

FOREST GENETIC RESOURCES IN BURDUR, TURKEY

BURDUR'DA ORMAN GENETİK KAYNAKLARI

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ABSTRACT

Actual and potential forest resources are of crucial importance because the demands of people from forests have increased to avoid different urban challenges lately. Accordingly, forest resources in the World need to be conserved and maintained for future generations. However, rapid population growth, unorganized land use planning and applications, climate changes and so on make pressures on conservation of forest genetic resources. Ultimately, in this study Burdur province is briefly introduced, its forest resources are elaborated and some recommendations are presented.

Keywords: *Burdur, Forest resources, Seed sources, Sustainability.*

ÖZET

Mevcut ve potansiyel orman kaynakları büyük önem arz etmektedir çünkü son zamanlarda farklı kentsel sorunlardan kaçınmak için insanların ormanlardan talepleri artmıştır. Buna göre, gelecek kuşaklar için Dünya'da orman kaynaklarının korunması ve devam ettirilmesi gerekmektedir. Fakat hızlı nüfus artışı, düzensiz alan kullanımı planlamaları ve uygulamaları, iklim değişimi vb. sebepler orman genetik kaynaklarının korunması üzerine etkiler yapmaktadır. Sonuçta, bu çalışmada Burdur ili kısaca tanıtılmış, orman kaynakları değerlendirilmiş ve bazı öneriler sunulmuştur.

Anahtar Sözcükler: *Burdur, Orman kaynakları, Tohum kaynakları, Sürdürülebilirlik.*

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1. INTRODUCTION

Forests cover %31.1 World's land area (WBG, 2015). On the other hand, being at the center of the junction joining Asia, Europe and Africa, Turkey has several unique ecosystems hosting many species of life. With its unique geographic position, rich topographic features and climatic differences among regions, Turkey has an impressive richness in terms of fauna and flora, earning it a prestigious place among the three continents. Such that, with nearly 30% of its total land area covered with forests, Turkey has 11.000 plant species, almost totaling the number of plant species the whole continent of Europe has. 3.708 of these species are endemic to the country (Anonymous, 2012). Forests are the single most important repositories of terrestrial biological diversity (FAO, FLD, IPGRI, 2004: 1). They also provide environmental benefits and also products to people throughout the World.

Forest tree species are long lived and have developed natural mechanism to maintain high levels of genetic variation within species including high rates of outcrossing and long-distance dispersal of pollen and seed (Amaral et al., 2004: 2). This genetic variation serves a number of fundamentally important purposes.

The value and importance of forest genetic resources is vital. Forest genetic resources are heritable materials maintained within and among tree and other woody plant species (FAO, 2014: 4). They have economic, environmental, social, cultural, medicinal and also scientific value. Another important point of forest genetic resources is that preserving for future developments and adaptation.

Increase in human population, land use and climate changes make pressure on conservation of forest genetic resources. Therefore, conservation, management and sustainable use of forest genetic resources are important for future generations. In this study, Burdur province is briefly introduced, its forest resources are explained and some recommendations are suggested.

2. BURDUR PROVINCE

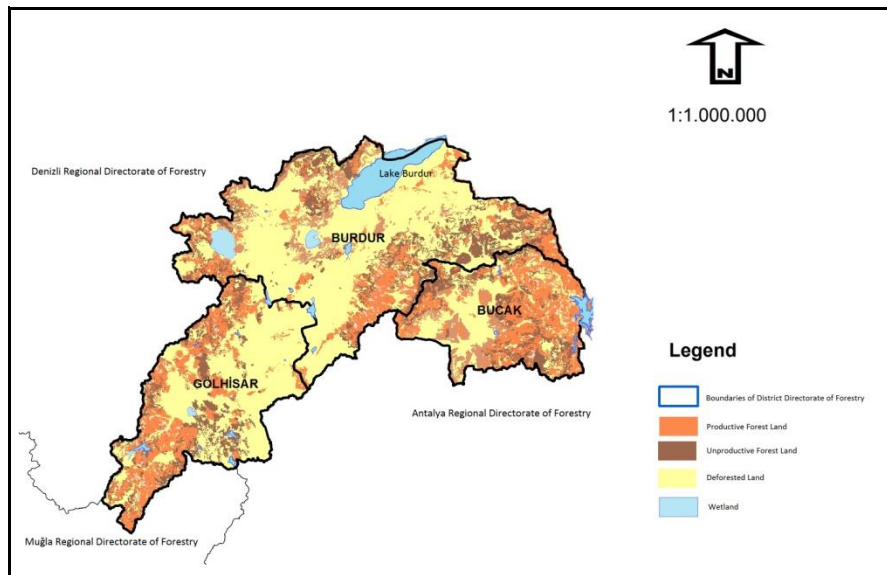
Burdur is a province of Turkey, located in the Southwest and bordering Muğla and Antalya to the South, Denizli to the West, Afyon to the North, and Isparta to the East. It has a population of 258 868. Burdur covers an area of 6887 km² between 36°53'N–37°50'N and 29°24'E–30°53'E. The area is formed of tectonic and karstic sedimentary basins among the Western Taurus Mountains. Because of the six lakes (Karataş, Salda, Yarıklı, Akgöl, Gölhisar and Burdur) within the tectonic sedimentary basins, this region is usually called the Lake District (Ege et al., 2015: 1164).

Nature of the city is quite hilly and its average altitude is about 1.000 m. Koçaş mountain, the highest one in Burdur, is approximately 2.598 m. Among mountains there are a lot of plains formed with the expiration of the old closed basin and separated from each other with narrow and deep gorges (Anonymous, 2013).

Burdur has a continental Mediterranean climate. Accordingly, summer is hot and dry, winter is too cold. Annual average temperature is 13 °C and annual average rainfall is 405 mm (Yiğitbaşıoğlu and Uğur, 2010: 133).

Burdur, Bucak and Gölhisar District Directorates of Forestry belonging to Isparta Regional Directorate of Forestry have conducted the forestry activities in Burdur, including the maintenance of forest ecosystems, the production of wood and non-wood forest products, afforestation, the control of erosion, recreational activities, the development of forest villagers etc. Burdur has natural forests and a large part of the province (48%) is forest land. However, 49% of these forest lands are unproductive (Anonymous, 2012; Figure 1).

Figure 1. Land Status of District Directorates of Forestry in Burdur



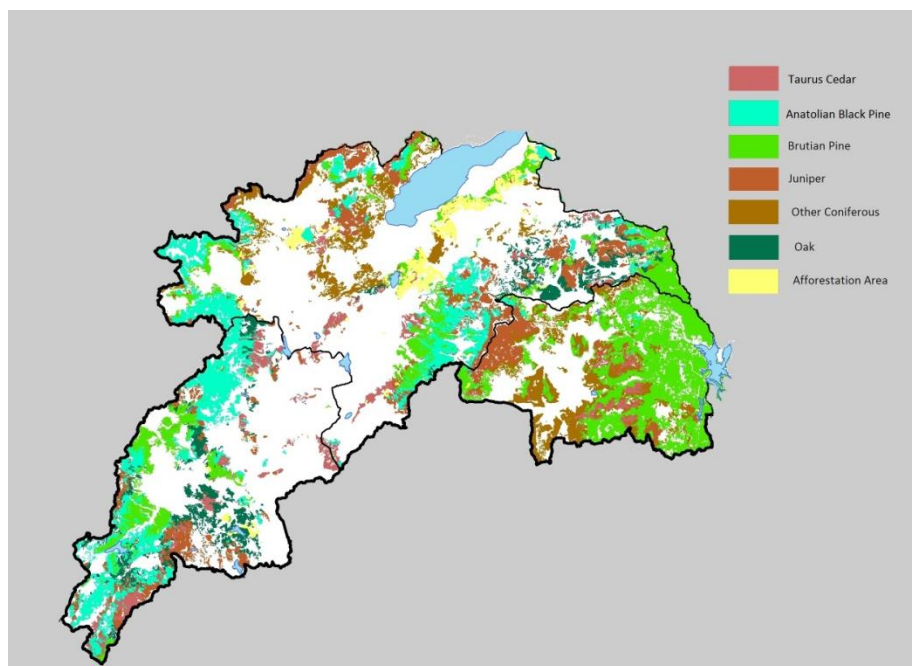
Source: Anonymous, 2016a.

3. FOREST GENETIC RESOURCES IN BURDUR

The main forest tree species in the forests of Burdur consists of Brutian pine (*Pinus brutia* Ten.), Anatolian Black pine [*Pinus nigra* Arnold *subsp. pallasiana* (Lamb.)], Cilician fir (*Abies cilicica* Carr.), Taurus cedar (*Cedrus libani* A. Rich), Juniper (*Juniperus* sp.), Oak (*Quercus* sp.), Sweetgum (*Liquidambar orientalis* Mill.), and Locust (*Acacia* sp.). In addition, small trees and shrubs such as dogwood (*Cornus mas* L.), hawthorn (*Crateagus* sp.), Prickly juniper (*Juniperus oxycedrus* L.), dogrose (*Rosa canina* L.), Myrtle (*Myrtus communis* Linn.), Sandalwood (*Arbutus andrachne* L.), Olive (*Olea europaea* L.), Sumac (*Rhus coriaria* L.), *Phillyrea latifolia* L., Blackberry (*Rubus fruticosus* L.), Storax (*Styrax officinalis* L.) and Kermes oak (*Quercus coccifera* L.) have occupied (Figure 2).

As seen in Figure 2, Anatolian black pine and Brutian pine forests have wide distribution in Gölhisar and Bucak District Directorates of Forestry, respectively. On the other hand, Anatolian black pine forests are mostly distributed in the boundary of Burdur District Directorate of Forestry. The majority of afforestation lands also are within the same directorate.

Figure 2. The Distribution of Forest Tree Species in Burdur



Source: Anonymous, 2016a.

Successful as well as cost effective and profitable afforestation activities may be possible if forests having the highest increment in terms of quality and quantity and adapting to environment are grown. In order to reach this aim, the main requirement is to use quality seedling. One of the basic requirements for obtaining quality seedlings is that seeds are collected from seed sources. These sources are seed stands, gene conservation forests, and seed orchards (Gezer and Yücedağ, 2013). Seed sources in Burdur are presented in Table 1. On the other hand, monumental trees in Burdur are listed in Table 2.

In a study presented by Çetin et al. (2012a), numerous medical and aromatic plants in the surroundings of Burdur Lake (between 2009 and 2011) were determined. In addition, Çetin et al. (2012b: 28) reported that endemism ratios in Tefenni-Burdur and in the surroundings of Burdur Lake are 21% and 11%, respectively. Özçelik et al. (2014: 30) stressed that endemism ratio and total number of plant in Burdur were close to their averages in Turkey. This finding confirmed Figure 2.

Table 1. Seed Sources in Burdur

SEED STANDS						
Tree Species	Regional Directorate	District Directorate	Forest Division	Area (ha)	Altitude (m)	Registration Year
Brutian pine	Isparta	Bucak	Pamucak	218.4	800	1972
Brutian pine	Isparta	Bucak	Bucak	164.0	800	1970
Brutian pine	Isparta	Bucak	Melli	271.0	350	1997
Brutian pine	Isparta	Göhlhisar	Göhlhisar	47.0	1100	1972
Black pine	Isparta	Göhlhisar	Göhlhisar	128.1	1150	1976
Taurus Cedar	Isparta	Göhlhisar	Dirmil	41.3	1650	1976
Cilician fir	Isparta	Bucak	Uğurlu	127.6	1200	1981
GENE CONSERVATION FORESTS						
Brutian pine	Isparta	Bucak	Pamucak	130.7	700	1997
Brutian pine	Isparta	Göhlhisar	Gölova	101.1	1510	2002
Taurus Cedar	Isparta	Bucak	Melli	122.9	1670	1999
Taurus Cedar	Isparta	Göhlhisar	Dirmil	164.1	1660	1999
Prickly juniper	Isparta	Göhlhisar	Dirmil	196.4	1550	1998
Prickly juniper	Isparta	Bucak	Kestel	97.5	1330	1997
Sweetgum	Isparta	Bucak	Pamucak	37.0	350	1997
SEED ORCHARD						
Tree Species	Regional Directorate	District Directorate	Forest Division	Provenance	Area (ha)	Establishment Date
Black pine	Isparta	Göhlhisar	Gölova	Göhlhisar	8.9	December/1985

Source: Anonymous, 2016b.

Table 2. Monumental trees in Burdur

County	CONIFEROUS SPECIES					DECIDUOUS SPECIES			Total
	<i>Cedrus libani</i>	<i>Juniperus excelsa</i>	<i>Juniperus foetidissima</i>	<i>Pinus brutia</i>	<i>Pinus nigra</i>	<i>Platanus orientalis</i>	<i>Populus alba</i>	<i>Quercus ithaburensis</i>	
Ağlasun	-	-			-	1			1
Altınyayla	5	-			1	6			10
Göhlisar	1	1	8	1	12	1		4	28
Merkez	-	1	-	-	-	-		-	1
Tefenni	-	-	-	-	-	-	1	-	1
Total	6	2	8	1	13	6	1	4	41

Source: Genç and Güner, 2003; Bayar et al., 2012; Özçelik and Tavuç, 2014; Anonymous, 2016c.

4. CONCLUSIONS

Afforestation and erosion control activities should be made taking into account the forest villagers. In this sense, today, as the demands of the people from a forest ecosystem are the non-wood forest products rather than wood more multifunctional forests including recreation, ecotourism, social benefits etc. should be established in Burdur District Directorates of Forestry. Therefore, the impacts on the forest will be minimized.

In Burdur, having very different topography and high endemism ratio, and also including numerous lakes various ways should be sought to realize alternative tourism opportunities sustainably. Besides, while making alternative tourism rare species in the district must be protected.

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