

Monumental Trees in Akçakoca (Düzce, Turkey): Utilities of Natural Resources for Ecotourism

Akçakoca (Düzce, Turkey)'nin Anıt Ağaçları: Ekoturizmde Doğal Kaynakların Kullanımı

Research Article

Aslı Doğru Koca

Hacettepe University, Faculty of Science, Department of Biology, Ankara Turkey

ABSTRACT

Ecotourism is typically a modern form of tourism in which learning about nature and help to protect of nature. Natural resources have significance in nature-based attractions in ecotourism. The monumental trees are one of these natural resources. In this research, the monumental trees in Akçakoca (Düzce) district are determined. Their morphological features and status are recorded. The present monumental point is calculated. Also, probable interaction between ecotourism and natural resources based monumental trees in Akçakoca are discussed.

Key Words

Ecotourism, monumental tree, Akçakoca, natural resources

ÖZET

Ekoturizm, tipik olarak doğayı öğreten ve onun korunmasına yardımcı olan modern bir turizm şeklidir. Doğal kaynaklar, ekoturizmdeki doğa kaynaklı aktivitelerde önemlidir. Bu araştırmada, Akçakoca (Düzce) ilçesindeki anıt ağaçlar tanımlanmaktadır. Bu ağaçların morfolojik özellikleri ve durumları kaydedilmiş, şuan ki anıtsal değerleri hesaplanmıştır. Ayrıca, Akçakoca'daki anıt ağaçlar üzerinden doğal kaynaklar ve ekoturizm arasındaki olası karşılıklı etkileşim tartışılmıştır.

Anahtar Kelimeler

Ekoturizm, anıt ağaç, Akçakoca, doğal kaynaklar

Article History: Received: Apr 18, 2014; Revised: Jul 9, 2014; Accepted: Aug 16, 2014; Available Online: Sep 15, 2014.

Correspondence to: A. D. Koca, Hacettepe University, Faculty of Science, Department of Biology, Ankara Turkey

Tel: +903122978008

Fax: +903122992028

E-Mail: adogrukoca@gmail.com

INTRODUCTION

Turkey has magnificent biodiversity in the temperate zone. The variation of habitats from coastal to alpine area, climatic factors and variable topology contribute to its diversity. On account of plants, approximately one third of species are endemic for Turkey.

Tourism concept has changed from traditional sand-sun-sea tourism to ecotourism (nature-based tourism) since late 1980's [1]. Weaver [2] defined ecotourism as "a type of nature-based tourism which provides opportunities to learn and appreciate the natural environment and its elements, and also strives to be ecological, sociocultural and economical". Eagles [3] recorded that ecotourism includes a trip to explore and learn about the nature and wildlife. Today, ecotourism is an important "export industry" in some countries such as Australia, Kenya, Nepal, New Zealand and Tanzania [3]. In ecotourism, there are three core characteristics: i) natural-based attractions, ii) motivations on learning-based activities and iii) being sustainability-based [4]. The natural-based attractions focusing normally on relatively undisturbed ecosystems and the non-captive endemic or native charismatic

megafloora (e.g., redwood trees), megaliths (e.g., volcanoes, cliffs) and charismatic megafauna (e.g., koalas) that inhabit these ecosystems are featured. Ecotourism applies in the protected natural areas such as national parks, nature parks, nature reserves and natural monuments. Natural monuments can be individual trees (monumental trees), alleys, parks, botanical gardens, etc. which have botanical value. A monumental tree is defined as "exceed the ordinary age, size and height of its kind; have a special place in the history, culture and folklore of the area and have a natural lifespan to provide communication between the past, present and future" [5, 6].

In Turkey, to create an inventory of monumental trees have been insufficient although there are many investigations since 1970's [7, 8]. It was recorded that there are 100 monumental trees in Turkey [9]. After that there were some records by botanists, forest engineers and geographers [10-20].

Akçakoca is a district of Düzce province in the Black Sea region of Turkey, located close to Ankara and İstanbul (Figure 1). The public makes a living by cultivation of hazelnut, tourism and fishing. Touristic attractions include beaches and "Genoese

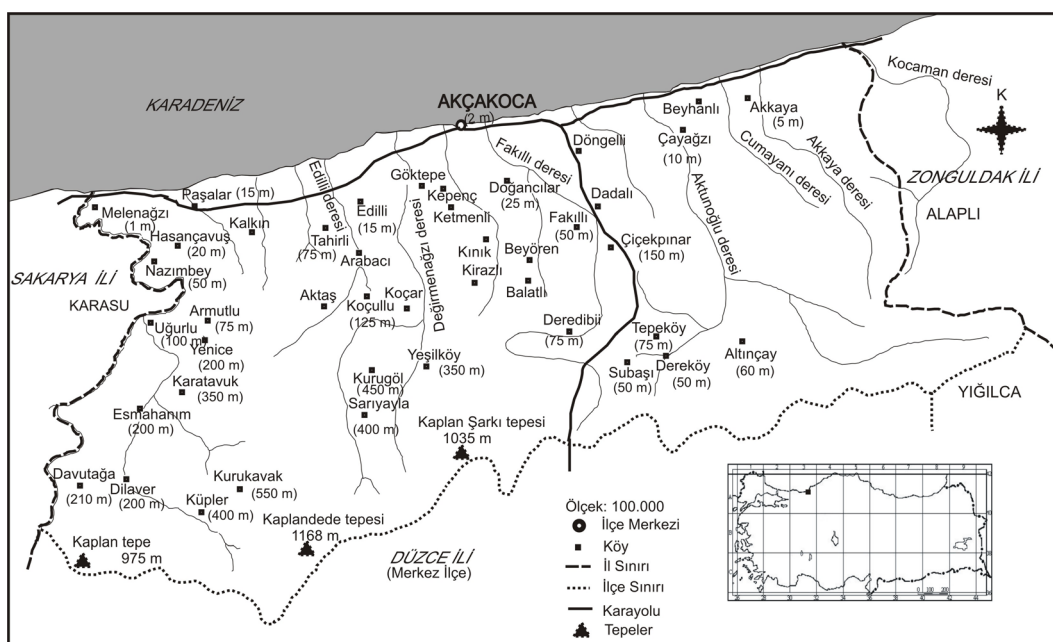


Figure 1. Geographical location of Akçakoca district in Düzce [modified from 24]. " " indicates Cumayarı monumental tree, " " indicates the monumental trees in the urban.

Castle" which remained from Genoese immigrants in 13 century [21]. In the last years, Akçakoca has become one of the popular touristic places for both Turkish and foreign visitors with not only sea-sand-sun attractions but also its cultural alternatives. The district is suitable for short time holidays, even just in the weekend because it is about 300 km far from İstanbul and Ankara. Additionally, it is remarkable due to its very different cultures and natural features from these mega cities and with its moderate climate in summer. In respect of floristic richness Akçakoca is home to 657 plant taxa were reported by Koca and Yıldırım [22]. These species mainly belong to Euro-Siberian phytogeographical region. The variations of habitats include coastal, deciduous forest and pasture [23].

In this research we aimed i) determination of the monumental trees of Akçakoca district, ii) to provide a contribution to the inventory of monumental trees in Turkey, iii) to provide a contribution to nature based attractions in Akçakoca, iv) to point out the rising trend of protection of nature via ecotourism activities.

MATERIALS AND METHODS

In this research the samples of trees were collected and prepared as herbarium materials, identified using Flora of Turkey and East Aegean Islands [25] and deposited in Herbarium of Hacettepe University (HUB). During the field trip, the inventory card after G-G method [7] was filled. The height of tree, circumference of trunk (at above 1.5 m) and crown, first brunch height and coordinate were recorded. The diameter of trunk and crown were calculated using their circumferences with $\pi = 3,14$. The estimated age of tree was calculated using diameter of trunk in inches and appropriate growth factor without damaging to tree (Anonymous 2014). The appropriate growth factor that is peculiar for tree species is listed as online in Missouri Department of Conservation [26]. The PMP (Present Monumental Point) was calculated and the MMPspecies (Minimum Monumental Point For a Species) was used according to Genç and Güner [7] (Table 1).

RESULTS AND DISCUSSION

The morphological features of five monumental trees in Akçakoca are given. Additionally, scientific names, estimated age, status and localities information are provided.

Cumayanı monumental tree (Fig. 2)

Platanaceae, Platanus orientalis L.

a. Tree height	40 m
b. The circumference of tree base	9 m
c. The circumference of tree at 1.3 m height	7.5 m
d. Diameter of geometric projection	27 m
e. The first brunch height (from the base)	1 m
f. Diameter of trunk (at tree base)	287 cm (113 inches)
g. Estimated age	452
h. Status	officially certified
i. Coordinate	41° 04' 008" N 31° 06' 005" E
j. Altitude	20 m

Çuhallı monumental tree

Platanaceae, Platanus orientalis L.

a. Tree height	30 m
b. The circumference of tree base	5.5 m
c. The circumference of tree at 1.3 m height	4.75 m
d. Diameter of geometric projection	24 m
e. The first brunch height (from the base)	2.5 m
f. Diameter of trunk (at tree base)	175 cm (69 inches)
g. Estimated age	276
h. Status	not certified
i. Coordinate	41° 05' 023" N 31° 08' 024" E
j. Altitude	0 m

Çınar monumental tree (Fig. 3)

Platanaceae, Platanus orientalis L.

a. Tree height	22 m
b. The circumference of tree base	6 m
c. The circumference of tree at 1.3 m height	5.5 m
d. Diameter of geometric projection	35 m
e. The first brunch height (from the base)	2 m
f. Diameter of trunk (at tree base)	191 cm (75 inches)
g. Estimated age	300
h. Status	not certified
i. Coordinate	41° 05' 025" N 31° 07' 058" E
j. Altitude	18 m

Coastal monumental tree

Platanaceae, Platanus orientalis L.

a. Tree height	31 m
b. The circumference of tree base	4,5 m
c. The circumference of tree at 1.3 m height	3,5 m
d. Diameter of geometric projection	17 m
e. The first brunch height (from the base)	3 m
f. Diameter of trunk (at tree base)	143 cm (56 inches)
g. Estimated age	224
h. Status	not certified
i. Coordinate	41° 05' 023" N 31° 07' 023" E
j. Altitude	1 m

Diapolis monumental tree (Fig. 3)

Platanaceae, Platanus orientalis L.

a. Tree height	25 m
b. The circumference of tree base	4.9 m
c. The circumference of tree at 1.3 m height	4.3 m
d. Diameter of geometric projection	19 m
e. The first brunch height (from the base)	3 m
f. Diameter of trunk (at tree base)	156 cm (61 inches)
g. Estimated age	244
h. Status	not certified
i. Coordinate	41° 05' 20" N 31° 07' 41" E
j. Altitude	26 m

In this research four potential dimensionally monumental trees (Çuhallı, Çınar, Coastal, Diapolis)

are determined. These are plane trees (*Platanus orientalis* L., Doğu çınarı, sycamore), in the district centrum, between the sea and main district road (Fig. 3). According to Genç and Güner [7], MMPs for *Platanus orientalis* should be more than 39 score. The MMPs for all these trees are between 41 and 74 (Table 1). Therefore, we recommended that these trees should accept as monumental trees. The last one, Cumayanı monumental tree, has already formally certified by General Directorate of Protection of Natural Assets since 1995 (Fig. 2). It is ca. 5 km far from district, in the Göktepe village limits, on the Arabacı village road (Fig. 1). Additionally, there are a historical Turkish bath, a mosque and a tomb belong to Seljuks.

In Turkey, there is only one natural *Platanus* species (*Platanaceae*), *P. orientalis* L., and it is widespread. This species was described from Taurus, Macedonia, Lemnos, Crete and Greece. It is also natural in Balkans, Crete, W. Syria, N. Iraq, Iran and eastwards to Himalayas [25]. There are some records as monumental trees of *Platanus orientalis* from Kahramanmaraş and Eskişehir in Turkey [19, 8]. Unfortunately, there are limited monumental trees records from Turkey. Some of them are related *Castanea sativa*, *Picea orientalis*, *Acer sempervirens*,



Figure 2. Cumayanı monumental tree. A) General view. B) The details of the trunk.

Table 1. The evaluation point of monumental trees in Akçakoca according to Genç and Güner [7].

Elements	Parameters	Points for height classes	Given Point				
			Cumayani	Çuhallı	Çınar	Coastal	Diapolis
Height (m)	05.0 - 07.5 08.0 - 10.0 10.5 - 15.0 15.5 - 20.0 20.5 - 25.0 25.5 - 30.0 30.5 - 35.0 35.5 - 40.0 40.5 - 45.0 45.5 - 50.0 > 50.0	0 0 0 0 0 3 6 9 12 16 20	12	6	0	6	3
Diameter of trunk (cm)	< 50 50 - 74 75 - 99 100 - 124 125 - 149 150 - 174 175 - 199 200 - 224 225 - 249 250 - 274 275 - 299 ≥ 300	0 0 0 3 6 9 12 15 18 22 26 30	26	12	12	6	9
Diameter of crown (m)	< 05.0 05.0 - 09.5 10.0 - 14.5 15.0 - 19.5 ≥ 20.0 m	0 2 4 7 10	10	10	10	7	7
Estimated age (year)	100 - 200 201 - 300 301 - 400 401 - 500 501 - 600 601 - 700 701 - 800 801 - 900 901 - 1000 > 1000	3 6 9 12 15 18 21 24 27 30	12	6	9	6	6
Site	In forest [between trunk exclusion and old-growth stages and its area is more than 1.0 ha] In stand (in rural area or city) In group (in rural area or city) In clump (in rural area or city) Alone (in rural area) Alone (in city)	2 10 9 8 4 6	4	6	6	6	6
Another positive properties	Protecting or keeping up the necessary site factors to tree is possible Healthy Being an illustrious tree in Turkey according to the at least one dimensional characteristic (such as height, dbh, crown diameter and age) Special (having particular bark, leaf, fruit, cone, branching, forking, trunk form etc. except general habit) Anything	10 6 9 3 0	10	10	10	10	10
Negative properties	Protecting or keeping up the necessary site factors to tree is impossible Stag-headed Worse (strong drying into crown) New Entomological or fungal injuries (must be consider if stag-headed is not present) Cavity trunk and the biggest cavity's Width < 1/5 Width = 1/5 - 1/ 3 Width > 1/ 3 [= Girth at the place of the biggest cavity] Wounded trunk or main branches and the biggest wound's Width < 1/5 Width = 1/5 - 1/ 3 Width > 1/ 3 [=Girth at the place of the biggest wound] Anything	-10 -8 -6 -8 -2 -3 -4 -1 -2 -3 0	0	0	-3	0	0
Present Monumental Point			74	50	44	41	41



Figure 3. Monumental trees in the urban. A. Diapolis monumental tree in the halfway. B. Çınar monumental tree near the main road C. Damaged trunk of Çınar monumental tree by cars. D. A lamp attached to the trunk of Cumayanı monumental tree.

Quercus cerris, *Quercus robur*, *Juniperus foetidissima* [16, 20, 8]. Whereas, the monumental trees are our values that connecting our history and future and develops the sense of belonging. In the long term, the activities of protection of these values also contribute to become established of nature precision and environment mind [19]. In the short term, the protection of these trees will contribute to ecotourism activities.

The urban trees have some benefits such as to provide a recreation area, decreasing the air pollution and noise, softening the climate, to provide a habitat for birds and other wild animals [27]. The urban monumental trees in Akçakoca have similar effects. However, they have difficult positions comparatively Cumayanı plane tree. Their status has become worse gradually (Fig. 3) since the district main road damaged to them, they embedded into footway and are treated unconsciously by public. In case of that they need of serious protection and

maintenance. If they accepted as monumental trees their protection activities possibly get better. For example the information plates and leaflets should prepare. So, the public will become more conscious about them and behave conservator and informative.

As a conclusion, in this research, four possible monumental trees were determined in Akçakoca (Düzce) District. We reported some morphological features and status of them. Additionally, the features of Cumayanı plane tree that has officially certified, is recorded. The potential importance for ecotourism of these trees is discussed. In general terms, these findings provide some contributions to reveal an inventory of monumental trees in Turkey.

References

1. D. Diamantis, The concept of ecotourism: Evolution and trends, *Current Issues in Tourism* 2 (1999) 93.

2. D. B. Weaver, Ecotourism as mass tourism: Contradiction or reality?, *Cornell Hospitality Quarterly* 2001, 42 (2001) 104.
3. P. F. J. Eagles, International trends in park tourism: The emerging role of finance, *The George Wright Forum*, 20 (2003) 25.
4. R. K. Blamey, Principles of Ecotourism, In: D. B. Weaver (ed.), *Encyclopaedia of Ecotourism*, UK, CABI, 2001.
5. Ü. Asan, Doğal ve Kültürel Miraslarımızdan Anıt Ağaç ve Ormanlar, *Yesile Çerçeve Dergisi*, (1991) 22.
6. Anonymous, Korunması gerekli tabiat varlıklarından anıt ağaçların tanımı ve korunması hakkında karar. TC. Kültür Bakanlığı Kültür ve Tabiat Varlıkları Koruma Yüksek Kurulu. Karar no: 597 Tarih: 14.07.1998, Ankara.
7. M. Genç, S.T. Güner, A new method to select monumental tree among the forest tree species of Turkey: An application, *FOREST RESEARCH: a challenge for integrated European approach*, August 27 - 01 September, Thessaloniki, Greece, (2001) 6.
8. M. Genç, Eskişehir ile anıt ağaçları. II. Ulusal Karadeniz Ormancılık Kongresi 15-17 Mayıs 2002 Kongre kitabı, II (2002) 510.
9. Ü. Özdemir, C. Göncüoğlu, C. Tütüncü, N. Tanca, A. Tümer, Doğal Anıtlar, *Ege U. Journal of Science Fac*, B8 (1986) 221.
10. A. Güner, Monumental Trees of Turkey: 7, *The Karaca Arboretum*, 2 (4) (1994) 181.
11. A. Güner, Monumental Trees of Turkey: 9, *Gökbulatan Fındık, The Karaca Arboretum Magazine*, 3(2) (1995) 87.
12. Güner, Monumental Trees of Turkey 13: Türbeçami, *The Karaca Arboretum Magazine*, 4(1) (1997) 43.
13. A. Düzenli, N. Türkmen, Monumental Trees of Turkey, 10: Kocasedir, *The Karaca Arboretum Magazine*, 3(3) (1996) 143.
14. U. Gül, C. Gümüş, H. Yavuz, M. Eroğlu, Z. C. Özkan, A. Demirci, Doğru Karadeniz Bölgesinde Saptanan Bazı Anıt Ağaç ve Meşcereler, *Turkish Journal of Agriculture and Forestry*, 23 (Ek Sayı 3) (1999) 671.
15. H. Özçelik, Ş. T. Güner, Anıt ağaçların önemi, *Göller Bölgesinin Anıt Ağaçları*. ISBN: 975-585-325-1, Isparta, 2003.
16. S. Akbulut, O. E. Sakıcı, Z. C. Özkan, Hemşin yöresindeki anıt doğu ladini (*Picea orientalis* (L.) Link.). *Kafkas Üniversitesi Artvin Orman Fakültesi Dergisi*, 3-4 (2004) 200.
17. S. Palabaş Uzun, A. Uzun, S. Terzioğlu, Doğal Mirasımıza Bir Katkı: Anıt Doğu Ladini (*Picea orientalis* (L.) Link), *Düzce Üniversitesi Ormancılık Dergisi*, 3 (2) (2007) 42.
18. F. Temel, M. Özalp, Monumental *Castanea sativa* Mill. individuals on the slopes of Genya Mountain, Artvin, Turkey, *Acta Hort. (ISHS)* 815 (2009) 171.
19. S. Palabaş Uzun, N. Bozali, F. Sivrikaya, Kahramanmaraş'ın Tarihine Işık Tutan Anıt Ağaçlar, *KSU J. Nat. Sci.*, 14 (2) (2011) 43.
20. R. Efe, A. Soykan, I. Cürebal, S. Sönmez, Kuyucak monumental cretan maple (*Acer sempervirens* L.) (Burhaniye-Balıkesir, Turkey), *Procedia* 120 (2014) 547.
21. K. Okan, Akçakoca - Dünü ve Bugünü. İlke Yayınevi, Ankara, (1996) 117.
22. A. Doğru-Koca, Ş. Yıldırım, Flora of Akçakoca district (Düzce-Turkey), In: D. Ivanova (ed.), *Plant, fungal and habitat diversity investigation and conservation. Proceedings of IV Balkan Botanical Congress*, Sofia, 20-26 June 2006, Institute of Botany, Sofia, (2009) 144.
23. A. Doğru-Koca, Ş. Yıldırım, Akçakoca (Düzce) ilçesinin genel vejetasyonu üzerine bir araştırma, *Bartın Orman Fakültesi Dergisi*, 10 (13) (2008) 46.
24. M. Emiroğlu, Akçakoca'da Nüfus, Yerleşme ve Ekonomik Faaliyetler, Ankara Üniv. Dil ve Tarih Coğrafya Fak. Yayınları, 192 (1970) 217.
25. F. Yaltırık, *Platanus L.*, In: P.H. Davis (ed.), *Flora of Turkey and East Aegean Islands*, 7 (1982) 656.
26. Anonymous, Missouri Botanical Garden, Department of Conservation, <http://mdc.mo.gov/your-property/your-trees-and-woods/backyard-tree-care/how-old-tree> (Accession date 15 May 2014).
27. H. Karakurt, Urladaki Yaşlı ve Korunmaya Değer Ağaçlar. Cumhuriyetin 80.Yılında I. Urla Sempozyumu, 25-26 Aralık 2003.