Safeguarding of potato onion (*Allium cepa* L. *Aggregatum* group) and garlic (*Allium sativum* L.) crop diversity in North Europe - Baltic region (SafeAlliDiv)

DNA analysis

Aim

The genetic analyses undertaken within the project **complemented the existing molecular marker analysis** of Nordic potato onions that was carried out in Sweden and Finland before starting SafeAlliDiv project **with analysis of additional material from partner countries**, in order to reach a better understanding of **existing genetic diversity in collections**

Markers

15 microsatellite (SSR) markers were selected and tested (which were also utilised to genotype Swedish Allium accessions).

The **DNA markers tested** were: AMS04, AMS06, AMS07, AMS08, AMS10, AMS12, AMS13, AMS14, AMS16, AMS22, AMS23, AMS25, AMS26, AMS29, AMS30.

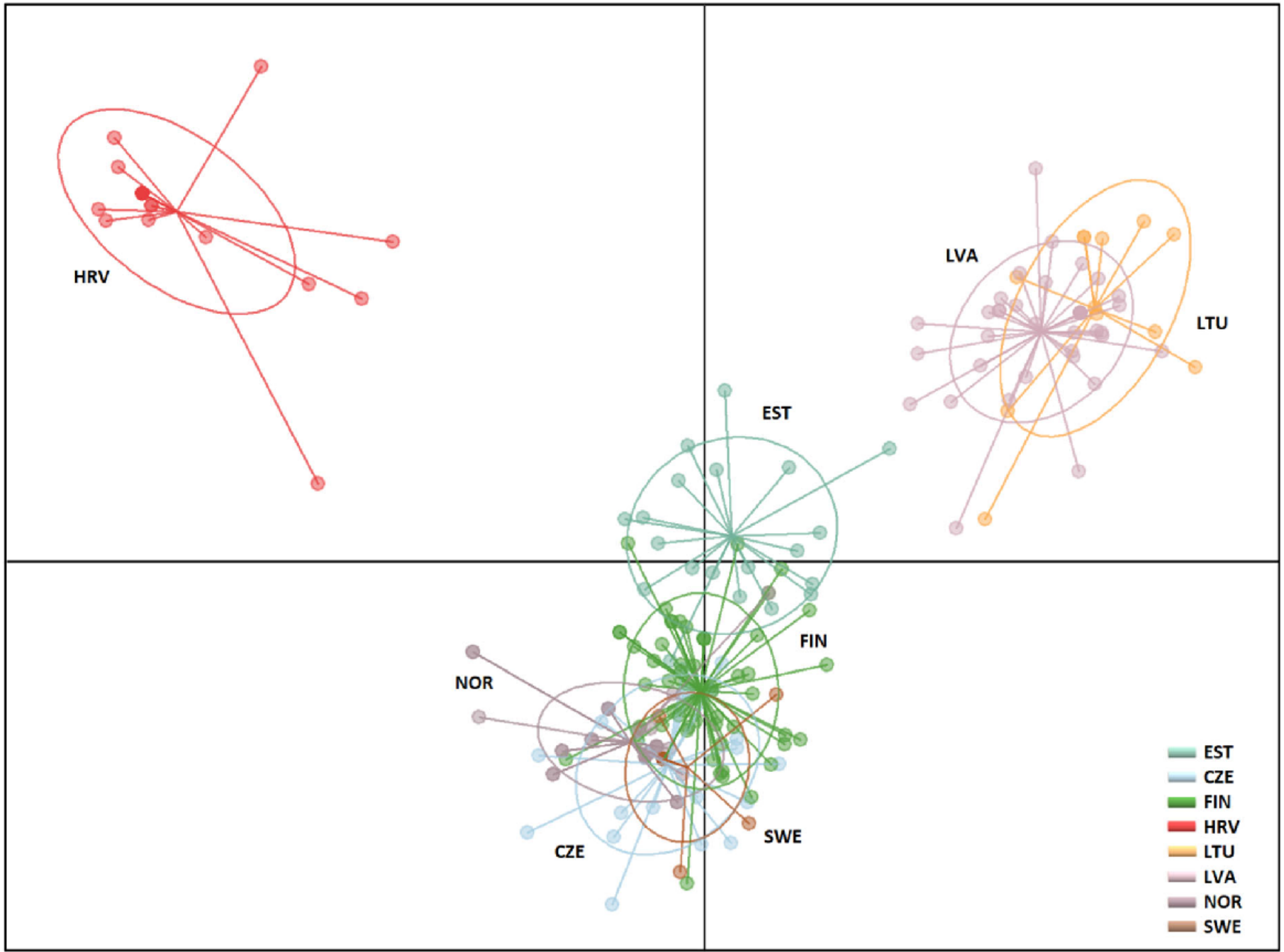
After selection of the **most informative and high quality** markers, the *Allium* collection was genotyped with 11 markers: AMS06, AMS08, AMS10, AMS12, ASM13, AMS14, AMS16, AMS23, AMS30, AMS22, and AMS25.

Nine of these markers were also utilised in a previous genetic analysis of potato onion in Sweden.

Country	Name of representative	Institute	Number of accessions for DNA analysis	Number of samples DNA extracted
Croatia	Smiljana Goreta Ban	Institute of Agriculture and Tourism	25	25
Czech Republic	Helena Stavěliková a	Crop Research Institute	129	129
Estonia	Külli Annamaa	Estonian Crop Research Institute (ECRI)	4	20 (*)
Finland	Terhi Suojala-Ahlfors	Natural Resources Institute Finland (Luke), Horticulture	24	24
Latvia	Liga Lepse	Institute of Horticulture	38	38
Lithuania	Danguolė Juškevičienė	Institute of Horticulture, LRCAF	12	12
Norway	Ingunn Molund Vågen	NIBIO – Norwegian Institute of Bioeconomy Research	23	23
Sweden	Matti Leino	Nordiska museet, Swedish Museum of Agriculture	9	9
Total			**264**	**280**

(*) 2 vegetatively propagated accessions, plus 9 individuals from each of 2 generatively propagated accessions (Jõgeva 3, Kolkja KA)

Discriminant analysis of principal components (DAPC) scatter plot



Results

Unique alleles were identified in accessions of

Estonian (5 alleles, 3 accessions), Finnish (5 alleles, 6 accessions),

Lithuanian (2 alleles, 3 accessions), Latvian (7 alleles, 10 accessions),

Russian (1 allele, 1 accession) origin

- Although potato onion germplasm has been exchanged throughout Europe for centuries, **alleles unique to a country of origin were identified and the majority of analysed accessions were genetically unique** (178 unique accessions of 258 vegetatively propagated accessions).
- These findings highlight **the value of conserving large numbers of accessions**, as well as **further collecting** of material as the majority of accessions are genetically unique.