

Third meeting of *Malus/Pyrus* working group of the ECP/GR



Status of *Malus* and *Pyrus* Collections in Georgia

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Tbilisi. Georgia.

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GEORGIA



Location:
South Caucasus

Longitude: $40^{\circ}05'$ - $46^{\circ}44'$
Latitude: $41^{\circ}07'$ - $43^{\circ}35'N$

Area: 69.700 km²



Annual average temperature: $+11^{\circ}$ - $+12^{\circ}$

Sum of active temperature: 3200° - 4000° and more

Minimal temperature: -15° one time in 20-25 years

Annual precipitation: 1000 - 2800 mm in Western Georgia,
300 - 800 mm in Eastern Georgia.

Climatic zones: Western Georgia - dominants humid subtropical climate,
Eastern Georgia - are ranging from subtropical to moderate

History of *Malus/Pyrus* Collections in Geo

- Introduction of European cultivars in Georgia started since **1845-1850**.
- In the **60th of XIX** century **Niko Ketskhoveri** from village *Tkviavi* had more than 200 cultivars of apple, pear and other fruits in his collection; **Isaia Purtseladze** from village *Mereti* had approximately 500 European cultivars and autochthonous varieties of different fruits.
- **Sokhumi Testing Station**, established in **1894**, maintained 147 introduced cultivars of apple and 262 cultivars of pear together with other crops.
- **Sakara Testing Station of Horticulture**, established in **1932**, had large collection of fruit crops with 291 varieties of apple and 169 varieties of pear (introduced + local) among those. For **1969** here was other collections with 495 varieties of apple and 200 varieties of pear with different fruit crops.
- **IHVO Varketili collection** of various fruits was established in **1961-1964** with 133 varieties of apple and 50 varieties of pear together with other fruits.
- **IHVO Galavani collection** of fruit crops was largest in the **80th of XX** centuries.

List of *Malus/Pyrus* Collections in Georgia for Today

1. IHVO Gori collection of apple and pear modern cultivars and rootstocks, established in the framework of the FAO project
2. IHVO Gori orchard of breeding apple forms
3. IHVO Vashlijvari collection of hybrid apple and pear
4. NGO “Elkana” collection of autochthonous varieties of apple in Akhaltsikhe
5. Gori Fruit Producers Association’s collection in Kareli district in village Bebnisi

IHVO Gori Collection- Apple & Pear



Cultivars



Rootstocks

Rootstocks:

- Apple – 4 acc. 755 plants
- Pear – 2 acces. 10 plants

The collection was established in the framework of the **FAO** project **“Fruit Sector Rehabilitation Project in Georgia”** in 2002.

Main mission of the collection is renew of cultivated varieties of apple and pear in Georgia.

The varieties are advanced European and American cultivars. They were introduced from the nursery of **Batistini**, Italy.

Apple - Number of:

- accessions -10
- plants in acc. 3-7
- total plants - 47

Pear - Number of:

- accessions – 10
- plants in acc.1-7
- total plants - 35

Planting Layout: 5.0x2.0
Grafted
Rootstocks: M9 (apple)
and seedlings (pear)



IHVO Gori Orchard of Breeding Forms of Apple



Year of Establishment – 2000
Planting Layout – 7.0 x 5.0 m
Status of plants – Hybrids
Grafted

Gori Breeding Station of IHVO
Longitude 42⁰⁰'58
Latitude – 44⁰⁶'30
Altitude – 620 m asl.

Numbers:

- **accessions – 20**
- **plants per acc. 2-10**
- **total plants - 126**

IHVO Vashlijvari Collections-Apple & Pear



Location:

Tbilisi. Inner Kartli.
In front of the main
building of the Institute

6 Marshal Gelovani Ave.

Longitude – 41°45/
Latitude – 44°47/
Altitude – 420 m asl.

Type of Soil – Alluvial

Average temperature in the year – 12,5 C°

Average rainfall in the year – 580 mm

IHVO Vashlijvari Collection – Apple



Year of Establishment – 2002
Planting Layout – 2.5 x 1.8
Type of Plants - grafted
Rootstock - seedlings

Number of:

- **accessions – 16**
- **hybrids – 9**
- **Introduced cultivars – 7**
- **selected forms – 3**
- **plants - 34**



IHVO Vashlijvari Collection – F₁ Hybrid Pears

Year of Establishment – 1995

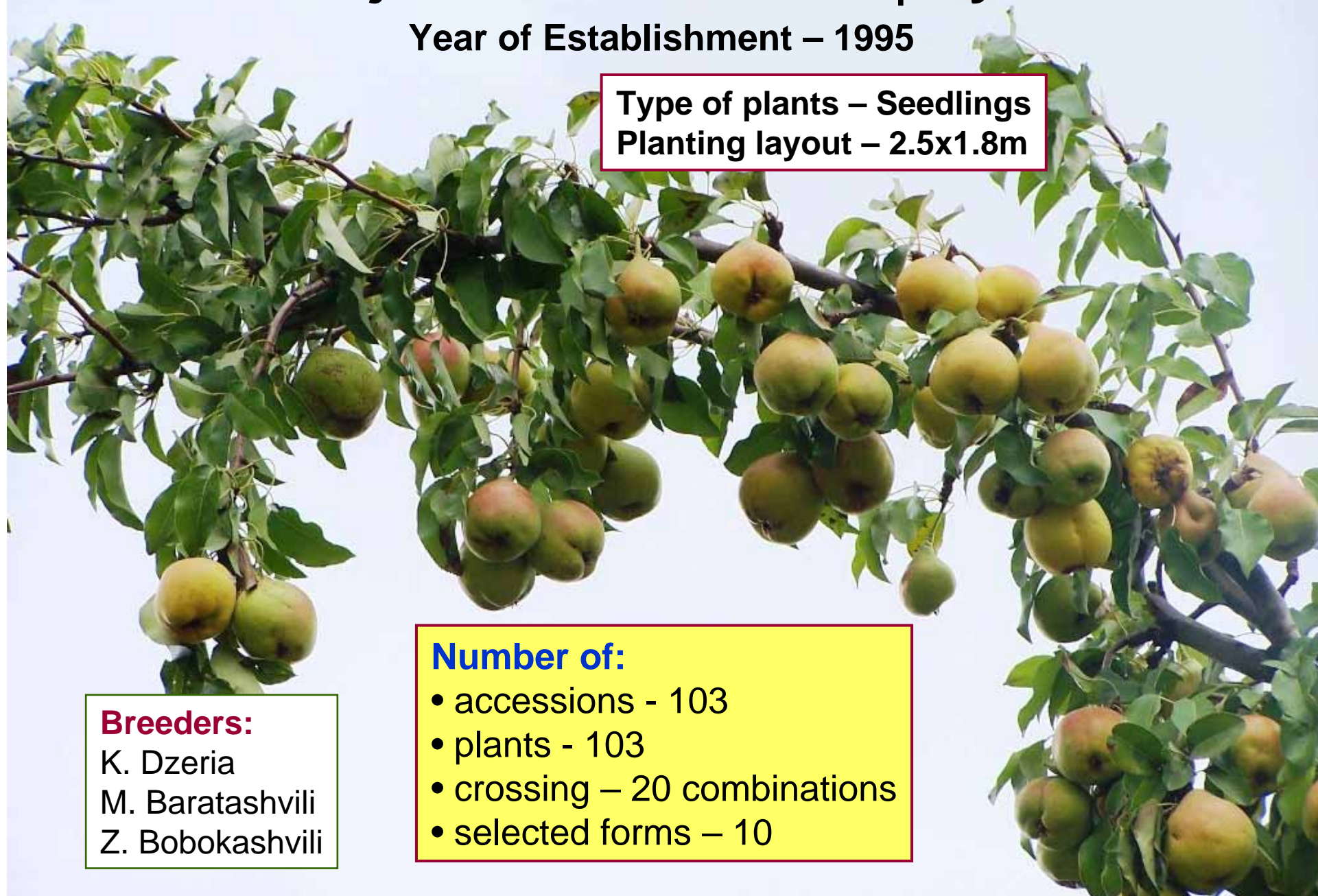
Type of plants – Seedlings
Planting layout – 2.5x1.8m

Breeders:

K. Dzeria
M. Baratashvili
Z. Bobokashvili

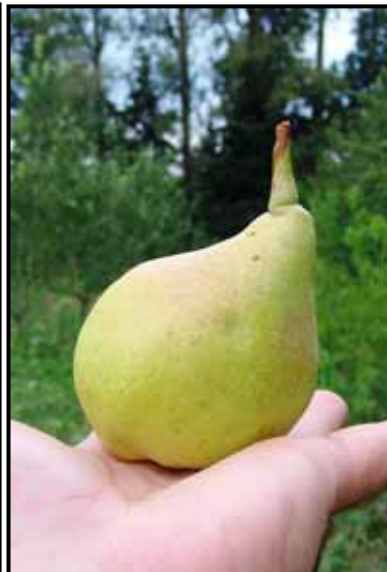
Number of:

- accessions - 103
- plants - 103
- crossing – 20 combinations
- selected forms – 10



Diversity of Hybrid Pears

(Vashlijvari Collection)



The Apple Collection of the Fruit Association



Year of Establishment – 2004
Planting Layout – 5.0 x 3.0 m
Status of plants – Modern Cultivars Grafted
Rootstocks – M7, M9, MM106, M111
Drop irrigation



Village Bebnisi (Kareli)
Longitude 42°02'55
Latitude – 43°54'31
Altitude – 662 m asl.

Numbers:

- accessions – 21
- plants per acc.- 34
- total plants – 846
- 3 rootstocks - 5000



GEF/UNDP Project on Agrobiodiversity

GEO/01/G41/A/1G/72

Title: Recovery, Conservation and Sustainable use of Georgia's Agrobiodiversity.

Receiver: Biological Farming Association "ELKANA" (NGO)

Realization: 3 agricultural regions of Georgia - **Samtskhe-Javakheti**, **Racha-Lechkhumi** and **Svaneti** - were investigated and biodiversity of autochthonous varieties of fruit crops have been described.

Expert Institution: Research Institute of Horticulture, Viticulture and Oenology

Supervisor from the Institute: Dr. Vazha Kvaliashvili

Fruit experts:

Samtskhe - Javakheti – Drs G. Jomardidze, T. Kurtanidze

Racha - Lechkhumi – Drs D. Maghradze, M. Donadze

Svaneti – Drs K. Dzeria, T. Trapaidze

Year: 2001

Results of the “Elkana Project ”

Ratcha-Lechkhumi:

Apple – 17

Pear – 18

Svaneti:

Apple – 4

Pear – 3



Total results:

Apple – 53

Pear – 48

Samtskhe – Javakheti:

Apple – 32

Pear – 27

“Elkana” Collection of Local Apple Varieties in Akhaltsikhe

The orchard



Year of planting - 2005

Number of:

- accessions - 22
- plants in acc. – 10
- total plants – 220
- autochthonous var.
- parents - unknown

Location:

Village – Tsnisi

Longitude – 41°39.33N

Latitude – 43°01.59E

Altitude - 970 asl.

Planting Layout: 5.0x4.0 m



The nursery



Research of Local Fruit Diversity by IHVO



In August 2005 the Department of Grapevine and Fruit Crop Germplasm Research, Genetics and Breeding and Skra Testing Station of Horticulture of the IHVO organized expedition for investigation local varieties of fruit in Gori district (Inner Kartli).

113 genotypes have been discovered. **Among those are 80 genotypes of apple and pear.**

Founded local varieties have been propagated in a nursery.

New orchard will be established in Spring 2007.



Status of Collections in Georgia

Accession type	No of accessions	
	Apple	Pear
Advanced cultivars	38	10
Local Varieteis	22	0
Hybrid - selected	29	0
Hybrid – F ₁ seedlings	0	103
Wild species	0	0
Rootstocs	7	2
Total	96	115

Table 1. Status of apple and pear collections in Georgia for 2006

PEAR

Crop Wild Relatives

APPLE

26 Species of *Pyrus* in the Caucasus
11 Species – in Georgia

1. *P. Caucasica* Fed.*
2. *P. Balansae* Decne.
3. *P. Ketskhoveli* Kuth.
4. *P. Demetrii* Kuth.
5. *P. Eldarica* Gross.*
6. *P. Fedorovii* Kuth.
7. *P. Oxypron* Woron.
8. *P. Takhtadzhiani* Fed.*
9. *P. Sakhokiana* Kuth.
10. *P. Georgica* Kuth.*
11. *P. Salicifolia* Pall.

3 Species of *Malus* in the Caucasus
1 Species – in Georgia

1. *M. Orientalis* Uglitzk.



Fig. Spreading of *Malus* Species in the Caucasus (Grossgeim, 1957)

“Fruits of Georgia”

In 1939 and 1941 trilingual (Geo, Russ, Eng) “**Fruits of Georgia**” was published by N. Khomizurashvili & E. Eristavi. Editor in Chief – N. Ketskhoveli.

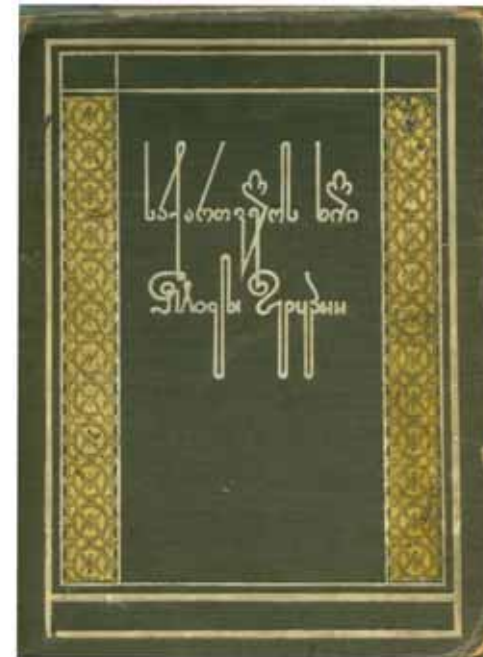
Volume 1.
“Varieties of Local Georgian Fruits”

Apple – 29 Pear - 14

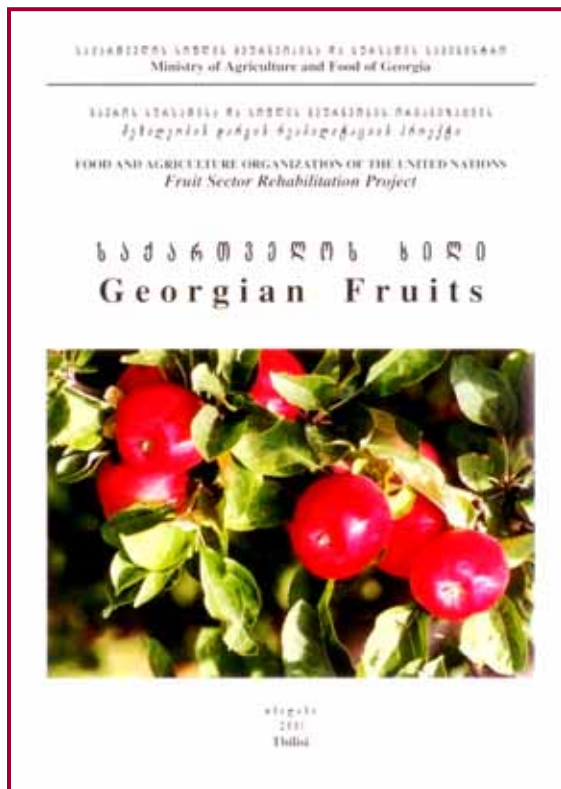


Volume 2.
“Varieties of Commercial Georgian Fruits”

Apple – 30 Pear – 27



The Catalogue “Georgian Fruits”



The bilingual (Geo, Eng) “**Georgian Fruits**” (Catalogue of the dominant and prospective pome and stone fruits) have been prepared in the framework of the FAO “**Fruit Sector Rehabilitation Project**” TCP/GEO/0065 (A) and was printed in 2001. Editor – V. Kvaliashvili.

Described Cultivars:
 Apple – 14 (4 local)
 Pear – 9 (2 local)
 Quince – 3 (local)



IPGRI & UPOV Descriptors' Usage

ARMAZI

MZIURI

KHORUMI

DELISI

These are new hybrid cultivars of IHVO breeding described with usage **47 descriptors** by Drs Z. Bobokashvili and M. Baratashvili.

Most of varieties need to be described.

DNA Analyses

No one Georgian varieties have been described by molecular markers since today.

In Georgia don't is any laboratory of DNA analyses for investigation agricultural biodiversity.

But in the framework of the World Bank "ARET" project our institute has ordered basic equipments for organization molecular laboratory.

Geo Malus/Pyrus Excel Database

Microsoft Excel - Unite Geo Malus & Pyrus database.xls

File Edit View Insert Format Tools Data Window Help

Type a question for help

Reply with Changes... End Review...

100%

Arial 10

J37

	A	B	C	D	E	F	G	H	I	J	
1	GORI breeding station - APPLE/ PEAR orchard (Italian)										
2								Place	sity Gori, Ckhinvali ave		
3					Contact person	Z. Bobokashvili		Establishment Time	10 - 11 APRIL 2002		
4					Phone	893335793		Elevation, ASL	620 m		
5								Long	42-00.58 N		
6								Alt	44-06.30 E		
7		Variety	Species	Pedigree	Supplier	Number	Rootstock	Average weight of fruit	Color of fruit	Harvest time	Pla
8											
9	1	Fuji (Nagafu 9)	Malus Mill	Introduction	Battistini nursery, ITALY	6	M9 Pajam1	150 - 170	RED	OCTOBER (II decade)	5 m
10	2	Steiman	Malus Mill	Introduction	Battistini nursery, ITALY	5	M9 Pajam1	160 - 180	RED	OCTOBER (II decade)	5 m
11	3	Red chief	Malus Mill	Introduction	Battistini nursery, ITALY	5	M9 Pajam1	180-200	RED	SEPTEMBER (III decade)	5 m
12	4	Galaxi	Malus Mill	Introduction	Battistini nursery, ITALY	3	M9 Pajam1	160 - 180	RED	SEPTEMBER (II decade)	5 m
13	5	Golden B	Malus Mill	Introduction	Battistini nursery, ITALY	6	M9 Pajam1	160 - 180	YELLOW	SEPTEMBER (III decade)	5 m
14	6	Goldrush	Malus Mill	Introduction	Battistini nursery, ITALY	5	M9 Pajam1	150 - 160	YELLOW	OCTOBER (III decade)	5 m
15	7	Mundial Gala	Malus Mill	Introduction	Battistini nursery, ITALY	5	M9 Pajam1	150 - 170	RED	SEPTEMBER (II decade)	5 m
16	8	Canadien Renette	Malus Mill	Introduction	Battistini nursery, ITALY	3	M9 Pajam1	160 - 180	YELLOW-russet	SEPTEMBER (III decade)	5 m
17	9	Royal Gala	Malus Mill	Introduction	Battistini nursery, ITALY	5	M9 Pajam1	160 - 180	RED	SEPTEMBER (II decade)	5 m
18	10	Imperatore Dalago	Malus Mill	Introduction	Battistini nursery, ITALY	4	M9 Pajam1	150-170	RED	OCTOBER (I decade)	5 m
19	11	Spadona estiva	Pyrus Communis	Introduction	Battistini nursery, ITALY	3	Pear seedlings	160 - 180	YELLOW	AUGUST (I decade)	5 m
20	12	Abatte fetelle	Pyrus Communis	Introduction	Battistini nursery, ITALY	4	Pear seedlings	160 - 180	YELLOW	SEPTEMBER (II decade)	5 m

Washlijvari apple | Washlijvari-Pear-2 | Gori hybrids | Gori-Italian | Elkana | Gori-Fruit prod. /

Draw | AutoShapes

Ready

start | Micro... | photo... | Micros... | Malus... | Micros... | EN | 0.17



<http://www.fao.org/hortivar/index.jsp>

New search Refine query **Search results**

Select one entry to see its information

HORTIVAR Horticulture Cultivars Performance Database

Home page->Search page->[\[Search results\]](#)

[Searched criteria]

Total found= 22
Total pages= 2, Current page= 1
(1 - 20) of 22

Common name ↑↓	Cultivar name ↓	Type ↑↓	Country ↑↓	Location ↑↓	Options
Apple (M. domest.)	Alkmene	Graft	Georgia	Galavani	
Apple (M. domest.)	Alpinist	Graft	Georgia	Galavani	
Apple (M. domest.)	Astraxans Red	Graft	Georgia	Galavani	
Apple (M. domest.)	Azbel spur	Graft	Georgia	Galavani	
Apple (M. domest.)	Crimson Beauty	Graft	Georgia	Galavani	
Apple (M. domest.)	Early red	Graft	Georgia	Galavani	
Apple (M. domest.)	Fantasia	Graft	Georgia	Galavani	
Apple (M. domest.)	Idared	Graft	Georgia	Galavani	

22 apple and 30 pear accessions from our institute present in this database.

Conclusions

- Little number of advanced cultivars are in the collections of our country
- Very few autochthonous and local varieties are protected in our collections in spite their wide number in farms and gardens in Georgia
- Wild species of *Malus* and *Pyrus* absent in our collections
- Absent of governmental funding projects for protection biodiversity of fruit crops
- Not all Georgian local varieties are described by pomological and agronomic traits yet
- Most local varieties need to be described with usage IPGRI and UPOV descriptors
- Do not exist the book with color photos and description of all local varieties
- Accessions of fruit crops from Georgia aren't included in the European *Malus, Pyrus*, EURESCO and other databases even only in the "Hortivar".

Acknowledgments

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