Albanian active collection with focus on documentation

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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).
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.
**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

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

Excel
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.
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