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VÝROBY

The old cherry genotypes in Slovakia — monitoring and evaluation

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INTRODUCTION

Cherries belong to the attractive fruit crops suitable for direct consumption or industrial processing and were traditional fruit plants for a long time.

The situation of fruit growing in the Slovak Republic is not favourable. Slovakia fruit growers currently being developed only species such as apples (3,051 ha), plums (443 ha) and walnuts (728 hectares). Cherries is intensive planting 230 ha, representing only 4% of the total area of orchards (6,213 ha) in Slovakia. Main reason is also that in Slovakia there is no research and breeding institution directly for fruit species.

Due to the current unfavorable situation without the fruit breeding, we decided to start addressing project issues with the search cherries old trees in locations that have a tradition in the cultivation of cherries in the past (19-20 centuries).



INTRODUCTION

The project running 2014–2017 years



Development of innovative approaches to characterise and control the economically important and emerging virus pathogens of cherry crops in Slovakia

Project partners:

Virology Institute SAS Bratislava

Gene bank SR of the Research Institute of Plant Production



AIMS

Gene bank SR:

- The collection of cherry genotypes for ex situ conservation and research purposes
- Evaluation and multiplication perspective genotypes
- Preparing methodology for ex situ conservation trees

Virology Institute SAS Bratislava:

- evaluation of plant molecular variability,
- study occurrence of economically important and emerging viruses of red stone-fruits
- development of molecular techniques for sensitive and specific detection



MATERIAL AND METHODS

The presence of old trees of the *Prunus avium* L. were monitored by means of collecting expeditions between 2014 and 2016 in different territory of Slovakia.

Descriptor list for Cherry ECPGR (Smidt et al 1985) were used for basic description of trees, flowers, leaves and fruits.

Standard rootstocks were used for genotypes regeneration by inoculation *Prunus avium* L., *Pr. mahaleb* and **GISELA 5**.

The presence of selected viruses (ACLSV, ArMV, PDV, PPV) in old cherry genotypes by DAS-ELISA was carried out.



RESULTS AND DISCUSSION

Researchers from Gene Bank SR focuses on the collecting monitoring and multiplication activities of the cherries genotypes.

All obtained samples (flowers, leaves) have been sending to the Virology institute Bratislava and were analysed in term of health status, mainly for the presence of viruses.

Researchers from Virology Institute Bratislava focuses on virology issues.



Monitoring of Cherries

Based on historical documents we carry out monitoring of cherries in 2014 till 2016 at 13 localities in Slovakia. From the monitored localities the 191 genotypes were obtained.

Number	2014	2015	2016	Total
Localities	5	9	6	13
Genotypes	93	35	63	191



Localities



Relics of orchards



Cherry valley



Single trees

Alley



GPS coordinate of monitored localities

No.	Locality	GPS	Altitude (m)
1	Brdarka	N 48°45'57.00" E 20°20' 2.40"	566
2	Cachtice	N 48°40'48.50" E 17°49'11.20"	175
3	Dechtice	N 48°23'40.58" E 17°33'40.58"	282
4	Katarinka	N 48°33'20.00" E 17°32'11.80"	336
5	Krakovany	N 48°36'52.70" E 17°45'36.20"	157
6	Nitra	N 48°18'04.40" E 18°05'51.50"	148
7	Piestany	N 48°34'55.70" E 17°49'19.71"	162
8	Podolie	N 48°40'23.50" E 17°44'03.60"	252
9	Velky Lapas	N 48°18'06.70" E 18°09'36.70"	210
10	Krupina	N 48°35'18.39" E 19°06'70.49"	271
11	Mednany	N49°02'64.61" E 18°21'08.34"	242
12	Trencin	N 48°89'20.92" E 18°04'31.95"	237
13	Nove Mesto	N 48°75'49.14" E 17°83'28.88"	195



Map of Slovak Republic with monitoring localities



Regeneration of cherry genotypes

Standard rootstocks registered in Slovakia were used for promising genotypes regeneration by inoculation cherries *Prunus avium* L., *Pr. mahaleb*, GISELA 5 about 5-10 pieces.

Rootstock	2014	2015	2016
<i>Prunus mahaleb</i>	35	24	23
GISELA5	38	-	32
<i>Prunus avium</i>	-	24	52
Total	72	48	107



Characterization of Cherries

The characterization of selected cherry fruit genotypes was realised by description of 11 fruit characters according to Descriptor lists of cherries.



Fruit variability

The Table shows **evaluation data** of genotypes from 3 selected localities Brdárka, Čachtice and Krakovany. The fruit weight of genotypes of locality Čachtice ranged from 5.8 to 9.7 g per fruit, in locality Krakovany from 6.3 to 8.9 g per fruit and in locality Brdárka from 6.7 to 8.8 g per fruit. The largest variability 3-9 point was in fruit colour. Fruits were small, from old trees, without any care. **Poster Benkova et al.**

Genotype /year	Fruit						Flesh			Pedicel length (mm)	Stone shape (1-9)
	Weight of one fruit (g)	Length (mm)	Width (mm)	Thickness (mm)	Shape (1-9)	Colour (1-9)	Colour (1-9)	Juice (1-9)	Firmness (1-9)		
CK-7	9.7	25.5	28.3	23.8	7	7	7	7	7	45	5
CK-10	7.3	22.1	25.1	20.1	7	7	7	7	7	53	7
CK-11	5.8	20.6	22.1	20.6	7	7	7	7	7	42	7
CK-12	6.8	23.2	24.6	21.5	7	7	7	7	7	45	5
CK-13	8.5	22.7	26.0	23.8	7	9	9	9	9	37	5
KR-1	7.9	23.8	26.0	22.0	7	9	9	9	9	38	5
KR-2	8.5	23.3	26.8	21.0	7	7	7	7	7	48	5
KR-4	6.3	23.1	23.1	19.7	7	7	7	7	5	53	5
KR-5	8.9	24.5	28.3	20.0	7	9	9	9	7	50	7
BR-311	8.8	24.4	25.4	29.3	5	5	3	1	7	37	7
BR- 245	6.8	22.8	24.4	20.6	7	3	3	1	7	34	5
BR- 532	6.7	23.5	24.9	22.3	3	5	5	5	7	48	3
BR- 296	7.7	25.2	28.2	23.8	5	5	3	1	7	38	3

Samples of perspective genotypes



CONCLUSIONS

- The monitoring results of old trees of genus *Prunus* confirmed our assumptions that still **it is possible to find interesting old trees** in the monitored regions of Slovakia.
- These trees are **very suitable material** for their **preservation** and **study** as very valuable **genetic resources** in field collections of the Gene Bank the SR.
- Were obtained **old cherries genotypes with different morphological and agronomical traits**.
- The **larger fruit genotypes** are useful for **next breeding process**.



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Thank you for your attention

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