



# **SUSTAINABLE PRESERVATION OF INDIGENOUS SOUTH EAST EUROPEAN LEGUMES AND THEIR TRADITIONAL FOOD AND FEED PRODUCTS**

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## **T E A M**

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**THE NATIONAL GRAIN LEGUMES COLLECTION IN SADOVO INCLUDES:**

**OLD VARIETIES, POPULATIONS  
LANDRACES, BREEDING LINES  
MUTANT FORMS, NEW BRED CULTIVARS  
COMMERCIAL VARIETIES , WILD RELATIVES**

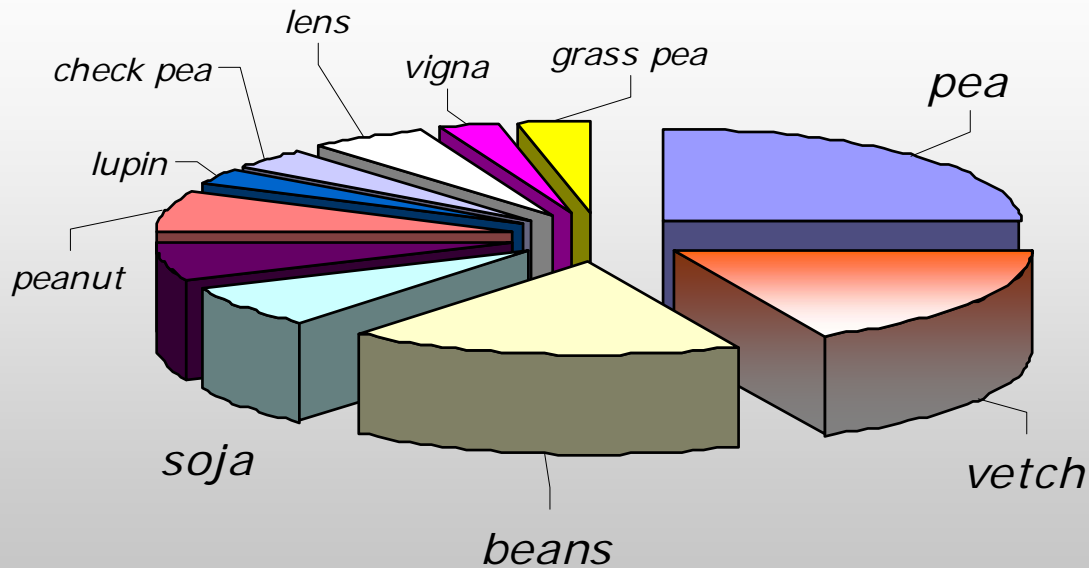




## COMPOSITION OF THE BULGARIAN GRAIN LEGUME COLLECTIONS

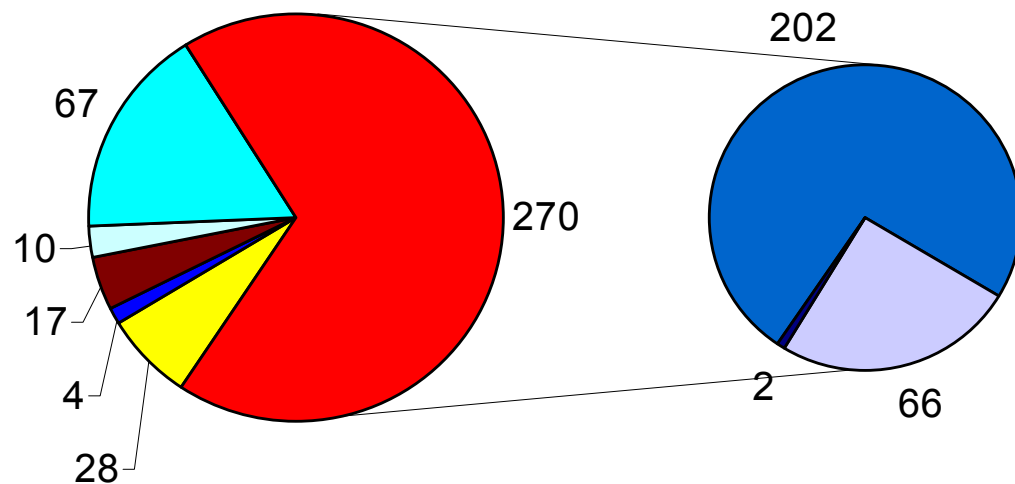
Genus	Total number	Long term conservation	Medium term	Working collection
<i>Pisum</i>	2540	810	1150	1120
<i>Lupinus</i>	308	70	208	14
<i>Lathyrus</i>	344	270	100	57
<i>Phaseolus</i>	1883	777	1151	158
<i>Cicer</i>	353	234	160	107
<i>Lens</i>	532	385	237	94
<i>Vicia sp.</i>	1880	1170	734	178
<i>Soja hispida</i>	700	692	7	7
<i>Vicia faba</i>	702	467	220	35
<i>Vigna</i>	283	117	123	98
<i>Arachis</i>	1111	378	752	700
<b>TOTAL</b>	<b>10 636</b>	<b>5 370</b>	<b>4 842</b>	<b>2 568</b>

## COMPOSITION OF THE BULGARIAN GRAIN LEGUME COLLECTIONS



### THE THREE LARGER COLLECTIONS –

PEA, BEANS AND VETCH, ARE REPRESENTED BY THE FOLLOWING MORE IMPORTANT SPECIES *PISUM SATIVUM* L., *PISUM ARVENSE* L., *VICIA SATIVA* COMPLEX AND *PHASEOLUS VULGARIS* L.



- |                          |                           |                             |
|--------------------------|---------------------------|-----------------------------|
| <i>Vicia villosa</i>     | <i>Vicia ervilia</i>      | <i>Vicia pannonica</i>      |
| <i>Vicia narbonensis</i> | други                     | <i>Vicia sativa complex</i> |
| <i>Vicia sativa</i>      | <i>Vicia angustifolia</i> | <i>Vicia incisa</i>         |

## DISTRIBUTION OF *VICIA* SP.

## INVENTORY OF GRAIN LEGUME COLLECTION WITH BULGARIAN ORIGIN

Genus	Total number	Landraces and primitive cultivars	Breeding lines	Breeding cultivars	Wild relatives
<i>Pisum</i> sp.	<b>278</b>	<b>34</b>	<b>218</b>	<b>25</b>	<i>P.elatius</i>
<i>Vicia</i> sp.	<b>569</b>	<b>167</b>	<b>7</b>	<b>50</b>	<b>176</b>
<i>Lathyrus</i> sp.	<b>35</b>	<b>13</b>	-	<b>2</b>	<b>20</b>
<i>Cicer arietinum</i>	<b>33</b>	<b>22</b>	<b>5</b>	<b>5</b>	<i>C.monbretii</i>
<i>Vicia faba</i>	<b>65</b>	<b>53</b>	<b>10</b>	<b>2</b>	
<i>Phaseolus</i> sp.	<b>345</b>	<b>158</b>	<b>28</b>	<b>35</b>	

# A C T I V I T I E S

- ✓ **INVENTORY OF GRAIN LEGUME COLLECTION WITH BULGARIAN ORIGIN**
- ✓ **COLLECTING INFORMATION ON MAINTENANCE “IN GARDEN” AND “ON FARM” CONSERVATION OF OLD VARIETIES AND POPULATIONS**  
(faba bean, peas, vetch, chickpea and other grain legumes)
- ✓ **COLLECTING OLD FORMS AND LOCAL POPULATION SEEDS**
- ✓ ***IN SITU* CONSERVATION - IDENTIFICATION OF TARGET SPECIES HABITATS**



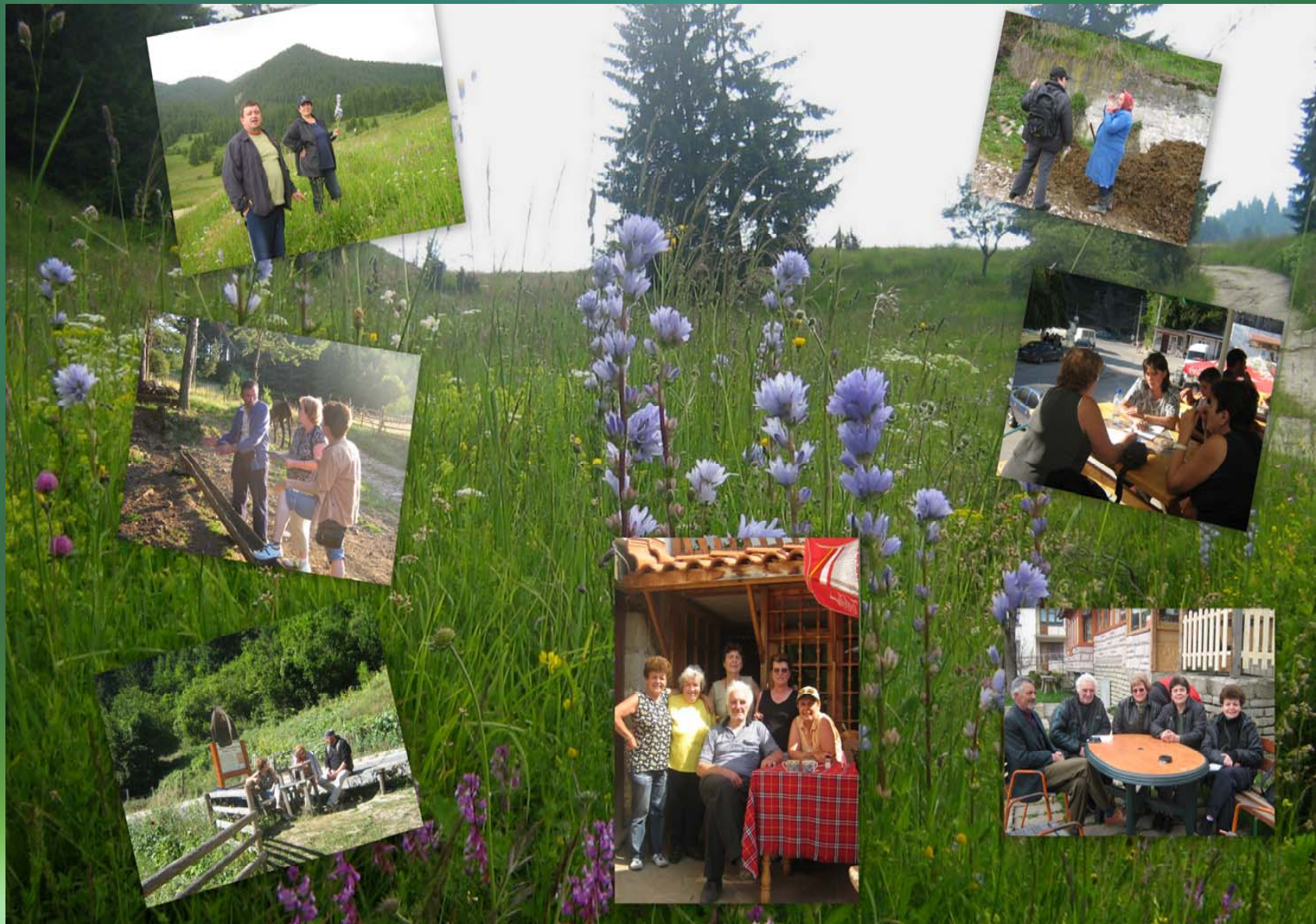
**SET UP CONTACT WITH FARMERS FOR MANAGEMENT  
OF VALUABLE SITES:  
farm, pasture, home garden**

**DISCRIPTION OF SITES**

**PLANT COMMUNITY SPECIES LIST AND ESTIMATION OF  
COVER**

**GEOGRAPHIC INFORMATION :  
coordinates, altitude, slope, aspect**

**LAND USE TYPE:**  
cut or grazed, fertilization, past and present land use, type  
vegetation, crops and cultivars





**LOCAL LANDRACES :  
CENTRAL BALCAN  
RHODOPI MNS.  
TRACIA PLAIN**





***Vicia Faba - local***



**B 1 E 238**



***Vicia Faba***



**B 0 E 095**



***Vicia Faba - local - 2***



**B 1 E 0236**



**B 1 E 0214**



**B 1 E 0231**





***Cicer arietinum - local***



***Cicer arietinum - local 2***





***Vicia sativa- purple flower***



***Vicia sativa - white flower***



***Vicia incisa - Strandja***



***Pisum sativum***

**B O E 018**



***Pisum sativum***

**B O E 0017**



***Pisum elatius***





***Lathyrus sativa - local***



***Lathyrus sativa- local 2***



- ***IN SITU* CONSERVATION - IDENTIFICATION OF TARGET SPECIES HABITATS**





## » COLLECTING SITES





- Collecting wild relatives of the genus *Vicia*, *Lathyrus*, *Cicer monbretii*, *Pisum elatius*.



**The fababean collection in our gene bank was not enlarged and enriched over the past ten years. The number of local landraces and old varieties is very small in gene bank. The efforts were directed to collect the traditional PGR with Bulgarian origin.**

**The farmers don't have interests toward fababean and we haven't breeding programe. The people grow it in their own garden. Recently, it is used for green manure and catch crop in plum orchards in the foothill regions.**

**Preliminary information show that from grain legumes landraces are grown only fababean and green beans**





**Rhodopi mns.- Arda village**



**Faba beans is grown in the plains, while green beans - in foothill and mountain areas. The farmers grow in their gardens the green peas and dry beans. They use commercially varieties. Very rarely they dispose with old local resources. On this basis, the itineraries are made for expeditionary surveys.**

**In all visited areas people grow faba beans, green peas and beans in the gardens. Somewhere for green fodder many farmers grown pea and vetch. These farmers utilize very old bulgarian varieties. They make production of seeds in the own farms.**



**Smilyan village**

**on farm concervation**



**Seven collection missions** were carried out in the period from 23.06 to 30.07 for collecting local grain legumes PGR and wild relatives from *Vicia sp.* Seeds were collected **25 samples: 13 landraces** (faba beans -11; one - peas ; 2 - vetch) and **12 accessions of 11 wild species** ( 11 - *Vicia sp.* and one - *Lathyrus sativus*). The farmers was interviewed by us - about the traditions and use of grain legumes. Most farmers do not have enough seeds. They produce seeds for their own needs.

**Identification of sites for *in situ* conservation of *Vicia onobrychoides*, *Vicia sepium*, *Vicia cracca*, *Lathyrus cicera* was made in Rhodopi mountain**

# COLLECTING ACTIVITIES

▶ **Collecting in a wide range of distinct ecological niches: local and old PGR; wild relatives for *ex situ* collection**

▶ **Identification the sites:**

*a/ History of utilization – land use type, fertilization, type of vegetation cut or grazed*

*b/ Eco-geographical survey – coordinates, altitude, slope, aspect*

*c/ Description of the habitat and farms – botanic composition and agro- biodiversity*

*d/ Establish of agro-biodiversity in garden and farms*

▶ **Evaluation and multiplication**

▶ **Long term conservation**



# **THE PROTECTION OF THE CROP WILD RELATIVES**

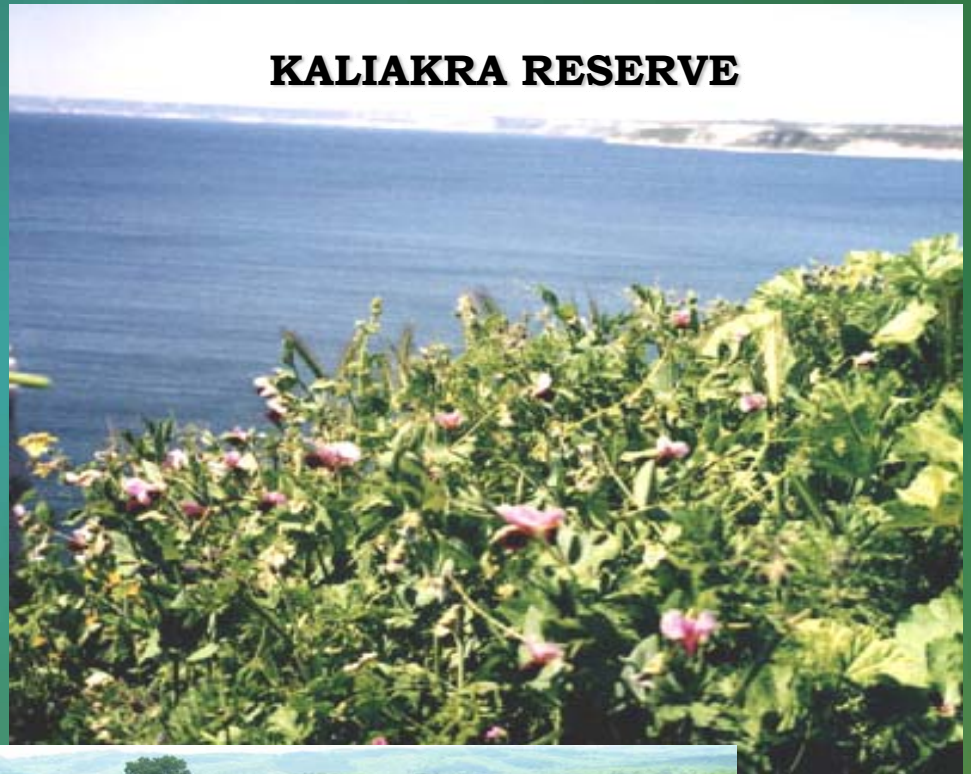
## **QUESTIONS**

- **IDENTIFY THE HABITATS WITH WILD RELATIVES**
  - **LOCATE THE REGION FOR CREATION A DATA BASE, INCLUDING ECOLOGIC, GEOGRAPHIC AND TAXONOMIC STUDIES**
    - **DESCRIPTION OF RARE, ENDANGERED AND ENDEMIC PLANTS**
    - **DESCRIPTION OF ECONOMICALLY VALUABLE SPECIES FOR BREEDING**
- **CONSERVATION OF SEED MATERIAL FOR *EX SITU* COLLECTION AND GENE BANK**





*Lathyrus tuberosus*



**KALIAKRA RESERVE**



**Strandja mns. - *Cicer monbretii***



# RESEARCH ACTIVITIES

**1. THE CLASSIFICATION OF *PISUM* SP. AND *LATHYRUS* SP. ACCESSIONS ACCORDING TO THE WINTER HARDINESS WAS CARRIED OUT IN COLLABORATION WITH OTHER AGRICULTURAL SCIENTIFIC CENTERS**

**2. A BREEDING PROGRAMME FOR HIGH TEMPERATURE AND DROUGHT STRESS RESISTANCE IN *PISUM SATIVUM* L. HAS BEEN DEVELOPED TOGETHER WITH INSTITUTE OF VEGETABLE CROPS RESEARCH MARITZA IN PLOVDIV . THE INVESTIGATION INCLUDES SCREENING OF 23 ACCESSIONS FROM SADOVO AND MARITZA INSTITUTS WITH CRITICAL TEMPERATURE REGIMES FOR THE CHOICE OF GENOTYPES TOLERANT TO HIGHT TEMPERATURE STRESS**

**3. MIXTURE CULTIVATION OF LEGUMES AND CEREALS**

**4. POSSIBILITY FOR GROWING OF LEGUMES IN A YOUNG PLUM PLANTATION FOR GREEN MANURE:**

***8 ACCESSIONS OF FABA BEAN, PEA, COMMON VETCH, BITTER VETCH***

**5. CHEMICAL CHARACTERIZATION OF PEA ACCESSIONS - PhD**



The study presents the possibilities for enlargement the range of annual legumes cultivated in mixtures with oats as alternative crops to pea through studying the interaction between the legumes with cereal components sowed in different proportions. The accessions were selected as a result of previous investigations regarding their cold tolerance, productive potential and biologic characters. As a result of this, the following legumes were included in the study: **pea, common vetch, hungarian vetch, grass pea and white lupine.** The winter **oat** cv. **Dunav 1** was used in each mixture combination. The combination of pea with oat was used as a control due to its proved economic qualities and wide utilization.

The specific biologic characteristics of each legume crop in maturity enables to receive green forage production continuously beginning with pea, followed by bitter vetch, common and hungarian vetch, grass pea and white lupine. Bitter vetch performs high potential as an alternative crop to pea due to its high productivity in mixture cultivation, early maturity and good forage qualities.



**OAT : COMMON  
VETCH**



**OAT : GRASS PEA**

# **FUTURE ACTIVITIES**

- ⇒ **ENRICH THE GENETIC BASIS OF THE COLLECTIONS**
- ⇒ **DEVELOP THE RECOMENDATION FOR MANAGEMENT OF NATURAL RESOURCES**
- ⇒ **MONITORING FOR RARE SPECIES *CICER MONBRETII*, *PISUM ELATIUS*, *VICIA INCISA* ETC.**
- ⇒ **REINTRODUCTION OF TRADITIONAL OLD PGR FOR REGIONAL FOOD PRODUCT**
- ⇒ **INVOLVING FARMERS IN *ON FARM* CONSERVATION APPROACH**



# **NEXT STEPS**

## ***1. FOR COLLECTED ACCESSIONS***

- ✓ **REGISTRATION OF PASSPORT DATA**
- ✓ **MULTIPLICATION OF SEEDS FOR *EX SITU* COLLECTION AND EXCHANGE**

## ***2. CONTINUING EXPEDITION MISSIONS IN OTHER AREAS***

## ***3. EVALUATION***



# Passport information about new collected accessions

ACCENUMB	GENUS	SPECIES	CROPNAME	ORIGIN	COLLSITE	LATITUDE	LONGITUDE	ALTITUDE	SAMPSTAT	STORAGE*
A8E0001	<i>Vicia</i>	<i>faba</i> L.	Faba bean	BGR	Stezhrovo, Pleven, Danube plain	43.5 N	25.15 E	199	Local Home garden Stanka A. Lazarova	20
A8E0049	<i>Vicia</i>	<i>faba</i> L.	Faba bean	BGR	Kochevo, Plovdiv, Tracian plain	4210N	2491E	148	Local Farmer: Penka Georgieva	20
A8E0050	<i>Vicia</i>	<i>faba</i> L.	Faba bean	BGR	Nevsha, Varna, Kamchiiska- Emenska Mt.	432495N	272828E	190	Local Farmer: Valentina Georgieva	20
A8E0415	<i>Vicia</i>	<i>faba</i> L.	Faba bean	BGR	Trakiec, Haskovo, Tracian plain	415544N	252732E	219	Local Home garden Mahmed Ali	20
A8E0494	<i>Vicia</i>	<i>faba</i> L.	Faba bean	BGR	Ivailovgrad, Eastern Rhodopi	413119N	260510E	150	Local Home garden Maria Shishmanova	20
A8E0529	<i>Vicia</i>	<i>faba</i> L.	Faba bean	BGR	Lyubimetz, Haskovo, Tracian plain	414958N	263500E	108	Local Home garden Elena Sultanova	20
A8E0555	<i>Vicia</i>	<i>faba</i> L.	Faba bean	BGR	Ierusalimovo, Yambol, Tundzha plain	415325N	2610E	108	Local Farmer: Jivka Koleva	20
A8E0564	<i>Vicia</i>	<i>faba</i> L.	Faba bean	BGR	Kapitan Andreevo	414258N	264818E	65	Local Farmer: Sofia A. Dimitrova	20
A8E0001	<i>Vicia</i>	<i>incisa</i>	Vetch	BGR	Rezovo, Burgass South Black Sea	419830N	280330E	20	Wild	13, 20
A9E0002	<i>Pisum</i>	<i>elatius</i>	Pea	BGR	Markovo, Plovdiv, Central Rhodopi	42067N	2470E	290	Wild	20



THANK YOU

