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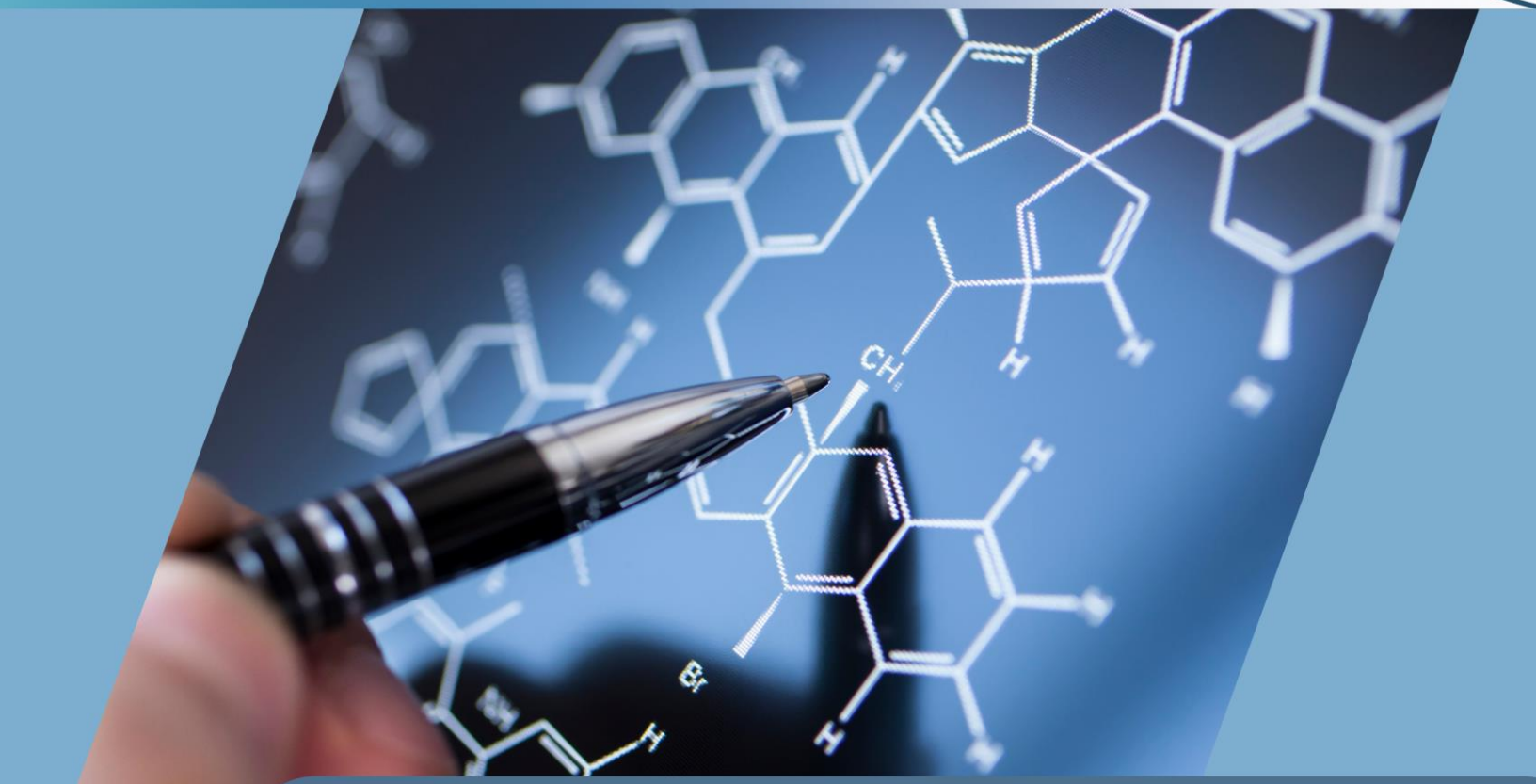

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Survey of Plant Species in Cyrene (Campus apollo) Shahat AL-Jabal AL-Akhdar, Libya

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A B S T R A C T

The main objective of this study was to survey plants on the campus of Apollo, located in the Shahat area. The vegetation sampling was carried out between November 2021 to May 2023 with several field trips to the study area, and make a preliminary list dealing with the floristic composition. 194 species belonging to 160 genera and 57 families were recorded, identified in the Herbarium and arranged using the Engler system. Pteridophyta were represented by one species one family, and 4 species 3 families of Gymnosperms, while the remaining 53 families belong to Angiosperms, Dicotyledon were represented by 43 families 154 species and Monocotyledon 10 families 35 species. The most dominant families were Asteraceae (14%), Poaceae family (11%), followed by Fabaceae family (9%). As for life forms, they were classified according to Raunkiaer and were the most dominant as Therophytes (48%), Chamaephytes (15%), and Geophytes (11%).

1 Introduction

Floristic studies are taxonomic examination of a given area's flora or a significant portion of it, including the identification, nomenclature, and documentation of plant species (Keith, 1988; Ilyas *et al.*, 2013). Furthermore, the floristic lists produced by these studies are frequently the only sources of botanical data for a specific region and may provide the foundation for additional in-depth research. For instance, in ecological studies, it can be used to compare the flora of the same habitat at various times or in different habitats (Ferreira *et al.*, 2013; Martínez-Calderón *et al.*, 2017; Bano *et al.*, 2018(. Recently, floristic studies and taxonomy of various ecosystems have also become essential for the conservation of biodiversity (Heywood, 2004). Floristic composition studies are crucial for understanding the range of plants existing in a region as well as having socioeconomic importance. They offer both humans and other species living in that region refuge, food, medical care, and everything else (Shehata & Galal 2015). A variety of floristic studies have been undertaken on the Flora of Libya, for example (Lemaire, 1703). Just 1% of Libya's total land area is made up of the Al-Jabal Al-Akhdar region. It has a width of 50 km and a length of 250 km along the Mediterranean coast. Boulos claims that Al-Jabal Al-Akhdar has over 90% of all the plant species in Libya, making it the most diversified area in terms of vegetation (Boulos, 1972). In northeastern Libya, on the second terrace of Al-Jabal Al-Akhdar, at an altitude of roughly 600 meters, is Cyrene, situated roughly 10 kilometers east of the city of Al-Bayda. Because of its flora, vegetation cover, biodiversity, climate, and ecological significance, the Al-Jabal Al-Akhdar area (in northeastern Libya) was the subject of recent assessments undertaken by local researchers. (Al-Traboulsi and Alaib, 2021; Omar *et al.*, 2021; Mukassabi *et al.*, 2012), still there is a lack of knowledge and data. Al-Jabal Al-Akhdar is a significant area for ecology. The current study aimed to the initial

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inventory of the types of plants in the region defining them, preparing a list of them, and distributing these plants within groups such as species, genera, and forms different life.

2 Materials and Methods

2.1 Study area

Cyrene is situated on the second terrace of Al-Jabal Al-Akhdar, in the northeast of Libya. It is roughly 10 kilometers east of the city of Al-Bayda. The study area's height ranges from 555 to 578 meters, and it is situated between latitudes 32°49´23.952 ´N and longitude 021°51´11.1888 ´E on the northeastern part of Al Jabal Al-Akhdar. (Figure 1).

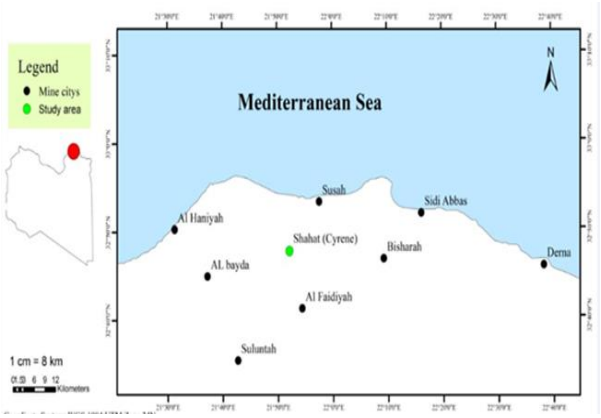

Figure (1) The study area

2.2 Sample collection and Identification

The vegetation sampling was carried out between November 2021 to May 2023 with several field trips to the study area. The specimens were dried for two weeks with presses, they were glued to the herbarium sheet. The plant specimens were identified in the Sylphium herbarium, Department of Botany, College of Science, Omar Al-Mukhtar University, using the Libyan Flora Books. The plant species were arranged and catalogued according to Engler system of classification (Melchoir, 1964), A special file was created for each family, and a serial number for each family was written on the file, according to the Engler system, these files are organized inside the herbarium cabinet, each file according to its own number, and each genus and species contained in the herbarium sheet is also numbered according to its arrangement inside the books of Flora of Libya.

2.3 Climatic data analysis

The region is characterized by a moderate climate with hot winters and dry summers.The average annual rainfall reaches 500 mm. The average annual temperature is 16°C. The information of climatic variables was acquired and gathered from Libyan Public Focus of Meteorology for ten successive years. They were analyzed according to various literatures based on the availability of precipitation and temperatures. A ten-year average show that there is a lot of precipitation, especially in December, January, and February, and that the dry season lasts from June to August. The average maximum temperature was 23 °C, and the average minimum temperature was 15°C. The highest temperatures were recorded in June, July, and August, while the lowest temperatures were recorded during December, January, and February. (Figure 2).

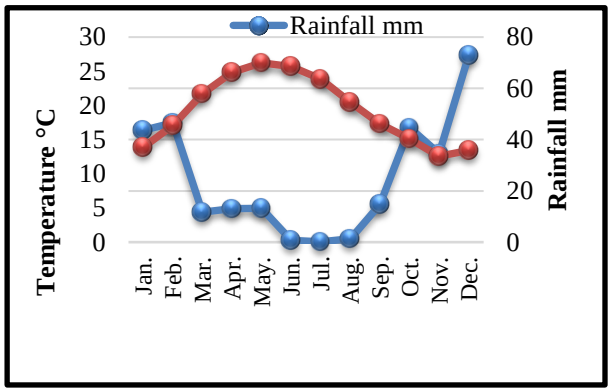

Figure (2) Mean monthly variation of temperatures °C and rainfall (mm) during the period (2010: 2019).

3 Results

The total number of recorded species surveyed in the present study was 194 species, belong to 160 genera and 57 families, they are represented by Pteridophyta 1species 1 family, Gymnosperme 4 species 3 families, Dicotyledone 154 species 43 families and Monocotyledone 35 species 10 families, as shown in (Table1), Families and number of species in each family According to the system Engler.

Table (1) Number of species in each family**.**

No.	Family	Number of species
I.	**Pteridophyta.**	
1	Adiantaceae	1
II.	**Gymnosperms**	
1	Pinaceae	1
2	Cupressaceae	2
3	Epheraceae	1
III.	**Angiosperms**	
a.	**Dicotyledone**	
1	Moraceae	1
2	Urticaceae	2
3	Polygonaceae	5
4	Cactaceae	1
5	Carophyllaceae	1
6	Chenopodiaceae	1
7	Illecebraceae	2
8	Lauraceae	1
9	Ranunculaceae	5
10	Clusiaceae	1
11	Papaveraceae	1
12	Fumariaceae	1
13	Capparaceae	1
14	Brassicaceae	8
15	Resedaceae	2
16	Crassulaceae	1
17	Rosaceae	6
18	Fabaceae	18
19	Caesalpiniaceae	1
20	Mimosaceae	2
21	Oxalidaceae	1
22	Geraniaceae	4
23	Euphorbiaceae	6
24	Anacardiaceae	1
25	Rhamnaceae	3
26	Malvaceae	2
27	Myrtaceae	1
28	Apiaceae	9
29	Primulaceae	2
30	Oleaceae	1
31	Apocynaceae	1
32	Rubiaceae	2
33	Covolvulaceae	1
34	Boraginaceae	7
35	Verbenaceae	1
36	Lamiaceae	10
37	Solanaceae	3
38	Scrophulariaceae	4
39	Caprifoliaceae	2
40	Valerianaceae	2
41	Dipsacaceae	1
42	Campanulaceae	1
43	Asteraceae	28
b.	**Monocotyledone**	
1	Liliaceae	4
2	Alliaceae	1
3	Amaryllidaceae	1
4	Iridaceae	2
5	Poaceae	21
6	Arecaceae	1
7	Araceae	2
8	Lemnaceae	1
9	Cyperaceae	1
10	Orchidaceae	1

Dominant families were Asteraceae (14%) with 28 species, Poaceae (11%) were represented by 21 species,Fabaceae (9%) were represented by 18 species, Lamiaceae (5 %) containing 10 species. The family Apiaceae (5%) containing 9 species. Boraginaceae (4%) represented by 7 species. There were families of 6 species such as Euphorbiaceae and Rosaceae, there were families of 5 species including Ranunculaceae and Polygonaceae, there were families of 4 species represented in Geraniaceae and Liliaceae, there were families containing 3 species represented by Rhamnaceae, Araceae, Scrophulariaceae and Solanaceae, there were families of 2 species such as Caprifoliaceae, Illecebraceae, Iridaceae, Malvaceae and Primulaceae, other families represented by 1 species such as Pinaceae, Papaveraceae and Fumariaceae. (Figure3) and (Table 2)

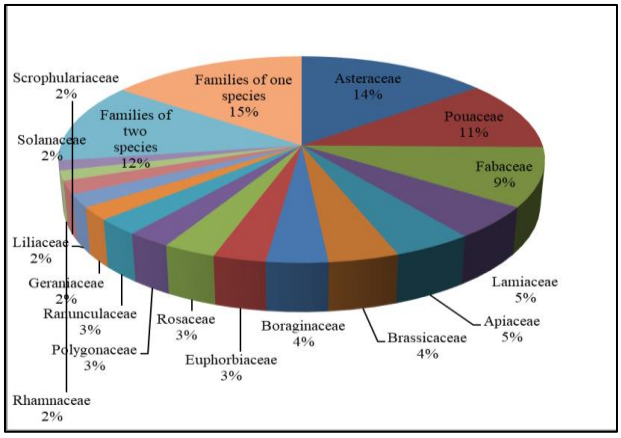

Figure (3) Percentage of species recorded in each family

Table (2) List of plant species in the study area.

No.	Family	Scientific name	Life Forms	Serial number
1	Adiantaceae	*Adiantum capillus-veneris* L.	He	8.1.1
2	Anacardiaceae	*Pistacia lentiscus* L.	Ph	73.1.2
3	Alliaceae	*Allium roseum* L.	G	146.1.5
4	Amaryllidaceae	*Narcissus elegans* (Haw.) Spach.	G	148.2.1
5	Apocynaceae	*Nerium oleander* L.	N. Ph	109.1.1
6	Apiaceae	*Ammi majus* L.	Th	102.24.1
7		*Apium nodiflorum* (L.) Lag	Th	102.21.2
8		*Foeniculum vulgare* Philip Miller.	G	102.15.1
9		*Pimpinella peregrina* L.	Th	102.11.1
10		*Pituranthos denudatus* Viv.	Ch	102.10.2
11		*Scandix pecten-veneris* L.	Th	102.4.2
12		*Smyrnium olusatrum* L.	Ch	102.8.1
13		*Thapsia garganica* L.	Ch	102.33.1
14		*Torilis leptophylla* (L.) Reichb.	Th	102.34.4
15	Araceae	*Arisarum vulgare* Targ. Tozz.	G	155.3.1
16		*Arum cyrenaicum* Hruby.	G	155.1.1
17	Arecaceae	*Phoenix canariensis* Chaub.	Ph	145.1.2
18	Asteraceae	*Anthemis pseudocotula* Boiss.	Th	135.32.4
19		*Bellis sylvestris-cyrenaica* Cyr.	H	135.1.2
20		*Chrysanthemum coronarium* L.	Th	135.40.2
21		*Cicerbita haimanniana* (Ascherson.) Beauverd.	G	135.93.1
22		*Cirsium creticum* (Lam.) D'Urv.	Ch	135.56.2
23		*Conyza aegyptiaca (*L.) Dryander.	Th	135.2.4
24		*Crepis senecioides* Delile.	Th	135.96.6
25		*Cynara cyrenaica* Weiller.	Th	135.61.4
26		*Echinops cyrenaicus* Durand &Barratte.	Th	135.54.3
27		*Evax contracta* Boiss.	Th	135.7.3
28		*Helichrysum stoechas* (L.) Moench.	Ch	135.11.1
29		*Hedypnois rhagadioloides* (L.) F.W Schmidf.	Th	135.79.1
30		*Leontodon tuberosus* L.	G	135.83.3
31		*Notobasis syriaca* (L.) Cass.	Th	135.57.1
32		*Onopordum arenarium* (Desf.) Pomel	Th	135.60.3
33		*O. cyrenaicum* Maire & Weiller.	Th	135.60.4
34		*Pallenis spinosa* (L.) Cass.	H	135.25.1
35		*Phagnalon rupestre* (L.) DC.	Ch	135.13.2
36		*Picris altissima* Delile, Descr.	Th	135.84.4
37		*P. hispanica* (Willd) P.D.Sell	Ch	135.84.6
38		*Ptilostemon gnaphaloides* (Cyr.) Sojak.	Ch	135.58.1
39		*Senecio leucanthemifolius* Poiret.	Th	135.49.2
40		*S. leucophylla* (DC.) Plelser.	--	135.49.
41		*Scolymus hispanicus* L.	Th	135.73.1
42		*Silybum marianum* (L.) Gaertner.	Th	135.62.1
43		*Sonchus oleraceus* L.	Th	135.91.3
44		*Tyrimnus leucographus* (L.) Cass.	Ch	135.59.1
45		*Xanthium spinosum* L.	Th	135.30.1
46	Boraginaceae	*Anchusa hybrida* Ten.	H	116.5.3
47		*Borago officinalis* L.	Th	116.3.1
48		*Cerinthe major* L.	Th	116.13.1
49		*Cynoglossum cheirifolium* L.	Ch	116.17.1

50		*Echium angustifolium* Mill.	Ch	116.12.3
51		*E. sabulicola* Pomel.	Th	116.12.11
52		*Heliotropium europaeum* L.	Th	116.15.7
53	Brassicaceae	*Biscutella didyma* L.	Th	52.32.1
54		*Enarthrocarpus clavatus* Del ex Godr.	Th	52.8.3
55		*E. pterocarpus* (Pers.) DC.	Th	52.8.2
56		*E. strangulatus* Boiss.	Th	52.8.1
57		*Nasturtium officinale* R.Br.	Hy	52.47.1
58		*Raphanus raphanistrum* L.	Th	52.7.1
59		*Sinapis alba* L.	Th	52.3.3
60		*S. flexuosa* Poiret.	Th	52.3.4
61	Cactaceae	*Opuntia ficus-indica* (L.) Mill.	--	37.1.3
62	Caesalpiniaceae	*Ceratonia siliqua* L	Ph	61.1.1
63	Campanulaceae	*Campanula erinus* L.	Th	134.1.2
64	Capparaceae	*Capparis spinosa* L	H	51.1.3
65	Caprifoliaceae	*Lonicera etrusca* Santi.	Ph	131.2.1
66		*Viburnum tinus* L.	Ph	131.1.1
67	Caryophylaceae	*Spergularia marina* (L.) Gariseb.	Th	33.4.2
68	Chenopodiaceae	*Chenopodium vulvaria* L.	Th	35.2.4
69	Clusiaceae	*Hypericum triquetrifolium* Turra.	H	47.1.1
70	Covolvulaceae	*Convolvulus althaeoides* L.	H	113.2.2
71	Crassulaceae	*Umbilicus horizontalis* (Guss.) DC.	G	54.2.3
	Cupressaceae	*Cupressus sempervirens.* *var.horizontalis* (Mill.)Gordon	Ph	15.1.1.b
72		*C. sempervirens* L. *var. Sempervirens*	Ph	15.1.1.a
73		*Thuja orientalis* L	Ph	15.3.1
74	Cyperaceae	*Cyperus alternifolius* L.	G	159.2.4
75	Dipsacaceae	*Scabiosa arenaria* Forskal.	Th	133.2.6
76	Epheraceae	*Ephedra alata* Desf.	Ch	16.1.1
77	Euphorbiaceae	*Andrachne telephioides* L.	H	68.1.1
78		*Euphorbia characias* L.	N. Ph	68.5.26
79		*E. dendroides* L.	Ph	68.5.5
80		*E. peplus* L.	Th	68.5.4
81		*Mercurialis annua* L.	Th	68.3.1
82		*Ricinus communis* L.	Ph	68.4.1
83	Fabaceae	*Anagyris foetida* L.	Ph	60.1.1
84		*Anthyllis tetraphylla* L.	Th	60.20.4
85		*Calicotome villosa* (poir)Link.	N. Ph	60.17.1
86		*Lathyrus aphaca* L.	Th	60.38.12
87		*L. gorgoni* Parl.	Th	60.38.6
88		*Lotus edulis* L.	Th	60.6.2
89		*Medicago lupulina* L.	Ch	60.31.1
90		*M. polymorpha* L.	Th	60.31.13
91		*Melilotus sulcatus* Desf.	Th	60.32.3
92		*Ononis natrix* L.	Ch	60.28.1
93		*O. spinosa* L.	H	60.28.5
94		*Robinia pseudoacaia* L.	Ph	60
95		*Tetragonolobus purpureas* Moench.	Th	60.18.1
96		*Trifolium campestre* Schreb.	Th	60.33.4
97		*T. nigrescens* Viv.	Th	60.33.2
98		*T. tomentosum* L.	Th	60.33.9
99		*Vicia monantha* Retz.	Th	60.34.3
100		*V.sativa* L.	Th	60.34.9
101	Fumariaceae	*Fumaria capreolata* L.	Th	49.1.5

102	Geraniaceae	*Erodium keithii* Guitt.	Th	64.2.11
103		*Geranium molle* L.	Th	64.47
104		*G. robertianum* L.	Th	64.4.2
105		*G. rotundifolium* L.	Th	64.4.6
106	Illecebraceae	*Paronychia arabica* (Linn.) DC.	Th	34.4.4
107		*P. argentea* Lamk.	H	34.4.5
108	Iridaceae	*Iris germanica* L.	G	150.2.1
109		*Romulea bulbocodium* (L.) Seb.	G	150.4.1
110	Lamiaceae	*Ballota pseudo-dictamuns* (L.) Benth.	Ch	119.14.1
111		*Marrubium vulgare* L.	G	119.8.1
112		*Micromeria graeca* (L.) Benth ex Reichenb.	Ch	119.22.4
113		*M. nervosa* (Desf.) Benth.	Ch	119.22.1
114		*Nepeta scordotis* L.	Ch	119.19.2
115		*Origanum cyrenaicum* Beg.	Ch	119.20.3
116		*Phlomis floccosa* D.	N. Ph	119.13.1
117		*Prasium majus* L.	Ch	119.11.1
118		*Rosmarinus officinalis* L.	Ch	119.4.1
119		*Stachys tournefortii* Poiret.	Ch	119.15.1
120	Lauraceae	*Laurus nobilis* L.	Ph	39.1.1
121	Lemnaceae	*Lemna gibba* L.	Hy	156.1.2
122	Liliaceae	*Asparagus aphyllus* L.	G	145.14.2
123		*Bellevalia mauritanica* L.	G	145.11.4
124		*Ornithogalum umbellatum* L.	G	145.10.3
125		*Urginea maritim*a (L.) Baker.	G	145.8.1
126	Malvaceae	*Malva nicaeensis* All.	Th	83.2.4
127		*M. parviflora* L.	Th	83.2 5
128	Mimosaceae	*Acacia farnesiana* (L.) Willd.	Ph	62.1.4
129		*A. cyanophylla* Lindley.	Ph	62.1.5
130	Moraceae	*Ficus carica L.*	Ph	22.2.2
131	Myrtaceae	*Eucalyptus gomphocephala* DC.	Ph	96.4.2
132	Oleaceae	*Olea europaea* L.	Ph	107.1.1
133	Orchidaceae	*Orchis Cyrenaica* Dur. &Barr.	G	163.4.5
134	Oxalidaceae	*Oxalis pes-caprae* L.	G	63.1.2
135	Papaveraceae	*Papaver rhoeas* L.	Th	48.3.4
136	Pinaceae	*Pinus halepensis* Mill.	Ph	14.1.2
137	Polygonaceae	*Polygonum argyrocoleon* Steud.	Th	26.5.3
138		*P. balansae* Boiss.	H	26.5.6
139		*P. equisetiforme* Sibth & Sm.	H	26.5.7
140		*P. patulum* M. Bieb.	Th	26.5.2
141		*Rumex pulcher* L.	Th	26.4.3
	Primulaceae	*Anagallis arvensis* L. *var arvensis*	Th	104.5.2 a
142		*A. arvensis* L. *var caerulea* (L.) Gouan	Th	104.5.2 b
143		*Cyclamen rohlfsianum* Aschers.	G	104.1.1
144	Poaceae	*Avena sterillis* L.	Th	153.37.5
145		*Briza maxima* L.	Th	153.21.2
146		*Bromus alopecuros* Poir.	Th	153.26.7
147		*B. madritensis* L.	Th	153.26.3
148		*Catapodium rigidum* (L.) C.E.Hubbard.	Th	153.9.1
149		*Cynosurus elegans* Desf.	Th	153.19.3
150		*Dactylis glomerata* L.	G	153.16.1
151		*Gastridium scabrum* C. Presl.	Th	153.48.2
152		*Hordeum murinum* L.	Th	153.32.2
153		*Lamarckia aurea* (L.) Moench.	Th	153.20.1
154		*Lolium loliaceum (*Bory et Chaub.)	Th	153.4.4

		Hand.Mazz.		
155		*L. multiflorum* Lam.	Th	153.4.2
156		*Lophochloa salzmanni (*Boiss.) H. Scholz	Th	153.40.2
157		*Melica minuta* L.	H	153.35.1
158		*Phalaris minor* Retz.	Th	153.54.5
159		*Piptatherum miliaceum* (L.) Coss.	H	135.61.1
160		*P. holciforme* (Bieb.) Roem. et Schult.	H	135.61.3
161		*Poa annua* L.	Th	153.18.7
162		*P. trivialis* L.	H	153.18.2
163		*Polypogon semiverticillatus* (Forsk.) Hyl.	H	153.47.3
164		*Trisetaria macrochaeta* (Boiss.) Maire.	Th	153.39.1
165	Urticaceae	*Parietaria judaica* L.	H	23.1.3
166		*Urtica pilulifera* L.	Th	23.2.1
167	Ranunculaceae	*Adonis microcarpa* DC.	Th	40.7.3
168		*Ranunculus asiaticus* L.	G	40.8.12
169		*R. bullatus ssp. cyrenaicus* (Pamp.) Maire.	Ch	40.8.5
170		*R. cyclocarpus* Pamp.	Th	40.8.11
171		*R. trilobus* Desf.	Th	40.8.6
172	Resedaceae	*Reseda alba* L.	Th	53.5.8
173		*R. lutea* L.	Th	53.5.9
174	Rhamnaceae	*Rhamnus alaternus ssp alateinus* L.	N. Ph	80.3.1
175		*R. lyciodes* L.	Ph	80.3.2
176		*R. oleoides* L.	N. Ph	80.3.3
177	Rubiaceae	*Galium aparine* L.	Th	111.4.3
178		*Sherardia arvensis* L.	Th	111.6.1
179	Rosaceae	*Potentilla reptans* L.	Ch	58.9.1
180		*Prumus amygdalus* Batsch.	--	58.2.
181		*Rosa deseglisei* Boreau.	--	58.12.2
182		*Rubus sanctus* Schreber.	N. Ph	58.7.1
183		*Sanguisorba minor* Scop.	H	58.11.9
184		*Sarcopoterium spinosum* (L.) Spach.	Ch	58.10.1
185	Scrophulariaceae	*Kickxia commutata* (Bernh.ex rcichenb.) Fritsch	Th	58.10.1
186		*Scrophularia canina* L.	Ch	122.1.3
187		*Veronica anagallis-aquatica* L.	Ch	122.2.1
188		*Verbascum sinuatum* L.	Ch	122.3.2
189	Solanaceae	*Datura innoxia* Mill.	Ch	120.9.4
190		*Nicotiana glauca* Graham.	N. Ph	120.5.1
191		*Solanum nigrum var nigrum* L.	Th	120.2.2.a
		S. nigrum var villosum L.	Th	120.2.2.b
192	Valerianaceae	*Centranthus calcitrapae* (L.) Dufresne.	Th	132.3.1
193		*Fedia cornucopiae* (L). Gaertner.	Th	132.2.1
194	Verbenaceae	*Verbena officinalis* L.	H	117.2.2

Figure (4) shows the life forms of the recorded species according to Raunkiaer (1934). The recorded species belong to ten different life forms. Therophytes (48%) includes 93 species, and were represented by the largest number of species. Of these were *Borago officinalis* L. *Sinapis alba* L. *Xanthium spinosum* L., *Notobasis syriaca* (L.) Cass., *Evax contracta* Boiss., *Scandix pecten-veneris* L., *Ammi majus* L., *Scabiosa arenaria* Forskal., *Chenopodium vulvaria* L. Chamaephytes has 29 species representing about (15%), among these species were *Onopordum arenarium* (Desf.) Pomel., *Phagnalon rupestre* (L.) DC., *Ephedra alata* Desf.,

Andrachne telephioides L., *Medicago lupulina* L. Geophytes represents about (11%), includes 21 species representing these species were, *Cyperus alternifolius* L., *Allium roseum* L., *Arum cyrenaicum* Hruby., Hemicryptophytes (10%) include 19 species, of these were *Bellis sylvestris-cyrenaica* Cyr., *Anchusa hybrida* Ten., also Phanerophyes (10%)includes 20 species, from these species are *Pinus halepensis* Mill. *Olea europaea* L. Nano-phanerophytes has 8 species representing about (4%), such as *Rhamnus alaternus ssp alateinus* L., Hydrophytes includes 2 species, as for Heleophytes has 1 species .

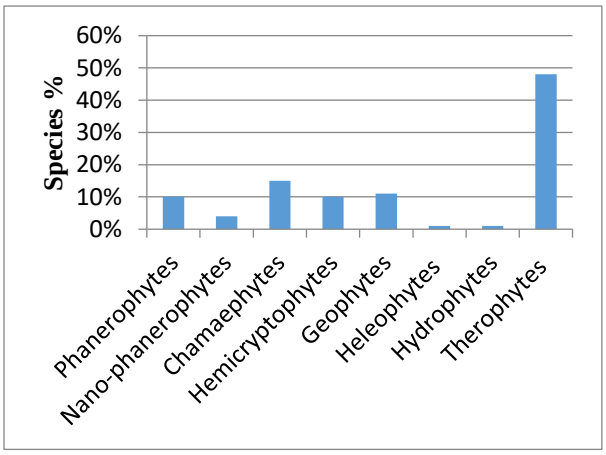

Figure (4) Life forms of the recorded species.

4 Discussion

floristic composition and vegetation analysis studies were becoming increasingly important to provide important critical data for understanding biodiversity and ecosystem functioning in these areas (Heywood, 2004). Since ancient times, Al-Jabal Al-Akhdar has been the focus because of its unique and diverse vegetation (Alzerbi & Alaib, 2017)., which reflects the biological diversity of plant life in a distinct way (Noah, 2014). This was shown by the results of the survey in the study area, which includes 194 species, 160 genera, and 75 families. The Asteraceae was the largest family in the flora of Libya, followed by Poaceae, and Fabaceae (Jafri & El-Gadi, 1977-1993). The survey results showed the dominance of Asteraceae (14%) with 28 species, followed by Poaceae (11%) represented by 21 species, then Fabaceae (9%) represented by 18 species, the results we obtained about these families' dominance were expected given that the study area was within the Mediterranean climate since these families typically dominate the communities in habitats that were influenced by this climate. Furthermore, these families are cosmopolitan in distribution (Mahklouf et al., 2020), and it was noted that there was a similarity in the results with the previous studies in Al-Jabal Al-Akhdar areas such as Al Mansora and Jarjar oma regions (Dahkel, 2014), Boras region (Alzerbi & Alaib., 2017), Al-Agar Valley (Alaib et al., 2017). The results of the survey showed dominance Therophytes (48%) includes 93 species, followed by Chamaephytes, which has 29 species representing about (15%) then Geophytes represent about (11%) including 21 species, and it was noted that there was a similarity in the results with the previous studies (Dahkel,2014) in Al Mansora and Jarjar oma regions , (Omar et al ., 2020) in Wadi Al-Hamar and (El-Darier & El-Mogaspi, 2009) in Al-Jabal Al-Akhdar areas, cold winter in the region may explain why Therophytes were dominant followed by Chamaephytes (Whitaker,1975). study (Mahklouf & Sh-hoob, 2023), also proved that there was a clear positive relationship between Therophytes and the Mediterranean climate because species the Therophytes annual complete their life cycle in a single season and can adapt to high temperatures and the dry summer in The Mediterranean climate which represents the climate of the study area.

5 Conclusion

The floristic composition in Cyrene (campus apollo) ShahatAL-Jabal AL-Akhdar, Libya displayed the presence of 194 plant species belonging to 57 families. The current study aimed to the initial inventory of the types of plants in the region defining them, preparing a list of them, and distributing these plants within groups such as species, genera, and different life forms. The methods developed during the study can be used as a basis for carrying out similar studies and for helping to devise management and conservation programs. In the study area, the major vegetation types, their composition and biodiversity were identified.

Conflict of interest: The authors declare that there are no conflicts of interest

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