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Full Length Research Paper

The cherry laurel (*Prunus laurocerasus* L.) tree selection

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Cherry laurel (*Prunus laurocerasus* L.) has attracted attention because of many different usage such as fresh fruit production, processing material for medicinal and pharmacy industry. This study carried out some pomological, chemical and phenological properties of cherry laurel phenotypes to selection of the favorable phenotypes for cultivation. A total of 40 phenotypes were evaluated in the program, between the year 2008 and 2010 for three growing seasons. According to the searched literature, there is need to select good quality phenotype fruits for this specie. Therefore, this research is very important with this point. The data regarding tested pomological characteristics were evaluated by the modified weighed-ranked method. According to the results obtained, fruits weights of the phenotypes were between 0.82 and 5.22 g. Fruit firmness, soluble solid contents, titratable acidity and flesh/seed ratio of phenotypes varied from 203 to 523 g/mm, 12.46 to 24.40, 0.12 to 0.62 and 2.39 to 20.72% respectively. Based on the result of this evaluation, ten phenotypes were selected as superior phenotypes with high scores. The taste was very good and astringency was very low for these phenotypes. Phenological characteristics, such as first flowering, full flowering and end of flowering were observed firstly for Phenotype 35 (corresponding 17 to 20 March, 21 to 27 March and 01 to 06 April respectively) and lastly for Phenotype 31 (corresponding 05 to 10 April, 13 to 16 April and 20 to 23 April respectively). In the selected phenotypes, the flower number per cluster and fruit number per cluster ranged from 31.38 to 44.63 flowers and from 5.49 to 16.84 fruits respectively. Selected superior phenotypes should be used in future breeding programmes and should be propagated for cultivation

Key words: *Prunus laurocerasus* L., selection, pomology, chemical characteristics.

INTRODUCTION

Prunus laurocerasus L. (Cherry laurel), from *Rosaceae* family, is a fruit native to the regions bordering the Black Sea in Southwestern Asia and Southeastern Europe. It is widely spread out in the North part of Turkey and there are many cultivars which show different characterization. Historically, the species was first described by a French researcher, P. Belan in 1546 in Northeast of Turkey (Ercisli, 2004). *Prunus laurocerasus* is an evergreen plant with small cherry fruits in a few centimeter diameters, turning red to black when ripe. Some phenotypes ripen in August but some phenotypes become eatable at ripening stage in early or middle autumn. Before maturity fruits are astringent, but become sweet and reasonably pleasant when fully ripe. The plant is distributed naturally on light, medium and heavy clay soils. It shows a better pest resistance than most other species in the genus *Prunus* (Frohne and Pfander, 1984; Komarov, 1968).

The fresh leaves of cherry laurel are used in herbal medicine because of their antispasmodic, narcotic and sedative properties. It is a good diet fruit that gives fullness. When it is eaten with stones, has a fall down effect for kidney stones. Powder of stones is very good for bronchitis. It supplies blood acid-base balance. Cherry laurel fruits are considered a significant source of phenolic compounds and antocyanins (Grieve, 1984; Halilova and Ercisli, 2010; Kolaylı et al., 2003).

Normally people grow it like a border tree, there are not closed orchards and as a result of insufficient cultural treatments, productivity is very low. Uses of cherry laurel fruits are a result of traditional habits rather than of economics because of heterogeneity of such plants, the lack of selection and varietal identification of phenotypes. The breeding programs to obtain cherry laurel cultivars with high fruit quality have rarely been attempted (Islam and Odabas, 1996; Islam and Vardal, 2009). There are a

Table 1. The scores of the characteristics and their relative values.

Characteristics	Relative values (%)	Class of the characteristics and their scores		
(FW) Fruit weight (g)	15	Large:3 (5.22-3.78)	Medium:2 (3.77-2.34	Small:1 (2.33-0.90)
(WF) Width of fruit (mm)	15	Large:3 (19.54-16.35)	Medium:2 (16.34-13.16)	Small:1 (13.15-9.97)
(FF) Fruit firmness (g/mm)	10	High:3 (523-416)	Medium:2 (415-310)	Low:1 (309-203)
(SSC) Solible solids contents (%)	15	High: 3 (24.40-20.42)	Medium:2 (20.41-16.44)	Low:1 (16.43-12.46)
(A) Astringency	20	Low: 3 (2.8-2.2)	Medium:2 (2.1-1.6)	High:1 (1.5-1.0)
(FT) Fruit taste	15	Tasty:3 (3.6-2.73)	Medium:2 (2.72-1.86)	Tasteless:1 (1.85-1.00)
(FSR) Flesh/seed ratio	5	High:3 (20.72-14.61)	Medium:2 (14.60-8.50)	Low: 1 (8.49-2.39)
(TA) Titratable acid (%)	5	High:3 (0.62-0.45)	Medium:2 (0.44-0.28)	Low: 1 (0.27-0.12)
Total scores	100			

few studies on the chemical composition of cherry laurels (Ayaz et al., 1996; Halilova and Ercisli, 2010). This plant became more popular in recent years. It is mostly consumed as fresh fruit in local markets, but may also be dried and processed into different products too. This fruit became important for producers and processing industries and as a result of this, we need to timely select the most favorable phenotype and propagate them economically. According to the searched literature, there is need to select good quality phenotype fruits for this specie.

Fruit size and fruit quality have to be investigated in order to increase commercial potential of new phenotypes. This study aimed to determine some pomological, chemical and phenological properties of cherry laurel phenotypes for the selection of the favorable phenotypes for cultivation. The determination of selection criterions and constitution for the property classes for modified weighed-ranked method was performed according to cherry selection criterion and previous studies about cherry laurel. The most appreciated evaluation criteria refer to productivity, maturation time, fruit size, skin color, pulp firmness. The instrumental analysis focused on the caliper, weight, color hue and the chemical analyses for cherries (Beceanu, 2007). Some organoleptic criteria as taste and flavor were also used for determination quality of cherries (Buret, 1990). As a result of this study, an alternative fruit crop will be obtained for the growers and the abundant high-quality curative fruits will be supplied to the consumers.

MATERIALS AND METHODS

This study was carried out in Kocaeli province between 2008 and 2010 for three growing seasons. The province of Kocaeli is located on north-western part of Turkey, at the latitude of 40°42' N and longitude 30°01'E and 76 m above sea level. The material of the study consisted of wild cherry laurel trees. Each tree was considered as a phenotype. A total of 40 phenotypes from the population were investigated by considering having large fruit, variability of fruit characteristics and healthy mature plants.

In all phenotypes, pomological and chemical characteristics were investigated for three years. In order to choose the superior phenotypes, the selection criteria used were fruit weight, fruit width, fruit firmness, soluble solid contents, astringency, fruit taste, titratable acid (as equivalent of malic acid) and flesh/seed ratio (Table 1). Cherry laurel phenotypes were rated from good to bad for their fruit characteristics by the modified weighed-ranked method (Ayfer et al., 1977; Michelson et al., 1958). The relative value for each characteristic was calculated from these ratings (scores) (Table 2).

Fruit characteristics

The fruit characteristics of the phenotypes such as fruit weight, width and length, color of fruit, fruit number on cluster, length of cluster were determined for 40 fruit and cluster samples picked up randomly from each phenotype. Weight of the fruit was determined by a 0.01 g sensitive balance. The measurement of length and width (diameter) of fruits, the length of fruit cluster was done by using a 0.01 mm sensitive digital caliper compass. Color reading of fruits was employed with a chromameter (Minolta CR-300, Minolta, Osaka, Japan), the color of fruit was objectively measured at three points. As hue angle (h°) is the most important color descriptor for cherry skin color (Crisosto et. al., 2003) and L value is scaled from 0 (black) to 100 (white) (Voss, 1992), in this study we use h° and L values together with c, a and b values. The qualitative fruit characteristics taste and astringency were rated by a taste group including ten people and they rated the fruits with scale 1 to 3.

Chemical characteristics

Soluble solid content was measured by hand held Brix refractometer, at 20°C. The titratable acidity was measured by neutralization of fruit juice to pH 8.2 with 0.1 N NaOH and total acidity given as a percentage of malic acid (Mitcham et al., 1996). Texture measurement was made in two different places in the equatorial region of the fruits with a handle penetrometer, with cone tip, as g/mm. pH of fruit juice was determined directly using pH meter with sensitivity of 0.001. In addition, dry matter was determined by using a 5±0.01 g sample and drying in an etuv at 105°C (24 h) to a constant weight. Flesh/seed ratio was determined as according to formulate of Asma and Ozturk, (2005) (mean fruit weight-mean seed weight)/ (mean seed weight).

Flower characteristics

The flower characteristics such as cluster length, flower number per

Table 2. Selection criterion and their scores and total scores (s:scores).

Phenotypes	FW	s	WF	s	FF	s	SSC	s	A	FT	FSR	s	TA	s	Total scores
T1	2.99	2	14.82	2	355	2	19.2	2	3	2	9.97	2	0.12	1	215
T2	4.82	3	19.18	3	244	1	15.71	1	2	2	13.45	2	0.23	1	200
T3	3.64	2	17.07	3	284	1	20.29	2	2	2	12.19	2	0.27	1	200
T4	4.51	3	18.51	3	285	1	19.25	2	3	3	16.12	3	0.16	1	255
T5	3.79	3	16.56	3	523	3	24.40	3	3	3	8.23	1	0.19	1	280
T6	1.15	1	12.10	1	404	2	18.24	2	2	2	2.39	1	0.20	1	140
T7	3.97	3	17.53	3	411	2	17.33	2	3	3	9.20	2	0.24	1	260
T8	0.82	1	9.97	1	272	1	23.20	3	1	1	3.06	1	0.62	3	140
T9	5.21	3	19.54	3	345	2	12.46	1	2	3	20.72	3	0.25	1	230
T10	5.22	3	19.20	3	383	2	19.26	2	3	3	17.70	3	0.20	1	265
T11	3.77	2	17.31	3	437	3	20.02	2	2	3	9.45	2	0.21	1	235
T12	3.04	2	16.25	2	395	2	20.00	2	2	3	9.74	2	0.26	1	210
T13	3.05	2	15.69	2	405	2	22.76	3	3	3	7.85	1	0.26	1	225
T14	3.90	3	16.88	3	306	1	20.00	2	2	2	11.23	2	0.35	2	220
T15	1.85	1	12.60	1	304	1	17.50	2	1	2	4.61	1	0.39	2	135
T16	3.17	2	14.38	2	346	2	18.13	2	1	2	7.12	1	0.37	2	175
T17	3.50	2	16.41	3	362	2	20.26	2	2	2	8.66	2	0.26	1	210
T18	4.04	3	16.25	2	309	1	18.32	2	3	2	10.47	2	0.25	1	220
T19	0.90	1	10.00	1	345	2	23.20	3	1	1	3.13	1	0.58	3	150
T20	3.37	2	16.25	2	232	1	12.48	1	2	2	8.64	2	0.31	2	175
T21	1.99	1	13.22	2	203	1	14.40	1	2	2	4.93	1	0.30	2	155
T22	3.50	2	16.87	3	278	1	18.83	2	1	2	10.25	2	0.22	1	180
T23	4.03	3	16.30	2	279	1	18.63	2	2	2	11.71	2	0.23	1	200
T24	3.91	3	16.85	3	332	2	17.22	2	3	3	9.82	2	0.28	2	265
T25	4.16	3	18.82	3	397	2	16.25	1	3	2	9.85	2	0.19	1	230
T26	3.75	3	17.40	3	337	2	16.16	1	2	2	8.54	2	0.30	2	215
T27	3.40	2	17.82	3	359	2	13.64	1	2	2	10.01	2	0.32	2	200
T28	4.04	3	18.01	3	341	2	15.75	1	2	2	10.96	2	0.28	2	215
T29	4.08	3	17.57	3	397	2	15.38	1	2	2	11.25	2	0.23	1	210
T30	3.73	2	17.30	3	280	1	17.69	2	3	3	10.39	2	0.23	1	235
T31	3.73	2	18.38	3	277	1	21.80	3	3	3	10.39	2	0.29	2	255
T32	4.35	3	16.96	3	362	2	17.33	2	3	3	12.12	2	0.28	2	265
T33	3.81	3	17.41	3	348	2	18.19	2	2	3	12.94	2	0.36	2	245
T34	4.32	3	18.68	3	353	2	17.32	2	3	3	12.02	2	0.33	2	265
T35	3.70	2	18.75	3	263	1	22.21	3	3	3	10.58	2	0.18	1	250
T36	4.31	3	18.79	3	428	3	18.71	2	3	3	10.17	2	0.32	2	275
T37	3.63	2	18.74	3	394	2	19.58	2	2	2	8.88	2	0.31	2	215
T38	3.79	3	17.81	3	384	2	19.15	2	3	2	10.11	2	0.25	1	245
T39	4.28	3	18.69	3	396	2	18.24	2	2	2	11.67	2	0.34	2	230
T40	2.24	1	14.11	2	236	1	16.34	2	2	1	7.20	1	0.20	1	160

cluster, pistil and anther number per flower were determined for 40 flower and cluster. Flowering dates were determined according to BBCH (Biologische Bundesanstalt, Bundessortenamt and Chemical industry identification keys of stone fruits (code 61, 65 and 69), (Meier et al., 1994) in 2008, 2009 and 2010 years separately. Climatic data of Kocaeli Province was given in Table 3.

Leaf characteristics

Leaf width, length and the leaf stalk length were measured with a 0.01 mm sensitive digital caliper compass for 40 leaves.

Seed characteristics

Seed weight, length and width were determined from 40 seeds. Weight of the seed was determined by a 0.01 g sensitive balance. The measurement of length and width (caliper) of seeds was done by using a 0.01 mm sensitive digital caliper compass. The state of the separation of flesh from seed was evaluated as easy, moderate and difficult by the taste group too.

Table 3. The long term outdoor climatic data of the experimental city.

Year / Months	Average temperature (°C)				Relative humidity (%)				Rainfall (kg/m^2) average			
	2008	2009	2010	1975-2009	2008	2009	2010	1975-2009	2008	2009	2010	1975-2009
January	4.2	7.4	7.5	6.2	77.3	72.4	73.9	75.9	66.5	115.9	144.3	90.0
February	6.2	7.5	9.6	6.4	73.9	75.9	72.6	74.1	67.8	149.1	159.7	77.8
March	12.1	8.8	9.1	8.6	67.8	70.8	71.3	72.3	128.7	109.0	114.5	71.1
April	15.7	11.8	13.4	13.0	65.3	70.7	70.5	69.4	32.5	54.5	77.0	54.6
May	17.7	18.0	19.4	17.4	64.8	64.6	62.7	69.5	47.4	24.4	54.1	45.8
June	23.0	23.3	22.4	21.8	62.8	59.3	71.2	66.7	70.1	76.4	48.2	50.6
July	24.3	24.9	25.4	23.7	62.6	65.5	70.9	68.4	17.4	52.6	38.9	39.0
August	25.8	23.6	27.6	23.6	64.1	65.5	66.3	70.7	0.0	8.7	0.0	51.5
September	20.6	20.2	21.6	20.2	72.5	71.0	69.8	71.8	97.4	50.7	36.8	51.1
October	16.6	18.4	14.9	16.0	78.2	72.3	78.8	76.2	91.4	51.9	238.8	90.9
November	13.3	12.4	16.6	11.4	77.1	77.0	65.7	75.5	69.0	101.9	20.8	88.6
December	9.2	10.9	-	8.2	72.3	70.9	-	75.3	91.3	116.7	-	106.8

RESULTS AND DISCUSSION

According to average values of three growing seasons from 2008 to 2010, pomological and chemical properties of cherry laurel fruit phenotypes were presented in Table 2. Fruit weights of phenotypes varied from 0.82 g (T8) to 5.22 g (T10). Islam and Odabas (1996) determined that the fruit weight of the cherry laurel phenotypes varied from 2.21 to 4.35 g in Trabzon. Our results showed that two phenotypes had fruit weight over 5 g. Fruit weight in cherries is affected by the cultivar and depends on the crop load. In this experiment weight of fruit depended on crop too and the shape of fruit was changed and started to lose round shape by the increasing number of fruit on cluster.

The fruit firmness was determined between 203 g/mm (T21) and 523 g/mm (T5). The most firm phenotypes were in superior selected ten phenotypes. Three of the selected phenotypes (T4, T31 and T35), have very soft but favorable fruit according the scores. The firmness and soluble solid contents of phenotypes was near to preferable quality criteria but titratable acidity was lower than standard cherries (Long et al., 2005). No analytical data were found about fresh firmness for cherry laurel in previous studies.

The total soluble solid contents of phenotypes studied here, varied from 12.46% (T9) to 24.40% (T5) and titratable acidity contents varied from 0.12% (T1) to 0.62% (T8). The highest flesh/seed ratio was determined for T9 (20.72). A high flesh/seed ratio was a generally desired criterion in other stone fruits too. In other studies, phenotypes had a smaller flesh/seed ratio (4.39-7.35) than most of our phenotypes (the highest value is 20.72) (Islam and Odabas, 1996).

The fruit skin color of cherry laurel phenotypes were given in Figures 1, 2, 3 and Table 4. The highest L value was observed for phenotype T7 (32.43) and the lowest L value for T1 (8.71). The h° value of phenotypes changed from 1.2 (T18) to 29.11 (T13), while c value varied from 3.61 (T8) to 26.14 (T1). According to skin color values, our cherry laurel phenotypes included black, blackish purple, purplish red and reddish orange fruit colors.

After the determination of the characteristics, their scores for each cherry laurel phenotype were evaluated and shown in Figure 4. While the highest weighed ranked score (280) was recorded for phenotype 5, the lowest weighed ranked score (140) was recorded for T6 and T8. T8 is the less preferable phenotype in this study with high astringency and tasteless small fruits and with a low flesh/seed ratio (Table 2).

Ten phenotypes, including (T4, T5, T7, T10, T24, T31, T32, T34, T35 and T36) were selected (Table 2 and Figure 4) and evaluated to propagate for orchard performance studies. Some morphological, phenological and chemical characteristics of these phenotypes were shown in Table 5

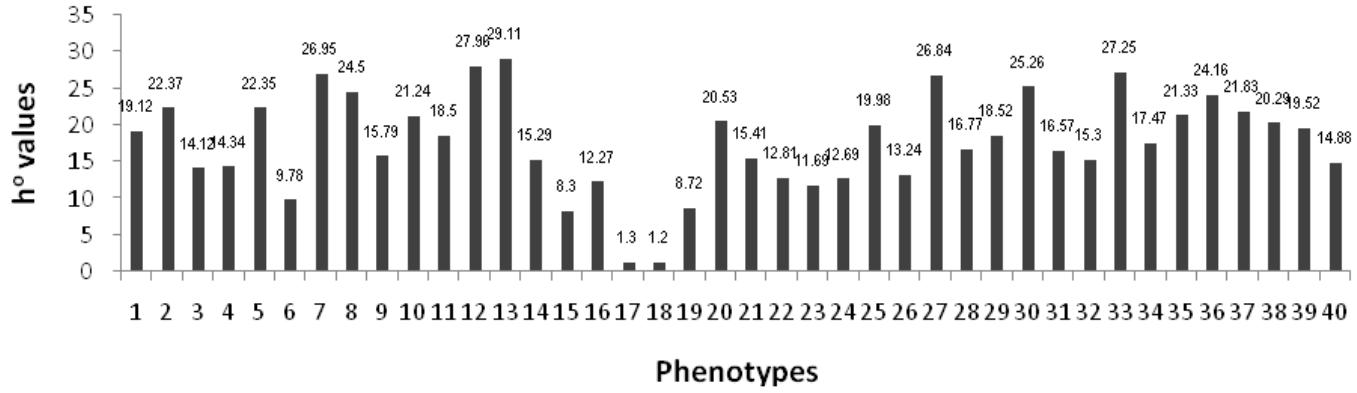

Figure 1. h°values of phenoptypes.

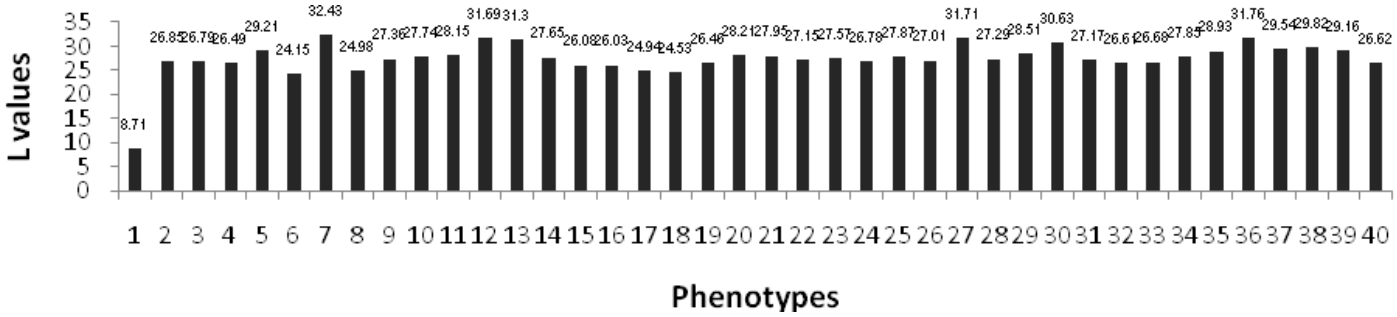

Figure 2. L values of phenotypes.

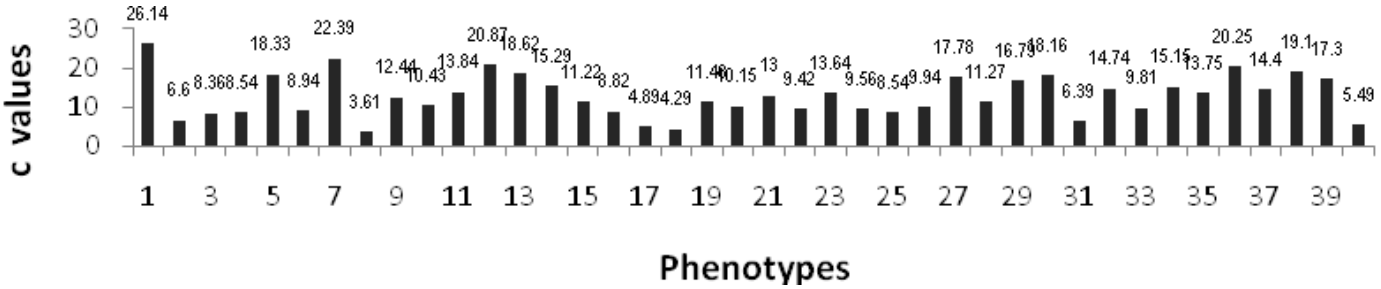

Figure 3. c values of phenotypes.

Table 4. Color values of phenoptypes.

Phenotypes	h^0	L	c	a	b	Phenotypes	h^0	L	c	a	b
T1	19.12	8.71	26.14	8.42	1.30	T21	15.41	27.95	13.00	12.30	3.89
T2	22.37	26.85	6.60	7.05	1.80	T22	12.81	27.15	9.42	9.11	2.28
T3	14.12	26.79	8.36	8.10	1.91	T23	11.69	27.57	13.64	13.24	3.15
T4	14.34	26.49	8.54	8.23	2.09	T24	12.69	26.78	9.56	9.24	2.25
T5	22.35	29.21	18.33	16.91	7.00	T25	19.98	27.87	8.54	8.01	2.94
T6	9.78	24.15	8.94	8.78	1.63	T26	13.24	27.01	9.94	9.58	2.48
T7	26.95	32.43	22.39	19.84	10.2	T27	26.84	31.71	17.78	15.70	8.16
T8	24.50	24.98	3.61	3.41	1.14	T28	16.77	27.29	11.27	10.81	3.17

Table 4. Contd.

T9	15.79	27.36	12.44	11.95	3.41	T29	18.52	28.51	16.79	0.84	5.57
T10	21.24	27.74	10.43	9.87	3.27	T30	25.26	30.63	18.16	9.26	8.20
T11	18.50	28.15	13.84	11.69	4.26	T31	16.57	27.17	6.39	6.12	1.82
T12	27.96	31.69	20.87	18.29	9.95	T32	15.30	26.61	14.74	14.12	4.10
T13	29.11	31.30	18.62	15.76	9.21	T33	27.25	26.68	9.81	9.47	2.36
T14	15.29	27.65	15.29	14.57	4.57	T34	17.47	27.85	15.15	14.42	4.55
T15	8.30	26.08	11.22	11.07	1.73	T35	21.33	28.93	13.75	12.50	5.52
T16	12.27	26.03	8.82	8.57	1.89	T36	24.16	31.76	20.25	18.01	8.97
T17	1.30	24.94	4.89	4.88	0.14	T37	21.83	29.54	14.40	13.37	5.36
T18	1.20	24.53	4.29	4.29	0.09	T38	20.29	29.82	19.10	17.62	7.00
T19	8.72	26.46	11.48	0.62	2.08	T39	19.52	29.16	17.30	16.29	5.65
T20	20.53	28.21	10.15	9.50	3.55	T40	14.88	26.62	5.49	5.31	1.41

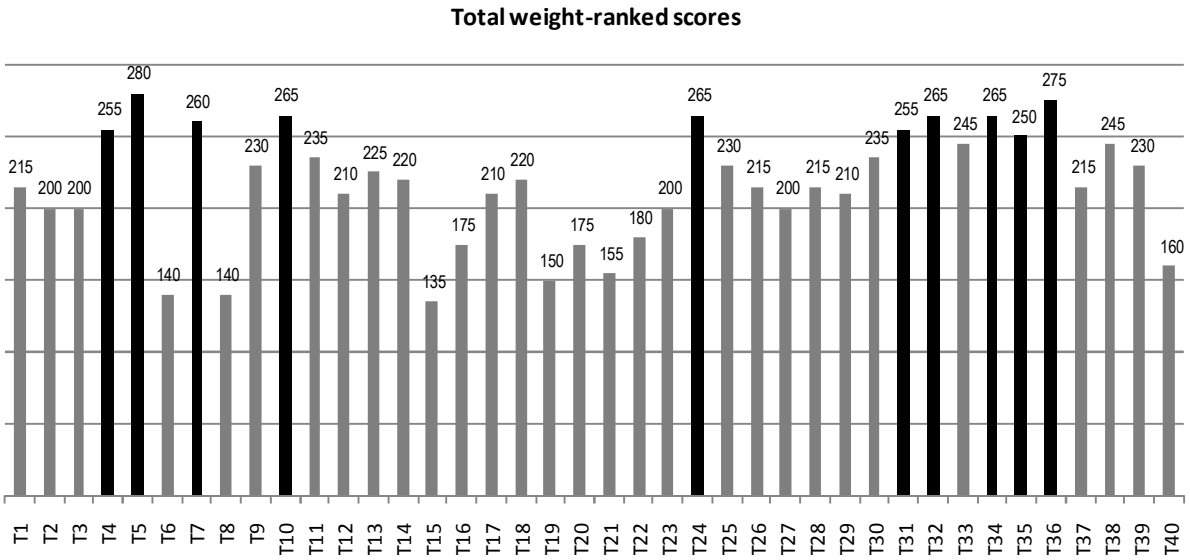

Figure 4. Total weighed-ranked scores for the phenotypes.

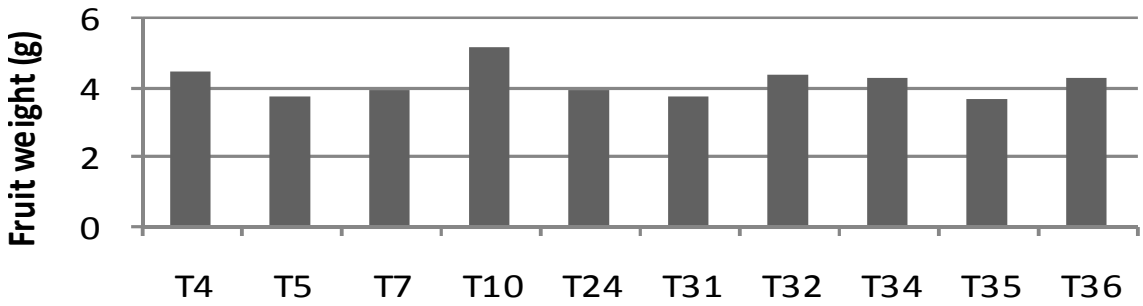

Figure 5. Fruit weighed of superior ten phenotypes according to modified weighed-ranked method.

and Figures 5, 6, and 7. The dry matter content of the selected phenotypes changed from 14.23% to 21.60%. There is no data about dry matter of cherry laurel that explained before. Seed separation was voted as moderate or easy in selected superior phenotypes except T24.

Flowering occurred from March to April depending on the cherry laurel phenotypes in our climatical conditions. As shown in Table 5, the first flowering (18 March 2008, 20 March 2009 and 17 March 2010), the full flowering (24

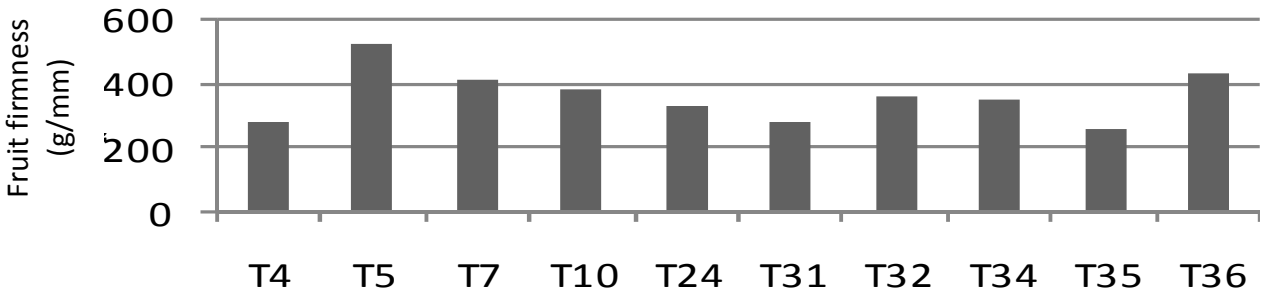

Figure 6. Fruit firmness of superior ten phenotypes according to modified weighed-ranked method.

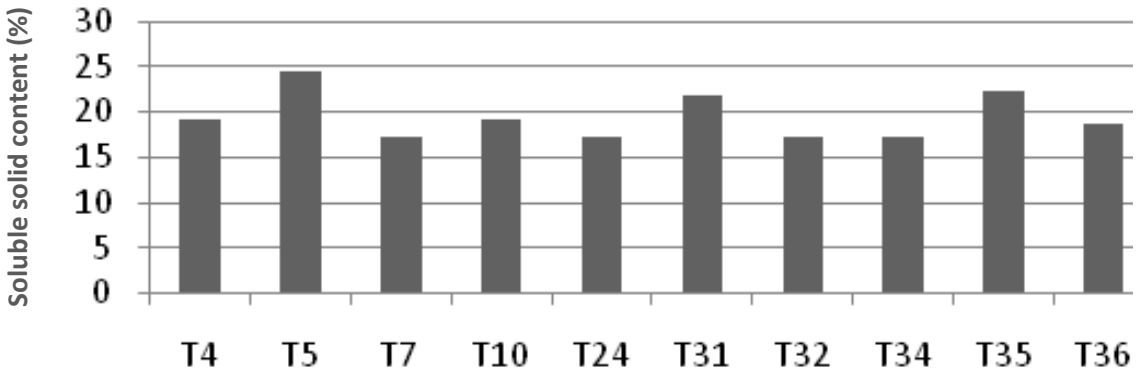

Figure 7. Soluble solid content of superior ten phenotypes according to modified weighed-ranked method.

Table 5. Selected cherry laurel phenotypes*.

Phenotypes	T5	T36	T32	T10	T34	T24	T7	T4	T31	T35
Leaf										
Width (cm)	6.33	5.13	5.36	5.43	5.21	4.97	6.05	4.55	5.05	5.15
Length (cm)	12.30	15.17	15.00	14.07	15.82	15.34	12.46	14.89	14.52	12.24
Stalk length (cm)	1.04	1.50	1.63	1.05	1.51	1.88	1.30	1.34	1.64	1.16
Flower										
Cluster length (cm)	11.93	9.18	10.31	10.69	10.47	10.25	11.64	11.13	8.88	7.66
Flower number/cluster	36.40	31.38	36.34	35.54	37.83	35.06	39.55	37.25	32.08	44.63
Pistil number	1	1.05**	1	1	1	1	1	1	1	1
Anther number	18.33	19.23	19.35	21.08	18.90	19.20	19.49	19.83	16.65	17.85
First flowering: (2008)	24 M	25M	27 M	22 M	28 M	24 M	22 M	23 M	08A	18 M
(2009)	25 M	03A	03A	25 M	03A	25 M	25 M	27 M	10A	20 M
(2010)	24 M	17 M	26 M	21 M	23 M	22 M	21 M	20 M	05A	17 M
Full flowering: (2008)	31M	01A	05A	03A	04A	05A	02A	02A	14A	24 M
(2009)	03 A	10A	08A	02A	07A	03A	03A	03A	16A	27 M
(2010)	02 A	23 M	01A	31M	01A	30 M	02A	02A	13A	21 M
End of flowering: (2008)	11A	07A	12A	08A	11A	10A	10A	10A	21A	02A
(2009)	10 A	16A	15A	11A	10A	10A	07A	12A	23A	06A
(2010)	13 A	27 M	13A	07A	13A	13A	13A	13A	20A	01A

Table 5. Contd.

Fruit										
Width (mm)	16.56	18.79	16.96	19.20	18.68	16.85	17.53	18.51	18.38	18.75
Length (mm)	16.72	18.12	17.65	19.42	18.42	17.09	17.90	18.45	17.04	16.51
Cluster length (cm)	13.40	9.87	9.10	10.37	10.41	10.65	12.20	11.37	7.58	6.16
Fruit number/cluster	9.63	12.61	5.49	9.89	11.64	6.86	13.81	16.84	9.90	7.50
Dry matter (%)	17.44	14.23	21.27	17.66	17.29	18.09	17.24	19.75	16.98	21.60
pH	4.71	4.63	4.62	4.66	4.60	4.72	4.71	4.83	4.80	4.91
Seed										
Width (mm)	8.99	8.72	8.43	9.03	8.55	8.23	8.96	8.75	8.61	8.49
Length (mm)	11.10	11.11	11.31	12.01	11.42	11.45	11.20	10.93	11.13	10.88
Weight (g)	0.39	0.39	0.33	0.28	0.33	0.36	0.39	0.26	0.33	0.32
Seed seperation***	3	2	2	2	3	1	3	3	2	2

*Average three years; M: March; A: April; **one of flower have 2 pistil; ***seed seperation: 3:easy; 2: moderate; 1: difficult.

March 2008, 27 March 2009 and 21 March 2010) and the end of the flowering (02 April 2008 and 06 April 2009) were realized earlier than the other phenotypes for T35. In 2010, T36 started to flower at the same day with T35 (17 March) and finalized flowering before than T35 (27 March). Climatic conditions can affect the flowering time and flowering dates were later in 2009 than in 2008 and 2010 (Tables 3 and 5). The average temperature was lower in February and March in this year (Table 3). The flowers of cherry laurel are bisexual. They normally have 5 white petals and 16.65-21.08 stamens and one pistil. In phenotype 36 we observed one flower with 2 pistils (average value of 1.05). In the selected phenotypes, fruit number per cluster ranged from 5.49 (T32) to 16.84 (T4) (Table 5). These values were similar with the results reported by Islam and Vardal (2009).

Conclusion

The pomological (shape, color, etc.) and qualitative (size, sugar content, etc.) characteristics of the investigated cherry laurel phenotypes have underlined an interesting variability. It leads to the need of better investigation on orchard performance of the selected phenotypes.

The results showed that the selected ten phenotypes appear promising with some unique properties for further investigations. Moreover, all trees investigated during the study were in their natural conditions. Therefore, it is certain that in case of more appropriate cultural conditions, it will be possible to get more productive trees and good fruit quality. In this study, all phenotypes having high scores more than 250 and with a high quality fruits, were propagated by vegetative propagation methods. In addition, pomological results of this study suggest that Kocaeli region has valuable resources of cherry laurel.

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