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THREATENING FACTORS ON PLANT DIVERSITY OF KAZDAĞI (IDA MOUNTAIN) NATIONAL PARK IN TURKEY AND SUGGESTIONS FOR CONSERVATION

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ABSTRACT

Kazdağı National Park is located in the Southern part of Marmara region in the North-west of Turkey. There are about 800 taxa naturally grown in the National Park and 79 of them are endemic to Turkey. Also, thirty one of the endemic taxa are grown only in the area. Additionally, there are thirty one "rare plants" in this area. Due to these characteristics, the area is an important plant area in Turkey and Europe as well. Therefore, the area was determined as "Important Plant Areas (IPAs)" by Planta Europa and WWF.

This paper evaluates the environmental and anthropogenic impacts on the plant diversity in the National Park. Threatening factors on the endemic and rare species in the National Park have been determined. Also, conservation suggestions for endemic and rare plants were emphasized in this study. Fieldwork was done on the area during 2007 and 2008.

The results show that the festival in Sarıkız hill and visitors density have negative effects on the natural resources of the protected area. Because of insufficient facilities and unplanned usage of the festival area, degradation of the plant habitat was observed. A number of precaution in Kazdağ National Park should be taken in order to minimize the anthropogenic impacts.

Keywords: Endemic, Kazdağı, National Park, Plantdiversity, Threat category

Introduction

Kazdağı, a mountain located in North-Western Turkey, is ecologically and floristically diverse, containing a number of plant species endemic to Turkey. It is about 1770 m high. Kazdağı National Park, founded in 1993, includes an area of 21 000 ha that is about just 20-30% of the mountain (**Fig. 1**).

Kazdağı has a rich flora because of climatic properties, geological structure and its location. There are about 800 taxa grown naturally in the area and 79 of them are endemic to Turkey. Also, thirty one of the endemic taxa are grown only in this Park. Additionally, there are thirty one rare plant species in this area (4, 5, 7, 14). Because of these characteristics, this park is an important floristic area not only for Turkey but also for Europe. Therefore, the area has been included in "Important Plant Areas (IPAs)" by Planta Europa and WWF (9).

The aim of this study is to evaluate some important environmental problems on plant diversity caused by human activities in Kazdağı National Park in terms of conservation

and utilization.

Materials and methods

Fieldwork was done on the Kazdağı National Park (**Fig. 1, 2**) during 2007 and 2008. We have investigated each naturally plant diversity region in the area. We have observed plant populations and the thretaned species.

The investigation have been carried out before and after festival especially at the intensively visited places and festival area for determining the damage on plant habitat.

Gatherers and National park staff were interviewed for idendification of the plants. Also, local market places were routinely visited to observe plants gatherer from Kazdağı.

Commercial species were collected, along with information on usage, grading methods, commerce, and resources at local marketplaces around Kazdağı

The collected species were identified from "Flora of Turkey and the East Aegean Islands" (4, 7). The identified specimens have been placed in the herbarium of the Arts and Science Faculty, Balikesir University.



Fig. 1. Kazdağı National Park (1).



Fig. 2. The summit of Kazdağı (Karataş and Baba hill)

Threat categories are determined for endemic taxa according to Red Data Book of Turkish Plants and IUCN Red List Categories (6, 8).

Results and Discussion

Threat factors to plant diversity in Kazdağı National Park are especially visitors and festival, gathering and trade of plants, fires, destruction of nature for urbanization and air pollution.

Visitors and Festivals: Each year, hundreds people visit the National park (Fig. 3). The summit of the Kazdağı, which has quite rich regarding endemic plants has been under threatened by visitors density. Especially these plants have been destroyed by the traditional festivals held each year.

The Sarıkız Festivale takes place 15th August at summit of Mt. Kazdağı (Fig. 4). On this day, hundreds of people, both local and non-local, move up to the summit of the mountain for celebration (1). The festivale have negative effects on natural resources of the protected area. Because of insufficient precautions and unplanned usage of the festival area, cause damage to the local habitat. Some parts of the habitat of the endemic plants in the Sarıkız area is flatten in order to pitch tents for the festival, thus flora has been

damaged.



Fig. 3. The Sarıkız hill is visited by hundreds of people daily during the Sarıkız festival.



Fig. 4. The Sarıkız Festivale takes place 15th August at summit of Mt. Kazdağı

Gathering Plant and Trade of Plant: Medical and aromatic plant species around the national park have been gathered for commercial purposes by local people. Plant species have been endangered as the result of the unplanned and uncontrolled gathering.

Mt. Kazdağı has the most diversity as medical and aromatic plant population. The plants species are gathered for trade by local people in Kazdağı. Trade of plant is an important source of income for people in this region (10, 11).

It is necessary to protect and conserv some plant species in Kazdağı National Park because of their intense exploitation, but conservation has not received yet the desired attention.

Sideritis trojana (Fig. 5) and *Thymus pulvinatus* grown only in Kazdağı (2, 3, 4). *Thymus pulvinatus* grown only at two different localities of Mt. Kazdağı where for both localities it has limited distribution in fields (2). *Satureja*

pilosa is rare in Mt. Kazdağı (6, 14). The population of this species is quite poor in its naturally growing areas. *Sideritis athoa* is also a rare plant, known of only two locations in Turkey (3). The plant is collected and used as herbal tea in both regions (10, 11).



Fig. 5. *Sideritis trojana* grown only in Kazdağı. The plant is collected and used as herbal tea in regions.

These species are not gathered for commercial reasons and only used by the local people. So, the habitats are under threat. These threats include over-exploitation, destructive harvesting techniques such as pulling out whole plant from root, habitat loss, and decrease in genetic diversity.

Origanum vulgare subsp *hirtum* and *O. onites* are nonendemik species, grown as a wide in Mt. Kazdağı (10). It has been observed that, there is not a serious threat factors for *Origanum* populations in near future.

Fires: Fire is the other serious danger among threatening factors for Kazdağı forest .

Destruction of nature for urbanization: New residential houses in the olive grove areas destroy the historic, aesthetic structure of Kazdağı and its environment.

Air Pollution: The air pollution by North winds from thermal power plant located in Çan District, damages especially endemic Kazdağı fir trees (*Abies nordmanniana* subsp. *equi-trojani*). The fir trees are so sensitive to poisonous gases and especially sensitive to acid rainfalls (**Fig. 6**).

Particularly, it is determined that mostly SO₂ damages the Kazdağı fir. The weakened trees lost their resistance and are exposed to insect epidemic (12, 13). Acid rain causes growth retardation, injury, or death of *Abies* forests. Especially the

damage in roots have been reported. The acid rain, washes the waxy layer on the leaves and makes the plant vulnerable to diseases. Plant germination and reproduction is also inhibited by the effects of acid rain.



Fig. 6. The air pollution by North winds from thermal power plant located in Çan District, damages especially endemic Kazdağı fir trees (*Abies nordmanniana* subsp. *equi-trojani*).

Suggestions for Conservation

1. Zonning studies are essential inside of the National Park. Absolute protection zones and surrounded tampon zones for these areas should be set up. Constructing the absolute protection zones and tampon zones, biology of target species, characteristics of living conditions, social structure and density should be taken into consideration.

2. All the data should be transferred to computer platforms (like GIS) and should be regularly updated.

3. At the top area, the paths must be established for visitors. Cautionary and instructive signs should be placed.

4. The support and participation of local people for national park guide should be supplied

5. A unit should be constituted in order to follow, coordinate and guide the studies in this areas.

6. Relevant academic staff, managers and agents of non-governmental organization (NGO) should be participated in this unit.

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