

日本における作物近縁野生種の保存：*Vigna* 属  
4. 九州の探索  
1998年10月16日～10月21日

ダンカン ヴォーン<sup>1)</sup>・横山 正<sup>2)</sup>・小松崎隆男<sup>3)</sup>

- 1) 農業生物資源研究所・遺伝資源第二部・集団動態研究室
- 2) 農業生物資源研究所・遺伝資源第二部・微生物評価保存研究チーム
- 3) 農業生物資源研究所・企画調整部・業務科

Wild relatives of crops conservation in Japan with a focus on *Vigna* spp.  
4. Collecting mission on Kyushu 16<sup>th</sup> -21<sup>st</sup> October 1998

D. A. Vaughan, T. Yokoyama, & T. Komatsuzaki

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

摘要

九州では、1996年に福岡、熊本、佐賀において野生アズキを中心とした探索を行い、野生アズキ4集団を収集した(友岡、1997)。本探索は、本報告書のひとつ前の探索報告(友岡ら、1999a)の隊に続いて福岡から出発し、長崎半島を除く九州を一周したものである。雑草アズキは1集団見つかったが、この生息地はこれまで雑草アズキが良くみられた生育環境とは異なり、若い針葉樹林の下の低日照環境であった。ここは、以前アズキ畑であった場所に針葉樹が10年ほど前に植林された可能性も考えられる。一つの野生アズキ集団では、雑草アズキかと思われる大きな葉を持った大型の個体が混生していたが、これには生息場所の低照度も影響しているかもしれない。野生ダイズは、九州の各地で頻繁にみられた。また、九州ではササゲのエスケープ集団が多くの場所で形成されていることが確認された。

本探索では、43集団を調査し種子の収集を行った。11地点の野生・雑草アズキ集団および5地点の野生ダイズ集団からは個体別に種子の収集を行った。また、ほとんどの集団から、根粒を収集し植物体の標本を作成した。

Summary

Previously collection specifically for wild relatives of azuki bean was conducted by Tomooka (1997) in the area of Fukuoka (福岡), Kumamoto(熊本) and Saga(佐賀) prefectures. During that trip 4 populations of wild azuki were collected. The trip reported here continues the collecting on Kyushu(九州) of the previous mission report of this volume (Tomooka et al., 1999b). The main observations during the trip were that, in less densely populated areas, wild *Vigna angularis* is sporadically found. Weedy *Vigna* was found in only one place an

unusual shaded habitat. Most of the plants of this weedy population were beneath young coniferous trees. It is possible that the habitat had once been an azuki field and was subsequently planted with trees perhaps about 10 years previously. One seemingly small complex population was found with wild plants and very large plants with very big leaves which appeared to be weedy *Vigna*. The large size of the plant similar to collection made in Tottori(鳥取) in 1997 (Tomooka et al., 1999a) may have been due to its shady location. Wild soybean (*Glycine soja*) populations were commonly found throughout the journey. In addition escaped cowpea (*Vigna unguiculata*) was collected at widely scattered locations in Kyushu (九州).

A total of 43 bulk samples were collected, in addition 148 single plant samples were collected from 11 populations of wild or weedy *V. angularis*, and 5 populations of *Glycine soja* (Table below). For most populations both root nodules and herbarium specimens were obtained.

#### 九州の探索によって収集した集団とその数

Species	Number of bulk populations and sub-population samples (plant samples)
<i>Vigna angularis</i> var. <i>nipponensis</i>	10(99)
<i>V. angularis</i> var. <i>angularis</i> (weedy)	1(10)
<i>V. angularis</i> var. <i>angularis</i> (cultigen)	5
<i>V. unguiculata</i> (cultigen)	2
<i>V. unguiculata</i> (escape)	9
<i>Glycine soja</i>	16(35)
<i>Dunbaria villosa</i>	2

KEY WORDS: wild soybeans, wild azuki bean, escaped cowpea, genetic resources, *Vigna* spp.

#### Field observations 探索ルートと収集地での情報

The collections reported here are the third set of collections made on Kyushu(九州) in this present series. The previous reports are Tomooka (1997) and Tomooka et al. (1999b). The previous collection trips were in the northwest region of Kyushu(九州). The present report covers central, southern, eastern and northeastern Kyushu (九州). The route traveled first across the Fukuoka plain then into the central mountains of Kumamoto (熊本県). From Kumamoto city (熊本市) the mission traveled along the highway to Kokubu(国分). The highway to Kokubu (国分) passes through high mountains and there are long tunnels through the mountains. From Kokubu (国分) the team traveled along the east coast through Miyazaki (宮崎) to Nobeoka (延岡). From Nobeoka (延岡) the team turned inland to Takeda(竹田) then down to the coastal resort of Beppu (別府) on the Bungo straits (豊後水道) that separates Kyushu (九州) from Shikoku (四国). From Beppu (別府) the team followed the northern coast to Fukuoka (福岡).

At several sites in the northeast only wild soybean, *Glycine soja*, were found. This may reflect the relatively high population and thus environmental disturbance in the area. On the first day of the mission only one population of wild azuki was found in the central mountains of Kumamoto prefecture (熊本県). This

population (CED98034, site no. 137) on the slopes of a stream beside a paddy field was collected in the heavy rain of a typhoon. That evening on checking collected seeds it was found that many seeds were germinating in the pod. The collections made that day were immediately dispatched to Tsukuba (つくば) for drying and processing.

One of the largest wild azuki bean populations found in Kyushu(九州) was at Hazakimachi (葉崎町), in Nobeoka (延岡) (CED98055, site no. 146) around farmland and within one kilometer of the sea. This population was scattered both along a stream and in a home garden where it was abundant in and around old greenhouses. Based on seed size and color this appeared to be a completely wild population.

A small population at Okamoto(岡本), in Oita prefecture(大分県) (CED98057, site no. 147) consisted of plants of variable habit. One plant growing in the shade had very large leaves and its main stem extended for several meters. This suggests that plants of the *Vigna angularis* complex have considerable environmental plasticity. A similar very large plant was found in 1997 in Tottori(鳥取県) (CED97044) (Tomooka et al., 1999a). This type of plant is presumed to be weedy.

Only one clearly weedy population of azuki bean was found in Kyushu(九州) during the mission at Iseidou(伊勢堂), in Oita prefecture(大分県) (CED98063, site no. 151). This population was unusual because it was growing predominantly in the shade of conifer trees (Fig.2). While the seed coat color of all plants sampled was black the seed weight was 0.77g compared to 0.41g for a small population of wild azuki(CED98062) growing about 2 kilometers away. It seems likely that the area where this population was growing was formerly an field which had subsequently been planted to conifers.

During the collecting mission escaped cowpea (*Vigna unguiculata*) was found in 4 locations. All populations were very small, less than 20 plants, but seed production high. At the time of collecting the pods appeared to be non-shattering. This escape from cultivation has naturalised in southern Japan. It is characterized by having black seeds and dark green leaves which generally were free of disease and insect damage. At one location Mashikimachi akai (益城町赤井) (CED98040, site no. 140) in a field which appeared to be either abandoned or untended azuki and cowpea of different types were found growing among abundant weeds (Fig.1; Table 1) Kumamoto (熊本県). It was not clear whether these legumes had been planted earlier in the year or were escapes from cultivation.

Table 1. Variation in seed weight and seed coat color of seeds from weedy field at Mashikimachi akai. 熊本県益城町赤井の雑草群落の中に生育していたアズキとササゲエスケープの種子色と種子重

Collection number	Seed coat color	10 seed weight
98040A-azuki	Red	2.0g
98040B-azuki	Red	1.2g
98048C-cowpea	Red	1.4g
98040D-cowpea	Black	0.9g
98040E-cowpea	Tan	1.0g

Observations were made throughout the trip of root nodules of wild azuki and wild soybean. In comparison with their respective cultigens the nodules of these wild plants is quite large even though the roots are generally thinner than the cultigen.

The areas of Kyushu(九州) not yet visited to collect wild *Vigna* and *Glycine* include the most southern peninsulas of Kagoshima prefecture(鹿児島県) and Amakusa island (天草島). These areas should be the focus of a future collecting mission.

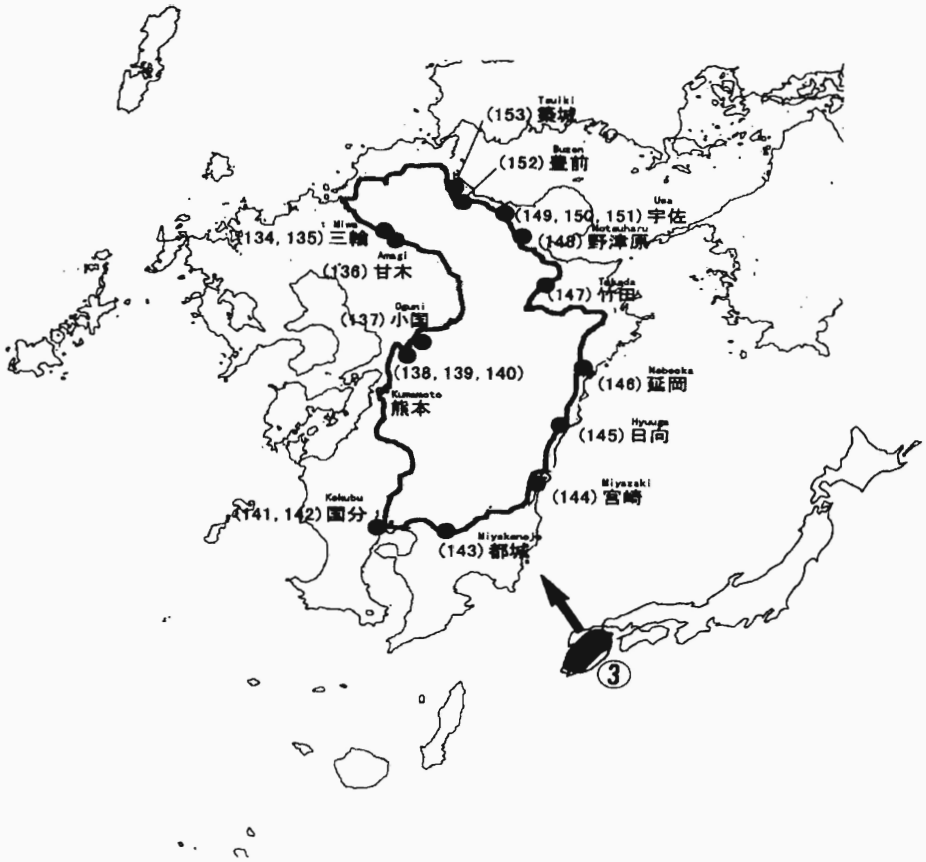
## References

- Tomooka, N. 1997. Collection of wild soybean (*Glycine soja*) and wild azuki bean (*Vigna angularis* var. *nipponensis*) in Ibaraki, Fukushima, Niigata, Tochigi, Kumamoto, Fukuoka and Saga Prefectures in Japan. Collecting reports (Plant Genetic Diversity Laboratory, NIAR, MAFF) 13:41-57 (in Japanese with English summary)
- Tomooka, N., D. A. Vaughan, A. Konarev and S. Tsukamoto. 1999a. Collection of the wild relatives of crops, 1997. 2. The azuki bean (*Vigna angularis* var. *angularis*) genepool and soybean (*Glycine max*) genepool in the central region of Honshu, Japan. 15-24th October. Collecting reports (Plant Genetic Diversity Laboratory, NIAR, MAFF) 14:71-83 (in Japanese with English summary)
- Tomooka, N., K. Doi and Y. Tsubokura. 1999b. Collection of the wild relatives of crops, 1998 2. The azuki bean (*Vigna angularis*) genepool and soybean (*Glycine max*) genepool in the San-in region of Honshu and northwestern part of Kyushu, Japan. 9th-15th October. Collecting reports (Plant Genetic Diversity Laboratory, NIAR, MAFF) 15 (in Japanese with English summary)

Table 2 Itinerary of the exploration and the collected samples on each day

## 探索収集日程と収集品の数

Date 日付	Itinerary and collection sites number 行程と収集地点番号	Collected species and number of accessions 収集した種と系統数
10/17 (Sat)	Fukuoka M i w a 福岡 市 --- 三輪 町 --- 134, 135, 136 --- A m a g i N a g a t a 甘木 市 --- 長田 --- 137 --- Kumamoto 熊本 市	<i>Dunbaria villosa</i> 1 <i>G. soja</i> 2 <i>V. angularis</i> var. <i>nipponensis</i> 1
10/18 (Sun)	Kumamoto Kagoshima 熊本 市 --- 138, 139, 140 --- 鹿児島 県 Kokubu Kokubu 国分 市 --- 141, 142 --- 国分 市	<i>Dunbaria villosa</i> 1 <i>G. soja</i> 4 <i>V. angularis</i> var. <i>nipponensis</i> 2 <i>V. unguiculata</i> (cult. and escaped) 3 <i>V. angularis</i> var. <i>angularis</i> (cult.) 3
10/19 (Mon)	Kokubu Miyazaki Miyakonojo 国分 市 --- 宮崎 県 都城 市 --- 143 --- Sadowara Hyuga Hyuga 佐土原町 --- 144 --- 日向 市 --- 145 --- 日向 市	<i>V. angularis</i> var. <i>nipponensis</i> 3 <i>G. soja</i> 3 <i>V. unguiculata</i> (escaped) 1
10/20 (Tue)	Hyuga Nobeoka Takeda 日向 市 --- 延岡 市 --- 146 --- 竹田 市 --- 147 --- Notsuharu Oita Bepu 野津原 町 --- 148 --- 大分県別府市	<i>V. angularis</i> var. <i>nipponensis</i> 3 <i>G. soja</i> 2
10/21 (Wed)	Bepu Ajimu Usa 別府市 --- 安心院町 --- 149 --- 宇佐市 --- 150 --- Shiida Tsuiki --- 椎田 町 --- 152 --- 築城 町 --- 153 --- Fukuoka 福岡 市	<i>V. angularis</i> var. <i>angularis</i> (cult.) 1 <i>V. angularis</i> var. <i>angularis</i> (weed) 1 <i>V. angularis</i> var. <i>nipponensis</i> 1 <i>G. soja</i> 3 <i>V. unguiculata</i> (cult.) 1 <i>V. unguiculata</i> (escaped) 1
Total		<i>Dunbaria villosa</i> 2 <i>G. soja</i> 14 <i>V. angularis</i> var. <i>nipponensis</i> 10 <i>V. unguiculata</i> (cult. and escaped) 6 <i>V. angularis</i> var. <i>angularis</i> (cult.) 4 <i>V. angularis</i> var. <i>angularis</i> (weed) 1 Total : 37 samples from 19 sites



Map. Exploration route and collection site (●). Number in parenthesis indicate site number.  
 探索経路と収集地点 (●)。括弧内は収集地点番号。

日本における作物近縁野生種の保存：Vigna 属

3. 九州の探索 1998年10月16日～10月21日



Fig.1 Abandoned or untended field in which a mixture of legumes were found growing including cowpea (*V. unguiculata* CED98039) surrounding electricity post at Mashik-imachi akai (益城町赤井), Kumamoto (熊本県).

熊本県益城町赤井(収集地点140)の荒地に見つかったアズキと数種の種皮色を持つササゲのエスケープ。木の電柱の周りにササゲが生育している。



Fig.2 Large weedy population of *V. angularis* (CED98063) growing in semishade beneath young conifer trees at Isedou (伊勢堂), Ooita (大分県).

若い針葉樹の下のやや日当たりの悪い環境で生育していた雑草アズキの集団(大分県伊勢堂, CED98063, 収集地点151)。

4. 山口, 広島, 岡山, 愛知, 静岡の探索 1998年10月22日～10月27日



Fig.1 Small field of cultivated *V. umbellata* (CED98072) growing at Kudamatsu (下松) Yamaguchi (山口県) above terraced rice paddy fields. The field was partially harvested at the time of collecting.

山口県下松市のツルアズキ; *V. umbellata* (CED98072) が栽培されていた場所(収集地点157)。ツルアズキはアズキに近縁な作物で、以前は日本の温暖な地域で広く栽培されていたと思われるが、近年ほとんど栽培されなくなった作物である。