

日本における作物近縁野生種の保存：*Vigna* 属
2. 栃木・茨城・滋賀・鳥取の集団のモニタリングと探索
1998年10月4日および10月6日～8日

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Wild relatives of crops conservation in Japan with a focus on *Vigna* spp.
2. Monitoring and collecting mission to Tochigi, Ibaraki, Shiga and
Tottori prefectures.
4th and 6th-8th October 1998.

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摘要

本報告では、10月4日および10月6日から8日にかけて行ったアズキ複合集団のモニタリングと収集調査について述べる。この調査の主要な目的は、1996年と1997年の調査で発見した多型性の高い集団を再訪問し年次変化を観察することである。再訪問した集団の様子に、一般的には大きな変化が見られなかったが、再訪問によっていくつかの新しい知見が得られた。例えば、栃木県馬頭町の集団 (CED98002, site no. 34) は休耕水田に種子色莢色に多型のある個体群が生育する集団で、3度目の訪問になるが以前発見していた場所より広範囲に個体群が生育していることが判明した。また、今年根集団の近くにアズキが栽培されていた。鳥取県の集団 (CED98009, site no. 73) では、水田脇の小水路に沿った野生アズキの中に数個体の雑草アズキが生育しているのを新たに発見した。アズキ複合集団で起こっている動態を解明するためには、定期的な集団の調査が不可欠である。

Summary

This report covers monitoring and collecting trips made on 4th October and between 6th and 8th October 1998. The main objective of the mission was to re-visit complex populations of the *Vigna angularis* complex first collected in 1996 and 1997. The complex populations re-visited were generally in a similar condition to earlier observations. However, the chance to visit known sites a second time enabled better understanding of the populations to be gained. For example, a population at Batou (馬頭) (CED98002, site no. 34), Tochigi prefecture (栃木県), was larger than realized when first found. In Tottori (鳥取) (CED98009, site no. 73) a small patch of plants within the population appeared to be a hybrid swarm and this was not seen in the previous year. Regular population monitoring is considered essential to understand crop gene pool dynamics.

Complete passport data, seed samples from individual plants and bulk population seed samples were gathered. For most populations herbarium specimens and root nodule samples were obtained.

Species	Number of bulk samples of populatuions and subpopulations (plant sampled)
<i>Vigna angularis</i> var. <i>nipponensis</i>	6 (23)
<i>V. angularis</i> var. <i>angularis</i> (weedy)	4 (19)
<i>V. angularis</i> var. <i>angularis</i> (cultigen)	4 (12)
<i>Glycine soja</i>	3 (18)

KEYWORDS: Wild legumes, genetic resources, *Vigna* spp., *Glycine soja*, in-situ conservation

Field observations (調査地での特性)

Three heterogeneous populations were revisited in 1998 which were first found and collected in 1996 or 1997. The objective of revisiting these populations was to determine to what extent changes in the environment and to the populations had occurred. The population number and dates visited in 1997 and 1998 are shown below. In 1998 populations were visited earlier than in 1998 but seed samples could still be collected.

Table 1. Passport collection number and date of collection of monitoring *Vigna angularis* complex populations in 1997 and 1998.

1997年と1998年における同一アズキ複合集団の収集番号と収集日

	1997 passport number	1998 passport number	1997 collection date	1998 collection date
Tochigi(栃木)	CED97201	CED98002	6 Nov.	4 Oct.
Tottori(鳥取)	CED97046-7	CED98006	21 Oct.	8 Oct.
Shiga(滋賀)	CED97055	CED98009	19 Oct.	7 Oct.

Tochigi(栃木) monitoring population (CED98002, site no. 34) 栃木モニタリング集団

In 1996 (CED96101717-96101710) a wild population of *Vigna angularis* was found at Batou(馬頭), Tochigi (栃木) prefecture. This population had seeds of two types, black and tan. The site map prepared in 1997 during

the second visit indicated that the population was 150m² in size. Since this is one of the nearest populations of *Vigna angularis* to NIAR, Tsukuba, it was revisited in 1998. There was more time during this third visit to the population to study the site in greater detail. It was found that the population was larger than realized in 1997 and covered 2-3 ha. The site consisted of what appeared to be both abandoned upland fields and paddy fallow and the dominant species varied from one area to the other in some areas dicotyledonous herbs, such as *Persicaria* spp., were dominant and in other areas grasses were dominant. *Vigna* was scattered mainly as a minor component with other dicots herbs. Adjacent to this population cultivated *Vigna angularis* was growing and thus the cultigen could be the source of variation found in the adjacent wild population.

A total of 17 single plant seed samples from the wild population were collected and 3 had tan seeds while 14 had black seeds.

Shiga(滋賀) monitoring population (CED98006, site no. 79) 滋賀モニタリング集団

This large population on a road embankment consisted of a mixture of wild and weedy azuki and wild *Glycine soja*. In 1998 on one side of this road embankment where wild azuki and wild soybeans were growing, a small levee around a paddy field was planted to soybean and azuki bean. Thus geneflow could occur between these two cultigens and their wild and weedy relatives. At one location on the road embankment a single 'escaped' plant of cultivated azuki was found. The majority of wild and weedy *Vigna* plants collected from this population had small black seeds only one plant had larger tan seeds.

Tottori (鳥取) monitoring population (CED98009, site no. 73) 鳥取モニタリング集団

This population has been the focus of specific research in our laboratory since this was one of the larger and more heterogeneous populations found in 1997 (Xu et al., 1999a, 1999b). In 1998 we found several changes. One change was that close by, on the opposite side of the railway tracks from most plants of this population, was a large field of azuki beans which was not present in 1997. However, the small azuki field found adjacent to wild plants (Fig.1) was the same as in 1997. We did not find, however, any plants in this small field of cultivated azuki that appeared to be weedy, i.e. shattering, which we did in 1997.

The distribution of the plants in 1998 was very similar to that observed in 1997. In one area a small patch of heterogeneous plants was found that resembled a hybrid swarm (Fig.2). A heterogeneous patch of plants was not in this location in 1997. Seed color varied from black to brown and the seed size of most plants was intermediate between that of wild and cultivated plants collected at this site (Table 2). The range in seed weight of this small patch was twice that of the range in seed weight for the plants with a wild habit (Table 2).

Table2. 10 seed weight of seeds from individual plants at Tottori (鳥取) monitoring population (CED98006)

鳥取モニタリング集団 (CED98006) における野生アズキ, 雑草アズキ, 栽培アズキ各個体別の種子重量

Wild plants		Intermediate plants		Cultigen	
Plant number	10-seed weight g	Plant number	10-seed weight g	Plant number	10-seed weight g
1	0.39	7	1.29	20	2.77
2	0.76	8	1.6	21	2.70
3	0.59	9	1.27	22	2.97
4	0.46	11	1.86	23	2.90
5	0.54	12	0.78	24	2.41
Mean	0.55	Mean	1.36	Mean	2.75

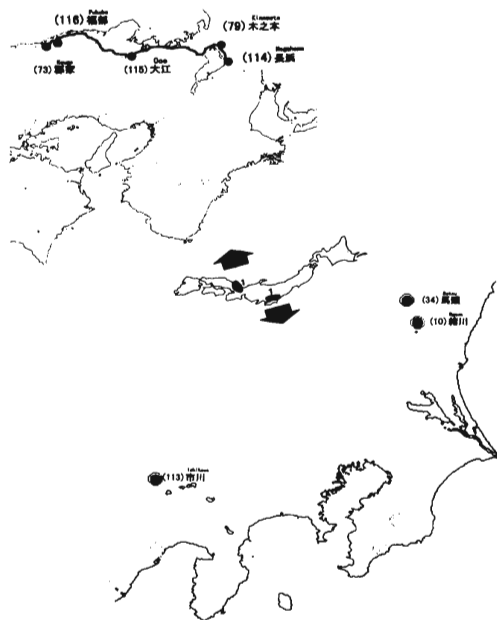
In addition to the monitoring populations visited a new weedy population was found at Nagahama (長浜), Shiga(滋賀) (CED98005) in a vacant lot. All seeds of all plants sampled were tan in color. In the area north of Nagahama(長浜) in many areas populations of the *V. angularis* complex could be seen in while travelling along the road. Also a population was found in a mountainous region of Yamanashi (山梨県) prefecture.

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Table 3 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
9/29 (Wed)	Yamanashi Ichikawa 山梨 県 市川 市 --- 113	<i>V. angularis</i> var. <i>nipponensis</i> 1
10/4 (Sun)	Tochigi Batou Ibaraki Ogawa 栃木 県 馬頭 町 --- 34 --- 茨城 県 緒川 村 --- 10	<i>V. angularis</i> var. <i>nipponensis</i> 2 <i>V. angularis</i> var. <i>angularis</i> (cult.) 1
10/6 (Tue)	Shiga Nagahama つくば市 --- 滋賀 県 長浜 市 --- 114	<i>G. soja</i> 1
10/7 (Wed)	Nagahama Kinomoto Kyoto 長浜 市 --- 114 --- 木之本 --- 79 --- 京都 府 Oe Tottori 大江町 --- 115 --- 鳥取	<i>V. angularis</i> var. <i>angularis</i> (weedy) 3 <i>V. angularis</i> var. <i>angularis</i> (cult.) 2 <i>V. angularis</i> var. <i>nipponensis</i> 2 <i>G. soja</i> 1
10/8 (Thu)	Tottori kouge Fukube Tottori 鳥取 県 郡家 町 --- 73 --- 福部 村 --- 116 --- 鳥取	<i>V. angularis</i> var. <i>angularis</i> (weedy) 1 <i>V. angularis</i> var. <i>angularis</i> (cult.) 1 <i>V. angularis</i> var. <i>nipponensis</i> 1 <i>Glycine soja</i> 1
Total		<i>V. angularis</i> var. <i>nipponensis</i> 6 <i>V. angularis</i> var. <i>angularis</i> (cult.) 4 <i>G. soja</i> 3 <i>V. angularis</i> var. <i>angularis</i> (weedy) 4 Total : 17 samples from 9 sites



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

Table 4. A list of collected samples in Yamanashi, Tochigi, Ibaraki, Shiga, Kyoto, and Tottori prefectures, Japan, 1998

地方で収集した作物近縁野生種遺伝資源、1998

No.	Month/date	Site No.	Col.No.	Acc.No.	Genus & Species	Status	Locality			Latitude Longitude	Alt.	Topography	Shading	Degree of disturbance	Population size	Growth stage	Seed samples	Nodule samples	Specimens	Characteristics and notes	Associated plants
							Prefecture	District	Village												
1	9/29	113	CED98001	03032372	<i>Vigna angularis</i>	wild	Yamanashi 山梨県	Nishiyatsushiro 西八代郡	Ichikawedaimon 市川大門町	35°33'02" N /138°29'53" E						bulk		3			
2	10/4	34	CED98002C	03032418	"	cultivated	Tochigi 栃木県	Batou 馬籠町		36°46'18.4" N /140°12'21.5" E	150m	hills/ mountains	open	med	1ha	mature	bulk		0		<i>Perisaria thumbergii</i>
3	10/4	34	CED98002A	03032373	"	wild + hetero geneous	"	"		36°46'18.4" N /140°12'21.5" E	150m	"	"	"	"	18 + bulk		3		"	
4	10/4	10	CED98003	03032374	"	wild	Ibaraki 茨城県	Ogawa 緒川村	kobune 小船	36°37'13.3" N /140°17'02.4" E	140m	"	"	"	200m ²	"	bulk		0		"
5	10/6	114	CED98004	03032442	<i>Glycine soja</i>	"	Shiga 滋賀県	Nagahama 長浜		35°22'53.4" N /138°16'55.4" E	105m	plain	light	"	only few plants	pre-mature	bulk		4	abandoned paddy, clay	<i>Ambrosia artemisiifolia</i> , <i>Solidago altissima</i>
6	10/7	114	CED98005	03032406	<i>Vigna angularis</i>	weedy	"	"		35°22'53.4" N /138°16'55.4" E	105m	"	"	"	in patches 100m ²	mature	10		5	seedtan(white), podblack, thick stems	"
7	10/7	79	CED98006B	03032410	"	"	"	Kinomoto 木之本		35°29'44.8" N /138°12'17.1" E	125m							3		3	
8	10/7	79	CED98006C	03032420	"	cultivated	"	"		35°29'44.8" N /138°12'17.1" E	125m							7		0	
9	10/7	79	CED98006A	03032375	"	wild	"	"		35°29'44.8" N /138°12'17.1" E	125m							11		2	
10	10/7	79	CED98007	03032443	<i>Glycine soja</i>	"	"	"		35°29'44.8" N /138°12'17.1" E	125m							7		3	
11	10/7	115	CED98008B	03032411	<i>Vigna angularis</i>	weedy	Kyoto 京都府	Ooe 大江町	Koumori 河守上	35°24'03.8" N /135°08'53.1" E	85m	Mountains	open	med	100m ²	mature	1		2		
12	10/7	115	CED98008C	03032421	"	cultivated	"	"	"	35°24'03.8" N /135°08'53.1" E	85m	"	"	"	"	"	bulk		0		
13	10/7	115	CED98008A	03032376	"	wild	"	"	"	35°24'03.8" N /135°08'53.1" E	85m	"	"	"	"	"	bulk		0	edge of road wild form seemed to have very small seeds + variation in pod	highly mixed <i>Humulus</i> / <i>Vitis</i> . <i>Portulaca americana</i>
14	10/8	73	CED98009B	03032412	"	weedy	Tottori 鳥取県	Kouze 郡家		35°25'17.0" N /134°15'38.7" E	40m	plain	"	"	several ha	"	6		6		
15	10/8	73	CED98009C	03032422	"	cultivated	"	"		35°25'17.0" N /134°15'38.7" E	40m	"	"	"	fields on both sides of railway back	"	5		0		
16	10/8	73	CED98009A	03032377	"	wild	"	"		35°25'17.0" N /134°15'38.7" E	40m	"	"	"	several ha	"	12		5		
17	10/8	118	CED98010	03032444	<i>Glycine soja</i>	"	"	Fukube 福部	Iwato 岩戸	35°33'32.8" N /134°16'34.0" E	0m	plain	open	med	5 × 10m	pre-mature	bulk		0	waste land, sandy	<i>Fueraria lobata</i> , <i>Solidago altissima</i> , <i>Amphicarpa bracteata</i> , ササ

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Fig.1 Tottori (鳥取) monitoring population (CED98009). Small field of cultivated azuki left with plants of wild azuki growing within 1 metre.

鳥取県郡家のモニタリング集団 (CED98009, site no.73)。野生アズキと栽培アズキがすぐ隣同士に生育している。



Fig.2 Tottori (鳥取) monitoring population. Small patch of heterogeneous plants resembling a hybrid swarm within the population (CED98009).

鳥取県郡家のモニタリング集団 (CED98009, site no.73)。野生アズキ集団の中に、雑種集団かと思われる雑草アズキ数個体が見つかった。

2. 山陰地方および九州西北部地域 アズキとダイズの野生種を中心にー



写真 1

鳥根県川本町古市 (site 119) の雑草形アズキ (98013B)。

茎が太く、基部は半直立で側枝が長く伸びほふくしていた。