

Comparative Study of Medicinal Plants in Al Mansora and Jarjar oma, Al Jabal Al Akhdar, Libya

Ensaf H. Dakeel^{1*}, Mohammed A. Alaib² and Abdelbaset M. Asker¹.

¹Botany department, Faculty of science, Omar Al Mukhtar University, Al Baida, Libya.

²Botany department, Faculty of science, Benghazi University, Benghazi, Libya.

Corresponding author Tel: +218 92-2381756; E-mail: ensaf.hussain@omu.edu.ly

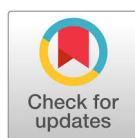
Abstract

Al Jabal Al Akhdar is very rich region in its vegetation with traditional uses. Medicinal plants are the most important element in this region. The results of the survey carried out show that the total species in two regions (Al Mansora and Jarjar oma) are 123 species. In Al Mansora area 55 species belonging to 53 genera and 31 families, one family belongs to gymnosperms and the remaining 30 families belong to angiosperms. Dicotyledons represented by 27 families, 47 genera and 49 species, and monocotyledons represented by 3 families, 5 genera and 5 species. While in Jarjar oma area 68 species belong to 58 genera and 33 families, one family belong to gymnosperms and the remaining 32 families belong to angiosperms. Dicotyledons represented by 24 families, 44 genera and 54 species, and monocotyledons represented by 8 families, 13 genera and 13 species. In Al Mansora region the Ammi and Cichorium genera contain two species each, while the rest of the genera were represented by one species each. In Jarjar oma the Euphorbia represented by 4 species, Plantago represented by 3 species, Cichorium, Herniaria, Aapparagus, Malva and Polygonum were represented by 2 species, the rest of the genera were represented by one species each. The comparative study showed that Jarjar oma region was found 13 species more than Al Mansora region.

Keywords: Al Jabal Al Akhdar; Medicinal plants; Al Mansora; Jarjar oma; Libya

Introduction

Global estimates indicate that 80 % of about 4 billion population cannot afford the products of the Western Pharmaceutical Industry and have to rely upon the use of traditional medicines which are mainly derived from plant material (Joy *et al.* 1998) Medicinal plants have been used in folk medicine in Libyan rural areas at relatively cheaper expenses than modern medicine. They have been widely used (Alghazeer *et al.* 2012) The plant kingdom still holds many species of plant containing substances of medicinal value which have yet to be discovered. The wealth of uninvestigated material available is illustrated by the fact that in 1985, it was reported that natural product research elicited some 3500 new chemical structures of which more than 2600 were extracted from higher plants (Heneidy and Bidak 2004). Of the 250,000 higher plant species on earth, more than 80,000 are medicinal (Joy *et al.* 1998). Although the area of the Al Jabal Al Akhdar constitutes only 1 % of the total area of the Libya, it is characterized by its great plant diversity, which includes more than 50 % of the total plant species spread throughout the entire area of the Libya (Al-Jabal Al-Akhdar south project 2005). The number of plant species in this region is about "1100" species of the total number of Libyan plant species estimated at about 2000 (Al-Jabal Al-Akhdar south



*Corresponding author:

Dakeel EH

Tel: +218 92-2381756

E-mail: ensaf.hussain@omu.edu.ly

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project 2005). It is worth mentioning that this area is rich in medicinal and aromatic plants such as *Thymus capitatus*, *Artemisia herba alba*, *Globularia alypum*, *Helichrysum stoechas*, *Cynara cornigera* and *Rosmarinus officinalis* which include in the production of some pharmaceutical compounds. (Al-Jabal Al-Akhdar south project 2005).

The aim of this study is to compare species richness of medicinal plant in Al Mansora and Jarjar oma regions, Al Jabal Al Akhdar to investigate the impact of habitat characteristics on distribution of medicinal plants in both regions.

Material and methods

Informations about medicinal plants were collected from literature review in the field (Dahkel 2014) of medicinal plants. (Al-Jabal Al-Akhdar south project 2005; Boulos 1983; Kotb 1985; EL-Mokasabi 2014; EL-Mokasabi 2014; El-Gadi and Bshana 1989; El-Gadi 1989; Rachid et al. 2012; Yadav 2013; Redzic 2010; Alaib et al. 2016).

Study areas

Location: As showed **Figure 1:**

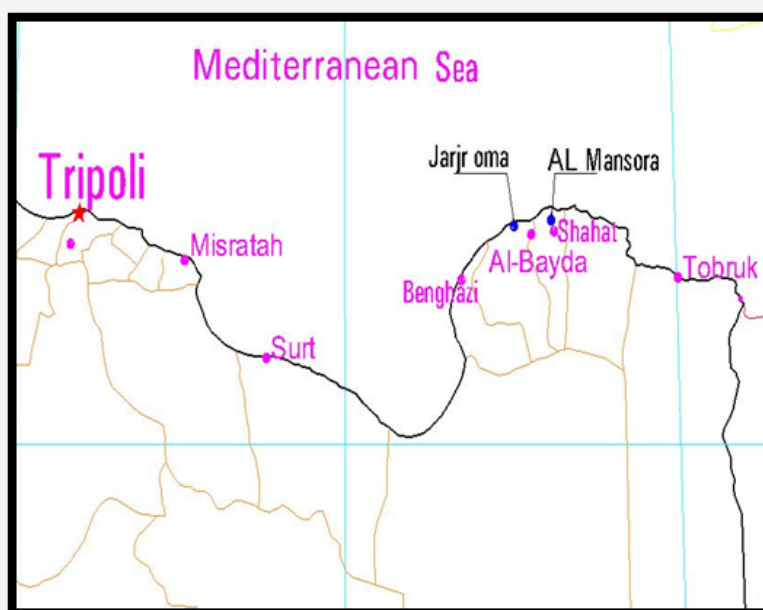


Figure 1: Showed map of the study areas.

Results

In Al Mansora 55 species belonging to 53 genera and 31 families, one family belong to gymnosperms and remaining 30 families are belonging to angiosperms. Dicotyledons represented by 27 family, 47 genera and 49 species, and monocotyledons represented by 3 families, 5 genera and 5 species. While in Jarjar oma 68 species belonging to 58 genera and 33 families, one family belong to gymnosperms and remaining 32 families belonging to angiosperms. Dicotyledons represented by 24 families, 44 genera and 54 species, and monocotyledons represented by 8 families, 13 genera and 13 species **Table 1**. The families which confined to Jarjar oma were Alliaceae, Amaryllidaceae, Asclepiadaceae, Chenopodiaceae, Cucurbitaceae, Dioscoreaceae, Juncaceae, Posidoniaceae, Urticaceae and Zygophyllaceae. While the families which confined to Al Mansora were Boraginaceae, Cistaceae, Cuscutaceae, Globulariaceae, Linaceae, Oleaceae, Ranunculaceae and Scrophulariaceae. One family belonging to gymnosperms recorded in the two regions was Cupressaceae with one species *Juniperus phoenicea* L. One species endemic of medicinal plants recorded in the Al Mansora are *Cyclamen rohlfsianum*, while the 3 endemic species of medicinal plants recorded in Jarjar oma are *Cyclamen rohlfsianum*, *Teucrium barbeyanum* and *Plantago cyrenaica*.

	Al Mansora	Jarjar oma
Latitude	32°50'44.8" N	32°47'49.8" N
Longitude	21°50'30.3" E	21°26'40.6" E
Altitude sea level	309.4 m	1m
Distance from the sea	6.5 km	300m
Distance from Al Baida city	11 km east A1 Baida	28 km west A1 Baida

Climate:

Climate		Al Mansora	Jarjar oma
Rainfall	Maximum / month	111.4 mm - January	191.6 mm - January
	Minimum / month	0.39mm June	1.2mm June and July
	mm / year	515.9	550.5
	Maximum / month	24 °C / August	24 °C/ August
Temperature	Minimum / month	9 °C / January and February	9.7 °C / February
Relative humidity	The highest	80.2 % / January	75.4 % / January
	The lowest	61 % - May	50 % - June
Wind speed	The highest	7.9 Knots - February	5.8 Knots- February
	The lowest	5.8 Knots - October	4.5 June, September and October

Table 1: Dicotyledons represented by 24 families, 44 genera and 54 species, and monocotyledons.

Soil: Soil texture in Al Mansora area varies between Silty loam, Silty clay and Silty clay loam. pH varies between 6.1 to 7.3. While Soil texture in Jarjar oma area varies between loam, loamy sand, Silty loam, Silty clay, clay loam and Silty clay loam. pH varies between 7.3 to 8.14.

The largest family was Asteraceae (12.7 %) with 7species, Fabaceae (10.9 %) with 6 species, Lamiaceae (7.3 %) with 4 species, Liliaceae and Apiaceae (5.5 %) with 3 species for each family. Boraginaceae, Caryophyllaceae, Euphorbiaceae, Primulaceae, Papaveraceae and Solanaceae were (3.6 %) with 2 species for each family. The other family was 36.4 % with 20 species belonging to 20 families (one species for each family) in Al Mansora area **Figure 2.**

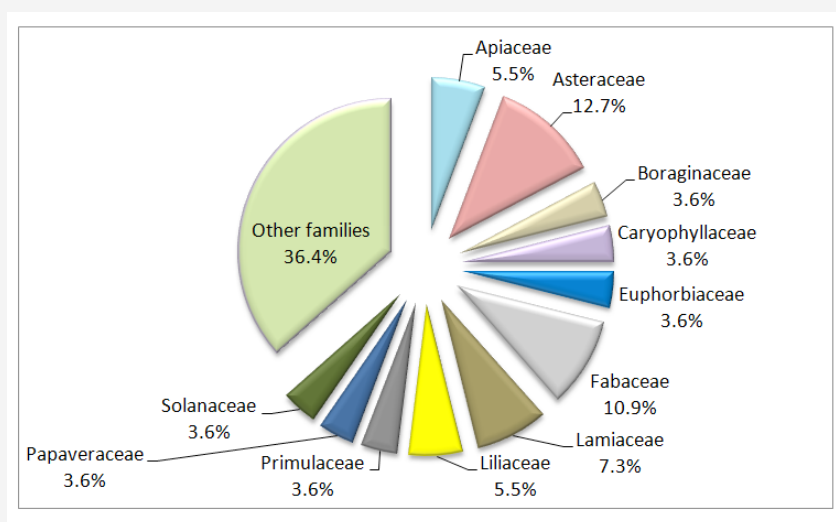


Figure 2: The percentage of medicinal plant in each family relative to total number of medicinal plant species in Al Mansora area.

While the largest family was Asteraceae (10.3 %) with 7 species in Jarjar oma. Liliaceae (8.8 %) with 6 species, Fabaceae, Euphorbiaceae and (7.4 %) with 5 species for each family, Polygonaceae (5.9 %) with 4 species, Caryophyllaceae, Chenopodiaceae and Plantaginaceae (4.4 %) with 3 species for each family, Anacardiaceae, Asclepiadiaceae, Convolvulaceae, Lamiaceae, Malvaceae, Primulaceae, and Poaceae (2.9 %) with 2 species for each family. The other family was (26.5 %) with 18 species belonging to 18 families (one species for each family) in Jarjar oma area **Figure 3**.

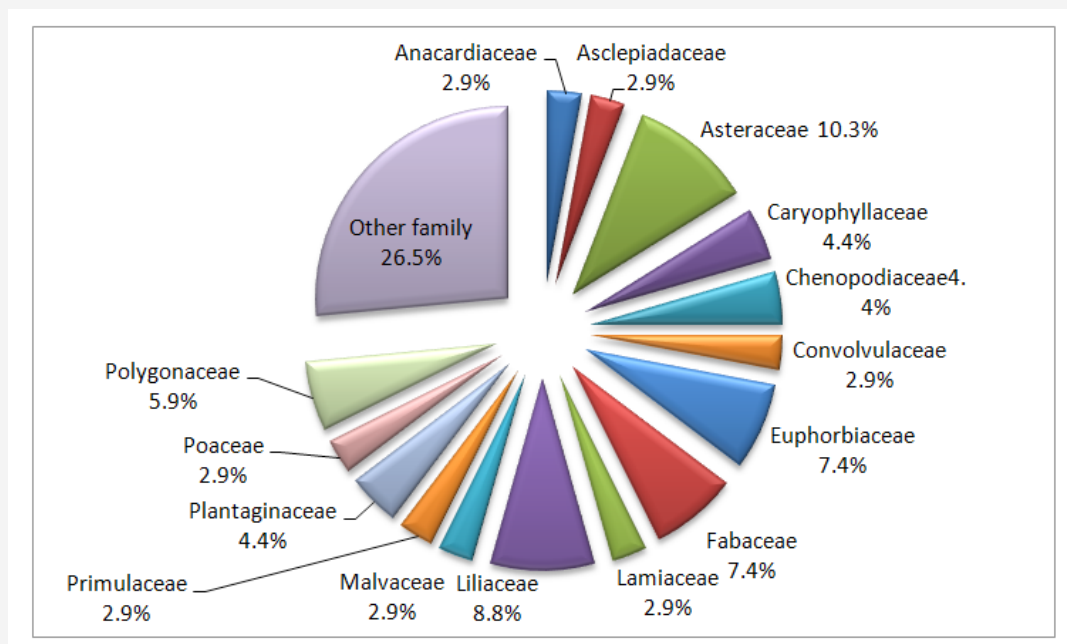


Figure 3: The percentage of medicinal plant in each family relative to total number of medicinal plant species in Jarjar oma area.

No.	Family	Scientific name	Al Mansora	Jarjar oma
1	Alliaceae	<i>Allium roseum</i> L.	-	+
2	Amaryllidaceae	<i>Pancreatium maritimum</i> L.	-	+
3	Anacardiaceae	<i>Pistacia lentiscus</i> L.	+	+
4		<i>Rhus tripartita</i> (Ucria) Grande	-	+
5	Apiaceae	<i>Ammi majus</i> L.	+	-
6		<i>Ammi visnaga</i> (L.) Lam	+	+
7		<i>Thapsia garganica</i> Lag.	+	-
8	Araceae	<i>Arisarum vulgare</i> Targ. Tozz	+	+
9	Asclepiadaceae	<i>Caralluma europaea</i> (Guss.) N.E.Br.	-	+
10		<i>Periploca angustifolia</i> Labill.	-	+
11	Asteraceae	<i>Centaurea alexandrina</i> Delile	+	+
12		<i>Cichorium endivia</i> L.	+	+
13		<i>Cichorium spinosum</i> L.	+	+
14		<i>Cynara cornigera</i> Lindley	-	+
15		<i>Dittrichia viscosa</i> (L.) Greuter	+	-
16		<i>Helichrysum stoechas</i> (L.) Moench	+	-

17		<i>Matricaria aurea</i> (Loefl.) Sch. Bip.	+	+
18		<i>Phagnalon rupestre</i> (L.) Dc.	+	+
19		<i>Silybum marianum</i> (L.) Gaertner	-	+
20	Boraginaceae	<i>Borago officinalis</i> L.	+	-
21		<i>Echium angustifolium</i> Mill.	+	-
22	Brassicaceae	<i>Sinapis alba</i> L.	+	+
23	Caryophyllaceae	<i>Herniaria cinerea</i> Dc.	-	+
24		<i>Herniaria glabra</i> Linn.	+	+
25		<i>Paronychia Arabica</i> (Linn.) Dc	-	+
26		<i>Paronychia argentea</i> Lamk.	+	-
27	Chenopodiaceae	<i>Beta vulgaris</i> L.	-	+
28		<i>Chenopodium murale</i> L.	-	+
29		<i>Salsola kali</i> L.	-	+
30	Cistaceae	<i>Cistus parviflorus</i> Lam.	+	-
31	Convolvulaceae	<i>Convolvulus althaeoides</i> L.	+	+
32		<i>Cressa cretica</i> L.	-	+
33	Cucurbitaceae	<i>Bryonia cretica</i> L.	-	+
34	Cupressaceae	<i>Juniperus phoenicea</i> L.	+	+
35	Cuscutaceae	<i>Cuscuta epithymum</i> L.	+	-
36	Dioscoreaceae	<i>Tamus communis</i> L.	-	+
37	Euphorbiaceae	<i>Euphorbia falcata</i> L.	+	+
38		<i>Euphorbia paralias</i> L.	-	+
39		<i>Euphorbia peplis</i> L.	-	+
40		<i>Euphorbia peplus</i> L.	-	+
41		<i>Mercurialis annua</i> L.	+	+
42	Fabaceae	<i>Anthyllis vulneraria</i> L.	+	-
43		<i>Psoralea bituminosa</i> L.	+	-
44		<i>Calicotome villosa</i> (Poir.) Link	+	-
45		<i>Ceratonia siliqua</i> L.	+	+
46		<i>Lathyrus aphaca</i> L.	-	+
47		<i>Lotus tetragonolobus</i> L.	+	+
48		<i>Melilotus indicus</i> (L.) All.	+	-
49		<i>Retama raetem</i> (Forsk.) Webb	-	+
50	Gentianaceae	<i>Centaurium pulchellum</i> (Swartz) Druce	+	+
51	Geraniaceae	<i>Erodium moschatum</i> (L.) L'Herit.	+	+
52		<i>Vicia sativa</i> L.	-	+
53	Globulariaceae	<i>Globularia alypum</i> L	+	-
54	Juncaceae	<i>Juncus acutus</i> L.	-	+
55	Lamiaceae	<i>Ballota pseudo-dictamnus</i> (L.) Benth.	+	-
56		<i>Marrubium vulgare</i> L.	+	-
57		<i>Phlomis floccosa</i> D. Don	+	+
58		<i>Teucrium barbeyanum</i> Aschers	-	+
59		<i>Thymus capitatus</i> (L.) Hoffm .& Link	+	-
60	Liliaceae	<i>Androcymbium gramineum</i> (Cav.) Mc Bride	+	+
61		<i>Asparagus aphyllus</i> L	-	+
62		<i>Asparagus stipularis</i> Forsk.	-	+
63		<i>Asphodelus microcarpus</i> Salzm.& Viv.	+	+
64		<i>Smilax aspera</i> L.	-	+
65		<i>Urginea maritima</i> (L.) Baker.	+	+
66	Linaceae	<i>Linum usitatissimum</i> L.	+	-

67	Malvaceae	<i>Malva aegyptia</i> L.	-	+
68		<i>Malva parviflora</i> L.	+	+
69	Oleaceae	<i>Olea europaea</i> var. <i>oleaster</i> (Hoffmg.&Link) Dc.	+	-
70	Primulaceae	<i>Anagallis arvensis</i> L.	+	+
71		<i>Cyclamen rohlfsianum</i> Aschers.	+	+
72	Papaveraceae	<i>Glaucium flavum</i> Crantz	+	+
73		<i>Papaver rhoeas</i> var. <i>rhoeas</i> L.	+	-
74	Plantaginaceae	<i>Plantago coronopus</i> L.	+	+
75		<i>Plantago cyrenaica</i> Durand & Barratte	-	+
76		<i>Plantago ovata</i> Forskal	-	+
77	Poaceae	<i>Cynodon dactylon</i> (L.) Pers.	-	+
78		<i>Lolium rigidum</i> Guad.	+	-
79		<i>Phragmites australis</i> (Cav.) Trin. ex Steud.	-	+
80	Polygonaceae	<i>Emex spinosus</i> (L.) Camped	-	+
81		<i>Polygonum equisetiforme</i> sm.	+	+
82		<i>Polygonum maritimum</i> L.	-	+
83		<i>Rumex crispus</i> L.	-	+
84	Posidoniaceae	<i>Posidonia oceanica</i> (L.) Delile	-	+
85	Ranunculaceae	<i>Nigella damascena</i> L.	+	-
86	Rhamnaceae	<i>Rhamnus lycioides</i> L. Jahandez	+	-
87		<i>Ziziphus lotus</i> (L.) Lam.	-	+
88	Rosaceae	<i>Sarcopoterium spinosum</i> (L.) Spach	+	+
89	Scrophulariaceae	<i>Scrophularia canina</i> L.	+	-
90	Solanaceae	<i>Datura innoxia</i> Mill.	+	-
91		<i>Lycium europaeum</i> L.	-	+
92		<i>Nicotiana glauca</i> R.C.Graham	+	-
93	Urticaceae	<i>Urtica urens</i> L.	-	+
94	Zygophyllaceae	<i>Zygophyllum album</i> L.	-	+

Table 1: Family and scientific name for medicinal plants species recorded in two regions (+) presence and (-) absence:

Discussion

Total number of medicinal plant species recorded in both regions 123 species 55 species in Al Mansora and 68 species in Jarjar oma. The results showed no significance differences between both two regions in richness. The number of medicinal plant species that shared between the two regions are 29 species belonging to 28 genera and 19 family, existence of these species in both regions indicates that their range are wide and can tolerate environmental factors in both regions. The number of medicinal plant species that confined to Al Mansora was 26 species belonging to 26 genera and 17 family. While the number of medicinal plant species that confined to Jarjar oma represents by 39 species belonging to 35 genera and 24 family, existence of these species in one region indicates that their range are narrow and may be have special requirements and some factors like distribution range, habitat specificity, population size, species diversity, growth rate, and reproductive system (Chen 2016).

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