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Salep Orchids and Salep in Kahramanmaraş Region

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Abstract
Orchids are perennial, wire rooted, with some varieties having (e.g. Orchis, Ophrys, Dactylorhiza, Serapias, Platanthera) two tuberous roots, herbaceous plants; In Europe and the Middle East, the most orchid variety is found in Turkey. Also known in native language as dilçıkık, dildamak, çam çiçeği, çayır or salep otu, it is known that there are about 154 orchid species in 24 genera in Turkey. 13% of them (20 species and 1 subspecies) are unique to Turkey. Ovoid- root tuberous species which are common in Turkey, used for obtaining salep, belong to Orchis, Ophrys, Anacamptis, Serapias, Himantoglossum, Barlia, Aceras genus, and species with tubercules belong to genus Dactylorhiza and Platanthera. Turkey's North, South, Southeast and Eastern Anatolia regions especially are richer in terms of wild orchids. There are 25 species belonging to 9 genera in Kahramanmaraş region, with 2 species (*Orchis palustris and Dactylorhiza osmanica*) being common and other species rare and rarely grown.

Keywords: Kahramanmaraş, orchid, salep

INTRODUCTION

Use of advanced production techniques and developments in cooling and deep freezing systems in the past 25 years in Turkey has led to an increase in the ice cream consumption and some studies to develop the quality of ice cream [1,2]. That being said, both wide use of salep in ice cream production in Turkey and its different functional properties have led some scientists to carry out various investigations on salep and/or stabilizer mixtures containing salep.

Maraş ice cream has superior quality properties, and preserves these properties during storage at low temperature (around -18º C) after production thanks to its salep ingredient as well as its production technique. This is because salep, with its stabilizer feature, gives the desired structure and mass (e.g., smooth, pulpy and homogeneous) to ice cream, delays melting, prevents the formation of large ice crystals during production and storage, and gives product-specific flavor and aroma [2-5]. But there is not much information in literature about the chemical properties of orchids. Salep, which is used in the production of Maraş ice cream, is obtained from nine genera of wild orchids grown in and around Kahramanmaras, an important region in the country for orchids [2,6,7]. Chemical composition of salep are various especially depending on the species obtained, and affect the properties of ice cream [8-13].

Orchidaceae family and orchids of Turkey

Orchids are perennial, wire rooted herbaceous plants. Some orchid species (*e.g. Orchis, Ophrys, Dactylorhiza, Serapias, Platanthera*) have two tuberous roots. The bodies of the orchids are upright cylindrical, with flowers of monocotyledonous, closed seed, bunch or spike. Orchids are in the family of *Orchidaceae*, which grows in mountain ecosystems, grasslands and peaks close to the coasts. It is stated that there are more than 25,000 species and more than 110,000 hybrids (individual resulting from the pollination of two different species or sexes) in 250 species recorded and more than 500 species unrecorded in the family [8, 14-15].

Turkey has the most variety of orchids in Europe and Middle East. It is reported that there are about 154 wild orchid species in 24 species, some of which are also known with different names such as *dilçıkık, dildamak, çam çiçeği, çayır or salep otu* in Turkey [17]. 13% of them (20 species and 1 subspecies) are unique to Turkey [15, 16, 16, 19, 20].

The ovoid tuberous species, common in Turkey and from which salep is obtained belong to Orchis, Ophrys, Anacamptis, Serapias, Himantoglossum, Barlia, Aceras while pieced tuberous belong to the *Dactylorhiza* and *Platanthera* species. Turkey is rich in wild orchids especially in the North, South, Southeast and Eastern Anatolian regions [8, 9, 16, 18, 20].

The first list of orchids of Turkey based on literature on herbarium and terrestrial studies was stated by Sezik [8]. According to this study, there are 18 genera and 91 species in Turkey. Later on, the same researcher reported that 24 genera and 85 species (except for subspecies) were found in Turkey considering recent researches. There are two important works related to the orchids of Turkey. One of them is the "*Orkidelerimiz*" by Sezik [18]. In this work, there is information about the characteristics and spread of the orchids in Turkey and about salep, and it is stated in the book that there are about 90 species belonging to 24 genera in Turkey. The other is the part of the book "Flora of Turkey" (Davis 1965) prepared by Renz and Taubenheim which contains the species and spread information of the *Orchidaceae* family. In this work, it is stated that there are 93 species and 32 subspecies belonging to 24 genera in Turkey. On the other hand, according to the book by Kreutz [21] about the orchids of Turkey which included the species which were named after 1984, there are 24 genera and 148 species in Turkey.

Orchids growing in Kahramanmaraş region

According to the quadrature system used by the botanist Davis (1965-1985) for the determination of the flora of Turkey and used to express the spreading areas of the plants, Kahramanmaraş region is located in B6 which contains the northern part and C6 frames which contains the southern part. Taking into account this quadrature system and the information in the literature [18, 22, 23], the registered and spreading orchids in Kahramanmaraş region are demonstrated in Table 1.

Table 1. Distribution of Orchid Species in Kahramanmaraş Region According to the Squaring System

B6 Square	C6 Square
Species	
	Anacamptis pyramidalis
	Cephalanthera damasonium
Cephalanthera kotschyana	*Cephalanthera kotschyana*
Cephalanthera rubra	*Cephalanthera rubra*
	Comperia comperiana
Dactylorhiza iberica	*Dactylorhiza iberica*
D. osmanica var. *osmanica*	*D. osmanica* var. *osmanica*
D. osmanica var. *anatolica*	*D. osmanica* var. *anatolica*
Epipactis helleborine	*Epipactis helleborine*
	Epipactis microphylla
	Epipactis persica
Epipactis veratrifolia	*Epipactis veratrifolia*
	Himantoglossum affine
	Limodorum abortivum
	Orchis anatolica
	Orchis mascula ssp. *pinetorum*
	Orchis palustris
	Orchis simia

From Table 1, it can be seen that 18 species of 8 genera spreading in the region are registered. In a survey under the name of "The origins of Maraş Salep and the Orchids of Maraş Area" carried out in Kahramanmaraş region [6], orchid species found in the region and collected in May-July of 1987-1988 were specified. According to the results of this survey, orchid species found in Kahramanmaraş region and collected by researchers are shown in Table 2.

Table 2. Types of Orchids Collected by Researchers in Kahramanmaraş Region

Orchids found in the region	Number			Orchids collected in the region	Number		
	Genus	Species	Subtype/ Variety		Genus	Species	Subtype / Variety
Anacamptis pyramidalis	1	1		*Anacamptis pyramidalis*	1	1	
Cephalanthera damasonium	2	2					
Cephalanthera kotschyana		3					
Cephalanthera kurdica		4		*Cephalanthera kurdica*	2	2	
Cephalanthera rubra		5		*Cephalanthera rubra*		3	
Comperia comperiana	3	6					
Dactylorhiza iberica	4	7		*Dactylorhiza iberica*	3	4	
D. osmanica var. *osmanica*		8	1	*D. osmanica* var. *osmanica*		5	
D. osmanica var. *anatolica*		9	2	*D. osmanica* var. *anatolica*		6	
D. romana				*D. romana*		7	
Epipactis helleborine	5	10					
E. microphylla		11					
E. persica		12					
E. veratrifolia		13					
Himantoglossum affine	6	14		*Himantoglossum affine*	4	8	
Limodorum abortivum	7	15		*Limodorum abortivum*	5	9	
Ophrys holosericea ssp. *holosericea*	8	16	1	*Ophrys holosericea* ssp. *holosericea*	6	10	1
Oph. tranchyrcana ssp. *tranchyrcana*		17	2				
Orchis anatolica	9	18		*Orchis anatolica*	7	11	
O. coriophora		19		*O. coriophora*		12	
O. mascula ssp. *pinetorum*		20	3	*O. mascula* ssp. *pinetorum*		13	2
O. morio ssp. *syriaca*		21	4	*O. morio* ssp. *syriaca*		14	3
O. palustris		22		*O. palustris*		15	
O. simia		23					
O. spitzelii		24		*O. spitzelii*		16	
O. tridentata		25		*O. tridentata*		17	

As can be understood from Table 2, Sezik and Baykal [6] reported that there were 25 species of 9 genera found in the region and samples of 17 species of 7 genera were collected during the research. On the other hand, the same researchers reported that 2 species (*Orchis palustris and Dactylorhiza osmanica*) were common and other species were rare in the region.

Obtaining and use of salep of Kahramanmaraş region

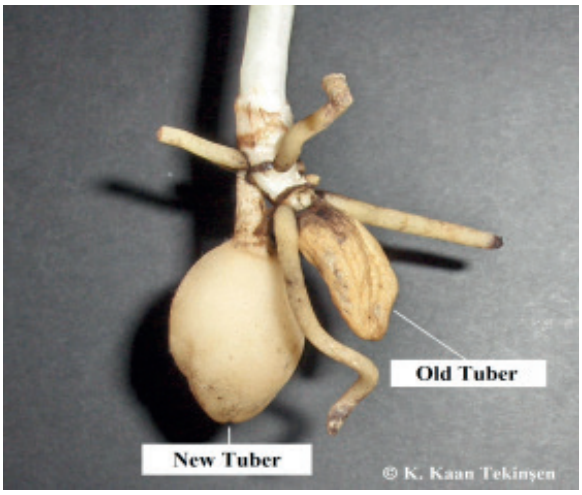
In Kahramanmaraş region, salep is mostly obtained from around the center and the northern and western parts of the province. The regions and the important villages where the salep is obtained are shown below [6].

In obtaining quality salep in Kahramanmaraş region, tubers of *Orchis anatolica, O. mascula ssp. pinetorum, O. spitzelii, O. tridentata, O. morio, Anacamptis piramidalis,*

Dactylorhiza romana, Himantoglossum affine and Ophrys holosericea species which are not commonly found are used. The salep obtained from the tubers of these orchid species is called Maraş salep [6]. Maraş salep obtained from white, red and purple flowering species is collected especially in Helete, Tanır, Tekir, Süleymanlı, Kürtül, Kösürge, Kayışlı, Dönüklü territories and pinetums on the slopes of Mount Amanos until the end of July. The salep obtained from *O. palustris* and *O. coriophora*, which are considered to be of low quality in the region, and *D. osmanica* varieties with pieced tubers and sometimes found in Maraş salep is called Çayır salep. Collectors do not prefer this salep because of the difficulty of collecting it due to the muddy features of its growing land and the low price. It is an additional occupation for shepherds and some villagers because of the difficulty of obtaining, finding and collecting salep throughout the region [2, 6, 16].

In the orchid species from which the salep is obtained, there are two tubers, one old tuber of the previous year (the main, midwife tuber is a great wrinkle because it forms the over-ground run of the plant of that year) and the other new tuber of the next year (sibling, sister tuber, grown that year, young small, full-grown to form the plant of next year). When the plant is in flower, the new tuber is collected, leaving the old tuber, which is larger, hard, wrinkled, dirty white. Fresh tubers, washed with cold water and cleaned from the soil, are boiled for 15 minutes in boiling water (sometimes in milk, whey, dry cottage cheese juice or ayran) in baskets to prevent germination, soften and loosen the outer shell. It is then immediately submerged in cold water, cooled and sometimes dried for 7-10 days, preferably in a sunless, airy location, in stringed way. During this process, the tubers lose 90% of their weight. Commercial salep tubers are pulverized in low-speed pulverizers and in machines in recent years by ice cream makers when they are used [2, 6, 16, 18, 20]. For 1 kg of commercial salep, 1000-4000 dried tubers, each 0.25-1.00 g are needed [15]. New and old tubers are shown in figure 1.

Figure 1. New and old tubers



Two non-orchid pseudo-saleps which are named Stye (garbage, noodle) and Deli salep and which are used in the adulteration of salep are obtained widely in the region, especially around Andırın and Göksun. The stye salep obtained from several tubers and roots of *Ranunculus ficaria ssp. ficariiformis* flowering in March-April and Deli salep (garlic salep) obtained after the small pieces of *Colchicum cilicicum* onions are boiled in water or saline for 10-15 minutes and dried until hard [2, 6].

The types of orchids obtained from Kahramanmaraş region and the orchid species with their local names [6] are shown in Table 3.

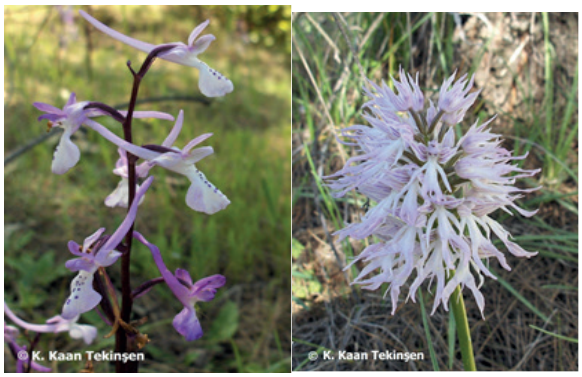
Table 3. Salep Varieties in Kahramanmaraş Region and Types of Orchids with Local Names

Kind	Species	Local Name
Maras Salep	*Anacamptis pyramidalis*	Çam salebi
	Dactyloriza romana	Parmaklı (Çatal) salep
	Orchis anatolica	Yayla (Tespih) salebi
	Orchis spitzelii	Dağ salebi
	Orchis tridentata	Beyaz dağ salebi
	Ophrys holoserica	Deşdiye salebi
Meadow Salep	*Orchis palustris*	Bataklık salebi
	Orchis coriophora	Çem (çim) salebi
	Dactylorhiza osmanica	Öz salebi, Çatal salep

Salep spread from the Middle East to Europe. It maintained its importance as a drink especially in England until the 16th century when the use of coffee spread. Salep, which was used as an expectorant or chest softener in various pharmaceutical preparations until recently in Turkey, is now used more as a traditional drink and as a food additive in food industry, especially in ice cream production [14, 16, 18, 24, 25]. The widespread use of salep is mainly due to Glucomannan, a polysaccharide that is hydrocolloid feature. Glucomannan absorbs water and causes gelling [1,2].

Salep was first used in Kahramanmaras in Turkey in the production of ice cream. It has spread to other regions of the country from Kahramanmaraş. The use of salep in the production of ice cream in the region has become almost indispensable due to the features that form when the salep is added to ice cream. Salep is used as powder in ice cream production, usually 0.5-1.0%, depending on the amount of glucomannan, and affects the quality of the ice cream [2, 4, 16]. In fact, in some studies [10, 26-29], some significant defects (e.g. insufficient volume expansion, sticky structure) were observed in ice cream samples where the salep ratio was low and when the salep was used in a suitable ratio considering its chemical quality, it delayed the melting of the ice cream and prevented the deterioration of the form to a great extent. The use of salep plays an important role in the reputation of Maraş ice cream. With its stabilizer feature, salep gives a smooth, pulpy and homogeneous structure and mass to the ice cream like the mortar used in construction. It prevents the formation of large ice crystals during the production and preservation of ice cream and partially delays melting [2, 4, 9]. Some orchid species are shown in Figure 2.

Figure 2. Photos of some orchid species



Orchis anatolica *Orchis italica*

Orchis morio *Orchis tridentata*

CONCLUSION

It is estimated that the number of tubers (plants) to uproot from nature varies between 1000-4350 units to obtain 1 kg dry tuber for salep production and the amount of salep consumed in Turkey is about 20 to 45 tons, and for this amount, 30 to 120 million plants are being collected [30]. To obtain good quality Maraş salep for many years and to convey this taste to future generations, first of all, it is necessary to protect these endangered wild orchid species which are destroyed by unconscious collecting from the nature for the purpose of obtaining salep, and to ensure that these species are collected and traded in a controlled manner. Relevant public institutions and the people of the region should undertake important duties in this regard.

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