airport (air) Fukuoka airport → (rent a car) → Hirado (Nagasaki)	Hirado (Nagasaki)
10/21	Hirado (Nagasaki) → Hirado island → Ikitsuki island → Hirado island → Sasebo → Isahaya → Obama (Nagasaki)	Obama (Nagasaki)
10/22	Obama (Nagasaki) → Unzen Mt. → Taira → Shimabara → Minamishimabara → Kuchinotsu → (ferry boat) → Oniike (Kumamoto) → Shimoda (Kumamoto)	Shimoda (Kumamoto)
10/23	Shimoda (Kumamoto) → Tomioka → Kawaura → Ushibuka → Gesushima → Ushibuka → Amakusa → Kamiamakusa → Yumigahama (Kumamoto)	Yumigahama (Kumamoto)
10/24	Yumigahama (kumamoto) → Kumamoto Airport (air) Haneda airport → NIAS (Ibaraki)	

Results and Discussions

A total of 91 accessions, consist of 51 wild soybean (*Glycine soja* Sieb. & Zucc., tsuru mame), 3 naturally growing intermediate azuki bean (*Vigna angularis*), 21 wild azuki bean (*Vigna angularis* (Willd.) Ohwi & H. Ohashi var. *nipponensis* (Ohwi) Ohwi & H. Ohashi, yabutsuru azuki), 6 wild *Vigna nakashimae* (Ohwi) Ohwi & H.Ohashi (himetsuru azuki), 6 naturally growing mungbean (*Vigna radiata*), 2 naturally growing rice bean (*Vigna umbellata*) and 2 naturally growing cowpea (*Vigna unguiculata*), was collected (Table 2). Passport informations of collected accessions are summarized in Table 3. Location of the collection site of each accession is shown in Fig. 1. Collected areas could be divided into 3 areas, i.e., Hirado area (consisting of Hirado island and Ikitsuki island, northern Nagasaki prefecture), Shimabara area (southern Nagasaki prefecture) and Amakusa area (western Kumamoto prefecture). Photos of the habitat were shown in Appendix 1 (Exploration Photos) and seeds of collected accessions were shown in Appendix 2 (Seeds Photos).

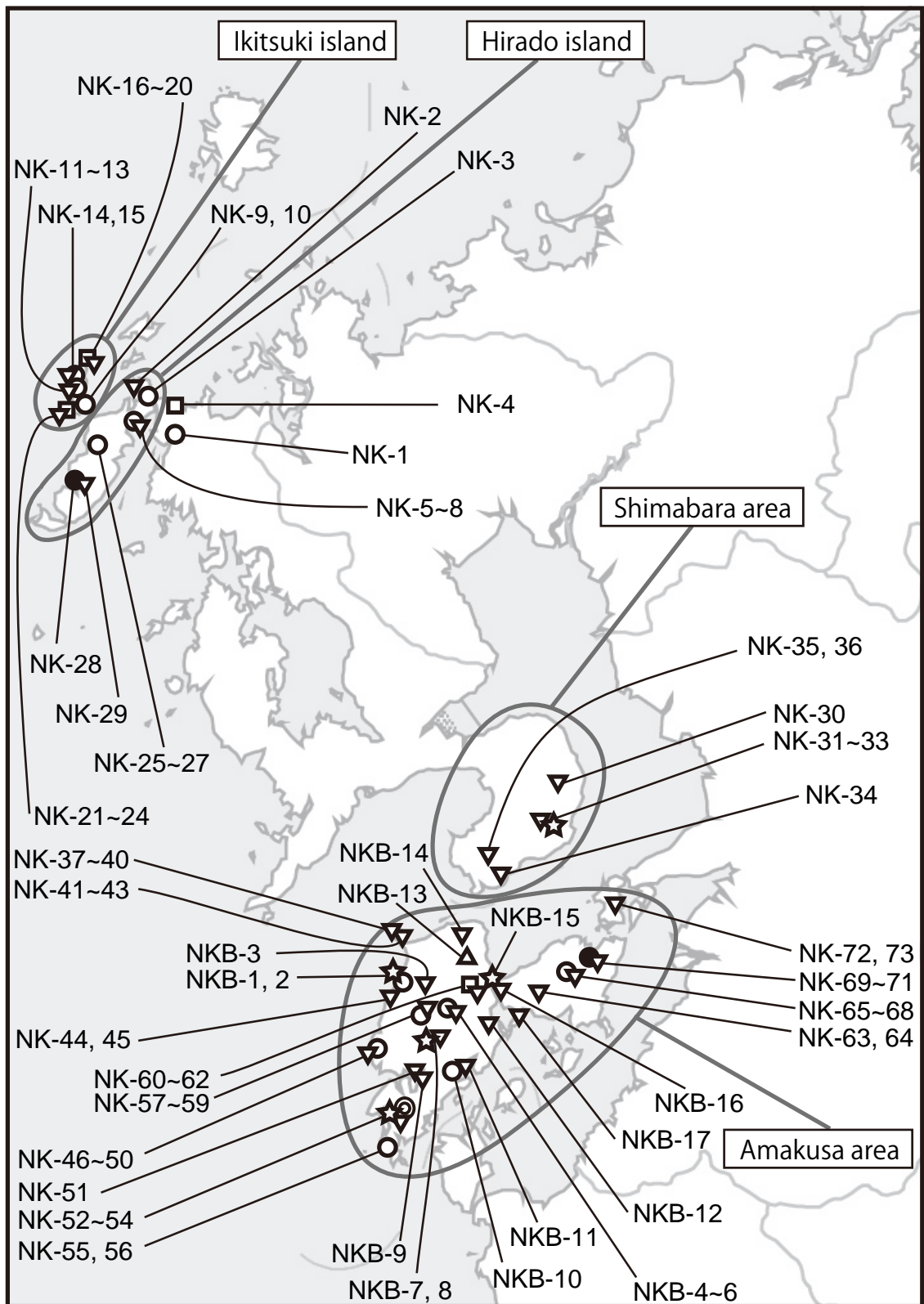


Fig. 1. A map showing collection sites in Hirado island, Ikitsuki island, Shimabara area in Nagasaki prefecture and Amakusa area in Kumamoto prefecture.

長崎県平戸島，生月島，島原地域および熊本県天草地域におけるマメ科植物遺伝資源の収集地点。

- ▼ *Glycine soja*
- ◎ *Vigna angularis*
- *Vigna angularis* var. *nipponensis*
- *Vigna nakashimae*
- ☆ *Vigna radiata*
- *Vigna umbellata*
- ▲ *Vigna unguiculata*

Table 2. A summary of collected samples in Nagasaki, Kumamoto
長崎県, 熊本県における収集品の内訳

Species	Cultivated	Naturally growing		Total
		Intermediate	Wild	
<i>Glycine soja</i>			51	51
<i>Vigna angularis</i>		3	21	24
<i>Vigna nakashimae</i>			6	6
<i>Vigna radiata</i>		6		6
<i>Vigna umbellata</i>		2		2
<i>Vigna unguiculata</i>		2		2
Total	0	13	78	91

In Hirado area, we have conducted a field survey mainly on Ikitsuki island and western side of Hirado island (Fig. 1). Eastern side of Hirado island was surveyed in 2013 (Takahashi *et al.*, 2014). In this area, we could collect a total of 30 accessions, consist of 11 wild soybean, 11 wild azuki bean, 2 naturally growing intermediate azuki bean, 5 wild *V. nakashimae*, and 1 naturally growing rice bean (Appendix 1, Photos 1 ~13, Appendix 2, NK-1 ~NK-29). Plenty of wild soybean and wild azuki bean populations were distributed in this area. At the northern tip of Ikitsuki island, we could collect both wild soybean (Photo 10, NK-18, NK-20) and wild *V. nakashimae* (Photo 10, NK-17, NK-19). Since the habitat was so windy that no trees could grow and the grassland changed leaves color to brownish probably because of the salty wind from the sea (Photo 11). Therefore, these accessions are expected to have salinity tolerance. *V. nakashimae* is cross compatible with both cultivated azuki bean and rice bean and therefore can be used for their breeding program (Tomooka *et al.*, 2002). In Nishihama of the Hirado island, a naturally growing rice bean plants were found in a home garden (Photo 13). The seed color was red (Appendix 2, NK-28) and considered to be a population escaped from cultivation. Probable escaped populations of rice bean were also found on Iki island and eastern side of Hirado island (Takahashi *et al.*, 2014).

In Shimabara area of Nagasaki prefecture, only 7 accessions consisting of 5 wild soybean and 2 naturally growing *V. radiata* accessions could be collected. Although we tried our best to find wild azuki bean population, we could not find any wild azuki bean population. This might be related to the soil type in this area. The soil in this area is volcanic ash derived soil from the Unzen mountain. The Unzen mountain erupted in 1991. Two accessions of naturally growing mungbean (NK-31, NK-33) had long crawling stem and easy shattering pods. The seed color was dirty greenish brown, indicating they are not directly escaped from modern mungbean variety having green seed color.

In Amakusa area, 54 accessions consisting of 35 wild soybean, 10 wild azuki bean, 1 naturally growing azuki bean, 1 wild *V. nakashimae*, 4 naturally growing mungbean, 1 naturally growing rice bean, 2 naturally growing cowpea accessions were found. Although we could find both wild soybean and wild azuki bean, wild soybean was more abundantly distributed. Four accession of naturally growing mungbean were found from Amakusa island, indicating the cultivation of mungbean was common in Amakusa area (NK53, NKB-2, NKB-7, NKB-15, Fig. 1). However, since the colors of seeds were dirty greenish brown or black mottled brown and seed size was small, it was considered that these accessions were not directly escaped from modern mungbean cultivar having green seed color. Two naturally growing cowpea accessions were found. One accession had black seeds (NK-49) and the other accession had creamy white seeds (NKB-13). Probable

escaped populations of cowpea were also found from Goto islands of Nagasaki prefecture (Tomooka *et al.*, 2013). Several plants of *V. nakashimae* were found growing at the edge of a paddy field (NK-62). As far as we know, this is the first site record of this species from Kumamoto prefecture.

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長崎県および熊本県におけるダイズ属およびササゲ属マメ科 植物遺伝資源の探索収集, 2014年10月20日～24日

友岡 憲彦・井関 洸太郎・内藤 健・秋葉 光孝・飯泉 敏勝

農業生物資源研究所

摘要

本報告は、これまで保存点数が少なかった長崎県平戸地域、島原地域および熊本県天草地域におけるダイズ属およびササゲ属植物遺伝資源の調査報告である。調査は2014年10月20-24日にかけて行った。その結果、野生ダイズ (*Glycine soja*, ツルマメ) 51点, アズキ自生集団 (雑草アズキ) 3点, 野生アズキ (*Vigna angularis* var. *nipponensis*, ヤブツルアズキ) 21点, ヒメツルアズキ (*Vigna nakashimae*) 6点, リョクトウ自生集団 (*Vigna radiata*) 6点, ツルアズキ自生集団 (*Vigna umbellata*) 2点, ササゲ自生集団 (*Vigna unguiculata*) 2点, 合計91点のマメ科植物遺伝資源を収集した。ヒメツルアズキは、環境省レッドデータ絶滅危惧IB類に分類されている種で、作物であるアズキやツルアズキと交雑可能である。ヒメツルアズキが熊本県に分布していることは、今回の調査で初めて明らかになった。これらの遺伝資源は、つくば市にある農業生物資源研究所で栽培し、特性評価と種子増殖を行う計画である。増殖種子は、農業生物資源研究所のジーンバンクで保存するとともに、研究や教育目的で利用するために配布可能な遺伝資源とする。

Table 3. A passport data of collected materials 収集品のパスポートデータ

JP No.	Coll. No.	Coll. Date	Species name	Status	Collection Site	Latitude	Longitude	Altitude (m)	Soil	Sampling method	100 seed weight (g)	Remarks
252141	2014NK-1	20 Oct., 2014	<i>Vigna angularis</i> var. <i>nipponensis</i>	wild	長崎県, 平戸市, 田平町荻田免 Tabiracho Ogitamem, Hirado-shi, Nagasaki	N33-19-27.0	E129-35-57.2	90	sand	bulk	2.9	growing between harvested paddy fields and a stream
252142	2014NK-2	20 Oct., 2014	<i>Glycine soja</i>	wild	長崎県, 平戸市, 大久保町, 田ノ浦温泉 Tanoura Onsen, Ookubocho, Hirado-shi, Nagasaki	N33-24-01.5	E129-31-36.1	40	clay	bulk	2.5	growing in a red soil disturbed habitat beside road, round leaflet
252143	2014NK-3	20 Oct., 2014	<i>Vigna angularis</i> var. <i>nipponensis</i>	wild	長崎県, 平戸市, 大久保町, 田助小下の棚田 rice terrace, below TASUKE elementary school, Ookubocho, Hirado-shi, Nagasaki	N33-23-32.8	E129-33-09.9	20	clay	bulk	3.3	growing in a gray soil grassland habitat, at a lower place of rice terrace paddy fields
252144	2014NK-4	21 Oct., 2014	<i>Vigna nakashimae</i>	wild	長崎県, 平戸市, 田平町大久保免 平戸ユースホステル クラブハウス裏, ヘリポート入口 at the entrance of heliport, backside of Hirado youth hostel, Tabiracho Ookubomen, Hirado-shi, Nagasaki	N33-22-34.4	E129-34-58.8	30	clay	bulk	2.9	growing in a grassland beside pathway, only 2 pods could be found and collected
252145	2014NK-5	21 Oct., 2014	<i>Glycine soja</i>	wild	長崎県, 平戸市, 木引町 Kohikicho, Hirado-shi, Nagasaki	N33-21-20.1	E129-31-53.9	110	organic soil	bulk	2.2	growing in a grassland beside a pathway of rice terrace paddy fields
252146	2014NK-6	21 Oct., 2014	<i>Glycine soja</i>	wild	"	N33-21-20.5	E129-31-53.9	92	organic soil	bulk	2.9	growing in a grassland beside a pathway of rice terrace paddy fields
252147	2014NK-7	21 Oct., 2014	<i>Vigna angularis</i> var. <i>nipponensis</i>	wild	"	N33-21-21.3	E129-31-53.3	110	organic soil	bulk	3.3	growing in a grassland beside a pathway of rice terrace paddy fields
252148	2014NK-8	21 Oct., 2014	<i>Vigna angularis</i> var. <i>nipponensis</i>	wild	"	N33-21-21.3	E129-31-53.3	110	organic soil	bulk	2.7	growing in a grassland beside a pathway of rice terrace paddy fields
252149	2014NK-9	21 Oct., 2014	<i>Vigna angularis</i> var. <i>nipponensis</i>	wild	長崎県, 平戸市, 生月町山田免, 松永建設横の棚田 rice terrace, beside Matsunaga Kensetsu company, Ikitsukicho Yamadamen, Hirado-shi, Nagasaki	N33-22-13.5	E129-25-42.3	60	clay	bulk	3.1	growing in a grassland in terrace paddy fields
252150	2014NK-10	21 Oct., 2014	<i>Vigna angularis</i> var. <i>nipponensis</i>	wild	長崎県, 平戸市, 生月町山田免, 松永建設横の棚田近くの天満神社過ぎた道脇 rice terrace, beside Matsunaga Kensetsu company, Ikitsukicho Yamadamen, Hirado-shi, Nagasaki	"	"	"	clay	bulk	2.7	growing in a grassland beside road after Tenman shrine
252151	2014NK-11	21 Oct., 2014	<i>Vigna angularis</i>	intermediate	長崎県, 平戸市, 生月町里免 Ikitsukicho Satomen, Hirado-shi, Nagasaki	N33-22-52.30	E129-25-30.17	63	clay	bulk	2.4	growing beside terrace paddy fields, tan seeds
252152	2014NK-12-1	21 Oct., 2014	<i>Vigna angularis</i> var. <i>nipponensis</i>	wild	"	"	"	"	clay	bulk	3.2	growing beside terrace paddy fields, black seed sample separated from 2014NK-12
253824	2014NK-12-2	21 Oct., 2014	<i>Vigna angularis</i>	intermediate	"	"	"	"	clay	bulk	3.2	growing beside terrace paddy fields, tan seed sample separated from 2014NK-12
252153	2014NK-13	21 Oct., 2014	<i>Glycine soja</i>	wild	"	"	"	"	clay	bulk	2.1	growing beside terrace paddy fields
252154	2014NK-14	21 Oct., 2014	<i>Glycine soja</i>	wild	長崎県, 平戸市, 生月町老部 Ikitsukicho Ichibu, Hirado-shi, Nagasaki	N33-24-18.4	E129-25-29.6	50	clay	bulk	2.5	growing in gray soil habitat, between road and rice paddy fields

Table 3 (Continued).

JP No.	Coll. No.	Coll. Date	Species name	Status	Collection Site	Latitude	Longitude	Altitude (m)	Soil	Sampling method	100 seed weight (g)	Remarks
252155	2014NK-15	21 Oct., 2014	<i>Vigna angularis</i> var. <i>nipponensis</i>	wild	長崎県, 平戸市, 生月町壱部 Ikitsukicho Ichibu, Hirado-shi, Nagasaki	N33-24-18.4	E129-25-29.6	50	clay	bulk	3.0	growing in gray soil habitat, between road and rice paddy fields
252156	2014NK-16	21 Oct., 2014	<i>Glycine soja</i>	wild	長崎県, 平戸市, 生月町御崎, 大濬灯台 Oobae lighthouse, Ikitsukicho Misaki, Hirado-shi, Nagasaki	N33-26-22.87	E129-25-53.48	48	clay	bulk	2.9	growing in a grassland near Oobae lighthouse
252157	2014NK-17	21 Oct., 2014	<i>Vigna nakashimae</i>	wild	"	"	"	48	clay	bulk	2.3	growing in a grassland near Oobae lighthouse
252158	2014NK-18	21 Oct., 2014	<i>Glycine soja</i>	wild	"	N33-26-24.04	E129-25-54.31	44	clay	bulk	2.4	growing in a brownish wilted leaved grassland on a cliff havig strong salty sea breeze
252159	2014NK-19	21 Oct., 2014	<i>Vigna nakashimae</i>	wild	"	"	"	44	clay	bulk	2.5	growing in a brownish wilted leaved grassland on a cliff havig strong salty sea breeze
252160	2014NK-20	21 Oct., 2014	<i>Glycine soja</i>	wild	長崎県, 平戸市, 生月町御崎, 大濬灯台駐車場 Parking, Oobae lighthouse, Ikitsukicho Misaki, Hirado-shi, Nagasaki	N33-26-22.3	E129-25-55.4	76	clay	bulk	1.9	growing beside car parking lots at Oobae lighthouse
252161	2014NK-21	21 Oct., 2014	<i>Glycine soja</i>	wild	長崎県, 平戸市, 生月町南免, 長瀬鼻灯台 Nagasebana lighthouse, Ikitsukicho Minamimen, Hirado-shi, Nagasaki	N33-21-39.1	E129-24-00.4	100	clay	bulk	2.0	growing in a grassland in a southern area of Nagasebana lighthouse
252162	2014NK-22	21 Oct., 2014	<i>Glycine soja</i>	wild	"	"	"	"	clay	bulk	3.2	growing in a grassland in a northern area of Nagasebana lighthouse
252163	2014NK-23	21 Oct., 2014	<i>Vigna nakashimae</i>	wild	"	"	"	"	clay	bulk	2.0	growing in a grassland in a northern area of Nagasebana lighthouse
252164	2014NK-24	21 Oct., 2014	<i>Vigna nakashimae</i>	wild	"	"	"	"	clay	bulk	2.5	growing in a grassland in a southern area of Nagasebana lighthouse
252165	2014NK-25	21 Oct., 2014	<i>Vigna angularis</i> var. <i>nipponensis</i>	wild	長崎県, 平戸市, 大石脇町, 人津久海水浴場向かい側 towards Hitotsuku beach, Ooishiwakicho, Hirado-shi, Nagasaki	N33-18-01.9	E129-26-34.5	5	gravel	bulk	3.6	growing in a disturbed habitat beside car parking lots at Hitotsuku beach
252166	2014NK-26	21 Oct., 2014	<i>Vigna angularis</i> var. <i>nipponensis</i>	wild	"	"	"	"	gravel	bulk	3.6	growing in a disturbed habitat beside car parking lots at Hitotsuku beach
252167	2014NK-27	21 Oct., 2014	<i>Vigna angularis</i> var. <i>nipponensis</i>	wild	"	"	"	"	gravel	bulk	2.4	growing in a disturbed habitat beside car parking lots at Hitotsuku beach
252168	2014NK-28	21 Oct., 2014	<i>Vigna umbellata</i>	intermediate	長崎県, 平戸市, 堤町, 西浜 Nishihama beach, Tsutsumicho, Hirado-shi, Nagasaki	N33-15-00.8	E129-24-56.2	5	organic soil	bulk	5.6	growing naturally at the edge of a farmer's home garden, probably escaped from cultivation, red seeds
252169	2014NK-29	21 Oct., 2014	<i>Glycine soja</i>	wild	長崎県, 平戸市, 猪渡谷町 Itoyacho, Hirado-shi, Nagasaki	N33-15-15	E129-25-43.1	1	organic soil	bulk	2.6	growing in a gray soil grassland beside harvested paddy fields
252170	2014NK-30	22 Oct., 2014	<i>Glycine soja</i>	wild	長崎県, 島原市, 上折橋町, 運動公園入口, 駐車場脇の荒地 Kamiorihashimachi, Shimabara-shi, Nagasaki	N32-47-11.2	E130-20-09.3	170	gravel	bulk	1.9	growing in an abandoned field beside car parking, near the entrance of athletic park
252171	2014NK-31	22 Oct., 2014	<i>Vigna radiata</i>	intermediate	長崎県, 南島原市, 西有家町慈恩寺, グリーンロード Green Road, Nishiariecho Jionji, Minamishimabara-shi, Nagasaki	N32-41-06.6	E130-17-00.2	190	gravel	bulk	2.5	growing in an abandoned roadside fields, long crawling branches spreading on the ground, probably escaped from cultivation, dirty greenish seeds

Table 3 (Continued).

JP No.	Coll. No.	Coll. Date	Species name	Status	Collection Site	Latitude	Longitude	Altitude (m)	Soil	Sampling method	100 seed weight (g)	Remarks
252172	2014NK-32	22 Oct., 2014	<i>Glycine soja</i>	wild	長崎県, 南島原市, 西有家町慈恩寺, グリーンロード Green Road, Nishiariicho Jionji, Minamishimabara-shi, Nagasaki	N32-41-06.2	E130-16-58.7	190	gravel	bulk	3.0	growing in an abandoned roadside fields
252173	2014NK-33	22 Oct., 2014	<i>Vigna radiata</i>	intermediate	"	N32-41-06.45 NK-31	E130-17-00.73	173	gravel	bulk	2.6	growing in an abandoned roadside fields, long crawling branches spreading on the ground, probably escaped from cultivation, dirty greenish seeds
252174	2014NK-34	22 Oct., 2014	<i>Glycine soja</i>	wild	長崎県, 南島原市, 南有馬町甲 Minamiarimacho Kou, Minamishimabara-shi, Nagasaki	N32-36-44.3	E130-13-32.8	40	clay	bulk	2.6	growing at the edge of abandoned grassland, gray soil habitat
252175	2014NK-35	22 Oct., 2014	<i>Glycine soja</i>	wild	長崎県, 南島原市, 加津佐町丁 Kazusacho Tei, Minamishimabara-shi, Nagasaki	N32-38-34.5	E130-10-53.4	35	clay	bulk	2.3	growing in a gray soil grassland beside terrace rice paddy fields, near Uchino Ohashi (bridge)
252176	2014NK-36	22 Oct., 2014	<i>Glycine soja</i>	wild	"	N32-38-35.0	E130-10-52.8	35	clay	bulk	2.6	growing in a gray soil grassland beside terrace rice paddy fields, near Uchino Ohashi (bridge)
252177	2014NK-37	23 Oct., 2014	<i>Glycine soja</i>	wild	熊本県, 天草郡, 苓北町, 富岡 Tomiooka, Reihokumachi, Amakusa-gun, Kumamoto	N32-31-39.31	E130-1-36.96	20	clay	bulk	1.4	growing between harvested rice paddy fields and an irrigation stream
252178	2014NK-38	23 Oct., 2014	<i>Glycine soja</i>	wild	"	N32-31-39.0	E130-01-36.5	20	clay	bulk	2.6	growing between harvested rice paddy fields and an irrigation stream
252179	2014NK-39	23 Oct., 2014	<i>Glycine soja</i>	wild	"	N32-31-40.84	E130-1-29.89	35	clay	bulk	3.4	growing between harvested rice paddy fields and an irrigation stream, most of the mature pods were damaged by stink bugs
252180	2014NK-40	23 Oct., 2014	<i>Glycine soja</i>	wild	"	N32-31-41.1	E130-01-29.5	35	clay	bulk	2.6	growing between harvested rice paddy fields and an irrigation stream, most of the mature pods were damaged by stink bugs, narrow leaves
252181	2014NK-41	23 Oct., 2014	<i>Glycine soja</i>	wild	熊本県, 天草郡, 苓北町, 志岐 Shiki, Reihokumachi, Amakusa-gun, Kumamoto	N32-30-28.7	E130-02-37.9	10	clay	bulk	3.2	growing in a grassland between harvested rice paddy fields and an irrigation ditch
252182	2014NK-42	23 Oct., 2014	<i>Glycine soja</i>	wild	"	N32-30-29.5	E130-02-37.5	10	clay	bulk	2.6	growing in a grassland between harvested rice paddy fields and an irrigation ditch
252183	2014NK-43	23 Oct., 2014	<i>Glycine soja</i>	wild	"	N32-30-29.9	E130-02-38.8	10	clay	bulk	3.0	growing in a grassland between harvested rice paddy fields and an irrigation ditch
252184	2014NK-44	23 Oct., 2014	<i>Glycine soja</i>	wild	熊本県, 天草市, 天草町下田南 Amakusamachi Shimodaminami, Amakusa-shi, Kumamoto	N32-23-59.9	E130-00-22.7	3	clay	bulk	3.1	growing in a grassland along a stream beside rice paddy fields
252185	2014NK-45	23 Oct., 2014	<i>Glycine soja</i>	wild	"	N32-23-58.2	E130-00-25.3	3	clay	bulk	3.0	growing in a grassland along a stream beside rice paddy fields
252186	2014NK-46	23 Oct., 2014	<i>Vigna angularis</i> var. <i>nipponensis</i>	wild	熊本県, 天草市, 天草町, 大江 Amakusamachi Ooe, Amakusa-shi, Kumamoto	N32-19-58.5	E129-59-39.6	16	clay	bulk	2.6	growing beside abandoned paddy fields

Table 3 (Continued).

JP No.	Coll. No.	Coll. Date	Species name	Status	Collection Site	Latitude	Longitude	Altitude (m)	Soil	Sampling method	100 seed weight (g)	Remarks
252187	2014NK-47	23 Oct., 2014	<i>Vigna angularis</i> var. <i>nipponensis</i>	wild	熊本県, 天草市, 天草町, 大江 Amakusamachi Ooe, Amakusa-shi, Kumamoto	N32-19-58.9	E129-59-39.7	16	clay	bulk	2.6	growing at the edge of abandoned paddy fields
252188	2014NK-48	23 Oct., 2014	<i>Glycine soja</i>	wild	"	N32-19-58.9	E129-59-39.7	16	clay	bulk	2.1	growing at the edge of abandoned paddy fields where a lot of <i>Glycine soja</i> plants covered the area
252189	2014NK-49	23 Oct., 2014	<i>Vigna unguiculata</i>	intermediate	"	N32-19-58.9	E129-59-39.7	16	organic soil	bulk	5.6	growing in an abandoned up-land fields where plenty of <i>Vigna unguiculata</i> plants covered the area, relatively strong pod shattering
252190	2014NK-50	23 Oct., 2014	<i>Glycine soja</i>	wild	"	N32-19-58.9	E129-59-39.7	16	clay	bulk	2.6	growing at the other side of abandoned paddy fields where a lot of <i>Glycine soja</i> plants covered the area
252191	2014NK-51	23 Oct., 2014	<i>Glycine soja</i>	wild	熊本県, 天草市, 河浦町, 白木河内 Kawauramachi Shirakikawachi, Amakusa-shi, Kumamoto	N32-18-54.8	E130-04-37.4	0	gravel	bulk	3.2	growing in a grassland on the embankment between river and canal, windy place
252192	2014NK-52	23 Oct., 2014	<i>Vigna angularis</i>	intermediate	熊本県, 天草市, 久玉町, 牛深やすらぎの里入口南 south of the entrance of Ushibuka Yasuraginosato, Kutamamachi, Amakusa-shi, Kumamoto	N32-14-34.3	E130-03-08.5	70	organic soil	bulk	9.6	growing naturally in a grassland of abandoned field beside road, probably escaped from cultivation, big reddish black mottled seeds
252193	2014NK-53	23 Oct., 2014	<i>Vigna radiata</i>	intermediate	"	N32-14-34.3	E130-03-08.5	70	organic soil	bulk	2.0	growing naturally in a grassland of abandoned field beside road, probably escaped from cultivation, greenish brown seeds with highly shattering pods, stem twining to <i>Solidago altissima</i> plants
252194	2014NK-54	23 Oct., 2014	<i>Glycine soja</i>	wild	"	N32-14-34.3	E130-03-08.5	70	organic soil	bulk	3.1	growing in a grassland beside road
252195	2014NK-55	23 Oct., 2014	<i>Vigna angularis</i> var. <i>nipponensis</i>	wild	熊本県, 天草市, 牛深町, 砂月海水浴場北 North of Satsuki beach, Ushibukamachi, Amakusa-shi, Kumamoto	N32-11-01.2	E130-01-36.7	80	organic soil	bulk	3.4	growing in a road side shrubs, yellow large leaves were seen from the car
252196	2014NK-56	23 Oct., 2014	<i>Vigna angularis</i> var. <i>nipponensis</i>	wild	"	N32-11-01.2	E130-01-36.7	80	organic soil	bulk	3.4	"
252197	2014NK-57	23 Oct., 2014	<i>Glycine soja</i>	wild	熊本県, 天草市, 宮地岳町 Miyajidakemachi, Amakusa-shi, Kumamoto	N32-21-54.1	E130-07-46.9	150	clay	bulk	2.6	growing in an abandoned paddy field, most of the field was covered by <i>Glycine soja</i> plants, collected at an edge of the field
252198	2014NK-58	23 Oct., 2014	<i>Glycine soja</i>	wild	"	N32-21-54.5	E130-07-45.9	150	clay	bulk	2.6	growing in an abandoned paddy field, most of the field was covered by <i>Glycine soja</i> plants, collected at another edge of the field
252199	2014NK-59	23 Oct., 2014	<i>Vigna angularis</i> var. <i>nipponensis</i>	wild	"	N32-21-55.1	E130-07-45.5	150	clay	bulk	3.5	growing between a stream and an abandoned paddy field cover by <i>Glycine soja</i> plants
252200	2014NK-60	23 Oct., 2014	<i>Glycine soja</i>	wild	熊本県, 天草市, 亀場町食場 Kamebamachi Jikiba, Amakusa-shi, Kumamoto	N32-26-07.9	E130-10-17.7	30	clay	bulk	2.5	growing in an abandoned field beside harvested rice paddy field
252201	2014NK-61	23 Oct., 2014	<i>Glycine soja</i>	wild	"	N32-26-07.9	E130-10-18.5	30	clay	bulk	2.6	growing in an abandoned field beside harvested rice paddy field

Table 3 (Continued).

JP No.	Coll. No.	Coll. Date	Species name	Status	Collection Site	Latitude	Longitude	Altitude (m)	Soil	Sampling method	100 seed weight (g)	Remarks
252202	2014NK-62	23 Oct., 2014	<i>Vigna nakashimae</i>	wild	熊本県, 天草市, 亀場町食場 Kamebamachi Jikiba, Amakusa-shi, Kumamoto	N32-26-07.9	E130-10-17.7	30	clay	bulk	2.0	growing at the edge of harvested paddy rice field, a few plants only
252203	2014NK-63	23 Oct., 2014	<i>Glycine soja</i>	wild	熊本県, 天草市, 栖本町河内, Sumotomachi Kawachi, Amakusa-shi, Kumamoto	N32-26-10.0	E130-17-19.9	60	clay	bulk	2.4	growing in an abandoned paddy field
252204	2014NK-64	23 Oct., 2014	<i>Glycine soja</i>	wild	"	N32-26-9.9	E130-17-19.7	60	clay	bulk	2.6	growing in an abandoned paddy field
252205	2014NK-65	23 Oct., 2014	<i>Vigna angularis</i> var. <i>nipponensis</i>	wild	"	N32-27-16.6	E130-20-00.0	140	clay	bulk	4.0	growing in a grassland in a stream
252206	2014NK-66	23 Oct., 2014	<i>Glycine soja</i>	wild	"	"	"	140	clay	bulk	3.0	growing in a grassland in a stream
252207	2014NK-67	23 Oct., 2014	<i>Vigna angularis</i> var. <i>nipponensis</i>	wild	"	N32-27-17.0	E130-19-59.9	140	clay	bulk	4.2	growing in a grassland in a stream
252208	2014NK-68	23 Oct., 2014	<i>Glycine soja</i>	wild	"	"	"	140	clay	bulk	3.0	growing in a grassland in a stream
252209	2014NK-69	23 Oct., 2014	<i>Glycine soja</i>	wild	熊本県, 上天草市, 松島町教良木 Matsushimamachi Kyouragi, Kamiamakusa-shi, Kumamoto	N32-27-52.3	E130-22-40.8	30	clay	bulk	2.5	growing in an abandoned field in paddy rice area, rice plants not yet matured
252210	2014NK-70	23 Oct., 2014	<i>Glycine soja</i>	wild	"	N32-27-54.9	E130-22-42.1	30	clay	bulk	2.9	growing in an abandoned field in paddy rice area, rice plants not yet matured
252211	2014NK-71	23 Oct., 2014	<i>Vigna umbellata</i>	intermediate	"	"	"	30	clay	bulk	7.6	probably escaped from cultivation, growing in an abandoned field in paddy area, large red seeds
252212	2014NK-72	24 Oct., 2014	<i>Glycine soja</i>	wild	熊本県, 上天草市, 大矢野町中 Ooyanomachi Naka, Kamiamakusa-shi, Kumamoto	N32-34-43.6	E130-25-54.0	3	clay	bulk	3.2	growing in a wet abandoned field beside road, very wet habitat with <i>Typha latifolia</i>
252213	2014NK-73	24 Oct., 2014	<i>Glycine soja</i>	wild	"	N32-34-43.6	E130-25-54.0	3	clay	bulk	2.4	growing in a wet abandoned field beside road, very wet habitat with <i>Typha latifolia</i>
252214	2014NKB-1	23 Oct., 2014	<i>Vigna angularis</i> var. <i>nipponensis</i>	wild	熊本県, 天草市, 天草町下田北, 下田温泉, 国道 24, 下田浄化センターとなり road side (Route 24), 2 - 3 km from Town, beside Shimoda purification Center, Amakusamachi Shimodakita, Amakusa-shi, Kumamoto	N32-25-28.70	E130-1-10.39	9	gravel	bulk	2.7	growing in an open land at road side
252215	2014NKB-2	23 Oct., 2014	<i>Vigna radiata</i>	intermediate	"	N32-25-30.03	E130-1-10.42	12	gravel	bulk	1.7	two plants growing in an open land at road side, probably escaped from cultivation, dirty greenish seeds
252216	2014NKB-3	23 Oct., 2014	<i>Glycine soja</i>	wild	熊本県, 天草市, 天草町福連木, 国道 24 川 向 - 八丁間, 林道入り口, 交差点から 600 m 600 m from the crossing, Route 24, Amakusama- chi Fukuregi, Amakusa-shi, Kumamoto	N32-25-02.05	E130-4-45.83	144	gravel	bulk	3.4	twining up to the tree of 2~3 m height at road side
252217	2014NKB-4	23 Oct., 2014	<i>Glycine soja</i>	wild	熊本県, 天草市, 宮地岳町, 木場 Miyajidakemachi, Amakusa-shi, Kumamoto	N32-21-56.74	E130-7-49.89	153	clay	bulk	3.6	growing in a grassland at road side rice paddy field near the stream

Table 3 (Continued).

JP No.	Coll. No.	Coll. Date	Species name	Status	Collection Site	Latitude	Longitude	Altitude (m)	Soil	Sampling method	100 seed weight (g)	Remarks
252218	2014NKB-5	23 Oct., 2014	<i>Vigna angularis</i> var. <i>nipponensis</i>	wild	熊本県, 天草市, 宮地岳町 Miyajidakemachi, Amakusa-shi, Kumamoto	N32-21-57.07	E130-7-49.86	152	clay	bulk	2.8	growing in a grassland at road side rice paddy field near the stream
252219	2014NKB-6	23 Oct., 2014	<i>Glycine soja</i>	wild	"	N32-21-58.37	E130-7-50.46	150	clay	bulk	3.1	growing in an abandoned road side paddy field together with <i>Solidaga altissima</i> plants
252220	2014NKB-7	23 Oct., 2014	<i>Vigna radiata</i>	intermediate	熊本県, 天草市, 河浦町新合 Kawauramachi Shingou, Amakusa-shi, Kumamoto	N32-20-36.75	E130-7-19.98	2	clay	bulk	2.2	growing at the edge of road side harvested paddy, probably escaped from cultivation, black mottled brown seeds
252221	2014NKB-8	23 Oct., 2014	<i>Glycine soja</i>	wild	"	N32-20-38.77	E130-7-21.45	52	clay	bulk	3.1	growing at road side abandoned paddy field
252222	2014NKB-9	23 Oct., 2014	<i>Glycine soja</i>	wild	熊本県, 天草市, 河浦町, 白木河内 Kawauramachi Shirakikawachi, Amakusa-shi, Kumamoto	N32-18-50.46	E130-5-39.52	17	clay	bulk	2.6	growing in an abandoned paddy field
252223	2014NKB-10	23 Oct., 2014	<i>Vigna angularis</i> var. <i>nipponensis</i>	wild	熊本県, 天草市, 河浦町, 宮野河内 Kawauramachi Miyanakawachi, Amakusa-shi, Kumamoto	N32-18-46.69	E130-8-09.13	11	clay	bulk	3.0	growing in a river side alluvial waste land
252224	2014NKB-11	23 Oct., 2014	<i>Glycine soja</i>	wild	熊本県, 天草市, 河浦町, 宮野河内, 国道 26, 西豪根より北側 800m, 800 m N from Nishihorine, Route 26, Kawauramachi Miyanakawachi, Amakusa-shi, Kumamoto	N32-18-42.20	E130-8-39.24	14	gravel	bulk	2.9	growing in an open land at road side
252225	2014NKB-12	23 Oct., 2014	<i>Glycine soja</i>	wild	熊本県, 天草市, 新和町大宮地, 県道 26 Route 26, Shinwamachi Oomiyaji, Amakusa-shi, Kumamoto	N32-23-04.65	E130-11-34.98	8	clay	bulk	2.1	growing along a stream beside paddy fields
252226	2014NKB-13	23 Oct., 2014	<i>Vigna unguiculata</i>	intermediate	熊本県, 天草市, 本町下河内, 県道 47 号沿い, 44 号との分岐近く along Route 47, near the divergence of Route 44, Honmachi Shimogawachi, Amakusa-shi, Kumamoto	N32-28-22.82	E130-10-00.16	25	organic soil	bulk	6.6	growing in an abandoned upland field, probably escaped from cultivation, whitish seeds
252227	2014NKB-14	23 Oct., 2014	<i>Glycine soja</i>	wild	熊本県, 天草市, 五和町手野 Itsuwamachi Teno, Amakusa-shi, Kumamoto	N32-30-39.88	E130-8-57.61	15	gravel	bulk	2.9	growing in a waste land beside paddy rice field
252228	2014NKB-15	23 Oct., 2014	<i>Vigna radiata</i>	intermediate	熊本県, 天草市, 志柿町, 国道 266, 本渡港より南 2km Route 266, 2km South from Hond port, Shikakimachi, Amakusa-shi, Kumamoto	N32-26-30.17	E130-12-24.88	8	organic soil	bulk	2.0	growing naturally on the slope of embankment beside road, probably escaped from cultivation, dirty greenish seeds
252229	2014NKB-16	23 Oct., 2014	<i>Glycine soja</i>	wild	熊本県, 天草市, 下浦町, 国道 266 沿い, 湯貫川河口すぐ near the mouth of Yunukigawa-river, Route 266, Shimouramachi, Amakusa-shi, Kumamoto	N32-25-45.94	E130-13-07.46	6	clay	bulk	2.5	growing in a roadside grassland beside a stream
252230	2014NKB-17	23 Oct., 2014	<i>Glycine soja</i>	wild	熊本県, 天草市, 栖本町馬場 Sumotomachi Baba, Amakusa-shi, Kumamoto	N32-23-48.53	E130-15-18.99	10	gravel	bulk	2.4	growing in an abandoned field



Photo 1. Habitat of *V. angularis* var. *nipponensis* (NK-1), Ogita, Hirado, Nagasaki



Photo 2. Habitat of *G. soja* (NK-2), Ookubo, Hirado, Nagasaki



Photo 3. Round leaflet of *G. soja* (NK-2), Ookubo, Hirado, Nagasaki



Photo 4. Habitat of *V. angularis* var. *nipponensis* (NK-3), Ookubo, Hirado, Nagasaki



Photo 5. Pod of *V. nakashimae* (NK-4), Tabira, Hirado, Nagasaki



Photo 6. Habitat of *V. angularis* var. *nipponensis* (NK-7 & 8), Kohiki, Hirado, Nagasaki



Photo 7. Plants of *V. angularis* var. *nipponensis* (NK-7), Kohiki, Hirado, Nagasaki



Photo 8. Plants of *V. angularis* var. *nipponensis* (NK-9), Yamada, Ikitsuki, Hirado, Nagasaki



Photo 9. Plants of *V. angularis* var. *nipponensis* (NK12) and *G. soja* (NK-13), Sato, Ikitsuki, Hirado, Nagasaki



Photo 10. Pods of *G. soja* (NK-18), Oobae, Ikitsuki, Hirado, Nagasaki



Photo 11. Habitat of *G. soja* (NK-18) and *V. nakashimae* (NK-19), Oobae, Ikitsuki, Hirado, Nagasaki



Photo 12. Habitat of *G. soja* (NK-21) and *V. nakashimae* (NK-24), Nagasebana, Ikitsuki, Hirado, Nagasaki



Photo 13. Plants of *V. umbellata* (NK-28), Nishihama, Hirado, Nagasaki



Photo 14. Habitat of *G. soja* (NK-30), Kamiorihashi, Shimabara, Nagasaki



Photo 15. Habitat of *G. soja* (NK-32) and *V. radiata* (NK-31 & 33), Nishiariie, Minamishimabara, Nagasaki



Photo 16. Pods of *V. radiata* (NK-33), Nishiariie, Minamishimabara, Nagasaki



Photo 17. Habitat of *G. soja* (NK-39 & 40), Tomioka, Reihoku, Kumamoto



Photo 18. Habitat of *G. soja* (NK-41, 42 & 43), Shiki, Reihoku, Kumamoto



Photo 19. Habitat of *G. soja* (NK-48), Ooe, Amakusa, Kumamoto



Photo 20. Habitat of *V. unguiculata* (NK-49), Ooe, Amakusa, Kumamoto



Photo 21. Habitat of *G. soja* (NK-51). Shirakikawachi, Amakusa, Kumamoto



Photo 22. Habitat of *V. radiata* (NK-53), Kutama, Amakusa, Kumamoto



Photo 23. Habitat of *V. angularis* var. *nipponensis* (NK-55 & 56), Ushibuka, Amakusa, Kumamoto

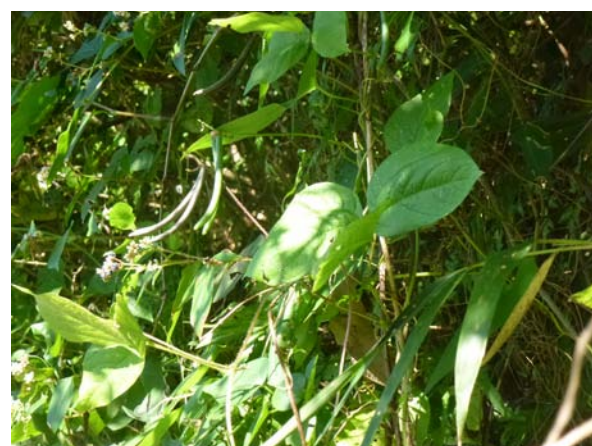


Photo 24. Plants of *V. angularis* var. *nipponensis* (NK-55), Ushibuka, Amakusa, Kumamoto



Photo 25. Habitat of *G. soja* (NK-57 & 58), Miyajidake, Amakusa, Kumamoto



Photo 26. Plants of *V. nakashimae* (NK-62), Kameba, Amakusa, Kumamoto



Photo 27. Habitat of *V. nakashimae* (NK-62), Kameba, Amakusa, Kumamoto



Photo 28. Habitat of *G. soja* (NK-66 & 68) and *V. angularis* var. *nipponensis* (NK-65 & 67), Sumoto, Amakusa, Kumamoto



Photo 29. Pods of *G. soja* (NK-66), Sumoto, Amakusa, Kumamoto



Photo 30. Habitat of *G. soja* (NK-70) and *V. umbellata* (NK-71), Matsuura, Amakusa, Kumamoto



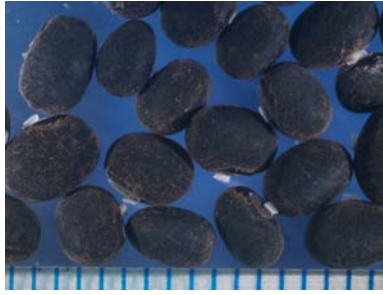
Photo 31. Pods of *G. soja* (NK-70) and *V. umbellata* (NK-71), Matsuura, Amakusa, Kumamoto



Photo 32. Habitat of *G. soja* (NK-72 & 73), Ooyano, Kamiamakusa, Kumamoto



NK-1, JP252141, *Vigna angularis* var. *nipponensis*



NK-2, JP252142, *Glycine soja*



NK-3, JP252143, *Vigna angularis* var. *nipponensis*



NK-4, JP252144, *Vigna nakashimae*



NK-5, JP252145, *Glycine soja*



NK-6, JP252146, *Glycine soja*



NK-7, JP252147, *Vigna angularis* var. *nipponensis*



NK-8, JP252148, *Vigna angularis* var. *nipponensis*



NK-9, JP252149, *Vigna angularis* var. *nipponensis*



NK-10, JP252150, *Vigna angularis* var. *nipponensis*



NK-11, JP252151, *Vigna angularis*



NK-12-1, JP252152, *Vigna angularis* var. *nipponensis*



NK-12-2, JP253824, *Vigna angularis*



NK-13, JP252153, *Glycine soja*



NK-14, JP252154, *Glycine soja*



NK-15, JP252155, *Vigna angularis* var. *nipponensis*



NK-16, JP252156, *Glycine soja*



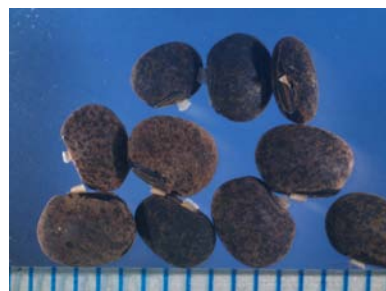
NK-17, JP252157, *Vigna nakashimae*



NK-18, JP252158, *Glycine soja*



NK-19, JP252159, *Vigna nakashimae*



NK-20, JP252160, *Glycine soja*



NK-21, JP252161, *Glycine soja*



NK-22, JP252162, *Glycine soja*



NK-23, JP252163, *Vigna nakashimae*



NK-24, JP252164, *Vigna nakashimae*



NK-25, 252165, *Vigna angularis* var. *nipponensis*



NK-26, 252166, *Vigna angularis* var. *nipponensis*



NK-27, JP252167, *Vigna angularis* var. *nipponensis*



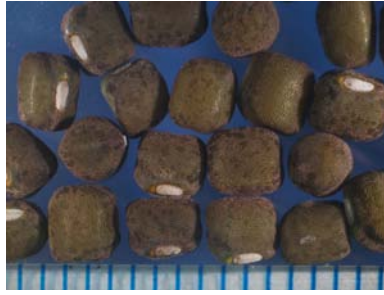
NK-28, JP252168, *Vigna umbellata*



NK-29, JP252169, *Glycine soja*



**NK-30, JP252170,
*Glycine soja***



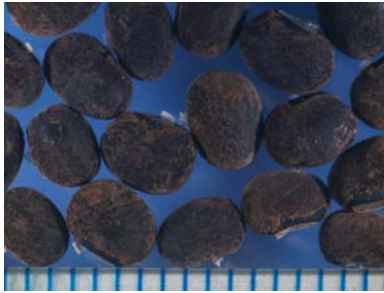
**NK-31, JP252171,
*Vigna radiata***



**NK-32, JP252172,
*Glycine soja***



**NK-33, JP252173,
*Vigna radiata***



**NK-34, JP252174,
*Glycine soja***



**NK-35, JP252175,
*Glycine soja***



**NK-36, JP252176,
*Glycine soja***



**NK-37, JP252177,
*Glycine soja***



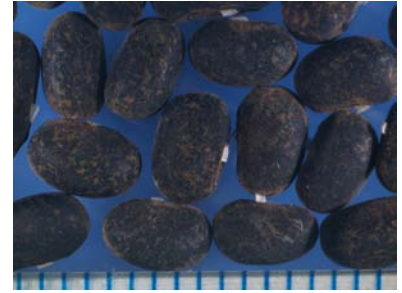
**NK-38, JP252178,
*Glycine soja***



**NK-39, JP252179,
*Glycine soja***



**NK-40, JP252180,
*Glycine soja***



**NK-41, JP252181,
*Glycine soja***



**NK-42, JP252182,
*Glycine soja***



**NK-43, JP252183,
*Glycine soja***



**NK-44, JP252184,
*Glycine soja***



**NK-45, JP252185,
*Glycine soja***



**NK-46, JP252186, *Vigna
angularis* var. *nipponensis***



**NK-47, JP252187, *Vigna
angularis* var. *nipponensis***



**NK-48, JP252188,
*Glycine soja***



**NK-49, JP252189,
*Vigna unguiculata***



**NK-50, JP252190,
*Glycine soja***



**NK-51, JP252191,
*Glycine soja***



**NK-52, JP252192,
*Vigna angularis***



**NK-53, JP252193,
*Vigna radiata***



**NK-54, JP252194,
*Glycine soja***



**NK-55, JP252195, *Vigna
angularis* var. *nipponensis***



**NK-56, JP252196, *Vigna
angularis* var. *nipponensis***



**NK-57, JP252197,
*Glycine soja***



**NK-58, JP252198,
*Glycine soja***



**NK-59, JP252199, *Vigna
angularis* var. *nipponensis***



**NK-60, JP252200,
*Glycine soja***



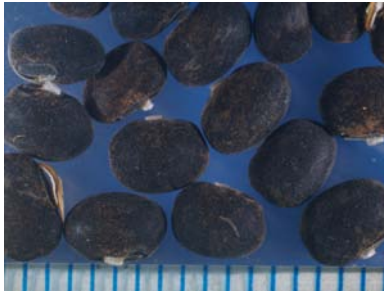
**NK-61, JP252201,
*Glycine soja***



**NK-62, JP252202,
*Vigna nakashimae***



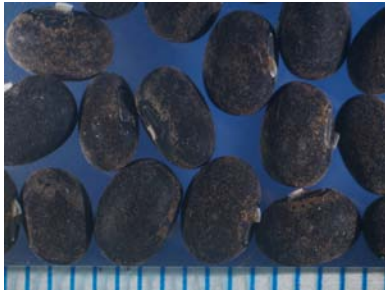
**NK-63, JP252203,
*Glycine soja***



**NK-64, JP252204,
*Glycine soja***



**NK-65, JP252205, *Vigna
angularis* var. *nipponensis***



**NK-66, JP252206,
*Glycine soja***



**NK-67, JP252207, *Vigna
angularis* var. *nipponensis***



**NK-68, JP252208,
*Glycine soja***



**NK-69, JP252209,
*Glycine soja***



**NK-70, JP252210,
*Glycine soja***



**NK-71, JP252211,
*Vigna umbellata***



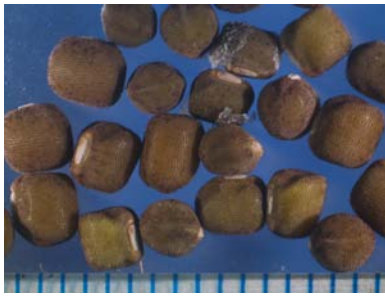
**NK-72, JP252212,
*Glycine soja***



**NK-73, JP252213,
*Glycine soja***



**NKB-1, JP252214, *Vigna
angularis* var. *nipponensis***



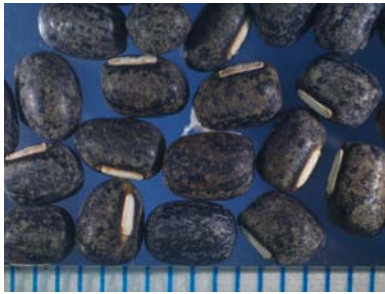
**NKB-2, JP252215,
*Vigna radiata***



**NKB-3, JP252216,
*Glycine soja***



**NKB-4, JP252217,
*Glycine soja***



**NKB-5, JP252218, *Vigna
angularis var. nipponensis***



**NKB-6, JP252219,
*Glycine soja***



**NKB-7, JP252220,
*Vigna radiata***



**NKB-8, JP252221,
*Glycine soja***



**NKB-9, JP252222,
*Glycine soja***



**NKB-10, JP252223, *Vigna
angularis var. nipponensis***



**NKB-11, JP252224,
*Glycine soja***



**NKB-12, JP252225,
*Glycine soja***



**NKB-13, JP252226,
*Vigna unguiculata***



**NKB-14, JP252227,
*Glycine soja***



**NKB-15, JP252228,
*Vigna radiata***



**NKB-16, JP252229,
*Glycine soja***



NKB-17, JP252230,
Glycine soja