

Collaborative action for updating the documenting about berry genetic resources in Europe

EUROPE.BERRIES

Period (01.11.2021 – 30.04.2022)

Monika Höfer



(June 2022)

Interim Technical Activity Report

INTRODUCTION

The Joint Action for 'Updating the documenting about berry genetic resources in Europe' contributes to the following ECPGR objectives: (1) record the varieties/cultivars of berry genetic resources in the respective participating countries, data harmonization, qualitative evaluation, and availability for inclusion to the respective National Focal Points for EURISCO; (2) elaborate a first draft of crop-specific technical guidelines for genebank management (manuals) of berry genetic resources and publish any related article.

The outcome of the above-mentioned objectives will provide the basis for the future work of the Berries Working Group (WG). Following the detailed inventory by which berry genetic resources are conserved under differing conditions in genebanks of European countries, further projects will focus on both phenotypic and molecular characterization of European genebanks to identify unique accessions for inclusion in AEGIS in the future. The EURISCO descriptors for the template were discussed with Stephan Weise (IPK Gatersleben, Germany) responsible for the EURISCO database.

Seventeen partners of the WG sent an Expression of Interest to participate in an ECPGR Activity and further partners would like to participate as self-funded partners.

APPROACH

In preparation for the project, the WG coordinator requested inventories of the respective genebanks of the WG partners. We started recording the **varieties/cultivars of berry genetic resources**. The query was carried out according to the EURISCO passport descriptors and contained information on the preserved accessions (https://www.ecpgr.cgiar.org/fileadmin/templates/ecpgr.org/upload/EURISCO/EURISCO_MCPD2_descriptors_updated_November_2017.pdf), but also additional information on the trueness-to-type of the variety and the virus status of the accession. Altogether, we had 17 inventories from partners of 16 countries at the beginning of the project. The partners sent inventories separated into the genera *Fragaria*, *Rubus*, *Ribes*, *Vaccinium* and other berry species (1. Interim Technical Report).

- **Altogether 14 inventories of *Fragaria*, 15 of *Rubus*, 11 of *Ribes*, 8 of *Vaccinium* and 8 of other minor species were sent.**

In the first phase of the work, the members of the project group asked the partners for the missing data of the template and to create a unified template of the accessions for each genus with a deadline of September 2021.

- **3,214 accessions of varieties/ cultivars of berry genetic resources have been specified.**

On 5 May 2022, the third video conference of the project group took place. During the virtual meeting, each member of the project group presented the results of their genus so far. The outcome, including discussions for further project work, are summarized below.

RESULTS

1. Verification and completion of the inventories for the respective genera according to EURISCO by the project group members

The next steps for the project group members include: (1) the revision of the accessions list concerning taxonomy (species) and variety names and (2) the integration of passport data.

Interim Technical Activity Report

Rytis Rugienius and Audrius Sasnauskas, responsible for the **genus *Fragaria***, demonstrated in their presentation some interesting statistics according to EURISCO passport descriptors: Biological status of accessions (SAMPSTAT) 76.5 % advanced or improved cultivars, 21.8 % traditional cultivars/landraces and 1.6 % breeding/research material. 36.6 % of the cultivars were virus tested, but only 2.7 % were certified as virus free. For 75 % of the mentioned accessions, pomological and/or molecular trueness-to-type determination has already been performed. The number of cultivars that are available in several partners is especially interesting for the processing of later projects: 11 cultivars are present in six partner institutions. The cv. 'Senga Sengana' is present in all collections. In contrast, 537 unique accessions exist.

Erika Schulte, responsible for the **genus *Rubus***, presented the summary of the data of 13 partner institutions. In the genus *Rubus*, there are 439 cultivars of raspberry (*R. idaeus*), 86 cultivars of blackberry (*R. subg. Rubus*) and 14 cultivars of black raspberry (*R. occidentalis*) in the collections recorded. 17 varieties with accessions in more than 3 collections e.g. *R. idaeus* 'Heritage' and 'Willmette' (6 coll.), e.g. *R. sect. Rubus* 'Thornfree' (5), 'Black Satin' (4), and 'Wilson's Early' (4). 310 varieties in one collection only.

Saila Karhu, responsible for the **genus *Ribes***, presented **1,002 accessions** from 13 partner institutions for blackcurrant (409 acc.), redcurrant (268 acc.), gooseberry (299 acc.) and others *Ribes* spp. (jostaberry, *R. spicatum* or blackcurrant species, 26 acc.).

Darinka Koron, responsible for the **genus *Vaccinium***, reported that she has processed the inventories of eight already reported partners and two additional partners: Fondazione Fojanini di Sondrio, Italy, and National Institute of Horticultural Research in Skierniewice, Poland. A total of 215 **accessions belonging to eight species** were reported (main cvs. of *Vaccinium corymbosum* 114 acc.; *Vaccinium myrtillus* 51 acc.).

Eleni Maloupa and George Pantelidis are responsible for the '**other genera of berry genetic resources**'. The definition of other genetic resources in berries was discussed during the 1st video conference in April 2021. Subsequently, another specific request was sent to the partners. Altogether, 76 acc. of *Morus alba* or *nigra* (mulberry), 50 acc. of *Sambucus nigra* (elderberry) and 35 acc. of *Sorbus aucuparia* (rowanberry) were reported.

For the final processing of the inventory lists, cross-genre questions were discussed: among other things, the spelling/naming of the leading name of a variety, further processing of missing passport data, etc.

The following target is for the members of the project group to send the revised inventory lists to the JKI, Institute for Breeding Research on Fruit Crops by the end of June 2022. The WG Chair will submit the revised lists for each project partner. An email will be sent explaining how the inventories must then be transferred to the EURISCO database via the National Focal Point of each country.

Furthermore, each member of the project group was asked to check the existing inventories and make suggestions for varieties/accessions to be used for further projects on characterization (phenotypic/molecular) to finally identify unique accessions for inclusion in AEGIS in the future (end of August 2022).

2. Elaboration of crop-specific technical guidelines for genebank management (manuals) of berry genetic resources

The first query on the existing accessions also included the descriptor 'Type of germplasm storage' (EURISCO 26 – STORAGE). Most of the temperate fruit species are genetically heterozygous and vegetatively propagated. The collections of berry genetic resources are maintained in the field or greenhouses as active plantations where the accessions are available for characterization, evaluation and distribution. Backups for the plant material are needed to provide security in case of a disease or an environmental disaster.

Interim Technical Activity Report

Based on the first overview, a template was developed, which was sent to all project partners, to request the detailed methods of conservation. The questionnaire contained questions on the cultivation of plants for the *ex situ* collection in the field or in the greenhouse as well as for the *in vitro* and cryo collections.

By the end of April 2022, the contributions of 18 partners were received, so that the preparation of the first draft of crop-specific technical guidelines for genebank management of berry genetic resources could be started. The *Prunus*-specific standards for genebank management should serve as an example (Giovannini et al. 2016).

SUMMARY

To date, the project is proceeding according to the work plan. (1) The revision of the inventories is in its final phase so that the updates can be sent to partners for submission to the national focal points on schedule. This means that the final goal of transferring the inventories to EURISCO can be achieved. (2) The query for the elaboration of the manuals was answered by the partners. Based on this, the first draft of the crop-specific technical guidelines for genebank management of berry genetic resources will be prepared in the next few weeks, which will subsequently be discussed with Jan Engels.

Thus, the requirements have been set in order to continue to fulfil the tasks in the project on time. The results of the project will be presented at the XXI International Horticultural Congress in Angers, France.

Bibliography

Giovannini, D., Balsemin, E. and Engels J. (2016) *Prunus*-specific standards for genebank management.

https://www.ecpgr.cgiar.org/fileadmin/templates/ecpgr.org/upload/WG_UPLOADS_PHASE_IX/PRUNUS/PGS_V1_final_20_January_2016.pdf