

„Studies on *Ribes* plants, *Cecidophyopsis* mites and Blackcurrant Reversion virus for sustainable resistance breeding and cultivation of *Ribes*”

1.1.1.1/18/A/026

Progress of the project (01.06.2021. – 31.08.2021.)

Within **Activity No.1**, 129 *TEF-1-α* and 87 *HSP70* gene PCR products of *Cecidophyopsis* mites after electron microscopy were prepared and given to partner BMC for Sanger sequencing. Sequencing of these samples and its optimization was done on the genetic analyzer ABI PRISM 3130xl. The assembly and quality control of obtained sequences was started. BRV PCR products from 12 different *Ribes* samples were prepared and sequenced at BMC with four primer pairs by the Sanger method. the analysis of sequences was performed.

Within **Activity No.2** was continued work on the analysis of genotyping data of chloroplast molecular markers (cpSSR) of *Ribes* plant material, development of a resistance gene *P* identification method and analysis and processing of NGS data. The results of blackcurrant genetic resources genotyping were demonstrated in a poster report at the international scientific conference "Sustainable horticulture from plant to product: Challenges in temperate climate", which took place in a remote format on 25-26. August in Dobele. The title of the report was "Evaluation of blackcurrant (*Ribes nigrum*) germplasm structure by microsatellite-based fingerprinting for the diversification of the breeding material" (authors: Gunārs Lācis, Katrīna Kārklīņa, Irita Kota-Dombrovska, Sarmīte Strautiņa).

Work on the analysis and processing of NGS data has continued. Work is ongoing on the isolation of total RNA and the preparation of NGS libraries for *Ribe* infested and control samples. Manuscript resubmission and corrections have been made according to the reviewers' comments for the article "First report of black currant-associated rhabdovirus in blackcurrants in Latvia" submitted in Plant Disease.

To assess host range of viruses, the two bioassays were established: 1) Different *in-vitro* propagated *Ribes* (blackcurrant, gooseberries, *R. ducuscha*, *R. spicatum*, *R. aureum*, *R. ussuriense*) were inoculated with BRV purified from infected blackcurrant; 2) *In-vitro* propagated plants of cultivar 'Ojebyn' were inoculated with BRV, newly detected Blackcurrant betanucleorhabdovirus (BCaRV) and combination of both viruses. The monitoring of symptom development was started.

The evaluation of *Ribes* genetic resources field collections was continued, performing the description according to RIBESCO descriptors. The third year data set on plant yield, fruit ripening time, phenotypical and quality characteristics, plant resistance to pests and diseases was collected. Three years of data on gooseberry genotype evaluation have been compiled and a poster presentation has been prepared. It was presented at the International Conference "Sustainable horticulture from plant to product: "Challenges in temperate climate"" organized by the Institute of Horticulture on August 25-26. As well as a manuscript for publication in the Proceedings of the Latvian Academy of Sciences on topic "Characterization of Latvian gooseberry genetic resources" was submitted. 14 *Ribes* genotypes of different species have been propagated *in vitro* and rooted for laboratory resistance research. In the Tissue Culture Laboratory in total 28 genotypes at present are preserved *in vitro* for plant resistance research and for the development of a recovered Germplasm Core Collection.