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The Importance of Using Design Plants in University Campus: COMU Case

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Abstract
The open area of the university campus is a potential social activity area where students and staff spend a significant portion of their time. It is also an open laboratory for landscape architecture students. In this study, the importance of the use of design plants in the university campus was put for ward and the Terzioğlu Campus of Çanakkale Onsekiz Mart University was examined. The study was carried out within the open green area between Çanakkale Onsekiz Mart University Rectorate Building, Atatürk Statue, ÖSEM, Library and Yamaç Café. Because this area is the most important meeting point and usage rate is very high. The main purpose of this study is to ensure that all students, staff and visitors whouse this region in their spare time are interested in and learn about plants. In addition, it is aimed to create data so that the area can become a living plant museum in the future. In this way, landscape architecture students will be ableto learn these plants on site by studying each season. The study method is based on territory research, examinations, analyzes and literatüre research. As a result of the study, woody plants in the area were identified at the family, genus and specieas. Suggestions were made for the area to become 'live plant museum: Arboretum'.

Keywords: Planting design, Dendroloji, Campus, Landscape plants

INTRODUCTION

The origin of the word university comes from the Latin word "universitas, which means a group of people with an independent legal personality and common interests. The campus also is the open space of an educational institution, university or college. Since the nineteenth century in Europe, the main function of universities has been determined to accommodate education and research activities and to enable individuals to know and develop themselves without being directed to any profession [1: 45]. The foundations of higher education institutions in Islamic civilizations date back to the Seljuk period (1040) madrasas. The Beyazıt II. Complex was a self-sufficient campus, founded in the 1400s in Edirne during the Ottoman Empire [2: 62]. These institutions, which are important role models in today's history of higher education, focus on religious education and positive sciences. These institutions have a campus understanding as they are today and all needs from accommodation to recreation areas are considered. By the twentieth century, major reforms had taken place and practices as a large university campus outside the city integrated into the city began to emerge [1: 44-47]. In this context, in the basic philosophy of universities, it is very important that the individual is able to complete his / her personal development as well as specializing in a particular subject. The light green areas of the campuses are important natural potential areas. They are also ideal areas for nature recognition and increasing interest in nature and plants.

According to Thomas Jefferson: (President of the United States - 1801-1809), «university should be like a village, not a big house ». He designed this idea in the campus of the University of Virginia, which he founded in the state of Virginia (Figure 1) [3; 4: 1].

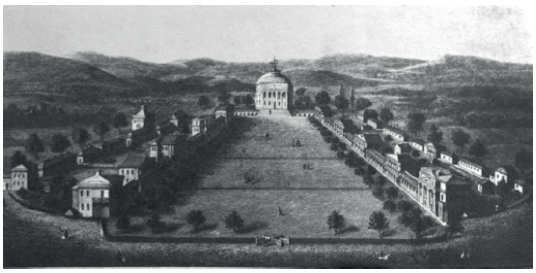


Figure 1. Virginia University Campus; Early 1800s [4: 1].

Today, being a university city has become an important mission in Turkey. In addition to being an important educational institution for the city, universities are one of the economic dynamics of the city with the potential of students and staff. The open green area potential of the university campuses adds value to the ecology and aesthetics of the city. The green area of the campus is very important for user comfort, meeting social and recreational needs and education, too.

Nowadays, Middle East Technical University (METU) and Ankara University Faculty of Science can be given as an example of a university campus with high green space potential. METU was established in Ankara in 1958 on 4500. hectares of land, near Mogan Lake and 3043 ha. section is divided into forest area. In addition, 20.000 trees were planted each year by the graduates. In the course of time, the campus has an aesthetic appearance with its landscape design and has pleasant walking paths. Thus, a rich habitat has been formed in the campus and there are many different species, mammals, birds, fish and butterflies. Also other contributions; purifying Ankara's air, preventing wind and noise, creating micro-air conditioners, balancing the climate (5: 136-137).

The Rectorate of Ankara University and the Faculty of Science campus are located in a large area between Tandogan and Konya Road. The area is an important collection garden. The campus design began in the early 1970s when a German gardener designed plants with plants suitable for the region and established a greenhouse. In the following years, designs were enriched by greenhouse management. It is an important green area in the city center which is the habitat of rich habitats. The area has been taken under protection due to the monumental trees. As a solution to the elements that threaten the human health of the city, these and similar campuses are obligatory areas for the future of the whole earth.

UNEP (United Nations Environment Program) has been working on the sustainable use of the entire biosphere since the early 1970s. One of these concerns the preservation and continuity of university campuses. They are preparing their long-term management plans for the future. Also in this context, it is emphasized that green infrastructure systems and plant uses are very important [5: 16].

A campus should not only be a place that meets the basic needs of its inhabitants, but also places where they feel they belong, leaving memories and creating meaning [6; 7; 8: 297]. In order to achieve this, campus is necessary to have a green area where young people from different regions can come together and carry out social activities. These areas should be capable of supporting the personal development of the individual with an attractive environmental design. Thus, young people can spend all their time except for their studies and classes by sharing more on campus together. In addition, with such designs, their interest in nature and plants can be increased and they can look at life with a wider perspective.

University employees and students receive education from many different disciplines, conduct research and spend energy in a constantly challenging work environment. Quality green spaces provide them with plenty of oxygen, and they can recover their lost energy through recreation opportunities, reduce stress, promote their physical and mental health.

Open and green areas that arrangements in university campuses and the circulation system connecting these spaces are considered as elements of recreation function [9: 56]. In addition, open and green areas create a healthy ecosystem, provide the aesthetic appearance of the general whole, ensure the integrity between the buildings, emphasize the circulation system, create a safe environment and development areas.

According to McFarland et al.'(2008) research, young people who use campus green areas frequently perceive their environment more comfortably [10]. Lau et al. (2009) emphasizes that natural areas in university campuses are physical environments that have positive effects on human mental health [11]. Many different researchers have defined landscapes containing natural elements as distinctly healing spaces because they provide emotional relaxation on individuals [12; 8: 298].

University campuses can also provide recreation opportunities for the citizens. A good example of this is the University of Georgia campus (in Athens, Georgia, USA) (Figure 2). Located in the center of the city, the campus is in harmony with the city. The opening of such use of the premises closed to the public in Turkey, will support the community's socio-cultural aspects of development.



Figure 2. A view of the University of Georgia campus (USA) (2015).

MATERIAL AND METHOD

The material of the study is Canakkale Onsekiz Mart University (COMU) Terzioğlu Campus Rectorship Building Environment and the plants used in the landscape design in this area. COMU Terzioğlu campus is the most populated area with the highest number of faculties (Figure 3). It has been chosen as the subject of study because of its high usage potential.



Figure 3. Location of the study area in COMU Terzioğlu Campus (using Goggle Earth'2012).

The campus is on an area of about 3 hectares, just a few hundred meters from the sea. There is a radar hill behind the university and its surrounding is surrounded by forest. Visually and its natural areas provide privilege to the campus. The plan of the settlement is given in Figure 4. 1- The main entrance is the study area: 6- Slope Cafe, 7- Rectorate, 8- Library, 9- Student Social Activity Center (ÖSEM) between the section [13].

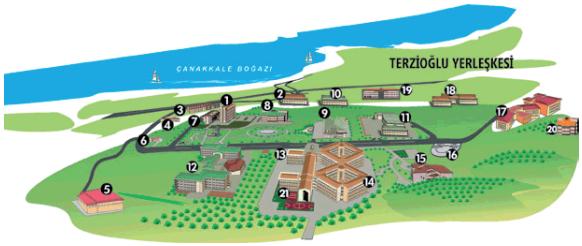


Figure 4. View of COMU Terzioglu Campus, 2019 [13].

The method of the study consists of the following steps: Literature search; on-site investigation and field research; identification of plants in the field; collecting and drying plant samples; identifying the families and species of the identified plants and creating lists; finally making recommendations.

RESULTS AND DISCUSSION

When the natural flora of the study area was examined, 3 different plant communities were found. These; I. *Quercus coccifera* society, II. *Sarcopoterium spinosum* society and III. *Pinus brutia* community. Although the area reflects the characteristics of the Mediterranean climate with its general character, it shows the characteristics of Mediterranean and Black Sea transition climate. Minimum temperature is -4,2 °C in February, Maximum temperature is + 35,8 °C in August. The average annual temperature is 14.7 °C and the average humidity is 72.6%. The dominant wind is the northern wind. The average annual rainfall varies between 662.8 m^3 (Gökçeada) and 854.9 m^3 (Ayvacık). The maximum number of days covered with snow is 8 days [14: 228].

In the study, in situ species of plants were determined by field investigations. Specimens from unknown species were taken and compared with herbarium specimens and literature. The family of design plants, Latin names determined on the basis of species in the study area are given in Table 1. The herbaceous species found in the area were not taken into consideration.

Leaf, flower, fruit, stem, details of the plants identified in the study can be used as course material and data for other studies are archived by taking photographs. At the same time, the locations of the plants were determined with a sketch to be used in future studies. In addition, the morphological and ecological characteristics of the plants have been determined by literature research in order to promote the plants.

Table 1. Landscape plants in the study area (2018-19). Prepared by using [15; 16; 17; 18; 19; 20; 21; 22; 23; 24; 25; 26; 27; 28; 29; 30; 31; 32; 33].

No	Familya	Scientific name
1	1.Caprifoliaceae	*Abelia×grandiflora* (RavelliexAndré) Rehder
2	2.Pinaceaea	*Abies alba cv* 'Columnaris'
3	3.Sapindaceae	*Acer buergerianum* Miq.
4	Sapindaceae	*Acer negundo*L. 'Variegatum'
5	Sapindaceae	*Acer pseudoplatanus* L.
6	4.Hippocastanaceae	*Aesculus hippocastanum* L.
7	5.Amaryllidaceae	*Agave americana* L.
8	6.Fabaceae	*Albizzia julibrissin* Durazz.
9	7.Chenopodioideae	*Atriplex halimus L.*
10	8.Poaceae	*Bambusa phyllostachys aurea*
11	9.Berberidaceae	*Berberis thunbergii* DC. 'Atropurpurea'
12	10.Fagaceae	*Betula alba; Syn. B. pendula* Roth.
13	11.Buxaceae	*Buxus sempervirens* L.
14	12.Myrtaceae	*Callistemon citrinus* Stapf.
15	13.Betulaceae	*Carpinus betulus* 'Fastigiata'
16	14.Bignoniceae	*Catalpa bignonioides* Scop.
17	Pinaceae	*Cedrus atlantica* Manetti
18	Pinaceae	*Cedrus atlantica glauca*
19	Pinaceae	*Cedrus deodora* G.Don.
20	Pinaceae	*Cedrus libani*A. Rich.
21	Fabaceae	*Cercissiliquastrum* L.
22	15.Rosaceae	*Chaenomeles japonica* Thunb.
23	16.Cupressaceae	*Chamaecyparis lawsoniana* (A. Murraybis) Parl.
24	17.Palmae	*Chamaerops humulis* L.
25	18.Cornaceae	*Cornus alba 'Sibirica'* L.
26	Poaceae	*Cortaderia selloana* (Schult. &Schult.f.) Asch. & Graebn.
27	19.Anacardiaceae	*Cotinus coggygria* Scop.
28	Rosaceae	*Cotoneaster horizontalis* Decne.
29	Rosaceae	*Crataegus monogyna* Jacq.
30	Cupressaceae	*Cupressocyparis leylandii* aurea (A.B.Jacks. &Dallim.) Dallim.
31	20.Elaeagnaceae	*Elaeagnus angustifolia* L.
32	Myrtaceae	*Eucalyptus camaldulensis* Dehnh.
33	21.Celastraceae	*Euonymus japonicus* Thunb.
34	Celastraceae	*Euonymus japonicus* Thunb. 'OvatusAureus'
35	22.Oleaceae	*Forsythia x intermedia* Zabel
36	Oleaceae	*Fraxinus excelsior* L.
37	23.Onagraceae	*Gaura lindheimeri* Engelm.&A.Gray
38	24.Ginkgoaceae	*Ginkgo biloba* L.
39	25.Araliaceae	*Hederacolchica* K.Koch.
40	26.Malvaceae	*Hibiscus syriacus* L.
41	Cupressaceaeae	*Juniperus excelsa* L.
42	Cupressaceaeae	*Juniperus chinensis* L.
43	Cupressaceaeae	*Juniperus sabina*L.
44	Sapindaceae	*Koelreuteria paniculata* Laxm.
45	27.Lythraceae	*Lagerstroemia indica* L.
46	28.Lauraceae	*Laurus nobilis* L.
47	29.Lamiaceae	*Lavandula angustifolia* Mill.
48	30.Magnoliaceae	*Liriodendron tulipifera* L.
49	Oleaceae	*Ligustrum japonicum* Thunb.
50	Oleaceae	*Ligustrum ovalifolium* Hassk. 'Aureum'
51	Lamiaceae	*Lavandula angustifolia* Mill.
52	31.Hamamelidaceae	*Liquidambar orientalis* Mill.
53	Caprifoliaceae	*Lonicera caprifolium L.*
54	MagnoliaceaE	*Magnolia grandiflora* L.
55	Berberidaceae	*Mahonia aquifolium* (Pursh) Nutt.
56	Rosaceae	*Malus floribunda* Sieboldex Van Houtte
57	Fabaceae	*Medicago arborea* L.
58	32.Meliaceae	*Melia azedarach* L.
59	33.Moraceae	*Morus alba* L.
60	Moraceae	*Morus alba*'Pendula'
61	Moraceae	*Morus nigra* L.
62	Oleaceae	*Nerium oleander* L.
63	34.Vitaceae	*Pearthenocissus quinquefolia* (L.) Planch.
64	35.Hydrangeaceae	*Philadelphus coronarius* L.
65	Oleaceae	*Phillyrea latifolia* L.
66	36.Aracaceae	*Phonix canariensis* Chabaud.
67	Roseceae	*Photinia serrulata*
68	37.Platanaceae	*Platanus orientalis* L.

69	Cupressaceaeae	*Platycladus orientalis* (L.) Franco
70	Pinaceae	*Picea orientalis* (L.) Link.
71	Pinaceae	*Pinus brutia* Ten.
72	Pinaceae	*Pinus pinaster* Aiton.
73	Pinaceae	*Pinus pinea* L.
74	Anacardiaceae	*Pistacia terebinthus* L.
75	38.Pittosporaceae	*Pittosporum tobira* (Thunb.) Ait.
76	Pittosporaceae	*Pittosporum tobira nana* (Thunb.)W.T.Aiton
77	Rosaceae	*Prunus cerasifera* Ehrh.
78	Rosaceae	*Prunus persica* Batsch.
79	Rosaceae	*Prunus serrulata* Lindl.
80	Lythraceae	*Punica granatum* L.
81	Rosaceae	*Pyracantha coccinea* M.Roem.
82	Fagaceae	*Quercus coccifera* L.
83	Lamiaceae	*Rosmarinus officinalis* L.
84	Fabaceae	*Robinia hispida* L.
85	Fabaceae	*Robinia pseudoacacia* L.
86	Fabaceae	*Robinia pseudoacacia* L. 'Umbraculifera'
87	Rosaceae	*Rosa* spp. Modern Rose 'Hybrid MuskRoses'
88	39.Salicaceae	*Salix babylonica* L.
89	Salicaceae	*Salix matsudana* Koidz.
90	Oleaceae	*Syringa vulgaris* L.
91	Oleaceae	*Syringa* spp.
92	Caprifoliaceae	*Sambucus nigra* L. 'Aurea'
93	40.Asteraceae	*Santolina chamaecyparissus* L.
94	Asteraceae	*Santolina rosmarinifolia* L.
95	Rosaceae	*Spiraea x bumalda*
96	41.Tamaricaceae	*Tamarix tetranda* Pall. ExM. Bieb.
97	Taxaceae	*Taxus baccata* L.
98	42.Tiliaceae	*Tilia tomentosa* Moench.
99	Caprifoliaceae	*Viburnum opulus* L.
100	Caprifoliaceae	*Viburnum tinus* L.
101	43.Apocynaceae	*Vincaminor* L.
102	44.Asparagaceae	*Yucca aloifolia* L.
103	45.Arecaceae	*Washingtonia filifera* (LindenexAndré) H.Wendl. ex de Bary
104	Caprifoliaceae	*Weigelia floribunda (*Bunge) A. DC.
105	Fabaceae	*Wisteria sinensis* Sweet

CONCLUSION

As a result of the study, 115 plant species belonging to 45 families were determined. These are perennial, woody plants, trees, shrubs, hugs, ground plants are classified as landscape plants. In this study, the characteristics of these plants were determined in order to increase the interest of individuals using all the green areas. With these data obtained, in future studies, labels can be prepared for plants with this data.

This study provides important data for the settlement to become an Arboretum (live woody plant museum). Thus, the field can be turned into an open laboratory by providing access to the knowledge of plants both for the students of landscape architecture and the visitors of the whole field. The following characteristics of all identified plants have been obtained by literature: natural habitats, morphological, dendrological characteristics, design characteristics, ecological requirements, pruning, production and use in landscape architecture. In the future, it is aimed to design plant identification cards with this information. In addition, while simultaneously identifying plants, a small herbarium (dried plant museum) is attempted with dried samples collected from leaves, flowers and fruits that allow them to be identified. Thanks to this collection, it will be able to identify plants in different seasons and introduce them to students better.

University campuses should be designed as a living laboratory. At the same time, continuous maintenance and repair work should be carried out in the area. It was determined that the composition of the plants deteriorated in the untreated areas of the study area, it was difficult to identify, some of them could not make enough of their genetic characteristics and development because they could not get enough sun. In addition, designs in which the plants can emphasize the aesthetic features of the plants are not sufficient.

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