



# GRAIN LEGUME GENETIC RESOURCES OF TURKEY

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# Grain Legume Genetic Resources of Turkey

Turkey is the one of the most significant countries for plant genetic resources and plant diversity in the world. Many agricultural crop species are part of the native Anatolian flora and domesticated 3000-7000 years ago, or they have gradually been introduced through cultural exchanges held with other civilizations in ancient times.

Turkey is located in the Eastern Mediterranean and a bridge between the Europe and Asia. It is an important gene or origin center because of its geographical situation and various ecological conditions. As a centre of origin many important crops, wild relatives, landraces and weedy forms of main crops are found in diverse forms. Turkey is described as micro gene centers for many crops also (Tan, 2010).

Turkey is centre of origin of *Cicer*, *Lens* and *Pisum* and described as micro gene centre for *Lens culinaris*, *Phaseolus vulgaris*, *Vicia faba*, *Lupinus spp.* (Harlan, 1951).

# Grain Legume Genetic Resources

The landraces of legumes in Turkey have a high level of genetic heterogeneity.

-The **lentil** landraces are still grown by farmers and are very diverse.

-Landraces of **field and garden pea, faba bean** are also grown.

-**Chickpea and beans** are remarkable landraces of Turkey.

Small seeded forms of chickpea are grown mainly in South East and Central Anatolia.

Beans are cultivated all over the Turkey for dry and vegetable use. It has a remarkable variation in pod and seed sizes, types and colors.

# Grain Legume Genetic Resources of Turkey

1. Seed Collection
2. Multiplication/Regeneration
3. Characterization and Evaluation



# SEED COLLECTION- (2007-2010)











**Table 1. Number of accessions collected (1966-2006)**

<b>SPECIES</b>	<b>1966-2006</b>
CICER SP.	2
CICER ANATOLICUM	1
<b>CICER ARIETINUM</b>	<b>2060</b>
CICER BIJUGUM	5
CICER ECHINOSPERMUM	7
CICER ISAURICUM	1
CICER PINNATIFIDUM	6
CICER RETICULATUM	7
LENS SP.	13
<b>LENS CULINARIS</b>	<b>1073</b>
LENS ERVOIDES	3
LENS MONTBRETII	5
LENS NIGRICANS	10
LENS ORIENTALIS	11
PHASEOLUS COCCINEUS	16
<b>PHASEOLUS VULGARIS</b>	<b>2874</b>
PISUM SP.	37
PISUM SATIVUM	41
PISUM SATIVUM ELATIUS BREVIPEDUNCULATUM	1
PISUM SATIVUM ELATIUS ELATIUS	4
PISUM SATIVUM SATIVUM ARVENSE	43
PISUM SATIVUM SATIVUM SATIVUM	42
VICIA FABA	372
VICIA FABA MAJOR	2
VICIA FABA MINOR	1
VIGNA RADIATA	7
VIGNA UNGUICULATA	90
<b>TOTAL</b>	<b>6734</b>



**Table 2. Number of accessions collected (2007-2012)**

SPECIES	2007-2012
<i>Cicer arietinum</i> L.	113
<i>Lens culinaris</i> L.	34
<i>Phaseolus coccineus</i>	9
<i>Phaseolus vulgaris</i> L.	811
<i>Pisum</i> sp.	1
<i>Pisum sativum</i>	7
<i>Pisum sativum elaitus elaitus</i>	1
<i>Pisum sativum sativum arvense</i>	53
<i>Pisum sativum sativum sativum</i>	7
<i>Vicia faba</i> L.	72
<i>Vigna radiata</i>	6
<i>Vigna unguiculata</i> L.	235
<b>TOPLAM</b>	<b>1327</b>

During 2007-2012, totally **1327 accessions** were collected

**Table 3. Number of accessions regenerated in 2007-2012**

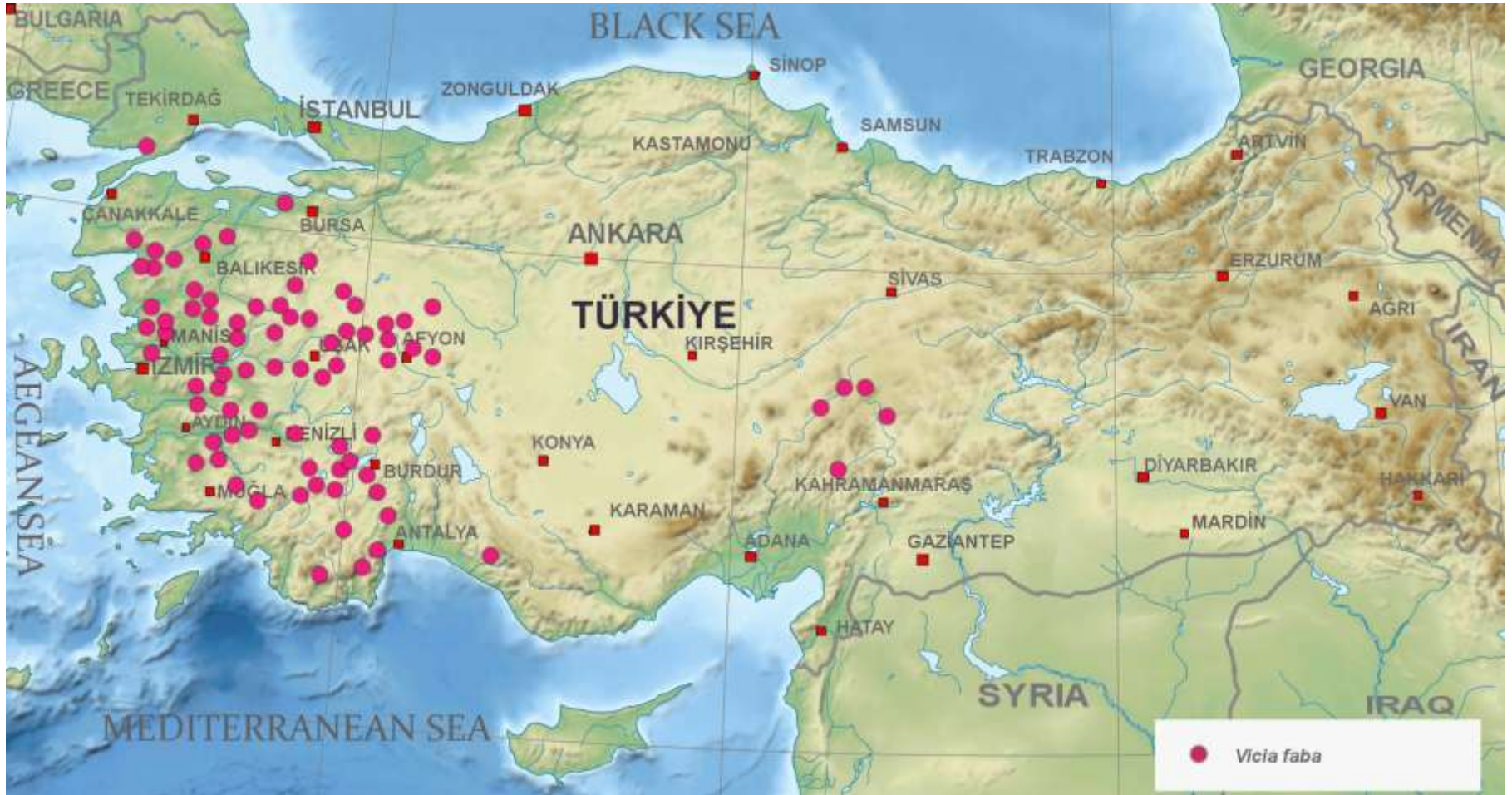
<b>Botanic name</b>	<b>Number</b>
<i>Cicer arietinum L.</i>	375
<i>Lens spp (wild)</i>	5
<i>Lens spp.</i>	10
<i>Lens culinaris Medik.</i>	8
<i>Pisum sativum L.</i>	133
<i>Phaseolus vulgaris L.</i>	325
<i>Vicia faba L.</i>	288
<i>Vigna unguiculata L.</i>	235

During 2007-2012, totally **1379 accessions** were regenerated

**Table 3. Number of accessions characterized in 2007-2012**

Botanic name	Number of accessions
<i>Cicer arietinum L.</i>	116
<i>Vicia faba L.</i>	225
<i>Vigna unguiculata L.</i>	235

# FABA BEAN (*Vicia faba* L.)





## COLLECTION DATA OF FABA BEAN LANDRACES (*Vicia faba* L.)

Province	Town	Villages	Height (m)
İzmir	Menemen, Ödemiş, Tire	Ayvacık, Kırtepe, Osmaniç	150-350
Manisa	Salihli, Köprübaşı, Gördes, Demirci, Selendi, Alaşehir	Yunt Mountain Villages, Yeniceköy, Musaca, Başlamış, Doğan kaya, Sarıçöy	60-600
Aydın	Yenipazar, Bozdoğan, Kuyucak, Karacasu, Çine		300-830
Denizli	Serinhisar, Acıpayam, Çameli		710-1518
Muğla	Köyceğiz, Ula, Milas, Yatağan		50-1400
Antalya	Kaş, Korkuteli Elmalı, Finike, Seki, Kumluca Konyaaltı		
Burdur	Bozova, Gölhisar Yeşilova, Çavdır Bucak, Tefenni, Karamanlı		
Balıkesir	Burhaniye, Edremit, Havran, İvrindi		90-490
Çanakkale	Bayramiç		
Bursa			
Antalya	Kaş, Korkuteli Elmalı, Finike, Seki, Kumluca Konyaaltı		
Kütahya	Aslanapa, Gediz, Simav, Emet, Şaphane, Tavşanlı, Altıntaş, Dumlupınar		800-1280
Afyon	Sinanpaşa İşcehisar, Emirdağ, Bolvadin, Çobanlar Şuhut		990-1320
Uşak	Banaz, Sivahlı, Karahallı, Ulubey, Eşme		670-950
Maraş	Afşin Göksun, Elbistan Türkoğlu, Nurhak		490-1300
<b>Faba Bean Genetic Resources (2007-2012)</b>	<b>72</b>		

# FABA BEAN LANDRACES (*Vicia faba* L.)





*Vicia faba* var. *minör*



**Dibekdere köyü, Milas / MUĞLA**





**Korucukköyü Milas MUĞLA**

***Vicia faba* var. *major***



# Faba Bean for fresh consumption



## MULTIPLICATION/REGENERATION STUDIES IN FABA BEAN (*Vicia faba* L.)



The faba bean accessions have been grown in isolated conditions since its partially cross-pollinated habit



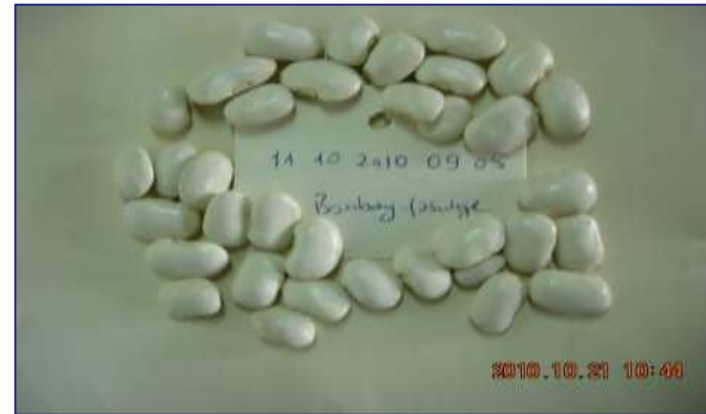


## COLLECTION DATA OF DRY BEAN LANDRACES (*Phaseolus vulgaris* L.)

Provinces	Towns	Villages	Height (m)
İzmir	Menemen, Ödemiş, Tire, Beydağ, Yeşiltepe	Osmancık	150-650 m
Manisa	Muradiye, Akhisar, Gördes	Yunt Mountain Villages ( Süngüllü, Örselli, Siyekli) Yeniceköy, Musaca, Başlamış, Doğankaya, Sarnıçköy, Şeyhyayla	50 -750
Aydın	Yenipazar,Bozdoğan, Kuyucak,Karacasu, Çine		300-830
Denizli	Serinhisar, Acıpayam, Çameli		710-1518
Muğla	Köyceğiz, Ula, Milas, Yatağan		50-1400
Antalya	Kaş,Korkuteli Elmalı,Finike, Seki, Kumluca Konyaaltı		
Burdur	Bozova,Göhlisar Yeşilova,Çavdır Bucak, Tefenni,Karamanlı		
Bahkesir	Burhaniye, Edremit, Havran, İvrindi		90-490
Çanakkale	Bayramiç		
Bursa			
Kütahya	Aslanapa,Gediz, Simav, Emet , Şaphane , Tavşanlı , Altıntaş, Dumlupınar		800-1280
Afyon	Sinanpaşa İşcehisar, Emirdağ , Bolvadin, Çobanlar Şuhut		990-1320
Uşak	Banaz, Sivash, Karahallı, Ulubey, Eşme		670-950
Maraş	Afşin Göksun, Elbistan Türkoğlu, Nurhak		490-1300
<b>Bean Genetic Resources</b>	<b>811</b>		



# BEAN LANDRACES (*Phaseolus vulgaris* L.)

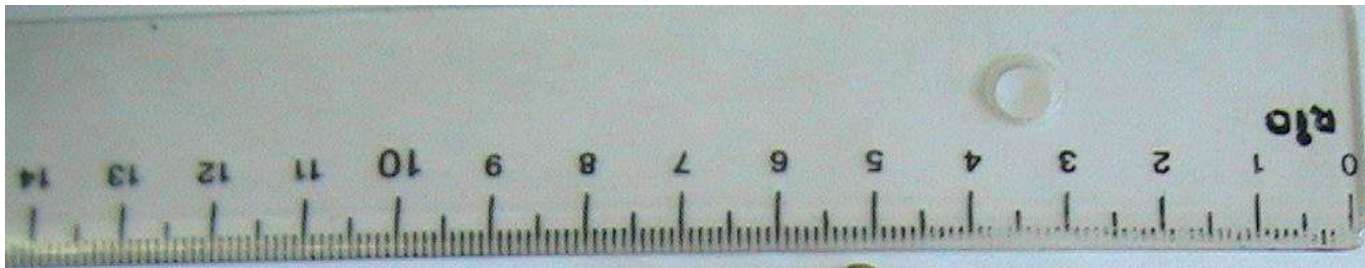














# MULTIPLICATION/REGENERATION STUDIES IN BEAN (*Phaseolu vulgaris* L.)



Bozdağ/İzmir- 1150m

# COWPEA (*Vigna unguiculata* (L.) Walp)



## COLLECTION DATA OF COWPEA LANDRACES

Province	Town	Villages	Height (m)
İzmir	Menemen	Ayvacık	150-500
Manisa	Salihli, Köprübaşı, Gördes, Demirci, Selendi, Alaşehir	Yunt Mountain Villages, Süngüllü, Siyekli, Yeniceköy, Musaca, Doğan kaya, Sarnıçköy, Dalgır	60-600
Aydın	Yenipazar, Bozdoğan, Kuyucak, Karacasu, Çine		300-830
Denizli	Serinhisar, Acıpayam, Çameli		710-1518
Muğla	Köyceğiz, Ula, Milas, Yatağan		50-1400
Antalya	Kaş, Korkuteli Elmalı, Finike, Seki, Kumluca Konyaaltı		
Burdur	Bozova, Gölhisar Yeşilova, Çavdır Bucak, Tefenni, Karamanlı		
Balıkesir	Burhaniye, Edremit, Havran, İvrindi		90-490
Çanakkale			
Bursa			
Uşak	Banaz, Sivashi, Karahallı, Ulubey, Eşme		670-950
Adana	Kozan Saimbeyli, Tufanbeyli		
Osmaniye	Merkez, Bahçe Hasanbeyli		
Hatay	Dörtyol, Serinyol, Reyhanlı, Samandağ, Kırıkhan		
Hakkari	Çukurca, Merkez Şemdinli, Yüksekova		
Maraş	Afşin Göksun, Elbistan Türkoğlu, Nurhak		490-1300
<b>Vigna unguiculata Genetic Resources (2007-2012)</b>		<b>235</b>	



## COWPEA LANDRACES (*Vigna unguiculata* L.)





# MUNG BEAN (*Vigna radiata* L.)



## COLLECTION DATA OF MUNG BEAN LANDRACES

Province	Town	Villages	Height (m)
<b>Antalya</b>			
Hakkari	Çukurca, Merkez Şemdinli, Yüksekova		
<b>Muğla</b>	Dalaman, Fethiye		
<b>Vigna radiata Genetic Resources (2007-2012)</b>		<b>6</b>	

# CHICKPEA (*Cicer spp.*)



Provinces	Towns	Villages	Height (m)
İzmir	Tire	Osmancık	350
Manisa	Muradiye, Salihli, Köprübaşı, Gördes, Demirci, Selendi, Alaşehir, Akhisar, Gördes	Yunt Mountain Villages ( Üçpınar, Süngüllü, Örselli, Siyekli, İlyasçılar, Osmançalı) Yeniceköy, Musaca, Başlamış, Doğankaya, Sarnıçköy, Şeyhyayla, Dalgır, Kılavuzlar	50 -750
Aydın	Yenipazar,Bozdoğan, Kuyucak,Karacasu, Çine		300-830
Denizli	Serinhisar, Acıpayam, Çameli		710-1518
Muğla	Köyceğiz, Ula, Milas, Yatağan		50-1400
Antalya	Kaş,Korkuteli Elmalı,Finike, Seki, Kumluca Konyaaltı		
Burdur	Bozova,Göhlisar Yeşilova,Çavdır Bucak, Tefenni,Karamanlı		
Kütahya	Aslanapa,Gediz, Simav, Emet , Şaphane , Tavşanlı , Altıntaş, Dumlupınar		800-1280
Afyon	Sinanpaşa İşçehisar, Emirdağ , Bolvadin, Çobanlar Şuhut		990-1320
Uşak	Banaz, Sivashlı, Karahallı, Ulubey, Eşme		670-950
Maraş	Afşin Göksun, Elbistan ,Türkoğlu, Nurhak		490-1300
Adana	Kozan Saimbeyli, Tufanbeyli		
Hakkari	Çukurca,Merkez Şemdinli,Yüksekova		
Bursa			
<b>Chickpea Genetic Resources (2007-2012)</b>	<b>113</b>		



# CHICKPEA LANDRACES (*Cicer arietinum* L.)





Desi types



Red chickpea



White chickpea





## *Cicer arietinum* L. Multiplication/Regeneration



# *Cicer pinnatifidum*

## Pots



## Field





# PEA (*Pisum sativum* L.)



## COLLECTION DATA OF PEA LANDRACES (*Vicia faba* L.)

Provinces	Towns	Villages	Height (m)
İzmir	Ödemiş		350
Manisa	Akhisar	Musaca	50 -750
Aydın	Yenipazar,Bozdoğan, Kuyucak,Karacasu, Çine		300-830
Denizli	Serinhisar, Acıpayam, Çameli		710-1518
Muğla	Köyceğiz, Ula, Milas, Yatağan		50-1400
Antalya	Kaş,Korkuteli Elmalı,Finike, Seki, Kumluca Konyaaltı		
Burdur	Bozova,Göhlisar Yeşilova,Çavdır Bucak, Tefenni,Karamanlı		
Balıkesir	Burhaniye, Edremit, Havran, İvrindi		
Çanakkale			
Nevşehir	Ürgüp		
<b>Pea Genetic Resources (2007- 2012)</b>	<b>69</b>		

# PEA LANDRACES (*Pisum sativum* L.)





*Different  
pod and  
grain types  
in pea*











# PEA (*Pisum spp.*) MULTIPLICATION/REGENERATION



# LENTİL (*Lens spp.*)



# LENTIL (*Lens spp.*) LANDRACES

Provinces	Towns	Villages	Height (m)
Manisa	Akhisar, Gördes	İlyasçılar, Yeniceköy, Musaca, Köseliler	500 -800
İzmir	Bergama	Kozak	
Aksaray	Güzelyurt		1507
Nevşehir	Ürgüp		1600
Burdur	Bozova, Gölhisar Yeşilova, Çavdır		
Kütahya	Aslanapa, Gediz, Simav, Emet , Şaphane , Tavşanlı , Altıntaş, Dumlupınar		800-1280
Afyon	Sinanpaşa İşcehisar, Emirdağ , Bolvadin, Çobanlar Şuhut		990-1320
Uşak	Banaz, Sivashlı, Karahallı, Ulubey, Eşme		670-950
Maraş	Afşin Göksun, Elbistan , Türkoğlu, Nurhak		490-1300
Adana	Kozan Saimbeyli, Tufanbeyli		
Hakkari	Çukurca, Merkez Şemdinli, Yüksekova		
Bursa			
<b>Lens spp Genetic Resources (2007-2012)</b>		<b>34</b>	



# LENTIL (*Lens spp.*) MULTIPLICATION/REGENERATION



# *Lens ervoides*









# *Lens orientalis*







# CHICKPEA CHARACTERIZATION

**Project: Food Grain Legumes Genetic Resources Research**

**Project Leader: Nüket Ay**

**116 landraces were characterized**

**Lattis design (8 x 8) , 2 replications,**

**4 m x 0,45 cm x 10 cm x 2 rows**

**Control Varieties: Canitez87, Sarı98, Cevdetbey98,**

**Menemen92, İzmir92, Aydın 92**









# FABA BEAN CHARACTERIZATION

**Project: Morphological and Molecular Characterization of Faba Bean (*Vicia faba* L.) Originated Turkey**  
**Project Leader: Dr. Eylem Tuğay Karagül**

**225 landraces were characterized**

**Lattis design (9 x 9) , 2 replications,**

**4 m x 0,45 cm x 10 cm x 2 rows**

**Control Varieties: Eresen87, Filiz99, Kıtık2003, Histal, Seher, Lara**









# **COWPEA CHARACTERIZATION**

**Project: Morphologic Characterization of Cowpea Landraces of Turkey and Evaluation for the Dry Conditions**  
**Project Leader: Dr. Alev Kır**

**235 landraces were characterized**

**Controls: Karagöz86, Akkız86, Poyraz**







# PROJECT: Characterization of Chickpea Genetic Resources and Improving Germplasm for Breeding Purposes

Project Leader: Eylem Tugay Karagul

- Seed Collection
- Characterization
- Surveying plants material having antrachnose
- Selecting single plants
- Testing the material for disease resistance
- Determining the protein contents
- Improving new germplasms

# The Projects Conducting on Grain Legumes in Turkey

1. Collection, Characterization and Conservation of Dry Bean Population in Artvin  
Ömer Sözen, Hüseyin Özçelik, Hatice Bozoğlu
2. Collection and Characterization of Dry Bean Genetic Resources in Black Sea Region  
Ömer Sözen, Hüseyin Özçelik, Meral Ergin, Hatice Bozoğlu
3. Breeding Studies of Dry Bean Landraces in Erzincan  
İbrahim Ulukan
4. Diversity and Use of Pinto Bean (*Phaseolus vulgaris* L.) Population from Samsun  
Ahmet Balkaya, Ahmet Ergün



5. Determination of Genetic Diversity among Chickpea (*Cicer arietinum* L.) Populations Collected from Konya Region using ISSR markers

Mustafa Yorgancılar

6. A study on Determining Yield and Yield Components on some Local Genotypes of Chickpea (*Cicer arietinum* L.) Collected from Çukurova and Middle Anatolia

Tolga Karaköy

7. Molecular Characterization of Chickpea (*Cicer arietinum* L.) Genotypes Sampled from Different Regions of Turkey

Alev Çeker

8. Nutritional and physicochemical variation in Turkish kabuli chickpea (*Cicer arietinum* L.) landraces

Sertaç Özer, Tolga Karaköy, Faruk Toklu, Faheem S. Baloch, Benjamin Kilian, Hakan Özkan

9. Molecular Characterization of Some Selected Landrace Green Bean

Kamile ULUKAPIA, Ahmet Naci ONUS