

## The Use of Plants That Stand Out with Their Odor in the Design of Disabled People (A Case of Ankara)

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### Abstract

Aesthetic and functional uses of plants are of great importance in landscaping. However, in most designs, aesthetics come to the fore. This situation prevents some very important characteristics of plants from coming to the fore. One of the most important and impressive characteristics of plants is their smell. Especially in outdoor designs for visually impaired people, it is important to use plants that stand out with their odor properties. In this study, a literature review on plants with odor characteristics was first conducted and evaluated. A total of 97 plant taxa were identified from important open and green areas within the borders of Ankara province, which are naturally distributed or used in designs as exotic/foreign taxa. In terms of landscape design, especially after providing all the necessary physical conditions for the visually impaired, the elements to be considered in the plant designs to be made with these plants are explained.

**Keywords:** Ankara, disability, odor, plant design.

## Koku Özelliği İle Ön Plana Çıkan Bitkilerin Engelli Tasarımında Kullanımı (Ankara Örneği)

### Öz

Peyzaj düzenleme çalışmalarında bitkilerin estetik ve fonksiyonel kullanımları büyük önem taşımaktadır. Fakat yapılan tasarımların büyük bir çoğunluğunda estetiklik ön plana çıkmaktadır. Bu durum bitkilerin çok önemli bazı özelliklerinin ön plana çıkmasının önüne geçmektedir. Bitkilerin en önemli ve etkileyici özelliklerinden bir tanesi de kokudur. Özellikle dış mekanda görme engelli bireyler için yapılacak tasarımlarda koku özelliği ön plana çıkan bitkilerin kullanımı önem arz etmektedir. Bu çalışmada; öncelikle koku özelliği gösteren bitkilerle ilgili literatür çalışması yapıp değerlendirilmiştir. Ankara İli sınırları içerisinde yer alan önemli açık ve yeşil alanlardan; doğal olarak yayılış gösteren ya da egzotik/yabancı yurtlu takson olarak tasarımlarda kullanılan koku özelliği gösteren toplam 97 adet bitki taksonu tespit edilmiştir. Peyzaj tasarımı açısından özellikle görme engelliler için gerekli tüm fiziksel koşullar sağlandıktan sonra bu bitkileri kullanarak yapılacak olan bitkisel tasarımlarda dikkat edilmesi gereken unsurlar açıklanmıştır.

**Anahtar kelimeler:** Ankara, bitkisel tasarım, engelli, koku.

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## **1. Introduction**

For centuries, urban green spaces have provided a green oasis in cities and a living environment for people. Making green spaces as accessible as possible to everyone is now a priority in design and management. Outdoor spaces should be designed to be used by all individuals and meet their needs, and should be created to include people from all segments of society (Kaya, 2015). The focus of green spaces should be on accessible, user-friendly, and safe spaces that provide both comfort and maximum enjoyment (Hussein & Maruthaveeran, 2001). In order to create accessible spaces in open green spaces, the definition of disability should first be well defined. In particular, disabled people may have very different limitations and needs according to different disability classes (Sağlık, Sağlık & Kelkit, 2014).

The National Coordination Board for the Protection of the Disabled and the Turkish Standards Institute (TSE) have divided the disabled into certain groups and defined disability according to the limitation in the physical environment. Accordingly, the definitions of disability are divided into two as temporary disabilities and permanent disabilities. Permanent disabled people are those people who have physical, sensory, mental and permanent diseases as a result of congenital or acquired factors (Özdingiş, 2007). Individuals who have completely or partially lost at least one of the senses of sight, hearing and speech are called sensory disabilities (Çınar, 2010). They are divided into three categories: visual, hearing and speech disabilities. One of the strongest features of visually impaired people is their strong sense of smell.

Smell is one of the basic senses of our body that allows us to communicate with the outside world and it is a sense with very complex effects that we are under the influence of both consciously and unconsciously (Öz, 2012). Humans have the ability to distinguish thousands of odor molecules from each other. Odor is released as a result of oxidation of volatile essences in plants with air. The essences in flowers are known as essential oils and are usually found in the upper cells of the petals. Flowers with more than one petal usually have more fragrance than those with a single petal (Hampton, 1925; Coşkun, 2011). Odors are usually evaluated using food names like lemon, honey, mint, black grapes, raspberries, pineapple, spices, chocolate, vanilla, coconut, cloves, almonds (Lacey, 1995). The content of odors is quite complex. They have components that can change according to weather conditions and ecological characteristics of plants. They can also change and disappear (Coşkun, 2011).

The design of the scent garden should aim to ensure that the scent remains as far as the person can reach. The most important factor is that the air should be relatively calm and the area should be protected from the wind (Minter, 1995). By grouping or separating the data we receive through our five senses of sight, sound, touch, taste, and smell, we make sense of it. We perceive space with all of these senses (Gezer, 2012). In the perception of space, smell affects both the memorability of the space and its identity. If there is a distinctive odor in the room, the brain encodes the room with it. Later, when it receives similar stimuli, it will remember that place. In addition, the identity of the space can also be enriched with smell. Spaces where scents are included in the design are more distinguishable (Khidirov, 2016).

People with visual impairments are only able to perceive objects and events that they can hear, touch, smell, or taste. Thus, they can use odors as cues to establish and maintain distance relationships (Dursin, 2013).

Despite the fact that smell is one of the most powerful and impressive elements of the designer, it is also one of the most neglected and undervalued elements. Smell can instantly overwhelm and easily affect a person, it happens slowly in the mind and evaporates as soon as it is perceived. Whether it is sweet or bitter, light or heavy, every smell somehow gets through to the person and causes an emotional response (Lacey, 1995).

Odor features have a high potential to influence the landscape of streets and avenues. The smells of a street or avenue not only help the visually impaired, but also leave strong feelings about the space (Mazumdar, 2007). Urban spaces can also have their own scents, which can sometimes feel good and sometimes have the opposite effect. This situation will also change the frequency of the use of that

place and will affect the length of time spent there (Khidirov, 2016). Studies show that certain odors affect people differently (Table 1) (Anonymous, 2024). It has been observed that the presence of odors that are generally considered pleasant in environments that require assistance positively affects people's social behavior and relationships (Ozan, 2014).

**Table 1.** Specific odors and their effects on psychological states

Psychological State	Odor Type
Antidepressant	Ylang Ylang, Geranium, Jasmine, Orange, Sandalwood, Lemon, Lemongrass, Tangerine
Anxiety	Cypress, Lavender, Petigrain, Flower Oil, Bergamot, Lime, Guelderwort, Rose, Purple Leaf
Irritation	Reyhan, Mint, Rosemary
Soothing	Cedar, Flower oil, Petigrain, Chamomile, Lemon balm, Valerian

Color is one of the most important design elements in plants. It has an important effect, like smell, in bringing the senses and emotions to the forefront. In plant design, color is used to make the area aesthetically beautiful.

There is a strong correlation between color and fragrance. The less pigment in the flowers, the more fragrance they will give off. The intensity of scent emitted by plants according to their flower colors are white, pink, light purple, pale yellow, dark yellow, violet blue, purple, pure blue, orange, and red (Lacey, 1995).

Tactile arrangements are particularly important for visually impaired individuals. The order of tactile writings, pictures and signs and the organization of information help the information to reach its goal. In addition, voice prompts and olfactory and gustatory clues that help with tactile designs further accelerate recognition and learning (Dursin, 2013).

The visually impaired live in a world of sound. Sounds that sighted people do not need to hear mean a lot to them. They see distances in sound. They approximate some metric properties of the space and interpret the sound based on the difference of the echoes in the space. For this reason, a variety of sound sources can be used in parking lots to provide audible warnings or signals (Stoneham & Thoday, 1996).

The aim of this study is to ensure that visually impaired people can use green spaces more comfortably and safely by taking into account other criteria, especially the odor feature in terms of herbal design, in addition to these solutions in green spaces where all structural solutions for the visually impaired are considered to be applied. In this context, it is aimed to identify the fragrant plants used naturally or exotically in natural environments or designed green spaces in Ankara conditions and to reveal the principles that should be considered in plant design for the visually impaired.

## 2. Material and Method

In this study, data obtained from different literature sources on morphological characteristics of plant taxa were collected and Altınpark, Kurtuluş Park, Atatürk Forest Farm, Egemenlik Park, Ankapark, TBMM Campus, Ankara University Tandoğan Campus and Ankara University Faculty of Agriculture Campus were visited during the vegetation period to determine the foliation, flowering, fruit formation, leaf color change and aromatic characteristics of the plants. In this context, an appropriate classification of natural and exotic plants with scent properties found in Ankara city center was given (Table 2). Plants with scent properties were divided into six groups as deciduous trees and shrubs, coniferous trees and shrubs, deciduous shrubs, climbers, perennials and seasonal flowers and their Latin and Turkish names were given.

The general characteristics of the plants were coded as evergreen (EG), deciduous (D), semi-evergreen (SEG), some of which shed their leaves in winter and some of which retain them. Herbaceous plants were coded as annual, biennial, and perennial.

Plants have a wide variety of odors that are grouped into different types. The general idea is that plants emit scent from flowers, but plants can emit scent not only from flowers but also from other organs.

It is important to know the leaf, flower and fruit periods of plants in order for them to show their fragrance characteristics, and to know the colors of leaves, flowers, fruits and stems in order to reveal their aesthetic features in terms of design. For this reason, the period/color relationship of plants is specified as leaf leafing period/leaf color/autumn leaf color for leaves, flowering period/flower color for flowers, and fruit ripening period/fruit color for fruits. Among evergreen plants, broad-leaved taxa remain on the plant throughout the year, while coniferous taxa shed some of their leaves due to self-renewal. Deciduous taxa exhibit many colors in different shades from yellow to red in autumn and present pleasant images.

Tactile movement is important for the visually impaired. When the plant is touched, those that show stinging properties are classified as hard-textured plants and those that do not show stinging properties are classified as soft-textured plants. If any part of the plant (stem, branch, leaf, etc.) shows thorny formation, it is considered as hard textured. The texture of the plants with spines or branching above the level of human touch was decided by looking at the general habitus. Whether the plants are evergreen or deciduous is important in determining the texture. In deciduous taxa, the texture of the plant was decided according to its condition during the period when the odor effect was dominant.

Although Turkey has 3/4 of the European plant diversity, foreign plants are generally preferred in plant design studies. This situation causes damage to the national economy (Çorbacı et al., 2017). In order to encourage natural plant taxa in plant design studies, it was determined whether the scented plants used in Ankara city center are of natural or exotic origin.

### **3. Findings and Discussion**

The plant material used in landscape design studies is most often preferred for its aesthetic qualities such as flowers, fruits, stems, and leaves (Sarı & Karaşah, 2018). However, plants also have many functional characteristics such as soil stabilization, air purification, noise reduction, wind protection, etc. In addition to these features, plants are also distinguished by their scent, thanks to the essences they contain. Recently, landscape design with sensory and scent content has become widespread and has attracted the attention of society. In particular, many of the plant taxa used in landscaping for medicinal and aromatic purposes have odor properties and attract the attention of users with this feature.

There are three basic elements to consider when creating a space with scented plants. These are where the scent will be in the room, how it will be presented, and what kind of scent it will contain. According to the characteristics of the plants, some of them can emit scents directly, while others emit scents when they come in contact with the plants. In this way, it is important to use plants that emit odors by rubbing with the hands in areas at a height where people can touch them to perceive the odor (Lacey, 1995).

Considering that visually impaired people will also use a green area to be designed in the city of Ankara, Table 2 was created to calculate the odor source, odor periods and odor duration of the taxa to be used in the herbal design based on odor.

**Table 2.** Plants showing odor and their phenological characteristics

BROADCASTLEAF TREES AND SMALL TREES										
Plant Name	Native/ Exotic	Plant Feature	Odor Type	Fragrant Organ	Odor Period	Period/Color			Texture	
						Leaf	Flower	Fruit	Soft	Hard
1 <i>Ailanthus altissima</i> (Mill.) Swingle	E	D	Aroma	F	F:5-6	4-11/Green/Orange	5-6/Yellow	10-11/Brown	x	
2 <i>Buxus sempervirens</i> L.	N	EG	Vanilla	F-L	F:3-4/L:1-12	1-12/Dark Green	3-4/ Yellow	8-9/Brown		x
3 <i>Castanea sativa</i> Mill.	N	D	Honey	F	F:5-6	4-10/Green/Yellow	5-6/ Yellow	8-9/Brown		x
4 <i>Cornus mas</i> L.	N	D	Spice	F-L	F:3/L:4-9	3-11/ Green/Yellow	3/Yellow	8-9/Red	x	
5 <i>Crataegus monogyna</i> Jacq.	E	D	Aroma	F	F:4-5	3-11/ Green/Yellow	4-5/ Yellow	7-8/Red		x
6 <i>Crataegus oxyacantha</i> L.	E	D	Aroma	F	F:4-5	3-11/ Green/Yellow	4-5/Pink	7-8/Red		x
7 <i>Cydonia oblonga</i> Mill.	N	D	Fruit	FR	FR:4-5	4-11/ Green/Yellow	5-6 /Pink/White	10-11/Yellow	x	
8 <i>Elaeagnus angustifolia</i> L.	N	D	Oleaster	F	F:5-6	4-11/ Green/Yellow	5-6/Yellow	9-10/Orange	x	
9 <i>Eriobotrya japonica</i> (Thunb.) Lindl.	E	EG	Fruit	F	F:5-6	1-12/Green	5-6 /White	8-9/ Yellow		x
10 <i>Fraxinus americana</i> L.	E	D	Aroma	F	F:4	Green/Yellow	3-4/White	7-8/Brown	x	
11 <i>Fraxinus excelsior</i> L.	N	D	Aroma	F	F:4	Green/Orange	3-4/Purple	7-8/Brown	x	
12 <i>Fraxinus ornus</i> L.	N	D	Aroma	F	F:4	Green/Yellow	3-4/White	7-8/Brown	x	
13 <i>Juglans regia</i> L.	N	D	Resin	L	L:4-10	Green/Yellow	4-5/Light Green	8-9/Brown	x	
14 <i>Laburnum anagyroides</i> Med.	E	D	Aroma	F	F:4-5	Green/Yellow	4-5/Yellow	8-9/Brown	x	
15 <i>Magnolia grandiflora</i> L.	E	EG	Tropical Fruit	F	F:5-6	1-12/Dark Green	5-6/White	9-10/Red		x
16 <i>Magnolia x soulangiana</i> Soul. Bod.	E	D	Aroma	F	F:3-4	Green/Yellow	3-4/Pink/White	9-10/Red	x	
17 <i>Malus floribunda</i> Siebold ex Van Houtte	E	D	Violet	F	F:3-4	Green/Yellow	3-4/Pimk	8-9/Red	x	
18 <i>Paulownia tomentosa</i> (Thunb) Steud.	E	D	Honey	F-FR	F:3-4/FR:9-10	Green/Yellow	3-4/Purple	9-10/Brown		x
19 <i>Populus alba</i> L.	N	D	Balsam	S	S:2-3	Green/Yellow	4-5/Light Green	7-8/Brown	x	
20 <i>Populus nigra</i> L.	N	D	Balsam	S	S:2-3	Green/Yellow	4-5/Light Green	7-8/Brown	x	
21 <i>Populus tremula</i> L.	N	D	Balsam	S	S:2-3	Green/Yellow	4-5/4-5/Light Green	7-8/Brown	x	
22 <i>Prunus amygdalus</i> (L.) Batsch	N	D	Almond	F	F:3-4	Green/Yellow	3-4/White	7-8/Brown	x	
23 <i>Prunus armenica</i> L.	N	D	Almond	F	F:3-4	Green/Yellow	3-4/White	7-8/Light Yellow	x	
24 <i>Prunus avium</i> L.	N	D	Almond	F	F:3-4	Green/Yellow	3-4/White	7-8/Light Red	x	

25	<i>Prunus cerasifera</i> JF Ehrh. 'Atropurpurea'	E	D	Almond	F	F:3-4	Red	3-4/White	7-8/Light Red	x	
26	<i>Prunus cerasus</i> L.	N	D	Aroma	F	F:3-4	Green/Yellow	3-4/White	7-8/Light Red	x	
27	<i>Prunus laurocerasus</i> L.	N	EG	Almond	F	F:3-4	1-12/Green	4-5/White	8-9/Red-Black	x	
28	<i>Prunus persica</i> (L.) Batsch	N	D	Almond	F	F:3-4	Green/Yellow	3-4/Pink	7-8/Red	x	
29	<i>Prunus serrulata</i> Lindl. 'Kanzan'	E	D	Aroma	F	F:3-4	Green/Yellow	3-4/Lilac	7-8/Red	x	
30	<i>Rhamnus alaternus</i> L.	E	EG	Spice	F	F:2-4	1-12/Green	2-4/White-Cream	7-8/Red	x	
31	<i>Rhus typhina</i> L. 'Laciniata'	E	D	Aroma	F	F:4-5	Green/Yellow	4-5/Red	9-10/Red	x	
32	<i>Robinia pseudoacacia</i> L.	N	D	Aroma	F	F:5-6	Green/Yellow	5-6/White	9-10/Brown	x	
33	<i>Salix caprea</i> L.	N	D	Linden	F	F:3-4	Green/Yellow	3-4/Yellow	7-8/Brown	x	
34	<i>Tilia cordata</i> Mill.	E	D	Linden	F	F:6-7	Green/Yellow	6-7/Yellow	9-10/Brown	x	
35	<i>Tilia rubra</i> DC.	N	D	Linden	F	F:6-7	Green/Yellow	6-7/Yellow	9-10/Brown	x	
36	<i>Tilia tomentosa</i> Moench.	N	D	Honey	F	F:6-7	Green/Yellow	6-7/Yellow	9-10/Brown	x	
CONIFEROUS TREES AND SMALL TREES											
	Plant Name	Native/ Exotic	Plant Feature	Odor Type	Fragrant Organ	Odor Period	Period/Color			Texture	
							Leaf	Flower	Cone	Soft	Hard
1	<i>Abies bornmulleriana</i> Mattf.	N	EG	Resin	L	L:1-12	Dark Green	5-6/Yellow	9-10/Brown		x
2	<i>Abies cephalonica</i> Loud.	E	EG	Resin	L	L:1-12	1-12/Green	5-6/ Yellow	9-10/Brown		x
3	<i>Abies concolor</i> (Gord. & Glend.) Lindl. ex Hildebr.	E	EG	Resin	L	L:1-12	1-12/Light Blue	5-6/Yellow	9-10/Brown		x
4	<i>Abies nordmanniana</i> (Stev.) Spach	N	EG	Resin	L	L:1-12	1-12/ Dark Green	5-6/Yellow	9-10/Brown		x
5	<i>Abies pinsapo</i> Boiss.	E	EG	Resin	L	L:1-12	1-12/Green	5-6/Red	9-10/Brown		x
6	<i>Cedrus atlantica</i> (Endl.)	E	EG	Black currant	L	L:1-12	1-12/Blue	5-6/ Gray Brown	9-10/Brown		x
7	<i>Cedrus deodara</i> Royle ex D. Don.	E	EG	Black currant	L	L:1-12	1-12/Light Green	5-6/ Gray Brown	9-10/Brown		x
8	<i>Cedrus libani</i> A. Rich.	N	EG	Black currant	L	L:1-12	1-12/ Dark Green	5-6/ Gray Brown	9-10/Brown		x
9	<i>Chamaecyparis lawsoniana</i> (A. Murr.) Parl.	E	EG	Resin	L	L:1-12	1-12/Green	5-6/ Dark Purple, Red	9-10/Brown	x	
10	<i>Cupressus arizonica</i> Greene	E	EG	Resin	L	L:1-12	1-12/Blue	5-6/ 5-6/ Gray Brown	9-10/Brown	x	
11	<i>Cupressus sempervirens</i> L.	N	EG	Resin	L	L:1-12	Dark Green	5-6/ Brown	9-10/Brown	x	
12	<i>Juniperus chinensis</i> L.	E	EG	Cone	L	L:1-12	1-12/Bluish Green	3-4/Blue Black	9-10/Blue	x	

	'Pfitzeriana Glauca'										
13	<i>Juniperus communis</i> L.	E	EG	Cone	L	L:1-12	1-12/Green	3-4/Blue Dark	9-10/Blue	x	
14	<i>Juniperus horizontalis</i> Moench.	E	EG	Cone	L	L:1-12	1-12/Green	3-4/Blue Dark	9-10/Gray Blue	x	
15	<i>Juniperus sabina</i> L.	N	EG	Cone	L	L:1-12	1-12/Green	3-4/ Blue Dark	9-10/Gray Blue	x	
16	<i>Juniperus oxycedrus</i> L.	N	EG	Fruit	L	L:1-12	1-12/Green	3-4/ Blue Dark	9-10/Orange	x	
17	<i>Picea abies</i> (L.) Karst.	E	EG	Resin	L	L:1-12	1-12/Green	5-6/Greem	9-10/Brown	x	
18	<i>Picea pungens</i> Engelm.	E	EG	Resin	L	L:1-12	1-12/Green	5-6/ Dark Red	9-10/Brown	x	
19	<i>Picea orientalis</i> (L.) Link	E	EG	Resin	L	L:1-12	1-12/Green	5-6/Green	9-10/Brown	x	
20	<i>Pinus brutia</i> Ten.	N	EG	Pine	L	L:1-12	1-12/Green	5-6/ Yellow Brown	9-10/Brown	x	
21	<i>Pinus nigra</i> Arnold	N	EG	Pine	L	L:1-12	1-12/Green	5-6/ Yellow Brown	9-10/Brown	x	
22	<i>Pinus sylvestris</i> L.	N	EG	Pine	L	L:1-12	1-12/Green	5-6/ Yellow Brown	9-10/Brown	x	
23	<i>Pseudotsuga menziesii</i> (Mirb.) Franco	E	EG	Resin	L	L:1-12	1-12/Green	5-6/Dark Red	9-10/Brown	x	
24	<i>Thuja occidentalis</i> L.	E	EG	Cone	L	L:1-12	1-12/Green	5-6/Brown	9-10/Brown	x	
25	<i>Platycladus orientalis</i> (L.) Franco	E	EG	Cone	L	L:1-12	1-12/Green	5-6/Brown	9-10/Brown	x	
BROADCASTLEAF SHRUBS											
	Plant Name	Native/ Exotic	Plant Feature	Odor Type	Fragrant Organ	Odor Period	Period/Color			Texture	
							Leaf	Flower	Fruit	Soft	Hard
1	<i>Abelia grandiflora</i> (Andre) Rehd.	E	SEG	Honey-suckle	F	F:6-9	Glossy Green	6-9/White	10-11/Brown	x	
2	<i>Berberis julianae</i> Schneid.	E	EG	Honey	F	F:3-4	1-12/Dark Green	3-4/Light Yellow	8-9/Red-Black	x	
3	<i>Berberis thunbergii</i> DC	E	D	Honey	F	F:3-4	Green/Yellow	3-4/Light Yellow	8-9/Red-Black	x	
4	<i>Berberis thunbergii</i> DC 'Atropurpurea'	E	D	Honey	F	F:3-4	Red	3-4/Light Yellow	8-9/Red-Black	x	
5	<i>Buddleja davidii</i> Franch.	E	SEG	Honey	F	F:5-7	Green/Yellow	5-7/Purple	9-10/Brown	x	
6	<i>Buxus sempervirens</i> L. 'Rotundifolia'	E	EG	Vanilla	F-L	F:3-4/L:1-12	1-12/Dark Green	3-4/Yellow	8-9/Brown	x	
7	<i>Chaenomeles japonica</i> (Thunb.) Lindl.	E	D	Fruit	FR	FR:9-10	Green/Yellow	3/Pink	9-10/Yellow	x	
8	<i>Chimonanthus praecox</i> (L.) Link	E	D	Spice	F-L	F:2-3/L:4-9	Green/Yellow	2-3/Yellow	9-10/Brown	x	
9	<i>Cistus laurifolius</i> L.	N	EG	Vanilla	F-L	F:3-4/L:1-12	1-12/Dark Green	3-4/Yellow	8-9/Brown	x	

10	<i>Elaeagnus pungens</i> Thunb. 'Maculata Aurea'	E	EG	Oleaster	F	F:5-6	1-12/ Yellow & Green Variegated	9-11/Cream	11-12/Reddish Brown	x	
11	<i>Elaeagnus x ebbingei</i> L.	E	EG	Oleaster	F	F:5-6	1-12/Green	9-11/ Cream	11-12/Reddish Brown	x	
12	<i>Hamamelis virginiana</i> L.	E	D	Almond	F	F:1-2	3-10/Yellow	1-2/Yellow	5-6/Brown	x	
13	<i>Jasminum nudiflorum</i> Lindl.	E	D	Exotic	F	F:3-4	Green/Yellow	3-4/Yellow	8-9/Black	x	
14	<i>Lavandula angustifolia</i> Mill.	N	EG	Lavender	F	F:6-10	Grayish Green	6-10/Purple	8-9/Brown	x	
15	<i>Lonicera nitida</i> EH Wilson	E	EG	Fruit	F	F:3-4	1-12/Green	3-4/White	8-9/Dark Blue	x	
16	<i>Magnolia stellata</i> (Sieb. and Zucc.) Maxim	E	D	Aroma	F	F:3-4	Green/Yellow	3-4/White	9-10/Red	x	
17	<i>Mahonia aquifolium</i> (Pursh) Nutt.	E	EG	Honey	F	F:3-4	1-12/Green	3-4/Yellow	8-9/Purple/Black	x	
18	<i>Osmanthus fragrans</i> Lour.	E	EG	Vanilla	F	F:3-4	1-12/Green	3-4/Yellow	9-10/Brown	x	
19	<i>Pieris japonica</i> D.Don ex G.Don.	E	EG	Vanilla	F	F:3-4	1-12/Green	3-4/Pink	8-9/Brown	x	
20	<i>Philadelphus coronarius</i> L.	E	D	Lemon	F	F:4-5	Green/Yellow	4-5/White	9-10/Brown	x	
21	<i>Ribes aureum</i> Pursh.	E	D	Clove	F	F:4-5	Green/Yellow	4-5/Yellow	9-10/Brown	x	
22	<i>Rosa x alba</i> L.	E	D	Rose	F	F:4-5	Green/Yellow	4-5/White	9-10/Brown	x	
23	<i>Rosa x centifolia</i> L.	N	D	Rose	F	F:6-7	Green/Yellow	6-7/Pink	10-11/Brown	x	
24	<i>Rosmarinus officinalis</i> L.	N	EG	Spice	F	F:4-5, 9-10	Green	4-5,9-10/Purple	11-12/Brown	x	
25	<i>Sambucus nigra</i> L.	N	D	Musk	F	F:4-5	Green/Yellow	4-5/ Dark Pink	8-9/Black	x	
26	<i>Syringa x chinensis</i> Willd.	E	D	Lilac	F	F:4-5	Green/Yellow	4-5/Purple	8-9/Brown	x	
27	<i>Syringa vulgaris</i> L.	N	D	Lilac	F	F:4-5	Green/Yellow	4-5/Purple	8-9/Brown	x	
28	<i>Viburnum fragrans</i> Bunge.	E	D	Honey	F	F:1-2	Green/Red	1-2/White	4-5/Brown	x	
29	<i>Viburnum opulus</i> L.	E	D	Honey	F	F:4-5	Green/Red	4-5/White	8-9/Red	x	
30	<i>Viburnum rhytidophyllum</i> Hemsley	E	EG	Honey	F	F:5-6	1-12/Dark Green	5-6/White	8-9/Red-Black	x	
31	<i>Viburnum tinus</i> L.	E	EG	Clove	F	F:4-5	1-12/Dark Green	4-5/White	8-9/Black	x	
32	<i>Yucca filamentosa</i> L.	E	EG	Fruit	F	F:5-6	1-12/Dark Green	5-6-11/Cream	8-9/Green	x	
ORNAMENTAL PLANTS											
	Plant Name	Native/ Exotic	Plant Feature	Odor Type	Fragrant Organ	Odor Period	Period/Color			Texture	
							Leaf	Flower	Fruit	Soft	Hard
1	<i>Aquilegia olympica</i> Boiss.	E	Perennial	Apple	L	L:3-10	Green	3-5/White	8-9/Brown	x	
2	<i>Calendula officinalis</i> L.	N	Perennial	Exotic	F	F:4-8	Green	4-8/Orange	10-11/Brown	x	

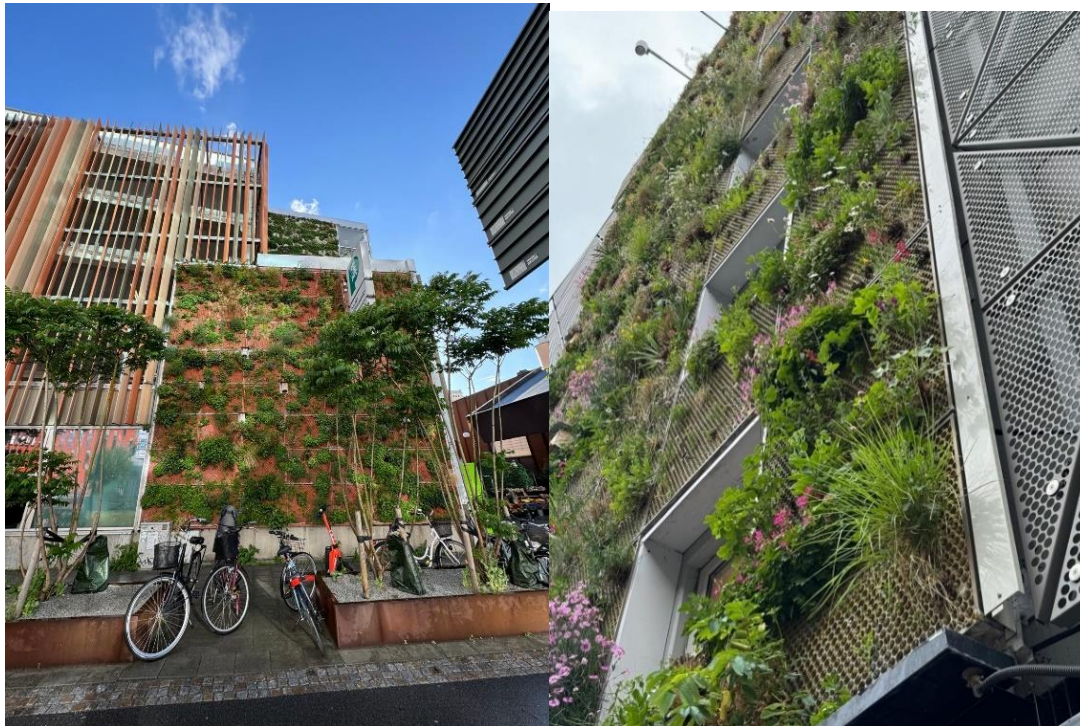


3	<i>Convallaria majalis</i> L.	E	Perennial	Aroma	F	F:4-5	Green	4-5/White	8-9/Red	x
4	<i>Crocus sativus</i> L.	E	Perennial	Saffron	F	F:9-10	Green	9-10/Purple	11-12/Orange	x
5	<i>Cyclamen persicum</i> Mill.	N	Perennial	Lily	F	F:3-4	Green	3-4/Pink-White	8-9/Brown	x
6	<i>Dianthus caryophyllus</i> L.	N	Perennial	Clove	F	F:6-8	Green	6-8/Red White	11-12/Brown	x
7	<i>Hemerocallis fulva</i> L.	E	Perennial	Lily	F	F:6-7	Green	6-7/Orange	11-12/Green	x
8	<i>Hosta plantaginea</i> (Lam.) Asch.	E	Perennial	Naphtthane	F	F:7-10	Green	7-10/White	11-12/Green	x
9	<i>Hyacinthus orientalis</i> L.	N	Perennial	Hyacinth	F	F:2-4	Green	2-4/Purple	8-9/Black	x
10	<i>Iris germanica</i> L.	N	Perennial	Exotic	F	F:4-5	Green	4-5/Purple	8-9/Orange Black	x
11	<i>Leucojum vernum</i> L.	N	Perennial	Violet	F	F:3-5	Green	3-5/White	8-9/Brown	x
12	<i>Lilium candidum</i> L.	N	Perennial	Honey	F	F:7-8	Green	7-8/White	11-12/Brown	x
13	<i>Melissa officinalis</i> L.	E	Perennial	Lemon	L	L:1-12	Green	7-9/Blue-White	11-12/Brown	x
14	<i>Mentha spicata</i> L.	E	Perennial	Mint	L	L:1-12	Green	6-7/Purple White	11-12/Brown	x
15	<i>Muscari armeniacum</i> Leichtlin ex Baker	N	Perennial	Honey	F	F:3-4	Green	3-4/Blue	7-8/Green	x
16	<i>Narcissus tazetta</i> L.	N	Perennial	Aroma	F	F:3-4	Green	3-4/White	7-8/Brown	x
17	<i>Nepeta x faassen</i> Bergmans	E	Perennial	Mint	L	L:1-12	Green	3-4/Blue	8-9/Brown	x
18	<i>Origanum onites</i> L.	N	Perennial	Spice	L	L:1-12	Green	7-8/Pink White	11-12/Brown	x
19	<i>Oxalis floribunda</i> Linn.	E	Perennial	Almond	F	F:4-5,8-10	Green	4-5,8-9/Red White	11-12/Brown	x
20	<i>Paeonia lactiflora</i> Pall.	E	Perennial	Aroma	F	F:5-6	Green	5-6/White	8-9/Green	x
21	<i>Phlox paniculata</i> L.	E	Perennial	Aroma	F	F:7-8	Green	7-8/Purple Pink	11-12/Brown	x
22	<i>Primula vulgaris</i> Huds.	E	Perennial	Aroma	F	F:3-4	Green	3-4/Yellow-Purple	8-9/Brown	x
23	<i>Salvia officinalis</i> L.	N	Perennial	Aroma	L	L:1-12	Gray-Green	6-8/Blue-Purple	11-12/Brown	x
24	<i>Santolina chamaecyparissus</i> L.	N	Perennial	Exotic	L	L:1-12	Gray	6-8/Yellow	11-12/Yellow	x
25	<i>Senecio maritima</i> L.	E	Perennial	Exotic	L	L:1-12	Gray	6-8/Yellow	11-12/Brown	x
26	<i>Sedum acre</i> L.	N	Perennial	Exotic	F	F:4-5	Green	4-5/Yellow	8-9/Brown	x
27	<i>Sedum reflexum</i> L.	N	Perennial	Exotic	F	F:5-8	Green	5-8/Yellow	10-11/Brown	x
28	<i>Sedum rosea</i> (L.) Scop.	E	Perennial	Exotic	R	K:1-12	Green	5-6/Yellow	10-11/Brown	x
29	<i>Sedum spurium</i> Bieb.	N	Perennial	Rose	F	F:5-8	Green	5-8/Pink	10-11/Brown	x
30	<i>Sedum spectabile</i> L.	N	Perennial	Exotic	F	F:5-8	Green	5-8/Pink	10-11/Brown	x
31	<i>Thymus vulgaris</i> L.	N	Perennial	Exotic	F	F:6-7	Green	6-7/Purple	11-12/Brown	x
32	<i>Tulipa humilis</i> Herb.	N	Perennial	Thyme	F	F:3-4	Green	3-4/Pink	7-8/Brown	x

33	<i>Viola cornuta</i> L.	E	Peren nial	Aroma	F	F:3-4	Green	3-4/Purple	8-9/Brown	x	
34	<i>Viola odorata</i> L.	N	Peren nial	Violet	F	F:3-4	Green	3-4/Purple- Pink-White	8-9/Brown	x	
WINDING/CLIMBING PLANTS											
	Plant Name	Native/ Exotic	Plant Feature	Odor Type	Fragrant Organ	Odor Period	Period/Color			Texture	
							Leaf	Flower	Fruit	Soft	Hard
1	<i>Hedera helix</i> L.	N	EG	Aroma	F	F:10- 11	1-12/Green	10- 11/Green- Yellow	1-2/Black	x	
2	<i>Lonicera caprifolium</i> L.	N	EG	Honey suckle	F	F:5-6	1-12/ Green	5-6/White- Pink	8-9/Orange	x	
3	<i>Rosa rampicante</i> L	E	D	Rose	F	F:5-6	Green/Yellow	5-6/Pink	9-10/Brown	x	
4	<i>Wisteria floribunda</i> (Willd.) DC.	E	D	Lilac	F	F:5- 6,10- 11	Green/Yellow	5-6,10- 11/Lilac	9-10/Brown	x	
5	<i>Wisteria sinensis</i> (Sims) DC.	E	D	Violet	F	F:4- 5,9-10	Green/Yellow	4-5,9- 10/Lilac	9-10/Brown	x	

\*Native /Exotic (N: Native, E: Exotic), Plant Feature (EG: Evergreen, SEG: Semi Evergreen, D: Deciduous), Fragrant Organ (F: Flower, FR: Fruit, L: Leaf, R: Root, S: Stem)

In order to best perceive odors, plants should be placed close to the level of the nose. Therefore, to better perceive the odor of plant taxa in the group of low shrubs and groundcovers with dimensions below 1m, pot designs should reach the average human nose level (1.6-1.8m). In the selection of plant taxa to be used in vertical gardens, which have recently become popular, it is important to use plants that stand out for their scent to the visually impaired in order to create scent corridors. The vertical garden designs to be created will eliminate the need to smell the plants by leaning down. An example of a vertical garden with scented plants is given in Figure 1. At the same time, plant taxa below the level of the nose can be used en masse to spread the scent throughout the area.



**Figure 1.** An example of a vertical garden with scented plants (downtown Malmö) (Kaya, 2024)

It is not possible to fully control the effects of weather in open green spaces. For example, some odors are more pronounced in rainy weather. It is thought that it is more appropriate to use plants with these characteristics near water elements (such as fountains, ponds, water lily ponds, etc.) to spread more effective odors in windy weather. However, the odors of rose petals from some plants (*Rosa* spp.) with very strong odor characteristics are always the same (Lacey, 1995).

It is important that the odor stays in the area and does not disperse. Therefore, windbreaks of evergreen trees and shrubs are necessary for odor mobility. The creation of wind corridors is important for the perception of the odor effect of plants with odor characteristics. Therefore, hedges or orientation plants that are planted at appropriate heights in terms of odor characteristics will cause the odor to spread evenly in the area without dispersing. According to Lacey (1995), in the selection of taxa used in fencing and orientation; it should be preferred to use plants that have a permeability between 30-50% and filter the wind.

Scented plants are typically used in design applications at entrances, roadsides, terraces, and near seating and resting areas. Water circulation in green spaces is very important for use by people with disabilities. The design of these areas should consider the safety and comfort of a wide range of users, as well as aesthetics. Plants are one of the most important materials for defining boundaries and edges, providing pleasant odors, and sheltering people from the sun, wind, and rain. Plants and shrubs with different colors and scents should be used to create interest and orientation, especially for visually impaired people (Accessibility Design Handbook, 2015; Turovtseva, Bredikhina, Pererva & Gnilyusha, 2022). To ensure freedom of movement, the effect will be stronger if the design uses plants of a single taxon that stand out for their scent, color, and texture features that provide orientation along the axis.

In the design of plantings or alleys to be made on the roadsides, it would be more accurate to start the top branching of the plants at 220 cm to make human circulation easy by calculating that the plants will come to the sidewalk with the growth of the plants (Accessibility Guide, 2020). Otherwise, the branches of the plant may harm visually impaired people or a user who cannot notice them.

Leaves, fruits, cones, branches, etc. of taxa used in vegetative design on or near roadways pose a great danger to wheelchair users and visually impaired people due to falling on hard ground. Especially the fruits of taxa such as *Aesculus* spp. (Horse Chestnut), *Quercus* spp. (Oak), *Sophora* spp. (Zofora), *Platanus* spp. (Sycamore), etc., (Pine) cones that fall as a whole, *Cedrus* spp. (Cedar) with its scattered and falling cone scales, *Morus* spp. (Mulberry) with its fruits that smell and attract insects when they fall, *Taxus* spp. (Yew) with its fallen false and poisonous fruits should not be preferred in the vegetative design on the roadside and in the immediate vicinity. Instead of these taxa, *Acer* spp. (Maple), *Fraxinus* spp. (Ash), *Tilia* spp. (Linden), etc., whose fruit characteristics are not very harmful to users and which can come to the fore with their shade characteristics, should be preferred.

It is important for the safety of visually impaired and other users that the plant taxa used on the roadside and on the road are not hard textured and do not contain stinging thorns, branches, etc. Hard textured plants found in the green areas of Ankara are shown in Table 2. For example, taxa belonging to the Rosaceae family (*Crataegus* sp., *Rosa* sp. etc.) with thorny stems and taxa with thorny leaves (*Mahonia aquifolium*, *Yucca filamentosa* etc.) can be given as examples. Taxa such as *Buxus sempervirens* 'Rotundifolia', *Lonicera nitida*, *Viburnum tinus*, *Lavandula angustifolia*, *Rosmarinus officinalis*, *Salvia officinalis*, etc., which can also be used as hedge plants, can be preferred for their medicinal and aromatic properties.

Taxa such as *Morus* spp., *Ficus* spp. etc., which attract insects after the fruits of the plants used on and on the roadside fall, create a bad smell, leave marks on the pavement or in the area, and allow the road to become slippery, should not be used in areas where the disabled are located for safety and aesthetic reasons.

Seating areas (benches, pergolas, camellias, etc.) should be arranged to meet the resting needs of visually impaired people using green spaces, and separate areas should be designed for wheelchair users. If the characteristics of the area are appropriate, seating and resting areas should be placed at least 100 m apart along the road, and flooring materials different from the main road material should

be used in these areas (Kuter & Çakmak, 2017). If there are structural elements such as camellias, pergolas, and high walls in the area, they can be surrounded by winding and climbing plants with odor characteristics. *Rosa* spp., *Lonicera* spp. and *Wisteria* spp. can be preferred for this planting design in Ankara city center (Table 2). The use of plant taxa with different odor characteristics in the green areas around the place where seating and resting elements are located is important for the perception of the place by visually impaired people. An example design application for seating areas and resting areas is shown in Figure 2.



**Figure 2.** Examples of plant designs that are distinguished by their odor in seating areas (Slottsträdgården in Malmö) (Kaya, 2024)

Since visually impaired people have highly developed olfactory and gustatory cues, the fruit and leaf characteristics of plants can be used in plant designs. By using plants whose fruits and leaves have a soft texture on the aisle that can be touched by the visually impaired, they can be allowed to touch and taste them and recognize the area in which they are located. In this regard, some well-known fragrant and aromatic plants such as *Mentha* sp., *Rosmarinus officinalis*, *Salvia officinalis*, *Lavandula angustifolia*, *Thymus vulgaris*, *Melissa officinalis*, etc. in the shrub group with sizes that people can reach can be used by touching and tasting, while grafted dwarf fruit *Prunus persica*, *Prunus laurocerasus*, *Prunus avium*, etc. can be used by tasting.

One of the most important principles in outdoor design is the period of time the designed area will be used. This is of great importance for the design of scented gardens. In areas that are used more intensively in the winter season, it is recommended to choose plants that have an intense scent effect in this period. In winter, the number of plants that are effective with their leaves and can emit scent when rubbed is high, while the number of plants that can emit scent with their flowers is low. *Chimonanthus praecox* and *Viburnum fragrans* are exotic species that can grow in Ankara conditions and emit pleasant scents in January and February.

In some plants, the fragrance is more pronounced after dark or in the cool of the night. *Jasminum* spp., *Nicotiana* spp., *Lonicera* spp., *Phlox* spp., *Hesperis* spp., *Cestrum* spp., *Mirabilis* spp., *Abronia* spp., *Petunia* spp. and *Daphne* spp. are among the plant species that have a night scent (Lacey, 1995).

In Ankara city center, *Lonicera caprifolium*, *Hosta plantaginea*, *Phlox paniculata*, *Petunia hybrida*, *Mirabilis jalapa*, *Narcissus tazetta*, *Hyacinthus orientalis* are used seasonally in open green areas. However, the flowering period of annuals used seasonally varies according to the characteristics of the taxon, but it is approximately 1-2 months, and the flowering and fragrance periods vary according to the planting times.

It is possible to create different compositions with plant scents. Contrasting spaces can be created with scents that are close together and those that are opposite. Plants and shrubs with different scents can provide an interesting orientation for visually impaired people. The use of contrasting flowers near walkways can also provide guidance (Facility Accessibility Design Standards, 2009). For example, spicy and resinous, apple and pineapple, lemon and thyme, lemon and thyme, lavender and rose are compatible, while fruit and resinous, almond and vanilla can create contrasting effects.



Some of the plants have a strong odor, which is even reflected in their names (*Osmanthus fragrans* and *Viburnum fragrans* etc.). In addition, *Wisteria floribunda*, *Rosmarinus officinalis*, *Yucca filamentosa*, *Oxalis floribunda* species can bloom twice a year, so they can show the odor effect in two different periods. It would be a more correct approach to use such taxa with strong odor effect in the design for the visually impaired at the accent points to attract the effect more. Bao (2019) also suggested the use of aromatic plants such as *Osmanthus* spp. and *Lonicera* spp. for odor stimulation to enhance people's landscape experience.

When it is desired to design an area consisting of a single color in terms of scent feature, using plants that show white, pink or light purple color feature will make the scent effect strong. However, using red and orange flowering plants, which are warm colors, will cause the scent effect to be felt less. In scent garden designs, it is important to prioritize scent features as well as color effects. Flowers are the most important organs that add different colors to the plant. When Table 2 is examined, it is seen that the flower stands out as the scent organ. In the scent gardens to be built, designs should come to the fore according to the flower colors and the amount of scent they emit. It would be more appropriate to use plants that stand out with the smell of leaves, fruits, buds and shoots in order to make the design strong in the period when the flower loses its feature. Some plant taxa, such as *Rosa* spp., *Antirrhinum* spp. and *Cheiranthus* spp. come to the fore both in terms of flower color and fragrance, while others, such as *Hyssopus* spp., *Lavandula* spp., *Melissa* spp., *Salvia* spp. and *Mentha* spp. come to the fore. In the herbal designs to be made, different compositions can be created by using the colors of different plants while taking advantage of the pleasant scent of different plants. In the winter months, when there is a visual lack of color, it is possible to use plants such as *Cupressus arizonica*, *Rosmarinus officinalis*, *Thymus vulgaris*, etc., which stand out for their evergreen fragrant leaves, to provide both fragrance and aesthetic views of the area.

Fragrant plants such as *Cornus mas*, *Chaenomeles japonica*, *Magnolia x soulangiana*, etc. can be used as accent plants because they bloom before they leaf out, heralding spring and providing aesthetically pleasing images.

*Taxus baccata*, *Senecio maritima*, *Ricinus communis*, etc., whose fruits or shiny leaves are attractive but also have poisonous parts, should not be used or should be used very carefully, as they pose a life-threatening danger to children, the mentally handicapped, the visually impaired and other users. Along with the dendrological characteristics of the taxa included in the design, it should be investigated whether they are poisonous or not. It is necessary to warn the visually impaired by placing labels and acoustic warning devices on the taxa that are determined to be poisonous, or to use them in the background in places far from the access area.

On roadsides used by people in wheelchairs and the visually impaired, *Salix* spp., *Populus* spp., *Ailanthus* spp. etc., which have a floating root system, will damage the pavement and road traffic with their strong root systems, so it would be better not to use them in the immediate vicinity of these areas in terms of planting design.

Resin formation in conifers can occur at any time as a result of plant injury. Therefore, in order to make the resin scent effective in the area, wounds can be opened with special knives to obtain resin scent in the presence of experts without damaging the plant.

The fact that the plant taxon to be used in a room designed for the visually impaired has a single odor is one of the most important factors in perceiving which room it is in. Too many different scents will cause confusion.

*Sambucus* spp., *Ailanthus* spp. taxa whose leaves give off a foul odor when rubbed should not be used in transition axes. Visually impaired people should be warned by restricting these plants to dangerous areas that they can feel by touch, but we do not want them to go to that area.

Green areas are areas that allow people to rest in peace by getting away from the negative effects of daily life. In these areas it is necessary to include plants, birds, insects, etc. where people can show that they are intertwined with nature. Since sound is a very important parameter for the visually impaired, it is important to use plant taxa that attract especially vocalizing bird species.

In order to create a natural environment in the spaces, planting designs that can attract birds, squirrels, butterflies, etc. to the area and benefit the urban ecology should be intensified. Plant species can be used to attract squirrels (e.g. *Castanea sativa*, *Juglans regia*, *Elaeagnus angustifolia*, *Crataegus monogyna*, etc.), butterflies (e.g. *Buddleja davidii*, *Abelia grandiflora*, etc.), birds (e.g. *Ribes aureum*, *Berberis thunbergii*, etc.). However, species that may be dangerous to humans, such as bees (e.g. *Buxus sempervirens*, *Tilia tomentosa*, etc.) or that may attract flies by falling when their fruit is not picked (e.g. *Cornus mas*, *Prunus laurocerasus*, *Prunus armenica*, etc.) should be used in the background outside the transition axes.

By designing houses suitable for the bird species living naturally in the region and hanging them on tall trees (e.g. *Fraxinus ornus*, *Robinia pseudoacacia*, *Tilia cordata*, etc.), living spaces should be created for birds, and the sounds they will make should enable the visually impaired to perceive the space.

Designs to be made with plants such as *Populus tremula*, *Paulownia tomentosa*, etc., which attract the attention and interest of the users of the space with the sound of their leaves swaying in the wind, will contribute to the visually impaired to obtain information about which space they are in.

Stagnant water elements (water lily pond, fish pond, etc.), moving water elements (waterfall, fountain pool, jumping water, etc.) and aquatic plants to be used around it should be used to create a focal point with audible stimuli to identify the space, orient it and leave permanent traces in the mind.

Scented plants to be used around the sound of water will make the design stronger. Different types of sounds can be created in the area by choosing plant taxa that can attract water birds.

Labyrinth gardens created with scented plants (*Cupressus arizonica*, *Buxus sempervirens*, *Lonicera nitida*, etc.) will enable disabled people to meet their entertainment needs.

#### 4. Conclusion and Suggestions

People with visual impairment have situations that prevent friendship relationships, such as falling behind their friends, not being able to be in the same environment with them, or not being able to travel, not being able to get to the given address on time and in a healthy way. Therefore, in order to prevent such psychological factors, it is necessary to design green areas that can be actively used by visually impaired people. In these areas to be designed, the visually impaired person will have the opportunity to be happier by recognizing his environment and having the opportunity to be an individual alone and fulfill his responsibilities.

In order to solve the problems of accessibility and use of green areas by the visually impaired, tactile information graphics, orientation designs and acoustic stimulants should be placed in the most appropriate places as part of the design, and information about the characteristics of the area and scented plants should be conveyed.

Along with the characteristics of the green area to be designed, promotional brochures should be prepared with information about the characteristics of fragrant plants that are of interest to the visually impaired, and the visuals to be created should be defined in the Braille alphabet used by the visually impaired.

Not only the fragrant plants of the green area, but also the paths, sitting and resting areas, etc. can be presented to the handicapped by placing them on the transitional axes of the area with stylized and more schematically drawn maps, not with their natural structure.

With these green spaces to be designed, visually impaired people will be able to communicate healthily in society, increase their self-confidence, overcome the feeling of deficiency, get rid of the feeling of exclusion, realize the ability to imagine, recognize plants, love nature, reach the power of the olfactory effect, etc., when they psychologically solve where and how to go. will cause many positive effects.

The use of scent in open spaces is difficult because the smell is very difficult to control. However, with herbal scent walls, scented vertical gardens, scented fences, scented everything, the scent can be controlled and more intense scent can be spread in the area. In this way, visually impaired people can feel better outdoors and gain positive energy. In addition, by increasing the memorability of the

designed spaces, it can be ensured that the disabled people who use the space can remember the paths and spaces more easily by matching them with scents.

One of the most important elements to be taken into account in the design of plants with olfactory properties is the control of air currents that may occur in the area. Depending on the design characteristics of the plant species to be used, it is very important to place them in the vicinity of circulation areas and areas with seating and resting functions in terms of odor effects. The number, size, type of scent, scent times and the period of formation of the organ with scent characteristics are the factors that directly affect the desired design. It has been observed that plants with scent characteristics grow better in sunny and light areas. When selecting plant taxa to be used in scent gardens, care should be taken to increase the use of natural taxa.

In a park that will be sensitive to the visually impaired, spaces, road axes, sitting and resting areas, children's playgrounds, sports fields, etc., can be created according to plant scents, and users can be informed about which type of scent they will encounter in which space, so that the user can perceive which area they are in. In this way, visually impaired people using the park can easily understand where they are in the park. A different smell at the place where there are stairs and ramps, a different smell that emits a bad smell when it comes to a dangerous place, etc. can be given as examples. Places can be named according to the type of smell. A template can be developed accordingly. For example, *Tilia* spp. (Linden) can be used in areas along road axes, *Lavandula* spp. (Lavender) can be used around bus stops, *Rosa* spp. (Climbing Rose) can be used around seating areas, since plants with winding and climbing properties are used.

Although study areas in Ankara generally have some arrangements for disabled access, completely barrier-free access is not provided everywhere. The condition of the roads and lack of maintenance in large parks and open areas can cause problems. Although there are arrangements and opportunities for the disabled on public and university campuses, some old structures can cause difficulties in terms of access. It is striking that functions such as scent corridors and scent gardens are inadequate in these areas, especially for ensuring urban integrity. In this context, more comprehensive designs should be made in plant designs in terms of aesthetics and functionality by evaluating plant diversity.

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The article complies with national and international research and publication ethics. Ethics Committee approval was not required for the study.

#### **Author Contribution and Conflict of Interest Declaration Information**

All authors contributed equally to the article. There is no conflict of interest.

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