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SOME FRUIT CHARACTERISTICS OF MEDLAR (*MESPILUS GERMANICA* L.) GENOTYPES GROWN IN ORDU, TURKEY

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Abstract

Medlar is grown mostly as scattered trees within or around hazelnut orchards in the Black Sea Region of Turkey. The harvested fruits are used for family consumption or sold in local markets. This research was carried out to determine certain morphological and chemical attributes of 39 medlar genotypes grown in Ordu region in 2012. There was large variation among the genotypes that the average fruit weight, fruit length and fruit width were between 6.32 and 36.42 g, 21.8 and 40.1 mm and 20.6 and 42.7 mm while width and length of calyx basin ranged from 8.3 to 23.3 mm and from 3.8 to 11.8 mm, respectively. Soluble dry matter, titreable acid contents and pH varied between 2.3 and 11.9 g/l, 8 and 18%, and 3.62 and 4.90, respectively. Based on especially fruit size and weight, the clone #3 was selected as a promising genotype.

Key words: *Medlar, Mespilus germanica L., pomology, selection.*

INTRODUCTION

Medlar (*Mespilus germanica* L.) is a genus in the Rosaceae family which has many fruit species. Medlar is deciduous and grows naturally as large shrubs or small trees in Southwest Asia and also in Southeast Europe, mostly in the coast of Black Sea in Turkey for 3000 years. The fruits of medlar have brown and sometimes reddish colour and they are 1.5-3 cm in diameter, the small ones have a weight of 10-80 g (Browicz, 1972; Bignami, 2000; Ayaz et al., 2008). The medlar fruit is widely consumed in Turkey. In Northeast Anatolia (Turkey) both wild and cultivated forms are grown, and their fruit is used in different ways. In October, the hard fruit is harvested from the medlar trees and stored in cold, dark and ventilated places. However, a substantial part of the crop at different stages of maturity is left on the trees and harvested later after fruit softening has started. The fruit is often consumed or sold in the local markets and stores.Cultivars of Mespilus germanica that are grown for their fruit include; hollandia, nottingham and russian, dutch (also known as giant or monstrous), royal, breda giant and large russian (Bignami, 2000). There are very few kinds of fruit in other types.This study was conducted in order to determine the fruit characteristics of genotypes grown in natural habitat of Ordu province.

MATERIALS AND METHODS

Plant material

The fruits of 39 different genotypes were taken into consideration among hundreds of genotypes grown in the district of Ulubey, Ordu. The fruits were harvested from the trees before softening and 15 fruits from each genotype were left for softening at 22 ± 2 ^{0}C.

The measurements of fruit length, fruit diameter, width and length of calyx basin were determined with digital calipers; fruit and seed weight were determined with 0.01 g sensitive precision scales by taking the average of the 15 fruits.

In soft fruits, the rate of total soluble dry matter was determined as percentage with hand refractometer. The rate of titreable acid content was determined as percentage considering the amount of total base consumed as malic acid, after the titration with 1N NaOH. The pH of fruit juice was also determined.

The data obtained from the fruits of the 39 genotypes were tested using variance analysis with the statistical packages of minitab (MINITAB Inc.). The differences were compared with Duncan method with using 0.05 *F* value ($P \leq 0.05$).

RESULTS AND DISCUSSIONS

Fruit characteristics of the 39 genotypes that were evaluated in the field observations are given in Table 1. According to the results, the genotype 3 has the highest value for fruit weight (36.42 g) and it is followed by genotype 1 (31.28 g) and genotype 33 (30.31 g). The lowest value for fruit weight was measured in the genotype 29 (6.32 g).

Studies in the literature carried out in different parts of Turkey showed that the values of fruit weight ranged from 9.46 to 40.80 g (Ozkan et al., 1997; Bostan, 2002; Bostan and Islam, 2007; Ercilsi et al., 2012).

The highest values in terms of fruit lengths were found in the genotypes 14 (40.12 mm) and 3 (39.74 mm). The lowest values were determined in the genotype 31 (20.69 mm). In previous studies, it was indicated that the fruit lengths ranged from 26.53 to 48.73 mm in the genotypes selected (Ozkan et al., 1997; Bostan, 2002; Bostan and Islam, 2007; Ercilsi et al., 2012). Our results are within the range of the values reported in the literature.

The fruit diameters of analyzed genotypes ranged from 23.10 to 42.65 mm. The highest value was determined in the genotype 3, as it was true for fruit length. In the literature, it was stated that the fruit diameters of identified genotypes varied from 23.67 to 42.51 mm (Ozkan et al., 1997; Bostan, 2002; Bostan and Islam, 2007; Ercilsi et al., 2012). Our fruit diameter results were almost similar to these values.

The width and length of calyx basin increased with the coarsening of fruit. For the width of calyx basin, the maximum value was determined in the genotype 15 (23.33 mm) and for the length of calyx basin, the maximum value was determined in the genotype 3 (12.94 mm).

The soluble dry matter contents of genotypes varied between 8-18%. In the literature these values ranged from 12.5 to 26% (Ozkan et al., 1997; Bostan, 2002; Bostan and Islam, 2007; Ercilsi et al., 2012).

The pH value of fruit juice was found between 3.62 and 4.76. These differences are not significant statistically.

The values of titreable acid contents were found between 2.35 and 11.93 g/l. These differences are not significant statistically too. Ozkan et al., (1997) and Bostan (2002) determined the titreable acid contents as between 1.91 and 8.71 g/l. Our results are linear with these findings except the genotype of 39 (11.93 g/l).

The maximum value of genotypes in terms of seed weight was found in the genotype 2 (4.28 g) and it was followed by genotype 4 (4.10 g). The lowest seed weight was found in the fruits of the genotype 29 (0.92 g).

Number of seeds in fruits was found above four in all genotypes except the genotypes 20, 22 and 36. On the other hand, the number of seeds was five in the genotypes 3, 32 and 39. Studies in the literature showed that the number of seeds were generally between 4 and 5 (Ozkan et al., 1997; Bostan, 2002; Bostan and Islam, 2007).

CONCLUSIONS

In this study, fruit characteristics of 39 genotypes were investigated. Four genotypes with fruit weight of 25 g or more, 6 genotypes with fruit length of 35 mm or longer and 6 genotypes with fruit diameter of 35 mm or more were determined. These leading genotypes have the potential of being used in developing new varieties.

In the study, 5 genotypes producing 17% soluble dry matter were regarded as outstanding genotypes because of their chemical composition and they also had high rate of titreable acid contents. This study carried out in the natural growing area of medlar revealed that the genotype 3 was promising in terms of the characteristics evaluated in variety development.

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