

## Floristic Study of Selected Districts in Sabratha region Libya

Halemah M. Al-khojah<sup>1</sup>, Lubnah A. Al-Yafour<sup>1</sup>, Mohammed H. Mahklouf<sup>2\*</sup>,

1. Department of Botany, Faculty of Sciences, University of Sabratha, Libya.

2. Department of Botany, Faculty of Sciences, University of Tripoli, Libya.

\*Corresponding author: Mohammed H. Mahklouf, E-mail: [mahklouf64@yahoo.com](mailto:mahklouf64@yahoo.com)

Received: April 20, 2020, Accepted: May 16, 2020, Published: May 16, 2020.

### ABSTRACT

This work was designed to study the present flora and biodiversity of selected districts of Sabratha region. The study has been carried out in the period between December 2018, and June 2020. A total number of 242 species belonging to 160 genera, and 42 families were collected. Five families are belonging to Monocotyledons and 37 are belonging to Dicotyledons. Analysis of the flora in relation to the number of species and genera belonging to each family showed that the family Asteraceae is the most represented in the study area, followed by Fabaceae then Poaceae. The study has also shown the dominance of the genera Euphorbia and Medicago with 5 species each. Floristic analysis of the collected plant species showed that the Mediterranean plants are the dominant with a number of 94 species, followed by Mediterranean / Iranu – Turanean species with a number of 53 species, while other chorological types were poorly represented. This analysis also showed the dominance of Therophytes with a number of 163 species, followed by Hemicryptophytes with 49 species.

**Keyword:** *Flora, Lifeform, Chorotype, Sabratha, District*

### INTRODUCTION

The Libyan vascular flora comprises about 2,118 species belonging to 864 genera and 161 families in Libya (Mahklouf, & Etayeb, 2019). The distribution among Libyan seed plants was characterized by a high proportion of herbs (annual to perennial), unlike the low number of woody (tree and shrub) species; these have an important influence on the structure of floral composition, the geographic element of the flora was predominantly tropical and Mediterranean (Mahklouf & Al-Sghair, 2016).

The history of floristic study in Libya has been done by several authors, the most important comprehensive floristic studies in Libya were a checklist of the flora of Libya by Keith (1965) and Flora of Libya by Jafri and El-Ghadi (1976 – 1990), furthermore, there were many regional floristic studies in different areas throughout Libya, such as floristic study of Msallata and Garaboulli province (Mahklouf et al, 2020), flora of Wadi Gerreem (Al-Osta and Erteeb, 2018), biodiversity of Hadaba treatment plant (Mahklouf and Al-Sghair, 2016), and Farwa island (Kikli and Erteeb, 2008). Since the flora of Sabratha has not been studied thoroughly during the work on the flora of Libya (1975-1989), and the only studies conducted were of El-Yafoor (2008), Abuhadra and Saed, (2015), and Saed et al, (2019). Therefore, the purpose of this survey is to have an exclusive study to its flora

### STUDY AREA:

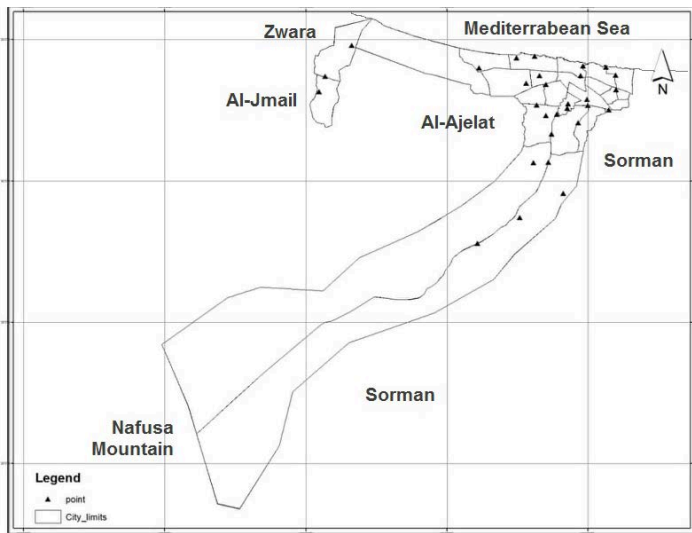
The boundaries of the study area were limited to 10 districts belong to the Sabratha city which located in the northwest of Libya about 60 km west of Tripoli, these are (Al-jifara, Al-khatatba, Galil, Dahman, Al-Wadi, Al-Ghot, Souq Al-Gomaa, Zwagha, Tellil, Al-Tweela). The study area is bordered to the north by the Mediterranean Sea, Sorman and Al-Ajelat city to the south, Sorman city to the east and Zwara city to the west, the total area of the study area is about (610 km<sup>2</sup>) divided into 10 different districts as mentioned above (Figure. 1, 2, 3) (Saed et al, 2018)



Figure 1: Map of Libya shows Sabratha city



Figure 2: Map of northwest Libya shows Sabratha city.



**Figure 3:** Map of Sabratha city shows the boundaries of the city

Ten different districts were selected for collection of plant species, which are (Al-jifara, Al-khatatba, Galil, Dahman, Al-Wadi, Al-Ghot, Souq Al-Gomaa, Zwagha, Tellil, Al-Tweela). The survey was conducted in two consecutive growing seasons 2018-2019 upon various field trips among which the trips were more frequently done during the rainy seasons and springtime, where the most of the plants are in flowering and fruiting conditions. The plant specimens were collected in flowering or in fruiting conditions for easy identification. The collected plant specimens were brought to the herbarium and then subjected to the usual herbarium procedures including pressing, poisoning, mounting, labeling, and identifying. Identification of plant species was done by using the following literature reviews (Keith, 1956; Jafri and El-Gadi 1967 – 1990). Eventually, the identified plant specimens were deposited at the herbarium of the Botany Department, Faculty of Sciences, University of Sabratha.

### RESULTS AND DESCUSSION

At the end of the survey, a total of 242 plant species belonging to 160 genera and 42 families were collected and identified, of which 5 families and 42 species belong to monocotyledons whereas 37 families and 200 species belong to dicotyledons (Appendix).

After calculation the percentage of each family in relation to the total number recorded. The result showed a predominance of the family Asteraceae with the number of represented by 48 species, followed by the family Fabaceae with the number of 33 species, then the family Poaceae with the number of 31 species, followed by Brassicaceae with the number of 16 species. The rest of the results shown in the (Appendix).

The dominance of the families Asteraceae, Fabaceae, Poceae and Brassicaceae, is expectable because most members of these families are herbs and dominating the Mediterranean region which characterizes the study area, besides, most members of these families are Mediterranean in origin, moreover, these are one of the largest families among the vascular plants, so we expect that it will occupy the highest ratio.

Floristic list also presented in this study which provided the chorotypes and life forms of collected species. The status of each plant species according to the survey also indicated in the floristic list (Appendix).

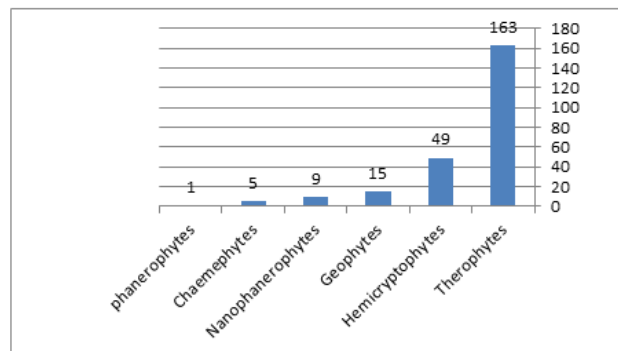
The study has also shown the dominance of the genera Euphorbia and Medicago with 5 species each, followed by the genera

Asteragalus, Bromus, Plantago, Rumex, Salsola and Silene with 4 species each, then the genera Amaranthus, Lotus, Ononis, Asphodellus, Centaurea, Conyza, Sonchus, Galium, Plygonum, Erodium with 3 species each.

Analysis of the biological spectrum of collected plant species according to Raunkiaer system of life forms of plants (1934), as modified by Govaerts et al. (2000) showed a predominance of therophytes which comprise (67.4 %) with the number of (163) species, followed by hemicryptophytes, which comprise (20.2 %) with the number of (49) species, then the geophytes which comprise (6.2 %) with the number of (15) species, the rest of the result shown in the (Table 1) and (Fig 4).

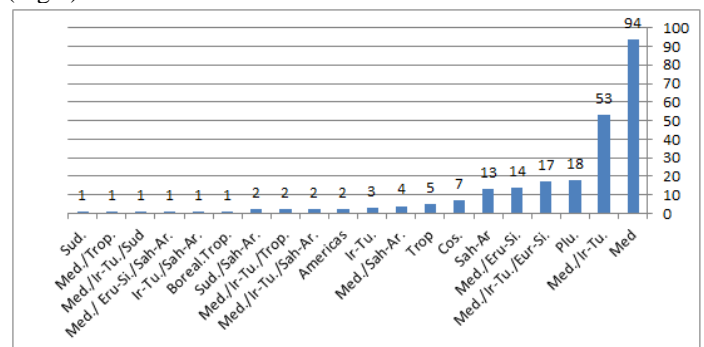
Table 1: Shows the Number and percentage of Species According to Their Life Forms.

Lifeform	No	%
Therophytes	163	67.4
Hemicryptophytes	49	20.2
Geophytes	15	6.2
Nanophanerophytes	9	3.7
Chaemephytes	5	2.0
phanerophytes	1	0.4



**Figure 4:** Shows the Number of Species According to Their Life Forms.

As we expect therophytes have a greater capacity for growth than other life forms, apparently because of their wider ecological amplitude, greater plasticity in size, and their small growth requirements. In addition, according to the result in (Appendix), there is a clear positive correlation between therophytes and Mediterranean chorotype, this explains why therophytes dominating the study area which falls within the Mediterranean region. Analysis of chorological spectrum of collected plant species showed a predominance of Mediterranean chorotypes, which comprise (38.8%) with the number of (94) species, followed by Mediterranean / Irano-Turanean chorotypes, which comprise (21.9 %) with the number of (53) species. (Table 2) and (Fig 5).



**Figure 5:** Shows the Number of Species According to Their chorotypes.

**Table 2:** Shows the Number and percentage of Species According to Their chorotypes.

Chorotype	No	%
Med	94	38.8
Med./Ir-Tu.	53	21.9
Plu.	18	7.4
Med./Ir-Tu./Eur-Si.	17	7.00
Med./Eru-Si.	14	5.3
Sah-Ar	13	5.3
Cos.	7	2.9
Trop	5	2.0
Med./Sah-Ar.	4	1.7
Ir-Tu.	3	1.2
Americas	2	0.8
Med./Ir-Tu./Sah-Ar.	2	0.8
Med./Ir-Tu./Trop.	2	0.8
Sud./Sah-Ar.	2	0.8
Boreal.Trop.	1	0.4
Ir-Tu./Sah-Ar.	1	0.4
Med./ Eru-Si./Sah-Ar.	1	0.4
Med./Ir-Tu./Sud	1	0.4
Med./Trop.	1	0.4
Sud.	1	0.4

This result is expected and not surprising because the study area is located mainly in the Mediterranean region which characterized by sub humid bioclimate, where the sun is not very strong, and the moisture remained longer. The presence of Mediterranean / Irano-Turanean with respected ratio because there are overlapping between the two regions, and both regions are located in the same latitude and have more or less similar climatic conditions. Instead, other chorological types such as Sudanean, Tropical, Saharo-Arabian, or plants that belong to more than one chorological type such as Saharo-Arabian / Irano-Turanean were poorly represented, this may have been due to having been transported or introduced.

## REFERENCES

1. Al-Osta, S and Erteeb, F. 2018. Study of Vascular Flora of Wadi Gerream in Msellata. Msc. University of Tripoli, Faculty of Sciences, Department of Botany. Tripoli, Libya.
2. El-Yafour, L. 2007, taxonomic study of the flora of Sabratha city. Msc. Department of Botany, Faculty of Sciences, University of Al-Zawya.
3. Govaerts, R; Frodin, D. G; Radcliffe-Smith, A. 2000. World Checklist and Bibliography of Euphorbiaceae (with Pandanaceae). Kew: The Royal Botanic Gardens.
4. Jafri, S. M; El – Gadi, A. A. 1976-1990. Flora of Libya, Al-Faateh.University. Faculty of Sciences. Department of Botany. Tripoli, Libya.
5. Keith HG. 1965. A preliminary check list of Libyan flora. London: Government of the Libyan Arab Republic, Ministry of Agriculture and Agrarian Reform.
6. Kikli AR. Floristic and Ecological Study of Farwa Island. Tripoli, Libya: Academy of Graduate Studies; 2008.
7. Mahklouf, M; Etayeb, K. 2019. Global biodiversity (selected countries in Africa (edi. Pullaiah, T). *Apple Academic Press, Inc - CRC Press, a member of Taylor & Francis Group*. Vol. 3 Ch 5. 113 – 133.
8. Mahklouf, M; Al –Sghair, F. G. 2016. Biodiversity and Floristic Study of Al-Hdaba Treatment Plant Tripoli–Libya. *American Journal of Life Science Researches*. 4(3): 101 – 103. DOI: 10.21859/ajlsr-040307.
9. Mahklouf, M; Sherif, A; Betelmal, A. (2020). Floristic Study and Species Diverisy of Msallata-Garaboulli Province in Libya. *J. of Advanced Botany and Zoology*, V7I3.04. DOI: 10.5281/zenodo.3752339.
10. Raunkiaer, C. 1934. The Life Forms of Plants and Statistical Plant Geography. Oxford: Th Clarendon Press.
11. Saed, Z. H; Abohbell, H. A; Mahklouf, M. H. (2019). Floristic Analysis of the Family Asteraceae in Sabratha city- Liby. *American Journal of Life Science Researches*. 7(1): 18-25. <http://www.diili.org/ojs-2.4.6/index.php/ajlsr/index>
12. Saed, Z; Abuhadra, M. 2015. Taxonomic Study and Inviromental Impact on the vegetation of Wadi Ghodwa in Jifara plain, Libya. *Al-Ostad Journal*. Vol: 8.

**Citation:** Mohammed H. Mahklouf et al. (2020). Floristic Study of Selected Districts in Sabratha region Libya. *J. of Advanced Botany and Zoology*, V7I4.02. DOI: 10.5281/zenodo.3830169.

**Copyright:** © 2020 Mohammed H. Mahklouf. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.