RIBESCO
Multinational Approach for Conserving the European Genetic Resources of Currants and Gooseberry
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RIBES species

Black and Red currants, Gooseberry

• some species grow wild in Northern Europe
• have long growing and breeding history
• high number of cultivars and local races
• national gene banks and collections available
• Northern Europe is the leading production area
RIBESCO

- Core Collection of Northern European Gene Pool of *Ribes*

A multi-national network to improve
- the level of characterisation (phenotypic and DNA-level)
- the level of documentation
- to establish a core collection

✓ with the most important part of the collections
✓ with optimal genetic diversity
✓ to be preserved with special care and double collections
Participants:

• MTT Agrifood Research Finland, Finland
• Estonian University of Life Sciences, Estonia
• Research Institute of Pomology and Floriculture, Poland
• Swedish University of Agricultural Science, SLU, Sweden
• Vilnius University, Lithuania
• Lithuanian Research Centre for Agriculture & Forestry, Lithuania
• Federal Office of Plant Varieties, Germany
• Latvian State Institute of Fruit Growing, Latvia
• University of Copenhagen, Denmark
Number of accessions

Gooseberry

Accessions not included in Ribesco
Accessions included in Ribesco

Partner 0
MTT, Finland
Partner 1
EMU, Estonia
Partner 2
LIGH, Latvia
Partner 3
LIH, Lithuania
Partner 4
BSA, Germany
Partner 5
RIPF, Poland
Partner 7
SLU, Sweden
Partner 8
VU, Latvia
Partner 9
UCPH, Denmark

Total
430

RIBESCO accessions

Number of accessions

Luke
NATURAL RESOURCES INSTITUTE FINLAND
The structure of the project

- Phenotypic characterisation
- Molecular characterisation
- Core collection definition
- Core collection establishment

RIBESCO
Phenotypic characterisation

- accessions conserved in ex situ collections
- common defined descriptors (EU Community Plant Variety Office CPVO; UPOV)
- phenological, morphological and agronomic characters
- some fruit quality analyses
ECP/GR Ribes-Rubus database

• passport data
• photos: 979 files linked
• phenotypic characterisation data:
  ✓ 646 black currants: 18486 records
  ✓ 342 red currants: 9060 records
  ✓ 413 gooseberries: 17068 records
Molecular characterisation

- to estimate the genetic relationships among accessions
- microsatellite SSR marker technology
- to provide a suggestion for an optimal core collection with maximum amount of the genetic variation
- to uncover trueness-to-type of cultivars and duplicated accessions
Molecular characterisation

Step 1. Standardising and calibrating analysis methods in the participating laboratories

- 6 published black currant SSR markers
- 4 new SSR markers developed for red currants and gooseberries
- Leaf material of standard cultivars from one single source (5 blackcurrants, 3 red currants and 1 or 3 gooseberry)

Step 2. Running analyses
864 accessions: 400 blackcurrants, 202 red currants, 242 gooseberries

Major part done by Dr. Kadri Järve, Tallinn Technical University
Some difficulties:

• obtaining good quality DNA from *Ribes* was challenging

• standardising of results not completely possible, amount of variation somewhat overestimated in the combined results (additional alleles)

Estimates of genetic relationships could be provided
Defining Core collection

1. Defining the target number of accessions in the core collection.

2.Selecting accessions important from the national point of view (historical or present value, rareness, etc.)

3. Selecting accessions important for breeding and cultivation (resistance to stress, yield quality, etc.)
4. Assuring that $\geq 10\%$ of genotypic variability is selected by using molecular marker analysis results

5. Assuring that $\geq 10\%$ of phenotypic variability is selected by using the cluster analysis dendrograms of field evaluation data
Establishing Core collections

(New) field collections

Problem: Black currant reversion virus (BRV) infection

- virus indexing (60 black currants + national projects)
- virus eradication (national projects)

Insect-proof greenhouses
In vitro collections

- 2 partners
- Red currant problematic: need of frequent subculturing
- Virus elimination
- For cryopreservation
Cryopreservation

• dormant buds (60 black currants, Partners 0-5, 8)
• Meristems (national projects)
• ”cryotherapy”???
Core collections

• Partners selected 25% of all accessions:
  ✓ 123 black currants (23%)
  ✓ 92 red currants (27%)
  ✓ 123 gooseberries (30%)

Improved conservation, characterisation, data availability, utilisation of *Ribes* germplasm

A model for future genetic resource projects?
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