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EVALUATION OF LOCAL BULGARIAN PLUM CULTIVARS FOR AGRONOMIC TRAITS AND RESISTANCE TO DISEASES

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A B S T R A C T

The investigation included the evaluation of Bulgarian local varieties: 'Zimna karadjeika', 'Klastechka', 'Uhrepka', 'Sinakvitsa', 'Sinia rakiynitsa', 'Drebna biala rakiynitsa', 'Zaeshka', 'Pushevka', 'Lyatna trankosliva G' and 'Kazanlashka' in the period 1998-2003. The trees of 'Sinakvitsa', 'Sinia rakyinitsa', 'Drebna biala rakyinitsa', 'Zaeshka', 'Zimna karadjeika' and 'Klastechka' have very high yield, what surpasses 10 t per hectare. The fruit mass is very different, ranges from 7.0 to 17.0 g. The content of a dry matter is higher in the fruits of variety 'Uhrepka' – 24.2%. The plum varieties 'Uhrepka', 'Sinia rakyinitsa', 'Drebna biala rakyinitsa' and 'Lyatna trankosliva G' are very tolerant to *Plum Pox Virus.* The investigated ten local varieties are resistant to *Monilinia laxa* and the most of them are tolerant to *Polistigma rubrum.*

Key words: plum, local cultivars, flowering, yield, diseases

INTRODUCTION

The regional varieties of plum trees are very good adapted to local conditions – soil and meteorological factors. In a part of Moravian Wallachia of Czech 23 local plum varieties and 417 trees were founded and described. Many of these trees are in a very good health condition and can be use for propagation, selection and breeding programs, and preservation of genetic resources (Vlk, 2004).

In some regions of Bulgaria local varieties show productivity, tolerance to low temperatures, diseases and pests. They could give opportunities for using not only for organic farming but and for breeding process.

The central Balkan is the main plum production region in Bulgaria. Some of the local plum varieties in this region are fruitful and tolerant to important economic diseases as *Plum Pox Virus*, *Monilinia laxa*, *Monilinia fructigena*, *Polistigma rubrum* (Marinov, 1961; Ivanova et al., 2002). The local plum variety 'Uhrepka' is very suitable as rootstock for apricot (Dimitrova and Marinov, 2000; Dimitrova, 2001). The purpose of this study is the evaluation of some agronomic characteristics and the behavior towards some diseases of ten local plum varieties. The experiment was led in the conditions of Dryanovo plum production area, situated in the Central Balkan Region.

MATERIAL AND METHODS

The experiment was carried out at the Plum Experimental Station of Dryanovo. Ten local varieties of plum: 'Zimna karadjeika', 'Klastechka', 'Uhrepka', 'Sinakvitsa', 'Sinia rakiynitsa', 'Drebna biala rakiynitsa', 'Zaeshka', 'Pushevka', 'Lyatna trankosliva G' and 'Kazanlashka', grafted on Myrobolan seedlings (*Prunus cerasifera* Ehrh.) were experimented during the period 1998-2003. The trees (replicates/cultivar) were planted in 1990 on the pseudopodzolic forest soil. The following characters have been observed: beginning and end of full bloom, duration of the bloom, height, diameter and volume of the crown, trunk girth, yield, mean fruit and stone weight, behaviour to *Plum Pox Virus*, *Polistigma rubrum*, *Monilinia laxa* and *Monilinia fructigena*.

RESULTS

Data for the phenologic observations are presented in Table 1. No significant differences concerning the beginning and the end of full bloom of the investigated ten plum varieties have been noted. The longest – duration of the flowering – 9 days was established – for 'Drebna biala rakiynitsa' and the shortest – 6 days for 'Lyatna trankosliva'.

Data concerning growth vigor of the plum trees are shown in Table 2. The highest values of the crown height, diameter and volume have been observed for the variety 'Drebna biala rakiynitsa'. The trees of varieties 'Uhrepka', 'Klestachka' and 'Lyatna trankosliva G' had the least crown size. The varieties – 'Drebna biala rakiynitsa', 'Sinia rakiynitsa' and 'Zaeshka' had the biggest trunk girth.

T a b l e 1 . Flowering of the plum varieties (1999-2003)

Variety	Beginning of full flowering		End of full flowering		Duration of flowering [g]
	x	±Six	x	±Sx	days
Uhrepka	13 IV	12.74	19 IV	13.28	7
Zimna karadjeika	15 IV	9.3	21 IV	10.44	7
Sinakvitsa	14 IV	12.16	20 IV	12.43	7
Sinia rakyinitsa	15 IV	10.22	22 IV	11.59	8
Zaeshka	15 IV	10.27	21 IV	11.53	7
Drebna biala rakiynitsa	13 IV	11.26	21 IV	13.89	9
Klestachka	14 IV	9.46	21 IV	11.53	8
Pushevka	14 IV	11.35	20 IV	12.80	7
Lyatna trankosliva G	16 IV	10.82	21 IV	11.53	6
Kazanlashka	15 IV	10.58	21 IV	10.22	7

T a b l e 2 . Crown's size and trunk girth of the plum varieties (1999-2003)

Variety	Crown height [m]	Crown diameter [m]	Crown volume [m^3]	Girth of the trunk[cm]
Uhrepka	3.70	3.10	11.10	50.4
Zimna karadjeika	3.89	3.78	14.97	50.4
Sinakvitsa	4.62	3.32	18.54	41.0
Sinia rakyinitsa	4.24	3.70	17.40	56.2
Zaeshka	4.14	4.36	19.55	54.8
Drebna biala rakiynitsa	4.62	4.95	27.64	59.7
Klestachka	3.77	2.70	10.04	36.4
Pushevka	4.35	4.23	20.94	51.3
Lyatna trankosliva G	3.37	3.58	10.64	40.0
Kazanlashka	4.13	3.43	15.30	38.0

The most fruitfull varieties were 'Sinakvitsa' and 'Drebna biala rakiynitsa', their yield surpassed 20 t/ha (Tab. 3). The varieties Uhrepka and Pushevka had a smaller yield.

The largest fruits were determined for 'Uhrepka' – 17.0 g and 'Zaeshka' – 15.5 g. The best varieties: 'Zimna karadjeika', 'Sinakvitsa', 'Sinia rakiynitsa', 'Drebna biala rakiynitsa', 'Klestachka', 'Pushevka', 'Lyatna trankosliva' and 'Kazanlashka' have small fruits, about 10-13 g. The weight of the fruit stones was low for the varieties 'Sinia rakiynitsa' and 'Drebna biala rakiynitsa'. The percentage of stone in respect to weight of whole fruit was comparatively lower in 'Uhrepka', 'Sinia rakiynitsa', 'Lyatna trankosliva G' and 'Drebna biala rakiynitsa'. The highest percentage of stone – 5.7, was established in the fruits of variety 'Sinakvitsa'.

Table 3. Yield and mechanical composition of plum fruits(1999-2003)

Variety	Weight of fruit [g]	Weight of stone [g]	Fruit stone [% of the fruit]	Yield [g/ha]
Uhrepka	17.0	0.5	2.9	7560
Zimna karadjeika	7.5	0.4	5.3	12210
Sinakvitsa	7.0	0.4	5.7	27530
Sinia rakyinitsa	9.7	0.3	3.1	18250
Zaeshka	15.5	0.7	4.5	11230
Drebna biala rakiynitsa	8.9	0.3	3.4	24140
Klestachka	13.1	0.6	4.6	18020
Pushevka	10.4	0.4	3.8	7510
Lyatna trankosliva G	12.3	0.4	3.3	18040
Kazanlashka	13.1	0.6	4.6	9010

The highest content of a dry matter was observed in the fruits of 'Uhrepka' – 24.2%. This index is high as well as for the other varieties and ranged from 17.4 to 21.7%.

Table 4. Behaviour of the local plum varieties to some important economical diseases (1999-2003)

Variety	*Plum Pox Virus* degree/0-3/		*Monilinia laxa* degree/0-5/	*Monilinia fructigena* degree/0-5/	*Polistigma Rubrum* degree/0-5/
	leaves	fruits			
Uhrepka	0	0	0	1	0
Zimna karadjeika	3	2	1	1	1
Sinakvitsa	3	2	1	2	0
Sinia rakiynitsa	1	1	0	2	2
Zaeshka	3	2	0	3	2
Drebna biala rakiynitsa	1	1	0	0	2
Klestachka	3	2	0	3	3
Pushevka	3	1	0	1	2
Lyatna trankosliva G	1	0	0	1	0
Kazanlashka	3	3	0	2	0

The data of the behaviour of the observed ten local plum varieties towards economical important diseases: *Plum Pox Virus, Monilinia laxa, Monilinia fructigena* and *Polistigma rubrum* are presented in Table 4. The variety 'Uhrepka' was resistant to *Plum Pox Virus*, without infections on the leaves and fruits. Tolerant varieties to this dangerous disease are 'Sinia rakiynitsa', 'Drebna biala rakiynitsa' and 'Lyatna trankosliva G'.

The investigated ten local varieties of plum are tolerant to *Monilinia laxa*. The fruits of 'Zaeshka' and 'Klestachka' are susceptible to *Monilinia fructigena*, but the ones of 'Uhrepka', 'Zimna karadjeika', 'Drebna biala

rakiynitsa', 'Pushevka' and 'Lyatna trankosliva G' are tolerant. The varieties 'Uhrepka, 'Sinakvitsa', 'Lyatna trankosliva' and 'Kazanlashka' are resistant to *Polistigma rubrum*, but 'Klestachka' is very sensitive.

DISCUSSION

The longest blooming time have been observed for the plum variety 'Drebna biala rakiynitsa'. This characteristic ensure a more efficient pollination in case of unfavorable meteorological conditions occurring during the pollination period. These data confirm our previous observations (Ivanova et al., 2002).

The highest development expressed by a large crown volume for the plum varieties 'Drebna biala rakiynitsa', 'Pushevka', 'Zaeshka', 'Sinakvitsa' and 'Sinia rakiynitsa' have to be taken into account for the determination of the planting distances in the new orchards.

The local varieties 'Drebna biala rakiynitsa', 'Sinakvitsa', 'Sinia rakiynitsa', 'Klestachka' and 'Lyatna trankosliva' are very fruitful, but their fruits are small and therefore mainly suitable for brandy production.

A very important character for the plum production is the tolerance of the varieties to the dangerous disease on plum – *Plum Pox Virus*. 'Uhrepka', 'Sinia rakiynitsa', 'Drebna biala rakiynitsa' and 'Lyatna trankosliva' are tolerant to PPV and they are suitable not only for propagation but also in a potential breeding process for finding new resistant plum cultivars.

The observed ten plum varieties are tolerant to Monilinia laxa and these results confirmed investigations of Marinova and Ivanova (1995).

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OCENA LOKALNYCH BUŁGARSKICH ODMIAN ŚLIWY POD WZGLĘDEM CECH AGRONOMICZNYCH I ODPORNOŚCI NA CHOROBY

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S T R E S Z C Z E N I E

W latach 1998-2003 oceniano plonowanie i jakość owoców lokalnych bułgarskich odmian śliwy: 'Zimna karadjeika', 'Klastechka', 'Uhrepka', 'Sinakvitsa', 'Sinia rakiynitsa', 'Drebna biala rakiynitsa', 'Zaeshka', 'Pushevka', 'Lyatna trankosliva G' i 'Kazanlashka'. W przeliczeniu na jeden hektar z drzew odmian 'Sinakvitsa', 'Sinia rakyinitsa', 'Drebna biala rakyinitsa', 'Zaeshka', 'Zimna karadjeika' i 'Klastechka' zebrano ponad 10 t owoców. W zależności od odmiany średnia masa owoców wynosiła od 7,0 do 17,0 g. Najwyższą zawartością suchej masy – 24,2% wyróżniały się owoce odmiany 'Uhrepka'. Śliwy odmian 'Uhrepka', 'Sinia rakyinitsa', 'Drebna biala rakyinitsa' i 'Lyatna trankosliva G' były tolerancyjne na szarkę (*Plum Pox Virus).* Wszystkie odmiany okazały się odporne na *Monilinia laxa,* a większość z nich była także tolerancyjna na *Polistigma rubrum.*

Słowa kluczowe: śliwa, odmiany lokalne, kwitnienie, plon, choroby