Current Trends in Natural Sciences Vol. 8, Issue 15, pp. 91-94, 2019

Current Trends in Natural Sciences (on-line)
ISSN: 2284-953X
ISSN-L: 2284-9521

Current Trends in Natural Sciences (CD-Rom)
ISSN: 2284-9521
ISSN-L: 2284-9521

FRUIT CHARACTERISTICS OF WILD PLUM (*PRUNUS DİVARİCATA* LEDEB.) GENOTYPES NATURALLY GROWING IN HIGH MOUNTAINOUS AREAS OF CENTRAL ANATOLIA

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Abstract
Prunus divaricata is a wild plum species also known as cherry plum within the Rosaceae family. This species is wild growing, diploid, self-incompatible fruit tree that widely distributed from the Balkan Peninsula across Anatolia and the Caucasus to Central Asia, including northern Iran. Grow as shrub or small tree, 2-4 m; weakly thorny, young shoots and buds glabrous. Fruit is the species 10-15 x 8-12 mm; globose or ovate, pendent, yellow, red or pink. In this study some fruit characteristics of P. divaricata genotypes naturally growing at 2200 m of altitude. Thirteen genotypes were evaluated and significant differences were found for fruit parameters. Fruit weight of studied genotypes ranged between 1.2-3.7 g. Pedicel lenght of genotypes changed from 9.2 to 15.9 mm. Total soluble solids (TSS) of wild plums varied between 12 and 27%. Rind color of the genotypes changed between light red and claret red. High level of variations found among P. divaricata genotypes may be due to seed propagation. Diversity of this species should be conservation and may be use to increase variation in cultivated Prunus species.

Keywords: Anatolia, fruit, plum, Prunus.

1. INTRODUCTION

Turkey has rich plant genetic resources including, many wild, transitional and perennial herbaceous and woody plants because of located in two gene centers (Near East and Meditarranean) (Agaoglu et al., 1997; Ercisli, 2004). Turkey to be with different environment from subtropical to cold climate, it makes possible to grow a great number of fruit taxa. More than 85 fruit species, including almost all deciduous fruit species, most subtropical species and some tropical species, can be grown (Ercisli, 2004).

Turkey (Anatolia) is one of the genetic centers of some plum species including, *P. cerasifera, P. institia, P. domestica and P. spinosa* (Özbek, 1978). Plum species grown in Turkey has very diverse plant features varied between shrubs and large tree, spreading to upright tree form and diverse blooming time (Ercisli, 2004). As one of the *Prunus* species *P. divaricata* is also naturally growing in some parts of Turkey. It was reported that the species is widely distributed from the Balkan Peninsula across Anatolia and the Caucasus to Central Asia, including the northern Iran (Browicz, 1969, Wohrmann et al., 2011). The plant can grow along the mountain slopes in woody or shrubby forest thickets, stony slopes and bottoms of ravines, near water, mountain river valleys (Batsatsashvili et al., 2017). This species is used as rootstock for plum and peach cultivars (Khoshbakht et al. 2007). Fruits of this species can be eaten or used for some processed product.

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Wild populations of *P. divaricata* are occurring in the mountainous regions at the foothill of Erciyes mountain in Central Anatolia. This populations contain considerable diversity for fruit quality parameters making them good candidates for cultivation. Researches on the fruit properties of this species are inadequate and more studies are needed to evaluate the species. In this study some fruit parameters of *P. divaricata* genotypes collected from 2200 m of high altitude in Central Anatolia region were determined.

2. MATERIALS AND METHODS

A total of 13 *P. divaricata* genotypes collected from 2200 meters of mountainous areas around Erciyes mountain (altitude: 3917 m) in Kayseri province, Turkey. Genotypes growing naturally within the forest area (Figure 1).

Figure 1. P. divaricata plant growing in natural site

Twenty-five ripe fruit collected from each genotype and fruit weight, fruit length, fruit width, pedicel lenght, total soluble dolids, seed weight and fresh ratio were measured. For investigated fruit characters, data were analyzed using JMP trial version (SAS Institute Inc.) and means were separated and grouped using Tukey's test ($P < 0.05$). Differences among selected genotypes were put forth and ultimately superior ones were identified.

3. RESULTS AND DISCUSSION

High level of variations were found among *P. divaricata* genotypes with regard to fruit characteristics. Significant differences were observed for all investigated traits. Figure 2 illustrates the variation of fruit characteristics of genotypes. Fruit weight of genotypes ranged between 1.2 and 3.7 g and genotype 13 was the best for this trait. Same vay, genotype 13 had the highest fruit lenght (19.9 mm) and fruit width (17.5 mm). On the other hand, genotype 4 had the smallest fruit weight, had minimum fruit lenght and fruit width (14.0 and 11.8 mm respectively). Pedicel lenght of genotypes varied between 15.9 (genotype 9)and 9.2 mm (genotype 4). Genotype 4 was the bset genotype for total soluble solids (TSS) (27%) whereas genotype 7 had lowest value (12%) for TSS.

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Seed weight of genotypes ranged between 0.66 and 0.32 g. Genotypes 8 and 12 had the highest seed weight. Rind color of the materşals was from light red to claret red (Table 1).

Figure 2. Differences in fruit characteristics of some P. divaricata genotypes

Table 1. Some fruit characteristics of P. divaricata genotypes studied

G.No	FW (g)	FL (mm)	FWD (mm)	PL (mm)	TSS (%)	SW (g)	RC
1	1.7 f	15.2 de	13.8 d	11.7 c-e	20 b	0.32 d	Claret red
2	2.4 b-d	16.9 c	14.5 d	10.2 ef	16 d	0.38 cd	Claret red
3	2.1 d-f	15.6 cd	14.4 d	13.8 a-c	21 b	0.45 b-d	Dark red
4	1.2 g	14.0 e	11.8 e	9.2 f	27 a	0.38 cd	Dark red
5	2.3 c-e	15.9 cd	14.8 cd	10.0 ef	18 c	0.32 d	Dark red
6	3.3 a	19.5 ab	16.9 ab	12.4 b-d	17.6 cd	0.54 ab	Red
7	1.8 ef	16.4 cd	13.8 d	9.3 f	12 e	0.47 bc	Red
8	2.8 bc	18.4 b	16.0 bc	14.5 ab	20 b	0.66 a	Dark red
9	2.1 d-f	16.2 cd	14.2 d	15.9 a	21 b	0.50 bc	Light red
10	2.1 d-f	16.5 cd	14.7 cd	10.7 d-f	18 c	0.38 cd	Red
11	2.8 b	16.9 c	16.3 ab	14.6 a	18 c	0.48 bc	Red
12	2.5 b-d	19.9 a	14.1 d	13.8 a-c	18 c	0.66 a	Dark red
13	3.7 a	19.9 a	17.5 a	14.1 ab	16 d	0.52 b	Light red

G. No: Genotype no; FW: Fruit weight; FL: Fruit length; FWD: Fruit width; PL: Pedicel lenght; TSS: Total soluble solids; SW: Seed weight; RC: Rind color

Only a few studies available regarding to fruit quality parameters of *P. divaricata*. Khoshbakht et al. (2007), reported fruit weights of investigated genotypes as between 2.1 – 6.7 g. Fruit lenght and fruit width of genotypes were found by same researcher as 16-34 mm and 10-19 mm respectively. It was reported in a study carried out in Kazdagi area of Turkey, mean of fruit weights of selected genotypes as between 6.7-7.0 g, mean of seed weights of selected genotypes 0.68-0.84 g (Onal,

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2013). These results generally higher than our results. This may be caused by ecological conditions and genetic structure of genotypes.

4. CONCLUSIONS

Our study revealed that these genotypes can grow at high altitudes contain significant morphological diversity. The establishment of in situ and ex situ conservation programs for the conservation of this diversity and use of these genotypes in different studies are important. The use of wild species in breeding programs is very suitable for increasing the genetic diversity of cultivated cultivars and expanding the gene pool (Wolko et al., 2010; Wohrmann et al., 2011). *P. divaricata* may be used to increase variation in *Prunus* species.

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