

## Some Local Plum Varieties Grown in Tokat Province

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**Abstract:** Tokat province is one of the most important regions of Turkey for fruit growth where several foreign origin, domestic and local plum varieties are commonly grown. Some of local plum varieties grown have economical importance for either fresh, dried consumptions or in processed products. In this study, some of the pomological and phenological characteristics of nine local plum varieties were evaluated. Pomological characteristics of these varieties were found as below: Fruit weights, lengths and diameters were ranged between 5.23-25.18 g, 22.83-34.29 mm, 20.05-35.48 mm values respectively. Flesh thicknesses and flesh rates of fruits were between 6.64 - 9.95 mm, 91.45 - 98.08 % rates respectively. Lengths, thicknesses, diameters and weights of stones of these varieties were determined between 14.42 - 22.19 mm, 5.86-8.55 mm and 8.10 -13.95 mm values respectively. Also pHs, soluble solid contents (SSC) and titratable acidities were ranged between 3.15-4.43, 13.67-19.83 and 0.18-1.88% rates respectively. The beginning of flowering, full flowering, end of flowering and harvest dates of varieties were recorded as phenological properties.

**Key words:** Plum, fruit, phenology, pomology

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### Introduction

Plums are excellent fruits that can be used in many ways for snacks and family meals. The fruits are suitable for fresh consumption, drying, canning, freezing and preserving into jams and jellies. The world plum production of this excellent fruit is about 9.15 million metric tons. China leads with 4.2 million tons of this production, the other important productive countries are U.S.A., Romania, Germany, Yugoslavia, France and Turkey respectively (Anonymous, 2002). Turkey has a quite important place among the plum producing countries and it is among the first seven countries with 195.000 tons of plum production based on 2002 year. The plum production of Turkey were in the range of 190-200 tons during the last five years (Anonymous, 2002). In Turkey, plum production has been extended to all over the regions of the country. The most important part of the production, however, comes from the Aegean, Mediterranean, Marmara Middle-North and Black Sea regions respectively. Regarding to the provinces, in a decreasing manner, Icel, Bursa, Hatay, Aydin, Kastamonu Konya, Sakarya and Tokat take place as important provinces (Anonymous, 2000). Plum cultivars grown in Turkey, generally belong to *Prunus cerasifera* Ehrh., *Prunus domestica* L., *Prunus institia* L., *Prunus spinosa* L., *Prunus divaricata* Led. and *Prunus salicina* Lindl (Davis, 1972).

Besides growing of many standard plum cultivars such as President, Giant, Stanly, Verte, Violette, Dalthan (foreign origin); Aynali, Can, Foca, Havran, Goynuk, Kostendil, Uryani (domestic) (Ozcagiran, 1977), some local plum varieties such as Hurma Erigi, Halil Erigi, Hatun Gobegi that have economical importance are grown in Tokat. Several of these local plums are consumed as dried and others consumed as fresh or canning. Although they have a commercial importance, there is no record on their characteristics.

The aim of this research was to determine some pomological and phenological characteristics of some local plum varieties that have economical importance in Tokat province.

### **Materials and Methods**

Nine local plum varieties that are commonly grown by fruit grower of Tokat were used in the experiment. The variety names are Kirmizi Erik, Hurma Erigi, Yesil Erik, Eksi Erik, Pic Erik, Hatun Gobegi, Catal Erigi, Halil Erigi and Kara Erik. Hurma Erigi and Yesil Erik, Catal Erik belong to *Prunus domestica* and the rest belong to *Prunus cerasifera*.

Phenological characteristics were determined as below:

- Beginning of flowering was recorded when at least 5 % of the flowers bloomed.
- The full flowering was accepted when at least 75 % of the flowers bloomed
- The end of flowering was determined when 95 % of the flowers bloomed and corollas began to fall off (Onur, 1977 and Ozcagiran, 1978).
- The harvesting dates were determined when the fruits become enough coloring and softening to be eaten (Funt, 1998).

Fruit length, diameter, weight, flesh thickness, stone length, thickness and diameter, flesh ratio, soluble solid, pH and titratable (malic) acid of varieties were determined as pomological characteristics. 10 fruits from each variety were evaluated to determine each character.

### **Results and Discussion**

The phenological characteristics of local plum varieties are presented in Table 1; Table 2 and Table 3 also shows the pomological and physical characteristics of varieties respectively.

According to Table 1, the beginning and finishing dates of blooming were especially occurred in during third and fourth weeks of March 2001. Harvesting period of varieties occurred in a longer comparing with blooming period. Blooming and harvesting periods can vary from year to year. This is expected because of environmental and climatical conditions (Buljko, 1977; Matta *et al.*, 1992; Ozakman *et al.*, 1995 and Gunes *et al.*, 2000).

Measurable pomological characteristics of fruit and stone were ranged as below (Table 2): Diameters, lengths, weights and flesh thicknesses of fruits were between 20.05 mm (Catal eriđi)-35.48 mm (Hatun Gobegi); 22.83 mm (Hurma Erigi)- 34.29 mm (Yesil Erik); 5.23 g (Catal Erigi)-25.18 g (Hatun Gobegi); 6.64 mm (Çatal Erigi)-9.95 mm (Yesil Erik) respectively. These results were lower particularly in fruit sizes comparing with foreign cultivars grown in Tokat (Gunes *et al.*, 2000) and grown in Central Otaga (McLaren and Glucina, 1992). Diameters, lengths, ticknesses and weights

of stones varied between 8.10 mm (Catal Eriği)-13.95 mm (Halil Eriği); 14.42 mm (Catal Eriği)- 22.19 mm (Yeşil Eriği); 5.86 mm (Catal Eriği)- 8.55 mm (Halil Eriği); 0.37 g (Catal Eriği)-0.99 g (Halil Eriği) values, respectively. pHs, soluble solid contents and titratable acidities of fruits ranged between 3.15-4.43; 13.67-19.83 and 0.18-1.88% rates respectively. Jarebica and Muratovic (1977) determined weights, flesh rates and total acids of fruits as 14.17-41.7, 97-98% and 0.88-1.3 respectively. Also Jovanićević (1977) reported the minimum-maximum values of fruit weights and soluble solid contents of some local plum varieties as 5.03-23.86g, 5.44-13.37% respectively. In another study, conducted on local plum varieties of Van province, fruit traits were

Table 1: Some phenological characteristics of local plum varieties grown in Tokat Province

	Kirmizi Erik	Hurma Eriği	Yeşil Erik	Eksi Erik	Pic Erik	Hatun Gobegi	Çatal Eriği	Halil Eriği	Kara Erik
Beginning of blooming	13.03	19.03	14.03	11.03	21.03	13.03	18.03	10.03	7.03
Full blooming	17.03	23.03	17.03	15.03	25.03	19.03	23.03	16.03	12.03
End of blooming	22.03	29.03	21.03	18.03	29.03	23.03	30.03	20.03	16.03
Harvest date	30.08	29.08	13.07	25.07	27.07	20.07	28.08	30.07	24.07

Table 2: Pomological characteristics of local plum varieties grown in Tokat Province

Character	Kirmizi Erik	Hurma Eriği	Yeşil Erik	Eksi Erik	Pic Erik
Fruit weight (g)	7.60	13.13	19.91	11.05	12.51
Fruit diameter (mm)	25.06±1.76	22.59±1.24	32.19±6.00	26.48±1.01	28.95±2.27
Fruit length (mm)	33.64±1.75	22.83±0.78	34.29±6.20	25.72±0.75	28.69±1.21
Flesh thickness (mm)	10.36±1.09	6.88±0.95	9.95±2.55	6.87±0.63	8.19±0.62
Stone weight (g)	0.65	0.51	0.88	0.84	0.72
Stone Diameter (mm)	9.40±0.85	11.49±0.49	12.72±0.21	12.38±0.42	11.44±0.76
Stone length (mm)	19.95±1.50	14.66±0.51	22.19±0.56	16.38±0.42	17.36±1.02
Stone thickness (mm)	6.24±0.53	8.29±0.55	6.83±0.14	8.32±0.27	7.12±0.37
Flesh rate (%)	91.45	96.12	95.58	92.39	94.24
PH	3.82	4.02	3.88	3.40	3.96
SSC (%)	17.83	19.83	14.83	15.67	13.67
Tit. Acid (%)	0.74	0.18	0.34	1.04	0.44

  

Character	Hatun Gobegi	Çatal Eriği	Halil Eriği	Kara Erik
Fruit weight (g)	25.18	5.23	13.67	13.56
Fruit diameter (mm)	35.48±2.04	20.05±0.77	29.31±0.95	28.49±1.39
Fruit length (mm)	32.08±1.80	25.66±0.82	27.52±0.78	27.72±1.48
Flesh thickness (mm)	10.97±1.60	6.64±0.55	7.98±1.10	8.86±0.54
Stone weight (g)	0.81	0.37	0.99	0.26
Stone Diameter (mm)	12.66±0.81	8.10±0.41	13.95±0.35	10.26±0.81
Stone length (mm)	16.81±0.95	14.42±0.70	16.59±0.60	15.21±0.50
Stone thickness (mm)	7.84±0.18	5.86±0.38	8.55±0.23	6.81±0.62
Flesh rate (%)	97.13	92.92	92.75	98.08
PH	4.28	4.43	3.24	3.15
SSC (%)	15.38	15.00	15.35	14.63
Tit. Acid (%)	0.28	0.46	1.37	1.88

Some physical characteristics of local plum varieties were presented in Table 3

Table 3: Physical characteristics of fruits of local plum varieties grown in Tokat province

Cultivar	Flesh color	Skin color	Skin thickness	Fruit Shape	Fruit Flavor	Fruit Firmness	Stone Freeness	Using
Kirmizi Erik	Orange-Red	Deep-Red	Thin	Round	Sweet	Firm	Cling	Fresh
Hurma Erigi	Yellowish	Deep-Purple	Thin*	Oval	Sweet	Semi-Soft	Free	Dried
Yesil Erik	Green	Purplish-Green	Medium*	Long-Oval	Sweet	Semi-Soft	Free	Dried
Eksi Erik	Reddish	Yellowish-Red	Medium	Round	Sour	Soft	Cling	Fresh
Pic Erik	Yellow	Reddish-Purple	Medium	Round	Bitter-Sweet	Firm	Free	Fresh
Hatun Gobegi	Yellow	Dark-Red	Thick	Round	Sweet	Soft	Semi-Cling	Fresh
Catal Erigi	Green	Green	Medium*	Long-Oval	Sweet	Soft	Cling	Dried
Halil Erigi	Yellow	Light-Yellow	Medium	Round	Tart	Soft	Cling	Fresh-Cane
Kara Erik	Yellowish-Red	Purple	Medium*	Round	Light-Sweet	Soft	Semi-Cling	Fresh

\*: Skin is covered with a greyish waxy bloom

found as follow; 8.30-29.50 g (fruit weights); 22.30-35.10 mm (fruit lengths); 23.00-36.20 mm (fruit diameters). The same researchers were found the soluble solid contents and titratable acidities as 13.37-19.56% and 0.45-2.81% rates, respectively (Askin and Koyuncu, 1992). In another research that conducted on adaptation of Japanese (*P. salicina* Lindh) plum cultivars, fruit and stone traits were recorded as follow; average fruit weights 9.81-69.96 g, seed ratio 1.68-15.65%, SSC 12.28-20.35% (Ozakman *et al.*, 1995). In a selection study undertaken on local plum types of East Mediterranean region of Turkey that carried out by Ayanoglu and Yilmaz (1995) some fruit and stone properties were determined as follow; fruit weights 19.9-78.16 g, SSC 9.7-13.5%, titratable acid 0.91-2.02%, flesh rate 95.98-98.09% and stone weight 0.8-1.9 g. These researches were in agree with our local study, especially in soluble solid contents and titratable acidities rates. But these values were found lower when compared with standard (foreign and domestic) commercial cultivars. It is necessary to consider that several fruit characteristics can vary connected with climatic and soil conditions.

Nine local plum varieties grown in Tokat were evaluated in this study. Some varieties of these local plums are very promising. Hatun Gobegi, Halil Erigi can be recommended for fresh consumption or canning, and Hurma Erigi and Yesil Erik can be recommended for drying.

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