



Valuable local apple cultivars and forms of genus *Malus* in the region of Apriltsi

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Abstract

The local plant resources of *Malus* genus were studied in the region of Apriltsi. A great variety was found and were selected valuable apple cultivar and forms. The growth vigour of trees was defined. Biometric measurements of fruits were made. Due to growing of fruits on a seedling root-stock, they had a great growth vigour and they reached significant sizes. Weight of fruits varied from 39 to 190 g. Sadovska Perusha had the largest fruits - 190 g, Baba Katarina - 175 g, form MA 6 - 165 g. The susceptibility to fungal diseases - apple scab (*Venturia inaequalis*) and powdery mildew (*Podosphaera leocotricha*) was accounted. Most of the studied forms, such as Stefanka, Baba Katarina, Sadovska Perusha, Bozhechka, Form MA 6, are slightly susceptible to studied diseases, which determined them as appropriate for biological fruit production. From the conducted study on the basis of obtained results, as the most perspective were selected the local cultivars Sadovska Perusha, Baba Katarina, Bozhechka, Stefanka and forms MA 6, TSM and MT.

Key words: plant genetic resources, apples, cultivars, diseases.

Introduction

The apple is one of the most widely spread fruit tree species and it can be found in almost all parts of the country. It grows well in mountain areas, mountain foothills, in the valleys of non-drying rivers and at places with north exposure (Mitov et al., 1990). The apple fruits are valuable dietary food. They are rich in pectin and vitamins (Denkov, Denkova, 1998).

For many areas in the region of the Central Balkan Mountain, including the region of Troyan, the fruit tree growing is typical, and there is concentrated the result of the century old human presence, which should be preserved for future generations. A number of forms from the local gene pool of the fruit species have increased susceptibility to economically important diseases in apples (Dragoyski et al., 2012; Minev et al., 2012; Stoyanova et al., 2014).

Old apple cultivars have been preserved in the region, such as Manastirka, Yovovka, Limonka, English Green Renette, Canadian Renette, Cheshka momina, Koravka and a

number of local forms (Minev et al., 2009; 2011).

The present study has the aim to select and study the valuable apple cultivars and forms from the local plant resources of genus *Malus* in the region of Apriltsi, Troyan region, which possess good economic qualities and slight susceptibility to diseases, which are suitable for storing and including in the organic fruit production.

Materials and Methods

An expeditionary exploration was conducted of the local plant resources of genus *Malus* in the region of Apriltsi. The neighbourhood of Marishnitsa, Yovchevtsi, Sabevtsi, Cherni vruch, Sholevtsi, Svinyova polyan were visited. They are situated along the river, which flows through, and the northern slopes at altitude from 500 to 699 m. They are grown under non-irrigating conditions. The region has cooler and more humid climate, due to its location. The growth vigour and sizes of trees were studied. Biological and

morphological characteristics of fruit were established. Forms of valuable economic qualities were selected. Trees with a natural background of contamination were marked with manifested tolerance and slight susceptibility to economically important diseases for apple. The characteristics of fruits were specified: their sizes, weight, shape, flavour qualities and colour. The researches were conducted according to Methods for Studying Plant Resources in Fruit Orchard Cultivars (Nedev et al., 1979).

Results and Discussion

Apriltsi is situated in a wide valley at the foot of Botev Peak. Due to the rough terrain and the favourable conditions for apple growing, a great number of cultivars and local forms of genus *Malus* were found in plantations, created from the former Labor Cooperative Farms and in private gardens.

Due to the character of the region, a great diversity of representatives of genus *Malus* has been preserved till nowadays. The discovered local cultivars and forms grow and develop at the altitude from 500 to 700 m. They are at the age of 60-70, most of which are vital with abundant fruit bearing. A considerable part of trees were engrafted on a seedling root-stock, which stimulated the vigour growth and great sizes - height of 10-15 m and trunk cross-section up to 50 m. In the conducted expeditions in the region of research, most of the trees are grown under non-irrigating conditions without soil treatment, prunings and plant protection. They are distinguished by good fruitfulness, abundant fruit bearing and quality fruits with attractive appearance. Most of the represented cultivars and forms have a late term of ripeness – the second half of September and October.

The richest collections in Apriltsi were discovered in the region of the neighbourhood of Marishnitsa and Yovchevtsi. The valuable form **TSM** was discovered in a private yard in the neighbourhood of Sabevtsi over Ostrets quarter. The tree is over 100 years old, with the following sizes – height 6.40 m, diameter 10.60 m and trunk cross-section 70 cm. The fruit production obtained by the owner was 700-800 kg. The average fruit weight was 76 g (Table 1). Regarding diseases, this cultivar is slightly susceptible to apple scab (*Venturia inaequalis*) and powdery mildew (*Podosphaera leocotricha*). In relation to external characteristics and

flavour qualities that cultivar resembles the Holland Winter Renette.

The local **Stefanka** cultivar is a large tree at the age over 60 years. It was discovered in the region of Marishnitsa in a private owner. The yield obtained was high – 1200 kg/per tree. Fruits had the weight about 40 g, height of 35.50 mm and average diameter 45.00 mm. The length of fruit stalk was 16 mm. The colour was yellow-green with blush (Table 1). Mesocarp was sweet, juicy, without acids. The cultivar is slightly susceptible to apple scab (*Venturia inaequalis*). Despite the inadequate size, due to high fruitfulness, significant yields of that cultivar are obtained.

In the same region was also found the local cultivar **Bozhechka**. The tree has a significant size. Fruits had the weight of 51.30 g, height of 41.80 mm and average diameter of 51.00 mm. The fruit stalk was 12.20 mm. The colouring of exocarp was yellow green. The mesocarp is sweet in taste, almost without acids. The cultivar is slightly susceptible to fungal diseases (Table 1).

Momini buzi is a local cultivar, which appearance resembles Ayvaniya cultivar. The tree has a large crown. Fruits had the weight of 87 g, height of 52.00 mm and average diameter of 61.00 mm. The stalk was short - 6.50 mm. The colouring of exocarp was whitish-green with blush from the side lit by the sun, hence the local name of the cultivar has come. The mesocarp is sweet, almost without acids. The cultivar is slightly susceptible to apple scab.

Baba Katarina cultivar is also known as Manastirka. The height of tree was 8.50 m. The fruits were relatively huge with weight of 175 g with the height of 67 mm, and average diameter 85.05 mm (Table 1). The colouring is greenish with a slight blush. The flavour qualities of the cultivar are very good, with balanced content of sugars-acids. The cultivar manifests a slight susceptibility to apple scab, having large dark green leaves, without spots.

An interesting form **apple MT**, different from those previously studied, was discovered and studied in the region of Marishnitsa. The average weight of fruits was 75 g. Their height was 51.10 mm and an average diameter 59.40 mm, with dark red to purple colouring of the exocarp with an attractive appearance. The mesocarp had very good flavour qualities. It manifests slight susceptibility to the studied fungal diseases.

Sadovska Perusha was discovered in a private orchard in the vicinity of Cherni vruh. The tree has ball-shaped crown with the height of 9.20 m. Fruits were large - over 190 g with a height of 63.20 mm, green in colour, with a pleasant taste with a balanced content of sugars - acids. The cultivar is slightly susceptible to apple scab.

Renete grise is an old cultivar discovered in several habitats in the studied region. The

trees had a considerable crowns and abundant fruit bearing. Due to the great burden of fruits, their weight is relatively lower – 62.20 g, rusty brown in colour, hence the name of cultivar has come. The mesocarp is sweet-sour, after storage its taste has a tendency to be sweet. It manifests slight susceptibility to the studied fungal diseases (Table 1).

Table 1. Biometric measurements of samples of apple fruits, collected in the region of Apriltsi

Cultivar/Form	Weight g	Stalk length mm	Height mm	Average diameter mm	Colouring	Fungal disease attack
Form TSM	76,00	7,20	61,30	59,80	Yellow green	Slightly susceptible
Stefanka	39,00	16,00	35,30	45,30	Yellow green with blush	Slightly susceptible
Bozhechka	51,30	12,20	41,80	51,10	Yellow green	Slightly susceptible
Momini buzi	87,00	6,50	52,00	61,00	Green	Average susceptibility
Baba Katarina	175,30	8,30	67,00	85,50	Green with a slight blush	Slightly susceptible
Form MT	75,40	11,700	51,10	59,40	Dark red to purple	Slightly susceptible
Sadovska perusha	191,30	5,60	63,20	79,10	Green	Slightly susceptible
Renete grise	62,20	7,00	44,60	52,70	Brown	Slightly susceptible
Form MA 6	164,30	8,40	60,00	77,30	Dark red with yellow spots	Slightly susceptible on the leaves, susceptible on fruits
Chardachka	182,50	7,60	61,50	74,30	Yellow with diluted red colour	Average susceptibility

In the private plantation of neighbourhood of Yovchevtsi was discovered an interesting apple cultivar – **form MA 6**, distinguished by dark red, relatively large fruits with the average weight 164 g and thick fruit stalk, characteristic for this local cultivar. The consistency of mesocarp is tender, with sweet-sour taste. It manifests slight susceptibility to fungal diseases.

In the same plantation was also discovered another old local cultivar – **Chardachka**, which is destined to extinction. Fruits are comparatively large - 182 g, with a

height of 61.50 mm and an average diameter 74.30 mm, yellow in colour with diluted red colour, with very good taste qualities. It manifests average susceptibility to fungal diseases.

A characteristic peculiarity and one of the trends of the study is to determine their behaviour towards the economically important fungal diseases for that species. Most of them have an increased resistance and slight susceptibility to fungal diseases. The greater economical significance for the studied region has the apple scab with *Venturia inaequalis* as

causer. The establishment of cultivars, which are less susceptible and resistant to diseases, allow their growing without application of plant protection, which makes them suitable for organic fruit production.

Conclusions

During the conducted expeditionary researches on the genetic plant resources of genus *Malus* in the region of Apriltsi, a great diversity of local forms and established old apple cultivars was found. Despite their age (60-70 years), many of them have good fruitfulness, great growth vigour - trunk cross-section over 50 cm and tree height of 10-12 m.

As the most perspective, with valuable economic qualities, are the cultivars Baba Katarina, Sadovska Perusha, Bozhechka, Stefanka and forms MA 6, TSM and MT. Weight of fruits varied from 39 to 190 g. Sadovska Perusha had the largest fruits – 190 g, Baba Katarina – 175 g, MA 6 – 165 g.

Most of the discovered local cultivars and forms have slight susceptibility to fungal diseases, which allows to be grown without plant protection and determines them as suitable for organic fruit production.

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