SUSCEPTIBILITY OF DIFFERENT VARIETIES OF TULIPS TO VIRAL DISEASES

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Tulips are one of the most popular ornamental spring flowers widely grown around the world. Breeders have also developed a myriad of tulip varieties that differ not only in their appearance, but also in their resistance to adverse environmental conditions and harmful organisms. Viral diseases are the most important problem in tulip cultivation and different varieties of tulips are not equally susceptible to viral diseases.
The objective of the study was to determine the susceptibility of 28 varieties of tulips grown in the botanical garden to viral diseases.

Results

The research was carried out in the Botanical Garden of Vytautas Magnus University. During 2016-2018 period 28 varieties of tulips were observed during flowering. Plants infected with viral diseases were identified visually by characteristic symptoms. Most of the observed tulip varieties had the least viral diseases in 2016. However, the prevalence of the disease increased in the following years, with many varieties suffering the most in 2019. Some varieties of tulips ('Vivex', 'Burgundy', 'Texas Flame') were infected with almost all plants.

Table 1. Resistance of tulip varieties to viral diseases in VMU Botanical Garden , 2016-2018

No.	Title of the variety	Group	Prevalence of the disease, %		
			2016	2017	2018
1.	'Monsella', Bakker Bros. 1981	2 Double Early Group	6	19	27
2.	'Bandoeng', J.F. van den Berg	3 Triumph group	3	4	2
3.	'Calgary', Vertuco, 1995	3 Triumph group	11	24	48
4.	3 Grand Perfection, Blumex Export B.V., 1999	3 Triumph group	14	19	29
5.	'Lech Walesa', Marax Tulips V.o.f. 2011	3 Triumph group	0	2	3
6.	'Prinses Irene', Van Reisen & Sons, 1949	3 Triumph group	9	15	23
7.	'Apeldoorn', D.W. Lefeber & Co. 1951	4 Darwin hybrid Group	2	1	0
8.	'Orange Goblet', Frijlink & Sons, 1959	4 Darwin hybrid Group	6	11	21
9.	'Pink Impression', Van der Wereld 1979	4 Darwin hybrid Group	0	3	2
10.	'Vivex', Konijnenburg & Mark 1960	4 Darwin hybrid Group	3	7	97
11.	'Blushing Beauty', D.W. Lefeber & Co. 1983	5 Single Late Group	11	24	18
12.	'Blushing Lady', J.N.M. van Eeden 1991	5 Single Late Group	9	12	20
13.	'Dordogne', W. Dekker & Sons 1991	5 Single Late Group	2	1	3
14.	'Burgundy', J. J. Grullemans & Sons, 1957	6 Lily Flowering	12	35	87
15.	'Elegant Lady', Nieuwenhuis Bros. 1953	6 Lily Flowering	6	13	9
16.	'Mona Lisa', Verbruggen 1988	6 Lily Flowering	14	23	68
17.	'Lambada', W. van Lierop & Zn. B.V.	7 Fringed Group	8	26	48
18.	'Red Hat', J.S. Pennings 2007	7 Fringed Group	0	0	2
19.	'Doll's Minuet', Konijnenburg & Mark 1968	8 Viridiflora Group	3	2	4
20.	'China Town', A.W. Captein & Son 1988	8 Viridiflora Group	2	3	2
21.	'Blue Parrot', J.F.Ch. Dix 1935	10 Parrot Group	0	3	7
22.	'Rococo', H. Slegtkamp & Co. 1942	10 Parrot Group	2	8	19
23.	'Supper Parrot', M. Boots Bloembollenselectie 1998	10 Parrot Group	0	16	46
24.	'Texas Flame', J.J. de Wit Czn. 1958	10 Parrot Group	5	29	87
25.	'Miranda', C.A. Verdegaal 1981	11 Double Late Group	4	2	3
26.	'Oriental Splendour', D.W. Lefeber & Co. 1961	14 Greigii Group	33	15	6
27.	'Red Riding Hood', C.V. Hybrida 1953	14 Greigii Group	0	5	3
28.	'Toronto', Uittenbogaard & Sons 1963	14 Greigii Group	0	3	1

Figure 1. Both tulip blossoms of the variety 'Vivex' are infected by viruses

Figure 2. Tulip blossoms healthy (left) and virus infected (right)

Figure 3. Tulip blossoms of the variety 'Apricot beauty', healthy (right) and virus infected (left)

The study concluded that none of the 28 tulip varieties observed were resistant to viral diseases, and some varieties appeared to be particularly susceptible ('Vivex', 'Burgundy', 'Texas Flame') and should be removed from the collection of cultivated varieties.