

# Conservation and breeding potential of native fruits in the Czech Republic and Norway/ NatFruit

Czech-Norwegian Research Programme CZ09

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# Project consortium



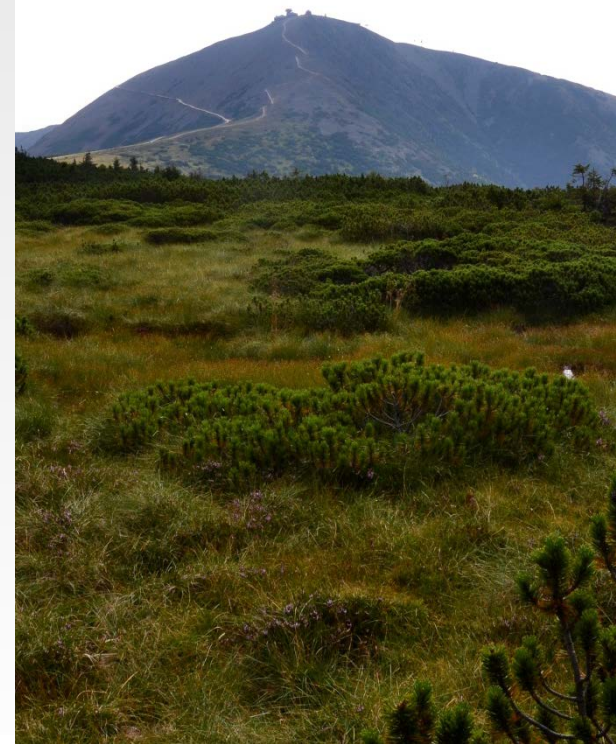
- Promoter: Gene bank, Crop Research Institute, Prague-Ruzyně, Czech R.
- Partners: Norwegian Institute of Bioeconomy Research (NIBIO), Ås/Tromsø, Norway
- Research and Breeding Institute of Pomology Holovousy Ltd., Hořice, Czech R.
- - National coordinators for PGR agreed to submit project highly beneficial for both sides
- - what is not possible to study without grant
- - based on basic research with practical outputs to conservation and horticulture
- - what would start future collaboration



# Why is project needed?

Fruits are (especially the native):

- irreplaceable part of human diet, **beneficial for health**
- they represent **germplasm** for future, treasury of genes for **breeding in the environment and climate changing**.
- CZE and NOR have similarities in flora: Krkonoše Mts are considered an **island of Nordic flora** with an occurrence of **glacial relics**, with the nearest sites in NOR
- They must be conserved (some are **critically endangered**)
- for that we **need more knowledge** (by this project)





# Why is project needed?

The leading idea of the basic research:

How have the native fruits differentiated after glacial period being separated in so distant sites?

Are the CZE glacial relics related closer to NOR sites or to Svalbard populations?



# Why is project needed?

The main ideas from the basic research to practical outputs:

- Crop landraces were primarily derived from native wild plants
- Which native fruit species played a role in creation of small fruit landraces?
- Can those genetic resources be used for further breeding?
- Are they good source of phytonutrients?
- Sources for new genetic variability in connection with climate changes?





# What is the material?



Cloudberry, *Rubus chamaemorus*, Colesdalen, Svalbard  
Kvaløya, NOR



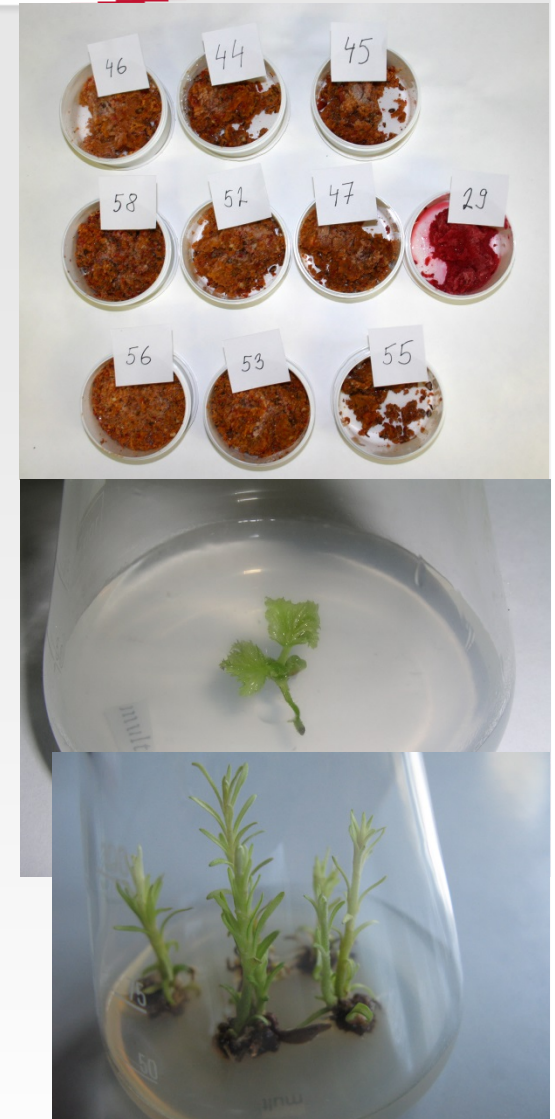
Rowan, *Sorbus sudetica*, Krkonoše

Red currant,  
*Ribes spicatum*  
NOR  
*Ribes petraeum*,  
Krkonoše



# What are the project's objectives?

- Distribution maps of crop wild relatives of small fruits
- Characterisation of populations and plants and their threat
- Molecular characterisation of plants for assessment of relatedness
- New genetic knowledge of populations is likely to uncover levels of divergence and possible migration of species.
- Chemistry: to determine bioactive compounds, radical scavenging capacity and metabolomic pattern
- To assess *in vitro* propagation and cryopreservation





# What is the project expected to achieve?

- *Ex situ*: Setting up a collection of selected clones of fruits from Norway and Czech R.
- Such collections will provide material for breeders.
- Assessment of breeding potential and phytonutrient content
- Finding plants with a higher fruit performance
- *In situ*: Assessment of needs for conservation
- Estimation of population size, fragmentation, stability and adaptation abilities





# How are you going to address these challenges?

- Collecting of material



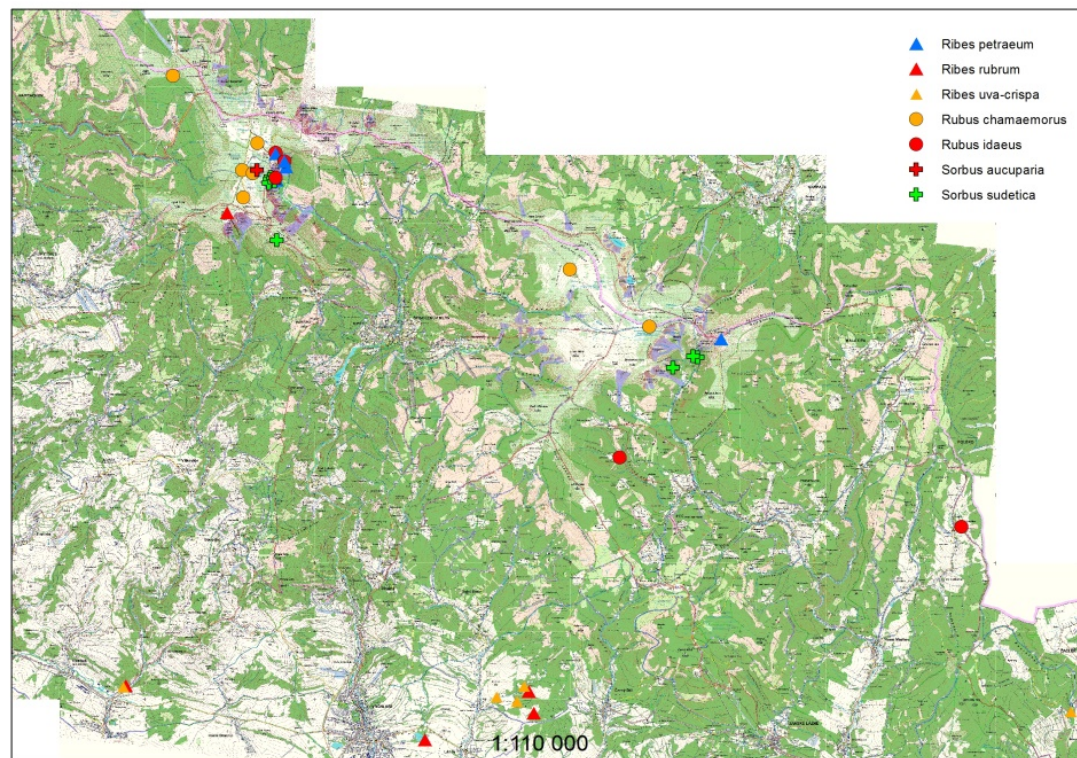


# Treatment of data and material

- Mapping of sites in Krkonoše Mts, NOR and Svalbard
- Botanical field research
- Site comparison:  
Phytosociological relevés
- Laboratory analyses  
(nutritional quality)

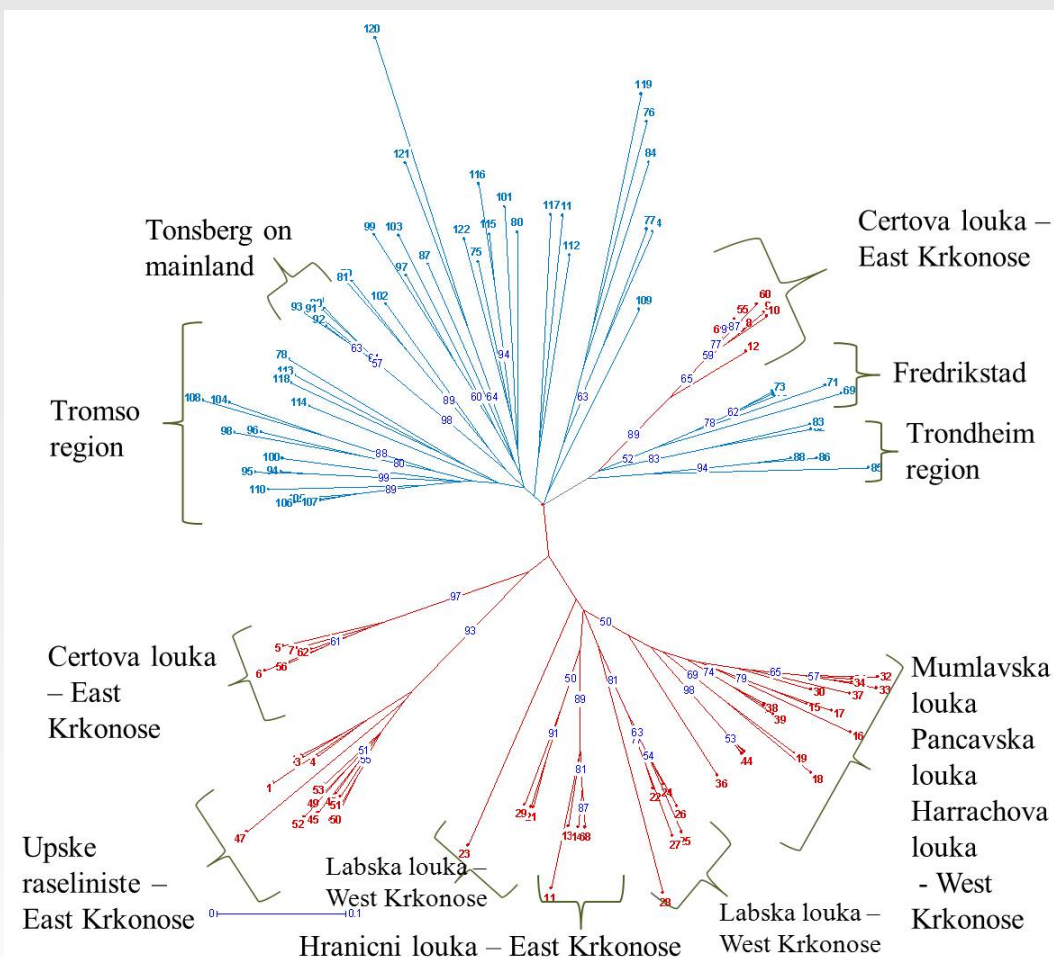


Mapping of native fruit sites in Krkonoše Mts.



# Treatment of data and material

- DNA comparison of NOR and CZE samples (AFLP)
- The populations were clearly separated geographically in the dendrogram
- Only one site got partly among NOR sites





# Who is going to benefit from the project?



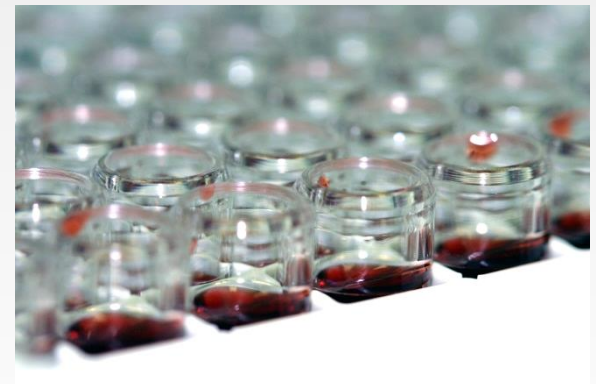
## Users:

- Conservation of nature
- GB collections
- Breeders
- Basic research

## Education of project participants

- PhD students, postdocs, university students

**Output:** further use of the valuable material



# Thank you very much!

## Tusen takk!



Speakers :

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NIBIO, Tromsø, NOR

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CRI, Prague, CZE

[www.vurv.cz/natfruit](http://www.vurv.cz/natfruit)

