

Albanian active collection with focus on documentation

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Introduction

In Albania, as in many countries, is increasing the loss of genetic resources of crop plants.

Future progress in crop improvement and food security depends on immediate conservation of the crop gene resources and their effective utilization by plant breeders.

In this context, a great deal has been accomplished by Albanian Gene Bank (AGB)/Centre of Genetic Resources (CGR) in the last 15 years to safeguard the PGR which constitutes the natural heritage.

However, **much** still **remains to be done** in improving the conservation strategies and **upgrading the collections**, which include a wide range of diversity (primitive cultivars, landraces, weedy forms, unimproved and modern cultivars, and wild relatives).

Base and active collections

Currently, **two main types** of collections are held in Albanian genebank.

Base collection & Active collection

Base collection: held under conditions which retain viability for long periods of time, has the purpose of acting as a conservation measure.

Base collection, is restricted in distribution, and it is used as a back-up to **active collection**.

Active collection refer to accessions kept for medium term, which are immediately available for distribution for utilization and multiplication.

Active collection in AGB was first created with **104 accession of maize** (2010).

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Active collection – Storage conditions

The active collections of AGB genebank are stored in standard aluminum cans for all crops and in paper bags at 0 - 4°C.



Depending on the crop species, the equilibrium moisture content for these samples ranges between 3 - 7 %.

Active collection are kept in conditions, which ensure that the accession viability remains above 65% for 10 years.

Storage conditions for active collection are less stringent than for base collection (for economic and practical reasons).



Active collection

Albanian genebank/Centre of Genetic Resources maintain **both types** of collection.

The processing of germplasm accessions for **active and base collections** in Albanian genebank is **done in a similar manner**.

The **sample size** of accessions in active collections are bigger than for base collections.

Active and base collections are linked by its **documentation system**.

Seeds of **active collection** are used as **breeder's collections, for regeneration, evaluation, research and distribution** to interested users.



Active collection – Documentation system

Documenting the information received with a sample is an important aspect of registration in genebank.

Documentation at registration process consists of passport data providing basic information for identification and general management of individual accessions.

Much of this information is recorded **when the sample is collected** or accompanies the sample if it is received from other sources.

The use of **internationally descriptor lists (MCPD)** to document passport information simplifies data exchange between genebanks.

Active collection – Actual status

No.	Name of taxon	Name of crop	No. Acc. in active collection
1	<i>Triticum aestivum</i>	Bread wheat	23
2	<i>Avena sativa</i>	Oat	8
3	<i>Secale cereale</i>	Rye	9
4	<i>Hordeum sativum</i>	Barley	68
5	<i>Allium cepa</i>	Onion	5
6	<i>Allium porrum</i>	Leek	1
7	<i>Solanum lycopersicum</i>	Tomato	11
8	<i>Solanum melongena</i>	Eggplant	3
9	<i>Cucumis melo</i>	Melon	3
10	<i>Capsicum annum</i>	Pepper	16
11	<i>Phaseolus vulgaris</i>	Common bean/Haricot	117
12	<i>Zea mays</i>	Maize	104
	Total		368

Active collection - Documentation

Documentation & Information are essential for genebank management (= play significant role in PGR conservation, and allow effective use of germplasm).

Documentation system of active collection kept record of genebank operation data, (storage conditions, location, stocks, monitoring, health tests, distribution status, etc).

Characterization and evaluation data are of little use **if they are not adequately documented** and incorporated into an information system that can facilitate access to data.

Computerized documentation systems enable rapid dissemination of information to users as well as assist curators to manage the collections more efficiently.

Active collection – Characterization/evaluation data

Characterization and evaluation data are of little use if they are not adequately documented and incorporated into an information system that can facilitate access to data.

Maize 104 acc.

(10 QL traits + 21 QN characters)

Pea 12 acc.

(15 QL traits + 23 QN characters)

Grass pea 12 acc.

(10 QL traits + 14 QN characters)

Common bean 117 acc.

(5 QL traits + 4 QN characters)

Active collection and germplasm distribution

The **purpose of creation of active collection** in genebank was:

- to make it available for use by current generations,
- to improve crop varieties through plant breeding processes.
- to meet the needs of farmers and communities,
- for research activities or
- to restore diversity lost on farm and in natural habitats.

Seeds or plant material is only distributed from active collections.

Genebank must be more proactive in establishing links with germplasm users, breeders, researchers, farmers and other groups to enhance the use of the germplasm.

Active collection and germplasm distribution

- **Genebank has mandate to distribute seeds** to all users who will use the germplasm for research purposes.
- **Samples** are generally distributed in small amounts, only few seeds since genebanks do not store large seeds stocks.
- **Distribution = Standard Material Transfer Agreement**, signed by the recipient before seeds are mailed.
- **A sanitary certification and a questionnaire** is generally added to the sent seeds in order to get feedback from the end users.
- **No fee** is generally requested for research institutions or non merchantile requests.

Active collection and germplasm distribution

Genebank has distributed seeds from active collection to users as follow:

Ukrainian genebank:

- *Triticum aestivum* = 10 accessions.
- *Phaseolus vulgaris* = 6 accessions.
- *Zea mays* = 4 accessions.

Institute of Field and Vegetable Crops (Novi Sad, Serbia):

Sorghum ssp. = 19 accessions.

Crop Production Department (Agriculture University of Tirana)

- *Pisum sativum* 12 accessions
- *Lathyrus sativus* 12 accessions
- *Origanum vulgare* 40 accessions

Horticulture Department (Agriculture University of Tirana)

- *Pisum sativum* 12 accessions
- *Vicia faba* 12 accessions

Faculty of Natural Sciences (University of Tirana):

- *Medicago sativa* = 20 accessions.

Active collection – Documentation & Information

A **simple modest information** system is created in genebank (Excel formats, photos, GIS Maps, etc).

The active collection database is searchable by the genebank curators, staff and users for specific information **through a request**.

Tools like GIS help in searching for:

- areas where germplasm was collected,
- possible geographic gaps,
- germplasm with specific characteristics (ALB genebank has obligatory to note **one or more characteristics** why one sample/accession is collected),
- monitoring changes in crops and varieties (in space and in time),
- deciding where to locate potential priority areas for in situ conservation.

Active collection – Documentation system

Documentation of active collection maintained all **mandatory fields** of base collection:

NICODE (0), INSTCODE (1), ACCENUMB (2), COOLNUMB, GENUS (5). Must be added: Geographical coordinates of Collecting Site: (*Latitude, Longitude, Elevation, Adm01, Adm02, Adm03*)

1	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	STC
NICODE	INSTCODE	ACCENUMB	COLLNUMB	COLLCODE	GENUS	SPECIES	SPA	SI	S	CROPIA	ACCENAME	ACQDATE	ORIGC	COLLSITE	LATITUDE	LONGITUDE	ELEVATION	COLLDATE	BR	SAMP	AN	COLL	DONORCO	DONORNU	OT	DUPL	SITE	STC
868	ALB	ALB017	AGB0867	KHP140	ALB006	Zea	mays	L.		maize	Çaragjati	20030108	ALB	Mat	4135--N	01959--E	350	1976----	300	40	ALB006	IMO0339	ALB006	13				
869	ALB	ALB017	AGB0868	KHP141	ALB006	Zea	mays	L.		maize	Qelqor i bard	20030108	ALB	Permet	4013--N	02021--E	350	1976----	300	40	ALB006	IMO0340	ALB006	13				
870	ALB	ALB017	AGB0869	KHP142	ALB006	Zea	mays	L.		maize	Miser i bardh	20030108	ALB	Permet	4013--N	02021--E	350	1976----	300	40	ALB006	IMO0341	ALB006	13				
871	ALB	ALB017	AGB0870	KHP143	ALB006	Zea	mays	L.		maize	I bardhe i me	20030108	ALB	Tropoje	4224--N	02010--E	600	1976----	300	40	ALB006	IMO0342	ALB006	13				
872	ALB	ALB017	AGB0871	KHP144	ALB006	Zea	mays	L.		maize	Dukaj	20030108	ALB	Permet	4013--N	02021--E	450	1976----	300	40	ALB006	IMO0343	ALB006	13				
873	ALB	ALB017	AGB0872	KHP145	ALB006	Zea	mays	L.		maize	Qeserat	20030108	ALB	Puke	4202--N	01954--E	400	1976----	300	40	ALB006	IMO0344	ALB006	13				
874	ALB	ALB017	AGB0873	KHP146	ALB006	Zea	mays	L.		maize	Filat	20030108	ALB	Korçe	4035--N	02040--E	600	1976----	300	40	ALB006	IMO0345	ALB006	13				
875	ALB	ALB017	AGB0874	KHP147	ALB006	Zea	mays	L.		maize	Fara e hadh p	20030108	ALB	Diber	4140--N	02027--E	400	1976----	300	40	ALB006	IMO0346	ALB006	13				
876	ALB	ALB017	AGB0875	KHP148	ALB006	Zea	mays	L.		maize	Mas e allore	20030108	ALB	Gjrokaster	4009--N	02010--E	400	1976----	300	40	ALB006	IMO0347	ALB006	13				
877	ALB	ALB017	AGB0876	KHP149	ALB006	Zea	mays	L.		maize	Fara e gurres	20030108	ALB	Shkoder	4215--N	01946--E	500	1976----	300	40	ALB006	IMO0348	ALB006	13				
878	ALB	ALB017	AGB0877	KHP150	ALB006	Zea	mays	L.		maize	Mis e gushtit	20030108	ALB	Puke	4202--N	01954--E	500	1976----	300	40	ALB006	IMO0349	ALB006	13				
879	ALB	ALB017	AGB0878	KHP151	ALB006	Zea	mays	L.		maize	Fara e Lushit	20030108	ALB	Tropoje	4224--N	02010--E	600	1976----	300	40	ALB006	IMO0350	ALB006	13				
880	ALB	ALB017	AGB0879	KHP152	ALB006	Zea	mays	L.		maize	Pa emertim	20030108	ALB	Kolonje	4049--N	01937--E	700	1976----	300	40	ALB006	IMO0351	ALB006	13				
881	ALB	ALB017	AGB0880	KHP153	ALB006	Zea	mays	L.		maize	Imesem	20030108	ALB	Shkoder	4215--N	01946--E	250	1976----	300	40	ALB006	IMO0352	ALB006	13				
882	ALB	ALB017	AGB0881	KHP154	ALB006	Zea	mays	L.		maize	Gushtak Pes	20030108	ALB	Kukes	4211--N	02012--E	400	1976----	300	40	ALB006	IMO0353	ALB006	13				
883	ALB	ALB017	AGB0882	KHP155	ALB006	Zea	mays	L.		maize	Mesutek	20030108	ALB	Kukes	4211--N	02012--E	400	1976----	300	40	ALB006	IMO0354	ALB006	13				
884	ALB	ALB017	AGB0883	KHP156	ALB006	Zea	mays	L.		maize	Reç i verdhe	20030108	ALB	Shkoder	4215--N	01946--E	400	1976----	300	40	ALB006	IMO0355	ALB006	13				
885	ALB	ALB017	AGB0884	KHP157	ALB006	Zea	mays	L.		maize	Gushtak i ve	20030108	ALB	Shkoder	4215--N	01946--E	450	1976----	300	40	ALB006	IMO0356	ALB006	13				
886	ALB	ALB017	AGB0885	KHP158	ALB006	Zea	mays	L.		maize	Reç i vedhe	20030108	ALB	Tropoje	4224--N	02010--E	450	1976----	300	40	ALB006	IMO0357	ALB006	13				
887	ALB	ALB017	AGB0886	KHP159	ALB006	Zea	mays	L.		maize	Koleskati	20030108	ALB	Sarande	3952--N	02000--E	100	1976----	300	40	ALB006	IMO0358	ALB006	13				
888	ALB	ALB017	AGB0887	KHP160	ALB006	Zea	mays	L.		maize	Bokel kuqe v	20030108	ALB	Diber	4140--N	02027--E	450	1976----	300	40	ALB006	IMO0359	ALB006	13				
889	ALB	ALB017	AGB0888	KHP161	ALB006	Zea	mays	L.		maize	Imesem	20030108	ALB	Shkoder	4215--N	01946--E	200	1976----	300	40	ALB006	IMO0360	ALB006	13				
890	ALB	ALB017	AGB0889	KHP162	ALB006	Zea	mays	L.		maize	Fara e dyte	20030108	ALB	Peshkopi	4140--N	02027--E	450	1976----	300	40	ALB006	IMO0361	ALB006	13				
891	ALB	ALB017	AGB0890	KHP163	ALB006	Zea	mays	L.		maize	I verdhe i me	20030108	ALB	Tropoje	4224--N	02010--E	550	1976----	300	40	ALB006	IMO0362	ALB006	13				
892	ALB	ALB017	AGB0891	KHP164	ALB006	Zea	mays	L.		maize	Fara e kuqe	20030108	ALB	Tropoje	4224--N	02010--E	500	1976----	300	40	ALB006	IMO0363	ALB006	13				
893	ALB	ALB017	AGB0892	KHP165	ALB006	Zea	mays	L.		maize	16-18 rresht	20030108	ALB	Fier	4044--N	01936--E	100	1976----	300	40	ALB006	IMO0364	ALB006	13				
894	ALB	ALB017	AGB0893	KHP166	ALB006	Zea	mays	L.		maize	Fara e dyte	20030108	ALB	Diber	4140--N	02027--E	450	1976----	300	40	ALB006	IMO0365	ALB006	13				
895	ALB	ALB017	AGB0894	KHP167	ALB006	Zea	mays	L.		maize	Gielash	20030108	ALB	Shkoder	4215--N	01946--E	300	1976----	300	40	ALB006	IMO0366	ALB006	13				

Information systems: **Problems identified**

As the **purpose of creation of active collection** (= used by breeders, for regeneration, evaluation, research and distribution) Information system must facilitate access to data.

Excel format used in genebank unfortunately is not a powerful tool in Genebank Information System. Information in Excel format is not very useful for users. Characterization data (in Excel) are less useful to users ..

Albanian genebank has **NOT** yet developed an advanced Genebank Information Management System designed to integrate various documentation activities and to provides information on accessions due for all genebank procedures.

AGB dos not use a Bar-coding as a useful tool that can compliment a genebank information system.

Information systems: **Problems identified**

- ☞ **Albania has all Tools for a contemporary DATABASE + necessary accessories (= FAO support) but not a proper Home Documentation and effective Information Systems easy to be used by users.**
- ☞ **Some training qualification of staff and support from Countries with Advanced Documentation and Information Systems is necessary.**

AGB Regeneration Field



