

## The floristic composition of Rocky habitat of Al Mansora in Al- Jabal Al- Akhdar- Libya

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**Abstract:** Due to the absence of a survey on all species in Al Mansora habitat, So conducted Floristic composition, to study the number of species and the families, order and life forms of the species found in the rocky habitat during four seasons of autumn 2010 to summer 2011 of Al Mansora site in Al Jabal Al Akhdar in Libya. The research area is located latitude 32, 50', 44.8" N and longitude 21, 50', 30.3" E. Used Raunkiaer's system to classify in life-forms the vascular plants present in 12 random 25 m<sup>2</sup> quadrat. Founded about 175 species belonging to 43 families and 142 genera were recorded in Al-Mansora area. They are represented by 78 perennial, 92 annual and 5 biennial species. The most characteristic families in rocky habitat are Asteraceae (15.4%) containing 27, Poaceae (12.6%) represented by 22 species, Fabaceae (12%) represented by 21, Lamiaceae (6.9%) 12 species. Noticed that 53% of species was annuals, 3% was biennials and 45% was perennials. In autumn and summer season increase perennials of 85.7% and 75%, respectively, wherein spring and winter increase annuals species by 54.1% and 40.7%, respectively. The life forms the vascular plants were Therophytes 59.4%, is represented by the largest number of species, Chamaephytes has 13.1%, Hemicryptophytes has a moderate value of 11.4%, Geophytes represents about (10.3%). Relationship the life forms with seasons increase Therophytes in spring and autumn, respectively. Chamaephytes highly during season autumn and summer. Hemicryptophytes low in all seasons except spring season. Geophytes highest in autumn and winter, lowest during summer and spring season. Phanerophytes high during summer and autumn season. Also, founded 22 order were recorded, given the order Asterales of the largest number of species Arrived to 27 species (15%), followed by Lamiales, Poales and Fabales order.

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**Keyword:** Rocky habitat, floristic composition and life forms

### 1. Introduction

The systematical analysis of the flora, by the families, is of great importance especially to the comparative analysis of the flora. In the Green Mountain area includes natural vegetation on a variety of plant associations, including plants annual and other perennial. Habitats are classified as scree or rock habitat types even if characteristic higher plant species are missing as long as characteristic moss and lichen species are present and the habitats are sufficiently natural (Schröder *et al.* 2006).

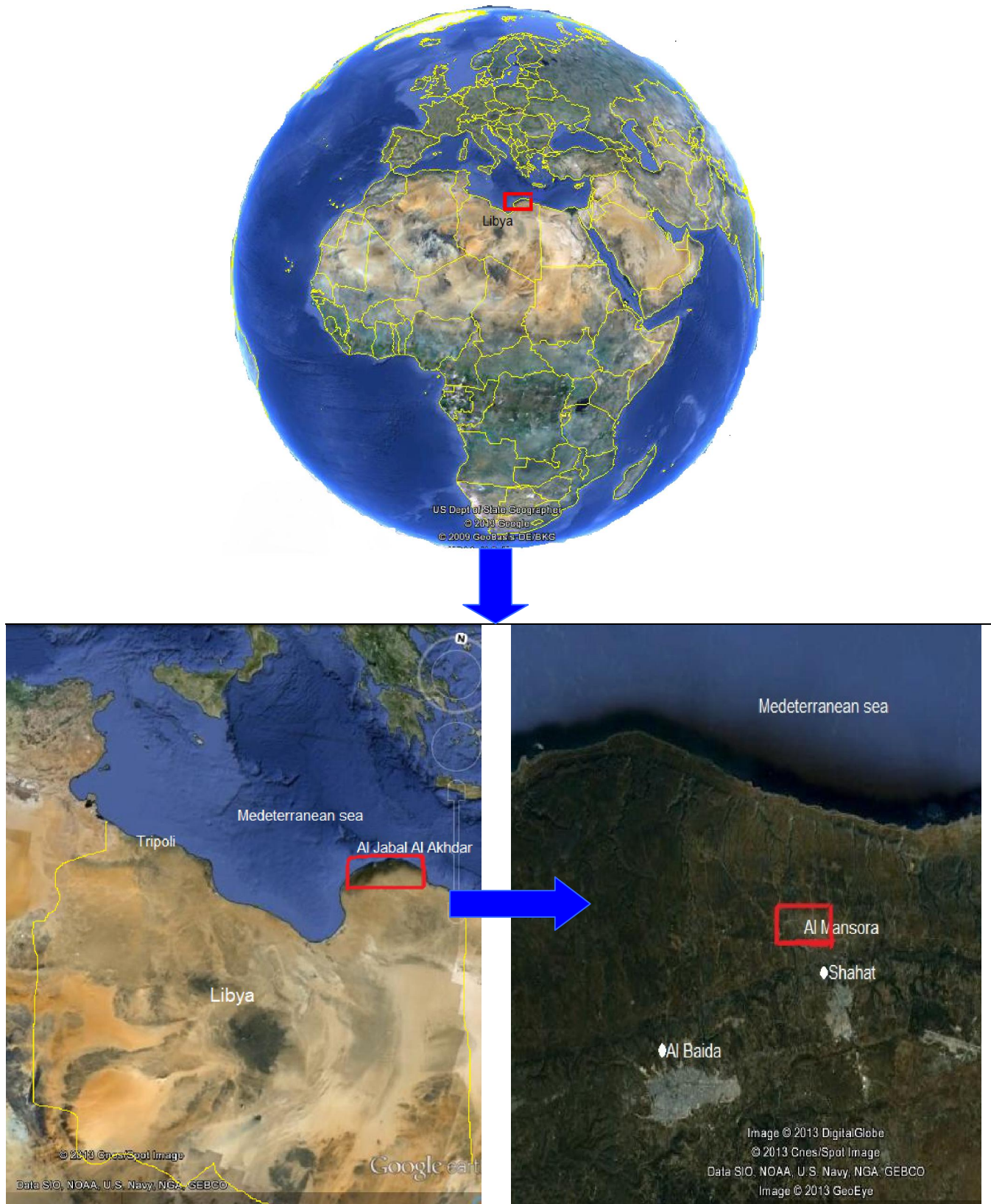
A life-form is characterized by plant adaptation to certain ecological conditions (Mera *et al.* 1999). In Raunkiaer's (1934) system, the more pronounced the unfavorable season, the more protected the renewing buds. In his classification to there are five major classes, arranged according to increased protection of the renewing buds: phanerophytes, chamaephytes, hemicryptophytes, cryptophytes and therophytes. Raunkiaer's classification was modified, by Mueller-Dombois and Ellenberg (1974), to include plant features in the favorable season. Inland rocky habitats of particular conservation value include natural rocks and cliffs, scree and limestone pavements. Each of these habitats is characterised by grasses, dwarf-shrubs and/or herbs growing in restricted crevices. In many

cases the result of this is that competition for light is less of an issue than in closed grassland canopies, so that the interaction with air pollutants may also differ. Currently, there is a lack of data on these interactions, and expected effects must be derived from experience with other habitat types (APIS, 2011). Dwarf-shrub formations linked to soils with rocky emergences and characterized (especially near Benghazi) (Brullo and Furnari, 1981).

The main objective of the present work is to examine the survey and study plant species to the flora of Al Jabal Al Akhdar of Al Mansora site in Libya, Our aim is to answer the following question with respect to different families and the life-forms of vascular species between seasons found in the rocky habitat of Al Mansora site.

### Study area

The study area is located in the Mediterranean Coast of Libya-Al Jabal Al Akhdar. The Rocky habitat Al-Mansora between latitude 32, 50', 44.8" N and longitude 21, 50', 30.3" E. Al-Mansora distance 11 Km east Al Baida city (Figure 1). Three transect were investigated from north to south. Distance Al Mansora 6.5 km of the Mediterranean sea with altitude at 309.4 m.



**Fig. 1. The location of Al Mansora area located in the Mediterranean region of Libya (by Google earth).**

Although the world's vegetation distribution is determined largely by climate (Woodward, 1987). Generally climate the Mediterranean zone has a semi-arid but not arid as often stated. Mediterranean climate has in effect three different definitions: (1) climate of the Mediterranean Sea and bordering land areas; (2) climate that favors broad-leaved, evergreen, sclerophyllous shrubs and trees; (3) winter-wet, summer-dry climate (Blumler, 2005). The Green Mountain region more areas of Libya precipitation, with an average annual precipitation 400 mm/year and maximum of rainfall reaches 650 mm/year belt area (Messa- Al Baida- Shahat). The average relative humidity of about 60% in the period from April until the end of September and about 90% during the months of December and January. The highest mean temperature meteorological station Shahat imitation Al Mansora region for years 1999 to 2009 about 24 C° through Augustus month.

Characterized land area Green Mountain generally high proportion of gravel and reveal the original material rock where he found that more than 45% of the soils Green Mountain severe rocky and nearly 50% of which has been characterized by shallow soil sector where less soil depth effective 50 cm due to high viability of soil erosion runoff water especially if they removed their natural vegetation cover (Al-Jabal Al-Akhdar south project, 2005).

## 2. Material and Methods

Vegetation study was undertaken during the autumn 2010 and winter, spring and summer 2011. A total of 24 stands in all season were sampled from Al Mansora (Figure 1). Stands and sites were selected as to represent the variation of vegetational, climatic and edaphic characteristics prevailing in the study area so that the location of stands was based on visual changes in plant communities along the transect. The floristic categories of species recorded in the study area were made with their characteristic distribution terms, the plant life forms, length of life, families and order. The species were identified according to Boulos (1999, 2000, 2002 and 2005) and Jafri and El-Gadi (1977-1993).

Three line transects at Al Mansora were chosen for this study. The take 500 meters for each transect the number of three transects and all transect four stands with an area of  $5 \times 5 \text{ m}^2$ . In these stands, the quadrat method was used and the size of each analytic quadrat area was  $1 \text{ m}^2$ . The stands were selected on the basis of visual difference and change in their vegetation coverage.

Used Raunkiaer's system to classify in life-forms the vascular plants present in random  $25 \text{ m}^2$  quadrats of Al Mansora site (Raunkiaer's, 1934). The species in each quadrat were listed. The number of individual of each species was counted.

## Statistical analysis

Classification and ordination of communities (stands) followed two trends of multivariate analysis. The applied classification technique here was the Two-Way Indicator Species Analysis (TWINSPAN), a CAP Program (Henderson and Seaby, 1999). Excel program 2007 was used in the organization and presentation of data statistically.

## 3. Results

### a. Characteristic families

Table (1) and Figure (2) show the floristic analysis of recorded survey and classification. A total of 175 taxa were determined species at the level of species which belong to 43 families and 142 genera were recorded in Al-Mansora area. They are represented by 78 perennial, 92 annual and 5 biennial species.

As shown in figure (2), the most characteristic families in rocky habitat are Asteraceae (15.4%) containing 27 species such as *Bellis sylvestris* var. *cyrenaica* Beguinot, *Leontodon tuberosus* L., *Crepis senecioides* ssp. *senecioides* Delile, *Onopordum cyrenaicum* Maire & Weiller, *Phaganlon rupestre* (L.) Dc. and *Senecio leucanthemifolius* Poiret. Poaceae (12.6%) represented by 22 species, from these species *Avena barbata* Pott ex Link, *Catapodium rigidum* (L.) C.E. Hubbard, *Stipa capensis* Thunb., *Trachynia distachya* (L.) Link. and *Trisetaria macrochaeta* (Boiss.) Maire. Fabaceae (12%) represented by 21 species including *Anthyllis vulneraria* L., *Calicotome villosa* (Poir.) Link, *Lotus cytisoides* L. and *Medicago minima* (L.) Bart. Lamiaceae (6.9%) 12 species that are *Thymus capitatus* (L.) Hoffm. & Link, *Micromeria juliana* (L.) Benth. Ex Reichenb., *Micromeria nervosa* (Desf.) Benth., *Phlomis floccosa* D. Don, *Prasium majus* L. and *Teucrium apollinis* Maire et Weiller. The family Apiaceae (5.1%) containing 9 species and represented by *Scandix australis* L. and *Thapsia garganica* Lag. Caryophyllaceae (5%) 8 species *Herniaria glabra* Linn, *Polycarpon tetraphyllum* (L.) L. and *Silene apetala* Willd. Brassicaceae (3%) 6 species contains *Biscutella didyma* L. and *Sinapis alba* L. Important families Anacardiaceae contains *Pistacia lentiscus* L. and Araceae *Arisarum vulgare* Targ. Tozz and Cistaceae by *Cistus parviflorus* Lam. and *Fumana laevipes* (L.) Spach and Colchicaceae *Colchium palaestinum* and Crassulaceae *Sedum sediforme* (Jacq.) Pau and *Umbilicus horizontalis* and Cupressaceae *Juniperus phoenicea* L. Ericaceae *Erica multiflora* L. and Plantaginaceae *Globularia alypum* L. and Iridaceae *Moraea sisyrinchium* and *Rumelea cyrenaica* and Rhamnaceae *Rhamnus lycioides* L. Jahandez and Rosaceae *Sarcopoterium spinosum* (L.) Spach and Xanthorrhoeaceae *Asphodelus microcarpus* Salzm. & Viv. The landscape of Rocky habitat Al-Mansora in Figs. 8 a and b.



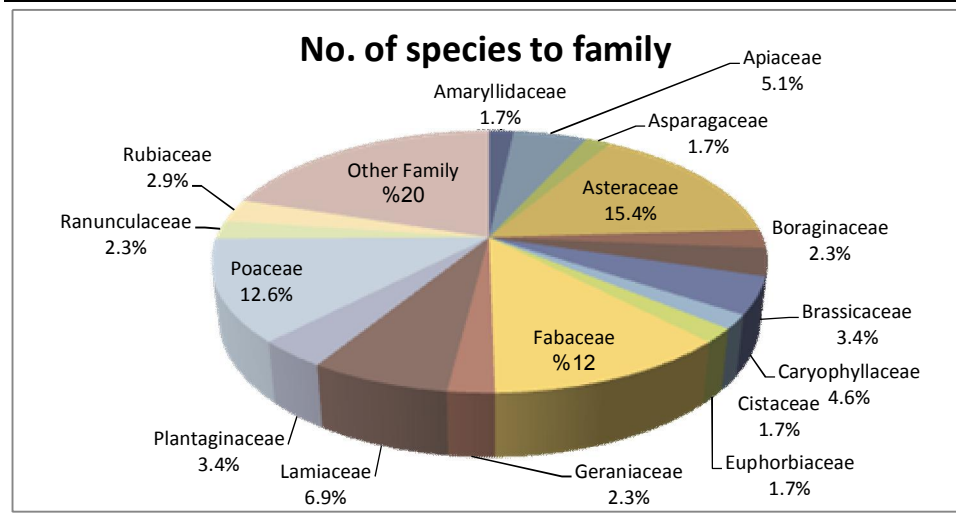


Fig. 2. Families percentage recorded in Al-Mansora site (Rocky habitat) during four seasons of autumn 2010 to summer 2011.

**b. Length of Life**

Figs. (3 and 4). It was noticed that 53% of species was annuals, 3% was biennials and 45% was perennials in Al Mansora region. In autumn and summer season increase perennials of 85.7% and

75%, respectively, wherein spring and winter increase annuals species by 54.1% and 40.7%, respectively, which disappear biennial in autumn and summer seasons.

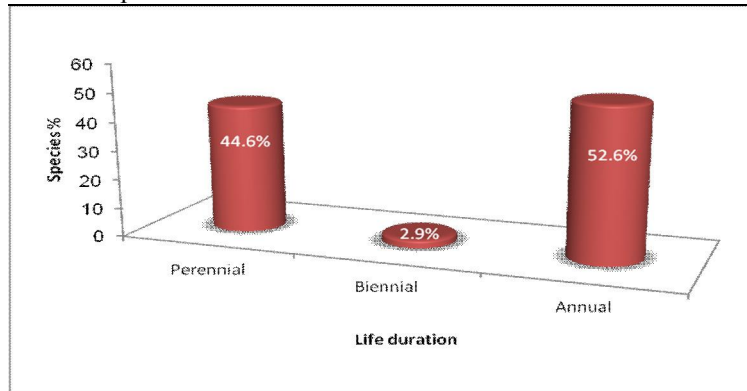


Fig. 3. Length of life of plant species recorded in Al Mansora site (Rocky habitat) during four seasons of autumn 2010 to summer 2011.

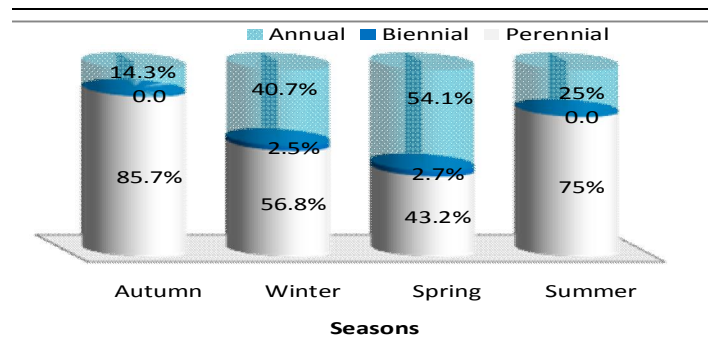


Fig. 4. Length of life percentage of plant species recorded during four seasons in Al Mansora site (Rocky habitat) during four seasons of autumn 2010 to summer 2011.

### c. Life forms

Figure 5 shows the life forms of the recorded species according to Raunkiaer (1934). The recorded species belongs to five different life forms in Al Mansora.

Therophytes (59.4%), is represented by the largest number of species, of these are *Galium verrucosum* Huds., *Medicago polymorpha* L., *Mercurialis annua* L., *Anagallis arvensis* L., *Plantago coronopus* L., *Avena barbata* Pott ex Link, *Bromus rigidus* Roth, *Lolium rigidum* Guad., *Phalaris minor* Retz., *Fedia cornucopiae* (L.) Gaetner and *Papaver rhoeas* var. *rhoeas*. Chamaephytes has 23 species representing about (13.1%) of the flora Al Mansora, from these; *Thymus capitatus* (L.) Hoffm. & Link, *Cistus parviflorus* Lam., *Sarcopoterium spinosum* (L.) Spach, *Sedum sediforme* (Jacq.) Pau, *Teucrium apollinis* Maire et Weiller, *Globularia alypum* L., *Phuopsis stylosa* Trin (L.f.) DC., *Satureja thymbra* L. Hemicryptophytes has a moderate value of (11.4%) that includes 20 species, of these are, *Bellis sylvestris* var. *cyrenaica* Beguinot, *Viola scorpiuroides* Coss., *Paronychia argentea* Lamk., *Anthyllis vulneraria* L., *Poa bulbosa* L., *Glaucium flavum*, *Polygonum equisetiforme*. Geophytes represents about (10.3%) of the flora that includes 18 species, from these species are;

*Bellevalia sessiliflora* (Viv.) Kunth, *Arisarum vulgare* Targ. Tozz, *Asphodelus microcarpus* Salzm.& Viv., *Colchium palaestinum*, *Drimia maritima* (L.) Baker, *Rumelea cyrenaica* Beguinot, *Cyclamen rohlfsianum* Aschers., *Ranunculus asiaticus* L. *Allium negrianum* Maire & Weiller. Phanerophytes contains 10 species, which are *Pistacia lentiscus* L., *Juniperus phoenicea* L., *Rhamnus lycioides* L. Jahandez, *Daphne jasminea* Sibth. et Sm., *Erica multiflora* L. and *Ceratonia siliqua* L.

Figure 6 shows relationship the life forms with seasons in Al Mansora habitat increase therophytes with 61.2 and 41.6% in spring and autumn, respectively. Chamaephytes highly during season autumn and summer of 35-37%. Hemicryptophytes low in all seasons except spring season. Geophytes highest in autumn and winter, lowest during summer and spring season. Phanerophytes high during summer and autumn season.

### d. The order

In this investigation, 22 order were recorded, given the order Asterales of the largest number of species Arrived to 27 species (15%), followed by Lamiales, Poales and Fabales with 25, 22 and 21 species respectively.

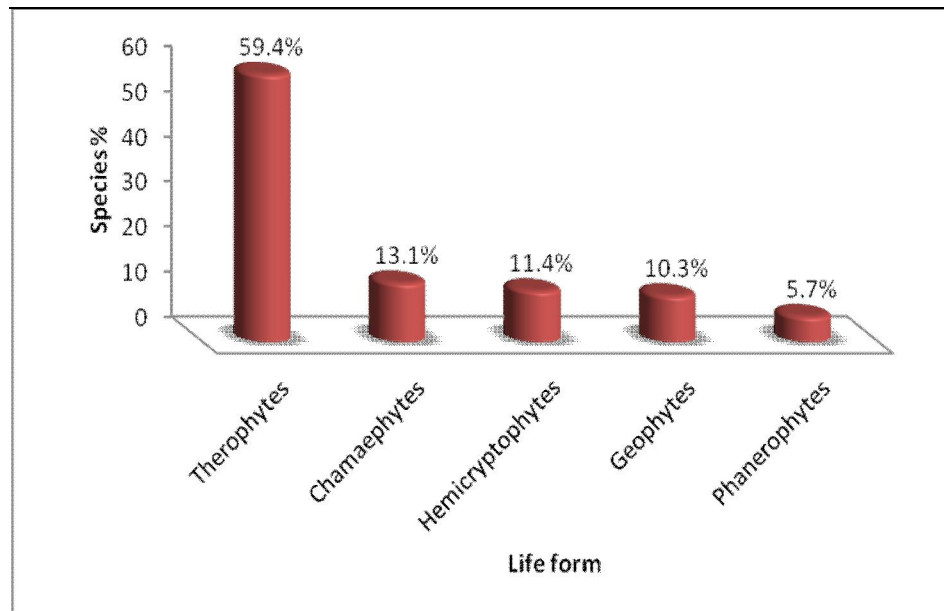


Fig. 5. Plant life forms category of the recorded species in rocky habitat of Al Mansora site.

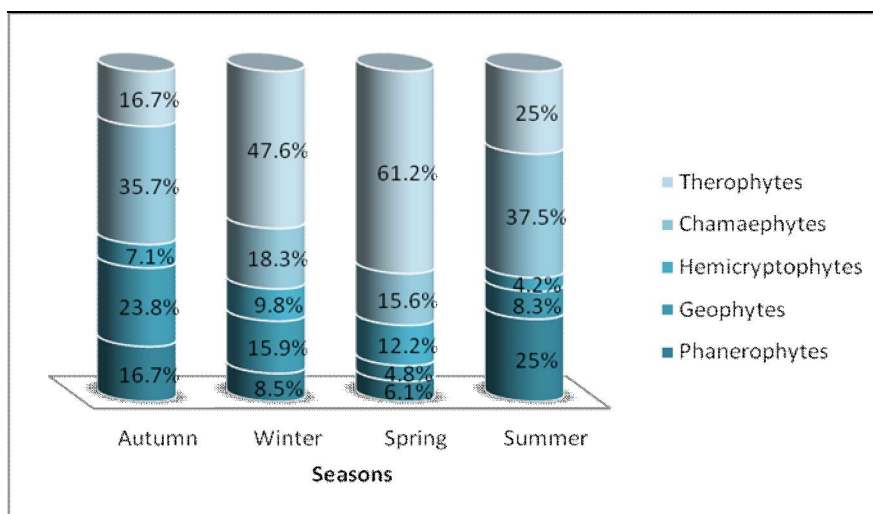


Fig.6. Plant life forms category of the recorded species of four seasons into rocky habitat of Al Mansora site during four seasons of autumn 2010 to summer 2011.

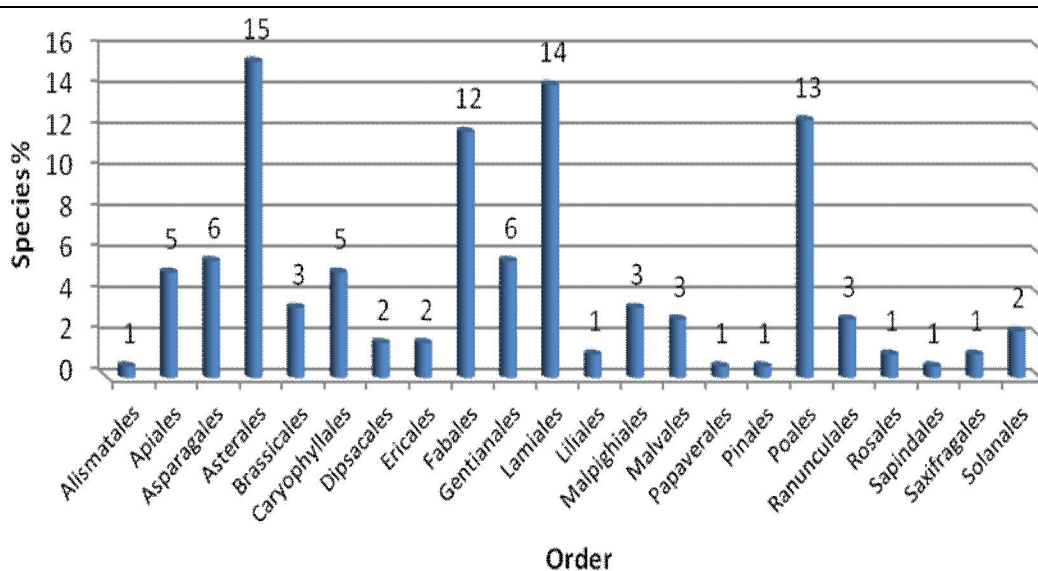


Fig.7. The order of plant species recorded in Al Mansora site (Rocky habitat) during four seasons of autumn 2010 to summer 2011.

Table 1. Botanical composition of plant species recorded in Al Mansora site (Rocky habitat) during four seasons of autumn 2010 to summer 2011.

No.	Family	Scientific name	*Length of Life	**Life forms	Order
1	Amaryllidaceae	<i>Allium negrianum</i> Maire & Weiller	Per.	G	Asparagales
2		<i>Allium nigrum</i> L.	Per.	G	
3		<i>Narcissus elegans</i> (Haw.) Spach.	Per.	G	
4	Anacardiaceae	<i>Pistacia lentiscus</i> L.	Per.	Ph	Sapindales
5	Apiaceae	<i>Ammi majus</i> L.	Ann.	Th	Apiales
6		<i>Ammi visnaga</i> (L.) Lam	Ann.	Th	
7		<i>Malabaila suaveolens</i> (Dcl.) Coss	Per.	Th	

8		<i>Scandix australis</i> L.	Ann.	Th	
9		<i>Thapsia garganica</i> Lag.	Per.	Th	
10		<i>Tordylium apulum</i> L.	Ann.	Th	
11		<i>Torilis arvensis</i> (Huds.) Link.	Ann.	Th	
12		<i>Torilis leptophylla</i> (L.) Reichb.	Ann.	Th	
13		<i>Torilis nodosa</i> (L.) Gaertn.	Ann.	Th	
14	Araceae	<i>Arisarum vulgare</i> Targ. Tozz	Per.	G	Alismatales
15	Asparagaceae	<i>Bellevialia sessiliflora</i> (Viv.) Kunth	Per.	G	Asparagales
16		<i>Dipcaidi serotinum</i> (L.) Medic.	Per.	G	
17		<i>Drimia maritima</i> (L.) Stearn	Per.	G	
18	Asteraceae	<i>Anthemis secundiramea</i> Biv.	Ann.	H	Asterales
19		<i>Bellis sylvestris</i> var. <i>cyrenaica</i> Beguinot	Per.	H	
20		<i>Calendula arvensis</i> L.	Ann.	Th	
21		<i>Carlina lanata</i> L.	Ann.	Th	
22		<i>Carthamus lanatus</i> L.	Ann.	Th	
23		<i>Centaurea alexandrina</i> Delile	Bien.	Th	
24		<i>Chrysanthemum segetum</i> L.	Ann.	Th	
25		<i>Cicerbita haimanniana</i> (Ascherson) Beauverd	Per.	Th	
26		<i>Cichorium endivia</i> L.	Ann.	Th	
27		<i>Cichorium spinosum</i> L.	Per.	Th	
28		<i>Crepis senecioides</i> ssp. <i>senecioides</i> Delile	Ann.	Th	
29		<i>Dittrichia viscosa</i> (L.) W. Greuter	Per.	Ch	
30		<i>Filago contracta</i> Boiss.	Ann.	Th	
31		<i>Hedypnois cretica</i> (L.) Dum. - Courset	Ann.	Th	
32		<i>Helichrysum stoechas</i> (L.) Moench	Per.	H	
33		<i>Hyoseris scabra</i> L.	Ann.	Th	
34		<i>Jasonia rupestris</i> Pomel	Per.	Th	
35		<i>Leontodon tuberosus</i> L.	Per.	H	
36		<i>Matricaria aurea</i> (Loefl.) Sch. Bip.	Ann.	Th	
37		<i>Onopordum cyrenaicum</i> Maire & Weiller	Per.	Th	
38		<i>Onopordum espiniae</i> Cosson ex Bonnet	Bien.	H	
39		<i>Pallenis spinosa</i> (L.) Cass.	Per.	H	
40		<i>Phagnlon rupestre</i> (L.) Dc.	Per.	Ch	
41		<i>Rhagadiolus stellatus</i> (L.) Gaertner	Ann.	Th	
42		<i>Scolymus hispanicus</i> L.	Bien.	H	
43		<i>Senecio leucanthemifolius</i> Poiret	Ann.	Th	
44		<i>Tragopogon</i> L.	Per.	H	
45	Boraginaceae	<i>Borago officinalis</i> L.	Ann.	Th	Lamiales
46		<i>Cynoglossum cheirifolium</i> L.	Bien.	Th	
47		<i>Echium angustifolium</i> Mill.	Per.	Ch	
48		<i>Echium sabulicola</i> Pomel	Bien.	Th	
49	Brassicaceae	<i>Alyssum minus</i> (L.) Rothm.	Ann.	Th	Brassicales
50		<i>Biscutella didyma</i> L.	Ann.	Th	
51		<i>Enarthrocarpus pterocarpus</i>	Ann.	Th	
52		<i>Rapistrum rugosum</i> (L.) All.	Ann.	Th	
53		<i>Sinapis alba</i> L.	Ann.	Th	
54		<i>Sinapis pubescens</i> L.	Per.	Th	
55	Caryophyllaceae	<i>Herniaria glabra</i> Linn.	Per.	Th	Caryophyllales
56		<i>Paronychia argentea</i> Lamk.	Per.	H	
57		<i>Petrorhagia cyrenaica</i> (Durand & Barratte) Ball & Heywood	Ann.	Th	
58		<i>Petrorhagia velutina</i> (Guss.) Ball & Heywood	Ann.	Th	
59		<i>Polycarpon tetraphyllum</i> (L.) L.	Ann.	Th	
60		<i>Silene apetala</i> Willd.	Ann.	Th	
61		<i>Silene colorata</i> Poiret	Ann.	Th	
62		<i>Silene cyrenaica</i> Maire & Weiller	Ann.	Th	
63	Cistaceae	<i>Cistus parviflorus</i> Lam.	Per.	Ch	Malvales
64		<i>Fumana laevipes</i> (L.) Spach	Per.	Ch	
65		<i>Fumana thymifolia</i> (L.) Spach	Per.	Ch	

66	Colchicaceae	<i>Colchium palaestinum</i>	Per.	G	Liliales
67	Convolvulaceae	<i>Convolvulus althaeoides</i> L.	Per.	G	Solanales
68		<i>Cuscuta epithymum</i> L.	Ann.	Th	
69	Crassulaceae	<i>Sedum sediforme</i> (Jacq.) Pau	Ann.	Ch	Saxifragales
70		<i>Umbilicus horizontalis</i>	Per.	G	
71	Cupressaceae	<i>Juniperus phoenicea</i> L.	Per.	Ph	Pinales
72	Dipsacaceae	<i>Scabiosa arenaria</i> Forskal	Ann.	Th	Dipsacales
73	Ericaceae	<i>Erica multiflora</i> L.	Per.	Ph	Ericales
74	Euphorbiaceae	<i>Euphorbia falcata</i> L.	Ann.	Th	Malpighiales
75		<i>Euphorbia parvula</i> Del.	Ann.	Th	
76		<i>Mercurialis annua</i> L.	Ann.	Th	
77	Fabaceae	<i>Anthyllis tetraphylla</i> L.	Ann.	Th	Fabales
78		<i>Anthyllis vulneraria</i> L.	Ann.	H	
79		<i>Bituminaria bituminosa</i>	Per.	H	
80		<i>Calicotome villosa</i> (Poir.) Link	Per.	Ph	
81		<i>Cerantonia siliqua</i> L.	Per.	Ph	
82		<i>Hippocrepis cyclocarpa</i> Murb.	Ann.	Th	
83		<i>Lotus cytisoides</i> L.	Per.	Ch	
84		<i>Lotus ornithopodioides</i> L.	Ann.	Th	
85		<i>Lotus tetragonolobus</i> L.	Ann.	Th	
86		<i>Medicago coronata</i> (L.) Bart	Ann.	Th	
87		<i>Medicago minima</i> (L.) Bart.	Ann.	Th	
88		<i>Medicago orbicularis</i> (L.) Bart.	Ann.	Th	
89		<i>Medicago polymorpha</i> L.	Ann.	Th	
90		<i>Medicago truncatula</i> Gaertn.	Ann.	Th	
91		<i>Melilotus indicus</i> (L.) All.	Ann.	Th	
92		<i>Ononis reclinata</i> L.	Ann.	Th	
93		<i>Ononis vaginalis</i> Vahl.	Per.	Ch	
94		<i>Scorpiurus muricatus</i> L.	Ann.	Th	
95		<i>Trifolium campestre</i> Schreb.	Ann.	Th	
96		<i>Trifolium scabrum</i> L.	Ann.	Th	
97		<i>Trifolium uniflorum</i> L.	Ann.	Th	
98	Gentianaceae	<i>Centaurium pulchellum</i> (Swartz) Druce	Per.	Th	Gentianales
99	Geraniaceae	<i>Erodium malacoides</i> (L.) L'Herit.	Ann.	Th	Geraniales
100		<i>Erodium moschatum</i> (L.) L'Herit.	Ann.	Th	
101		<i>Erodium touchyanum</i> Delile	Ann.	Th	
102		<i>Geranium molle</i> L.	Ann.	Th	
103	Hypericaceae	<i>Hypericum triquetrifolium</i> Turra	Per.	H	Malpighiales
104	Iridaceae	<i>Moraea sisyrinchium</i> (L.)Ker Gaweler (Europe)	Per.	G	Asparagales
105		<i>Rumelea cyrenaica</i> Beguinot	Per.	G	
106	Lamiaceae	<i>Ballota pseudo-dictamnus</i> (L.) Benth.	Per.	Ch	Lamiales
107		<i>Marrubium vulgare</i> L.	Per.	Ch	
108		<i>Micromeria juliana</i> (L.) Benth. ex eichenb.	Per.	Ch	
109		<i>Micromeria nervosa</i> ( Desf.) Benth.	Per.	Ch	
110		<i>Origanum cyrenaicum</i> Beg. et Vaccari	Per.	Ch	
111		<i>Phlomis floccosa</i> D. Don	Per.	Ch	
112		<i>Prasium majus</i> L.	Per.	Ch	
113		<i>Satureja thymbra</i> L.	Per.	Ch	
114		<i>Siderites curvidens</i> Stapf.	Ann.	Th	
115		<i>Teucrium apollinis</i> Maire et Weiller	Per.	Ch	
116		<i>Teucrium brevifolium</i> Schreber	Per.	Ch	
117		<i>Thymus capitatus</i> (L.) Hoffm. & Link	Per.	Ch	
118	Liliaceae	<i>Gagea reticulata</i> (Pall.) Schult.	Per.	G	Liliales
119	Linaceae	<i>Linum usitatissimum</i> L.	Ann.	Th	Malpighiales
120	Malvaceae	<i>Malva parviflora</i> L.	Ann.	Th	Malvales
121	Myrsinaceae	<i>Anagallis arvensis</i> L.	Ann.	Th	Ericales
122		<i>Cyclamen rohlfsianum</i> Aschers.	Per.	G	
123	Oleaceae	<i>Olea europaea</i> var. <i>oleaster</i> (Hoffmg.&Link)Dc.	Per.	Ph	Lamiales
124		<i>Phillyrea latifolia</i> L.	Per.	Ph	



125	Orchidaceae	<i>Anacamptis collina</i> (Banks & Sol. ex Russell) R.M. Bateman, Pridgeon & M.W.Chase	Per.	G	Asparagales
126	Papaveraceae	<i>Glaucium flavum</i> Crantz	Per.	H	Ranunculales
127		<i>Papaver rhoeas</i> var. <i>rhoeas</i>	Ann.	Th	Papaverales
128	Plantaginaceae	<i>Globularia alypum</i> L.	Per.	Ch	Lamiales
129		<i>Linaria triphylla</i> (L.) Mill.	Ann.	Th	
130		<i>Linaria virgata</i> (poir) Desf.	Ann.	Th	
131		<i>Misopates orontium</i> (L.) Rafin.	Ann.	Th	
132		<i>Plantago coronopus</i> L.	Per.	Th	
133		<i>Plantago lagopus</i> L.	Ann.	Th	
134	Poaceae	<i>Avena barbata</i> Pott ex Link	Ann.	Th	Poales
135		<i>Briza maxima</i> L.	Ann.	Th	
136		<i>Bromus alopecuroides</i> Poir.	Ann.	Th	
137		<i>Bromus madritensis</i> L.	Ann.	Th	
138		<i>Bromus rigidus</i> Roth	Ann.	Th	
139		<i>Catapodium rigidum</i> (L.) C.E. Hubbard	Ann.	Th	
140		<i>Crithopsis delileana</i> (Schultes) Rozhev.	Ann.	Th	
141		<i>Cynosurus elegans</i> Desf.	Ann.	Th	
142		<i>Dactylis glomerata</i> L.	Per.	H	
143		<i>Gastridium ventricosum</i> (Gouan) schinz et Thell.	Ann.	Th	
144		<i>Hyparrhenia hirta</i> (L.) Stapf	Per.	H	
145		<i>Lolium loliaceum</i> (Bory et Chaub.) Hand.-Mazz.	Ann.	Th	
146		<i>Lolium rigidum</i> Guad.	Ann.	Th	
147		<i>Melica minuta</i> L.	Per.	Th	
148		<i>Oryzopsis miliacea</i> (L.) Asch. & Schweinf.	Per.	H	
149		<i>Parapholis incurva</i> (L.) C.E. Hubbard	Ann.	Th	
150		<i>Paspalidium geminatum</i> (Forsk.) Stapf	Per.	H	
151		<i>Phalaris minor</i> Retz.	Ann.	Th	
152		<i>Poa bulbosa</i> L.	Per.	H	
153		<i>Stipa capensis</i> Thunb.	Ann.	Th	
154		<i>Trachynia distachya</i> (L.) Link.	Ann.	Th	
155		<i>Trisetaria macrochaeta</i> (Boiss.) Maire	Ann.	Th	
156	Polygonaceae	<i>Polygonum equisetiforme</i> sm.	Per.	H	Caryophyllales
157	Ranunculaceae	<i>Adonis microcarpa</i> DC.	Ann.	Th	Ranunculales
158		<i>Nigella damascena</i> L.	Ann.	Th	
159		<i>Ranunculus asiaticus</i> L.	Per.	G	
160		<i>Ranunculus bullatus</i> L.	Per.	G	
161	Rhamnaceae	<i>Rhamnus lycioides</i> L. Jahandez	Per.	Ph	Rosales
162	Rosaceae	<i>Sarcopoterium spinosum</i> (L.) Spach	Per.	Ch	Rosales
163	Rubiaceae	<i>Galium verrucosum</i> Huds.	Ann.	Th	Gentianales
164		<i>Phuopsis stylosa</i> Trin.	Per.	Ch	
165		<i>Sherardia arvensis</i> L.	Ann.	Th	
166		<i>Theligonum cynocrambe</i> L.	Ann.	Th	
167		<i>Valantia lanata</i> Del. ex Coss.	Ann.	Th	
168	Scrophulariaceae	<i>Scrophularia canina</i> L.	Per.	H	Lamiales
169	Solanaceae	<i>Datura innoxia</i> Mill.	Ann.	Th	Solanales
170		<i>Nicotiana glauca</i> R.C.Graham	Per.	Ph	
171	Thymelaeaceae	<i>Daphne jasminea</i> Sibth. et Sm.	Per.	Ph	Malvales
172	Valerianaceae	<i>Centranthus calcitrapae</i> (L.) Dufresne	Ann.	Th	Dipsacales
173		<i>Fedia cornucopiae</i> (L.) Gaetner	Ann.	Th	
174	Violaceae	<i>Viola scorpiuroides</i> Coss.	Per.	H	Malpighiales
175	Xanthorrhoeaceae	<i>Asphodelus microcarpus</i> Salzm.& Viv.	Per.	G	Asparagales

\*Per.=Perennial, Bien.=Biennial, Ann. = Annual, \*\*G= Geophytes, Ph= Phanerophytes, Th= Therophytes, H= Hemicryptophytes, Ch= Chamaephytes



a.



b.

**Figs. 8a and b. Landscape in Rocky habitat Al Mansora area.**



#### 4. Discussion

This study examined botanical composition, to species and the families, order and life forms of the species found in the rocky habitat, The communities on rocky habitats and special types rocky habitat be *Cistus parviflorus* Lam. and *Erica multiflora* L. *Globularia alypum* L. *Rumex cyrenaica*, *Satureja thymbra* L., *Thymus capitatus* (L.) Hoffm. & Link, *Daphne jasminea* Sibth. et Sm. And *Viola scorpiuroides* Coss. It is characterized by its ability to resist the shallowness of the soil and grow among the rocks. The analysis of vegetation of rocky ridges and similar areas of shallow soils by the ecological profile technique indicate a general group of species: *Plantago albicans*, *Asphodelus microcarpus*, *Thymelaea hirsute*, *Reaumuria mucronata*, *Thymus capitatus*, *Globularia arabica*, *Dactylis glomerata*, *Noaea mucronata*, *Atractylis carduus*, *Limonium pruinosum* and *Limonium tubiflorum* (Kamal, 1982). From the ecological-structural point of view, the association of *Limonium cyrenaicum* corresponds to the belt of *Limonium sp.* Pl. and *Crithmum maritimum* which characterizes the Mediterranean rocky coasts (Brullo and Furnari, 1981). The most families in rocky habitat Al mansora are Asteraceae, Poaceae, Fabaceae and Lamiaceae, Most members of Asteraceae are herbaceous, but a significant number are also shrubs, vines and trees, the family has a worldwide distribution, and is most common in the arid and semi-arid regions of subtropical and lower temperate latitudes (Barkely *et al.*, 2006). Also, given the order Asterales of the largest number of species in rocky habitat Al Mansora. Spread lamiaceae family in rocky habitat (Klopper *et al.*, 2006).

Different life forms are regularly associated with special climate (Richkleffs, 1973). Phanerophytes usually correspond to tropical climates, chamaephytes mainly relate to cold, dry climates, hemicryptophytes and geophytes mostly associate with cold moist climates (Richkleffs, 1973). These have been confirmed by many previous studies, for example Wang *et al.* (2002) and DaCosta *et al.* (2007) found that therophytes were the most dominant life forms in arid or semi arid area, and therefore, overall, chamaephytes and therophytes are the rarest life forms, while phanerophytes, geophytes and hemicryptophytes are the most dominant life forms.

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