

VIRUS INFECTION OF ORNAMENTAL PLANTS IN HUNGARY

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Introduction

Recently the economic importance of the ornamental plant production has shown remarkable growth. Following the country's joint to the EU increased competition has become characteristic of the Hungarian market.

More than 20 viruses have been isolated in the various vegetatively propagated *Petunia* species and varieties [Richert (1992), Lesemann and Dalchow (1995), Bellardi et al. (1996), Mavric et al. (1996) Salamon (1996), Richert-Pöggeler and Shepherd (1997), Feldhof et al. (1998), Boonham et al. (1999), Alexandre et al. (2000)]. Metelik et al. (1994, 1996), Mokrá and Götzová (1994), Lesemann and Winter (2002) as well as Pham et al., (2002) examined the health condition of *Zantedeschia aethiopica* and other *Zantedeschia* species. The presence of *Bean yellow mosaic virus* (BYMV), *Dasheen mosaic virus* (DsMV), *Cucumber mosaic virus* (CMV), *Konjac mosaic virus* (KoMV) and *Tomato spotted wilt virus* (TSWV) were detected. *Hosta virus X* (HVX) and *Impatiens necrotic spot virus* (INSV) were isolated in the examined *Hosta* species (Lockhart 2002). Lockhart et al. (2002) verified the presence of *Turnip mosaic virus* (TuMV) in *Heuchera* samples and that of *Alfalfa mosaic virus* (AIMV) in *Pulmonaria* species. The goal of our work was to make a virological survey of herbaceous ornamental plants in Hungary.

Material and Methods

54 samples were analysed from species or varieties from the genera *Echinacea*, *Heuchera*, *Hosta*, *Peonia*, *Petunia* and *Zantedeschia*. More than 20 varieties of the *Petunia* genus were tested, which had a great prominence. Samples were taken from Hungarian ornamental plant producing companies, public areas and also private gardens. Collected ornamental plant species growing in the different regions of Hungary showing various symptoms on the leaves and flowers, were screened through DAS ELISA test, using CMV, *Potato virus X* (PVX), *Potato virus Y* (PVY), *Tobacco mosaic virus* (TMV), *Tomato mosaic virus* (ToMV) and TSWV antiserum from Loewe Biochemica (Clark and Adams 1977). Samples were considered negative if ELISA absorbance values were not three times higher than the values of the negative control.

Results and conclusions

Different symptoms (mosaic, chlorosis, leaf deformation, and necrotic lesions) have been observed on the collected plants. Among the 54 samples, 11 were infected with the examined viruses. Four samples of the examined varieties of the genus *Petunia* were infected by PVY, 5 by CMV and 2 by TMV (Table 1). In the other genera the presence of the following viruses were established: PVY in the *Pulmonaria* sample, TSWV in the *Heuchera* and CMV, PVY, TMV and TSWV complex infection in one *Echinacea* species. Beside these, the presence of other viruses can be also presumed in those samples, which showed virus symptoms, but were considered negative to the examined viruses. Complex infections were found in *Echinacea*

(4), *Petunia* Surfinia Blue 'Sunblu' (PVY, TMV and CMV) and *Petunia* Surfinia Purple 'Shili Brillar' (PVY and TMV) plants (Table 1).

Table 1 Virus infection of ornamental plants (Hungary, 2005)

Species	Cultivar	Symptoms*	Virus infections**
<i>Echinacea purpurea</i>	unknown	M, Ch	PVY, TSWV, TMV, CMV
<i>Heuchera sanguinea</i>	unknown	M	TSWV
<i>Hosta</i> sp.	unknown	-	-
<i>Hosta</i> sp.	unknown	-	-
<i>Peonia lactiflora</i>	unknown	-	-
<i>Peonia lactiflora</i>	unknown	-	-
<i>Peonia lactiflora</i>	unknown	-	-
<i>Peonia lactiflora</i>	unknown	-	-
<i>Petunia atkinsiana</i>	'Bright Red'	Ch, Ldef	-
<i>Petunia atkinsiana</i>	'Jamboree Burgundy'	Ldef	-
<i>Petunia atkinsiana</i>	Wispers 'Rose Vein'	M, Ldef	-
<i>Petunia atkinsiana</i>	Wispers 'Rose Vein'	M, NI	-
<i>Petunia atkinsiana</i>	Wispers 'Rose Vein'	M	-
<i>Petunia atkinsiana</i>	Wispers 'Rose Vein'	M, Ch	-
<i>Petunia atkinsiana</i>	Wispers 'Rose Vein'	M, Ldef	-
<i>Petunia atkinsiana</i>	Wispers 'Rose Vein'	M, Ldef	-
<i>Petunia atkinsiana</i>	Wispers 'Rose Vein'	M, Ldef	-
<i>Petunia atkinsiana</i>	Wispers 'Rose Vein'	M, Ldef	-
<i>Petunia x hybrida</i>	unknown	M, Ch, NI	PVY
<i>Petunia x hybrida</i>	unknown	-	-
<i>Petunia x hybrida</i>	unknown	-	-
<i>Petunia x hybrida</i>	unknown	-	-
<i>Petunia x hybrida</i>	unknown	-	-
<i>Petunia x hybrida</i>	unknown	-	-
<i>Petunia sp.</i>	Conchita 'Double White'	-	-
<i>Petunia sp.</i>	Conchita 'Double White'	-	-
<i>Petunia sp.</i>	Conchita 'Double White'	-	-
<i>Petunia sp.</i>	Conchita 'Double White'	-	-
<i>Petunia sp.</i>	Petutinia 'Happy Dream'	Ldef	-
<i>Petunia sp.</i>	Petitunia 'Yellow Dream'	-	-
<i>Petunia sp.</i>	Supertunia 'Blushing Princess'	-	CMV
<i>Petunia sp.</i>	Supertunia 'Chili Red'	-	-
<i>Petunia sp.</i>	Surfinia 'Blue'	Ch	-
<i>Petunia sp.</i>	Surfinia Blue 'Sunblu'	M	PVY, TMV, CMV
<i>Petunia sp.</i>	Surfinia Blue Vein 'Sunsolos'	Ldef	-
<i>Petunia sp.</i>	Surfinia 'Burgundy'	-	-
<i>Petunia sp.</i>	Surfinia 'Crazy Pink'	-	CMV
<i>Petunia sp.</i>	Surfinia Double Purple 'Keidopnel'	Ch	PVY
<i>Petunia sp.</i>	Surfinia 'Giant Purple'	Ldef	-
<i>Petunia sp.</i>	Surfinia 'Giant Purple'	M, Ldef	-

<i>Petunia sp.</i>	Surfinia 'Giant Purple'	Ch	-
<i>Petunia sp.</i>	Surfinia 'Giant Purple'	Ldef	-
<i>Petunia sp.</i>	Surfinia 'Giant Purple'	Ch	-
<i>Petunia sp.</i>	Surfinia 'Purple'	-	-
<i>Petunia sp.</i>	Surfinia Purple 'Shili Brillar'	M	CMV
<i>Petunia sp.</i>	Surfinia Purple 'Shili Brillar'	M, Ch	PVY, TMV
<i>Petunia sp.</i>	Surfinia Purple 'Shili Brillar'	Ldef	CMV
<i>Petunia sp.</i>	Surfinia 'Purple Vein'	Ch	-
<i>Petunia sp.</i>	Surfinia 'White'	Ldef	-
<i>Petunia sp.</i>	Surfinia 'White'	Ch	-
<i>Petunia sp.</i>	Sylvana 'King'	-	-
<i>Pulmonaria sp.</i>	unknown	M	PVY
<i>Zanthedeschia aethiopica</i>	unknown	-	-

* -: symptomless, M: mosaic, Ch: chlorosis, Ldef: leaf deformation, NI: necrotic lesions

** -: no infection found

The identification of viruses in an ornamental crop is the first step to the control of diseases. The intensification of ornamental plant production, the introduction of contaminated propagation plant material, and the outbreaks of virus vectors may play role in the establishment and distribution of viral diseases.

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