

## Contribution to a Morphometric Study of *Rosmarinus Officinalis* in the North West Algerian

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### Abstract

*This work is devoted to a morphological study of Rosmarinus officinalis in the Tlemcen region (Northwest Algeria). Results are obtained on the morpho-metric and ecological aspect. The observation of the physiognomy and the general appearance of the study area show heterogeneity of sward. To better understand the adaptation of Rosmarinus officinalis a morpho-metric study is required. It shows that there is a strong relationship between the parameters measured on the one hand and the middle where Rosmarinus officinalis on the other hand.*

**Keywords:** *Rosmarinus Officinalis* - Morphometrics - Tlemcen - Ecology.

### Introduction

The Mediterranean basin is quite diverse in plant species and is of great interest for any scientific study, given its wealth related to the heterogeneity of historical, Paleogeographic, geological and ecological factors, but it is characterized by climatic and soil stresses strong, salinity, drought and soil shallow and mobile.

The vegetation of the region of Tlemcen, presents a good example of study of the dynamics of natural ecosystems, despite the fact that she has suffered for several years a continuous regression most often due to a combined action of climate, ecological, and anthropogenic factors.

The high full steppe and the coast of Algeria, who are part of this Mediterranean landscape are excellent experimental plots dedicated to embrace these studies.

*Rosmarinus officinalis* L. is a shrub growing in the wild in regions with a semi-arid vorbeurteilung and sub - humid. It is the most popular plant in the Mediterranean basin (EMBERGER, 1960).

This work will enable us to understand the morphological appearance of *Rosmarinus officinalis* and its ecological significance. Indeed, several authors looked at the problem of the growth of plants and their adaptations. Among them, we can mention: DEBOUZIE and al. 1960; DEMELON, 1968; GOUNOT, 1969; LE HOUEROU, 1971; ROY, 1977; EL HAMROUNI, 1978; AIDOU, 1983; FRONTIER, 1983.

### Materials and Methods

The study area is located in the western part of the North

West Algerian; it is shared between the wilaya of Tlemcen and the wilaya of Ain TEMOUCHENT. Two stations are selected for our study, one part of the High Plains steppe (Sidi El Mokhfi) and the other is located in the littoral (Sidi Safi)

#### 1- The station of Sidi El Mokhfi

6 Miles next to Sidi Djilali to the right of the path of wilaya n° 107 connecting Sebdou at Sidi Djilali lies our station with a North East exposure and an approximate altitude of 1276 to 1282 m. It is characterized by a flat topography and a recovery rate between 40 and 50%. This station is dominated by

- *Stipa tenacissima*
- *Rosmarinus officinalis*.
- *Plantago Logopus*
- *Paronychia argentea*.

#### 2- The station of Sidi Safi

The study of *Rosmarinus officinalis* station belongs to the municipality of Beni Saf and is located on the axis of Sidi Safi, next to the cement factory.

East of the Traras Mountains lies the plateau with a Northern exposure and an altitude of approximately 176 m. as it characterized by a slope of 10-20% and a rate of recovery between 50 and 60%.

The species that dominate this station are:

- *Erica multifida*
- *Calycotome intermedia*
- *Urginea maritima*
- *Cistus villosus*

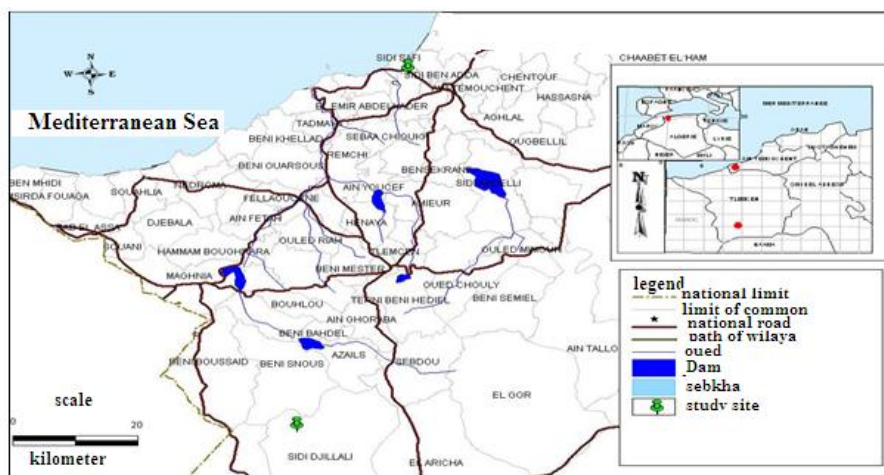


Figure 1 : Geographical location of the study area map

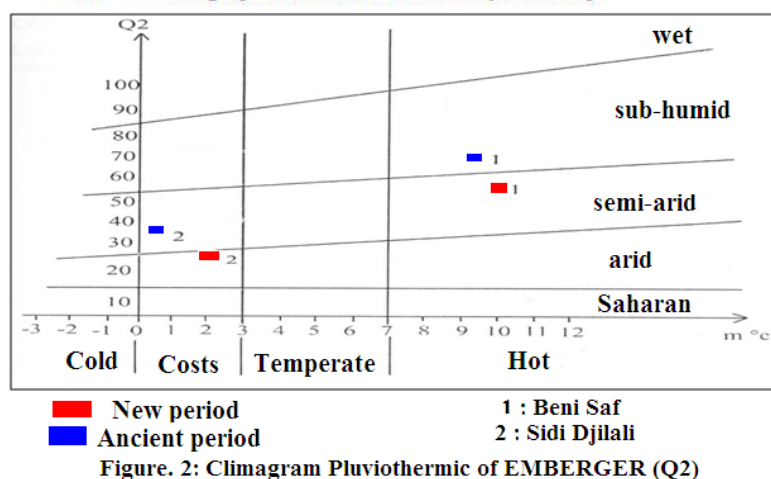


Figure 2: Climagram Pluviothermic of EMBERGER (Q2)

Bioclimatic studies the Oranie and Tlemcen region are numerous; it is worth mentioning the recent work: **ALCARAZ (1969-1982)** in his study on the vegetation of the Western Algerian or it performs a very complete study of the spatial variations in the climate of the region, **AIME (1991)**, **HADJADJ (1995)**, **BENABADJI & BOUAZZA (2000)**.

In relation to the climate of the study area is of Mediterranean type, on the basis of the pluviometric quotient of Emberger, it belongs to the semiarid bioclimatic floor.

The ombrothermics of BAGNOULS and GAUSSEN diagrams show that the duration of the drought extends from 5 to 6 months for the two stations.

So the specificity of *Rosmarinus officinalis*, is clearly defined as well as its ability to resist and adapt to the environment extremely difficult, We considered it useful to carry out a number of morpho metric.

The analysis focused on ten individuals sampled randomly in full vegetation.

The measured parameters are: number of branches; the number of flowers; the diameter and the height.

The use of statistical analysis remains in biometrics an effective method to highlight the degree of correlation between different parameters measured.

## Results and Interpretation

Morphometry can understand the close relationship between coexisting measured parameters and the environment. This study remains fundamental; it gives an idea of the adaptation of the species in coastal and steppe as it was long used as a medicinal plant (Table 1,2 ,3 and 4).

### Station 1 :

In the station of Sidi Mekhfi, the correlation between the diameter and the number of branches and between the diameter and the inflorescence is good with  $R^2 = 51.6\%$  and  $R^2 = 58.4\%$  respectively, so there is a relationship between these two parameters.

The correlation between the inflorescence and the height is  $64.9\%$ , so the height and the inflorescence are closely related.

Believed in this case height and the inflorescence becomes largest and most important large number of flowers; so Bloom depends on the height and the age of the species.

A very strong correlation occurred between the inflorescence and the number of branches of the order of  $77.9\%$

**Table 1:** Results of the analysis of the Morphometry of *Rosmarinus officinalis* ( Sidi Mokhfi station)

Individual	Diameter	height	Number of branches	Inflorescence
1	150	50	24	200
2	125	40	42	383
3	90	30	14	93
4	88	45	19	134
5	30	32	9	72
6	148	40	33	191
7	198	68	160	1440
8	179	64	138	1238
9	75	43	11	57
10	64	32	10	98
11	185	40	28	53
12	69	45	21	34
13	94	39	47	43
14	110	30	102	157
15	75	51	44	95

**Table 2 :** Results of the analysis of the Morphometry of *Rosmarinus officinalis* (Sidi Safi station)

Individual	Diameter	height	Number of branches
1	75	54	16
2	33	31	10
3	55	48	20
4	87	65	25
5	72	94	38
6	145	66	45
7	36	62	16
8	46	44	13
9	63	39	24
10	48	44	18
11	34	26	23
12	80	51	70
13	61	28	18
14	72	33	30
15	74	35	36

**Table 3:** Results of the correlation (Sidi Mokhfi station)

Parameters	R <sup>2</sup> %	Correlation
Diameter / height	45.1	Poor correlation
Diameter / Number of branches	51.6	Good correlation
Diameter / Inflorescence	58.4	Good correlation
height / Number of branches	45.1	Poor correlation
height / Inflorescence	64.9	Good correlation
Number of branches / Inflorescence	77.9	Good correlation

**Table 4:** Results of the correlation (Sidi Safi station)

Parameters	R <sup>2</sup> %	correlation
Diameter /Number of branches	35.8	Poor correlation
height / Number of branches	9.5	Poor correlation
Diameter / height	36	Poor correlation

This good correlation is explained according to **Demolon (1968)**: two characters are highly correlative, if any variation of one corresponds to one variation of the other in a determined direction.

Demolon (1968) clarifies in this regard "that a loose positive correlation of 0.60 reflects the fact that the considered characters depend on both of the species itself, and conditions of the environment (texture, humidity...)".

#### Station 2:

Sidi Safi station is characterized by a poor correlation between the diameter and the number of branches and between the diameter and height with 35.8% and 36% respectively as well as a very poor correlation between the length and the number of branches 9.5%.

The fourth parameter is absent in this resort, *Rosmarinus officinalis* during their flowering period but has followed without feasibility. This absence or delay is probably due to the effects of the cement plant, which is near our resort of study of human action and its mostly herds by the phenomenon of overgrazing.

#### Conclusion

*Rosmarinus officinalis* morphometric study shows that the obtained correlation is negative for the resort of Sidi Safi and positive for Sidi Mekhfi station, and that there is a link between the various parameters measured (height, diameter, the inflorescence and number of branches). This can be explained by different environmental ecological conditions (soil, water, climate anthropogenic and other) for each station study.

According to Heller et al. (1990): "the development of a body does not depend on those ambient conditions and its own potential, but the functioning of the other organs widely.

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