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CONTRIBUTION TO A CARTOGRAPHIC AND PHYTOGEOGRAPHIC STUDY OF A *LAVATERA MARITIMA* MALVACEAE IN THE TLEMCEN COAST

Ghalem Sarra*, Hassani faiçal, Bouayad Ibtissam Sarah and Zettam Amine

Laboratory of Ecology and Management of Natural Ecosystems, University of Tlemcen, Algeria.

*Email : sarah.ghalem@outlook.com

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ABSTRACT

This study allowed us to define on the one hand the biogeographical criteria, and on the other hand to develop a cartographic sketch of the physiognomy of *Lavatera maritima* in our study area. This work is devoted to the biogeographical analysis of *Lavatera maritima* in the Tlemcen Coast (Rachgoune 1 and 2, Béni-saf1 and 2 Oulhassa and Madrid). The biogeographic distribution shows the dominance of the Mediterranean element. A vegetation map can be viewed in different ways, as a physiognomy map showing the present state of vegetation, or as a land use map.
The development of a cartographic test of the distribution of *Lavatera maritima* in the coast of Tlemcen aims to know the current status and range of this plant species.

Keywords: *Lavatera maritima,* Malvaceae, cartography, littoral, Tlemcen, Phytogeographic.

INTRODUCTION

In the assessment established by (Quézel *et al.,* 1999), the Mediterranean forest is made up of approximately 247 woody species compared to European forests (13 species). Algeria, due to its geographical position, presents a great diversity of biotope occupied by an important floristic wealth. In addition, the drought experienced in the Oranian region has profoundly disrupted nature, causing significant phenomena of water stress and adaptation in plants (Benabadji *et al.,* 2004). The phytogeographic study is also a real model for interpreting regression phenomena (Olivier *et al*., 1995). For (Quézel 1991), a phytogeographic study constitutes an essential basis for any attempt to conserve biodiversity. The phytogeographic element corresponds to "the floristic and phytosociological expression of a well-defined extended territory; it encompasses the species and phytogeographic communities characteristic of a given region or domain «according to (Braun-Blanquet 1919). The phytogeographic study also constitutes a real model for interpreting the regression phenomena (OLIVIER *et al*., 1995). For (Quezel 1991) a phytogeographic study constitutes an essential basis for any attempt to conserve biodiversity. Finally, it is from floristic analysis that we can be led to study the particular location of taxa that are often rare, such as endemics or certain endangered species, or only at the limit of their range distribution, or introduced accidentally by humans. The analysis of the areas of origin and the areas of distribution of taxa is an essential task of botanists and phytogeographers which takes on all its value at the very moment when public opinion is sensitized by the problems of conservation and protection of nature. , and safeguarding «genes» (Frankel and Bennet- 1970). At the level of the study area, the determination of the biogeographic types of all the taxa was carried out using the flora of Algeria (Quézel and Santa, 1962, 1963) and the flora of the Sahara (Ozenda 1977). The International Cartographic Association defines cartography as the discipline concerned with the design, production, dissemination and study of maps. Cartography is also representation - the map. Mapping therefore encompasses the entire process of creating maps (Bouayad I, 2017).

MATERIALS AND METHODS

The study focused on the new distribution of the taxon Lavatera maritimma (Malvaceae) in the coastal region of Tlemcen located in the North-West of Algeria. A survey of the floristic procession of *Lavatera maritima* (Malvaceae) was carried out by the Zurich-Montpellier method (Braun-Blanquet, 1951) and by the linear method. The choice of stations was imposed by the presence of the species studied. This map gives us a general overview of the different species existing in our region and allows us to highlight the current state of the coast of the Tlemcen region. The map we produced includes the study stations in the following stations: Madrid, Rachgoune 1 and 2, Béni-saf 1 and 2 and Oulhassa. To achieve this goal we made several field trips and about 251 floristic surveys in order to give a general overview of the different species existing in our region and to highlight the current state

of the groups in *Lavatera maritima* in The different stations and to develop this map, help was requested from Mr. Zettam Amine, cartographer at the University of Tlemcen. Which in turn had used several cartographic supports:

- The Tlemcen land use map produced by the Agency services National Regional

Planning.

- Landsat E. T. M.
- Bioclimatic map of the Wilaya of Tlemcen (1 / 150,000) established by URBAT /

Tlemcen.

- The cartographic study showed us the importance of the floristic procession linked to

Lavatera maritima in the Tlemcen coast.

- The floristic surveys carried out in the field, but also the floristic surveys of the

various researchers of the Laboratory of Ecology and Management of Natural Ecosystems.

Lavatera maritime (*Lavatera maritima*) is a perennial woody bushy plant of 30 cm to 1.20 m of the genus Lavatera and the family of Malvaceae. Woody plants, over 1m. Flowers of a pale pink ± purplish in the center, isolated and long stalked in the leaf axils.

Photos 01: Tuft of *Lavatera maritima*.

A vegetation map is now established that vegetation mapping constitutes an effective approach to achieve the most rapid spatial representation of ecosystems and in particular at regional or geographic scale (Barka F, 2016).

This map shows us the distribution of the groups in *Lavatera maritima* according to the biogeographic types.

Code	Lon	Lat
Béni-saf 2	001° 23 W	35° 18 N
Rachgoune 2	001° 28 W	35° 17 N
Madrid	001°27 W	35°17 N
Rachgoune	001°29 W	35°17 N
Oulhassa	001°27 W	35°17 N
Béni-saf	001°25 W	35°17 N

Table 01: Geographical location of our study area (area 1).

We note that the Med type is dominant in all the stations, and therefore zone 1 is dominated by this biogeographic type.

RESULTS AND DISCUSSION

To study the distribution of species, we based ourselves on information provided by the New Flora of Algeria QUEZEL and SANTA (1962-1963).

- Beni-saf station 1: The figure shows us the predominance of Mediterranean

biogeographic type species with a percentage of 33%, followed by the Canar-Méd, W. Med and Macar-Méd type with a percentage of 7%. other elements remain relatively low.

- Oulhassa station: Figure n ° 02 shows us the predominance of Mediterranean

biogeographic type species with a percentage of 35%, followed by the Eur – Med type with a percentage of 08% And the other elements remain relatively low.

- Rachgoune station 1: Figure n ° 03 shows us the predominance of Mediterranean

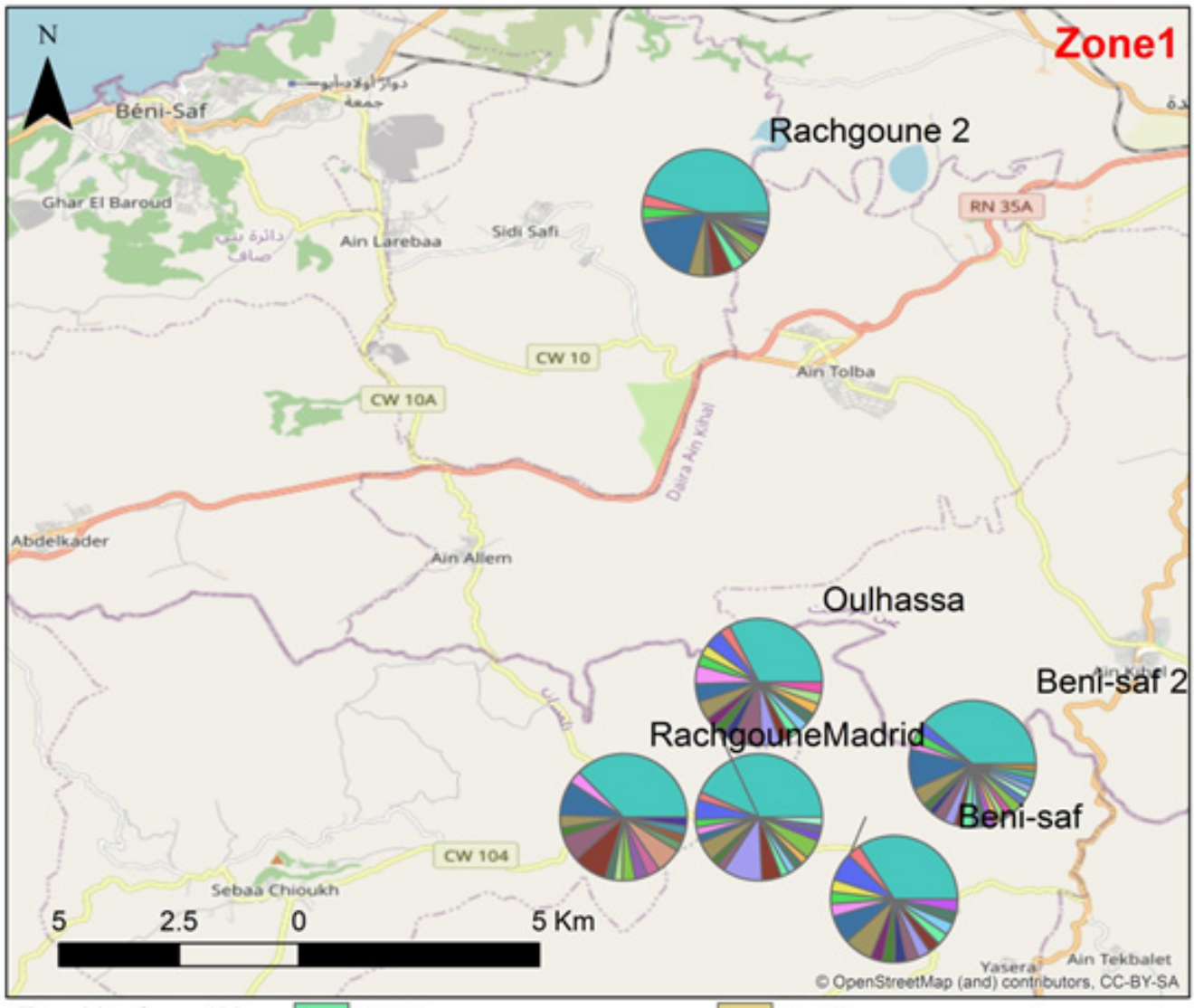
biogeographic type species with a percentage of 34%, followed by the Cosmop, W-Méd and Eur-Méd type with a percentage of 8%, then the Naturalized type with 6% And the other elements remain relatively low.

- Madrid station: Figure n ° 04 shows us the predominance of Mediterranean

biogeographic type species with a percentage of 43%, followed by the Cosmop, Euras, Canar-Méd and Macar-Méd type with a percentage of 5% And finally the other elements remain relatively weak.

- Rachgoune Station 2: The most represented biogeographic type in the study area is

Mediterranean as shown in the figure above with a percentage of 43%, we also find species belonging to the Western Mediterranean a percentage of with 17%, And finally the other elements remain relatively weak.



Map 01: The presence of *Lavatera maritima* in Zone 1

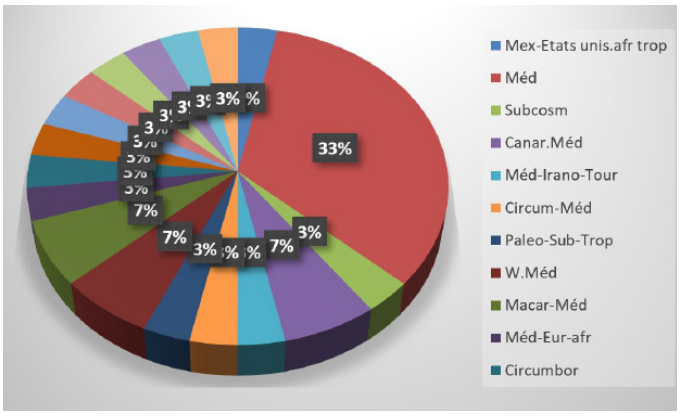


Figure 01: Percentages of biogeographic types in the Béni-saf station 1.

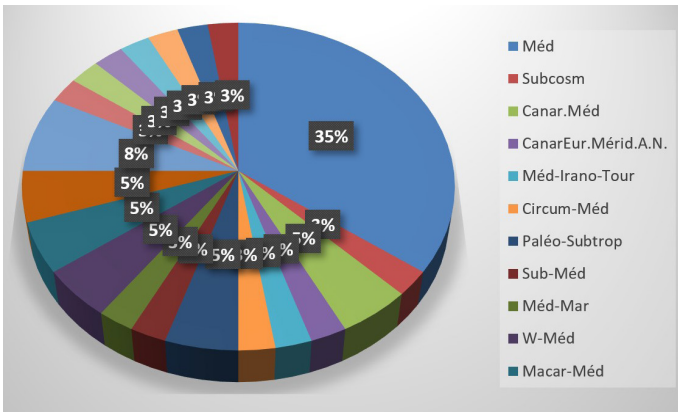


Figure 02: Percentages of biogeographic types in the Oulhassa station.

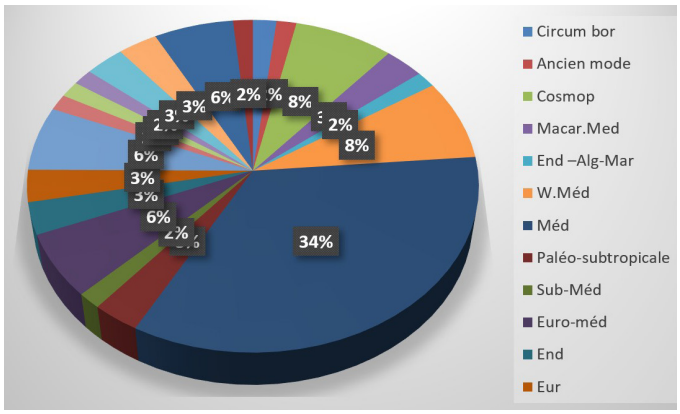


Figure 03: Percentages of biogeographic types in the Rachgoune station.

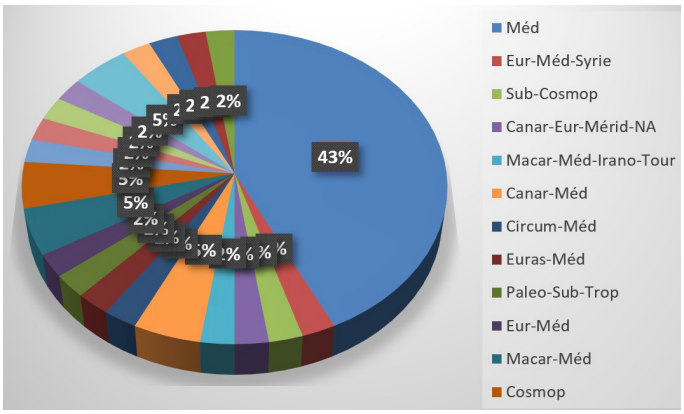


Figure 04: Percentages of biogeographic types in the Madrid station.

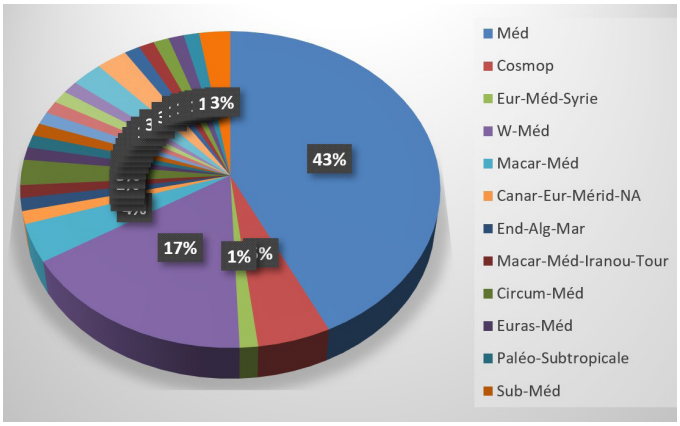


Figure 05: Percentages of biogeographic types in the Rachgoune 2 station.

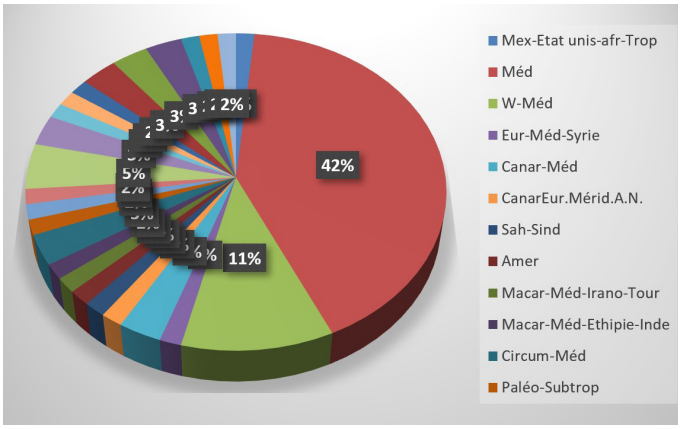


Figure 06: Percentages of biogeographic types in the Béni-Saf 2 station.

- Béni-saf 2 station: The most represented biogeographic type in the study area is Quaternary.

Mediterranean as shown in the figure above with a percentage of 42%, we also find species belonging to the western Mediterranean with the percentage of with 11%, the Macar-Med type with the percentage of 5%, And finally the other elements remain relatively low. According to Cardona et al. (1961) geographers and geologists agree that the history of the Mediterranean has been very turbulent over time and has not evolved in the same way in the different parts of the Mediterranean basin following the great upheavals Tertiary and

CONCLUSION

For a long time, biogeography was confined to the description of the distribution of flora and fauna, to the elimination of vast regions where biodiversity is more homogeneous and to the study of the mechanisms of dispersal and colonization on a continental scale (Kerzabi R, 2017). On the biogeographic level, the distribution of species shows a dominance of Mediterranean-type species in the six stations. The phytogeographic spectrum showed an important endemism in which most of the

species belong to the Mediterranean element compared to other types of distribution.

In the Tlemcen region, the appearance of the woodland atmosphere exists and still persists. With our analysis, we noted that this atmosphere tends to change through an invasion of Asylvatic species, more adapted to stressful ecological conditions (Barka F, 2016). The map we have produced encompasses the biogeographic types of each study station on the Tlemcen coast (North West Algeria). It is intended to show the exact location of each station. The physiognomic map of the vegetal carpet of Moutas developed meets our objectives; it helps better individualize the plant groups studied and understand their regression phenomena using modern methods from ecology. This map remains in our eyes a unifying concept for the management of forest massifs for both scientists and the public (Babali I; 2014). However, during our field surveys we noticed that the groups in *Lavatera* are in continual regression and, our results obtained confirm to us that under the effect of several degradation actions, the dynamics of vegetation in the study area is in the regressive sense.

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ABBREVIATIONS USED

- End: Endemic
- End. Alg. : Algerian endemic
- Med : Mediterranean
- Eur. : European
- Euras. : Eurasian
- Paleo-temp. : Paleotemperate
- Cosm. : Cosmopolitan
- Med. Atl. : Mediterranean Atlantic
- Circumbor. : Circumboreal
- Macar-Méd: Mediterranean Macaronian
- Sah: Saharan

- Paleo-Subtrop: Paleo subtropical

- Subcosmo: Subcosmopolite

- Mex-United States.afr-Trop: Mexico-United States. africa-Tropical

- Ibero-Med: Ibero Mediterranean

- Eur-Med-Syria: European- Mediterranean-Syrian

- Méd-Occiden: Western Mediterranean

- Thermocosmo: Cosmopolitan Thermo

- Canar-Méd: Canarian- Mediterranean

- W-Med: West - Mediterranean

- Méd-Irano-Tour: Mediterranean- Irano-Touranien

- Circum-Med: Circum- Mediterranean

- Méd-Eur-afr: Mediterranean-European-African

- Eur-Med: European- Mediterranean

- End-N.A: Endemic-North African

- Ibéro-Mar: Ibero-Moroccan

- Canar-Eur.Mérid.A.N: Canary-European-South-North-African

- Sub-Med: Sub-Mediterranean

- End-Alg-Mar: Endemic-Algerian- Moroccan

- Macar-Med-Irano-Tour: Macaronesian- Mediterranean-Irano-Touranien

- Madira.W.Med: Madeira-West-Mediterranean