Sources for late blight resistance from Potato Collection in Vavilov' Institute of Plant Industry

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- Manifestation of the late blight resistance in wild tuber-bearing *Solanum* species from Collection of Vavilov' Institute of Plant Industry
- Distribution SCAR-markers for *R*-genes and their aptitude for prediction of late blight resistance in wild potato species
- *Solanum* genotypes promising for breeding program

Race non-specific late blight resistance in wild tuber-bearing *Solanum* species

SEEDLING TEST in the field

Series	*Species*	Number of accessions (families) tested	Distribution of families on rating scale:			
			1-2	3-4	5-6	7-9
Bulbocastana	***S. bulbocastanum***	**4**	**1** (1) *	**2** (1,6-2,8)	**1** (3)	
Longipedicellata	***S. stoloniferum***	**27**	**6** (0-1)	**5** (1-2,6)	**6** (0-2,7)	**10** (0-2)
Demissa	***S. demissum***	**24**	**4** (0-1)	**4** (0,8-2,3)	**5** (0-1)	**11** (0-0,5)

* **Number of families** (standard deviation s_x min-max)

Diversity of wild *Solanum* germplasm on relation to disease.

Haw to find new sources of late blight resistance?

Race non-specific late blight resistance in wild tuber-bearing *Solanum* species

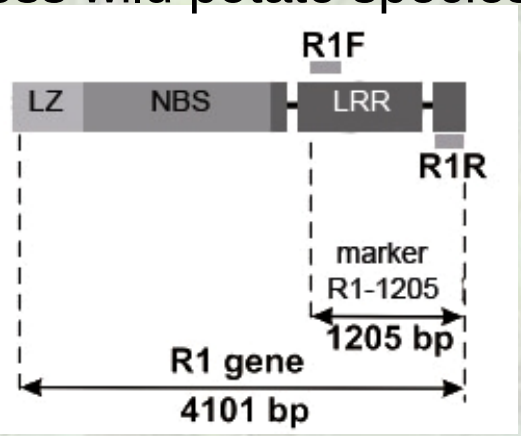
CLONAL PLANTS in the laboratory test

Series	Species	Number of genotypes (accessions) tested	Distribution of genotypes in groups with a resistance rating:		
			2-4	5-7	8-9
Bulbocastana	***S. bulbocastanum***	**26 (19)**	**4**	**3**	**19**
Pinnatisecta	***S. brachistotrichum***	**2 (2)**	**2**		
	S. cardiophyllum	**6 (6)**	**2**	**3**	1
	ssp. *ehrenbergii*	**16 (13)**	**10**	**2**	**4**
	S. jamesii	**12 (10)**	**3**	**7**	**2**
	S. pinnatisectum	**10 (7)**		**4**	**6**
	S. stenofillidium	**3 (3)**	**3**		
	S. tarnii	**3 (3)**	**1**	**2**	
Polyadenia	***S. polyadenium***	**7 (7)**		**1**	**6**
Tuberosa	***S. verrucosum***	**12 (9)**	**7**	**4**	1
Longipedicellata	***S. fendleri***	**3 (3)**	**3**		
	S. hjertingii	**5 (4)**	**3**	**2**	
	S. papita	**2 (2)**		**2**	
	S. polytrichon	**9 (9)**	**5**	**3**	1
	S. stoloniferum	**33 (27)**	**18**	**5**	**10**
Demissa	***S. brachycarpum***	**4 (4)**		**4**	
	S. demissum	**26 (23)**	**3**	**10**	**13**
	S. hougasii	**4 (3)**		**3**	1
Total	**18**	**183 (156)**			

Distribution SCAR-markers for *R*-genes across wild potato species

SCAR marker R1-1205 for *R1* gene (*S. demissum*) ,

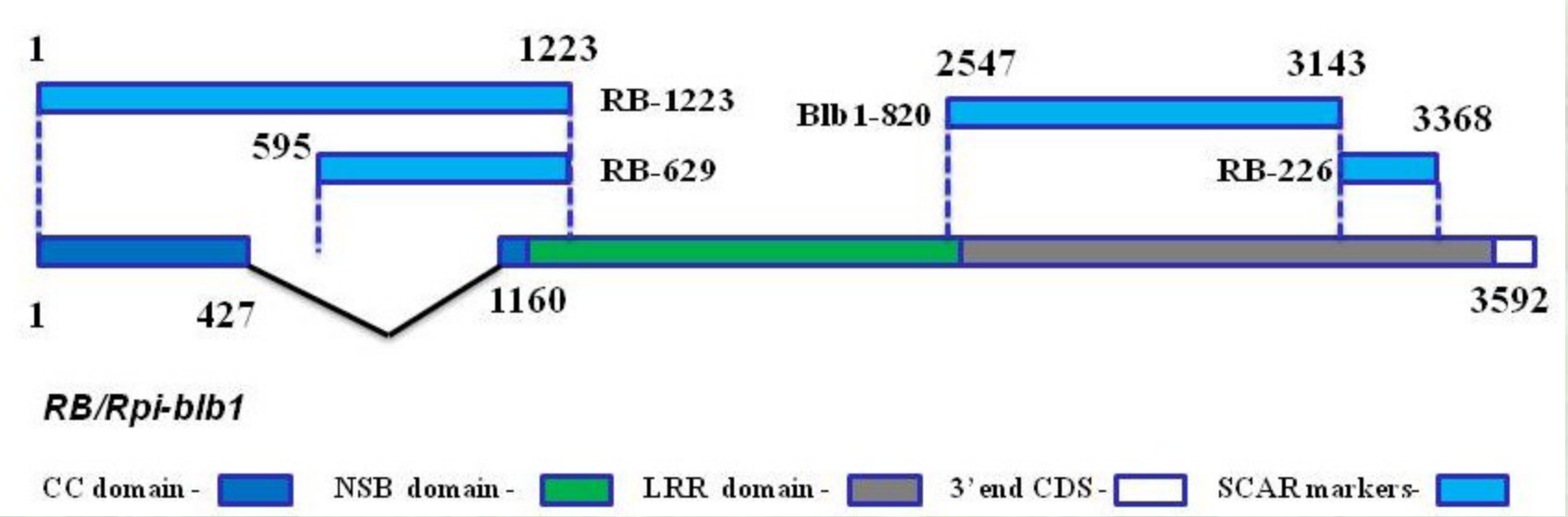
for more details of markers for ***R1*- gene** see the poster by E. Sokolova et al. at this meeting



Frequency of the marker R1-1205 in 18 wild potato species

Series	*Species*	Number of genotypes tested	F
Demissa	***S. brachycarpum***	**4**	**0,75**
	S. demissum	**36**	**0,42**
	S. hougasii	**3**	**0,66**
Longipedicellata	***S. polytrichon***	**12**	**0,08**
	S. stoloniferum	**33**	**0,15**
	fen, hjt, pta	10	0
Polyadenia	*pld*	8	0
Pinnatisecta	*bst, jam, pnt, sph, trn, cph, ehr*	51	0
Bulbocastana	*blb*	27	0
Verrucosa	*ver*	10	0

SCAR markers for *RB/Rpi-blb1* gene (*S. bublocastanum)*



for more details of markers for ***RB/Rpi-blb1* gene** see the poster by O. Fadina et al. at this meeting

Distribution of markers RB-629 and RB-226 (*S. bulbocastanum*) across wild potato species

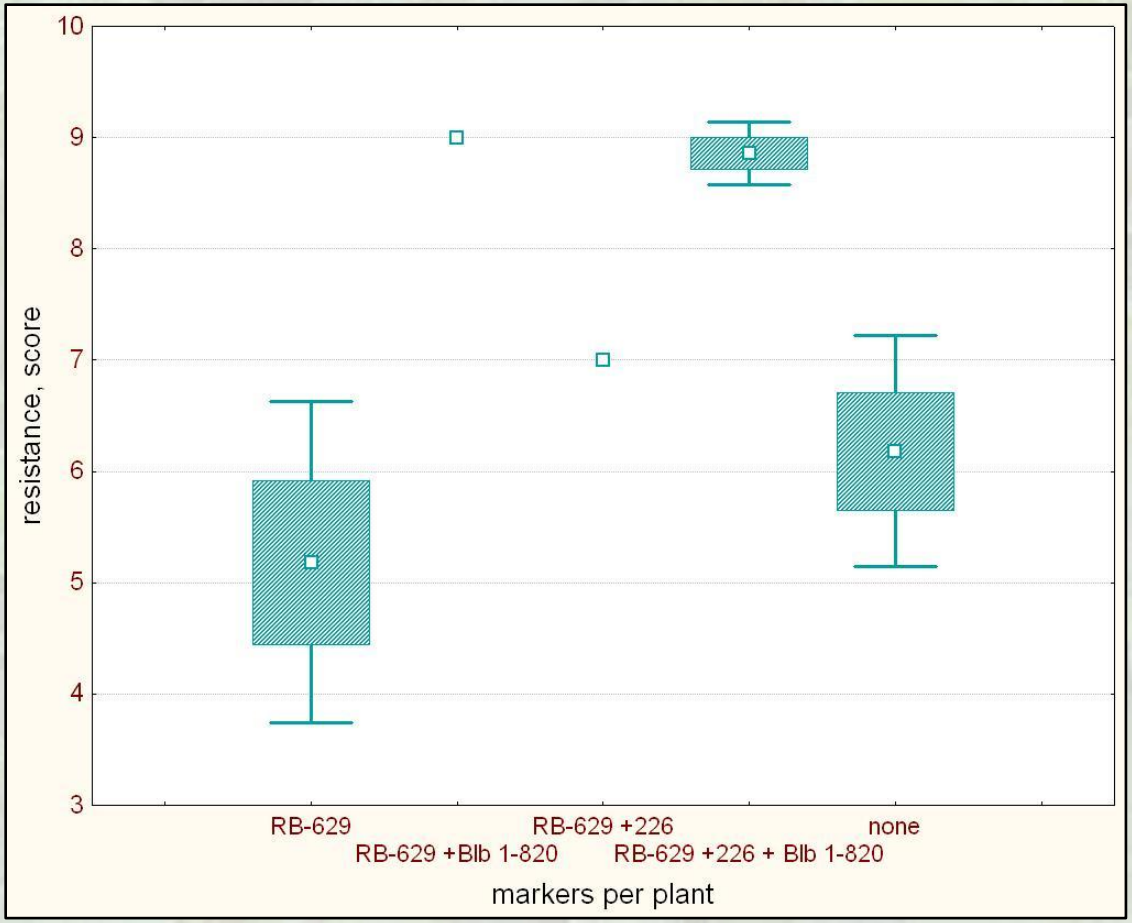
Series	Species	Number of genotypes tested \ **frequencies of SCAR-markers**:	
		RB-629	**RB-226**
Bulbocastana	***S. bulbocastanum***	**22 \ 0,68**	**11 \ 0,45**
Pinnatisecta	***S. brachistotrichum***	**2 \ 1,0**	**n.d.**
	S. cardiophyllum	**4\ 0,75**	**5\ 0,20**
	ssp. *ehrenbergii*	**13\ 0,31**	**16 \ 0,06**
	S. jamesii	**8\ 0,62**	**3 \ 0**
	S. pinnatisectum	**9\ 0,78**	**3\ 0**
	S. stenofillidium	**3\ 0,67**	**2 \ 0**
Polyadenia	***S. polyadenium***	**5\ 0,40**	**1\ 0**
Tuberosa	***S. verrucosum***	**6\ 0,17**	**4 \ 0,25**
Longipedicellata	***S. fendleri***	**3\ 1,0**	**n.d.**
	S. hjertingii	**6\ 0,67**	**1 \ 0**
	S. papita	**2\ 0,50**	**n.d.**
	S. polytrichon	**10\ 0,90**	**n.d.**
	S. stoloniferum	**24\ 0,50**	**9\ 0,33**
Demissa	***S. brachycarpum***	**4\ 0**	**n.d.**
	S. demissum	**20\ 0,35**	**3 \ 0,33**
	S. hougasii	**5\ 0,40**	**2 \ 0,50**

Association of potato late blight resistance with the presence of markers of the *RB/Rpi-blb1* gene

	RB-629	RB-226	Blb 1 - 820	RB-226+ Blb 1-820
resistance, score	0,13	**0,43**	**0,51**	**0,49**
markers per plant	**0,95**	**0,74**	**0,74**	**0,78**
RB-629		0,51	0,51	0,54
RB-226			**0,85**	

Spearman correlation coefficient is calculated for n=41, $p < 0,05$

Segregation of *Solanum* genotypes according to results of phytopathological and marker analysis for ***RB/Rpi-blb1*** gene



ANOVA (n=41): each of three groups of genotypes of wild potato species are different in resistance to late blight significantly: **F=3,24, p=0,002**.

SCAR- markers for the *R* genes as predictors of late blight resistance in wild potato species

the germplasm of *Solanum* resistant to LB and carrying markers for ***R1*** or(and) ***RB/Rpi-blb 1*** **gene:**

S. bulbocastanum	*S. stoloniferum*	*S. demissum*	*S. hougasii*
• K-21266 • K-24862 • K-24866 (2)	• K-23652 • K-24420 • K-24976 • K-24981	• K-18487	• K-24389 • i-599618

the germplasm of *Solanum* resistant to LB and non-carrying markers for *R1 and RB/Rpi-blb 1* gene:

S. bulbocastanum	*S. pinnatisectum*	*S. verrucosum*	*S. polyadenium*
• K-21274 • K-24866	• K-24239	• K-24990 • K-24995	• K-24408

«Success is the ability to go from failure to failure without losing your enthusiasm»

Prime Minister Winston Churchill