

## LOCAL PLANT RESOURCES OF GENUS *MALUS* IN THE REGION OF TROYAN

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### Abstract

*A survey was carried out in the region of Troyan and Apriltsi and its adjacent villages and neighborhoods from the Central Balkan Mountain region of Bulgaria. Because of its specific climate and intersected relief, it has favorable conditions for growing of orchards. The development of fruit-growing and the traditions of lovers of fruit trees in the region have led to the creation of a wide variety of local cultivars of fruit crops and especially apple cultivars and forms. A wide range of members of genus Malus have been selected for the investigations. Most of the selected forms belong to the group of autumn and winter varieties according to their ripening period. Some of them are distributed across all parts of the surveyed areas, while others are found in single sites.*

*The most common are: 'Cheshka momina', 'Jonathan', 'Troyanka', 'English Green Renet', 'Renet du Canada', 'Limonka', 'Manastirka', 'Shekerka', 'Perusha', 'Yellow Bellflower', 'Ayvaniya', 'Tsiganka'.*

*The following cultivars are also marked: 'Stefanka', 'Bozhechka', 'Amerikanka', 'Medena abalka', 'Ostreshka reneta CM', 'Marishnitsa 8/10', 'Winter green', 'Yovovka', 'Kojesta reneta' presented as single trees in separate habitats.*

*The fruit of the group of Petrovka apple had the earliest ripening period - they start to ripen from the first half of July and have a weight of 28.8 g to 80.6 g.*

*Fruits of 'Cheshka momina', 'Jonathan', 'Troyanka', 'Ayvaniya', 'Limonka' are long lasting and are preserved and kept in ordinary cellars until the end of March and early April.*

*Valuable forms are selected and marked for reproduction and preservation.*

**Key words:** plant genetic resources, apples, varieties.

### INTRODUCTION

Apple is one of the most valuable fruit crops. Despite of the specific climate and soil requirements, it has a large range of distribution. From all the fruit species of temperate climate, the most economic importance is the apple. World apple production exceeds the production of any of the other fruit species by several times. It is highly fertile compared to other perennial crops and produces high yields. Its fruits have a long shelf life and good transportability. They are rich in pectin and important biochemical ingredients, which determines their importance and high demand. Apple is among the most traded fruits on the world market (Dzhuvinov, 2016; Radomirska, 2007; Wagner et al., 2014).

Unformer fruit growers have played an important role in enriching the diversity of varieties and forms of the genus *Malus* in Europe, Asia and America. (Bostan, 2009; Bozovic et al., 2013; Chavlesh et al., 2019;

Giovannoni, 2010; Dzhangaliev, 2003; Gradinariu et al., 2003; Ercisli, 2004; Forsline et al., 2003). Apple fruits are a valuable diet food. They are rich in pectin and vitamins (Denkov, 1998; Denkova, 1998; Dzhuvinov, 2016).

The requirements of the world market production of fruit grown without using pesticides. In practice this can be achieved by reclaiming old varieties that have shown increased resistance to disease. One reason for the growing of local varieties and forms apples is their good adaptability to habitats, and their resistance to diseases and pests (Bozhkova et al., 2006; Iliev, 1985; Stoyanova et al., 2014).

The aim of this study to select and study valuable apple varieties and forms from the local plant resources of the *Malus* genus in the Troyan region, possessing good economic qualities and low susceptibility to diseases suitable for storage and inclusion in organic production.

## MATERIALS AND METHODS

Expeditionary studies of local plant resources of the genus *Malus* in the Troyan region have been carried out. Growing conditions are not irrigated. The altitude is from 380 to 600 m. The soils are gray forested. Selected genotypes are with high valuable agricultural qualities. The region has a cool and humid climate, due to the location. Studied varieties are found in habitats near rivers and riverbeds, where they found conditions for good growth and fruiting. Forms with valuable economic qualities were selected. Trees are marked against a natural background of contagion with manifested tolerance and low sensitivity to economically important diseases of the apple. The biological and morphological features of the fruits have been established. The peculiarities of the fruits are taken into account: their size, mass, shape, taste and color. The studies were performed according to the Methodology for the Study of Plant Resources in Fruit Plants (Nedev et al., 1979).

## RESULTS AND DISCUSSIONS

A study of the *Malus* gene pool in the study areas revealed a wide variety of shapes and the proven old varieties of apples. They cover a very long harvest period - from July to October. The established apple trees are in preserved

orchards of cooperative land use and single trees, some of which are 80-100 years old in private estates and yards.

Apple is a water-loving crop and grows best in mountainous areas, at the foothills of mountains, in valleys of non-drying rivers, and in places with northern exposure.

During the expeditionary studies and the laboratory tests, are selected representatives from the group of Shekerki and 14 local genotypes were discovered and studied. They cover a 30-40 day harvest period. In early ripening genotypes, the fruits reach the harvest ripening of the second half of September, and in the late ripening genotypes, known as winter Shekerka, the second half of October. Yields are significant, reaching 200-280 kg per tree in some years. The most important characteristic of this group of apples are the sweet fruits with low acid content.

Most fruits are yellowish in color with intense red blush and darker streaks with a relatively small size. The weight of the studied genotypes varied from 27.4 g to form 1 / 25.09. to 124.6 g in the form of Petran / 24.09., in most forms the weight of the fruit is 40-60 g. The most promising are the forms of Dyadovata Hristova winter Shekerka and Petran / 24.09.

The advantages of the Shekerka genotypes are their fertility, relatively low sensitivity to diseases and pests and good preservation of their fruits (Table 1).

Table 1. Measurement of samples of apple fruits of the type Sekerki collected in the Troyan region

Genotype	Weight, g	Length of the fruit stem, mm	Height, mm	Average diameter, mm
1/25.09.	27.4	8.3	34.1	38.0
Petran/24.09.	124.6	11.7	59.6	65.6
4/24.09.	40.9	14.2	40.0	47.2
6/24.09.	85.3	13.3	49.6	59.0
8/25.09.	54.7	9.2	46.1	49.8
9/25.09.	51.2	5.9	43.1	50.0
11/24.09.	43.6	14.5	40.8	45.2
14/24.09.	44.8	19.8	44.6	46.3
14/25.09.	53.2	9.2	43.3	51.6
15/25.09.	63.9	10.2	48.4	54.3
1/10.10.	56.8	7.8	45.5	50.8
16/10.10.	40.6	8.2	42.5	44.8
18/10.10.	62.4	8.0	46.3	53.2
19/10.10. Dyadovata Hristova	71.0	10.8	49.1	56.7
<b>Average</b>	58.60	10.79	45.21	50.89
<b>STDEV</b>	23.85	3.64	5.81	6.83

In the surveyed areas of the group of Rene registered following varieties: Skinny Reinnette, Canadian Reinnette, Banana Reinnette, Dutch Reinnette, Blenhaymska Reinnette de Blenheim, Cox Orange Reinnette, English green Reinnette.

The main color of the fruit skin is green in shades, while in the Skinny and Canadian Reinnette it is brownish. Their fruits begin to ripen from the end of September, and at the

latest ripen the fruits of the English Green Reinnette - the end of October. Fruit in all of the tested Reinnette is sweet and sour. Their fruit weight ranges from 58 g in Cox Orange Reinnette to 172 g in English Green Reinnette (Table 2).

They usually begin to ripen in the second half of July. At full maturity it is greenish-yellowish, covered with fuzzy redness in some forms, with well-visible red streaks with blush.

Table 2. Fruit sizes

Genotype	Weight, g	Length of the fruit stem, mm	Height, mm	Average diameter, mm
Skinny Reinnette	95.7	11.0	44.6	51.0
Canadian Reinnette	145.6	8.0	58.8	73.4
Banana Reinnette	100.0	22.4	48.4	63.4
Dutch Reinnette	90.0	4.2	53.3	62.2
Reinnette de Blenheim	117.8	15.5	57.5	63.6
Cox Orange Reinnette	58.0	17.2	42.3	53.4
English green Reinnette	172.7	8.0	61.1	79.6

## CONCLUSIONS

This allowed to select the varieties of Czech Momina, Jonathan, Troyanka, English Green Reinnette, Canadian Reinnette, Limonka, Manastirka, Shekerka, Perusha, Yellow Bellflower, Ayvania, Tsiganka, which are widespread in many areas of the area.

Within as single trees in separate locations and as single trees, were found the local varieties - Stefanka, Bozhechka, American Honey apple, Ostreshka Reinnette, Marishnitsa 8/10, Winter green, Jovovka, Skinny Reinnette. The larger-fruited of these, are Perusha with a fruit weight of 124.6 g, Canadian Reinnette - 145.6 g and English green Reinnette - 172.7 g. Their fruits ripen from the second ten days in September to the second ten days in October, which defines them as winter varieties.

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