Diversification of Botanic Tourism by Benefiting from the Plant-Bioinformatics System

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Abstract

Plants are the main source of human beings and they are very important component of biological richness of the earth. Plants have been used for ages as the principal source of food for human beings besides various purposes such as fuel, construction material, and medical input. Plants also provide variety and richness in ecosystems and habitats. It is known that there are about 300 thousand vascular plants in the earth. Nowadays plants are under threat because of over and unconscious uses. On the other hand, it can be asserted that nature is also the main resource of tourism, which comfort and relax people in the modern and industrial era. This potential (natural resource) provides an opportunity serving as botanic tourism in which many different forms of tourism activities can be carried out. Data on plants play very important role, in order to determine and shape the environment protection and tourism policies. As being in informative era, it can be stated that most of information, data, and data bases are stored in a data bank. Turkey is one of the richest countries in the world with respect to floristic diversity and one quarter of them is endemics. 26 percent of the Anatolian territory is covered with forests, 93 percent of them are natural, and about one million hectares possess special habitats and ecosystems which are under protection by the legislation. This study overviews the variety of plant diversity of the country, and its position in tourism and significance are discussed. It is asserted that by using the data and information from Turkey Plant Bank, the variety and richness of tourism products can be increased. These potentials are conceptualized with botanic tourism, ecosystem tourism, habitat tourism, endemic plant tourism, tourism in protected area, agro plant and farm tourism, and artificial garden tourism.

Key words: Bioinformatics, plant bank, endemic plant tourism, botanic tourism, protected area tourism, artificial garden tourism.
JEL Classification: Q01, Q56, Q57
1. Introduction

Human beings have been in close contacts with plants for ages. For the first time, human beings gathered plants from the nature, and cultivated plants on the fields during the Neolithic period. Thus, plants have impacts on the mankind not only as a food, but they also have cultural and social impacts. Plants are still used for various purposes such as medicinal, food, wood, cosmetics, and landscape. It is estimated that the plants have been utilized for about 50 thousand years in the Anatolian peninsula. Finally, plants have been contributing widely and significantly to the emergence of tourism in a country.

Nowadays it is widely agreed on the fact that all kinds of resources, either living or nonliving organism materials should be used in a sustainable way, so that future generations would be able to benefit from these resources too. In order to reach sustainable resource management, firstly, these resources have to be identified, and determined as to where and how they have to be used, and its sustainable, controlled usage. All these process of course requires a plant bank, which should be uploaded with current and accurate data, and should be able to be practical and dynamic. When these data and resources are used in a planned and sustainable manner, they have better chance to survive. Generally speaking it can be asserted that if mass tourism activities are done regardless of its carrying capacity, there would be great negative impacts on species, gene, and ecosystem of plant diversity.

In order to measure the richness and the attractiveness of countries in tourism, various indicators have been used such as plant diversity, size of naturally developed forests, pesticides and chemical fertilizers used in agriculture in the 21st century. It is worth mentioning that scientific men with elaborated and detailed studies with constant monitoring must undertake such inventory studies. In this study, how Turkey Plant Bank can be utilized in order to offer new activities for botanic tourism, which would also increase the diversification of tourism products of the country.

2. Review of Literature

2.1. Plant Bioinformatics Systems

There are not many studies about direct plant banks and plant databases in national and international literature. In general, it has been seen that systematic and floristic data bases are created by researchers up to these days. These software were generally accomplished by writing a program according to specific objective in narrow-scoped. The most important plant databases and banks that are related with the subject matter are discussed below.

Ongi et al. accomplished the project of The Digital Flora of Texas in 2002. In the database, a hierarchical taxonomic browser, specimen distribution and density maps, and stackable bar graphs of temporal specimen data were applied.
Duzenli et al. (2000, 2002) created a database by collecting data belonging to the systematic features of plant from Windows 98, Microsoft Office Access 8.0 in the Eastern Mediterranean Region Flora Database project. This database has 45 features belonging to status of botanic, usage and conservation.

Duzenli, Karaomerlioglu and Cakan formed an index of endemic plants belonging to province of Adana in 2003. 364 plants taxa and systematic features of these plants were included in the study.

BASECO a floristic and ecological database of Mediterranean French flora was realized by Gachet et al. (2005). The database allows several queries about the botanical and ecological characteristics of 1800 plants. Each species is identified by a code and characterized by several qualitative traits relating to morphology, reproduction, life forms and biogeographically distribution, including several modalities.

Duzenli and Karaomerlioglu (2006) developed BOTANI2005 database in which the plants of the eastern Mediterranean region of Turkey were analyzed.

BIOTA-Canarias database was implemented by Hortal et al. (2007). The database of BIOTA contains data based on the presence of all species in the Canary Islands. Information came from BIOTA-Canarias database, which stores the information regarding seed plants of Tenerife (Canary Islands).

VegItaly is accomplished by Landucci et al. (2012) for Italy. In the study some basic statistical analyzes were presented such as data distribution in space and time, and represented vegetation types expressed as physiognomic categories.

Phytoinformatic modeling of endemic plants in Turkey was modeled by Düzenli and Karaömerlioğlu (2012). The web based program is suitable for relative-inquiring of taxa by SQL server data base. The study was carried out for identification of the current status of endemic plants and improving the protection policies.

Duzenli & Karaomerlioglu-Boz created Turkey Plant Bank, phytoinformatic automation, as a new and effective method in order to use the plant data in 2012-2013. By transferring systematic and botanical 65 characteristics of plant to a computer environment, the terms that represent synonymous and similar characteristics are transformed into single statements as much as possible. Thus, the data can be inquired relatively easily. The bank has synonym, CITES-conservation-export status, monumental plants, useful plants, habitat, social-syntaxonomic-ecological value, map to GPS coordinates, photos, etc. These features can be separately inquired and done relative-inquiring each other among all of these features of taxa. Some of the data in the bank has been entered as codes in suitable standards. Turkey Plant Bank is the first plant bank done relative-inquiring each other among all of these features of taxa.
VASCAN database was developed by Desmet and Brouillet (2013). This database includes the accepted scientific name, French and English vernacular names, and their synonyms, as well as the distribution status (native, introduced, ephemeral, excluded, extirpated, doubtful or absent) of the plant for each province or territory, and the habit (tree, shrub, herb and/or vine) of the plant in Canada.

A database called Euro+Med PlantBase by Greuter et al. (2014). This project provides an on-line database and informatics system for the vascular plants of Europe and the Mediterranean region, against an up-to-date and critically evaluated consensus taxonomic core of the species concerned. It includes scientific name, author citation, place of publication, basionym, synonyms, distribution, status of occurrence, endemic, description, growth form, ecology - basic habitat type, phenology, karyology.

2.2. Botanical Tourism

Many Australian plant species and communities appear to be threatened by tourism (Kelly et al., 2003). A review of management plans, recovery plans and a survey of experts found that tourism was considered to be a direct or indirect threatening impact for 72 plant taxa. This is one fifth of threatened species for which threats have been identified.

Another study was implemented by Pickering and Hill (2007) in Australia. This paper reviews recent research into the impact of recreation and tourism in protected areas on plant biodiversity and vegetation communities. Australia’s unique flora is of international significance and this has significantly contributed to increasingly high levels of tourism and recreation use of protected areas. The review highlights the need for more recreational ecology research in Australia. There are many threats to vegetation in Australian protected areas from tourism. Greater recognition needs to be given by protected area managers.

Furthermore, the study of Ballantyne and Pickering (2013) states that tourism and recreation are large industries to the global economy. However they also argued that tourism and recreation activities threaten species including rare and listed in the Red List of the International Union for the Conservation of Nature. It is stated that tourism and recreation are listed as threatening 42 % (194) of plant species in Australia. The most common of these threats were trampling (61 species), plant collection (59), the maintenance or construction of tourist infrastructure (43) and habitat degradation due to the urbanization of tourist sites (13).

The paper, which is on the Great Britain, reports on a survey of garden owners in the country, and uses historical reconstructions to assess the theme of continuity and change in garden management and visiting through time by Connell in 2005.

Kumble and Houston (2009) studied the status and importance of ecotourism in Belize Botanic Garden. The garden is one that evolved in response to the conservation desires and requirements of local cultures. This paper discusses the role of a conservation botanic garden,
and specifically how it can function as a destination for eco tourists. The paper proposes planning and design guidelines that demonstrate the principles of a conservation botanic garden.

Another study was presented by Olimpia and Filimon (2013), who analyzed six counties of Romania that have rich and valuable natural and anthropic potential. The aim of this work is to identify the main touristic resources in the central region of where the adequate types of tourism that can be turned to good account.

Machnik (2013) studied is on tourist preferences of spending time during the holidays, opinions on nature, natural tourism resources and values, nature protection, nature-based tourism and ecotourism is presented by. The principle aim of this paper is to present some attitudes towards nature, its protection and nature-based tourism discovered among tourist questioned in some landscape parks in Poland. The paper attempts to sketch out some models of developing nature-based tourism and ecotourism.

Another study on sustaining visitor use in protected areas was accomplished by Monz et al. (2010). Recreation ecology is a relatively new field of scientific study having emerged over the last 50 years. Most studies have focused on vegetation and soil responses to recreation-related trampling on trails and recreation sites using indicators such as percent vegetation cover and exposed mineral soil. Then, based on the authors’ perspective of research in the USA and North America, several research directions are suggested as essential for continued progress in this field, including theoretical development, broadening scale, integration with other disciplines, and examination of synergistic effects.

Botanic gardens attract a wide range of domestic and international tourists, as well as regular visitors from their local areas (Ballantyne and all, 2008). Gardens’ visitors were found to be less interested in and committed to conservation issues, and less motivated to learn, than visitors to other free-choice learning settings such as museums, zoos, aquariums, heritage sites, natural areas and wildlife tourism activities. The implications for interpretive practice in botanic gardens were discussed in the study.

Olafsdottir (2013) defines bird watching, hiking, fishing, and beachcombing activities as nature based tourism. In the study, leisure travel is undertaken largely or solely for the purpose of enjoying natural attractions and engaging in a variety of outdoor activities.

3. Material and Method

Plant-bioinformatics systems (such as; plant banks, databases) are forming information about flora and the natural environment and scientific centers serving humanity, and they can be considered as indicators of civilized societies nowadays. Turkey Plant Bank was designed to be very comprehensive which includes all plants in Turkey, as well as all kinds of data.
about these plants (Düzenli and Boz, 2013). The bank allowed researchers to enter new data on the subject, to perform rapid and simultaneous processes, to visualize and document numerous data upon request. Botanists and software specialists worked in coordination for examining floristic and ecological data, and use and conservation status of plants. In the bank various experts worked such as botanist, software specialist, data entry persons and data controllers. The bank had 65 different features such as synonym, CITES-conservation-export status, monumental plants, useful plants, habitat, social-syntaxonomic-ecological value, map to GPS coordinates, photos, etc.. These features can be separately inquired and done relative-inquiring each other among all of these features of taxa. In the bank data was entered as a code and in suitable form.

As in many other tourism destinations, tourists also show interest to visit natural areas and flora in Turkey. There are various reasons why tourists would like to visit these green areas such as urbanization, recreation needs of city dwellers and continuing damage of the natural environment. On the other hand, it can be asserted that uncontrolled tourist flow to the natural areas and flora can even cause more damage than the absence of tourism. In other words not any tourism flow to natural areas, but controlled and managed tourism activities in natural areas should be allowed. In order to ensure sustainable use of natural areas and plant species, plant-bioinformatics systems can be used.

Turkey Plant Bank can help administrators who can determine the appropriate use of natural areas and flora, which means that, these resources would be protected efficiently in the future. Therefore, more tourism activities can be done properly in different seasons and locations. Apart from these objectives, the bank would provide some additional benefits such as accessing to lists of plants and plant groups, habitat kinds and characteristics, endemism, threat category, flowering period, locality, status of ecologic, systematic and usage. Furthermore, monumental trees, geophytes, plants species, ecosystems and habitats, which can be derived from the bank, would be considered as new tourism products for Turkey’s tourism products. The information, which comes from the bank, can be used in determining the itinerary, route and duration of tourist activities of botanical tourism.

4. Results

This study has revealed plant diversity in Turkey by means of plant-bioinformatics systems, and involved evaluation varieties in botanical tourism. Accordingly, botanical tourism was mainly examined under the headings of endemic tourism, habitat tourism, ecosystems tourism, tourism in protected areas, agricultural plants and farm tourism, and artificial gardens tourism.
4.1. Plant Status in Turkey and Endemic Plant Tourism

Although Turkey is not a separate continent, she has alone a whole ecosystem and habitat characteristics that a continent has. At the same time Turkey is very rich in terms of floristic diversity which can be expressed by variety and variability of living species, interactions with their complex ecological structure, and with each other and their environment (Duzenli & Karaomerlioglu, 2010). In recent years, according to the data obtained from plant-bioinformatics system, the plant diversity of Turkey is more than in other countries. While there are 13 000 plant species on the European continent, there are 12 000 species in Turkey and 3100 of these are endemic plants that they live only in Turkey due to different climate and isolation conditions (Figure 1). For example in comparison with the other countries, while the United Kingdom and Holland have 1850 and 1600 taxa respectively, only Istanbul, which is a city in Turkey, has 2000 plant species (Gökyiğit, 2013).

Figure 1. The Number of Endemic Species from Seedy Plants in Turkey and Comparison with Neighboring Countries

![Graph showing the number of species and endemic species in Turkey and neighboring countries.]

Wetlands which consist of biodiversity and different habitats include special living areas, endemic and rare plants in Turkey. For example, there are more than 40 endemic plants on the salt lake (Tuz gölü), which is only one of wetlands in Turkey (Gökyiğit, 2013). Turkey is a motherland of many geophytes which are tuberous and bulbous plants, and they are used as an ornamental plant. There are recorded 688 geophytes species belonging to 26 genera in the flora of Turkey, and 162 of these geophytes, are endemics. Some of geophytes are produced in Turkey, and exported abroad. Furthermore, Turkey is also rich in terms of old and monumental trees. Since 1998 the Ministry of Environment and Forest registered 93 monumental trees. Out of these, there are maximum monumental trees in Turkey. The monumental tree tourism can be a good example for sustainable eco-biotourism, and increases the differentiation of tourism products of the country.
4.2. Habitats of Turkey and Tourism
Habitats can be classified as floristically, ecologically and sociologically, and according to their dimensions such as macro, micro or even nano. Natura 2000 Habitats Directive (EEC/92/43) and Birds Directive (EEC/79/409) are ecological networks created by the European Union (Anonymous, 2003). This network aims to protect biodiversity, endangered species and fragile habitats in European countries. Habitats are divided into nine classes according to the Natura2000 Habitats Directive. These are halophytic and coastal habitats, coastal sands and inland sands, freshwater habitats, temperate heath land and scrubland, Mediterranean arborous shrubs, natural and semi-natural grassland formations, rising marshes, reeds and peat bogs, cliffs and caves, and forests. These classifications are still being undertaken in Turkey. It should be stated that differences in plant species are noted, but many habitat structures are generally overlapped.

4.3. Turkey’s ecosystems and tourism
Turkey’s ecosystem diversity is comparable to and as good as with a continent. It can be compared to Anatolian diagonal which was a shelter for bio diversity during the arctic era. While there are 37 different flora regions in the world, Turkey herself possesses three of these regions existed together at one place which are the Mediterranean, Europe-Siberia, and Irano-Turanian floristic geographic regions. Furthermore there are 3 different types of bio-climates in Turkey which are Mediterranean, continental, and oceanic climates. It should be accounted that the ecosystems in Turkey are differentiated because of ecological and floristic differences, diversities of topography, geological, geomorphology, hydrology, and altitude differences between 0-5100 meters. At the end of these differences, the most evident sights in Turkey are agriculture, forest, mountain, steppe, wetland, coastal, and marine ecosystems.

Agricultural ecosystems cover 7 different geographical regions in Turkey which are Mediterranean, Aegean, Marmara, Black Sea, Inner Anatolia, Southeast Anatolia, and East Anatolia. Most suitable areas for agriculture are coastlines.

Forest ecosystems, which posses the highest number of living and nonliving organisms, are the most valuable areas for tourism activities. The forests in Turkey mostly consist of trees with leaf. The abundance of relict and endemic plants in forests in Turkey increases the significance of Turkey’s forests regarding their biological diversity. 27.6 percent of the Anatolian territory is occupied with forests, and 93 percent of these forests are natural, and there are 564 kinds of trees of which 76 of them are endemic (Gökyiğit, 2013). In comparison with other countries, while Europe has 27 kinds of oak trees, Turkey has 22 kinds of them. The forests ecosystems are classified according to bio geographic regions in Turkey (Figure 2).
Mountain ecosystems are differentiated according to its forming style and altitude (twisted, broken, volcano, etc.). The mountains in Turkey can be classified into sub-ecosystems such as alpine meadows, subalpine meadows, moving hills, etc. Furthermore, biodiversity of each ecosystem is considerably different and rich from each other (Anonymous, 2008).

Steppe ecosystems existed particularly on the alpine layers of the inner (central) Anatolia, Aegean and Mediterranean and the vast majority parts of the East Anatolia regions, and they cover as large as 21 million hectare areas. They are known either as plain or mountain steppe according to their altitude.

Wetlands and inland water ecosystems covers approximately an area of 10000 km$^2$ in Turkey. Van Lake is the largest natural lake (374000ha), the second is Tuz Lake (salt lake, 128000ha). There are nine rivers in Turkey, and each river’s length is more than 500 km, (Kızılırmak, Fırat, Sakarya, Murat, Aras, Seyhan, Dicle, Yeşilırmak, Ceyhan). The differences in salinity, temperature and topographic structure of lakes and rivers cause also differences in their ecosystems.

With respect to coastal and marine ecosystems, Turkey is surrounded by 4 seas on three sides (the Mediterranean, Aegean, Black Sea, and Marmara). The highest salinity and temperature are in the Mediterranean Sea. Differences in the formation of mountains slopes toward sea and coastal topography in the coastal regions of Turkey have created various coastal ecosystems.

**4.4. Protected Areas of Turkey and Tourism**

In Turkey, there are 40 national parks, 32 nature protection areas, 22 natural parks, 16 special environment protection areas, 144 important plant areas, 1 biosphere reserve area. It
should be noted that all these protection status mean that they possess either natural varieties or rare species. These areas are very important, where there are special plants and ecological features, in which particularly sustainable tourism activities can be undertaken under controlled situations. The identification of these plants, systematic and ecological features, flowering periods, and information on use, rareness and endemic status of the plants existed in these protection areas can be found in Turkey Plant Bank (Düzenli & Boz, 2013). It should be stated that a user can learn from the bank that when these plants are abundant and the most charming view is observed. Then according to the information received from the bank, appropriate tourism activities could be planned.

4.5. Agricultural plants and farm tourism in Turkey

Agricultural pesticides in Turkey are used one third less than in Europe (Gökyiğit, 2013). There are still some agricultural fields in Turkey where pesticides have never been used, and thus organic agricultural harvest can be produced in these fields. Anatolia is considered to be homeland for more than 30 plants such as fig, grape, olive, cherry, and hazelnut. This potential provides an advantage and opportunity for Turkey in farm tourism and agro-plant tourism. In Turkey there are 69 farms in which farm tourism activities are carried out.

4.6. Artificial Garden Tourism in Turkey

Botanic gardens that are built by handmade such as Nezahat Gök yiğit Botanic Garden, and arboretums for example Karaca Arboretum, and institutions such as museums in which there are materials related with nature, and herbariums are often used to protect variety of floras and plants which can be considered as protected areas in tourism. According to information received from the bank, plants that have ecological and touristic values can be produced in these gardens, and can be protected at the same time.

5. Results and Discussion

As being part of ecosystem, human beings obtain various economic, ecologic, aesthetic, and cultural benefits from biological diversity and richness. Floristic diversity and richness result from collective products of developments in the millions of years in the past (Işık, 2009). It is seldom possible to save and maintain extinct species and genetic sources as they were in their original position. A particular diversity and richness in an area or region has to be conserved, without damaging its special features according to the principles of sustainable life practices and development. They should be searched and managed rationally, and then they should be used.

Protection efforts are not only common interest of humankind, but they also determine the continuation of use in the future. Protection of plants in a particular location, and conservation of a lifecycle would not only maintain the richness of the nation, since the species of the
country can live, but it would also maintain the economic benefits obtained from plants, and protect the economic wellbeing of local people (Çakmak, 2008). Tourism industry has significant contribution in the national economy of Turkey, in which natural resources and plant diversity play important role in order to upgrade the Turkey’s position in the international tourism arena. Problems such as deterioration of habitats, uncontrolled and unplanned tourism activities and developments, deforestation, drying up wetlands, exceeding carrying capacity of ecosystems can cause a loss of major species and habitats. Such problems that happen very often nowadays in the world would also cause a loss of areas where ecotourism and botanic tourism activities, can be executed that are considered one of the most important branch of tourism industry in the future. Turkey should be able to use such potential in tourism with a planned and sustainable approach, and protect them.

Nowadays, because of intense tourism activities, some tourism destinations are under pressure and threatened. It can be stated that accurate and updated floristic data is very important to determine, develop, and apply sustainable environment protection policies. Plant–bioinformatics systems are very important in order to avoid the negative impacts of tourism on flora by developing protection policies and creating a new tourism products depend on floristic potential of a region or a country. It can be offered that necessary information on habitats and resources that have value from tourism point of view existed nearby tour routes should be loaded into these informatics systems. In this case, every individual plant and the area where its habitat existed should be searched with respect to all kinds of potential such as sociology, history, geology, folklore, architecture, and handicrafts; and they should be uploaded into the system (plant bank). Plant-bioinformatics systems have high capacity and are able to enter new data, and add of new features continuously (Karaömerlioğlu and Düzenli, 2008). It can be asserted that other countries’ floristic databases are appeared to be similar to Turkey Plant Bank (Ongi et al., 2002; Gachet et al. 2005; Hortal et al., 2007; Landucci et al., 2012; Desmet and Brouillet, 2013; Greuter et al., 2014). However, the bank also includes geographic distributions, habitat distributions and photographs of the plants in Turkey. Contrary to floristic databases elsewhere, there are various special features of Turkey Plant Bank such as detailed information related to structural features and usage of the plant and map display with GPS coordinates. The bank is presented with new approach for relative-inquiring, mapping and storing bank (Düzenli and Karaömerlioğlu, 2012). The plant bank is intended to meet all critical requirements for storing documents in relational bank with the support and use of excel and jpeg formats. Comparisons with previous work have shown that the bank has fulfilled these essential requirements.
It is a fact that nowadays tourists prefer and enjoy more visits and tours organized to remote and natural areas (Olafsdottir, 2013). These tours include not only accommodation and other tourist services, but they also provide information and activities to get to know the flora and natural environment in the proximity of the route. In this respect it is quite important to have such plant-bionformatic systems in order to reach information easily and quickly on flora on the tourist’s routes. It is worth to note that one quarter of plants in Turkey is endemic and they are under threat (Düzenli and Karaömerlioğlu, 2012). For example Tuz lake (salt lake) region which is protected under special environment protection area mentioned above (16 of them), which is located at the 150 km south of Ankara, geographic and political center of Turkey, possesses 40 percent of these plants (Gökyiğit, 2013). However, current tours include only soft trekking activities reaching to bank and inside of the lake. The identification and briefing of these rare species and plants to tourists that should be done according to sustainable tourism principles are yet to be implemented. On the contrary, such tourist activities that should be implemented in sustainable manner not only protect plants but also help to survive the natural area.

There are 540 geophytes taxa that belong to 26 genuses in Turkey, according to a study undertaken. They are used for various purposes such as medicine and food and have impressive flowers, which have existed for such a long time. This potential attracts the attention of special tour groups, and is instrumental to organize geophytes tours. This tour activity is organized in an area where there are special habitats, and in a particular time of the year. However since their importance of rareness and endemics of these plants are not known by tourist guides and visitors, they might damage the geophytes habitats during the tour. At the same time, animal stock-breeding can also damage and treat these endemic plants. However, it is of great importance of this eco-biotours to protect the monumental trees where they usually live alone, to increase the awareness of all people but especially the locals. Therefore, one would be able to observe these monumental trees all year around.

In Turkey there are various treats observed on habitats such as unconscious interventions on the environments, drying up wetlands and permissions on urban developments. These problems may destroy and extinct these plants and treat their survival. Additionally, ecosystem and climate in these areas would be also negatively affected in the long run. These negative consequences can deteriorate due to inappropriate tourist activities, or just the opposite may happen, and thoughtful and knowledgeable eco-tourist practices can assist to protect the habitats visited by tourists.

Forests areas accommodate various tourist activities such as trekking and camping. On the other hand, hill and mountain systems may possess hundreds of plant species, which can vary according to the altitude of these mountains. Particularly in the alpine regions, the
numbers of endemic plant species increase even more. Since this information, which varies according to the altitude, is already available in Turkey Plant Bank, they could be used very easily. Thus, such information inputs would increase the quality and content of tours, and improve the awareness of visitors with respect to the environment protection.

In Turkey there are many areas under protection, and these areas may have various types of environment protection status. These areas can be very important due to their possession of flora, special habitats, ecosystems and other species. The inventory studies of many of these areas have been completed, and information on the plants of these areas were already uploaded into the Turkey Plant Bank. The information is safe with the bank, which would allow to users to analyze the habitats where plants existed, and the necessary environment protection measures can be determined. Thus, these measures can avoid environmental damage, and shape the tourism activities to be more sustainable.

Tourism related activities such as agricultural plants, farm tourism, and organic food production are being realized in certified farms in Turkey. Turkey Plant Bank can be used to observe and obtain information about the domestic plants in its original environment whose unique homeland is Turkey (Düzenli and Boz, 2013). The information from Turkey Plant Bank also allows users to observe the original wild forms of agricultural products. This potential can be used to increase the variety of tourism products of Turkey, besides protect domestic agricultural products.

Visiting botanic gardens and arboretums, which are considered to be popular short term recreational activities, can be very informative for visitors who can also have opportunity to observe many plant species at the same time (Ballantyne et al., 2008). These gardens are also important to protect the plants which are endemic or under treat, and to protect economically valuable plants and to maintain their survival. It is also important to note that these gardens also have their own databases. The bank contains information about plants existed in these gardens and their features. Some tourist activities such as trekking, picnicking, gardener training, planting trees, shooting documentaries, special educational activities and performance on the nature and environment for children can be carried out in these gardens. These activities are drawing the attention of tourists, and becoming more important when compared to the traditional tourist attractions, and demanded particularly by scientific professionals and those who live in cities and would like to do short term activities.

References


