

## A New Source of Genetic Resistance to Potato Blight (*Phytophthora infestans*)

Marin ARDELEAN<sup>1</sup>, Mirela Irina CORDEA<sup>1</sup>, Viorel BUDIU<sup>1</sup>, Lucia MIHALESCU<sup>2</sup>)

<sup>1</sup>) Faculty of Horticulture, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, 3-5 Mănăştur Street, Cluj-Napoca, 400372, România; [mcordea@usamvcluj.ro](mailto:mcordea@usamvcluj.ro)

<sup>2</sup>) Department of Biology, Technical University of Cluj-Napoca, North University of Baia Mare Center, 76 Victoriei Street, Baia Mare, Romania

**Abstract.** A selection of local potato (*Solanum tuberosum*) was evaluated, under field conditions, for resistance to potato blight (*Phytophthora infestans*). Data obtained during 2011-2013 trials suggest that this selection is highly resistant to potato blight, with very low values for the degree of attack (DA). This selection could be used as a source for breeding new varieties genetically resistant to this disease. Since there were no reliable data concerning the origin of this selection, it was named as MB-

**Keywords:** genetic resistance, MB-1, *Phytophthora infestans*, potato blight, *Solanum tuberosum*

**Introduction.** The importance of sources for genetic resistance of agricultural crops to plant diseases has already been largely advocated by many geneticists and breeders (Allard, 1967; Gallais, 1990; Giosan and Săulescu, 1969; Kuckuck *et al.*, 1991; Mureşan, 1967). In fact, genetic resistance sources are the starting material in the process of creating new plant varieties which will yield abundantly without the aid of chemical/organic disease control treatments. The importance of such resistant varieties from economic and ecological points of view has been clearly emphasized by the above mentioned authors.

In potato (*Solanum tuberosum*), one of the most harmful diseases is the potato blight, produced by *Phytophthora infestans*. The pathogen attacks both the above ground parts of the plant (leaves, stems) and the tubers, and the losses in yield and its quality range from 30% to 100%, depending on the severity of disease symptoms.

The present paper presents the results on initial evaluation of a new source of genetic resistance of potato to blight (*Phytophthora infestans*).

**Aims and objectives.** The aims of research were to evaluate the degree of attack with potato blight of MB-1 potato selection plants grown in field condition during three consecutive years (2011-2013). At the same time a multiplication of the planting material (tubers) was undertaken, in order to make possible future investigations concerning the inheritance of resistance to potato blight in plants of MB-1.

**Materials and methods.** The tubers of resistant plants originated in a potato field located in Muntele Băişorii, Cluj County, Romania. The existence of such plants was reported by a PhD student in the UASVM Cluj-Napoca who was a native of that location. In the summer of 2010 an exploratory trip was organized to Muntele Băişorii and, indeed, in a rather large potatoes field, indicated by the PhD student, heavily attacked by blight, we found several plants which were perfectly healthy and remained in this condition until the end August when the crop was harvested. At that moment the tubers of resistant plants were harvested separately and stored in the same conditions (6-8 °C; 40-60% air humidity) as the rest of the potato crop destined for market and for planting.

The tubers of blight resistant plants were considered a homogenous population as far as the morphological features and the blight resistance were concerned and were given the name MB-1 since the selection originated in a potato field in Muntele Băişorii.

In 2011, the tubers of resistant plants were planted in a small experimental plot neighboring commercial potato fields, in Feleacu (720m alt.), Cluj County. The resulting tubers were planted in 2012 to a larger plot and the same procedure was applied in 2013 when the plot of resistant plants was situated within a commercial potato field, to have plenty of infection sources.

In all three years (2011-2013), during the first decade of July and the beginning of August the frequency and intensity of potato blight attack were noted and, on these basis, the degree of attack (DA %) was computed ( $DA \% = F\% \times I\%/100$ ), where F is Frequency and I is Intensity.

**Results and Discussion.** The results of potato blight assessment on the MB-1 (resistant) plants as well as on the plants of commercial potato field (only in 2013) are presented in Tab. 1.

Tab.1

Results of potato blight assessment (DA%), Feleacu 2011-2013

Year	Type of plant	No. of plants	1 <sup>st</sup> decade of July			1-5 August		
			F %	I %	DA %	F %	I %	DA %
2011	resistant	26	0.0	0.0	0.0	3.8	2.6	0.10
2012	resistant	83	1.6	3.2	0.05	2.9	4.2	0.12
2013	resistant	255	1.3	2.0	0.03	5.2	3.4	0.18
	sensitive	255	96.3	44.2	42.6	-	-	-

Data in Tab. 1 indicate, with a wide degree of confidence, that the blight resistant plants behaved constantly as resistant in all three years of assessment. The values of DA %, both in the first decade of July and at the end of growth season, are very small, significantly lower than those obtained for the same number of sensitive plants analyzed in the commercial potato field. This might mean that the resistance involved in this case is either quantitative or a combination of oligogenic and polygenic resistance. Further works of hybridization are needed to clarify the inheritance of blight resistance in the plants of this new source of resistance.

### Conclusion

MB-1 potato selection seems to be a valuable source for genetic resistance to potato blight.

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