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Life Forms and Biological Spectrum in Flora Of The Al-Jabal Al-Akhdar, North-Eastern Libya

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اشكال الحياة والطيف البيولوجى للفلورا الجبل الاخضر – شمال شرقى ليبيا

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Abstract:
This study was conducted in the Al-Jabal Al-Akhdar area in northeastern Libya during the spring of the years 2022, 2023 2024. It aims to analyze the life forms and biological spectrum of the flora in the Green Mountain. Twenty-one sites were selected to represent different topographies with a gradient in elevation above sea level. A total of 833 plant species belonging to 422 genera and 86 plant families were recorded. The results showed that the most dominant family is the Asteraceae 99 species (11.88%), followed by the Fabaceae 86 species (10.32%), then the Poaceae 81 species (9.72%), and the Apiaceae 52 species (6.24%). These proportions correspond to those of the Libyan flora, with 476 annual species (56.42%) and 357 perennial species (42.86%), which are close due to the presence of geophytes belonging 99 (27.33%) to the perennials that are buried beneath the soil surface in summer. The results of the analysis of life forms of the studied plants according to Raunkiaer's classification showed that Therophytes are the most dominant 476 species (56.42%), followed by hemicryptophytes 145 species (17.64%), Geophytes 99 species (11.88%), Chamaerphytes 60 species (7.44%), phanerophytes 45 species (5.64%), and flowering parasitic plants 8 species (0.96%). The ratios of the biological spectrum were similar to the Largest families attributed to their high adaptability to environmental conditions, while climate and topography play a role in patterns life forms in flowering plants.

Keywords: Biological spectrum, Life forms, Libya, Al-Jabal Al-Akhdar.

الملخص
اجريت هذه الدراسة على منطقة الجبل الاخضر شمال شرقى ليبيا خلال فصل الربيع للاعوام 2022،2023،2024م. وتهدف الى تحليل اشكال الحياة و الطيف البيولوجى للفلورا الجبل الاخضر،اختيرت 21 موقع يمثل مختلف تضاريس مع التدرج فى الارتفاع عن مستوى سطح البحر.سجل 833 نوع نباتى ينتمى الى 422 جنس و 86 عائلة نباتية. اظهرت النتائج ان اكثر عائلات سيادة هى عائلة المركبة بعدد 99 نوع (11.88%) تليها عائلة البقولية 86 نوع (10.32%) ثم عائلة النجيلية 81 نوع (9.72%) و اخيرا عائلة الخيمية بعدد 52 نوع (6.24 %) وكانت هذه النسب تتوافق مع نسب الفلورا الليبية وكانت النسبة بين النباتات الحولية 476 نوع (56.42%) و النباتات المعمرة 357 نوع (42.86%) متقاربة بسبب ان هناك النباتات الارضية بعدد 99 نوع (27.73%) تنتمى الى النباتات المعمرة والتى تكون مدفونة تحت سطح التربة فى فصل الصيف.اظهرت نتائج تحليل اشكال الحياة للنباتات المدروسة وفقا لتصنيف رونكفير ان النباتات الحولية اكثر سيادة بعدد 476 نوع (56.42%) يليها النباتات نصف المخفية 145 نوع (17.64%) ،النباتات الارضية 99 نوع (11.88%) ، نباتات طويلة المعمرة بعدد 60 نوع (7.44%)، نباتات القصيرة المعمرة 45 نوع (5.64%) و نباتات المتطفلة الزهرية 8 انواع (0.96%).اظهرت نسب الطيف البيولوجى متقاربة مع العوائل الاكثر عددا و يرجع الى قدرتها العالية على التكيف مع ظروف الوسط و ان عامل المناخ و التضاريس تلعب دورا كبيرا فى تشكل انماط الحياة فى النباتات الزهرية.

Introduction

The biological spectrum of plants in any ecosystem reflects the impact of climate on the various forms of plant life and provides a clear picture of the plants' ability to adapt to their different environments, in which it resides [1], [2] proposed the term "biological spectrum" to express the distribution of life forms in plants in the region, along with the prevailing climate in it that has developed and given rise to these life forms. This is important for describing the vegetation. Plants take various forms such as trees, shrubs, and annual or perennial herbs, and their ability to adapt to their environment. Flowering plants are classified into life forms based on similarities in structure and function, and the characteristics of life forms are indicators of the specific climate and location. Based on the positions of the regenerative buds, life forms are divided into the following types: Chamaephytes (buds located close to the ground) and phanerophyte (buds more than 25 cm above the ground). Cryptophytes (the buds are hidden in the soil or at the bottom of the water) include ground-stem plants and Hemicryptophytes (the buds are in contact with the soil surface) [3] and Therophytes (whose life cycle is completed within one year from seed to fruit formation). It is important to study the biological spectrum and life forms of different plants to understand the characteristics of climatic regions [4], [5], [6], [7], [8] and [9], such as the Mediterranean region and the life forms within it [10].

Al-Jabal Al-Akhdar is characterized by the diversity of its plants, their forms of life, and their density in the valleys. The vegetation in the Al-Jabal Al-Akhdar constitutes about 85% of the number of plant species in the Libyan flora. It is known for its evergreen trees, and these plants grow in all the terrains of Al-Jabal Al-Akhdar, including valleys and slopes, due to the abundant rainfall and the depth of the soil, especially in the bottoms of the valleys. The northern part of the mountain has a greater diversity of plants due to heavy rainfall and its proximity to the coastline, while the southern part is less diverse and dominated by a desert climate. The density of annual plants is noted after the rain falls, with a thick growth occurring in the spring season, which constitutes a large percentage of the plants in the Green Mountain, especially the species from the Asteraceae, Poaceae, Fabaceae and Apiaceae families. As for bulbous plants, they have a specific strategy where they bury their root system under the soil during the dry season and grow and thrive in the spring. The flora of the Al-Jabal Al-Akhdar was described as in previous studies [11], [12], [13], [14], [15], [16], [17], [18], [19], [20], [21] and [22].

Most Ecological studies analyzed vegetation on the plants of the Al-Jabal Al-Akhdar to understand their diversity and floristic structure, analyze the vegetation, and assess the effects of climate and topography on their spread and distribution in different habitats, as well as the impact of [23] human activities on the mountain ecosystem, such as the studieds by [24], [25], [26] and [27]. recent research by [28] about the effect of soil characteristics on the spread and diversity of plants in the Green Mountain at several different altitudes and. understanding the pattern of diversity and the floral composition of the Mediterranean ecosystem. The study aims to analyze the biological spectrum of the Al-Jabal Al-Akhdar flora.and compared to of largest families in the Libyan flora.

Materials and Methods

Study area:

This work was carried out in Al-Jabal Al-Akhdar, located on the Northeastern of Libya. We Selected of 21 sites in Al-Jabal Al-Akhdar representing various topographic with a gradient in elevation from sea level and proximity to or distance from the coast using a GPS, with a code for each site as follows: R1 to R21 shown in (Table:1 and fig :1).

Data Collection

In this botanical survey over twenty field trips were conducted seasonally to the study area from 2022 to 2024, collections included all wild flora plant species. Specimens were identified based on the Flora of Libya by [14], [19], [28], [29], [30], [31]and the Flora of Egypt [15]. Furthermore, All the plants species were classified on the basis of life forms as defined by [1].

Table (1): Location and elevation of study sites.

Sites	Symbol	Longtitude	Latitude	Elevation a.s.l (m)
Tokar	R1	32° 31' 16.2" N	20° 44' 50.4" E"	11
Wadi EL-Akar	R2	32° 30' 4.1" N	20° 43' 40.4" E"	302
EL-Merj	R3	32° 31' 19.9" N	20° 53' 29.5" E"	287
Talmeta	R4	32° 39' 50.2" N	20° 56' 22.3" E"	80
Gasr Libya	R5	32° 38' 46.4" N	21° 28' 48.0" E"	376
El-Wardia	R6	32° 39' 16.6" N	21° 33' 54.7" E"	445
Massa	R7	32° 43' 32.5" N	21° 35' 26.7" E"	506
Wadi EL-Kouf	R8	32° 41' 15.0" N	21° 33' 48.6" E"	310
Wadi Mousa	R9	32° 45' 17.2" N	21° 51' 46.7" E"	628
Labrag	R10	32° 47' 29.3" N	22° 05' 29.3" E"	685
Shahat	R11	32° 50' 29.1" N	21° 53' 50.4" E"	355
Susa	R12	32° 51' 29.1" N	22° 24' 14.4" E"	03
Ras El-Hilal	R13	32° 51' 16.2" N	22° 10' 20.8" E"	452
Sidi El-Hemery	R14	32° 38' 21.0" N	21° 47' 21.7" E"	839
Slonta	R15	32° 30' 55.8" N	21° 27' 20.1" E"	529
Qandula	R16	32° 31' 23.5" N	21° 35' 42.5" E"	626
Marrow	R17	32° 28' 58.0" N	21° 22' 28.7" E"	473
Wadi Karssa	R18	32° 51' 24.4" N	22° 24' 14.0" E"	350
Wadi Zaza	R19	32° 28' 15.0" N	20° 38' 14.4" E"	386
Wadi Jarjar Amma	R20	32° 47' 18.0" N	21° 28' 10.0" E"	300
AL Mansora	R21	32° 50' 44.8" N	20° 50' 30.3" E"	286

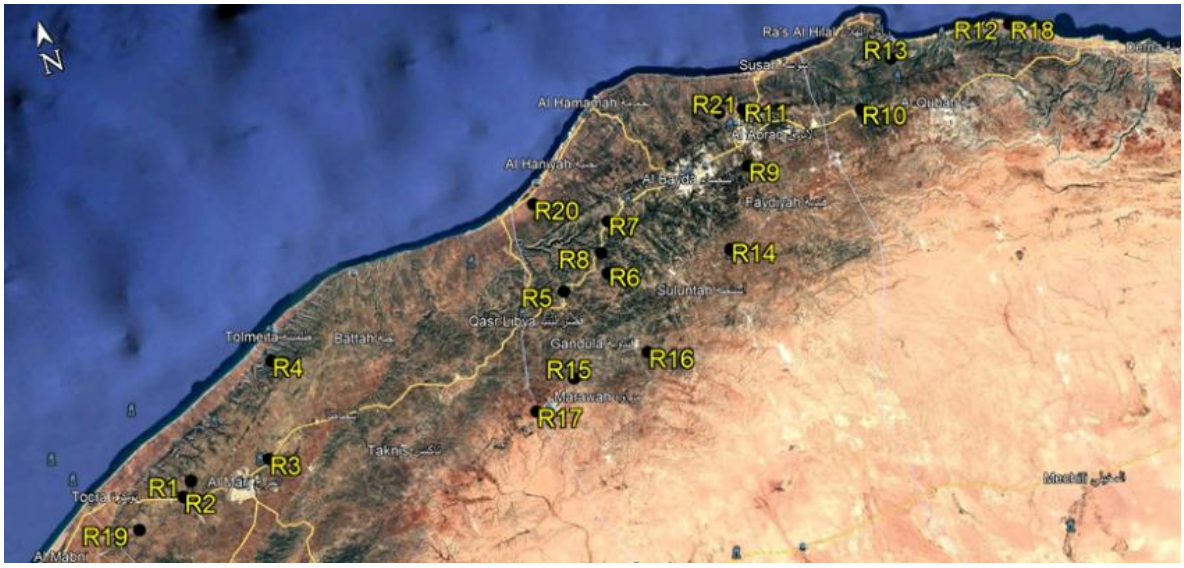

Figure 1: Map of the study sites.

Results and Discussion

In the present investigation, 833 species were reported belongings to 422 genera and 86 families in Green Mountain. (Table 1.). The largest represented families were Asteraceae (99 sp.) followed by Fabaceae (86 sp.), Poaceae (81sp.), Apiaceae (52 sp.), Lamiaceae (40sp.), Caryophyllaceae (32sp.), Boraginaceae (25 sp.), Liliaceae (20 sp.) for each Geraniaceae, Brassicaceae, Rubiaceae, Rununculaceae and Euphorbiaceae (19 sp.), Scrophulariaceae (17 sp.), then Cyperaceae, Chenopodiaceae and Crassulaceae (13sp.) for each, while other families each was represented by 12 to 1 sp. As shown in Figure 2. Here was a similarity in the results with [12], [32], [33] and [34].

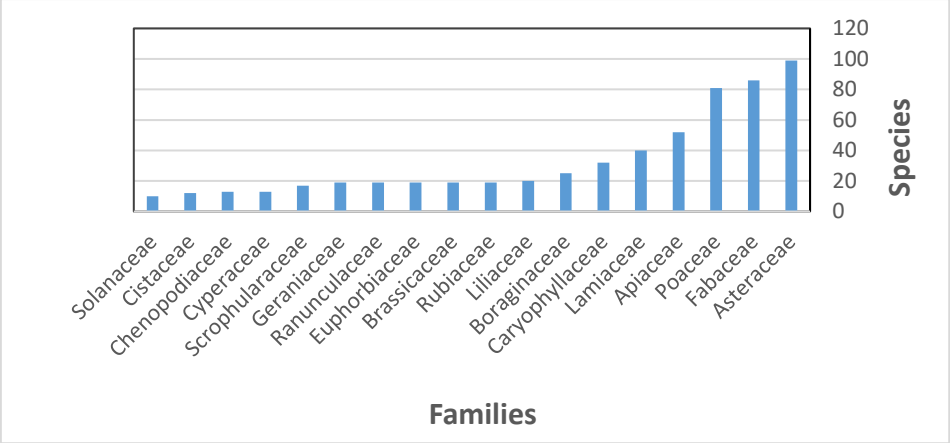

Figure 2: The largest represented families of the study area.

The dominance of these plant families is due to their high adaptations to the Mediterranean climate and their great ability to spread and thrive in mountainous environments, and that the climate and topography are factors that affect their growth. [18], [19]. Similarly, [35] reported the predominance of the family Asteraceae in Jarajar oma with 28 species, it was also the largest family in Wadi Alkuf, represented by 50 species [20], [36]. In general, Asteraceae has been documented as the most predominance family in Libyan flora with 240 species [37]. Based on the plant habit 476 (57.14%) species were Annial herbs, 357 (42.85%) species of perennial as presented in Figure 3. Our findings are comparable with those of [38] also It was observed that the herbs are more diverse in the Mediterranean mountains ecological system.

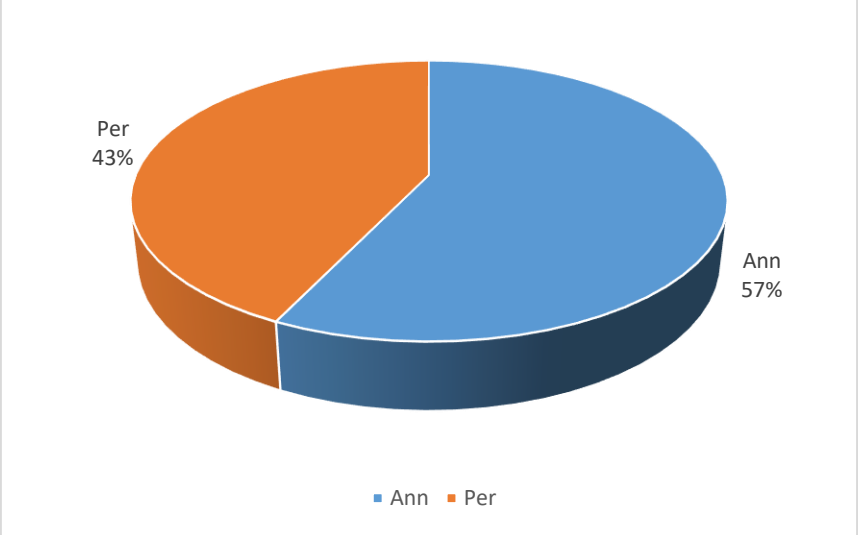

Figure 3: Habit plant of species of the study sites.

The life form spectrum of Green mountain showed that the most dominant life form is Therophytes with (56.42 %), followed by Hemicryptophytes (17.64%) and Geophytes (11.88 %), phanerophytes (7.44 %), Chamaephytes (5.64%) then Parasites (0.96 %) (Table 2 and Fig. 4) here was a similarity in the results agreed with studies [6], [11], [13], [17], [22], [35], [39] [40], [41], [42], [44], [45]and [46].

The results showed that Throphytes are more dominant in the study sites, which is attributed to their short life cycle during the rainy season, and weather factors directly affect the patterns of flowering plant life, as confirmed by [26]. The dominance of Therophytes in arid areas may be attributed to the long duration of drought throughout the year, from April to October, [24], [36] and [40]. In most bulbous plants and rhizomes, they adapt to seasonal climatic changes, belonging 99 species (11.88%) with different topographic of the Green Mountain. They successfully grew and flowered in the spring, while vegetative growth in the end during the dry season, which gives them a great ability to cope with climate changes [9]. They form a significant percentage of the flora of Libya in terms of perennial plants, aside from evergreen trees and shrubs. The proportions of dominance of Theorphytes the biological spectrum of the environment may change due to biotic influences such as grazing,

agricultural operations, deforestation, and trampling, [32]. In addition, the characteristics of the Mediterranean climate, including dry and high temperatures, lead to an adaptive strategy for Therophytes, which make up more than 50% of the Mediterranean flora [23].

Table 3: life-forms classes of species of the flora of study sites.

Life form classes	Abbreviation	No. of species	Percentage
Therophytes	Th	470	56.42 %
Hemicryptophytes	He	147	17.64 %
Geophytes	Ge	99	11.88 %
Phanerophytes	Ph	62	7.44 %
Chamaephytes	Ch	47	5.64 %

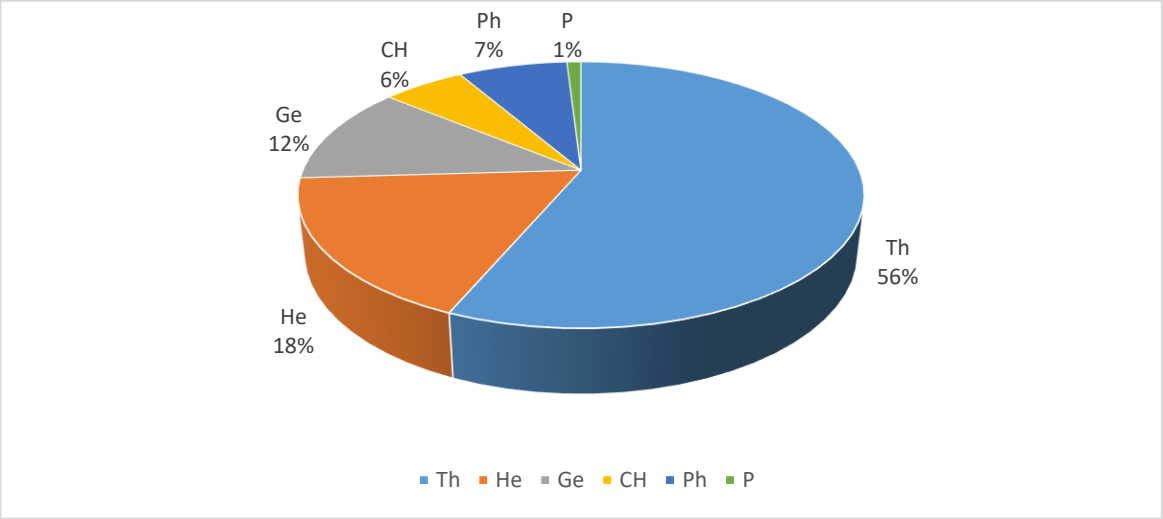

Figure 4: Life form of plants in study sites.

The results showed that the percentages of the biological spectrum of the largest families, such as the Asteraceae, Fabaceae, Poaceae, and Apiaceae, were present in the study sites across various topographic and with a gradual increase in elevation. This is attributed to their high ability to produce seeds and rapid spread due to their light weight and various means of dispersal, such as the wind, and their tolerance of surrounding environmental conditions, especially since they are annual herbs and some are perennial herbs.

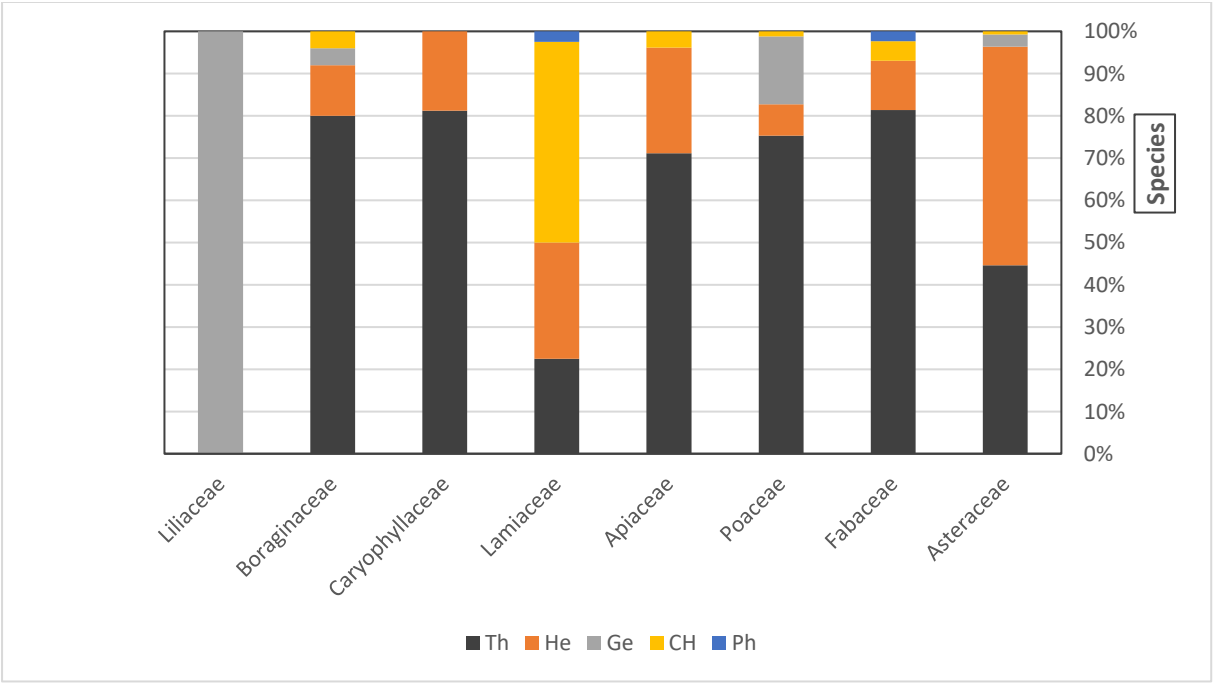

Figure 5: Biological spectrum of The Largest Families plants in Study regions.

Table 2: List of plants, life form and Habit plants of study sites. Per. = Perennials, Ann. = Annuals; Th. = Therophytes, H.=Hemicryptophytes, G.= Geophytes, Ch. = Chamaephytes, P.=Parasites.

Family	Scientific names	Habit	Life forms
Asteraceae	Anvillea garcinii (Burm.f.) DC.	Per	He
	Xeranthemum inapertum (L.) Miller.	Ann	Th
	Xanthium strumarium L.	Ann	Th
	Varthemia sericea (Batt. &Traubut)Diels.	Per	He
	Varthemia candicaus (Delile.) Boiss.	Per	He
	Urospermum picroides (L.) F.W.Schmidt	Ann	Th
	Urospermum dalechampii (L.) F. W. Schmidt	Per	He
	Tyrimnus leucographus (L.) Cass.	Ann	Th
	Tragopogon hybridus L.	Ann	Th
	Tolpis virgata (Desf.) Bertol.	Per	He
	Sylibum marianum (L.) Gaetner	Ann	Th
	Sonchus oleraceus L.	Ann	Th
	Sonchus asper (L.) Hill	Per	He
	Senecio leucanthemifolius Poir.	Ann	Th
	Serratula cichoracea (L.) DC.	Ann	Th
	Rhagadiolus stellatus (L.) Gaerrtner	Per	He
	Scorzonera lacinita L.	Per	Ge
	Scorzonera hispanica L.	Per	Ge
	Reichardia picroides (L.) Roth.	per	He
	Reichardia tingitana (L.) Roth	per	He
	Pulicaria vulgaris Gaertin.	Ann	Th
	Pulicaria inuloides (Poiret.) DC.	Ann	Th
	Ptilostemon gnaphaloides (Cirillo) Sojak	Ann	Th
	Picris mauginiana Pamp.	Ann	Th
	Picris asplenioides L.	Ann	Th
	Phagnalon saxatile (L.) Cass.	Per	He
	Phagnalon rupester (L.) DC.	Per	He
	Phagnalon graenum Boiss &Heldr.	Per	He
	Pallenis spinosa (L.) Cass.	Per	He
	Pallenis cyrenaica Alavi Asteraceae	Per	He
	Otanthus maritimus (L.) Hoffmanns& Link.	Per	Ge
	Onopordum espinae Coss & Bonnet	Per	He
	Onopordum arenarium (Dest.) Pomel.	Per	He
	Onopordum cyrenaicum Maire & Weiller	Per	He
	Notobasis syriaca (L.) Cass.	Ann	Th
	Chamomilla aurea (Loefl.) Sch.Bip.	Ann	Th
	Mantisalca duriaei (Spach.) Briq. & Cavillier	Ann	Th
	Leontodon tuberosus L.	Per	He
	Launaea nudicaulis (L) Hooker.	Per	He
	Iogfia gallica L.	Ann	Th
	Hypochaeris glabra L.	Ann	Th
	Hypochaeris achyrophorus L.	Ann	Th
	Helichrysum stoechas (L.) Moench A	Per	He
	Hedypnois cretica (L.) Dum.	Ann	Th
	Francoeuria lanciniata Cosson &Durien.	Ann	He
	Filago pyramidata L.	Ann	Th
	Filago desertorum Pomel	Ann	TH
	Evax pygmaea L. Brot	Ann	Th
	Echinops galalenis Schwein.	Per	He
	Echinops cyrenaicus Durand & Barratt.	Ann	Th
	Dittrichia viscosa (L.) Greuter	Per	He
	Cynara cyrenaica Maire & Weiller	Ann	Th
	Crepis senecioides Delile subsp. filiformis (Viv.) Alavi	Ann	Th
	Crepis pusilla (Sommier) Merxm.	Ann	Th
	Crepis nigricans Viv.	Ann	Th
	Crepis spathulata Guss.	Per	He
	Crepis vesicaria ssp tarxcifolia (Thull.). ex Schinz &Keller.	Per	He
	Crepis libyca (Pamp.) Shabet	Per	He
	Cichorium spinosum L.	Per	He
	Cichorium pumilum Jacq.	Ann	Th
	Cichorium endivia L. subsp. Divaricatum (Schousb.) P.D.	per	Th
	Cicerbita haimanniana (Ascher.) Beau	Per	Ge
	Chrysanthemum segetum L.	Ann	Th
	Chrysanthemum coronarium L.	Ann	Th
	Chamomilla aurae (Loeft.) Gay ex Cosson &Kralik	Ann	Th
	Centaurea cyrenaica Beguinot & Vacc	Ann	Th
	Centaurea pumilio	Ann	Th

	Centaurea melitensis	Ann	Th
	Crupina vulgaris Cass	Ann	Th
	Crupina crupinastrum (Moris.) Vis	Ann	Th
	Carduncellus caeruleus (L.) C.Presl.	Ann	Th
	Carthamus divaricatus Beguinot&Vacc	Ann	Th
	Carthamus glaucus Bieb.	Ann	Th
	Amberboa tubiflora Murb.	Ann	Th
	Amberboa crupnoides (Deaf.) DC	Ann	Th
	Mantiseta duriaei (Spach.) Briq.&Cavillier.	Ann	Th
	Carthamus lanatus L.	Per	Ch
	Carlina lanata L.	Ann	Th
	Carlina involcrate Poiret.	Ann	Th
	Carlina sicula Ten	Ann	Th
	Calendula arvensis L.	Ann	Th
	Bellis sylvestris Cyn. var. cyrenaica Beg	Ann	Th
	Bellis sylvestris Cirillo	Ann	Th
	Asteriscus aquaticus (L.) Less	Ann	Th
	Anthemis cyrenaica Coss. var. cyrenaica	Ann	Th
	Anthemis cotula L.	Ann	Th
	Anthemis maritima L.	Ann	He
	Anthemis tanbertii Durand & Barratte.	Ann	Th
	Aetheorhiza bulbosa (L.) Cass.	Per	He
	Achilliea santolina L. Zefra	Per	He
	Evax contracta Boiss.	Ann	Th
	Cynara cornigera Lindley.	Ann	Th
	Centaurea alexandrina Delile.	Ann	Th
	Cardus pycnocephalus L.	Ann	Th
	Cirsium monpessulanum (L.)Hill	Per	He
	Cirsium creticum (Lam.) Durv.	Per	Th
	Atractylis canduus (Fork.)Christensen.	Per	He
	Atractylis cancellata L.	Ann	Th
	Anacyclus clavatus (Desf.) Pers -	Ann	Th
Fabaceae	Trifolium scabrum L.	Ann	Th
	Trifolium subterraneum L.	Ann	Th
	Vicia lutea L.	Ann	Th
	Anagyris foetida L.	Ann	Th
	Anthyllis tetraphylla	Ann	Th
	Anthyllis vulneraria ssp maura (Beck) Bornn	Per	He
	Astragalus boeticus L.	Ann	Th
	Astragalus taubertianus Aschres&Barbey.	Ann	Th
	Astragalus tribuloides Del.	Ann	Th
	Astraglus hispidulus DC	Ann	Th
	Biserrula pelecina L.	Ann	Th
	Calicotome spinosa (L.) Link	Per	Ph
	Calicotome villosa (Poir.) Link	Per	ph
	Cicer arietinum L.	Ann	Th
	Dorycnium hirsutum (L.) Ser.	Per	He
	Ebenus armitagei Schweinf .et Traub.	Per	He
	Genista acanthoclada DC.	Per	Ph
	Glycyrrhiza glabra L.	Ann	Th
	Hippocrepis cyclocarpa Murb.	Ann	Th
	Hymenocarpos circinatus (L.)Savi	Ann	Th
	Lathyrus aphaca L.	Ann	Th
	Lathyrus gorgonei Parl	Ann	Th
	Lathyrus hierosolymitanus Boiss	Ann	Th
	Lathyrus clymenum L.	Ann	Th
	Lathyrus setifolius	Ann	Th
	Lotus conimbricensis Brot.	Ann	Th
	Lotus gebella Vent.	Ann	Th
	Lotus halophilus Boiss . exBorum	Ann	Th
	Lotus suaveolens Pers.	Ann	Th
	Lotus collinus (Boiss.) Heldr.	Ann	Th
	Lotus creticus L.	Per	He
	Lotus cytisoides L.	Ann	Th
	Lotus edulis L.	Ann	Th
	Lotus ornithopodioides L.	Ann	Th
	Lotus tetragonolobus L.h	Ann	Th
	Lupinus micranthus Guss	Ann	Th
	Medicago turbinata (L.) All.	Ann	Th
	Medicago lupulina L.	Per	He
	Medicago disciformis Dc	Ann	Th

	Medicago polymorpha L.	Ann	Th
	Medicago truncatula Gaertn.	Ann	Th
	Medicago cyrenaica Maire & Weill	Ann	Th
	Medicago rugosa Desr.	Ann	Th
	Medicago sative L.	Per	Ch
	Medicago littoralis Rohde ex Lois.	Ann	Th
	Medicago minima L.	Ann	Th
	Medicago orbicularis (L.) Bart.	Ann	Th
	Medicago truncatula Gaertn.	Ann	Th
	Melilotus indicus (L.) All.	Ann	Th
	Melilotus italicus (L.) Lam.	Ann	Th
	Melilotus messanensis (L.) All	Ann	Th
	Melilotus sulcatus Desf.	Ann	Th
	Onobrychis crista-galli (L.) Lam.	Ann	Th
	Ononis spinosa L.	Per	He
	Ononis pendula Desf.	Ann	Th
	Ononis hispida Desf.	Per	Ch
	Ononis natrix L.	Per	Ch
	Ononis reclinata L.	Ann	Th
	Ononis viscosa L.	Ann	Th
	Psoralea bituminosa L.	Per	He
	Scorpiurus muricatus L.	Ann	Th
	Spartium junceum L.	Per	Ch
	Tetragonolobus purpureum Lois.	Ann	Th
	Trifolium suffocatum L.	Ann	Th
	Trifolium campestre Schreb,	Ann	Th
	Trifolium uniflorum L.	Per	He
	Trifolium fragiferum L.	Per	He
	Trifolium lappaaceum L.	Ann	Th
	Trifolium micranthum Viv	Ann	Th
	Trifolium strictum L	Ann	Th
	Trifolium tomentosum L.	Ann	Th
	Trifolium angustifolium L.	Ann	Th
	Trifolium arvense L.	Ann	Th
	Trifolium Pupureum Lios.	Ann	Th
	Trifolium stellatum L.	Ann	Th
	Trifolium subterranean L.	Ann	Th
	Trignella coerulescens (Bieb.) Halac.	Ann	Th
	Trignella maritima Del.ex Poir.	Ann	Th
	Trignella gladiata Stev.	Ann	Th
	Vicia laxiflora Brot.	Ann	Th
	Vicia peregrina L	Ann	Th
	Vicia ervilia (L.) Willd	Ann	Th
	Vicia hybrida L.	Ann	Th
	Vicia sativa L .	Ann	Th
	Vicia tetrasperma (L.) Schreb.	Ann	Th
	Vicia monantha Retz.	Ann	Th
Poaceae	Aegilops neglecta Req.ex Berto.	Ann	Th
	Aegilops kokschyi Boiss.	Ann	Th
	Aegilops peregrina peregrine (Hack.) Maire et Weill.	Ann	Th
	Aegilops ventricosa Tausch.	Ann	Th
	Triticum compactum Host.	Ann	Th
	Avena barbata Pott ex Link.	Ann	TH
	Avena sterilis L.	Ann	Th
	Briza maxima L.	Ann	Th
	Briza minor L.	Ann	Th
	Cynosurus elegans Desf.	Ann	Th
	Antinoria insularis(Parl.)Maire.	Ann	Th
	Milium vernale M.Bieb.	Ann	Th
	Polypogon monspecliensis (L.)Desf.	Ann	Th
	Polypogon maritmus Willd.	Ann	Th
	Polypogon semiverticllatus (Forsk.)Hyl.	Ann	Th
	Gastridium ventricosum (Gouan) Schinz et Thell.	Ann	Th
	Lagurus ovatus L.	Ann	Th
	Alopecurus mysnroides Huds.	Ann	Th
	Phalaris truncata Guss.	Per	He
	Phalaris paradoxa L.	Ann	Th
	Arando donax L.	Per	Ge
	Phragmites australis (Cav.) Trin. ex Steud.	Per	He
	Schismus arabicus Nees.	Ann	Th
	Stipa capensis Thunb.	Ann	Th

	Piptatherum miliaceum (L.)Coss.	per	He
	Piptatherum coerulescens (Desf.) P.Beauv.	Per	He
	Piptatherum holcifome (Bieb)Roem.et Schult.	per	He
	Dinebra retroflexa (Vahl)Panz.	Ann	Th
	Sporobolus virginicus (L.) Kunth.	per	He
	Digitaria sanguialis (L.) Scop.	Ann	Th
	Setaria adhaerens (Forsk.)Chiov.	Ann	Th
	Setaria verticillate (L.) P.Beauv.	Ann	Th
	Setaria glauca(L.) P.Beauv.	Ann	Th
	Hyparrhenia hirta (L.)Stapf.	Per	Ge
	Andropogon distachyos L.	Per	Ch
	Sorghum halepensa (L.)Pers.	Per	Ge
	Festuca arundinacea Schreb.	Per	Ge
	Lolium perenne L.	Per	Ge
	Lolium multiflorum Lam.	Per	Ge
	Lolium rigidum Gaud.	Ann	Th
	Lolium loliaceum (Bory et Chaub.) Hand-Mazz	Ann	Th
	Ammophila austalis (Mbille.) Port et Rigo	Per	Ge
	Trachynia distachya (L.)Link.	Ann	Th
	Bromus madritensis L.	Ann	Th
	Bromus rubensL.	Ann	Th
	Bromus chrysopogon Viv.	Ann	Th
	Bromus alopacuros Poir.	Ann	Th
	Bromus caroli-henrici Greuter..	Ann	Th
	Bromus intermodius Guss.	Ann	Th
	Bromus lanceolatus Roth.	Ann	Th
	Catapodium rigidum (L.) C.E. Hubb.	Ann	Th
	Catapodium marinum (L.) C.E.Hubbard.	Ann	Th
	Cynodon dactylon (L.) Pers.	Per	Ge
	Crithopsis delileana (Pourr.) Breistr.	Ann	Th
	Desmazeria philistaea (Bioss.)H.Scholz.	Ann	Th
	Parapholis incurva (L.)C.E.Hubbard.	Ann	TH
	Gaudinia fragilis (L.) P.Beauv.	Ann	Th
	Lophochloa pubsscens (Lam.)H.Scholz.	Ann	Th
	Lophochloa cristata (L.) Hyl.	Ann	Th
	Aira tenorii Guss.	Ann	Th
	Aira cupaniana Guss.	Ann	Th
	Hordeum bulbosum L.	Per	Ge
	Hordeum murinum L. subsp. Murnium.	Ann	Th
	Hordeum vulgare L.	Ann	Th
	Lamarckia aurea (L.) Moench	Ann	Th
	Melica minuta	Ann	Th
	Phalaris minor Retza.	Per	Th
	Psilurus incurvus (Gouan) Schinz et Thell.	Ann	Th
	Dactylis glomerata L.	Ann	Th
	Poa trivialis ssp trivialis	Per	Ge
	Poa trivialis ssp sylvicola (Guss.)H.Lindb.f	Per	Ge
	Poa pentapolit ana H.Scholz.	Per	Ge
	Poa infirma Kunth.	Ann	Th
	Poa bulbosa L.	Ann	Th
	Cynosurus coloratus Lehm .ex Steud.	Per	Ge
	Poa annua L.	Ann	Th
	Trisetaria macrochaeta (Boiss.)Mair.	Ann	Th
	Vulpia bromoidea (L.)S.F.Gray	Ann	Th
	Vulpia ciliata Dumort.	Ann	Th
	Vulpia ligustica (All.) Link.	Ann	Th
	Vulpia inops (Del.) Hackel.	Ann	Th
Brassicaceae	Alyssum minus (L) Rothm	Ann	Th
	Alyssum montanum L	Per	He
	Biscutella didyma L.	Ann	Th
	Brassica cyrenaica Spreng	Ann	Th
	Carrichtera annua (L.) DC	Ann	Th
	Capsella bursa-pastoris (L.) Medik.	Ann	Th
	Cardamine hirsuta L.	Ann	Th
	Cakile aegyptica (L.) Willd .	Ann	Th
	Coronopus squamatus (Forsk.)Ascherson.	Ann	Th
	Didesmus aegyptius (L.) Desv	Ann	Th
	Diplotaxis virgata (Cav) DC	Ann	Th
	Enarthrocarpus pterocarpus (Pers.) DC.	Ann	Th
	Erophila verna (L.) Besser	Ann	Th
	Erucaria microcarpa Boiss	Ann	Th

	Hirschfeldia incana (L.) Lag.-Foss.	Ann	Th
	Lepidium sativum L.	Ann	Th
	Matthiola tricuspidata (L.) R.Br.	Ann	Th
	Matthiola lunata DC.	Ann	Th
	Matthiola sinnata (L.) R.Br	Ann	Th
Apiaceae	Pituranthos tortuosus (Desf)Benth.	Per	Ch
	Ammi majus L.	Ann	Th
	Ammi visnaga (L.) Lam	Ann	Th
	Bifora testiculata (L.) Roth.	Ann	Th
	Bunium incrassatum (Boiss.)Batt.	Per	He
	Crithmum maritimum L.	Per	He
	Athamanta della - cellae Ascher.et Barbey.	Per	He
	Feoniculum vulgar Mille.	Ann	Th
	Anethum gravelons L.	Ann	Th
	Conium maculatum L.	Per	He
	Bupleurum lancifolium Hornem.	Ann	Th
	Bupleurum subovatum Link et.Spreng.	Ann	Th
	Bupleurum odontitus L.	Ann	Th
	Bupleurum gerardii	Ann	Th
	Bupleurum trichopodum	Ann	Th
	Bupleurum semicompositum	Ann	Th
	Apium nodiflorum (L.) Lag.	Ann	Th
	Ridolfia segetum (Guss.) Moris.	Ann	Th
	Ammoides pusilla (Brot.) Breist.	Ann	Th
	Brachyapium dichotomum(L.) Maire.	Ann	Th
	Cuminum cyminum L.	Ann	Th
	Ferula communis L.	Ann	Th
	Ferula marmarica Aschers. Et Traub.	Ann	Th
	Malabaila suaveolans (Del.)Coss.	Per	He
	Tordylium apulum L.	Ann	Th
	Elaeoselinum asclepinum (L.)Bert.	Per	He
	Torillis heterophylla Guss.	Ann	Th
	Torillis tenella (Del.) Reichb.	Ann	Th
	Turgenia latifolia (L.) Hoffm.	Ann	Th
	Pachyctrnium mirabilis Maire& Pamp.	Per	He
	Daucus guttatus Sibth& Sm.	Ann	Th
	Pseudoraya pumila (L.)Grande.	Ann	Th
	Daucus littoralis Sibth.& Sm.	Ann	Th
	Conium maculatum L.	Per	He
	Coriandrum sativam L.	Ann	Th
	Daucus syrticus Murb.	Ann	Th
	Deverra tortuosa (Desf.) DC.	Ann	Th
	Eryngium campestre L.	Per	He
	Lagoecia cuminoides L.	Ann	Th
	Malabaila suaveolens Delile & Coss.	Per	He
	Pimpinella peregrina L.	Ann	Th
	Scaligeia cretica (Mill.) Boiss.	Per	Th
	Scandix australis L.	Ann	Th
	Scandix pecten-veneris L.	Ann	Th
	Scandix stellata Banks&Sol	Ann	Th
	Smyrnium olusatrum L.	Per	He
	Thapsia garganica L.	Per	Ch
	Torilis arvensis (Huds.) Link	Ann	Th
	Torilis leptophylla (L.) Rchb.f.	Ann	Th
	Torilis nodosa (L.) Gaertn.	Ann	Th
	Seseli tortuosum L.	Per	He
	Opopanax chironum (L.) Koch.	Per	He
Lamiaceae	Micromereria Juliana (L.) Bent ex Rechenb.	per	Ch
	Ajuga iva (L.) Schreb.	per	He
	Ballota andreuzzians Pomp.	Per	Ch
	Ballota pseudo-dictamnus (L.) Benth	per	Ch
	Calamintha incana (Sm.) Boiss. Ex Benth	per	Ch
	Lamium amplexicaula L.	Ann	Th
	Marrubium alysson L.	Per	He
	Marrubium vulgare L.	per	He
	Mentha pulegium L.	per	He
	Micromeria graeca (L.) Benth. ex Reichenb.	Per	He
	Micromeria guichardii(Quezel exZaffran) Brullo et Furnari.	per	Ch
	Micromeria nervosa (Desf.)Benth.	per	Ch
	Nepeta cyrenaica Quezel & Zaffran.	Per	He
	Nepeta scordotis L.	per	He

	Origanum cyrenaicum Beg. & Vacc.	per	He
	Phlomis floccosa D. Don	per	Ch
	Prasium majus L.	per	Ph
	Rosmarinus officinalis L.	per	Ch
	Salvia fruticosa Mill.	per	Ch
	Salvia lanigera Poir.	Ann	Th
	Salvia spinosa L.	Per	He
	Salvia verbenace L.	Ann	Th
	Salvia viridis L.	Ann	Th
	Satureja fortii Pamp.	Per	Th
	Satureja thmbra L.	per	Ch
	Scutellaria rubicunda Hornem.	Per	He
	Siderites curvidens Stapf	Ann	Th
	Siderites romana L.	Ann	Th
	Stachys ocymastrum (L.)Briquet.	Ann	Th
	Stachys rosea (Desf.) Bioss.	per	He
	Stachys tournefortii Poiret.	Per	Ch
	Teucrium barbeyanum Asch.	per	Ch
	Teucrium brevifolium Schreb.	per	Ch
	Teucrium campanulatum L.	per	Ch
	Teucrium davaeanum coss.	Per	Ch
	Teucrium divaricatum Sieber ex Boiss.	Per	Ch
	Teucrium lini-vaccarii Pamp.	Per	Ch
	Teucrium polium L.	Per	Ch
	Thymus capitatus (L) Hoffm &Link.	Per	Ch
Liliaceae	Urginea maritima (L.) Baker.	per	Ge
	Asparagus aphyllus L.	Per	Ge
	Colchicum ritchii R.Br.	Per	Ge
	Androcymbium gramineum (Cav.) Mc.	per	Ge
	Asphodelus microcarpus Salzm&Viv	per	Ge
	Asphodelus aestivus Brot.	per	Ge
	Asphodelus Tenuifolius Cav.	per	Ge
	Gagea trinervia (Viv) Greuter	per	Ge
	Scilla villosa Desf.	per	Ge
	Urginea autumnalis (L,) EL-Gadi	per	Ge
	Ornithogalum tenuifolium Guss	per	Ge
	Ornithogalum umbellatum L.	per	Ge
	Bellevalia sessiliflora (Viv) Kunth.	per	Ge
	Bellevalia cyrenica Maire & Weiller	per	Ge
	Ruscus aculeatus L.	per	Ge
	Asparagus acutifolius L.	per	Ge
	Muscar racemosum (L.) Mill.	per	Ge
	Smilax aspera L.	per	Ge
	Bellvalia mauritanica Pomel.	Per	Ge
	Gagea reticulata (Pall.) Schult.	Per	Ge
Rubiaceae	Galium recurvum Ren ex Dc.	Ann	Th
	Asperula arvensis L.	Ann	Th
	Rubia peregrina L.	Per	He
	Galium mollugo L.	Per	He
	Galium spurium L.	Ann	Th
	Galium aparine L.	Ann	Th
	Galium tricornutum Dandy.	Ann	Th
	Asperula aristata L.F.	Per	He
	Sherardia arvensis L.	Ann	Th
	Crucianella maritima L.	Per	He
	Crucianella aegyptiaca L.	Ann	Th
	Crucianella latifolia	Ann	Th
	Galium murale (L.) All.	Ann	Th
	Galium setaceum Lam.	Ann	Th
	Galium verrucosum Huds.	Ann	Th
	Putoria calabrica (L.F) DC.	Per	Ph
	Sheradia arvensis L.	Ann	Th
	Valantia hispida L.	Ann	Th
	Valantia lanata Delile & Coss.	Ann	Th
Caryophyllaceae	Polycarpon prostratum (Forssk.) Asch. & Schweinf.	Ann	Th
	Polycarpon tetraphyllum (L.) L.	Ann	Th
	Silene apetala willd	Ann	Th
	Silene cyrenaica Maire & Weiller	Ann	Th
	Silene gallica L.	Ann	Th
	Silene behen L.	Ann	Th
	Silene fruticosa L.	Per	He

	Silene italicus (L.) Pers.	Per	He
	Silene rubella L.	Ann	Th
	Silene sedoides Poiret	Ann	Th
	Silene biiappendiculata Ehrenb. Ex Rohrb.	Ann	Th
	Telephium sphaerospermum Boiss.	Ann	Th
	Spergularia bocconii (Scheele.)Asch & Graebn.	Ann	Th
	Spergularia diandra (Guss.) Heldr & Sart.	Ann	Th
	Sagina apetala Ard.	Ann	Th
	Sagina maritima G.Don.	Ann	Th
	Cerastium illyricum Ard.	Ann	Th
	Cerastium glomeratum Thuill.	Ann	Th
	Stellaria media (L.) Cyrill.	Ann	Th
	Minuartia hybrida (Vill) Schiskin.	Ann	Th
	Minuartia geniculata (Poiret.) Thell.	Per	He
	Minuartia mediterranea (Ledeb.) K.Maly.	Ann	Th
	Vaccaria pyramidata Medik.	Ann	Th
	Petrorhagia velutina (Guss.) Ball&Heywood.	Ann	Th
	Petrorhagia cyrenaica (Durand& Barratte)Ball& Heywood.	Ann	Th
	Spergularia marina (L.) Gariseb.	Ann	Th
	Silene longipetetala Vent.	Per	He
	Silene tridentata Desf.	Ann	Th
	Silene cerastioides L.	Ann	Th
	Silene articulata Viv.	Ann	Th
	Silene vulgaris (Moench) Garcke.	Per	He
	Silene marmarica Beg&Vace.	Per	He
Euphorbiaceae	Andrachne telephioides L.	per	He
	Chrozophora tinctoria L.	Ann	Th
	Euphorbia characias L.	Per	He
	Euphorbia dendroides L.	Per	Ph
	Euphorbia dracunculoides Lam.	Ann	Th
	Euphorbia falcata L.	Ann	Th
	Euphorbia helioscopia L.	Ann	Th
	Euphorbia paralias L.	Ann	Th
	Euphorbia peplis L.	Ann	Th
	Euphorbia chamaesyce L.	Ann	Th
	Euphorbia squamigera Lois	Per	Ph
	Euphorbia spinosa L.	Per	Ph
	Euphorbia pseudo-apios Maire & Weill.	Per	He
	Euphorbia pterococca Brot.	Ann	Th
	Euphorbia oxyodonta Boiss&Hausskn.	Ann	Th
	Euphorbia exigua L.	Ann	Th
	Ricinus communis L.	Per	Ph
	Mercurialis annua L.	Ann	Th
	Euphorbia bivonae Stend	Per	Ch
Boraginaceae	Anchusa aegyptiaca (L.) DC.	Ann	Th
	Anchusa hybrida Ten.	Ann	Th
	Anchusa azuurea Miller.	Per	He
	Anchusa aggregata Lehm.	Ann	Th
	Borago officinalis L.	Ann	Th
	Gastrocolyle hispida (Fforsk .) Bunge.	Ann	Th
	Cynoglossum cheirifolium L.	Ann	Th
	Echium angustifolium Mill.	Per	Ch
	Echium humile Desf.	Per	He
	Echium sabulicolum Pomel	Ann	Th
	Echium italicum L.	Ann	Th
	Echium plantagineum L	Ann	Th
	Echium arenarium var.debile Pamp.	Ann	Th
	Cerinthe major L.	Ann	Th
	Heliotropium supinum	Ann	Th
	Heliotropium hirsutissimum Grauer.	Ann	Th
	Heliotropium europaeum L.	Ann	Th
	Arnebia decumbens(Vent.) Coss&Kral.	Ann	Th
	Cynoglossum cheirifolium L.	Ann	Th
	Myosotis pusilla Loisel.	Ann	Th
	Lithodora rosmarinifolia (Ten.) I. M. Johnst.	Per	He
	Nonea viviani DC	Ann	Th
	Nonea vesicaria (L.)R.Br.	Ann	Th
	Elizaldia calycina ssp multicolor (Kunze.)Maire,	Ann	Th
	Onosma cyrenaicum Durand & Barratte	Per	Ge
Cyperaceae	Carex illegitima Cesate.	Per	Ge
	Carex divisa Huds.	Per	Ge

	Carex flacca Schreb.	Per	Ge
	Carex distans L.	Per	Ge
	Carex extersa Good.	Per	Ge
	Cyperus laevigatus L.	Per	Ge
	Cyperus fuscus L.	Per	Ge
	Cyperus longus L.	Per	Ge
	Shoenus nigricans L.	Per	Ge
	Eleocharis palustris (L.) R.Br.	Per	Ge
	Scirpus maritimus L.	Per	Ge
	Scirpus holoshoenus L.	Per	Ge
	Scirpus lacustris L.	Per	Ge
Crassulaceae	Crassula vaillanvii (Willd .) Roth.	Ann	Th
	Sedum lanconicum Boiss .et Held.	Per	He
	Sedum sediforme (Jacq.) Pau.	Per	He
	Sedum certense Maire	Per	He
	Sedum mirum Pamp.	Ann	Th
	Sedum cepaea L.	Ann	Th
	Sedum rubens L.	Ann	Th
	Sedum hispanicum L.	Ann	Th
	Sedum album L.	Per	He
	Sedum bracteatum viv	Ann	Th
	Sedum caespitosum (Cav.) DC.	Ann	Th
	Umbilicus horizontalis (Guss)Dc	Per	He
	Umbilicus rupestris (Salisb) Dandy	Per	He
Cistaceae	Cistus incanus L.	Per	Ch
	Cistus parviflorus Lam.	Per	Ch
	Cistus salviifolius L.	Per	Ch
	Fumana laevipea(L.)Spach.	Per	Ch
	Fumana arabica (L.) Spach	Per	Ch
	Fumana thymifolia (L.) Spach.	Per	Ch
	Helianthemum salicifolium (L.) Mill.	Ann	Th
	Helianthemum ciliatum (Deaf.)Pers.	Ann	Th
	Helianthemum ledifolium Mill.	Ann	Th
	Helianthemum cinereum(Cav.) Pers	Ann	Th
	Helianthemum aegyptiacum (L.) Miller	Ann	Th
	Tuberaria guttata (L.) Fourr.	Ann	Th
Convolvulaceae	Convolvulus humilus Jaeq.	Per	He
	Convolvlus althaeoides L.	Per	He
	Convolvlus oleifolus Desr.	Ann	Th
	Convolvulus arvensis L.	Per	He
	Convolvulus maireanum Pamp.	Per	He
	Convolvulus dorycnium L.	Per	He
	Convolvulus siculus L.	Ann	Th
	Convolvulus pentapetaloides L.	Ann	Th
	Convolvulus tricolor L.	Ann	Th
Geraniaceae	Erodium cicutarium (L) L.Herit.	Ann	Th
	Erodium gruinum (L) L. Herit.	Ann	Th
	Erodium malacoides (L.) LHerit.	Ann	Th
	Erodium chium L.	Ann	Th
	Erodium keithii Guitt .et Le Houerou.	Ann	Th
	Erodium toeranum Guitt .et Le Houerou.	Ann	Th
	Erodium touchyanum Delile.	Ann	Th
	Erodium moschatum (L.)L Herit.	Ann	Th
	Erodium hirtum (Frorsk.) Will	per	He
	Erodium ciconium (L.) L Hert.	Ann	Th
	Erodium neuradifolium Delile ex Godr.	Ann	Th
	Geranium molle L.	Ann	Th
	Geranium rotundifolium L.	Ann	Th
	Geranium lucidum L.	Ann	Th
	Geranium robertianum L.	Ann	Th
	Geranium tuberosum L.	per	Ch
	Geranium colombinum L.	Ann	Th
	Geranium dissectum L.	Ann	Th
	Geranium brutium Gasp.	Ann	Th
Scrophulariaceae	Linaria tarhunesis Pamp.	Ann	Th
	Linaria virgata (Poir) Desf.	Ann	Th
	Linaria arvensis (L.) Desf.	Ann	Th
	Linaria haelava (Forsk.)Delile.	Ann	Th
	Linaria triphylla (L.)Mill	Ann	Th
	Kickxia commulata (Bernh .ex Reichenb.)Fritsch	Ann	Th
	Parentucellia floribunda Viv	Ann	Th

	Parentucellia latifolia (L.) Carnel.	Ann	Th
	Scrophularia canina L.	Per	He
	Scrophularia peregrina L.	Ann	Th
	Antirrhinum siculum Mill.	Ann	Th
	Veronica anagallis- aquatica L.	Ann	Th
	Veronica cymbalaria Bod	Ann	Th
	Veronica hederfolia L.	Ann	Th
	Verbascum lentourneuxii Asch &Schweinf.	Per	He
	Verbascum sinuatum L.	Per	Ch
	Misopates orontium (L.) Rafin.	Ann	Th
Solanaceae	Datura fastuosa L.	Ann	Th
	Datura arborea L.	Per	Ph
	Hyposcyamus allba L.	Ann	Th
	Lycium schweinfurthii Dammer.	Per	Ph
	Nicotiana rustica L.	Ann	Th
	Nicotiana glauca R.C.Graham	Per	Ph
	Solanum tuberosum L.	Per	He
	Solanum nigrum L.	Ann	Th
	Solanum sodomeum L.	Ann	Th
	Withania somnifera (L.) Dunal	Per	Ph
Ranunculaceae	Rananculus muricatus L.	Ann	Th
	Adonis dentata Delile	Ann	Th
	Adonis microcarpa DC.	Ann	Th
	Clematis cirrhosa L.	Per	Ph
	Clematis flammula l.	Per	Ph
	Anemome coronaria L	Per	Th
	Nigella arvensisL.	Ann	Th
	Nigella damascena L.	Ann	Th
	Delphinium halteratum Sm.	Ann	Th
	Myosurus minimus L.	Ann	Th
	Ranunculus asiaticus L.	Per	He
	Ranunculus bullatus L.	Per	He
	Ranunculus cyclocarpus Pamp.	Ann	Th
	Ranunculus ficaria L.	Per	He
	Ranunculus macrophyllus Desf.	Per	He
	Ranunculus sprunerianus	Per	He
	Ranunculus trichophyllus Chaix.	Per	He
	Ranunculus paludosus Poiret	Per	He
	Ranunculus trilobus Defs	Ann	Th
Alliaceae	Allihum roseum L.	Per	Ge
	Allihum ampeloprasum L	Per	Ge
	Allihum orientale Boiss	Per	Ge
	Allihum erdelii Zuec	Per	Ge
	Allihum nigrum L.	Per	Ge
	Allihum schubertii Zuec	Per	Ge
	Allihum negrianum Maire & Weiller.	Per	Ge
	Allihum barthianum Asch &Schw.	Per	Ge
	Allihum paniculatum L.	Per	Ge
	Allihum ruhmerianum Asch	Per	Ge
	Allihum subhirsutum L.	Per	Ge
Chenopodiaceae	Atriplex stylosa Viv.	Per	Ph
	Atriplex halimus L.	Per	Ph
	Suaeda pruinosa Lange.	Ann	TH
	Suaeda vera forsk.	Per	Ph
	Beta vulgaria ssp vulgaria	Ann	TH
	Chenopodium vulvaria L.	Ann	TH
	Kochia indica Wight	Ann	TH
	Suaeda palestina Eig & et Zob.	Ann	TH
	Salsola kali L.	Ann	TH
	Salsola vermiulata L.	Ann	TH
	Hammada scoparia (Pomel) Iijin.	Per	Ch
	Noaea mucronata (Forsk.)Asch& Schweinf.	Per	Ch
	Chenopodium murale L.	Ann	Th
Orchidaceae	Orchis collina Soland.	Per	Ge
	Orchis papilionacea Linn	Per	Ge
	Orchis simia Lamk.	Per	Ge
	Ophrys bolosericea (Burm.F.)	Per	Ge
	Ophrys rosea (Desf.) G.Sampaio.	Per	Ge
	Ophrys bombyliflora Link.	Per	Ge
	Neotinea maculata (Desf.)Stearn.	Per	Ge
	Barlia robertiana (Lois.) W.Greuter	Per	Ge

	Ophrys fusca Link	Per	Ge
	Ophrys speculum Link	Per	Ge
	Orchis cyrenaica Dur. & Barr.	Per	Ge
	Orchis italica Poir.	Per	Ge
Polygonaceae	Emex spinosa (L.) Camped	Ann	Th
	Polygonum patulum M.Bieb.	Ann	Th
	Polygonum salicifolium Brouss .ex Willd.	Per	He
	Polygonum maritimum L.	Per	He
	Polygonum aviculare L.	Ann	Th
	Polygonum balansae Boiss.	Per	He
	Polygonum equisetiforme Sm.	Per	He
	Rumex bucephalophorus L.	Ann	Th
	Rumex pulcher L.	Per	He
	Rumex crispus L.	Ann	Th
	Rumex conglomeratus Murray.	Per	He
	Polygala aschersoniana Chodat	Per	Ph
Fumariaceaa	Fumaria dnsiflora DC.	Ann	Th
	Fumaria gaillardotii Boiss	Ann	Th
	Fumaria capreolata L.	Ann	Th
	Fumaria parviflora L.	Ann	Th
	Fumaria macrocarpa Parlatore	Ann	Th
	Fumaria judaica Boiss.	Ann	Th
Iridaceae	Gladiolus byzantinus Miller .	per	Ge
	Gladiolus segatum Ker. Gowl.	per	Ge
	Iris germanica L.	per	Ge
	Iris sisyrinchium L.	per	Ge
	Romulea cyrenaica Beguinot.	per	Ge
	Romulea bulbocodium (L.) Seb&Mauri	per	Ge
	Romulea colmnena Seb&Mauri	per	Ge
	Crocus boullosii Greuter.	per	Ge
Malvaceae	Malva verticillata L.	Ann	Th
	Malva nicaeensis L.	Ann	Th
	Malva parviflora L.	Ann	Th
	Malva aegyptia L.	Ann	Th
	Malva sylvestris L.	Ann	Th
	Althaea hirsuta L.	Ann	Th
	Lavatera bryoniifolia Mill.	Per	Ph
	Lavatera cretica L.	Ann	Th
Plumbaginaceae	Limoniastrum monopetalum (L.) Boiss.	per	Ch
	Limonium pruinosum (L.) Chaz.	Per	He
	Limonium tubiflorum (Delile) Kuntze	Per	He
	Limonium oleifolium Mill.	Per	He
	Limonium cyrenaicum (Rouy)Brullo.	Per	He
	Limonium delicatulum (Girard)O.Ktze.	Per	He
	Limonium subbrotundifolium (Beg.&Vacc.)Bruullo	Ann	Th
	Limonium thouinii (Viv.) O.Ktze.	Ann	Th
Resedaceae	Reseda orientalis (Mull.) Boiss.	Ann	Th
	Reseda alba L. subsp alba	Ann	Th
	Reseda alba L. subsp decursive (Forsk)	Ann	Th
	Reseda lutea L	Ann	Th
	Reseda phyteuma L.	Ann	Th
	Reseda odorata L.	Ann	Th
	Reseda luteola L.	Ann	Th
Rosaceae	Potenilla reptans L.	Per	He
	Malus sylvestris (L.) Mill.	Per	Ph
	Sanguisorba minor Scop.	Per	He
	Rubus sanctus Schreb.	Per	Ph
	Sacropoterium spinosum (L.) Spach	Per	Ch
Urticaceae	Urtica dioica L.	Per	He
	Urtica pilulifera L.	Ann	Th
	Urtica urens L.	Per	He
	Parietaria judaica L.	Per	He
	Parietaria lusitanica L.	Ann	Th
Zygophyllaceae	Fagonia cretica L.	Per	He
	Peganum harmala L.	Per	He
	Zygophyllum album L.	Per	Ph
	Fagonia microphylla Pomal	Per	He
	Zygophyllum geslinii Coss	Per	Ph
Valerianaceae	Centranthus calcitrapae (L.) Dufresne	Ann	Th
	Feddia cornucopiae(L.) Gaetner.	Ann	Th
	Feddia caput-bovis pomel.	Ann	Th

	Valerianella vesicaria (L.) Moench.	Ann	Th
	Valerianella petrovitchii Ascherson.	Ann	Th
	Valerianella muricata (Steven)J.W.Loudon.	Ann	Th
	Verbena officinalis L.	Per	He
	Vitex agnus-castus L.	Per	Ph
	Lantana camara L.	Per	Ph
Oleaceae	Olea europaea L.	Per	Ph
	Phillyrea latifolia L.	Per	Ph
	Phillyrea angustifolia L.	Per	Ph
	Jasminum grandiflorum L.	per	Ph
Lythraceae	Lythrum salicaria L.	Per	He
	Lythrum hyssopifolia L	Ann	Th
	Lythrum thymifolia L.	Ann	Th
Linaceae	Linum bienne Mill.	Ann	Th
	Linum decumbens Desf.	Ann	Th
	Linum nodiflorum L.	Ann	Th
	Linum trigynum L.	Ann	Th
	Linum strictum L.	Ann	Th
	Linum usitatissimum L.	Ann	Th
Juncaceae	Juncus acutus L.	Per	Ge
	Juncus bufonium L.	Ann	Th
	Juncus maritimum Lam	Ann	Th
	Juncus capitatus Weig.	Ann	Th
	Juncus fontanesii .Gay	Per	Ge
Amaryllidaceae	Amaranthus viridis L.	Ann	Th
	Narcissus elegits(Haw.) Spach.	Per	Ge
	Narcissus tazetta L.	Per	Ge
	Pancratium maritimum L.	Per	Ge
ILLecebraceae	Paronychia arabica (Linn) DC	Ann	Th
	Paronychia argentea Laimk	Per	He
	Paronychia chlorothyrsa Murb.	Per	He
	Herniaria cinerea DC.	Ann	Th
	Herniaria cyrenaica Hermann.	Per	He
	Herniaria glabra Linn.	Ann	Th
Guttiferae	Hypericum aegpticum L.	per	Ph
	Hypericum empetrifolium Willd.	per	Ph
	Hypericum decaisnneanum Coss &Daveau.	per	He
	Hypericum triquetrifolium Turra.	per	He
Orobanchaceae	Orobanche nana (Reut.) Noe	Ann	P
	Orobanche mutelii Schultz	Ann	P
	Orobanche crenata Forsk.	Ann	P
	Orobanche versicolor F.Schultz.	Per	P
	Orobanche cernua Loefl.	Per	P
	Orobanche cyrenaic G.Beck.	Ann	P
Papveraceae	Papaver hybridum L.	Ann	Th
	Papaver rhoeas var .rhoeas	Ann	Th
	Papaver dubium L.	Ann	Th
	Roemeria hybrida var dodecandra (forsk) Durand&Barratte.	Ann	Th
	Glaucium flavum Cranz	Per	He
	Glaucium corniculatum (L.)Rud.	Ann	Th
Plantaginaceae	Plantago albicans L.	per	He
	Plantago cyrenaica Durand & Barrate	Ann	Th
	Plantago lanceolata L. Anam	per	He
	Plantago lagopus L.	Ann	Th
	Plantago phaeostoma Boss &Heldr	Ann	Th
Potamogetonaceae	Potamogeton natans L.	Per	Ge
	Potamogeton nodosus Poir.	Per	Ge
	Potamogeton schweinfurthii Bennet.	Per	Ge
	Potamogeton pusillusL.	Per	Ge
Primulaceae	Anagullis arvensis L.	Ann	Th
	Cyclamen rohlfsianum Aschers.	Per	Ge
	Samolus valerandi L.	per	He
Dipsacaceae	Pterocephalus papposus (L,) Coulter.	Ann	Th
	Scobiosa arenaria forskal.	Ann	Th
	Scabiosa libyca Alavi.	Ann	Th
Ericaceae	Arbutus pavarii Pamp.	Per	Ph
	Erica multiflora L.	Per	Ph
	Erica sicula Guss.	Per	Ch
Rhamnaceae	Rhamnus lycioides L.	Per	Ph
	Rhamnus alaternus L.	Per	Ph
	Rhamnus oleoides L.	Per	Ph

Aizoaceae	Carpobrotus acinaciforme (L.)L.Bolus	Per	Ph
	Mesembryanthemum nodiflorum L.	Ann	Th
Anacardiaceae	Pistacia lentiscus L.	Per	Ph
	Rhus tripartita (Ucria) Grande	Per	Ph
Araceae	Arisarum vulgare Targ.Tozz.	Per	Ge
	Arum cyrenaicum Hruby Araceae	Per	Ge
Asclepiadaceae	Caralluma europaea (Guss.) N.E.Br. Adghamus	Per	He
	Periploca angustifolia Labill. Helaab	Per	Ph
Buddlejaceae	Buddeja asiatica Lour.	Per	Ph
	Nicodemia madagascariensis (Lamk)Parker.	Per	Ph
Caprifoilaceae	Lonicera etrusca Santi	per	Ph
	Lonicera nummularifolia Jaub&Spach.	per	Ph
	Viburnum tinus L.	Per	Ph
Campanulaceae	Campanula erinus L.	Ann	Th
	Legousia falcata(Ten.) Fritsch.	Ann	Th
Cupressaceae	Cupressus sempervirens L.	Per	Ph
	Juniperus phoenicea L.	Per	Ph
Gentianaceae	Centaurium pulchellum (Swartz) Druce	Ann	Th
	Centaurium spicatum (L.) Fritsch	Ann	Th
Globulariaceae	Globularia arabica Jaub. & Spach	per	Ph
	Globularia alypum L.	per	He
Lauraceae	Laurus nobilis L.	per	Ph
	Laurus azorica (Seub) J.	Per	Ph
Cuscutaceae	Cuscuta europaea L.	Ann	P
	Cuscuta epithymum (L.) Murray	Ann	P
Oxalidaceae	Oxalis articulata Savig.	Per	Ge
	Oxalis pes-caprae Linn	Per	He
	Epilobium hirsutum L.	Per	Ge
Violaceae	Viola scorpiuroides Coss.	Per	He
Zannichelliaceae	Zanniclellia palustris.L.	Ann	Th
Salicaceae	Salix subserrata Willd.	Per	Ph
	Thesium erythronic Pamp	Per	He
Saxifragaceae	Saxifraga hederacea L.	Ann	Th
	Saxifraga tridactylites L.	Ann	Th
Sparganiaceae	Sparganium neglectum Beeby.	Per	He
Tamaricaceae	Reaumuria vermiculata L.	Per	He
Theigonaceae	Theligonum cynocrambe L.	Ann	Th
Thymelaceae	Daphne jasminea Sibth. & Sm.	Per	Ph
Typhaceae	Typha domigensis Pers.	Per	Ph
Alismataceae	Damasonium alisma Mill.	Ann	Th
Aquifoliaceae	Ilex aquifolium L.	Per	Ph
Apocynaceae	Nerium oleander L	Per	Ph
Arallaceae	Hedera helix L.	Per	Ph
Caesalpiniaceae	Ceratonia siliqua L.	Per	Ph
Ceratophyllaceae	Ceratophyllum demersumL.	Per	Hy
Cucurbitaceae	Ecballium elaterium (L.) A. Rich.	Per	He
Dioscoreaceae	Tamus communis L.	Per	He
Elatinaceae	Elatine macropoda Guss	Ann	Th
Fagaceae	Quercus coccifera L.	Per	Ph
Hypecoaceae	Hypecoum imberbe Sibth&Sm	Ann	Th
Moraceae	Ficus carica L.	Per	Ph
Myrtaceae	Myrtus communis L.	per	Ph
Phytolaccaceae	Phytolacca dioica L.	Per	Ph
Rafflesiaceae	Cytinus hypocistis L.	Per	Para
Punicaceae	Punica granatum L.	Per	Ph
Rutaceae	Casimiroa edulis L.	Per	Ph

Conclusion

This study showed that there are 833 species including 422 genera and 86 families in this area The predominant life form of the plants is Thorphytes. This study is the fundamental base to light out the important sources of valuable plant species that found in the in Al-Jabal AlAkhdar. One of the most important results obtained is that the biological spectrum of the Green Mountain area corresponds with the Mediterranean climate, and that human activities such as grazing, agriculture, and deforestation affect the patterns of flowering plant life. Therefore, we recommend preserving the natural vegetation in the Green Mountain areas from the challenges and dangers posed by these negative activities.

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