

An Important Genetic Resource for Turkey: Cherry Laurel (*Laurocerasus officinalis* Roemer)

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Keywords: characteristics, fruit, karayemis, laurel cherry, Turkey, utilization

Abstract

Karayemis (*Prunus laurocerasus* L.) is included in the *Rosaceae* family, *Prunoideae* sub-family, *Prunus* genus. Like for many other fruits, Anatolia is the origin of karayemis. This species is naturally found in Caucasia, East Black Sea, North and East Marmara and Taurus mountains. The height of the karayemis plant is 2-6 m, and evergreen. The flower of karayemis is white in color and the fruit is black and red in color just like sweet cherry. Fruits are connected to clusters which are 10-20 cm long. In growing areas of Turkey (East Black Sea region), it is consumed by the people as a fresh fruit, also evaluated as dried, pickled, jam and stewed fruit. Because of being an evergreen plant, it is used as an ornamental plant in parks, also having many chemicals in young shoots, fruits and seeds it is used in pharmacology extensively. Except for the Black Sea region, karayemis is a new fruit species for Turkey and the world. Recently new fruits are always interesting for the world markets and for our country and have high prices such as kiwifruit and some tropical fruits. In our country, the origin of karayemis, important economic advantages will be gained by introducing karayemis to inner and outer markets. Such as in other fruit species originated in our country, also in karayemis, most important genetic resources are being depleted. Therefore, to preserve these resources, precautions have to be taken immediately.

INTRODUCTION

Turkey is one of the most important countries in the world in terms of genetic variability with 10754 wild species (Şehirali et al., 2005; Köse, 1997; Sarıbaş, 1998). The geological and ecological conditions of Turkey allow to grow many plant species. Because of being the place of origin of many fruit species, Turkey is one of most important fruit crop centers with 80 fruit species out of 138, cultivated in the world (Özbek, 1978).

One of those fruits species is cherry laurel, karayemis (*Laurocerasus officinalis* Roemer) known in local areas under the names of “Taflan”, “Gürcü Kirazı”, “Karamış”, “Kattak”, “Laz Üzüümü”, “Laz Yemişi” and “Tahnal” (Alpınar and Yazıcıoğlu, 1991). Karayemis (*Prunus laurocerasus* L.) is included in the *Prunus* genus, *Rosaceae* family, *Prunoideae* sub-family (Kayacık, 1982; Sandallı, 2002; Anon., 2007). It has been reported that there are many cultivars showing differences within the *Laurocerasus officinalis* (Özbek, 1952).

There are three cultivated cultivars (‘Oxygemmis’, ‘Globigemmis’ and ‘Angusti-

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folia') and one wild form of karayemis in Turkey especially in the Black Sea Region (Ayaz et al., 1997a). The cultivated forms of karayemis show differences in morphological and cytological characteristics, fruit and leaves contents. The fruits of the 'Oxygemmis' cultivar are large and black when ripe and astringent (Sandallı, 2002). The fruits of 'Globigemmis' that have a thinner mesocarp compared to that of 'Oxygemmis', are hard, more sweet than that of 'Oxygemmis' and of a black colour when ripe with a slight astringency. The 'Globigemmis' cultivar is cultivated as a fruit crop whereas 'Angustifolia' is widely cultivated as an ornamental plant in Europe (Sandallı, 2002). Alpınar and Yazıcıoğlu (1991) reported that there are 20 cultivars showing differences in leaves shape, growth rate and cold resistance.

DISTRIBUTION AREA

The fruits of karayemis have been first identified and named as *Cerasus trapezuntina* (Trabzon Kirazı) in Trabzon (Turkey) by Pierre Belon in 1546. The plant has been introduced to Italy via Istanbul in 1546 then introduced to Vienna by Clusius in 1574. From there it has been exported to France and England. Since 1600, It has been widely grown as an ornamental plant in parks and gardens in Europe (Alpınar and Yazıcıoğlu, 1991).

Karayemis is found as a native fruit crop in the Eastern Black Sea Region, Southern Anatolia and the Eastern Marmara region of Turkey, some of the Balkans, Northern Ireland, Western Europe, Southern and Western Caucasia, Iran and some Mediterranean countries and is widely consumed in the Eastern Black Sea Region (Gökmen, 1973; Onur et al., 1999; İslam, 2005; Turna and Güney, 2006; Anon., 2007). The cherry laurel as being a native plant can grow up to 20-2700 altitude in the northern mountains of the Black Sea Region (İslam, 2005; Turna and Güney, 2006).

THE PLANT AND FRUIT CHARACTERISTICS

Karayemis that can be used as an ornamental and fruit crop is an evergreen plant. The wild form of Karayemis can reach 5-6 m in height with tree or shrub forms whereas the cultivated form can reach 15-20 m in height with tree form (Kayacık, 1982; Sandallı, 2002; Turna and Güney, 2006).

The plant requires light and well-drained soils and can grow in full shade and semi-shade (Gökmen, 1973). It is deeply rooted and it can be propagated by sowing the seeds, grafting, in vitro culture or planting the young woods. It has to be planted with 3×4, 4×4, 4×6 m spaces (İslam, 2005).

In wild forms of the plants, the leaves are smooth, simple, broad, ovate or broad-elliptic, unlobed, toothed or toothless, the upper face is dark green and the lower face is paled green. The white carpels are located on a cluster of 5-10 cm long. The fruit is conical drupe juicy with seeds, 8-10 mm in diameter and resembles black cherries except that it grows in clusters, fruit color is reddish-black when ripe (Kayacık, 1982; Sandallı, 2002).

The cultivated forms show significant differences in leaf size, flower whorl, fruit color and size. Besides that differences in leaf and fruit size, fruit color and taste also exist between wild and cultivated forms (Turna and Güney, 2006). The date of fall bloom is from March-April, and the harvest period is from 25 June to 15 July. The flowers consist of 5 sepals, 5 petals, 1 ovary, and 15-20 stamens (İslam, 2005). The immature fruit is green (İslam, 2005) and becomes reddish-black when ripe (Ayaz et al., 1997a).

The succulent fruits can be sweet, astringent or bitter (İslam, 2005). The shape of fruits can be oval-round with one seed (Yücel, 2005), conic, ecliptic, sometimes or round similar to berries of grapes. The seed is like a conic olive and smooth (İslam, 2005). Bulk length ranges from 8.5 to 12.0 cm, bulk weight from 46.8 to 67.9 g, the fruit number in bulk from 9.9 to 18.9, fruit weight from 3.8 to 4.9 g. The malic acid content in the fruits is about 0.23-0.29% and the fruits have a pH 4.6-4.8, the total soluble solids content is 15.4°Brix (Bostan, 2001; İslam, 2002; Kaya et al., 2004).

The ripe fruit is characterized by high levels of fructose and glucose as sugars,

especially vanillic acid, as a phenolic acid, and linoleic acid, as an unsaturated fatty acid (Ayaz et al., 1997a, b). Data on phenolic acids, fatty acid, glucose and ascorbic acid contents in the fruits of three cultivars of *L. officinalis* are presented in Table 1.

The antioxidant effect of karayemis (*L. officinalis* Roem.) arises from its phenolic compounds (Orhan et al., 2003). The mineral elements have an important role in human health and the fruits are a good nutritional source of minerals for human health (Bettger, 1993; Hardisson et al., 2001). It appeared to have high mineral content. The concentrations of macroelements K, Mg, Ca and Na were high at 2215, 179, 153 and 55 mg/kg respectively, and the concentrations of trace elements Mn, Fe, Zn and Cu were 24.2, 8.3, 1.9 and 0.8 mg/kg, respectively (Kolaylı et al., 2003). In addition, the fruit showed very low contents of Pb, Ni, Co and Cr, below the detection limits, which is considered to be a good food quality. As it is a rich source of protein, sugar, ascorbic acid, minerals and antioxidants (Kolaylı et al., 2003).

MEDICINAL AND OTHER USES

Plantings of *L. officinalis* contribute to reduction of the risk of desertification due to its evergreen nature, and its leaves present an alternative use in landscape architecture (Turna et al., 2002). The fruit is consumed directly both fresh and dried as well as in the form of jam, pulp, marmalade and drinks (Ayaz, 1997; İslam, 2005). The fruits of cherry laurel are used for food additives such as flavouring and leaves are used as a medicinal plant (İslam, 2002, 2005). The fruits of cultivated as well as wild plants that have almond flavor when ripe can be used to prepare various alcoholic drinks (Milan, 1984). The fruits and seeds of cherry laurel and its cultivated forms are well-known folk medicinal plants in Turkey and used in the treatment of stomach ulcer, digestive system illnesses, bronchitis (seeds), eczemas, diuretic and hemorrhoid (fruits) (Milan, 1984; Baytop, 1989, 2001; Alpınar and Yazıcıoğlu, 1991; Ayaz et al., 1997b; İslam, 2005). It is used externally for antipruriginous and analgesic effect on local pains (Güven and Geçgil, 1961; Çubukçu, 1989; Alpınar and Yazıcıoğlu, 1991). The oil of its seeds are used in the cosmetics industry (Zlatanov and Janakieva, 1998). The leaves are used as a substitute for tea that has an beneficial effect in the treatment of digestive system illness, bronchitis (Alpınar and Yazıcıoğlu, 1991; İslam, 2005).

DISCUSSION

Cherry laurel, locally named karayemis, is a summer fruit highly characteristic of the Black Sea Region in Turkey. It is used as a fruit crop as well as an ornamental plant. The nutritional value of karayemis (*L. officinalis* Roem.) arises from its phenolic acid, fatty acid and sugar contents. The fruit is consumed directly both fresh and dried as well as in the form of jam, pulp, marmalade, pickle, drinks and food additive for flavoring. Although the fruits and seeds of karayemis and its cultivated forms are well-known medicinal plants and used in the treatment of some diseases, the fruits of cultivated plants are not sufficiently known as a potential food source in Turkey and in the world. Therefore, it is necessary to conduct research on the physical and chemical properties of cherry laurel fruits, its medicinal use and its cultivation and protect its genetic resource.

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Tables

Table 1. Data on phenolic acids, fatty acid, glucose and ascorbic acid contents in the fruits of three cultivars of *L. officinalis*.

Compounds		Values	References
Sugars (% dry weight)	Glucose	14.0-27.62	Ayaz et al., 1997a
	Fructose	20.3-27.3	
	Sorbitol	10.2-14.2	
Phenolic acids (% w/w)	Vanillic acid	1.70-4.46	Ayaz et al., 1997b
	Protocatechuic acid	≤0.1-0.85	
	p-hidroxybenzoic acid	≤0.1-0.69	
	Caffeic acid	≤0.1-0.37	
	p-coumaric acid	≤0.1	
Fatty acids (g/100 g dry matter)	Oleic acid (18:1)	0.69-1.56	Ayaz et al., 1997b
	Linoleic acid (18:2)	1.86-2.14	
	Palmitic acid (16:0)	0.71-1.07	
	Stearic acid (18:0)	0.41-0.66	
Ascorbic acid (mg/100 g)		108.6-133.0	Yavru, 1997

