

# Exploration and Collection for Wild Relatives of Leguminous Crops in Tokyo, Saitama and Yamanashi Prefectures, Japan 16<sup>th</sup> -18<sup>th</sup> October 2012

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## Summary

A field survey was conducted in Tokyo, Saitama and Yamanashi, Japan, from 16<sup>th</sup> to 18<sup>th</sup> October, 2012. The main focus of the mission was to collect wild azuki beans (*Vigna angularis*). The resulting collection consisted of 28 azuki accessions (24 sites) including one weedy azuki accession, and 9 wild soybean accessions (9 sites). Particularly interesting fact was that the relative abundance of wild azuki was found so close to Tokyo and nearby urban centers. Wild soybean was not found as frequently as wild azuki. All the accessions collected were conserved at the NIAS genebank, Japan. These accessions will be grown and evaluated in 2013 and will become available for research, breeding and educational purposes.

KEY WORDS : Tokyo, *Vigna*, *Glycine*, wild crop relatives

## Introduction

Collecting wild crop relatives previously focused on areas far from urban centers. Therefore, until now, there had been a few efforts to seek relatives of wild azuki in and around the Tokyo area. Former explorations for collecting wild *Glycine* and *Vigna* germplasm were summarized in Appendix 1 and 2 of “*Glycine* Genetic Resources” in the proceedings of the 14<sup>th</sup> NIAS international workshop (Vaughan *et al.*, 2010).

Trip itinerary is summarized in Table 1. At each collection site, seeds from matured pods were collected from several plants and were conserved as one accession.

## Results and Discussions

A total of 37 accessions consisting of 27 wild azuki bean, 1 weedy azuki bean and 9 wild

Table 1. Itinerary of the field survey in Saitama, Tokyo, Yamanashi, Japan  
日程表 (埼玉・東京・山梨)

| Date       | Itinerary  | Stay                     |
|------------|--|--------------------------|
| 2012/10/16 | Tsukuba -- Saitama prefecture (EXPLORATION) -- Hinohara village, Tokyo                 | Hinohara village (Tokyo) |
| 2012/10/17 | Hinohara village, Tokyo (EXPLORATION) -- Akiruno city, Tokyo (EXPLORATION)             | Hinohara village (Tokyo) |
| 2012/10/18 | Hinohara village, Tokyo (EXPLORATION) -- Yamanashi prefecture (EXPLORATION) -- Tsukuba |                          |

soybean was collected (Table 2). Collection site for each accession is plotted in a map (Fig. 1). Pod length and number of seeds per pod for each accession were measured for well grown pods without pest and/or disease damage (Table 3). Detailed passport information is listed in Table 4.

#### Day 1. (October 16, 2012, Saitama)

The first site visited was in a nature reserve that was part of a large flood plain park beside the river Arakawa (Photos 1 & 2, site 1a). The nature reserve was surrounded by a wire netting fence. Wild azuki and wild soybean were growing at the edge of the site. Wild azuki bean population was also found in an adjacent area and plants here had variation in pod color (Photos 3 & 4, site 1b).

Other sites where wild azuki bean was growing were smaller than the first site and in a variety of disturbed open sites (Photos 5 & 6). One large population was found beneath a bridge over a river (Photo 7, site 5). In the evening of the first day, we found a site in the northwest of Saitama where both wild azuki bean and wild soybean were growing (Photo 8, site 10).

A characteristic of the first day was that wild azuki bean seems to be more common (11 accessions collected) than wild soybean (2 accessions collected) in the areas of Saitama visited. However, based on the experience of the first author from previous explorations, the two species usually grow in a similar environmental condition, and wild soybean was often more common.

#### Day 2 (October 17, 2012, Tokyo)

Collections made on the first day were all at low elevation (<160 m). On the second day, the team explored Hinohara village and collecting sites ranged from 180 to 285 m. Two sites visited were community recreation/nature reserve sites where wild azuki bean was growing (Photo 9, sites 13 & 15). An accession collected at one site in an irrigation ditch seems to represent naturally growing escaped azuki bean population or weedy azuki bean population derived from natural hybridization between cultivated and wild azuki bean as the seeds were large and red in color (Photo 10, seed photo JP247266, site 14).

In addition to the natural sites where wild azuki bean grows, the collecting team visited the mountain-side field where one of the author, Sakaeda has been growing wild azuki bean (Photo 11). The wild azuki bean seeds were harvested for use in various dishes (Photo 12).

Table 2. A summary of collected samples in Saitama, Tokyo, Yamanashi, Japan  
 埼玉・東京・山梨における収集品の内訳

| Species                | Number of collected accessions |       |      | Total |
|------------------------|--------------------------------|-------|------|-------|
|                        | Cultivated                     | Weedy | Wild |       |
| <i>Vigna angularis</i> |                                | 1     | 27   | 28    |
| <i>Glycine soja</i>    |                                |       | 9    | 9     |
| Total                  |                                | 1     | 36   | 37    |

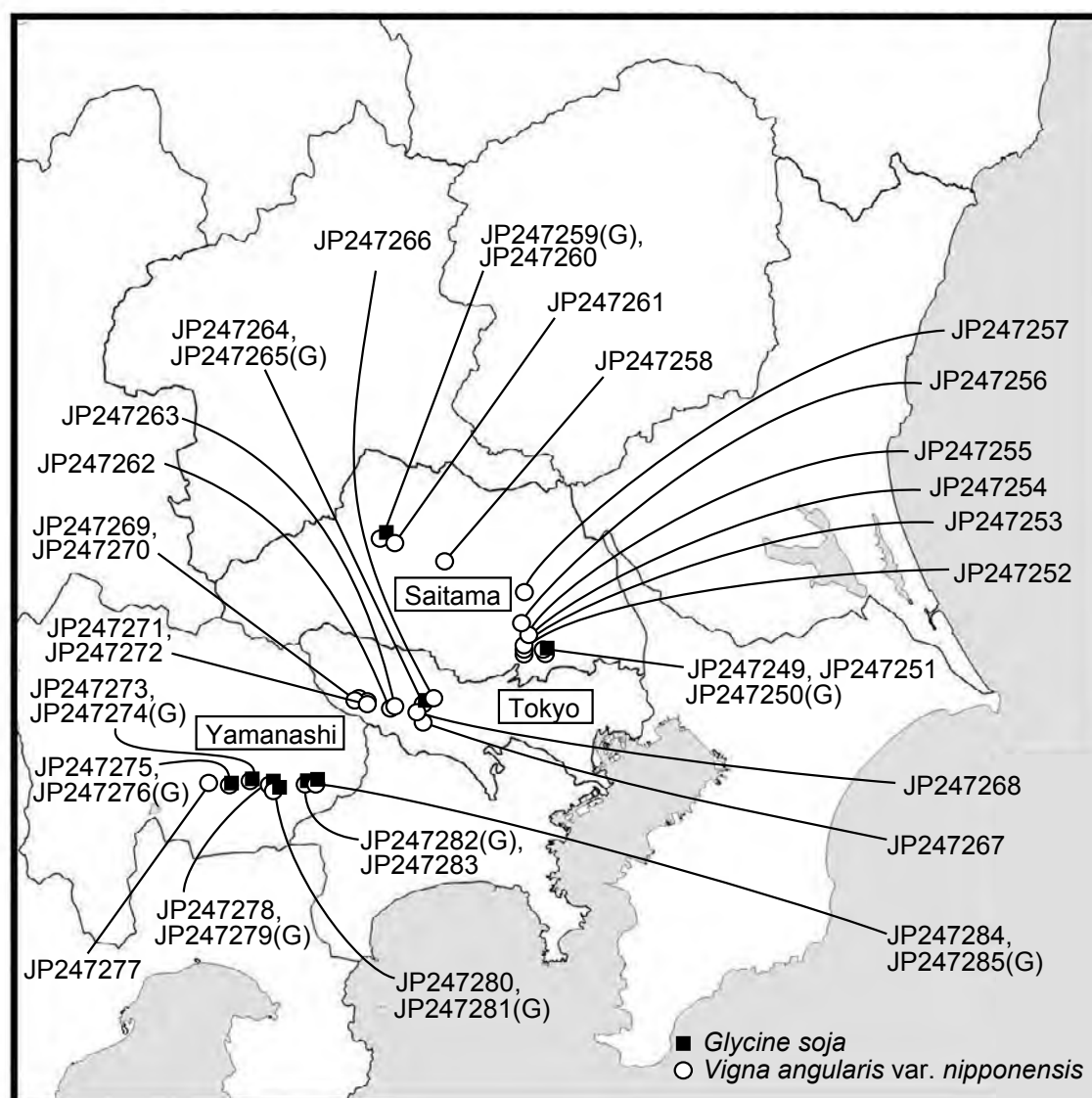


Fig. 1. A map showing collection site of *Glycine soja* (■) and *Vigna angularis* (○).  
 Collection site of *Glycine soja* was indicated with (G) after each JP number.

### Day 3 (October 18, 2012, Tokyo and Yamanashi)

On the third day, all but the first two sites visited were in Yamanashi prefecture. All the sites were at a considerably higher altitude than the previous two days, ranging from 484 m to 698 m. At site 19 (alt. 510 m) in Yamanashi, two accessions of wild azuki bean were collected (Photos 13 & 14). Both wild azuki bean and wild soybean were found at sites 20 (Photo 15), 21, 23, 24 (Photo 16) and 25.

In all the populations of wild azuki bean, seeds were mottled black in color. However, seed size of wild azuki bean varied greatly. For example, seeds of JP247284 were about twice as large as seeds of JP247278 and JP247280. In addition, some azuki bean accessions such as JP247275 had considerable variation in seed size within the accession. These differences in seed size might reflect introgression in the past.

*Glycine soja* was collected at 9 sites and no special variation was observed in accessions of this species, although within accession seed size varied considerably.

From this mission, a great deal of new information was gathered on the geographic distribution of wild azuki bean and wild soybean. All the accessions collected are conserved at the NIAS genebank, Japan. These accessions will be grown and evaluated in 2013 and will become available for research, breeding and educational purposes.

### References

Vaughan D.A., Tomooka N., Kaga A., Isemura T. and Kuroda Y. 2010. *Glycine* Genetic Resources. In Proceedings of the 14<sup>th</sup> NIAS International Workshop on Genetic Resources “Genetics and Comparative Genomics of Legumes (*Glycine* and *Vigna*)”.

[http://www.gene.affrc.go.jp/pdf/misc/international-WS\\_14\\_1.pdf](http://www.gene.affrc.go.jp/pdf/misc/international-WS_14_1.pdf)

# 東京都，埼玉県，山梨県におけるマメ科作物近縁野生種の 探索収集，2012年

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## 和文摘要

本報告は、東京都、埼玉県、山梨県におけるマメ科作物近縁野生植物遺伝資源の調査報告である。これらの地域は、大都市圏に近接するため、近縁野生種の生育地が少ないと思われており、これまでほとんど調査が行われていなかった。著者の一人である東京都檜原村在住の酒枝は、これらの地域で独自に調査を実施し、多くの野生アズキ自生地を特定・収集してきた。この自生地情報に基づいて、2012年10月16日～18日にかけて調査を行った。調査の結果、野生アズキであるヤブツルアズキ (*Vigna angularis* var. *nipponensis*) 27点、栽培からの逸出かと思われる雑草アズキ1点、野生ダイズであるツルマメ (*Glycine soja*) 9点、合計37点の植物遺伝資源を新たに収集・保存した。これらの遺伝資源は、2013年度につくば市の農業生物資源研究所において栽培し、特性評価、種子増殖を行い配布可能なアクティブコレクションとして生物研ジーンバンクにおいて保存する計画である。

Table 3. Pod length and number of seeds per pod

| JP No. | Coll. No.    | Species name           | Pod length (cm) |      |      |     |     |              | Number of seeds per pod |    |    |    |    |                 |
|--------|--------------|------------------------|-----------------|------|------|-----|-----|--------------|-------------------------|----|----|----|----|-----------------|
|        |              |                        | 1               | 2    | 3    | 4   | 5   | Average (cm) | 1                       | 2  | 3  | 4  | 5  | Average (seeds) |
| 247249 | 2012STY-1    | <i>Vigna angularis</i> | 7.0             | 7.5  | 6.8  | 7.0 | 6.5 | 7.0          | 11                      | 10 | 11 | 11 | 10 | 10.6            |
| 247250 | 2012STY-2    | <i>Glycine soja</i>    | 3.0             | 3.0  | 2.9  | 2.8 | 3.0 | 2.9          | 3                       | 3  | 3  | 3  | 3  | 3.0             |
| 247251 | 2012STY-4    | <i>Vigna angularis</i> | 6.5             | 5.6  | 7.0  | 6.3 | 6.6 | 6.4          | 10                      | 10 | 10 | 8  | 9  | 9.4             |
| 247252 | 2012STY-5    | <i>Vigna angularis</i> | 7.0             | 6.6  | 6.8  | 6.9 | 6.7 | 6.8          | 10                      | 11 | 11 | 11 | 11 | 10.8            |
| 247253 | 2012STY-6    | <i>Vigna angularis</i> | 5.7             | 5.5  | 6.2  | 6.2 | 5.2 | 5.8          | 9                       | 9  | 11 | 8  | 9  | 9.2             |
| 247254 | 2012STY-7    | <i>Vigna angularis</i> | 6.8             | 6.8  | 6.5  | 6.3 | 6.0 | 6.5          | 10                      | 11 | 11 | 12 | 10 | 10.8            |
| 247255 | 2012STY-8    | <i>Vigna angularis</i> | 6.7             | 7.5  | 6.8  | 6.7 | 6.3 | 6.8          | 12                      | 12 | 11 | 11 | 12 | 11.6            |
| 247256 | 2012STY-9    | <i>Vigna angularis</i> | 6.4             | 6.3  | 6.2  | 6.7 | 7.0 | 6.5          | 10                      | 11 | 10 | 10 | 10 | 10.2            |
| 247257 | 2012STY-10   | <i>Vigna angularis</i> | 6.2             |      |      |     |     | 6.2          | 10                      |    |    |    |    | 10.0            |
| 247258 | 2012STY-11   | <i>Vigna angularis</i> | 6.4             | 5.9  | 7.0  | 6.6 | 5.7 | 6.3          | 8                       | 9  | 10 | 10 | 9  | 9.2             |
| 247259 | 2012STY-12   | <i>Glycine soja</i>    | 2.6             | 2.6  | 3.0  | 2.7 | 2.6 | 2.7          | 3                       | 3  | 3  | 3  | 3  | 3.0             |
| 247260 | 2012STY-13   | <i>Vigna angularis</i> | 8.4             | 9.2  | 8.2  | 8.3 | 8.0 | 8.4          | 13                      | 12 | 10 | 11 | 11 | 11.4            |
| 247261 | 2012STY-14   | <i>Vigna angularis</i> | 7.2             | 8.5  | 8.6  | 7.3 | 8.1 | 7.9          | 9                       | 11 | 11 | 11 | 9  | 10.2            |
| 247262 | 2012STY-15   | <i>Vigna angularis</i> | 7.3             | 6.7  | 7.3  | 7.6 | 6.5 | 7.1          | 12                      | 11 | 12 | 10 | 9  | 10.8            |
| 247263 | 2012STY-16   | <i>Vigna angularis</i> | 7.5             | 6.6  | 7.4  | 6.8 | 7.6 | 7.2          | 10                      | 10 | 11 | 10 | 13 | 10.8            |
| 247264 | 2012STY-17   | <i>Vigna angularis</i> | 7.5             | 7.5  | 7.2  | 8.1 | 7.0 | 7.5          | 12                      | 11 | 11 | 12 | 11 | 11.4            |
| 247265 | 2012STY-18   | <i>Glycine soja</i>    | 2.7             | 2.8  | 2.8  | 2.5 | 2.5 | 2.7          | 3                       | 3  | 3  | 3  | 3  | 3.0             |
| 247266 | 2012STY-19   | <i>Vigna angularis</i> | 9.4             | 10.6 | 10.4 | 8.5 | 9.0 | 9.6          | 13                      | 12 | 11 | 10 | 9  | 11.0            |
| 247267 | 2012STY-20   | <i>Vigna angularis</i> | 6.4             | 6.6  | 6.3  | 6.5 | 7.3 | 6.6          | 11                      | 11 | 11 | 10 | 9  | 10.4            |
| 247268 | 2012STY-21   | <i>Vigna angularis</i> | 8.4             | 7.4  | 8.1  | 8.5 | 6.6 | 7.8          | 9                       | 11 | 11 | 11 | 11 | 10.6            |
| 247269 | 2012STY-24-1 | <i>Vigna angularis</i> | 7.9             | 7.4  | 7.0  | 7.5 | 7.0 | 7.4          | 9                       | 10 | 9  | 10 | 11 | 9.8             |
| 247270 | 2012STY-24-2 | <i>Vigna angularis</i> | 7.1             | 8.5  | 8.0  | 8.2 | 7.5 | 7.9          | 9                       | 10 | 9  | 10 | 10 | 9.6             |
| 247271 | 2012STY-25-1 | <i>Vigna angularis</i> | 8.7             | 8.6  | 7.9  | 9.2 |     | 8.6          | 10                      | 10 | 10 | 9  |    | 9.8             |
| 247272 | 2012STY-25-2 | <i>Vigna angularis</i> | 6.8             | 6.4  |      |     |     | 6.6          | 10                      | 9  |    |    |    | 9.5             |
| 247273 | 2012STY-26-1 | <i>Vigna angularis</i> | 7.0             | 7.1  | 6.5  | 7.0 | 6.1 | 6.7          | 9                       | 10 | 10 | 9  | 10 | 9.6             |
| 247274 | 2012STY-26-2 | <i>Glycine soja</i>    | 2.7             | 2.6  | 3.4  | 2.6 | 2.6 | 2.8          | 3                       | 3  | 3  | 3  | 3  | 3.0             |
| 247275 | 2012STY-27-1 | <i>Vigna angularis</i> | 8.6             | 7.7  | 6.8  | 6.2 | 7.1 | 7.3          | 11                      | 10 | 11 | 12 | 12 | 11.2            |
| 247276 | 2012STY-27-2 | <i>Glycine soja</i>    | 2.5             | 2.5  | 2.7  | 2.5 | 2.5 | 2.5          | 3                       | 3  | 3  | 3  | 3  | 3.0             |
| 247277 | 2012STY-28   | <i>Vigna angularis</i> | 6.2             | 6.1  | 5.7  | 6.0 | 6.6 | 6.1          | 9                       | 10 | 10 | 8  | 9  | 9.2             |
| 247278 | 2012STY-29-1 | <i>Vigna angularis</i> | 7.2             | 6.4  | 6.2  | 6.3 | 7.2 | 6.7          | 12                      | 11 | 12 | 11 | 11 | 11.4            |
| 247279 | 2012STY-29-2 | <i>Glycine soja</i>    | 2.5             | 2.5  | 2.7  | 2.6 | 2.7 | 2.6          | 3                       | 3  | 3  | 3  | 3  | 3.0             |
| 247280 | 2012STY-29-3 | <i>Vigna angularis</i> | 6.7             | 5.9  | 6.0  | 5.7 | 5.8 | 6.0          | 10                      | 10 | 11 | 12 | 11 | 10.8            |
| 247281 | 2012STY-29-4 | <i>Glycine soja</i>    | 3.0             | 2.7  | 3.0  | 2.9 | 2.5 | 2.8          | 3                       | 3  | 3  | 3  | 3  | 3.0             |
| 247282 | 2012STY-30-1 | <i>Glycine soja</i>    | 3.2             | 2.7  | 2.7  | 2.6 | 3.0 | 2.8          | 3                       | 3  | 3  | 3  | 3  | 3.0             |
| 247283 | 2012STY-30-2 | <i>Vigna angularis</i> | 7.4             | 6.8  | 6.7  | 7.0 | 7.0 | 7.0          | 10                      | 10 | 11 | 10 | 9  | 10.0            |
| 247284 | 2012STY-31-1 | <i>Vigna angularis</i> | 7.5             | 7.6  | 8.4  | 7.1 | 8.0 | 7.7          | 8                       | 10 | 11 | 10 | 9  | 9.6             |
| 247285 | 2012STY-31-2 | <i>Glycine soja</i>    | 2.5             | 2.4  | 2.5  | 3.2 | 2.5 | 2.6          | 3                       | 3  | 3  | 3  | 3  | 3.0             |

\* Measurements were conducted for well grown pods without pest and/or disease damages

Table 4. A passport data of collected samples in Saitama, Tokyo, Yamanashi, Japan.

(埼玉県, 東京都, 山梨県における収集品のパスポートデータ)

| JP No. | Coll. No.<br>(Site No.)     | Coll. Date   | Species name           | Status | Coll. Site  | Latitude     | Longitude    | Altitude<br>(m) | Soil | Seed | Herbarium | Nodule | Remarks   |
|--------|-----------------------------|--------------|------------------------|--------|---|--------------|--------------|-----------------|------|------|-----------|--------|---|
| 247249 | 2012STY-1<br>(Site No. 1a)  | 16 Oct. 2012 | <i>Vigna angularis</i> | wild   | Sakuraso-Park, beside Arakawa river, Tajima, Sakura-ku, Saitama city, Saitama Pref.               | N35-50-17.7  | E139-36-51.3 | 7               | clay | bulk | yes       | no     | slope 0° , pod color variable (black, tan), seeds seems to be same color.   |
| 247250 | 2012STY-2<br>(Site No. 1a)  | 16 Oct. 2012 | <i>Glycine soja</i>    | wild   | "   | "            | "            | "               | clay | bulk | yes       | no     | slope 0°  |
| 247251 | 2012STY-4<br>(Site No. 1b)  | 16 Oct. 2012 | <i>Vigna angularis</i> | wild   | roadside beside Sakuraso-Park, near Arakawa river, Tajima, Sakura-ku, Saitama city, Saitama Pref. | N 35-50-14.3 | E139-36-43.1 | 10              | clay | bulk | no        | no     | black pods and tan pods mixed   |
| 247252 | 2012STY-5<br>(Site No. 2)   | 16 Oct. 2012 | <i>Vigna angularis</i> | wild   | in front of Donguriyama-Park, Mizuko, Fujimi city, Saitama Pref.                                  | N35-50-14.1  | E139-33-46.3 | 10              | clay | bulk | no        | no     | slope 0° , beside upland field  |
| 247253 | 2012STY-6<br>(Site No. 3)   | 16 Oct. 2012 | <i>Vigna angularis</i> | wild   | behind Fujimi-Sogo Hospital, Tsuruma, Fujimi city, Saitama Pref.                                  | N 35-51-20.8 | E139-33-05.4 | 9               | clay | bulk | yes       | no     | pale brown seeds  |
| 247254 | 2012STY-7<br>(Site No. 4)   | 16 Oct. 2012 | <i>Vigna angularis</i> | wild   | Minamihata, Fujimi city, Saitama Pref.  | N35-51-7.231 | E139-33-11.6 | 11              | clay | bulk | no        | no     | climbing on the fence beside a canal  |
| 247255 | 2012STY-8<br>(Site No. 5)   | 16 Oct. 2012 | <i>Vigna angularis</i> | wild   | beside Memorial Garden, Higashi Ookubo, Fujimi city, Saitama Pref.                                | N35-52-18.6  | E139-33-44.2 | 8               | clay | bulk | no        | no     | slope 5° , bank along a river   |
| 247256 | 2012STY-9<br>(Site No. 6)   | 16 Oct. 2012 | <i>Vigna angularis</i> | wild   | Furuyahongo, Kawagoe city, Saitama Pref.  | N 35-54-14.6 | E139-32-44.1 | 16              | clay | bulk | no        | no     | beside the railroad (JR Kawagoe line)   |
| 247257 | 2012STY-10<br>(Site No. 7)  | 16 Oct. 2012 | <i>Vigna angularis</i> | wild   | North side of the Maruyama-Park, Hirakata, Ageo city, Saitama Pref.                               | N35-57-12.6  | E139-32-47.0 | 18              | clay | bulk | no        | no     | slope 20°   |
| 247258 | 2012STY-11<br>(Site No. 8)  | 16 Oct. 2012 | <i>Vigna angularis</i> | wild   | Shimogarako, Higashimatsuyama city, Saitama Pref.   | N36-00-56.2  | E139-22-18.2 | 25              | clay | bulk | yes       | no     | slope 0° , around paddy fields (after harvested) near the TAKASAKA Golf practice field  |
| 247259 | 2012STY-12<br>(Site No. 9)  | 16 Oct. 2012 | <i>Glycine soja</i>    | wild   | Kiroko, Hikigun Ogawa town, Saitama Pref.   | N36-05-05.2  | E139-12-46.9 | 152             | clay | bulk | no        | no     | abandoned field beside the railroad   |
| 247260 | 2012STY-13<br>(Site No. 9)  | 16 Oct. 2012 | <i>Vigna angularis</i> | wild   | "   | "            | "            | "               | clay | bulk | no        | no     | tan pod, shiny black seeds  |
| 247261 | 2012STY-14<br>(Site No. 10) | 16 Oct. 2012 | <i>Vigna angularis</i> | wild   | Kiroko, Hikigun Ogawa town, Saitama Pref.   | N36-05-00.7  | E139-12-51.8 | 133             | clay | bulk | no        | no     | slope 0° , black pods   |
| 247262 | 2012STY-15<br>(Site No. 11) | 17 Oct. 2012 | <i>Vigna angularis</i> | wild   | Otsu, Akiruno city, Tokyo   | N35-43-40.7  | E139-10-45.9 | 238             | clay | bulk | no        | no     |   |
| 247263 | 2012STY-16<br>(Site No. 12) | 17 Oct. 2012 | <i>Vigna angularis</i> | wild   | Tokura, Akiruno city, Tokyo   | N35-43-45.4  | E139-11-29.9 | 239             | clay | bulk | no        | no     | abandoned field   |
| 247264 | 2012STY-17<br>(Site No. 13) | 17 Oct. 2012 | <i>Vigna angularis</i> | wild   | Satoyama conservation area "Yokosawa-Iri", Yokosawa, Akiruno city, Tokyo                          | N35-44-04.2  | E139-14-33.0 | 215             | clay | bulk | no        | no     | before Satoyama conservation arera constructed, this was abandoned paddy field and was covered by a large population of wild azuki bean, slope 0° , between mountains |
| 247265 | 2012STY-18<br>(Site No. 13) | 17 Oct. 2012 | <i>Glycine soja</i>    | wild   | "   | "            | "            | "               | clay | bulk | no        | no     | "   |

Table 4. (Continued).

| JP No. | Coll. No.<br>(Site No.)       | Coll. Date   | Species name           | Status | Coll. Site   | Latitude     | Longitude     | Altitude<br>(m) | Soil | Seed | Herbarium | Nodule | Remarks  |
|--------|-------------------------------|--------------|------------------------|--------|--|--------------|---------------|-----------------|------|------|-----------|--------|--|
| 247266 | 2012STY-19<br>(Site No. 14)   | 17 Oct. 2012 | <i>Vigna angularis</i> | weedy  | Ina, Akiruno city, Tokyo   | N35-44-04.2  | E139-15-03.0  | 184             | clay | bulk | no        | no     | weedy azuki. red seeds, tan pod, twining type.               |
| 247267 | 2012STY-20<br>(Site No. 15)   | 17 Oct. 2012 | <i>Vigna angularis</i> | wild   | around paddy fields in the Komine Visitor Center Park, Totohara, Akiruno city, Tokyo | N35-43-07.2  | E139-13-49.2  | 285             | clay | bulk | no        | no     |  |
| 247268 | 2012STY-21<br>(Site No. 16)   | 17 Oct. 2012 | <i>Vigna angularis</i> | wild   | beside Hinohara library, Motoshuku, Nishitamagun Hinohara village, Tokyo             | N35-43-51.9  | E139-08-37.3  | 277             | clay | bulk | no        | no     | twining up tea tree in the field                             |
| 247269 | 2012STY-24-1<br>(Site No. 18) | 18 Oct. 2012 | <i>Vigna angularis</i> | wild   | Uzushiki, Nishitamagun Hinohara village, Tokyo                                       | N 35-42-48.7 | E139-04-46.6  | 532             | clay | bulk | no        | no     | slope 3° , upland field beside road                          |
| 247270 | 2012STY-24-2<br>(Site No. 18) | 18 Oct. 2012 | <i>Vigna angularis</i> | wild   | "  | "            | "             | "               | clay | bulk | no        | no     | opposite side of 2012STY-24-1                                |
| 247271 | 2012STY-25-1<br>(Site No. 19) | 18 Oct. 2012 | <i>Vigna angularis</i> | wild   | Henbori, Nishitamagun Hinohara village, Tokyo  | N35-42-48.3  | E139-05-11.6  | 510             | clay | bulk | yes       | no     | slope 5° , at the steps beside upland field                  |
| 247272 | 2012STY-25-2<br>(Site No. 19) | 18 Oct. 2012 | <i>Vigna angularis</i> | wild   | "  | "            | "             | "               | "    | bulk | no        | no     | slope 0° , opposite side of 2012STY-25-1                     |
| 247273 | 2012STY-26-1<br>(Site No. 20) | 18 Oct. 2012 | <i>Vigna angularis</i> | wild   | Ohata, Tsuru city, Yamanashi Pref.   | N35-33-57.5  | E138-52-30.9  | 505             | clay | bulk | no        | no     | slope 0°   |
| 247274 | 2012STY-26-2<br>(Site No. 20) | 18 Oct. 2012 | <i>Glycine soja</i>    | wild   | "  | "            | "             | "               | clay | bulk | no        | no     | slope 0°   |
| 247275 | 2012STY-27-1<br>(Site No. 21) | 18 Oct. 2012 | <i>Vigna angularis</i> | wild   | Ohata, Tsuru city, Yamanashi Pref.   | N35-33-59.7  | E138-50-54.5  | 579             | clay | bulk | no        | no     | slope 0°   |
| 247276 | 2012STY-27-2<br>(Site No. 21) | 18 Oct. 2012 | <i>Glycine soja</i>    | wild   | "  | "            | "             | "               | clay | bulk | no        | no     | slope 0°   |
| 247277 | 2012STY-28<br>(Site No. 22)   | 18 Oct. 2012 | <i>Vigna angularis</i> | wild   | Ohata, Tsuru city, Yamanashi Pref.   | N35-33-59.6  | E138-50-01.1  | 698             | clay | bulk | no        | no     | slope 10° , beside Helicopter port "Takara Kozan"            |
| 247278 | 2012STY-29-1<br>(Site No. 23) | 18 Oct. 2012 | <i>Vigna angularis</i> | wild   | Asahibaba, Tsuru city, Yamanashi Pref.   | N35-33-33.5  | E138-57-43.3  | 484             | clay | bulk | no        | no     | slope 0° , beside "Daisei Norin Recycle Center"              |
| 247279 | 2012STY-29-2<br>(Site No. 23) | 18 Oct. 2012 | <i>Glycine soja</i>    | wild   | "  | "            | "             | "               | clay | bulk | no        | no     | slope 0° , beside "Daisei Norin Recycle Center"              |
| 247280 | 2012STY-29-3<br>(Site No. 23) | 18 Oct. 2012 | <i>Vigna angularis</i> | wild   | Asahibaba, Tsuru city, Yamanashi Pref.   | N35-33-33.73 | E138-57-40.38 | 465             | clay | bulk | no        | no     | near the house below 50 m from "Daisei Norin Recycle Center" |
| 247281 | 2012STY-29-4<br>(Site No. 23) | 18 Oct. 2012 | <i>Glycine soja</i>    | wild   | "  | N35-33-33.73 | E138-57-40.38 | "               | clay | bulk | no        | no     | near the house below 50 m from "Daisei Norin Recycle Center" |
| 247282 | 2012STY-30-1<br>(Site No. 24) | 18 Oct. 2012 | <i>Glycine soja</i>    | wild   | Akiyama, Uenohara city, Yamanashi Pref.  | N35-34-05.9  | E139-00-52.6  | 660             | clay | bulk | no        | no     | slope 0° , just after the end of "Shin-Hinazuru Tunnel"      |
| 247283 | 2012STY-30-2<br>(Site No. 24) | 18 Oct. 2012 | <i>Vigna angularis</i> | wild   | "  | "            | "             | "               | clay | bulk | yes       | no     | slope 0° , just after the end of "Shin-Hinazuru Tunnel"      |
| 247284 | 2012STY-31-1<br>(Site No. 25) | 18 Oct. 2012 | <i>Vigna angularis</i> | wild   | Akiyama, Uenohara city, Yamanashi Pref.  | N35-34-16.11 | E139-01-12.5  | 554             | clay | bulk | yes       | no     | slope 0° , after 2012STY-30                                  |
| 247285 | 2012STY-31-2<br>(Site No. 25) | 18 Oct. 2012 | <i>Glycine soja</i>    | wild   | "  | "            | "             | "               | clay | bulk | no        | no     | slope 0° , after 2012STY-30                                  |





Photo 1. Writing passport data at JP247249, site 1a (Saitama)



Photo 2. Preparing herbarium at JP247249, site 1a (Saitama)



Photo 3. Searching JP247251 *V. angularis* (wild), site 1b (Saitama)



Photo 4. Collecting JP247251 *V. angularis* (wild), site 1b (Saitama)



Photo 5. Collecting JP247252 *V. angularis* (wild), site 2 (Saitama)



Photo 6. Observing JP247254 *V. angularis* (wild), site 4 (Saitama)



Photo 7. Collecting JP247255 *V. angularis* (wild), site 5 (Saitama)



Photo 8. JP247259 *G. soja*, JP247260 *V. angularis* (wild), site 9 (Saitama)





Photo 9. JP247264 *V. angularis* (wild) JP247265 *G. soja*, site 13 (Tokyo)



Photo 10. JP247266 *V. angularis* (weedy), site 14 (Tokyo)



Photo 11. Sakaeda's cultivated field of *V. angularis* (wild & weedy) (Tokyo)



Photo 12. Wild *V. angularis* seeds cooked with glutinous rice



Photo 13. JP247272 *V. angularis* (wild), site 19 (Tokyo)



Photo 14. JP247272 *V. angularis* (wild), site 19 (Tokyo)

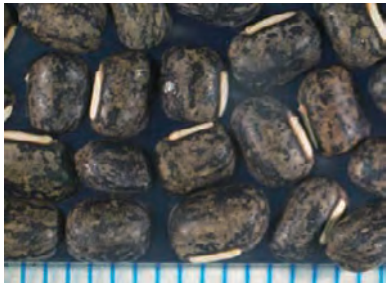


Photo 15. JP247273 *V. angularis* (wild), JP247274 *G. soja*, site 20 (Yamanashi)

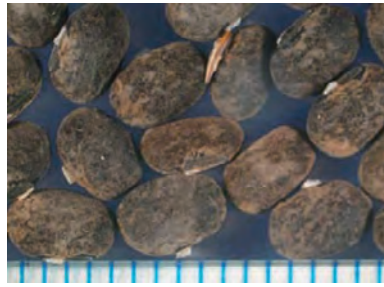


Photo 16. JP247283 *V. angularis* (wild), site 24 (Yamanashi)

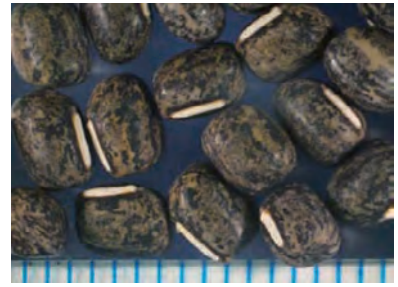




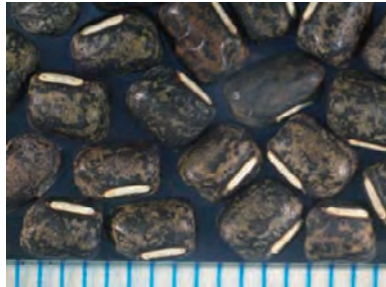
JP247249, *Vigna angularis*



JP247250, *Glycine soja*



JP247251, *Vigna angularis*



JP247252, *Vigna angularis*



JP247253, *Vigna angularis*



JP247254, *Vigna angularis*



JP247255, *Vigna angularis*



JP247256, *Vigna angularis*



JP247257, *Vigna angularis*



JP247258, *Vigna angularis*



JP247259, *Glycine soja*



JP247260, *Vigna angularis*



JP247261, *Vigna angularis*



JP247262, *Vigna angularis*



JP247263, *Vigna angularis*





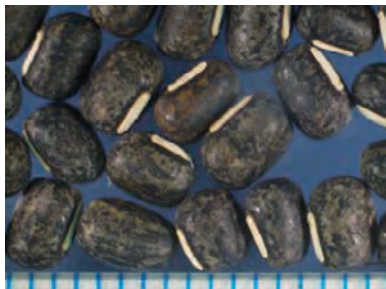
JP247264, *Vigna angularis*



JP247265, *Glycine soja*



JP247266, *Vigna angularis*



JP247267, *Vigna angularis*



JP247268, *Vigna angularis*



JP247269, *Vigna angularis*



JP247270, *Vigna angularis*



JP247271, *Vigna angularis*



JP247272, *Vigna angularis*



JP247273, *Vigna angularis*



JP247274, *Glycine soja*



JP247275, *Vigna angularis*



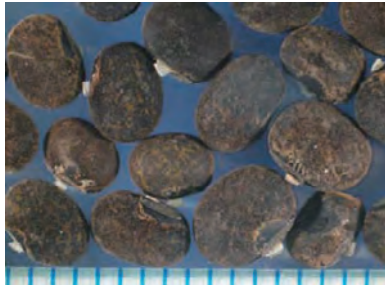
JP247276, *Glycine soja*



JP247277, *Vigna angularis*



JP247278, *Vigna angularis*



JP247279, *Glycine soja*



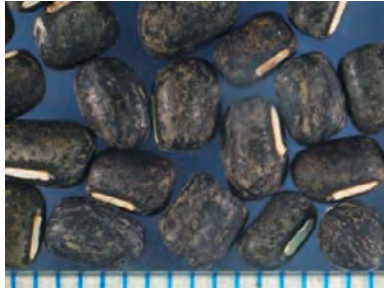
JP247280, *Vigna angularis*



JP247281, *Glycine soja*



JP247282, *Glycine soja*



JP247283, *Vigna angularis*



JP247284, *Vigna angularis*



JP247285, *Glycine soja*