

An overview of the ornamental and herbaceous plants in the central ZED Park located in Al Sheikh Zayed City, Giza Governorate, Egypt

Tarek Abou Dahab Mohamed Abou Dahab¹, Hossam Ahmed Ashour¹, Mohammed Ahmed Ibrahim Abdelkader², Khaled Sobhy Elsayed Ahmed Awad^{1*}

¹ Ornamental Department, Fac. Agric., Cairo Univ, Giza, 12613 Egypt.

² Horticulture Department, Fac. Agric., Zagazig Univ, 44523 Egypt.

Abstract

It is possible to achieve good plant utilization in public gardens by utilizing the right plant in the right location. In order to ascertain the purposes and landscaping values of the ornamental and herbaceous plants found in Al Sheikh Zayed City, Giza Governorate, Egypt, between 2020 and 2021, a survey of these plants was carried out. The current study established to determine the aesthetical values parameters as form beauty, ornamental foliage, ornamental fruit, ornamental flowers, and fragrance. While, the existing and potential uses of these plants were utilized to record the landscape uses. As a result of the study, totally 152 plant species belong to 49 families were recorded and they follow trees (33%), shrubs (19%), large shrubs (6%), palms (5%), succulents (6%), vines (6%) and ground covers (25%). From surveying work, it has been found that *Bougainvillea stans* X-Butiana, *Duranta plumieri*, *Lonicera japonica* and *Euphorbia miliare* attractive for eight parameters of landscape use. *Albizia Lebbeck*, *Anisacanthus vulgar*, *Antigonon Leptopus*, *Azadirachta indica*, *Bombax Ceiba*, *Chorisia speciosa*, *Callistemon viminalis*, *Punica granatum*, *Vitex Agnus-castus* and *Gleditsia triacanthos* detected to be in three different aesthetical value.

Keywords: Ornamental plants, Landscape use, Aesthetical value, ZED Park.

Full length article *Corresponding Author, e-mail: Ksobhy.awad@gmail.com

1. Introduction

All over the world, increasing population and growing urbanization raise the significance of public as well as private gardens, while the preservation of natural resources near the cities and the servicing of environmental balance become a major demand. It is possible to improve alternative solutions to eliminate different visual contaminations utilizing soft scape (ornamental plants), which is one of the serious landscape design elements especially in urban spaces [1].

In the realm of landscaping, ornamental plants (such as trees, palms, shrubs, climbers, herbaceous, succulents, cactus and lawns) and aromatic plants are regarded as essential plant components. Ornamental and landscape plants play a significant role in human existence [2]. Ornamental plants are considered as non-traditional horticultural crops with outstanding economic return, where production is available throughout the year which allows that Egypt occupies a privileged position on the global map [3].

Ornamental and aromatic plants contribute to the urban environment in various ways, for example minimizing releasing moisture, air pollution, conserving energy through balancing temperatures and providing habitats for flora and fauna [4]. Plants also reduce the negative influences of dust, greenhouse gases and wind [5], as well as noise control [6] and decrease light reflection [7], in addition to positive functions such as conditioning waste areas, preventing soil erosion and soil amelioration in order to landscape restoration [8]. Also, plants and plantations are among the main areas of work in landscape architecture.

Ornamentals include woody (palms, trees, vines and shrubs), succulent and cactus plants, herbaceous (perennials, bi-annuals and annuals) and aquatic and semi-aquatic plants as well as lawns. These plants are estimate by their capability to satisfy the eye of consumers as pot or garden plants or when sold as cut flowers. For these purposes, ornamental and aromatic plants must achieve aesthetic criteria in demand. Furthermore, medicinal plants can be considered in several areas such as beverage, soap, medicine industry, perfume, toothpaste, cosmetic, spices, essence and

tea. It utilized both for ornamental and for benefit in the traditional houses and gardens. These days, medicinal plants are included at many of thematic parks and they are concerned by the humanity [9].

The study area (ZED Park) is one of these expansions. In recent decades, urban expansion has drawn people from the valley and delta regions. New residential neighborhoods have emerged with their lovely designs and gardens. Determining the aesthetic value and landscape application of woody ornamentals surveyed in ZED Park located in Al Sheikh Zayed City, Giza Governorate, Egypt is the goal of this study.

2. Materials and Methods

Study groups included ornamental and herbaceous plants that grown in ZED Park (Fig. 1) located in Al Sheikh Zayed City, Giza Governorate, Egypt, during 2020 and 2021. The study location under review situated between latitude (30°02'40.0"N) and (30°59'44.6"E). The large park at the center of the project area, known as the ZED area, serves as the focal point and extends throughout the development in a network of connected courtyards, providing ample, private, and planted open spaces for all residents. The master plan incorporates mixed-use, retail, and entertainment purposes, transforming the area from a residential suburb into a new urban quarter.

2.1. Evaluation methods:

In the scope of the study, (trees, palms, shrubs, woody vines and aquatic plants) and herbaceous plants grown in ZED Park were listed depending on field visits. Data about the plant materials was obtained through observations and with the help of horticultural experts.

Herbaceous and ornamentals plants grown in ZED Park, including trees, palms, shrubs, woody vines aquatic and flowering plants, were included in the study's scope based on five visits. Through observations and with the assistance of horticulture specialists, information about the plant materials was gathered.

- A. The evaluation of plant species was focused on their current or projected usefulness in the landscape.
- B. An alternative approach to evaluation relied on aesthetic and landscape values, drawing inspiration from [10] and [9].
 1. **Form beauty:** natural plant shape and branches sequence.
 2. **Ornamental foliage:** leaf color, shape and size, its being attractive in vegetation period and in autumn.
 3. **Ornamental fruit:** its being attractive in terms of structure, size and color.
 4. **Ornamental flowers:** Suitable for using in landscape architecture in terms of floescence structure, number and sequence.
 5. **Fragrance:** Leaf, flower and fruits having a nice scent concretely.

3. Results and Discussion

3.1. Families and species count

It was recorded as a result of the current survey that totally 152 ornamental plant species belonging to 49 families are grown in ZED park gardens. The highest families in number of species were *Leguminosae* (28 Awad et al., 2023

species), *Asteraceae* (14 species), *Aizoaceae* (6 species) and *Euphorbiaceae* (6 species). In addition, nineteen families had only one species for each, four families had two species for each, six families had three species for each, three families had four species for each, four families had five species for each and three families had six species for each (Table 1). In addition, Fig. 2 showed the distribution of surveyed species according to their plant groups as follows: trees (33%), shrubs (19%), large shrubs (6%), palms (5%), succulents (6%), vines (6%) and ground covers (25%).

3.2. Aesthetical/landscape value

For aesthetical value of surveyed species, form beauty, ornamental foliage, ornamental fruit and ornamental flowers and fragrance parameters were taken into consideration. Plants revealing the parameters of aesthetical value are signed by "+" as shown in Table 2. From surveying work, it has been found that *Bougainvillea stans* x-*Butiana*, *Duranta plumieri*, *Lonicera japonica* and *Euphorbia miliare* attractive for eight parameters of landscape use. *Albizia Lebbeck*, *Anisacanthus vulgar*, *Antigonon Leptopus*, *Azadirachta indica*, *Bombax Ceiba*, *Chorisia speciosa*, *Callistemon viminalis*, *Punica granatum*, *Vitex Agnus-castus* and *Gleditsia triacanthos* detected to be in three different aesthetical values.

Moreover, the plants *Spathiphyllum wallisii* and *Zantedeschia aethiopica* remarkably contribute in the removal of pollutants in wastewater. Additionally, the use of ornamental plants, with commercial interest such as those evaluated, enables an added value to the Constructed Wetlands to be given, which can be used for flower production purposes on a larger scale and favor its acceptance within rural communities [11]. In addition, [1] indicated that, the importance of ornamental plant and their compositions in the solution of visual problems in urban environments in cold climatic conditions is emphasized. The potential of ornamental plants that can be used for this purpose in preventing visual pollution is given. In addition to the design group disciplines that are effective on planning or application basis in the city and its surroundings, the studies to be carried out in detail in terms of planting design as a discipline of Landscape Architecture can provide visual improvement. However, large and coniferous trees and shrubs are suitable plants for aesthetic and functional purposes in plant design studies for winter cities. Broad-leaved trees; *Acer campestre*, *Acer pseudoplatanus*, *Aesculus hippocastanum*, are resistant to salt and are suitable for use as wind and snow curtains. From coniferous trees, *Abies concolor* and *Picea pungens* are suitable for creating snow and wind curtains. *Fraxinus americana*, *Picea pungens*, *Symphoricarpus orbiculatus* and *Syringa vulgaris* are suitable for use in winter cities because of their salt-resistant plant species and their visual values.

3.3. Landscape use

Table 2 and Fig. 3 revealed that *Bougainvillea stans* x-*Butiana* (pink or white or yellow colors), *Duranta plumieri*, *Euphorbia milii*, *Lonicera japonica* are detected to be in eight different landscape uses, while, *Ficus benjamina* only is noticed in nine position for landscape uses, whereas *Antigonon Leptopus*, *Bougainvillea glabra*, *Ixora coccinea* (Pink Color), *Ixora coccinea* (white Color), *Lantana camara*, *Lantana montevidensis*, *Pittosporum tobira*,

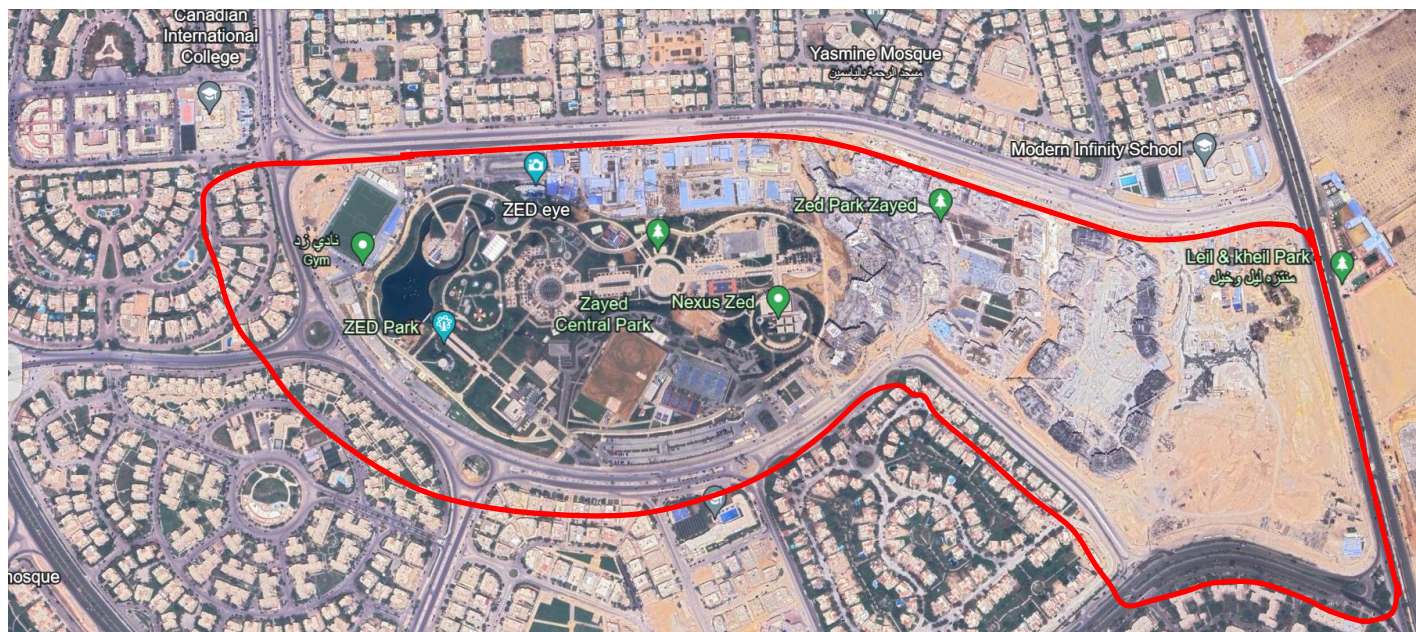


Figure 1. Location of ZED Park, Al Sheikh Zayed City, Giza Governorate, Egypt

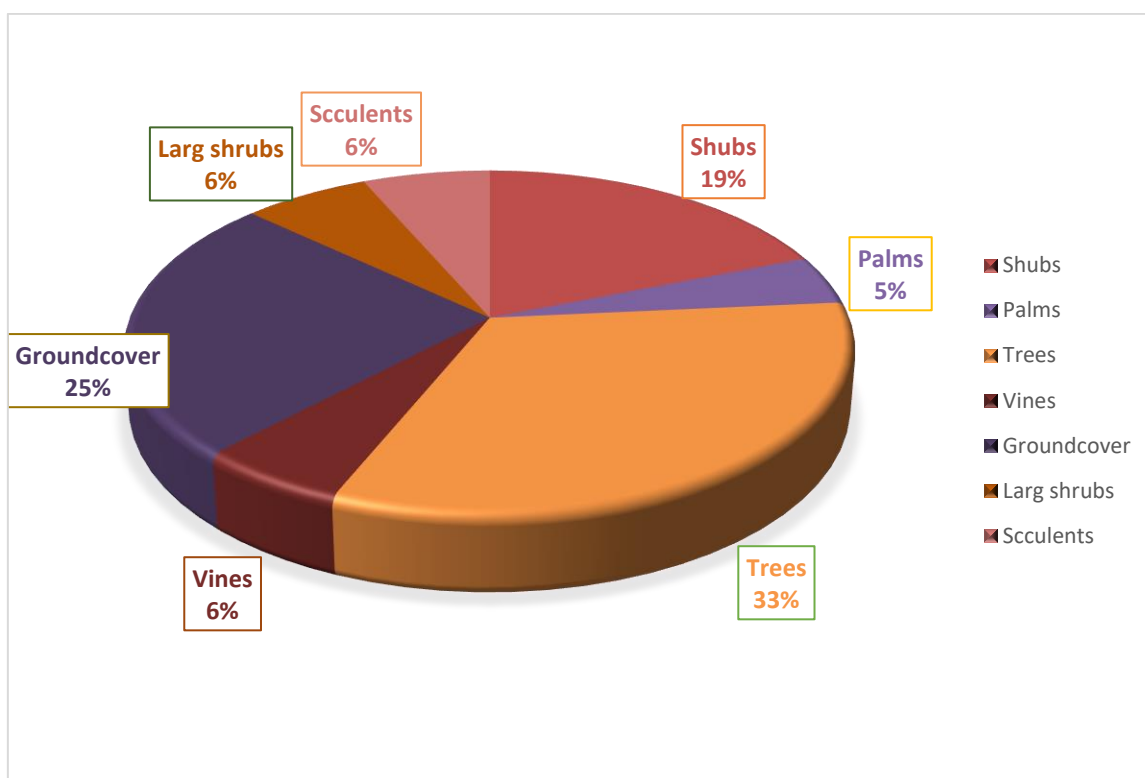


Figure 2. Percentage of surveyed species according their groups

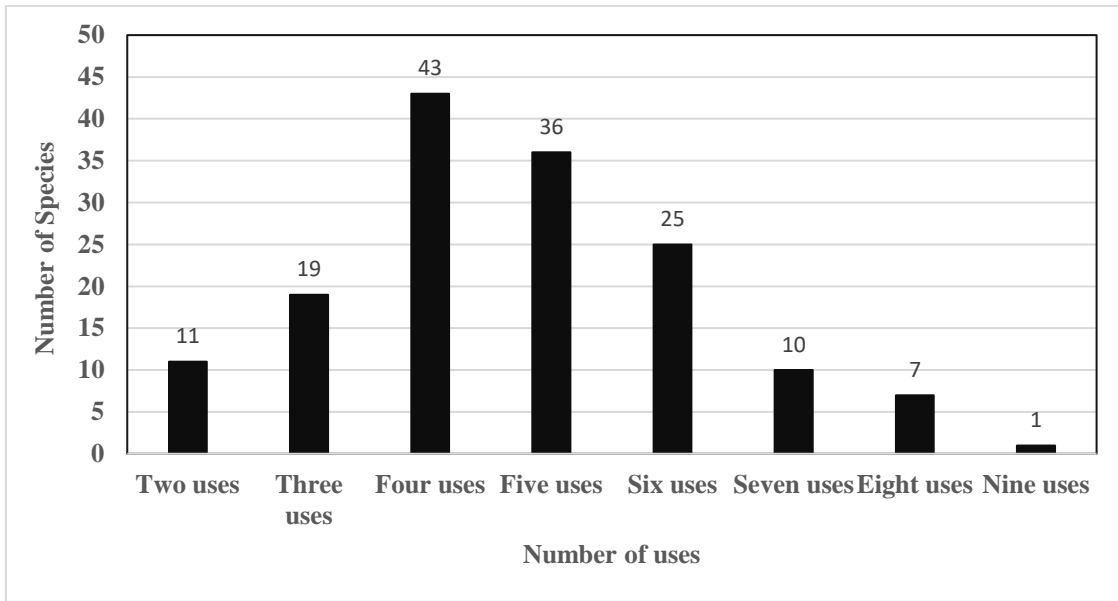


Figure 3. Relationship between number of species and the number of landscape uses

Table 1: Distribution of evaluated species located in ZED Park gardens based on families

Families	Number of species	Families	Number of species	Families	Number of species	Families	Number of species	Families	Number of species
Asteraceae	14	Bignoniaceae	3	Geraniaceae	4	Phyllanthaceae	1	Scrophulariaceae	1
Acanthaceae	3	Bombacaceae	2	Leguminosae	28	Pittosporaceae	1	Solanaceae	1
Aizoaceae	6	Boraginaceae	1	Lamiaceae	5	Plumbaginaceae	1	Strelitziaceae	1
Amaranthaceae	2	Cactaceae	2	Lythraceae	4	Poaceae	3	Verbenaceae	6
Anacardiaceae	4	Caprifoliaceae	1	Malvaceae	1	Polygonaceae	1	Yuccaceae	1
Apocynaceae	3	Combretaceae	1	Meliaceae	3	Portulacaceae	1		
Araliaceae	1	Commelinaceae	1	Moraceae	5	Punicaceae	1		
Arecaceae	7	Convolvulaceae	1	Myrtaceae	3	Rubiaceae	5		
Asparagaceae	7	Crassulaceae	1	Nyctaginaceae	5	Rutaceae	1		
Asphodelaceae	1	Euphorbiaceae	6	Oleaceae	3	Sapindaceae	2		

Table 2: Distribution of evaluated species located in ZED Park gardens based on families

Scientific Name	Family	Aesthetical value					Landscape use
		Form beauty	Ornamental foliage	Ornamental fruit	Ornamental flowers	Fragrance	
<i>Acacia arabica</i>	Fabaceae		+		+		7, 9, 18, 19,
<i>Acacia farnesiana</i>	Fabaceae				+	+	7, 9, 18, 19,
<i>Acacia nilotica</i>	Fabaceae		+		+		7, 9, 18, 19,
<i>Acacia saligna</i>	Fabaceae		+		+		1, 7, 9, 18, 19, 23,
<i>Acalypha wilkesiana</i>	Euphorbiaceae	+	+				11, 13, 14, 15, 17,
<i>Agave americana</i>	Asparagaceae	+	+				13, 16, 20,
<i>Agave victoriae-reginae</i>	Asparagaceae	+	+				16, 20,
<i>Ageratum houstonianum</i> (pink color)	Asteraceae	+			+		3, 9, 12, 15, 16, 20,
<i>Ageratum houstonianum</i> (Purple color)	Asteraceae	+			+		3, 9, 12, 15, 16, 20,
<i>Albizia julibrissim</i>	Fabaceae	+			+		9, 18, 19
<i>Albizia lebbeck</i>	Fabaceae		+		+	+	9, 18, 19
<i>Alternanthera versicolor</i>	Amaranthaceae	+	+				3, 6, 12, 22,
<i>Anisacanthus vulgar</i>	Acanthaceae	+	+		+		3, 9, 12,
<i>Antigonon leptopus</i>	Polygonaceae	+	+		+		2, 5, 8, 9, 10, 14, 20,
<i>Aptenia cordifolia</i>	Aizoaceae		+		+		6, 7, 9, 12, 20,
<i>Asparagus Sprengeri</i>	Asparagaceae	+	+				12, 20,
<i>Atriplex Narrow</i>	Amaranthaceae		+				2, 16
<i>Azadirachta indica</i>	Meliaceae	+	+		+		4, 18, 19,
<i>Bauhinia variegata</i>	Fabaceae		+		+		4, 9, 18,
<i>Bombax ceiba</i>	Bombacaceae	+	+		+		4, 9, 13, 19
<i>Bougainvillea stans x-Butiana</i> (Pink color)	Nyctaginaceae				+		2, 5, 9, 10, 14, 17, 19, 21
<i>Bougainvillea stans x-Butiana</i> (white color)	Nyctaginaceae				+		2, 5, 9, 10, 14, 17, 19, 21
<i>Bougainvillea stans x-Butiana</i> (Yellow color)	Nyctaginaceae				+		2, 5, 9, 10, 14, 17, 19, 21
<i>Bougainvillea glabra</i>	Nyctaginaceae				+		2, 5, 9, 10, 14, 17, 21
<i>Bougainvillea stans X-Butiana</i> (Orange color)	Nyctaginaceae				+		2, 5, 9, 10, 14, 17, 19, 21
<i>Brahea armata</i>	Arecaceae	+	+				13, 19,
<i>Caesalpinia gilliesii</i>	Fabaceae		+		+		2, 9, 13, 14, 19
<i>Caesalpinia pulcherrima</i>	Fabaceae		+		+		2, 9, 13, 14, 19
<i>Calliandra haematocephala</i>	Fabaceae		+		+		9, 13, 14, 17, 19
<i>Callistemon viminalis</i>	Myrtaceae	+	+		+		9, 11, 13, 16, 17, 19
<i>Carissa grandiflora</i>	Apocynaceae		+		+	+	2, 3, 9, 13, 14
<i>Carpobrotus edulis</i>	Aizoaceae		+		+		6, 7, 9, 12, 16,
<i>Cassia Didymobotrya</i>	Fabaceae		+		+		2, 9, 13, 22
<i>Cassia fistula</i>	Fabaceae		+		+		4, 9, 18, 19
<i>Cassia Glauca</i>	Fabaceae		+		+		1, 4, 9, 13, 18, 19,
<i>Cassia nodosa</i>	Fabaceae	+	+		+		1, 4, 9, 18, 19,
<i>Cassia Spectabilis</i>	Fabaceae		+		+		1, 4, 9, 18, 19,
<i>Cassia tomentosa</i>	Fabaceae		+		+		9, 13,
<i>Cestrum aurantiacum</i>	Solanaceae				+	+	9, 13, 14, 17, 19, 21
<i>Chamaerops humilis</i>	Arecaceae	+	+				17, 19
<i>Chorisia speciosa</i>	Bombacaceae		+		+	+	1,3 ,9 , 18,19,
<i>Chrysanthemum Species</i>	Asteraceae		+		+		9, 12, 15, 20,
<i>Citrus sinensis</i>	Rutaceae		+		+	+	9, 18, 19,
<i>Codiaeum variegatum</i>	Euphorbiaceae	+	+				12, 15, 20, 22,

Scientific Name	Family	Aesthetical value					Landscape use
		Form beauty	Ornamental foliage	Ornamental fruit	Ornamental flowers	Fragrance	
<i>Cuphea cyanea</i> (Pink Color)	Lythraceae		+		+		9, 12, 15, 20,
<i>Cuphea cyanea</i> (Purple Color)	Lythraceae		+		+		9, 12, 15, 20,
<i>delonix regia</i>	Fabaceae	+		+	+		4, 9, 18, 19
<i>Dimorphotheca Fruticosa</i> (pink color)	Asteraceae		+		+		9, 12, 20,
<i>Dimorphotheca Fruticosa</i> (white color)	Asteraceae		+		+		9, 12, 20,
<i>Dodonaea Viscosa</i>	Sapindaceae		+				2, 3, 7, 14, 21,
<i>Duranta plumieri</i>	Verbenaceae		+				3, 9, 13, 14, 17, 19, 20, 21
<i>Echinocactus grusonii</i>	Cactaceae	+					13, 20,
<i>Enterolobium cyclocarpum</i>	Fabaceae		+				4, 9, 18, 19
<i>Erythrina indica</i>	Fabaceae		+		+		4, 9, 18, 19
<i>Erythrina Lysistemon</i>	Fabaceae		+		+		4, 9, 18, 19
<i>Eugenia myrtifolia</i>	Myrtaceae		+		+		2, 12, 14, 17, 20, 21,
<i>Euphorbia candelabrum</i>	Euphorbiaceae	+					2, 13, 15, 19, 20,
<i>Euphorbia Lactea</i>	Euphorbiaceae	+					2, 13, 16, 20,
<i>Euphorbia milii</i>	Euphorbiaceae		+		+		2, 3, 6, 9, 12, 16, 20, 22,
<i>Euphorbia tirucalli</i>	Euphorbiaceae	+					6, 12, 16, 20,
<i>Euryops pectinatus</i>	Asteraceae		+		+		2,3, 9, 12, 20, 22,
<i>Festuca cinerea</i>	Poaceae	+	+				6, 12, 20, 22,
<i>Ficus benjamina</i>	Moraceae	+	+				1, 4, 13, 14, 15, 17, 19, 20, 21
<i>Ficus Infectoria</i>	Moraceae		+				1, 4, 7, 18, 19,
<i>Ficus maclellandii</i>	Moraceae	+	+				13, 14, 15, 19, 20,
<i>Ficus microcarpa</i>	Moraceae		+				1, 7, 15, 18, 19, 20,
<i>Ficus Religiosa</i>	Moraceae		+				1, 4, 7, 18, 19,
<i>Furcraea gigantea</i>	Asparagaceae	+					13, 16, 20,
<i>Gaillardia Pulchella</i>	Asteraceae				+		13, 19
<i>Gazania silver</i>	Asteraceae		+		+		9, 12, 22,
<i>Gazania splendens</i> (white Color)	Asteraceae		+		+		9, 12, 22,
<i>Gazania splendens</i> (Yellow Color)	Asteraceae		+		+		9, 12, 22,
<i>Gleditsia triacanthos</i>	Fabaceae	+	+		+		1, 9, 18, 19,
<i>Haematoxylum campechianum</i>	Fabaceae				+		1, 4, 18, 19, 23,
<i>Harpephyllum caffrum</i>	Anacardiaceae	+	+				1, 4, 17, 18, 19,
<i>Hemerocallis aurantiaca</i>	Asphodelaceae		+		+		9, 12, 20, 22,
<i>Hibiscus rosa- sinensis</i>	Malvaceae		+		+		9, 11, 13, 14, 17, 19, 20
<i>Inga Edulis</i>	Fabaceae		+				1, 4, 9, 17, 18, 19,
<i>Ipomea tricolor</i>	Convolvulaceae		+		+		5, 6, 7, 9, 10, 12,
<i>Ixora Coccinea</i> (Pink Color)	Rubiaceae		+		+		3, 9, 12, 14, 15, 20, 22,
<i>Ixora Coccinea</i> (white Color)	Rubiaceae		+		+		3, 9, 12, 14, 15, 20, 22,
<i>Jacaranda ovalifolia</i>	Bignoniaceae				+	+	1, 4, 9, 17, 19
<i>Jasminum grandiflorum</i>	Oleaceae				+	+	5, 8, 9, 10, 14, 17
<i>Jasminum humile</i>	Oleaceae				+	+	5, 8, 9, 10, 14, 17
<i>Justicia adhatoda</i>	Acanthaceae		+		+		3, 9, 12, 20,
<i>Justicia Spicigera</i>	Acanthaceae		+		+		3, 9, 12, 20,
<i>Kalanchoe marmorata</i>	Crassulaceae		+		+		12, 15, 17, 20,
<i>Khaya senegalensis</i>	Meliaceae		+				4, 18
<i>Koelreuteria paniculata</i>	Sapindaceae		+		+		4, 13, 18, 19

Scientific Name	Family	Aesthetical value					Landscape use
		Form beauty	Ornamental foliage	Ornamental fruit	Ornamental flowers	Fragrance	
<i>Lagerstroemia indica</i>	Lythraceae		+		+	+	4, 9, 13, 14, 17, 19
<i>Lampranthus roseus</i> (Pink Color)	Aizoaceae		+		+		6, 7, 9, 12, 20, 22,
<i>Lampranthus roseus</i> (Red Color)	Aizoaceae		+		+		6, 7, 9, 12, 20, 22,
<i>Lampranthus spectabilis</i>	Aizoaceae		+		+		6, 7, 9, 12, 20, 22,
<i>Lantana camara</i>	Verbenaceae				+	+	3, 6, 9, 13, 16, 20, 22
<i>Lantana camara nana</i>	Verbenaceae				+	+	3, 6, 9, 13, 16, 20, 22
<i>Lantana montevidensis</i>	Verbenaceae				+	+	6, 7, 9, 10, 12, 16, 20
<i>Lawsonia alba</i>	Lythraceae				+	+	4, 13, 14, 17, 19
<i>Leucaena leucocephala</i>	Fabaceae		+				2, 9, 14, 17, 18, 23,
<i>Leucophyllum frutescens</i>	Scrophulariaceae		+				2, 9, 12, 14, 16,
<i>Livistona chinensis</i>	Arecaceae	+	+				1, 13, 19,
<i>lonicera japonica</i>	Caprifoliaceae				+	+	2, 6, 9, 10, 12, 14, 15, 20,
<i>Mammillaria geminispina</i>	Cactaceae	+					9, 13, 16, 20,
<i>Melaleuca leucadendra</i>	Myrtaceae		+				2, 13, 17, 19, 23,
<i>Melia Azedarach</i>	Meliaceae		+		+		1, 4, 18, 19, 23,
<i>Mesembryanthemum Edule</i>	Aizoaceae	+			+		6, 7, 9, 12, 16,
<i>Ocimum basilicum</i>	Lamiaceae		+			+	2, 3, 9, 12, 15, 20, 22,
<i>Olea europaea</i>	Oleaceae		+	+			4, 18, 19, 21
<i>Parkinsonia aculeata</i>	Fabaceae		+				1, 2, 9, 18, 19, 23,
<i>Paspalum vaginatum</i>	Poaceae		+				6, 7, 12,
<i>Pelargonium fragrans</i>	Geraniaceae		+		+		9, 12, 15, 20, 22,
<i>Pelargonium Peltatum</i> (Pink color)	Geraniaceae		+		+		9, 12, 15, 20, 22,
<i>Pelargonium Peltatum</i> (Red color)	Geraniaceae		+		+		9, 12, 15, 20, 22,
<i>Pelargonium Peltatum</i> (white color)	Geraniaceae		+		+		9, 12, 15, 20, 22,
<i>Peltophorum africanum</i>	Fabaceae			+	+		1, 4, 9, 18, 19,
<i>Pennisetum setaceum Purpureum</i>	Poaceae			+			9, 12, 22,
<i>Pentas Lanceolata</i> (Pink color)	Rubiaceae	+		+			9, 12, 20, 22
<i>Pentas Lanceolata</i> (Red color)	Rubiaceae	+		+			9, 12, 20, 22
<i>Pentas Lanceolata</i> (white color)	Rubiaceae	+		+			9, 12, 20, 22
<i>Phoenix dactylifera</i>	Arecaceae	+	+	+			1, 4, 13, 18, 19, 23
<i>Phyllanthus atropurpureus</i>	Phyllanthaceae	+	+				2, 12, 22,
<i>Pittosporum tobira</i>	Pittosporaceae				+	+	3, 9, 13, 14, 17, 19, 20
<i>Pleomele reflexa</i>	Asparagaceae	+	+				5, 13, 15, 20,
<i>Plumbago capensis</i>	Plumbaginaceae		+		+		2, 3, 7, 9, 12,
<i>Plumeria alba</i>	Apocynaceae	+	+		+	+	9, 19, 20
<i>Pongamia Pinnata</i>	Fabaceae						1, 4, 9, 18, 19,
<i>Portulaca grandiflora</i>	Portulacaceae						6, 9, 12, 20,
<i>Ptychosperma elegans</i>	Arecaceae						1, 13, 19,
<i>Punica granatum</i>	Punicaceae		+	+	+		3, 9, 13, 14, 19, 20
<i>Quisqualis indica</i>	Combretaceae	+			+		5, 8, 10, 12, 14, 15, 20,
<i>Rosmarinus officinalis</i>	Lamiaceae	+	+				3, 12, 15, 20,
<i>Roystonea regia</i>	Arecaceae	+	+				1, 4, 13, 19,
<i>Salvia splendens</i>	Lamiaceae	+			+		3, 9, 12, 20
<i>Santolina chamaecyparissus</i>	Asteraceae		+		+		3, 9, 12, 20,
<i>Schefflera actinophylla</i>	Araliaceae	+	+				2, 3, 12, 15, 20,
<i>Schinus dependens</i>	Anacardiaceae						2, 12

<i>Schinus molle</i>	Anacardiaceae	+	+	+		+	2, 17, 19, 23
----------------------	---------------	---	---	---	--	---	---------------

Scientific Name	Family	Aesthetical value					Landscape use
		Form beauty	Ornamental foliage	Ornamental fruit	Ornamental flowers	Fragrance	
<i>Schinus terebinthifolius</i>	Anacardiaceae	+	+	+		+	1, 4, 18, 19,
<i>Senecio cineraria</i>	Asteraceae		+		+		3, 12,
<i>Solenostemon scutellarioides</i>	Lamiaceae	+	+				6, 12, 20, 22,
<i>Strelitzia reginae</i>	Strelitziaceae		+		+		9, 13, 16, 20
<i>Tagetes Erecta</i>	Asteraceae				+		4, 9, 13, 14, 17, 19,
<i>Tecoma Stans</i>	Bignoniaceae				+		4, 9, 13, 14, 17, 19,
<i>Tecomaria capensis</i>	Bignoniaceae				+		4, 9, 13, 14, 17, 19,
<i>Thevetia neriifolia</i>	Apocynaceae		+		+	+	9, 11, 17, 19, 20
<i>Tipuana tipu</i>	Fabaceae		+		+		4, 9, 18, 19
<i>Tradescantia pallida(purpurea)</i>	Commelinaceae		+				6, 7, 12, 22,
<i>Verbena hybrida</i>	Verbenaceae				+		6, 7, 9, 12, 22,
<i>Vitex Agnus- castus</i>	Lamiaceae		+		+	+	9 14, 19, 20
<i>Wedelia trilobata</i>	Asteraceae				+		6, 7, 9, 12, 22,
<i>Wigandia Caracasana</i>	Boraginaceae				+		9, 19,
<i>Wodyetia Bifurcata</i>	Arecaceae	+	+				1, 4, 13, 19
<i>Yucca aloifolia</i>	Asparagaceae	+	+				11, 15, 16, 19, 20
<i>Yucca Filamentosa</i>	Yuccaceae	+	+				11, 15, 16, 19, 20

Avenue (1), Barrier (2), Borders (3), Street (4), Covering buildings (5), Covering slopes (6), Erosion control (7), Arbour/pergolas (8), Flowering (9), Trellis/pillar/wall (10), Foundation (11), Ground covers (12), Group planting (13), Hedge (14), House planting (15), Rock gardens (16), Screening (17), Shade (18), Specimen (19), Containers (20), Topiary (21), Under trees (22), Wind break (23).

Quisqualis indica, are detected to be in seven position in landscape. Moreover, among identified species 9 species [*Ageratum houstonianum* (pink or purple colors), *Alternanthera versicolor*, *Anisacanthus vulgar*, *Duranta plumieri*, *Euphorbia milii*, *Euryops pectinatus*, *Ixora coccinea*, *Justicia adhatoda*, *Lantana camara nana*, *Ocimum basilicum*,....etc.) are used as borders, 87 species (*Acacia farnesiana*, *Acacia saligna*, *Ageratum Houstonianum*, *Bauhinia variegata*, *Bombax ceiba*, *Cassia fistula*, *Chorisia speciosa*, *Chrysanthemum Species*,....etc.) are used for flowering and 23 species (*Acacia farnesiana*, *Albizia Lebbeck*, *Carissa grandiflora*, *Cestrum aurantiacum*, *Citrus sinensis*, *Jasminum grandiflorum*, *Jasminum humile*, *Lagerstroemia indica*, *Lawsonia alba*,....etc.) are used in fragrance while the minimum utilizes were wind break (*Leucaena leucocephala*, *Melaleuca leucadendra*, *Melia Azedarach*, *Parkinsonia aculeata* and *Schinus molle*) and covering arbour/ pergolas (*Antigonon leptopus*, *Jasminum grandiflorum*, *Jasminum humile* and *Quisqualis indica*).

Furthermore, [12] evaluated 401 taxa for utilization in landscape architecture design, the majority of these plants Awad et al., 2023

were suitable for aesthetic use (water gardens, rock and dry wall, urban design, roof and terrace gardens, special designs, roadside plantation, road median planting, border fronts, fences, hiding unwanted views....etc.) and others were suitable for ecological and functional landscape use (ground cover, erosion, slope stabilization, avalanche and landslide protection, landscape restoration and preservation, sound and wind prevention).

4. Conclusions

From above mentioned findings, it is preferable to survey ornamental and herbaceous plants of different to know their landscape value and use as well as to evaluate of plant species was focused on their current or projected usefulness in the landscape.

References

- [1] F. Aşur. (2019). Ornamental plants which can be used in visual landscape improvement in cold climate regions. J. Int. Environmental Application & Science, 14 (4): 152-159.

- [2] A. S. I. Abdelnaby, A. A. Mewead, A. S. H. Gendy & M. A. I. Abdelkader. (2021). Landscape use and aesthetical value of surveyed woody ornamental plants in Cairo Festival City - Cairo - Egypt in landscape gardening. *Plant Archives*, 21 (1): 116-122.
- [3] H. N. Mohamed & M. Moawad. (2016). Egyptian exports of cut flowers and ornamental plants. *Egyptian Journal of Agricultural Economics*, 26 (6B): 893-908.
- [4] H. Akbari, M. Pomerantz & H. Taha. (2001). Cool surfaces and shade trees to reduce energy use and improve air quality in urban areas. *Solar Energy*, 70 (3): 295-310.
- [5] D. J. Novak & D. E. Crane. (2002). Carbon storage and sequestration by urban trees in the USA. *Environmental Pollution*, 116 (3): 381-389.
- [6] T. D. Walker. (1991). *Planting Design*. Van Nostrand Reinhold, New York.
- [7] G. M. Heisler & R. H. Grant. (2000). Ultraviolet radiation in urban ecosystems with consideration of effects on human healthy. *Urban Ecosystems*, 4 (3): 193-229.
- [8] S. Braun & W. Fluckiger. (1998). Soil amendments for plantings of urban trees. *Soil and Tillage Research*, 49 (3): 201-209.
- [9] Ş. Dönmez. (2016). Uses of some medicinal and aromatic plants in the landscape architecture grown in the lakes district. *International Journal of Advanced Research*, 4: 30-36.
- [10] M. A. Irmak. (2013). Use of native woody plants in urban landscapes. *Journal of Food, Agriculture & Environment*, 11 (2): 1305-1309.
- [11] L. C. Sandoval-Herazo, A. Alvarado-Lassman, J. L. Marín-Muñiz, J. M. Méndez-Contreras & S. A. Zamora-Castro. (2018). Effects of the use of ornamental plants and different substrates in the removal of wastewater pollutants through microcosms of Constructed Wetlands. *Sustainability*, 1594 (10): 1-19.
- [12] H. Surat, & Ö. Eminağaoğlu. (2018). Determination of the aesthetical and functional use of certain natural plants in Hatila valley national park in landscape architecture. *International Journal of Ecosystems and Ecology Science*, 8 (1): 113-134.