

Floristic Features of Wadi El-Rashrash, North Eastern Desert, Egypt

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Abstract: The study considers an examination of the floristic highlights, including list of recorded taxa, chorotype, life-form spectra and floristic investigation of the plant life within the northern portion of the Eastern arid region of Egypt. The recorded plant taxa studied in the region of study was 83 species having a place to 68 genera and 26 families totally. According to their duration these taxa were divided into 3 major classes as follows: 51 perennials, 2 biennials and 30 annuals. The largest families were Asteraceae, Fabaceae, Chenopodiaceae, Plantaginaceae and Brassicaceae. All these taxa were also separated under 6 types of life forms: therophytes, geophytes, nanophanerophytes, hemicryptophytes, chamaephytes and phanerophytes. Out of the recorded taxa 22 (about 26.50 % of all listed species) were Mediterranean taxa, which either Pluriregional (6 taxa = 7.22 %), Biregional (14 taxa = 16.86 %) or Monoregional (2 taxa = 2.40 %). It has been also found that, 4 taxa or about 4.81 % of all number of the listed taxa were Cosmopolitan and Neotropical

keywords: Eastern desert, flora, life form, chorotype, Egypt.

1. Introduction

Egypt, as a portion of the Incredible Forsake Belt, is specialized by a warm and about rainless climate [1]. In Egypt, take off regions include nearly eighty five percent of the full extend. Spurn in Egypt is between the hyperarid divisions in the world. Rainfall is restricted (not surpassing 10mm/year in almost nation's parts), locales, the design of water dispersion is worthy critical than precipitation sum [2]. The ground surface, least in connection to nearby geology, may get sums of surface water a few times from all rainfall [3].

The Eastern Forsake of Egypt that possesses the range amplifying from the Nile Valley eastbound to the Inlet of Suez and the Ruddy Ocean, which is around 223,000 km², i.e. 22.3% of the whole range of Egypt. It is navigated by various canyon like sorrows (aqueducts) running to the Nile Valley or to the Ruddy Ocean. These watercourses denote an account of the vegetation sorts and natural properties of the Ruddy Ocean coastal arrive and the inland forsake regard as the most biological parts in the east of Forsake of Egypt. Most of the watercourses deplete westbound into the Nile [4,5]. The run of the Ruddy Ocean

coastal mountains isolates the east of Leave into 2 fundamental environmental units: the Ruddy Ocean coastal arrive and the inland forsake [6,7].

Wadi El-Rashrash (also known as Wadi ar Rashrash) is a depression in the north section of Eastern Desert (Helwan Desert), Egypt. The watercourse bowl with winds and tributaries reach a greatest length of around 67km. A Wadi could be a valley or ravine, bounded by generally soak banks, which within the blustery season gets to be a water and characterized by a few relict stands [8]. South of Watercourse Rashrash, the location of the ancient cultivate and an mountain goat save. In the way of watercourse cuts over the stones & sand porches in the valley of Nile, Its eastbound expansion cuts a profound gorge over a level. That gets a few of the waste of the western limits of the Galalla El-Bahariia level [9].

The present work aims to investigate the floristic features, counting record of species, dispersion design, chorotype, life-form spectra and categories of flora of the plant taxa in Wadi El-Rashrash in Egypt to identify the ordered

and phytogeographical importance of its flora composition.

STUDY AREA

The region of study is found in the eastern side of the Nile Valley, is bounded by El-krumat-El zafrana road in the south, Cairo-Suez road in the north, and in the East by Suez Gulf, as well as the Nile Valley in the west. Wadi El-Rashrash (also known as Wadi ar Rashrash) is a depression in the north section of Eastern Desert (Helwan Desert), Giza Governorate, Egypt. It is found at an height of 79 meters over ocean level. Its coordinates are 29° 27' 51" N and 31° 22' 02" E.

The area of Cairo – Suez desert road is a belt that transects the northeast desert of Egypt, which is bound on its southern side by the edge of the Eastern Desert limestone plateau that stretches from the Mokattam near Cairo to the Ataqa near Suez. Northward of this edge extends an undulating plain of gravel desert studded with low bodies of limestone that reaches to the boundaries of the Delta and its northern saline marshes [10].

The application of a few strategies proposed for the classification of climate illustrates that, the Cairo-Giza arid region is belonging to arid mesothermal type of Thornthwaite [11], the Saharn Mediterranean climate of Emberger [12], the arid climate of Meig [13], the hot desert climate of Millar [14], and the arid- or extreme arid climate of Walter [15]. Meteorological information of the Suez Locale appears that, the climate of this locale is clearly dry and hot. The high temperature and low precipitation are the most perspectives of its aridity



Figure 1. Egypt Map displaying northern part of Eastern arid region

2. Materials and methods

Sampled of stands are distributed in two Governorates of Egypt, namely: Giza and Suez. After different customary visits to the distinctive area location area of the study region, 67 location (area = 20 × 20 m) have been chosen for sampling taxa along Wadi El-Rashrash. The locations have been selected and distributed to cover all physiographic variation in each habitat type and to ensure sampling of wide range of vegetational variations. The thickness and cover of each taxa have been assessed per chosen site. The thickness of each plant taxa was determined by checking the numbers of members of the taxa inside a arrangement of arbitrarily conveyed sites [16]. By using the line intercept method [17], cover of plant of each taxa in the studied stands was measured. Relative values of density and cover were measured for each plant species. They were summed up to provide an assess of its importance value (IV) in each stand that is out of 200.

Amid each visit, plant examples were possessed from distinctive destinations for recognizable proof. All tests were hold within the Herbarium of Botany Office, Workforce of Science, Mansoura-University. The depiction and doff life-divisions forms within the show consider were as suggested by Raunkiar [18,19]. The recognizable proof and floristic categories classification were as said by Tutin *et al.* [20], Davis [21], Zohary [22], Täckholm [23], Meikle [24], Feinbrun-Dothan [25] and up to date by Boulos [26].

3. Results and discussion

1. Floristic features

Table (1) display the composition flora of plant taxa in Wadi El-Rashrash (Northern sector of Eastern desert), 67 stands have been selected for sampling vegetation. The listed of wild plants in the area of study are presented in Table (1), which appeared that, the all number of plant species in the recent study is 83. These taxa are classified as shown in Figure (2) into three major groups: 30 annual species (36.14%), two biennial species (2.41%) and 51 perennial species (61.45%). In Egypt, most of the wild flora are annuals and very few are true biennials. The perennial species are mostly herbaceous either with woody base or with

tuberous underground parts and few are shrubs. On the premise of plant life span (term), the vegetation of the consider zone (83 species) is composed of 30 yearly species (36.14%), two biennial species (2.41%) and 51 lasting species (61.45%). Perennials dominance may be attributed to the nature of the living space sorts within the show consider regenerative capacity, environmental, morphological and hereditary versatility are the constraining components for the growth and abundance of either annuals or biennials [27, 28, 29]. This concurred with the thinks about of Shaltout and El-Fahar [30], Mashaly [31], El-Demerdash *et al.* [32], Fossati *et al.* [33], Shaltout *et al.* [34], Galal and Fawzy [35] and El-Amier *et al.* [36].

Agreeing to the depiction and classification of life-forms [18], within the display consider are assembled beneath six sorts as takes after: therophytes, geophytes, nanophanerophytes, hemicryptophytes, chamaephytes and phanerophytes (Figure 3). Most of the listed taxa are therophytes (37.35%) taken after by chamaephytes (33.73%) after that hemicryptophytes (14.46%), nanophanerophytes (8.43%) and phanerophytes (3.61%). The most reduced esteem of life-forms is recorded as geophytes which

accomplished esteem of (2.41%). The past comes about concurred with those detailed by El-Demerdash *et al.* [37], Mashaly [38], El-Halawany *et al.* [39] 010), Salama *et al.* [40], Salama *et al.* [41] and El-Amier and Abdulkadur [42]. Therophytes dominance over the other life shapes appears to be a reaction to the neighborhood climate (yearly precipitation), geography variety and biotic impact [43]. Therophytes are similarly less adjusted to dry season and saltiness and their nearness could be a regular marvel, they ended up plenteous as it were during the stormy season and where saltiness isn't a constraining figure [44]. The nature of the winning bone-dry climate within the think about locale, the degree of water accessibility and the sandy nature of the soil causing dominance of therophytes amid the ideal season. The relatively great values of chamaephytes, hemicryptophytes and nanophanerophytes may be credited to the capacity of taxa to stand up to dry season, saltiness, sand aggregation and touching [45,46]. Great of the listed cryptophytes are rhizomatous taxa, this will be an character for their compelling development and their conveyance [47]

Table 1. Floristic Structure of the listed taxa.

Species	Family	Duration	Life form	Chorotype
<i>Acacia tortilis</i> (Forssk.) Hyne	Fabaceae	Per	Ph	SZ
<i>A. mellifera</i> (Vahl) Benth.	Fabaceae	Per	Ph	SZ
<i>Achillea fragrantissima</i> (Forssk.) Sch.Byp.	Asteraceae	Per	Ch	SA-SI+IT
<i>Aerva javanica</i> (Burm.F.) Jus. Ex. Schult.	Amaranthaceae	Per	Ch	SA-SI + SZ
<i>Alkanna lehmanii</i> (L.) Boiss.	Boraginaceae	per	H	ME
<i>Anabasis articulata</i> (Forssk.) Moq	Chenopodiaceae	per	Ch	SA-SI+IT
<i>Anthemis cotula</i> L.	Asteraceae	Ann	Th	ME+IT+ES
<i>Artemisia judaica</i> L.	Asteraceae	Per	Ch	SA-SI
<i>A. monosperma</i> Delil.	Asteraceae	Per	Ch	ME+SA-SI
<i>Astragalus bombycinus</i> Bois.	Fabaceae	Ann	H	SA-SI + IT
<i>A. spinosus</i> (Forssk.) Muschl.	Fabaceae	Per	Ch	SA-SI + IT
<i>Atriplex lindleyi</i> Moq.	Chenopodiaceae	Ann	Th	ME+IT+ER-SR
<i>Bassia indica</i> (Wight) A. J.Scot	Chenopodiaceae	Ann	Th	SZ+IT
<i>B. muricata</i> (L.) Asch.	Chenopodiaceae	Ann	Th	IT+SA-SI
<i>Calotropis procera</i> (Wild.) R.Br.	Asclepiadaceae	Per	Ph	SA-SI + SZ
<i>Calligonum comosum</i> (L'Hér.) Sockov	Polygonaceae	Per	Nph	IT+SA-SI
<i>Centaurea aegyptiaca</i> L.	Asteraceae	Bi	Th	SA-SI
<i>Chenopodium murale</i> L.	Chenopodiaceae	Ann	Th	COSM
<i>Cleome amblyocarpa</i> Barrate& Murb.	Cleomeaceae	Ann	Th	SA-SI
<i>C. droserifolia</i> (Forssk.) Delile.	Cleomaceae	Per	Ch	SA-SI + IT
<i>Crotalaria aegyptiaca</i> Benth.	Fabaceae	per	Ch	SA-SI
<i>Cynanchum acutum</i> L.	Asclepiadaceae	Per	H	ME+IT
<i>Cynodon dactylon</i> (L.) Pers.	Poaceae	Per	G	COSM
<i>Diplotaxis harra</i> (Forssk.) Boiss.	Brassicaceae	Per	Ch	ME+ SA-SI

<i>Deverra tortuosa</i> (Disf.) DC.	Apiaceae	Per	Ch	SA-SI
<i>Diplotaxis acris</i> (Forssk.) Boiss.	Brassicaceae	Ann	Th	SA-SI
<i>Echinops spinosus</i> L.	Asteraceae	Per	H	ME+SA-SI
<i>Emex spinosa</i> (L.) Campid.	Polygonaceae	Ann	Th	ME+SA-SI
<i>Erodium laciniatum</i> (Cav.) Wild.	Geraniaceae	Ann	Th	ME
<i>Erysimum repandum</i> L.	Brassicaceae	Ann	Th	ME+IT+ES
<i>Euphorbia retusa</i> Forssk.	Euphorbiaceae	Per	H	SA-SI
<i>Fagonia arabica</i> L.	Zygophyllaceae	Per	Ch	SA-SI
<i>F. mollis</i> Dilile.	Zygophyllaceae	Per	Ch	SA- SI
<i>Farsetia aegyptia</i> Tura.	Brassicaceae	Per	Ch	SZ+SA-SI
<i>Forsskaolea tenacissima</i> L.	Urticaceae	Per	H	SA-SI + S-Z
<i>Francoeuria crispa</i> (Forssk.) Cass.	Asteraceae	Per	Ch	SA-SI
<i>Gypsophila capillaris</i> (Forssk.) C.Chr	Caryophyllaceae	Per	H	SA-SI+IR-TR
<i>Haloxylon salicornicum</i> (Moq.) Bungi ex Boiss.	Chenopodiaceae	Per	Ch	SA-SI
<i>Heliotropium curassavicum</i> L.	Boraginaceae	Per	Ch	NEO
<i>Herniaria lysistemon</i> J.Gaey	Cayophyllaceae	Ann	Th	ME+ SA-SI
<i>Hordeum leporinum</i> L.	Poaceae	Ann	Th	ME+IR-TR
<i>H. spontaneum</i> K C. Kosh	Poaceae	Ann	Th	ME+IR-TR
<i>Hyoscyamus muticus</i> L.	Solanaceae	Per	Ch	SA-SI
<i>Ifloga spicata</i> (Forssk.) Sch. Bip.	Asteraceae	Per	Th	SA-SI
<i>Iphiona mucronata</i> (Forssk.) Asch. &Schwiinf.	Asteraceae	Per	Ch	SA-SI
<i>Kickxia aegyptiaca</i> (L.) Nábelik.	Scrophulariaceae	Per	Ch	ME+SA-SI
<i>Lasiurus scindicus</i> Hinrard.	Poaceae	Per	G	SA-SI+SZ
<i>Launaea mucronata</i> (Forssk.)Muschl.	Asteraceae	Per	H	ME+SA-SI
<i>L. nudicaulis</i> (L.) Hok.f.	Asteraceae	Per	H	SA-SI
<i>L. spinosa</i> (Forssk.) Sch. Bip. ex Kntze	Asteraceae	Per	Ch	SA-SI
<i>Launaea capitata</i> (Spring) Dandi.	Asteraceae	Bi	Th	SA-SI+ SZ
<i>Lavandula coronopifolia</i> Poir.	Lamiaceae	Per	Ch	SA-SI
<i>Leptadenia pyrotechnica</i> (Forssk.) Decne.	Asclepiadaceae	Per	Nph	SA-SI
<i>Lotus glinoides</i> Delile.	Fabaceae	Ann	Th	SZ
<i>Lycium shawii</i> Roem. & schytl.	Solanaceae	Per	Nph	SA-SI+SZ
<i>Malva parviflora</i> L.	Malvaceae	Ann	Th	ME+IT
<i>Matthiola longipetala</i> (Vent.) DC.	Brassicaceae	Ann	Th	ME+IT
<i>Mesembryanthemum forsskaolii</i> Hochst.ex Bois.	Aizoaceae	Ann	Th	ME+ES
<i>Nauplius graveolens</i> (Forssk.)Wilkund.	Asteraceae	Per	Ch	SA-SI
<i>Neurada procumbens</i> L.	Neuradaceae	Ann	Th	SA-SI + SZ
<i>Ochradenus baccatus</i> Delile.	Resedaceae	Per	Nph	SA-SI
<i>Panicum turgidum</i> Forssk.	Poaceae	Per	H	SA-SI
<i>Plantago notata</i> Lag.	Plantaginaceae	Ann	Th	IT+SA-SI
<i>Plantago ovata</i> Forssk.	Plantaginaceae	Ann	Th	IT+SA-SI
<i>Pulcaria undulata</i> (L.) C.A.Mey. subsp.	Asteraceae	Per	Ch	SA-SI+SZ
<i>Poa annua</i> L.	Poaceae	Ann	Th	COSM
<i>Polycarpaea repens</i> (Forssk.) Asch. & Schweinf.	Caryophyllaceae	Per	Ch	SA-SI
<i>Reichardia tingitana</i> (L.) Roth	Asteraceae	Ann	Th	ME+IT
<i>Reseda discarvia</i> Forssk.	Resedaceae	Ann	Th	SA-SI
<i>Retama raetam</i> (Forssk.) Webb & Berthel.	Fabaceae	Per	Nph	SA-SI
<i>Rumex vesicarius</i> L.	Polygonaceae	Ann	Th	SA-SI+ME+SZ
<i>Scrophularia deserti</i> Delilei	Scrophulariaceae	Per	Ch	SA-SI
<i>Senecio glaucus</i> L.	Asteraceae	Ann	Th	ME+IT+SA-SI
<i>Spergularia media</i> (L.) C. Prisl	Caryophyllaceae	Per	H	ME+ IT+ES
<i>Tamarix aphylla</i> (L.) H. Karst.	Tamaricaceae	per	Nph	SA-SI+SZ
<i>T. nilotica</i> (Ehrenb.) Bungi	Tamaricaceae	Per	Nph	SA-SI
<i>Trichodesma africanum</i> (L.) R.br.	Boraginaceae	Per	H	SA-SI+SZ
<i>Trigonella stellata</i> For sk.	Fabaceae	Ann	Th	SA-SI+IT
<i>Volutaria lippii</i> (L.) Cass. ex Mair	Asteraceae	Ann	Th	SA-SI
<i>Zilla spinosa</i> (L.) Prantil	Brassicaceae	Per	Ch	SA-SI
<i>Zygophyllum coccineum</i> L.	Zygophyllaceae	Per	Ch	SA-SI
<i>Z. decumbens</i> Dille.	Zygophyllaceae	Ann	Ch	SA- SI
<i>Z. simplex</i> L.	Zygophyllaceae	Ann	Th	SA-SI

Abbreviations:			
	Life Span	Life Form	Floristic Category
	Per. = Perennials	H.= Hemicryptophytes	COSM = Cosmopolitan
	Bi. = Biennials	Th. = Therophytes	NEO = Neotropical
	Ann. = Annuals	Ph. = Phanerophytes	ME = Mediterranean
		Ch. = Chamaephytes	SA-SI = Saharo-Sindian
		Nph = Phanerophytes	ER-SR = Euro-Siberian
		G = Geophytes	IR-TR = Irano-Turanian
			S-Z = Sudano-Zambezian

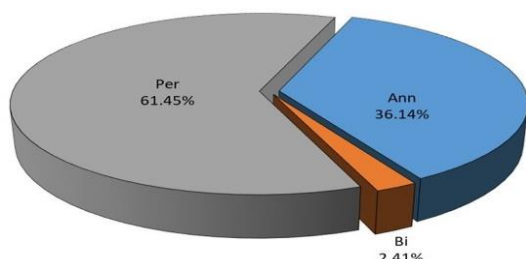


Figure 2. Plant life-span

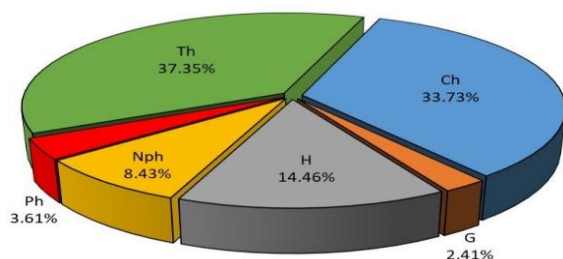


Figure 3. Plant life-forms

2-The Chorotype Analysis of the Study Area

The overall number of the listed plant taxa studied in the present study is 83 taxa belonging to 68 genera and which sign for 26 families. Out of these families, the 4 biggest families basic of species number were, Asteraceae, Fabaceae, Chenopodiaceae and Plantaginaceae. These families numbered collectively for about 38.7 % of the all flora of area of the study. In the other Wadis in Eastern Desert of Egypt, these families were also listed to be the most frequent e.g. Sharaf El-Din and Shaltout [48] reported the phytosociology of Wadi Araba in the Eastern Desert of Egypt. Bournkamm and Kehl [49] studied the plant communities of the Western Desert of Egypt. Briggs *et al.* [50] reported an indigenous knowledge's and taxa utilize around the bedouin area within the Eastern Forsake of Egypt. Hasan [51] considered territory and

plant taxa differing qualities along the Red Sea coast in Egypt. Salama *et al.* [40] studied the vegetation investigation, chorological

affinities and phenological patterns in Wadi Qena, Eastern Desert. Salama *et al.* [41]

regarded floristic composition and plant communities of the vegetation of Channel Al-Assiuty and Waterway Habib inside the Eastern Forsake, Egypt. El-Amier and Abdulkadur [42] examined the vegetation and taxa differing qualities of Wadi Hagul, Northern division of Eastern Leave, Egypt. El-Amier [36] assessed vegetation composition and soil characteristics of five known geophytes in forsake of Egypt. The floristic composition of the plant life in the studied region are exhibit in Table (2). The foremost mutual components of the Asteraceae are Saharo-Sindian (9 taxa), Biregional (7 taxa) and Pluri-regional (2 taxa), In Fabaceae, represented by Biregional, Sudano-Zamdzian (each 3 taxa) and Saharo-Sindian is represented by two species. The most abundant floristic element in Chenopodiaceae is represented by Bi-regional (3 species), Pluri-regional, Saharo-Sindian and Cosmopolitan (only one species each). The most abundant floristic component in Plantaginaceae is spoken to by Biregional (5 species) and Cosmopolitan (only one taxa). The floristic elements of family Brassicaceae are Saharo-Sindian (2 taxa), Biregional (2 taxa) and plurioregional is represent as it were one taxa the floristic elements in Zygophyllaceae are Biregional (5 taxa), the other families (with less than 4 species) include various kinds of floristic composition that are generally spoken to by a little numbers of taxa. The floristic investigation of the study region revealed the 31 species (37.35%) of the overall listed taxa was belonging to Monoregional Saharo-Sindian element. Table (3) reveals also that, 22 species or represented 26.50 % of the whole number of listed taxa are Medit. taxa. These species are either Pluri-regional (6 species = 7.22 %), Bi-regional (14 species = 16.86 %) or Mono-regional (2 species= 2.40 %). It has been also found that, four taxa or 4.81 % of the all no. of the obtained taxa are Neotropical and cosmopolitan.

Table (2). Floristic categories of the recorded families.

Families	Genus	Species	COSM	NEO	ME	Plurioregional	Bi-regional	SA-SI	S-Z
Aizoaceae	1	1	-	-	-	-	1	-	-
Amaranthaceae	1	1					1		
Apiaceae	1	1						1	
Asclepiadaceae	3	3					2	1	
Asteraceae	14	18				2	7	9	
Boraginaceae	3	3		1	1		1		
Brassicaceae	4	5				1	2	2	
Caryophyllaceae	4	4				1	2	1	
Chenopodiaceae	5	6	1			1	3	1	
Cleomaceae	1	2					1	1	
Cruciferae	1	1					1		
Euphorbiaceae	1	1						1	
Fabaceae	6	8					3	2	3
Geraniaceae	1	1			1				
Poaceae	2	2	1					1	
Lamiaceae	1	1						1	
Malvaceae	1	1					1		
Neuradaceae	1	1					1		
Plantaginaceae	4	6	1				5		
Polygonaceae	3	3				1	2		
Resedaceae	2	2						2	
Scrophulariaceae	2	2					1	1	
Solanaceae	2	2					1	1	
Tamaricaceae	1	2					1	1	
Urticaceae	1	1					1		
Zygophyllaceae	2	5					5		
Total	68	83	3	1	2	6	42	26	3
Percentage	3.61	1.20	2.41	7.23	50.60	31.33	3.61		

Table 3. Phytochorotypes of recorded species in the studied wadi.

Families	Genus	Species	COSM	NEO	ME	Plurio-regional	Bi-regional	SA-SI	S-Z
Asteraceae	14	18				2	7	9	
Fabaceae	6	8					3	2	3
Brassicaceae	5	6				1	3	2	
Chenopodiaceae	5	6	1			1	3	1	
Plantaginaceae	4	6	1				5		
Zygophyllaceae	2	5					5		
Caryophyllaceae	4	4				1	2	1	
Asclepiadaceae	3	3					2	1	
Boraginaceae	3	3		1	1		1		
Polygonaceae	3	3				1	2		
Cleomaceae	1	2					1	1	
Poaceae	2	2	1					1	
Resedaceae	2	2						2	
Scrophulariaceae	2	2					1	1	
Solanaceae	2	2					1	1	
Tamaricaceae	1	2					1	1	
Aizoaceae	1	1	-	-	-	-	1	-	-
Amaranthaceae	1	1					1		
Apiaceae	1	1						1	
Euphorbiaceae	1	1						1	
Geraniaceae	1	1			1				
Lamiaceae	1	1						1	
Malvaceae	1	1					1		
Neuradaceae	1	1					1		
Urticaceae	1	1					1		
Total	68	83	3	1	2	6	42	26	3
Percentage			3.61	1.20	2.41	7.23	50.60	31.33	3.61

Conclusion

It can be concluded that, Egypt is the assembly point of the floristic components having a place to at slightest 4 phytogeographical districts: the African Sudano-Zambesian, the Asiatic Irano-Turanian, the Afro-Asiatic Sahro-Sindian and the Euro-Afro-Asiatic Mediterranean. The overall number of the listed plant taxa listed in the study region was 83 taxa having a place to 68 genera and closed to 26 families. The main families include Asteraceae, Fabaceae, Chenopodiaceae, Plantaginaceae Brassicaceae and Zygophyllaceae. The recorded plant species were distinguished into 51 perennials, 30 annuals and two biennials. The listed taxa were assembled under 6 kinds of life forms as takes after: therophytes, geophytes, nanophanerophytes, hemicryptophytes, chamaephytes and phanerophytes. The floristic analysis of the study area showed that 31 taxa (37.35 %) of the overall listed species was Monoregional Saharo-Sindian element. The floristic examination of the think about region moreover uncovered that 22 species or around 26.50 % of the entire number of listed taxa were Mediterranean. These species were either Pluriregional, Biregional or Monoregional. It has been moreover found that, 4 taxa or approximately 4.81 % of the full number of the listed taxa were cosmopolitan and Neotropical.

4. Reference

1. El-Hawagry, M.S. (2017) Catalogue of Egyptian Tephritoidea (Diptera: Schizophora: Acalyptratae). *Zootaxa*, **4299(2)**, p.151-190.
2. Hegazy, A. and Doust, J.L. (2016). Plant ecology in the Middle East. Oxford University Press.
3. Millington, A. and Pye, K. (1994). Biogeographical and geomorphological perspectives.
4. Said, R. (1962). The Geology of Egypt. Amsterdam: Elsevier, 5
5. Salama, F.; Abd El-Ghani, M.; El-Tayeh. (2013) Vegetation and soil relationships in the inland wadi ecosystem of central Eastern Desert, Egypt. *Turkish Journal of Botany*, **37**: 489-498.
6. Abu Al-Izz, M.S. (1971) Landforms of Egypt. The American University in Cairo Press.. Cairo, Egypt, 281 p.
7. Said, R. (1990) The Geology of Egypt. Rotterdam Balkema,.
8. Girgis, S., (1972) April. Anatomical and functional adaptations i-n the venous system of a diving reptile, *Trionyx triunquus* (FOR. SKAL). In Proceedings of the Zoological Society of London,. (Vol. **138**, No. 3, pp. 355-377). Oxford, UK: Blackwell Publishing Ltd.
9. Zahran, M.A. and Willis, A.J., (2009) The vegetation of Egypt, 2nd ed. – London: Springer Science and Business Media,. B.V.
10. El-Bakry, A. A. (1982). Studies on Plant Life in the Cairo-Ismailia Region. M.Sc. Thesis, Fac. Sci., Cairo Univ., Egypt,
11. Thornthwaite, C.W. (1948) An approach towards a national classification of climate. *Geogr. Rev.*, **38**: 55 – 94.
12. Emberger, L. (1955) Une Classification Biogeographiques des Climates. Recueil des Travaux de Laboratoires de Botanique, Geologie et Zoologie de la Faculte de Science dl'Universite de Montpellier, Fascicule,. **7**: 3-43.
13. Meigs, P. (1953) World distribution of arid and semi-arid homoclimates. *Arid Zone Hydrology*, UNESCO, Paris,.
14. Millar, G. J. (1953) Studies on the polarography of proteins. 1. The relation of wave heights to protein concentration and the origin of wave III, *Biochemical Journal*, **53(3)**: 385.
15. Walter, H. (1955) Die Klima-Diagramme als Mittel zur Beurteilung der Klimaverhältnisse für ökologische, vegetationskundliche und landwirtschaftliche Zwecke. *Ber. deut. bot. Ges.*, **68**: 321-344.
16. Shukla, R.S. and Chandel, P.S. (1989) Plant ecology and soil science. S. Chand and company ltd. Ram nagar, New Delhi, India,.
17. Canfield, R. (1941) Application of the line interception method in sampling rang vegetation. *J. Forestry*, **39**: 288-394.
18. Raunkiaer, C. (1943) The Life Forms of Plants and Statistical Plant Geography. Translated by Carter Fausboll and Tansley; Oxford Univ. Press, London,.

19. Raunkiaer, C. (1937) Plant Life Forms. Clarendon, Oxford,.
20. Tutin, T. G.; Heywood, V. H.; Burges, N. A.; Moore, D. M.; Valentine, D. H.; Walters, S. M. and Webb, D. A. , (1964 – 1980) eds. Flora Europaea, Cambridge Univ. Press. 1 -5.
21. Davis, P. H. (1965 – 1985) Flora of Turkey and the East Aegean Islands. Vols. **1 – 9**. Edinburgh Univ. Press. Desert. Egypt. *J. Arid Env., ed. New Age Intern., Limited, New Delhi*, (ed.). **66**: 210-217.
22. Zohary M. (1966 & 1972). Flora Palaestina. Vols. **1&2**. The Israel Acad. of Sci. and Humanities. Jerusalem,
23. Täckholm, V., (1974) Students' Flora of Egypt. 2nd. edn. Publ. Cairo Univ., Beirut, 888..
24. Meickle, R. D. (1977 & 1985). Flora of Cyprus. Vols. **1 & 2**. Bentham-Maxon Trust, Royal Botanic Gardens, Kew,
25. Feinbrun-Dothan, N. (1978) Flora Palaestina.. Israel Acad. Sci. Humanities, Jerusalem., Vol **3**.
26. Boulos, L. (1999, 2001, 2002 & 2005) Flora of Egypt. Al Hadara Publishing, Cairo, Egypt.. **1(4)**.
27. Harper, J. L. (1977) Population Biology of Plants. Academic Press, , London.
28. Grime, J.P., (1979) Plant strategies and vegetation processes John Wiley and Sons.. New York.
29. Qadir, M.; Ghafoor, A. and Murtaza, G. (2000) Amelioration strategies for saline soils. a review, Land Degrad., Dev., **11**: 501–521
30. Shaltout, K. H., and El Fahar, R. A. (1991) Diversity and phenology of weed communities in the Nile Delta region. *Journal of Vegetation Science*,. 385-390
31. Mashaly, I. A. (1996) On the phytosociology of Wadi Hagul, Red Sea coast, Egypt. *J. Environ. Sci.*, **12**: 31-54.
32. El-Demerdash, M. A.; Hosni, H. A. and Al-Ashri, N. (1997) Distribution of the weed communities in the north east the Nile Delta, Egypt. *Feddes Repertorium*, **108**: 219-232.
33. Fossati, J.; Pautou, G. and Peltier, J. P. (1998) Wadi vegetation of the NorthEastern desert of Egypt. *Feddes Repertorium*, **109**: 313–327.
34. Shaltout K. H.; Hassan L. M. and Farahat E. A (2005). Vegetation-environment relationships in south Nile Delta. *Taekholmia*.. **25**: 15-46.
35. Galal, T. M. and Fawzy, M. Global (2007) *Journal of Environment and research*,. **1(2)**: 74-85.
36. El-Amier, Y.A. (2016) Vegetation structure and soil characteristics of five common geophytes in desert of Egypt. *Egyptian Journal of Basic and Applied Sciences*,. **3(2)**, pp.172-186.
37. El-Demerdash, M. A.; Zahran, M. A. and Serag, M. S. (1990) On the ecology of the deltaic mediterranean coastal land Egypt. III. The habitat of salt marshes of damietta-port said coastal region. *Arab Gulf J. Sci. Res.*, **8**: 103-119.
38. Mashaly, I. A. .(1996) On the phytosociology of Wadi Hagul, Red Sea coast, *Egypt. J. Environ. Sci.* **12**: 31-54.
39. El-Halawany, E. F.; Mashaly, I. A.; Abu-Ziada, M. E. and Abd El-Aal, M. (2010). Habitat and Plant Life in El-Dakahlyia Governorate, *Egypt. J. Envi. Sci.* **39(1)**: 83-108.
40. Salama, F. M.; Ahmed, M. K.; El-Tayeh, N. A. and Hammad, S. A. (2012) Vegetation analysis, phenological patterns and chorological affinities in Wadi Qena, Eastern Desert, *Egypt. Afr. J. of Ecol.* **50(2)**: 193-204.
41. Salama, F.; El-Ghani, M. A.; Gadallah, M.; Salah, E. N. and Ahmed, A. M. R. O. (2014) Variations in Vegetation Structure, Species Dominance and Plant Communities in South of the Eastern Desert-Egypt. *Notulae Scientia Biologicae*,. **6(1)**: 41-58.
42. El-Amier, Y.A.; Haroun, S.A.; El-Shehaby, O.A. and Abdulkader, O.M. (2015a). Floristic Features of Northern Sector of the Eastern Desert, Egypt. *Journal of Environmental Sciences, Mansoura Univ.* **44(2)**: 387-401.
43. Heneidy, S. Z. and Bidak, L. M. (2001) Multipurpose plant species in Bisha, Asir region, southwestern *Saudi Arabia. J. King Saud uni. Sci.*. **13.1(2)**: 11-26.
44. Ayyad, M. A. and El-Ghareeb, R. (1982) Salt marsh vegetation of the western

- Mediterranean desert of Egypt. *Vegetatio*, **49**: 3–19.
45. Danin, A., and Orshan, G. (1990) The distribution of Raunkiaer life forms in Israel in relation to the environment. *Journal of Vegetation Science*, **1(1)**: 41–48.
 46. Danin, A. (1996) *Plants of desert dunes*. Springer-Verlag..
 47. Serag, A. E. (1991) *Studies on the Ecology and Control of Aquatic and Canal Bank Weeds in the Nile Delta, Egypt*. Ph. D. thesis, Mansoura University, Mansoura..
 48. Sharaf El-Din, A. and Shaltout, K.H. (1985) On the phytosociology of Wadi Araba in the Eastern Desert of Egypt. *Proc. Egypt. Bot. Soc. IV Ismailia Conf.*, 1311–1317.
 49. Bornkamm, R. and Kehl, H. (1990) The plant communities of the Western Desert of Egypt. *Phytocoenologia*, **19(2)**: 149–231.
 50. Briggs, J.; Badri, M. and Mekki, A. M. (1999) Indigenous knowledge's and vegetation use among bedouin in the Eastern Desert of Egypt. *Applied Geography*, **19(2)**: 87–103.
 51. Hasan M. H. (2003). Ecology and distribution patterns of the threatened holothuroids as correlated with over-fishing in the Gulf of Aqaba, Northern Red Sea, Egypt. *Journal of Egyptian Academic Society of Environmental Development*, **4(3)**: 101–118