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RESEARCH ARTICLE

A STUDY OF THE NATURAL VEGETATION COVER IN AL-KHAWABI REGION, AL-JABAL AL-AKHDAR, LIBYA

Mabroka AL-Hammaly

Department of Environment, University of Benghazi, ALmarj- Benghazi Libya.
**Corresponding Author Email: Mabroka.alhammaly@uob.edu.ly*

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ABSTRACT

The study dealt with the natural vegetation cover of the Khawabi region, as it abounds with many trees, shrubs, and herbs. This study was conducted during the years 2020-2021, and 173 plant species were randomly collected.,the study included the classification of plant species using the Libyan flora and the analysis of the growth patterns of the plant species The predominance are annual plants with a percentage of 60.11%, then followed by short perennial plants with a percentage of 28.90%, then terrestrial plants with a percentage of 7.51%, then tall plants with a percentage of 3.46% and comparing the order of the ten largest families in the Libyan flora with the families in the study area, where the ancestral family was It is the first and then the compound family, and the number of endemic plant species accounted for 3.46%, as the region is characterized by a Mediterranean climate.

KEYWORDS

The Khawabi region, Libyan Flora, endemic plants, life forms

1. INTRODUCTION

Libya is characterized by its wide area, which is estimated at about 17,50,000 km, and varies with vegetation cover according to the nature of each region of Libya. Due to the large area of Libyan lands, the subject of the current study will be confined to a specific part represented in the Green Mountain region, and where the location of this study was chosen due to As it enjoyed a dense vegetation cover, however, this cover has recently become declining and its density has decreased. In fact, there are parts of this area in the process of desertification and the emergence of thorny plants instead of the herbaceous plants that covered most parts of the land in the study area, which are included in the family Vegetable plants for several reasons, which we will mention in this study, which, in fact, were a catalyst for the subject of this study.

And natural plants mean by natural plants what the earth produces from a plant on its own without human intervention in this process (Abdel-Maguid, 1970). It reflects the general appearance of the climate in a region. Whereas the great variation in the amount of rainfall, the increase in population expansion, logging and grazing operations affected the diversity of the natural vegetation cover. The study area is characterized by a Mediterranean climate, which led to a diversity of plant communities and fluorescent composition.

2. THE STUDY PROBLEM

This problem has increased, especially in recent years, and is considered one of the most important problems that have negative effects on the life of the vegetation cover and led to a decrease in natural plant species, and also what the region suffers from a noticeable decrease in the amount of rainfall, which led to the lack of plant species represented in trees and Shrubs that have a major role in maintaining the cohesion of soil particles and preventing erosion, which will affect the increase in carbon dioxide gas and the lack of oxygen, which will negatively affect the life of the organisms in that area.

2.1 Questions

Q1: What are the most likely types of trees and shrubs to be targeted in the study area?

Q2: What are the factors affecting the diversity of natural vegetation cover?

Q3: What are the necessary methods to preserve the natural vegetation cover?

2.2 Objectives of the study

- This study aims to know the composition of the vegetation cover, inventory and classification of plant species, and compare with the Libyan flora.

- Knowing the role of the environmental impact in decreasing the diversity of the natural vegetation cover.

Determining the most endemic plant species in the study area.

2.3 Hypotheses

1- It can be said that the environmental impact has a major role in the disappearance of the feast from plant species in the study area.

2- It can be said that the study area is located within the semi-arid areas that are exposed to a significant shortage in the amount of rain water, especially in recent years.

2.4 Research importance

The importance of the research lies in knowing the importance of natural plants because of their important role in maintaining clean air free of pollutants, thanks to the dissemination of environmental awareness,

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especially in recent years that display natural vegetation cover natural deterioration in plant species that will lead to global warming.

2.5 Research materials and methods

This study was conducted as a descriptive study to describe the study area based on field visits throughout the seasons, and the collection of samples while they are in flowering condition to facilitate their classification and comparison with the Libyan flora.

Secondary studies: in which it relied on previous studies:

There are many studies conducted on the vegetation cover in Libya, where the first studies were made when a studied some archaeological remains from the Cyrenaica region, and explained his vision of the Sylphium plant, which he called Selfione (The fourth national report, 2010). Geography Climate and Plant - Dar Al-Nahda Al-Arabia for Printing and Publishing, Beirut (Abdel-Maguid, 1971).

2.6 Study area

The AL-Khawabi area is located in the northeastern of aljabal alkhdar in Libya, east of bangahzi city about 72km and west of a almarj city about 28 km. A s for astronomy: it is located between latitude 32˚39 00, 22 30 32◌̊N and longitudes E20˚50 00,20˚35 00

The study area is divided into two areas, which are as follows:

The first region: It is represented at the foot of an area and is characterized by the presence of a vegetative cover represented in trees, shrubs and herbs, such as carob, fennel, olives, cypress, Qamol, Ansal and Pharaoh.

The second area: a central area represented by trees, shrubs, herbs, olives, carob and juniper.

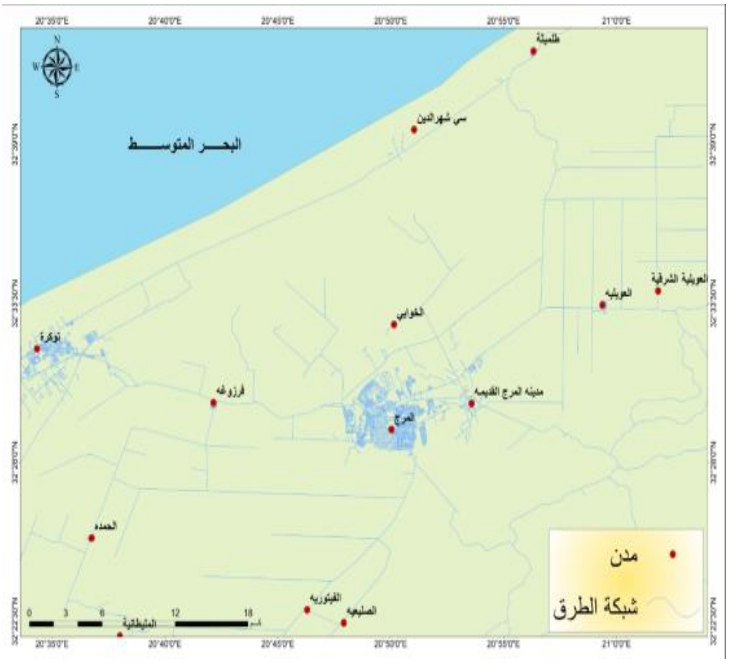

Figure 1: Study Area
Source: Land Sat8 moon images using Arc Gis10.5.

2.7 The climate

Climate has an important role in the distribution of natural vegetation cover, which affected the adaptation of plant species to the prevailing climate in the study area, where the climate of the study area prevails, the Mediterranean climate, which is characterized by being rainy in winter and warm in summer. It is evident from Table 1 and Figure 2 that the highest annual average total of the amount of rain falling is 85 mm, while the lowest annual average total of the amount of rain falls is 0 mm June July August, as well as the relative humidity and its role in the biodiversity in the study area, where the humidity rises in winter to reach 77% in January, while it decreases in summer to reach 53.91%, and also the wind has an effect on the vegetation cover, as the increase in wind speed works to crack the branches of soft herbal plants. Especially, it also affects the increase in the transpiration process in the plant, which affects its dryness. Satellite imagery analysis from the American land Sta 8 and 5 using the space change equation. **[10]** The fourth national report on the implementation of the Convention on Biological Diversity - Libya, p 19 (The fourth national report, 2010).

Table 1: Monthly averages of the amount of rain, mm for the years from 1989 –2007

Year	Average rainfall mm	Temperature	Relative humidity	Wind speed
January	85	11.5	77٪	10.4
February	83	11.3	73٪	10.7
March	43.5	13.6	68٪	9.3
April	13.7	16.9	60٪	9.7
May	6.6	21.1	58٪	8.4
June	0.9	24.5	55٪	8.0
July	0.0	25.4	60٪	8.5
August	0.1	26.1	61٪	8.1
September	2.2	25.0	61٪	7.6
October	21.8	21.2	65٪	7.8
November	52.3	16.7	69٪	8.9
December	11.2	13.6	74٪	9.6
Annual average	26.69	18.9	65٪	8.9

Source: 1 National Center meteorological station, Tripoli, meteorological station Marj from the year1989-2007

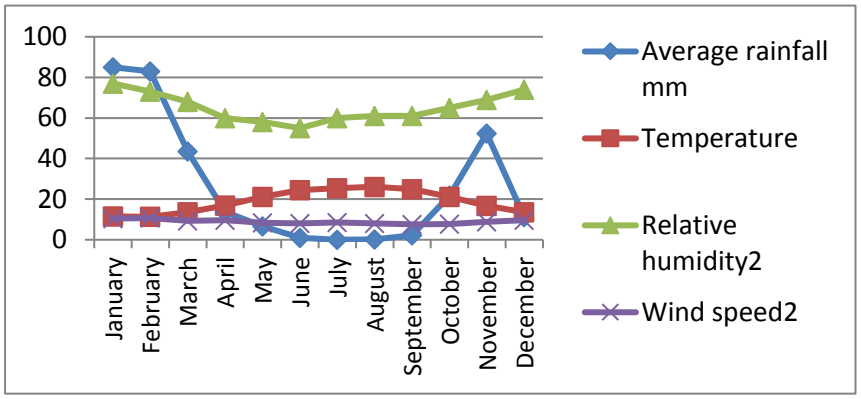

Figure 2: Annual average total of the amount of rain

3. Study Materials And Methods

And from the frequent field visits that were conducted to the study area, samples were collected starting from January 2020-2021 throughout the year, and from different places, and care was taken in the process of collecting samples that they be in the state of flowers or fruits to facilitate the classification process, and care was taken during the collection to make sure that the samples are free From infection with fungi and insects, and the length of the branches is about 25 cm from, and cleaning the samples

by removing the dust and insects attached to them, then placing them in newspapers and keeping the samples in their natural form, then drying them with writing the scientific and local name of the use samples, their geographical location in the study area, And the date of compilation and of National Center meteorological station, Tripoli, meteorological station almarj from the year1989 – 2007. the various taxonomic encyclopedias, the most important of which is Flora of Libya, where the definition is confirmed by comparing it with the samples in the Libyan flora herbarium.

4. Results And Discussion

The study addressed the knowledge of the natural plants present in the study area through repeated field visits, as it is an area that had not been studied before, where 173 plant species were collected and classified, and classified according to the Libyan flora, as in Appendix (1), represented by 33 families belonging to 173 species and 133 genera. It was divided into naked and angiosperm plants, and the gymnosperms represented two types: Cupressus, Juniperus phoenicea, and sempervirens, which belong to the Cupressaceae family, and the angiosperms represented 173 plant species divided into dicotyledons (Dicotoyledons). Which contained 26 families, 105 species and 84 genera, and monocotyledons, which contained 6 families, 66 species and 45 genera, as in Table No Table (1) shows the division of plant groups obtained from the study area (2020-2021)

Table 2: Shows the division of plant groups obtained from the study area (2020-2021).

Number	Number of plant aggregates	Number of species	Number of genera	Number of families
1	Gymnosperm	**2**	**2**	**1**
	Angiosperms			
	Dicotoyledons	**105**	**84**	**26**
	Monocotyledons	**66**	**45**	**6**
Total		**173**	**133**	**33**

The study dealt with the knowledge of the natural plants present in the study area through repeated field visits, as it is an area that has not been studied before. 173 plant species were collected and classified according to the Libyan flora. as in Appendix (1), represented by 37 families belonging to species and genus, and divided into gymnosperms and gymnosperms, two types of which are Cupressus and Juniperus phoenicea. , sempervirens, and they belong to the Cupressaceae family, and either Angiosperms represent 184 plant species divided into Dicotoyledons, which contained 147 species and 111 genera, and Monocotyledons, which contained 37 species and 30 genus.

Number	Plant aggregates	Number of species	Percentage
1	Phanerophytes	**6**	**3.46%**
2	Chamaephytes	**50**	**28.90%**
3	Cryptophytes	**13**	**7.51%**
4	Therophytes	**104**	**60.11%**

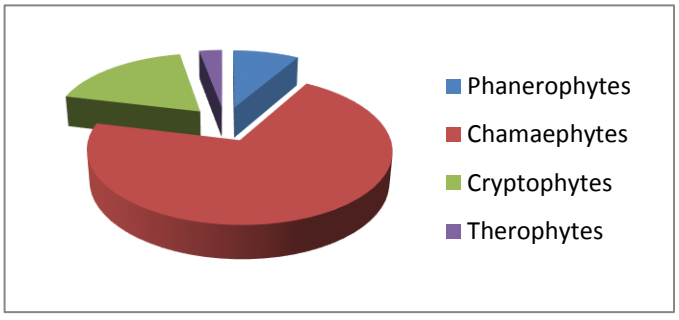

Figure 3: Percentages of growth forms in the study area according to the system (1934, Raunkiaer)

Percentages of growth forms in the study area according to the system, and through study area Table 2 and Figure 2, which shows the growth forms that were collected from the and the classification of the collected plant species, and by using the classification of growth forms according to the Roncaire system 1934 and comparing them with some studies conducted on the Green Mountain region, and this is consistent with the study of the semi-desert region (Raunkiaer, 1934). It extends between the cities of Suluq and Al-Abyar, where the highest percentage of annual plants was about 55.2%, while its percentage in the study area was 57.73%, and being plants whose life cycle is related to rainfall, and due to the scarcity of rainfall in the study area, this led to the emergence of plants Thistles are plants that tolerate drought and their ability, by nature, to reduce transpiration processes.

Then plants come in second placeThen the short perennial plants come in second place, which amounted to 26%, while in the study area it amounted to 31.54%, as it is an open area that is always exposed to exploitation and on an ongoing basis, such as residents cutting trees and shrubs randomly, in addition to grazing operations that led The occurrence of dwarfism in the bushes of eucalyptus, in addition to infection with fungi, then comes the terrestrial plants, and its rate reached 11.4%, while its rate in the study area reached 7.14% in the study area: cypress, juniper, olive, and carob for logging operations and used it as charcoal, which negatively affected its density in the area The study showed an imbalance in the balance of the vegetation cover, while it amounted to 6.58%, and due to what these species are exposed to, especially trees and shrubs, then tall perennial plants, which reached a percentage of 3.57%.

By comparing the arrangement of plant families in the study area, we find that the largest family is the Pole family, which contains 56 plant species, and we find that the Pole family is more than the non- Pole family, and this is due to the fact that the regenerative buds of the Pole family are found on the rhizomes buried in the soil Therefore, it is not affected by grazing, but rational grazing may help the growth of these phyla, p. 144 reference, then followed by the compound family, which contained 36 plant species, then followed by Apiaceae, which contained 12 plant species, then followed by Brassicaceae, which contained 8 plant species, then followed by two families of Fabaceae and Lamiaceae, which contained contains 7 plant species, then followed by the Liliaceae family, which contained 5 botanical (Raunkiaer, 1934).

The life forms of Plants and statistical Plant geography. Study of the flora and vegetation of the semi-desert region extending between the cities of Suluq and Al-Abyar - the first highland of the Green Mountain - Libya. The fourth Scientific Conference of Environment and Sustainable Development in the Arid and Smi-Arid Regions(ICESD) p24. species, then followed by the Euphorbiaceae and Linaceae families, each of which containedcontains 4 plant species, then followed by the Boraginaceae family, which contained 3 plant species, then followed by each of the families Araceae Convolvulaceae, Cistaceae, Cupressaceae, Dioscoreaceae, Ranunculaceae, Malvaceae, Geraniaceae, then followed by each of the families that contained two types of plant species, then followed by the Allaceae, Anacardiaceae and Anacardiaceae families Caesalpiniaceae, Chenopodiaceae, Cuscutaceae, Ericaceae, Thymelaeaceae, Illecebraceae, Oleaceae, Oxylidaceae, Papaveraceae, Primulaceae, Rosaceae, and Valerianaceae, which contain one type of plant species Arrangement of plant families and their types and comparison with the arrangement of Libyan flora families**.**

Family	Libya	Number of species in regon study
Asteraceae	**240**	**36**
Poaceae	**220**	**56**
Fabaceae	**200**	**7**
Brassicaceae	**100**	**8**
Apiaceae	**75**	**12**
Lamiaceae	**62**	**7**
Caryophylaceae	**65**	**-**

RECOMMENDATION

Environmental awareness and awareness of the danger of vegetation cover deterioration among the local population. Work on planting trees, shrubs and species for more growth, which are compatible with the environmental conditions of the region. Exchanging experiences with neighboring countries in finding sound ways to preserve the vegetation cover. Establishing many reserves to preserve plant species from extinction. Activating strict laws and procedures and activating Law No. 17 of 1985 AD dated 12/29/1985 by activating Article No. (3) and paying financial fines ranging between 1000-1500 Libyan dinars. Which prevent the depletion of natural plant species to the most vulnerable to depletion Protection of trees and shrubs that make up a large part of the vegetation cover, such as juniper trees, carob trees, bell peppers, olive trees, fennel trees, etc.

Table 3: shows endemic plant species in the study area (2020-2021)	
Asteraceae	*Bellis sylvestris var . cyrenaica* Beuinot .
Alliaceae	*Allium longanum* Pamp .
Araceae	*Arum cyenaicum* Hruby.
Ericaceae	*Arbutus pavarii* Pamp .
Primulaceae	*Cyclamen rohlfsianum* Asehers .
Ranunculaceae	*Ranunculus cyclocarpus* Pama.
Plantaginaceae	Plantago cyenaica Durand & Barratte

List of plant species collected through the 2020-2021 field study for the study area.

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