Abstract

The long-term trial with investigation of the susceptibility of plum cultivars to Plum pox virus by inoculation of PPV-D strain into the crowns of two-year-old plum trees was established in 1990 and 1991. Plum trees were re-inoculated in 1996. On the whole, 207 cultivars and hybrids of plums were evaluated in 2001–2004. Fruit symptoms were evaluated using 9-grade scale. 33 cultivars were classified as tolerant, 51 cultivars as slightly susceptible, 84 cultivars as medium-susceptible, 28 cultivars as susceptible and 11 cultivars and hybrids as very susceptible.

Key words: Plum pox virus, plum, cultivars, tolerance, fruit symptoms

Introduction

Plum pox virus (PPV) is common in many Prunus species. The virus is economically the most harmful for plum production. In many European countries growing traditional cultivars is almost impossible. Many old and new cultivars have been tested for resistance/tolerance/susceptibility to PPV, but the results were not always consistent (Kegler et al. 1998). At present the mechanism of tolerance is not yet reliably determined. The resistance is often effective only against one particular group of isolates or specific virus strains. Abiotic factors can also influence the degree of observed resistance (region, agrometeorological conditions, nutrition, etc.) (Glasa and Kúdela 1998).
Plum cultivars grown in collections of Research and Breeding Institute of Pomology Holovousy Ltd were examined for their resistance, on the basis of their reaction to artificial infection with PPV.

**Material and methods**

Experimental orchards were located at Holovousy in eastern Bohemia in altitude 320 m. Average temperature is 8.14°C and average rainfall 655 mm. Artificial infections were carried out by inoculation of PPV-D strain (three buds from infected ‘Domestic Prune’) into the crowns of two-year-old plum trees in 1991. These plum trees were re-inoculated in 1996. 207 cultivars and hybrids of plums were evaluated in 2001–2003. Symptomatic reactions of the genotypes were evaluated using 9-grade scale (percentage of damaged fruits included into the scale, 100 fruits) according to Jordovic and Rankovic (1972). The scale was established for evaluation of resistance to fruit damage: 1 – severe symptoms, very frequent occurrence of depressions (poxes) on fruit surface, deformed fruits; 5 – low occurrence of surface depressions (poxes), to 10% of fruit surface; 9 – no symptoms. Symptoms on leaves and premature fruit drop (%) were also monitored. All tested cultivars and hybrids were finally classified into five groups, on the basis of symptoms occurrence (%), symptoms severity (1–9 scale), and premature fruit dropping occurrence/intensity. There were following groups: **Tolerant**: all fruits (100%) were rated 9, which means no symptoms at all. **Slightly susceptible**: low occurrence of fruits with mild symptoms, mostly only changes in colour of fruits (rated 7 and 8); sporadic premature fruit drop. **Medium susceptible**: more than 50% fruits had symptoms, which were rated 5–8; premature fruit drop. **Susceptible**: more than 50% fruits had symptoms, which were rated 3–5; premature fruit drop. **Very highly susceptible**: more than 75% fruits had symptoms, which were rated 1–5; premature fruit drop.

**Results**

‘Verity’, ‘Vision’, ‘Erssinger’, ‘Valjevka’ and ‘Wazonova’. The third group contained 84 medium susceptible cultivars and hybrids. In the fourth group, there were 28 susceptible plum genotypes. 11 cultivars and hybrids included in the fifth group showed very high susceptibility.

Discussion

Out of 207 plum cultivars and hybrids examined in the work for their susceptibility to PPV, and evaluated according to intensity of symptoms on fruits, 33 (15.94%) cultivars and plum hybrids did not react with visible symptoms on fruits. They could be classified as tolerant. Paprstein and Karesova (2001) evaluated sharka symptoms on fruits in the same experimental orchards in 1998 and 1999. Only 28.5% cultivars had no symptoms of PPV infection on fruits. The results of our evaluation (in 2001–2003) suggested that the number of cultivars with this type of reaction towards artificial PPV infection decreased. ‘Hanita’ did not develop any symptoms on fruit during our evaluation. This is in agreement with the results obtained by Schreiber (1998) and Hartmann (1999). Our results concerning ‘Czernowice’, which had no symptoms of PPV agreed with Hamdorf (1992) and Rühl (1994). Also our results concerning tolerance and partial resistance of ‘Ruth Gerstetter’ agreed with those obtained by Schreiber (1998), Zawadzka et al. (1994) and Hamdorf (1992). Our reports concerning the tolerance of ‘Chrudimer’ to PPV agreed with those obtained by Hamdorf (1992). ‘Jelta Butylkovidna’ did not develop any symptoms on fruit during our evaluation. The case was similar in the work by Sutić and Rankovic (1983). Trifonov (1971) considered this cultivar as low susceptible. This difference could be caused by climatic conditions and by different virulence of virus strains (Candresse et al. 1993).

Literature


Authors' addresses: Ing. Jana Kučerova,
Dr Renata Karešová,
Dr František Paprštein,
Research and Breeding Institute of Pomology Holovousy,
Holovousy 1,
508 01 Hořice,
Czech Republic
e-mail: kucerova@vsuo.cz

Dr Milan Navrátil,
Dr Dana Šafářová,
Palacký University,
Department of Cell Biology and Genetics,
Šlechtitelů 11,
783 71 Olomouc,
Czech Republic
e-mail: navratil@prfholnt.upol.cz

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