

Plant Diversity in the King Saud University Female Campus

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Abstract: *Vegetation one of types of biological diversity, which is an important element on which human and animal depend on providing the energy sources necessary for the continuation of their lives, in addition to its environmental importance in preserving the soil from erosion by water erosion and aerobic and desertification resistance. Therefore, the study aimed to define the vegetation cover of the University City for female students of King Saud University in Riyadh and the documentation of existing species to be a reference for women interested in conducting studies and research in the field of Botany or other related sciences. The study also aims to encourage the student community to take care of the biodiversity of their university, where flora was the studied area. A total of 52 different plants were observed between local and exotic flora plants, and plants planted for decoration and shade. The number of flora plants was 31 different plant species. Cultivated plants for decoration 21 different species. The study also recorded five plant species of Monocotyledon represented by the two groups poaceae and Cyperaceae, while the remaining 48 species of Dicotyledon belong to 21 different plant species*

Keywords: Vegetation- Biodiversity- King Saud University- Al-Diriyah

1. Introduction

Biodiversity is wide range of different species of organisms that are naturally present in one environment. This environment includes plants of all kinds, sizes and shapes, and also includes vertebrate animal organisms such as mammals, birds, invertebrates Such as worms and insects, and also microorganisms such as bacteria, fungi, algae and others. In the last years of this century, where various human activities contributed to the extinction of some plant and animal species. But the expansion of environmental studies and the deepening of the precise specialization of species relations have demonstrated the great importance and great role of biodiversity in the environment and human life, which makes biodiversity synonymous with the beauty of nature. Vegetation is one of the types of biological diversity. It is one of the important elements on which humans and animals depend on the provision of energy sources for the continuation of their lives, as well as their environmental importance in preserving the soil from erosion due to erosion and resistance to desertification (Oudat *et al.*, 1993). Vegetation is associated with a series of related interactions in the environment. When a part of the chain breaks down, it causes a disruption in the chain resulting in global economic, industrial and aesthetic losses. If plants are diversified into the environment, on farms and orchards, they will yield different benefits. The most important of which is the continuity and sustainability, increase the fertility of the soil and protect it from erosion and sand crawling, the presence of different species of organisms in the environment is very important. Because the physiological difference and the difference in the chemical composition (secondary compounds) and the structure between these species provide a variety of sources of food, clothing, shelter and medicine for humans, and it is a source of food for animals (herbs, fruits, seeds,..... etc) (Patrick *et al.*, 2009). On the other hand, biodiversity provides the base for the improvement of agricultural crops, decoration Plants, foliage and fruit trees. It also preserves the functions of natural ecosystems such as Photosynthesis, pollination, biological cycle of elements,

etc., on evolutionary processes in nature and contributes to the balance of local and regional climate. Global and sustainable development at the local, regional and global levels (Nahal, 2003). Maintaining biodiversity means providing food, housing, medicine and other sources of human life on the planet. According to many studies what has been recorded from the threat of many types of plant and animal kingdoms located on the planet, which is estimated 10 to 14 million species have documented the exposure of 1.2 million species of the threat of extinction for many reasons, including natural, including human activities Different. The disappearance of plant species, which have been an important part of the discovery of treatments for human and animal diseases, has forced humans to compensate for this with chemical compounds and drugs that pose a threat to their health. For these and other reasons, interest in biological heritage has become important for any country. This is why local and international plant banks have been formed, as well as the establishment of nature reserves to provide suitable habitat for threatened animals. This was agreed at the UN General Assembly on December 22, 2010, 2011 to 2020 Biodiversity Conservation Decade based on the Convention on Biological Diversity Convention on Biological Diversity. Attention to biodiversity is not the responsibility of governments alone, but of all civil society organizations and individuals in general, because, as we have already pointed out, the greatest threat to living organisms through activities and behaviors is more damaging than natural disasters.

In this regard, we believe that as students in the field of Botany, we must be proactive in preserving plant biodiversity and its importance and spreading the culture of utilization of natural plant resources while preserving it as a sustainable biological resource, especially under environmental conditions that are often inappropriate to increase plant biodiversity. , And the work of studies and research on the conservation of plant biodiversity and encourage propagation by natural or laboratory methods and the use of modern genetic engineering methods. Therefore, the objective of this study is to shed light on the vegetation

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in the University City of female students of King Saud University in Riyadh (Kingdom of Saudi Arabia) and document the existing species to be a reference for women interested in conducting studies and research in the field of Botany or other related sciences. The study also aims to encourage the student community to take care of the biodiversity of their university.

2. Study Area

King Saud University Located in the eastern corner of Al-Diriyah north-west of Riyadh, with an area of 1.232.000 m². Although it consists of 14 colleges and administrative buildings, it contains green areas planted and uncultivated. It contains natural flora plants that grow and bloom and bear fruit in their natural seasons. Since the study will be in the University City for female students in Riyadh, we will give a simplified overview of the study area represented by the city of Riyadh. Riyadh occupies an area of approximately 375,000 km² in central Saudi Arabia, comprising 47 cities and 1,383 population centers between center and village. The area is characterized by a variety of environmental elements, where the different terrain represents the plateau Najd component of the most prominent, in addition to the mountains of Tuwaiq in the north, Wadi Hanifa and Wadi Aldawasr, and thus constitute a relatively homogeneous geographical composition contains a unique group of plants and animals that have been affected and are still affected Negatively affected by the expansion of urban activity and associated activities from industrial, mining, agricultural, grazing and extortion activities. The vegetation in the region extends in various forms, most notably landscaping, gardens and green spaces within the urban areas as well as pastures, forests and ranches, which extend in the valleys and plains in addition to the vegetation cover represented by the existing agricultural areas. in view of the importance of vegetation in the various environmental aspects necessary for human life, the need to restore, rehabilitate and strengthen it has been expressed by efforts to preserve the availability and rehabilitation of degraded areas, as well as the cultivation of more trees, shrubs and plants in natural areas and more importantly within urban areas and expansion In accordance with the environmental determinants of the region such as the availability of water, soil and climate. Vegetative environments are divided into two types of natural and updated environments as follows updated environments, which are man-made environments, including urban clusters (cities and cities), all cities, villages, and migration. They often include farmed reforestation, as well as surrounding areas or plantations and orchards. The agricultural areas include the vast areas of agricultural land, which extend in the south, center, and north of the region, and are part of the environmental geographical map. and natural environments that make up the local habitat and include in the Riyadh region; Sand dunes, Sand Sheets, Rocky plains, Gravel plains, Rock/ Rocky Mountain, Sabkhat, valleys and main cliffs. Riyadh region has a desert climate characterized by heat and drought. In the summer, from June to September, the temperature rises to 43°C. The winter colds - December to February - fall to minus 10°C and sometimes, rainfall is rare at an annual rate of 84.4 mm and a humidity of 33.1%. These climatic conditions lead to more demand for plants in Riyadh, especially within urban

areas. Improving the local climate in dry lands is a major goal for all afforestation and horticulture workers. Plants play their role in tempering the climate, reducing sun glare and filtering dust, In addition to aesthetic value, providing the comfort and visual pleasure of man. The plants also play an important role in stabilizing the soil and increasing its moisture levels, which leads to the relaxation of the surrounding environment and significantly reduce the temperature (Supreme Council for the Development of Riyadh, 2015).

3. Mechanisms and methods of study

To achieve the objectives of the study, the research team of research project course students undertook the task of conducting a survey of the plant species in the University City, based on the division of the study area into several parts according to the university map (Fig 1) as shown in Table (1). Each student of the research project is responsible for the depiction of the vegetation cover and the identification of the plants with the assistance of the project supervisor, refer to the books of Saudi Arabia flora (Collenette,1999; Migahid, 1974).

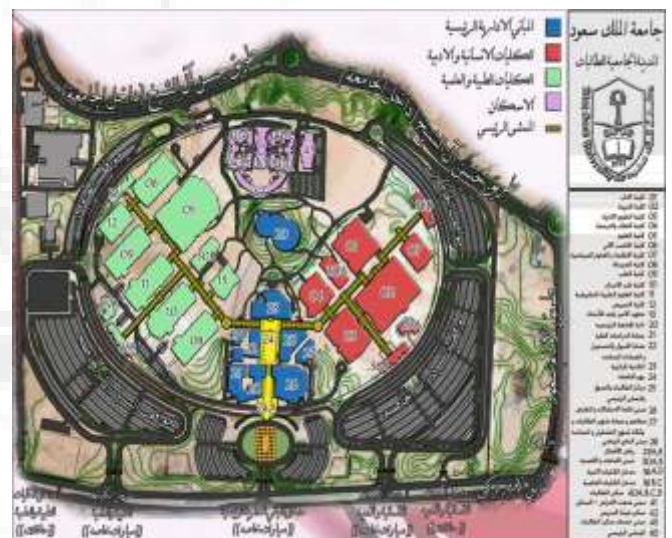


Figure 1: Planning of king suad university for female students shows the locations of colleges and departments

Table 1: Division of the university city into areas according to the number of buildings that fall within them

Zone Code	Building Number
A	5, 6, 9, 11, 12
B	8, 10, 13, 30B
C	1, 2, 3, 4, 30A
D	7, 43 (Area for student housing)

4. Results

A large number of plants were observed throughout the university city, some of which were planted for decoration and shade. Most of the plant species are natural plants. plants were identified through Saudi flora books. also contacted the experts of wild plants in the Kingdom to identify them as Right. Plants are a natural object that can exist in abundance if suitable conditions are created or disappear if the conditions surrounding it are not

appropriate. So we may find these plants in search before you for years to come and sometimes will not find it and other plants will grow. A total of 52 different plants were observed among flora, local and exotic plants, and Planted plants for decoration and shade, sorted alphabetically according to their scientific name (Table 2). The images were also edited in the order of plant species in the table. Plant species were characterized in terms of the nature of growth, the original habitat of the plant and economic importance.















The number of flora plants was 31 different plant species with 59.7% of the total plants of the study area. cultivated plants 21 different species by up to 40.4% Table (3) Figure (2). Also recorded the number of 5 species of Monocotyledon, represented by the Poaceae and Cyperaceae, with a low diversity of 9.7%. While the remaining 48 species of Dicotyledon, represent a plant diversity of 90.3% Table (4) and Figure (3). Total of plant




















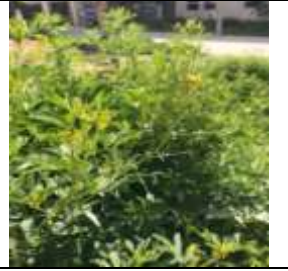




families in the study area was 23 different families 21 belonging to Dicotyledon and 2 remaining belong to Monocotyledon, Table (5). Asteraceae recorded the highest percentage of plant diversity as high as 19% of the plant species recorded in the study, while some species recorded a low variability of up to 2% of the number of species recorded in this study, as shown in Figure (4). Some species of plants are very high frequencies, which are present in most areas of the study. This is natural due to the spread between species and the suitable environment conditions for their growth and breeding. Therefore, the area can be limited but the diversity is large. Some areas, despite their large area, A large number of plants, but they are of one or two species, making them a low variety. Area A, which includes buildings (5,6,9,11,12), recorded the largest number of plant species with a diversity of 30.8%, while the area D represented by buildings (7, 43) recorded a decrease in plant diversity by to 1.9%.

Table 2: Inventory of plant species arranged alphabetically by scientific name

#	Plant Name	Family Name	Common Name	Plant location	Type of plant
1.	<i>Aloe barbadensis</i>	Asphodelaceae	صبار	A,B, D	F
2.	<i>Anagallis arvensis</i>	Primulaceae	اناغليس، حشيشة العلق	C	P
3.	<i>Asclepias curassavica</i>	Asclepiadaceae	الدفة القرمزية، حشيشة اللبن	A	P
4.	<i>Asclepias syriaca</i>	Asphodelaceae	الصقلاب السوري	D	F
5.	<i>Atriplex prostrata</i> DC.	Chenopodiaceae	رغل، القطة، القطاف	A,B	F
6.	<i>Bassia eriophora</i>	Chenopodiaceae	الصوفانه، قطينه، قطين	A,C	F
7.	<i>Bougainvillea spectabilis</i>	Nyctaginaceae	الجهنمية	A,B	P
8.	<i>Calendula tripterocarpa</i>	Asteraceae	حنوة	A,B	F
9.	<i>Calotropis procera</i>	Asclepiadaceae	العشار، العشر	C	F
10.	<i>Cassia fistula</i>	Fabaceae	خيار شنبر	B	P
11.	<i>Cenchrus ciliaris</i> L.	Poaceae	الاييد، اللبيد	C	F
12.	<i>Citrullus colocynthis</i>	Cucurbitaceae	حنظل، شري	C	F
13.	<i>Clerodendrum tomentosum</i>	Verbenaceae	الياسمين الزفر	A	P
14.	<i>Convolvulus arvensis</i>	Convolvulaceae	العليق	A	F
15.	<i>Convolvulus oxyphyllus</i>	Convolvulaceae	العضرس	A	F
16.	<i>Conyza bonariensis</i>	Asteraceae	كونيزا	A	F
17.	<i>Cordia sebestena</i>	Boraginaceae	المخيط	B	
18.	<i>Cyperus alternifolius</i>	Cyperaceae	السعد، سعد مطلي	A,B,C,D	P
19.	<i>Dimorphotheca sinuata</i>	Asteraceae		C	P
20.	<i>Eleusine indica</i>	Poaceae	نجيل	A,B,C,D	F
21.	<i>Euryops pectinatus</i>	Asteraceae	حنقلان، ايرويس	A,B, D	F
22.	<i>Fagonia laevis</i>	Zygophyllaceae	الشكاة، الجنية، الطليحة	A	F
23.	<i>Helianthus annuus</i>	Arecaceae	دوار الشمس	A	P
24.	<i>Heliotropium europaeum</i>	Boraginaceae	رقيب الشمس الأوروبي	A	F
25.	<i>Hibiscus rosa</i>	Malvaceae	الهيبسكس	A	P
26.	<i>Hibiscus tiliaceus</i>	Malvaceae	كرديه ساحلي	A	P
27.	<i>Holcus lanatus</i>	Poaceae	هولكوس، نجيل	A,B,C,D	F
28.	<i>Lactuca virosa</i>	Asteraceae	خس نفاذ، الخس المرير	A,B,C,D	F
29.	<i>Lantana camara</i>	Verbenaceae	اللانانا	A	P
30.	<i>Launaea mucronata</i>	Asteraceae	العصيد	A,B,C,D	F
31.	<i>Launaea nudicaulis</i>	Asteraceae	حوا، بفرا	A	F
32.	<i>Malva parviflora</i>	Malvaceae	الخبيزة	A,B,C,D	F
33.	<i>Medicago minima</i> L.	Fabaceae	البرسيم البري، النفل	A	P
34.	<i>Melilotus sulcatus</i> Desf	Fabaceae	حنذقوق	A,D	F
35.	<i>Nerium olender</i>	Apocynaceae	الدفة	A,C	P
36.	<i>Pennisetum setaceum</i>	Poaceae	ثيوم شانك	A	F
37.	<i>Petunia integrifolia</i>	Solanales	بتونيا	A,B,C,D	P
38.	<i>Phoenix dactylifera</i>	Arecaceae	نخل التمر	A	P
39.	<i>Pulicaria crispa</i>	Asteraceae	الجثجات	A,B,C,D	F
40.	<i>Ruellia simplex</i>	Acanthaceae	روليا	A	P
41.	<i>Rumex vesicarius</i>	Polygonaceae	الحميض	A,B,C,D	F
42.	<i>Schimpera arabica</i>	Brassicaceae	صفار، صفراء، خس البر	A,B, D	F
43.	<i>Senna silvestris</i>	Fabaceae	سنط، سنا	B	F
44.	<i>Solanum nigrum</i>	Solanaceae	عنب الديب	A,B	F

45.	<i>Sonchus arvensis</i>	Asteraceae	تفاف بستاني ، الجعبيض	B	F
46.	<i>Taraxacum mongolicum</i>	Asteraceae	الهندباء	A,B,C,D	F
47.	<i>Tecoma tenuiflora</i>	Bignoniaceae	التيكوما	A,B,C	P
48.	<i>Thevetia peruviana</i>	Apocynaceae	سفيتيا، ثقيتيا	B	P
49.	<i>Vinca rosea</i>	Apocynaceae	ونكا، فنكا	B	P
50.	<i>Washingtonia robusta</i>	Arecaceae	نخل واشنطونيا	C	P
51.	<i>Withania somnifera</i>	Solanaceae	سم القراخ	A,B,C,D	F
52.	<i>Ziziphus spina-christi</i>	Rhamnaceae	سدر بلدي، نيق	B	F

<i>Aloe barbadensis</i>	<i>Anagallis arvensis</i>	<i>Asclepias curassavica</i>	<i>Asclepias syriaca</i>
			
<i>Atriplex prostrata</i>	<i>Bassia eriophora</i>	<i>Bougainvillea spectabilis</i>	<i>Calendula tripterocarpa</i>
			
<i>Calotropis procera</i>	<i>Cassia fistula</i>	<i>Cenchrus ciliaris</i>	<i>Citrullus colocynthis</i>
			
<i>Clerodendron inerme</i>	<i>Convolvulus oxyphyllus</i>	<i>Convolvulus arvensis</i>	<i>Conyza bonariensis</i>
			
<i>Cordia sebestena</i>	<i>Cyperus alternifolius</i>	<i>Dimorphotheca sinuata</i>	<i>Eleusine indica</i>
			

<i>Euryops pectinatus</i> 	<i>Fagonia laevis</i> 	<i>Hibiscus rosa</i> 	<i>Hibiscus tiliaceus</i> 
<i>Holcus lanatus</i> 	<i>Lantana camara</i> 	<i>Lantana camara</i> 	<i>Launaea mucronata</i> 
<i>Launaea nudicaulis</i> 	<i>Malva parviflora</i> 	<i>Medicago minima L.</i> 	<i>Melilotus sulcatus</i> 
<i>Nerium olender</i> 	<i>Pennisetum setaceum</i> 	<i>Petunia integrifolia</i> 	<i>Phoenix dactylifera</i> 
<i>Pulicaria crispa</i> 	<i>Ruellia simplex</i> 	<i>Rumex vesicarius</i> 	<i>Schimpera arabica</i> 
<i>Senna silvestris</i> 	<i>Solanum nigrum</i> 	<i>Sonchus arvensis</i> 	<i>Taraxacum mongolicum</i> 

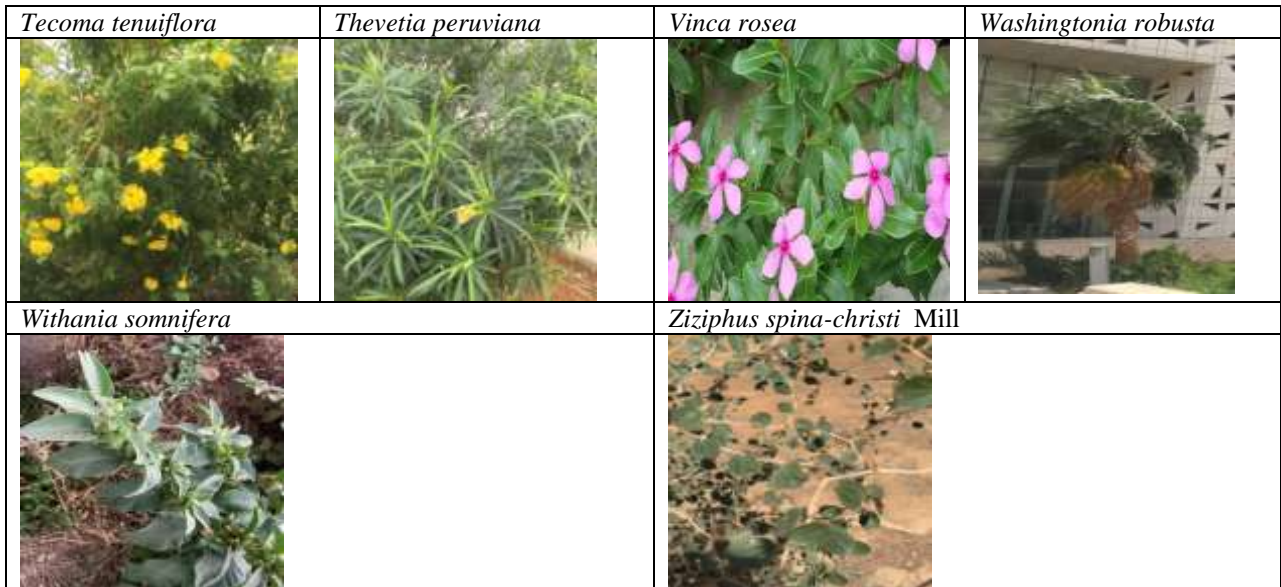


Table 3: Classification of vegetation in the study area by origin

Class of plants	number	Percentage %
Dicotyledon	47	90.3
Monocotyledon	5	9.5

Table 6: Percentage of plant species frequency in areas identified in the study

Zone code	Frequency	Percentage %
A	16	30.8
A,B	4	7.7
A,B, D	4	7.7
A,B,C,D	11	21
A,C	2	3.8
A,D	1	1.9
B	7	13.5
C	6	11.5
D	1	1.9

Table 4: List of plant constituents of plant cover in the study area

Plant type	number	percentage %
flora	31	59.7
planted	21	40.4

Table 5: List of Plant Varieties of Vegetation in the Study Area

#	class	Family Name	Number of species
	Dicotyledon	Acanthaceae	1
		Apocynaceae	3
		Arecaceae	3
		Asclepiadaceae	3
		Asphodelaceae	1
		Asteraceae	10
		Bignoniaceae	1
		Boraginaceae	2
		Brassicaceae	1
		Chenopodiaceae	2
		Convolvulaceae	2
		Cucurbitaceae	1
		Fabaceae	4
		Malvaceae	3
		Nyctaginaceae	1
		Polygonaceae	1
		Primulaceae	1
		Rhamneae	1
		Solanaceae	3
		Verbenaceae	2
	Zygophyllaceae	1	
	Monocotyledon	Cyperaceae	1
		Poaceae	4

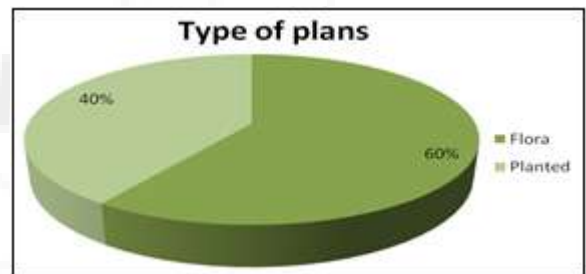


Figure 2: Proportion of Flora and Plants Cultivated in the Vegetation of the University City

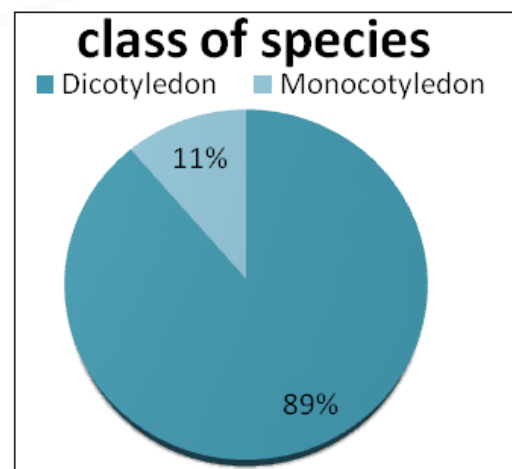


Figure 3: Percentage of phlox and flora plants in the vegetation of the university city

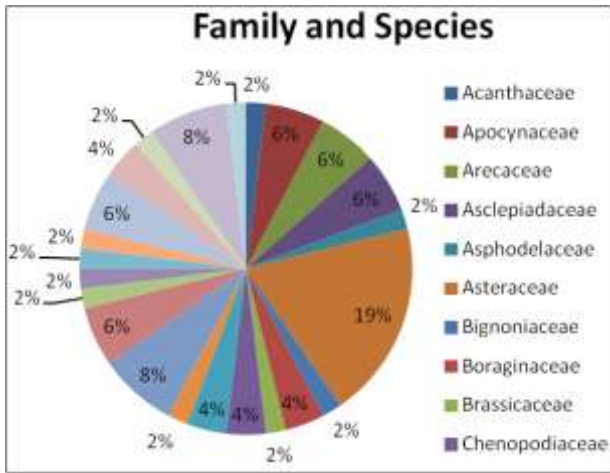


Figure 4: Percentage of species and subspecies in the vegetation of the university city

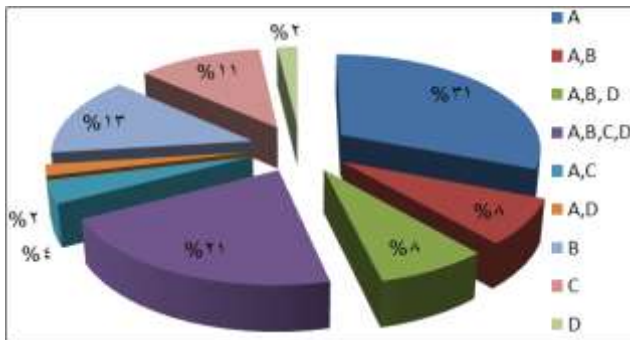


Figure 5: Percentage of plant species in areas identified in the study

5. Conclusion

The plants that have been monitored in this study are varied in terms of their classification between wild plants and planted plants, which in general enrich their area of presence and contribute to the improvement of environmental conditions, whether air or soil and its components, the most important in terms of plant groups and the most diverse in The studied area of Asteraceae species This indicates that belonging to endemic species and appropriate conditions surrounding them contributed to the diversity, but some species recorded low diversity and this is evidence that the plants exotic or planted like Nyctaginaceae It is found that some areas appear dense vegetation and some of the vegetation seems poor and widespread and this indicates that the region lacks some important factors for the growth of water, for example, wild plants of course, so when there is a scarcity of rain water there will be a decline in vegetation (growth and diversity). vegetation can change in the coming year, so new species will appear and the species that have been registered here will disappear. This is due to the surrounding environmental conditions and the high level of environmental awareness among the people living in this area.

6. Recommendations

Plants are living organisms of the basic constituents of the food cycle in nature. The spread of plants throughout the globe has contributed to the conservation of soil from

erosion and the environment from desertification, as well as adaptation to living in all environments. It also provides the environment with oxygen when it is made, Food for other creatures, and soothe the atmosphere and moisturize it by putting water vapor in the air. Therefore, the study recommends that plants should be kept as long as possible by not cutting them or walking on them, or throwing the waste and the remains of food on them. Plants are creatures adapted to the surrounding conditions If the environmental conditions suitable for plant germination and growth will grow and flourish and vice versa so have been recorded plant species that we saw in this period of the year January - February - March, it is possible to grow new species in the coming years and disappear in return Some species are listed here. Therefore, it is necessary to complete studies in this area (vegetation in the university city). This study is a simple reference for students and researchers in the university city and do not need to study some plants or their extracts by reference to this study for help and inference.

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