The Experience of a Collaborative Network on Grapevine Genetic Resources in the Caucasus and Northern Black Sea Area

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The Project Coordinated by the International Plant Genetic Resources Institute

“Conservation and Sustainable Use of Grapevine (Vitis vinifera L.) Genetic Resources in the Caucasus and the Northern Black Sea Region”

Financial Support of the Government of Luxembourg

Starting data
Oct. 2003

The countries
Azerbaijan
Armenia
Georgia
Moldova
Russia
Ukraine
Aim and Motives of the Project

The AIM is identifying, collecting, characterizing and conserving the rich diversity of grapevine genetic resources throughout the Caucasus and the Northern Black Sea region as a basis to improve local viticulture and wine making industry.

- The large number of traditional local varieties existing in the region;
- Significant relevant of these resources for the development of the European modern cultivars;
- The wild, *Vitis vinifera* ssp. *silvestris*, ancestor of the cultivated grapevine, still occurs throughout this region;
- Wine production is a major potential source of income for the local population;
- Economical difficulties of regional countries to protect biodiversity.
The Caucasus - One of the Ancient Center of Origin and Domestication on Grapevine in the World

G. Forni, 2005
The Network of the Project

Partner Countries

Azerbaijan
Res. Inst. of Viticulture and Winemaking

Armenia
Acad. of Viticulture, Winemaking and Fruit-growing

Georgia
Inst. of Horticulture, Viticulture and Oenology

Moldova
National Inst. for Viticulture and Oenology

Russia
Kuban State Agrarian University

Russia
Crimean Res. Station of N.I. Vavilov Inst. of Plant Industry

Ukraine
Inst. for Vine and Wine “Magarach”

IPGRI

The Project Facilitator

Partner Institutions - Fellowship and Research

Luxembourg
Centre de Recherche Public-Gabriel Lippmann

Italy
The University of Milan

Germany
Inst. of Grapevine Breeding Geilweilerhof

Italy
Laboratory of archaiobotanic, Rome

Partnership

ECP/GR and the Working group on Vitis
Main Directions of Project
Activities for Conservation

1. Investigation sanitary conditions of old collections
2. Inventory of local varieties
3. Mobilization and identification of local varieties & clones
4. Establishment of new collections
5. Characterization and description of varieties
6. Research biodiversity of national grapevines
Inventory of Local Varieties

In 2004 IPGRI took in sub-projects “Inventory of autochthonous grapevine (Vitis sp.) varieties in Azerbaijan, Armenia, Georgia, Moldova, Russian Federation and Ukraine”.

During implementation this task each countries made observation of their collections, defined more exactly number of existing local (autochthonous, clones, breeding) varieties of project partners and evaluated their conditions with synonyms and some important agronomic traits.

Total number of accessions in the database are 3354 from 13 collections
The Project Database

On the basis of the inventory 2004 a database of the Project has been completed in Excel format, including: institute numbers, names, synonyms, FAO codes for institutions, basic information about their location, origin and sanitary conditions.

The database has been transferred to Dr E. Maul for including it in the European Vitis Database.
Two New Collections

2 new collections have been established in the framework of IPGRI’s project:

**ARMENIA:** A new Ararat collection was established with 190 accessions (90 varieties and 120 clones) in 2005. There are planted Armenian autochthonous varieties, they clones and breeding varieties of Armenia.

**GEORGIA:** A new Vashlidjvari collection was established with 218 accessions in 2003. For today total number of accessions reached to 350. There are planted Georgian autochthonous varieties, their clones and breeding varieties of Georgia in the collection.
Genetic Resources Mobilization & Partnership

For compilation of new Vashlidjvari collection in Georgia our local varieties have re-introduced from collections of Italy, Moldova and Ukraine in 2004-2006.

For establishment the new Ararat collection in Armenia 90 varieties and their clones were transferred from 3 old collections and from old vineyards of the country.

For enlargement the new Anapa collection Russia mobilized 536 local genotypes from other collections of country.

Azerbaijan mobilized inside the country and 7 varieties from Moldova.
Identification

✓ 24 previously recovered varieties have been identified and 19 varieties were discovered by the Institute “Magarach” in Sudak region of Crimea.

✓ Armenia and Azerbaijan described rare varieties in farms inside the countries.

✓ Georgia identified his autochthonous varieties in Chisinau Collection (78 varieties) and in Magarach Collection (68 varieties).
Developing Capacity

Three fellowships on *Vitis* has been developed by IPGRI for researchers from the southeastern Europe during period 2003-2006:

1. **S. Gorislavets** from the Institute for Vine and Wine ‘Magarach’ (Ukraine) and **A. Zviagin** from the Kuban State Agrarian University (Russia) had 3 months fellowship in the *Centre de Recherche Public - Gabriel Lippmann* in Luxembourg. 34 cvs from UKR were investigated.

2. **D. Maghradze** from the Research Institute of Viticulture, Horticulture and Oenology (Georgia), had 10 months fellowship at the *University of Milan* under guide Profs. A.Scienza and O.Failla

The **Aim** of the fellowships was capacity building among researchers from east and west Europe and transferring basic knowledge to increase *Vitis* research ability in Ukraine, Russia and Georgia.

The project facilitates development of a molecular lab at the “Magarach” inst.
Investigation of Georgian Germplasm at the University of Milan

Goal - to research biodiversity of Georgian autochthonous varieties by using modern techniques of ampelography and molecular genetics

✓ Ampelographic and ampelometric investigation and compilation of ampelographical cards of varieties based on IPGRI, OIV and GENRES descriptors;

✓ Ripening profiling of grape;

✓ Chemo–taxonomical characterization of berry skins and defining the anthocyanins profile of varieties on the basis of High Performance Liquid Chromatography (HPLC) for the technological condition;

✓ DNA fingerprinting to detect genetic variation with usage the 6 Simple Sequence Repeats (Microsatellites) (SSR) markers.

150 Georgian autochthonous varieties have been involved in the research
Fig. **Classification of Georgian varieties according to their anthocyanins levels in grapes at harvest**

![Done Works](image)

**Morphological variability**

**UPGMA dendrogram based on 6 SSR loci**
34 varieties from Ukraine were investigated in the Centre de Recherche Public - Gabriell Lippmann (LUX) with 6 microsatellite loci. Level of heterosigosity and genetic relation have been described among varieties. The dendrogram has been constructed.

7 local varieties of Ukraine have been investigated according to anthocyanins analyzes at the “Magarach” institute.
Ampelographic Characterization of Varieties

Each country made according to the descriptors of IPGRI, OIV and GENRES and main agronomic traits:

- **Moldova's** National Institute for Viticulture and Oenology has researched 34 autochthonous varieties with phenology, basic agronomic traits of plant, yielding, must and resistant towards pathogens;
- **Russia** has started characterizing 140 local varieties and 30 wild forms using IPGRI descriptors for grapevine;
- **The Ukrainian** Institute “Magarach” investigated 160 varieties of the proles Pontica subproles Georgica Negr. group and autochthonous varieties from Crimea with morphological characters.
- **Azerbaijan** has investigated 35 local varieties according to descriptors, phenology, fertility and grows of young shoots linked with sum of temperature, bunch and seed characteristics of varieties.
## Description of Important Autochthonous Varieties for Publication

### Name

### Synonyms

### Erroneous homonyms

### Historical & geographical background

### Intra-varietal variability (clones, biotypes)

### Phenology (average/2006)

### Ecological particularity

### Agronomic particularity

### Susceptibility to pests and diseases

### Fruit usage (W, T, R)

### Type of wine / Fruit characteristic

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### Ampelographic Card

- **Variety:** KAKHIS TETRA
- **Description:** University of Milan
- **State:** ITALY

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<th>Characteristic</th>
<th>Code O.I.V.</th>
<th>Notation</th>
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<td>002: 2</td>
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<td></td>
<td>003: 3</td>
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<tr>
<td>Shoot</td>
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<td>Tendrils</td>
<td>051: 1</td>
<td>052: 1</td>
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<tr>
<td>Young leaf</td>
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<td>066-5: 3</td>
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<td>067: 2</td>
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<td>068: 3</td>
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<td>079-1: 7</td>
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<td>Woody shoot</td>
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<td>Production</td>
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<tr>
<td>Rootstock</td>
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50 varieties per country will be described
The inventory were carried out by organization of expeditions in each country and a large number of wild populations have been discovered:

- Ukraine-163 forms in Crimea
- Georgian -140 forms
- Russia–57 in the North Caucasus
- Azerbaijan has wide research
- Moldova studied as in spontaneous conditions as in collection.
Publications

In Italy under editor F. Del Zan, O. Failla and A. Scienza was published pictured book “LA VITE E L’UOMO – Dal rompicapo delle origini al salvataggo delle reliquie”, with basic information about viticulture of the region’s countries and descriptions of essential varieties.

- Materials of the second working meeting of the IPGRI’s project on grapevine (2004).
Translations

English

Georgian

Russian

Practical guide for planting and managing grapevine collections
Osvaldo Failla – University of Milan

Summary
• Purposes of the collection and general project
• Choice of the site
• Planting design
• Training system and pruning methods
• Cultural practices
• Facilities
• Data collection

Содержание
• Назначение коллекций и общий проект
• Выбор участка
• Дизайн размещения
• Система формировки и методы обрезки
• Уход за насаждением
• Оборудование
• Сбор данных
Obtained research materials have been presented on:

1. The first International Conference on ‘Crop Wild Relatives Conservation and Use’ in Agrigento, Italy, in September, 2005.


One oral presentation and two posters will be presented on the 9th International Conference on Grape Genetics and Breeding in Udine, Italy, in 2-6 June, 2006.

One poster informed to participants about the IPGRI’s project on grapevine.
Public Awareness Events

The Centre de Recherche Public Gabriel Lippmann (CRP-GL) and the International Plant Genetic Resources Institute (IPGRI) organized the one-day meeting in May 10, 2005 to provide an update on the progress made in implementing the annual project workplan and to communicate main project outcomes to the wider audiences in Luxembourg. The Communique of the meeting have been prepared.

WEB - IPGRI of the Project

http://www.ipgri.cgiar.org/regions/europe/PGRinSEE/PGR_SE_Europe.htm

Some information are available on:

http://www.vitis.ru/pubs.asp?r=10
The meetings have been organized with purpose to provide an update on the progress made in implementing the project workplan, to communicate main project outcomes and to agree on the workplan for following one-year period.

Next meeting – 19 November, Luxembourg
Archaeobotanical research in the field of ancient grapevine biodiversity was facilitated in the region and information about grapevine fossils from Georgia and Ukraine were collected.

A protocol for seeds investigation has been developed by Prof L. Costantini.

Two trainings have been organized on investigation of seeds.
Main Results

- Wide number of local varieties of Azerbaijan, Armenia, Georgia, Moldova, Russia and Ukraine are preserved effectively due to stable financial support in the ex-situ collections;

- The successful collaborative network among institutions of Western and Eastern Europe was organized by the IPGRI, which increases chances for Eastern institutions to be integrated in the Western European research programs;

- Local varieties of grapevine and wild vine from the region were involved in the joint investigation of European research;

- Information about the project have been presented to the wide auditory in different ways (symposia, conferences, meetings, workshops, publications, Web) increased interest to the biodiversity of the local germplasm from the Caucasus and Northern Black Sea region;

- The database of the project will be available on the European Vitis database and it will be usable for all interesting persons soon.
Acknowledgment

✓ The Government of Luxembourg

✓ Centre de Recherche Public - Gabriel Lippmann in Luxembourg –
  Drs Lucien Hoffman, Jean-François Hausman.

✓ IPGRI Regional Office for Europe –
  Dr. Jozef Turok, M. Bozzano, K. Elphinstone, M. Kiczkajlo

✓ University of Milan. Facolta’ di Agraria - Prof. Attilio Scienza,
  Prof. Osvaldo Failla, Drs M. Rossoni, S. Imazio, C. Maitti, L.
  Brancadoro.

✓ Dr. Erika Maul – Institute for grapevine selection Geilweilerhof,
  Germany

✓ Staff of institutions and collections in the project partner
  countries