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## RESEARCH ARTICLE

# CONTRIBUTION TO THE STUDY OF PSAMMOPHILE COASTAL REGION OF TLEMCEN (ORAN-ALGERIA): PHYTOSOCIOLOGICAL ASPECTS AND MAPPING

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**ABSTRACT**

**Objects:** This study is devoted to the analysis of the vegetation of the coastal dunes of the region of Tlemcen. Results were obtained on these in general, including the phytosociological and topographic aspect.
**Methods:** is to choose stations of the coastline of the region of Tlemcen from Rechgoune Beach until Marsat Ben M'hidi which determine vegetation of coastal psammophytes
**These Results:** allowed us to individualize different phytosociological classes (Cakiletea maritimae, Ammophiletea) for species with the beach, (Therobrachypodietea, Quercetea ilicis) in bright dune and fixed dune. The class of the Cakiletea maritimae and Ammophiletea include species of the embryonic dunes.
The Therobrachypodietea class includes vivid dune species. Quercetea ilicis class brings together the most advanced dune species and more fixed. Using the phytosociological and phytodynamiques data, we were able to understand the evolution of this vegetation and its diversity.
**Conclusion:** establish a mapping test different of course with their floristic cortege coastal dunes and highlight the different phytosociological units.



## INTRODUCTION

Mediterranean coastal ecosystems are characterized by climatic and soil stresses strong, salinity, wind, drought and soil little deep or mobile. Moving from beach to the inland, we encounter a succession of elements of the dune landscape whose morphological and plant character is linked to the gradual modification of the atmosphere: salinity, wind power and sand movements. The phytosociological interpretation of the psammophilous remained until recent, very imperfect. Some authors; GÉHU *et al.* (1984) and CHAABANE (1993) had however undertaken an analysis of these species and expressed a first synthetic approach. It is in particular in this regard that was envisaged for the first time a class of the Ammophiletea and Cakiletea Maritimae. Many items of QUÉZEL (1965) and BARBERO *et al.* (1969) brought interesting details on the structures phytosociological, phyto-ecologiques and ecological complexes psammophilous of the Western and Eastern Mediterranean in general and which remained very incomplete especially for the extreme Western Mediterranean. The purpose of this study is to illustrate the species composition and ecology of the sandy Mediterranean coast by one approach mapping. The work we present here concerns the vegetation of the coast from the beach béni - saf until Marsat Ben M'hidi (Figure 1).

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It is associated with a high percentage of sand, still higher than 60%. The vegetation of the Tlemcen region presents a good example for the study of plant diversity and especially an interesting synthesis of the natural dynamics of ecosystems, coastal. This type of work has been addressed by several authors. Mainly include Zeraia (1981), Dahmani (1997), Quezel (2000) and Bouazza and Benabadji (1998).

## MATERIAL AND METHODS

The study focuses on the analysis of the distribution of species of coastal region of Tlemcen: stations from the beach béni – Saf until Marsat Ben M'hidi was chosen. These help us to gain a better understanding of the dynamics of vegetation but also to better understand the ecological factors and establish a mapping spatial distribution of psammophilous through coastal.

For this we chose 2 areas distributed thus:

1 areas representing the embryo dunes and bright dunes (from the beach béni - Saf until Marsat Ben M'hidi).
1 area representing the semi-fixee dunes (Ghazaouet, cement station (Béni-Saf)). These areas differ from each another by: geographical location, climate, topography, edaphic conditions, anthropogenic factors and plant diversity.

Stratify From sampling, we have selected ten study sites representative so the study of coastal vegetation in the region of Tlemcen. Each of these stations has several fundamentally different situations. These stations are localized in the western part of the north-western Algeria. They are located between 1 ◦ and 1 ◦ 27_ 51_west longitude and 34 ◦ and 35 ◦ 27_ 18_ north latitude. The zone is restricted geographically:

To the north by the Mediterranean Sea;

- the south by the mounts of Tlemcen;
- to the west by the Algéro-Moroccan border;
- to the east by the wilaya of Témouchent.

Genesis of Sea dunes Under the effect of erosion, sand particles are going to move grace to winds to feed the dune ridge of coastline. 2.4. Dunes. The wind pushes the sand which will hang on waste brought by the sea. This forms a hump get bigger and bigger. This is the birth of a dune where embryonic going to develop a ephemeral vegetation based on: *Medicago marina; Cakile maritima; Euphorbia paralias.* According to CHAABANE (1993), dune is a deposition of sand edified by the wind into coming up against various obstacles such as vegetation and asperities terrain encountered between the beach and the mainland.

The dynamics of dunes depends on the one hand of the Wind speed and the dimension of sand particles and, on the other hand, obstacles which are the vegetation or the reliefs. As a function of the latter we distinguish 04 kinds of dunes.

**The high dunes**: encountered the vicinity of the sea (beach Rachgoune, Beidar, Egla M'Khaled).
**Dunes on slopes**: are on slopes exposed to the sea (the valleys Rachgoune).
**Suspended dunes**: are formed on the cliffs parallel to neighborhood of the sea (Ouled Benayad).
**Dunes clad**: depots constitutes tackles against of the scree of slope. It is characterized by a vegetationbased on: *Crucianella maritima, Thymelaea hirsuta* and *Elichrysum stoechas.* (Marsat Ben M'hidi) The bioclimatic study for two periods (1913-1938) and (1970-2002) Figure 2 showed a vertical indent of each station in direct relation with the Q2 Emberger. Station Ghazaouet, despite falling on of the value of Q2 always under floor lower semi-arid to hot winter This climate favors the extension of a vegetation therophytic xerophyte.

## RESULTS

Examination of the distribution of the psammophiles card to make a few major observations Figure 3.

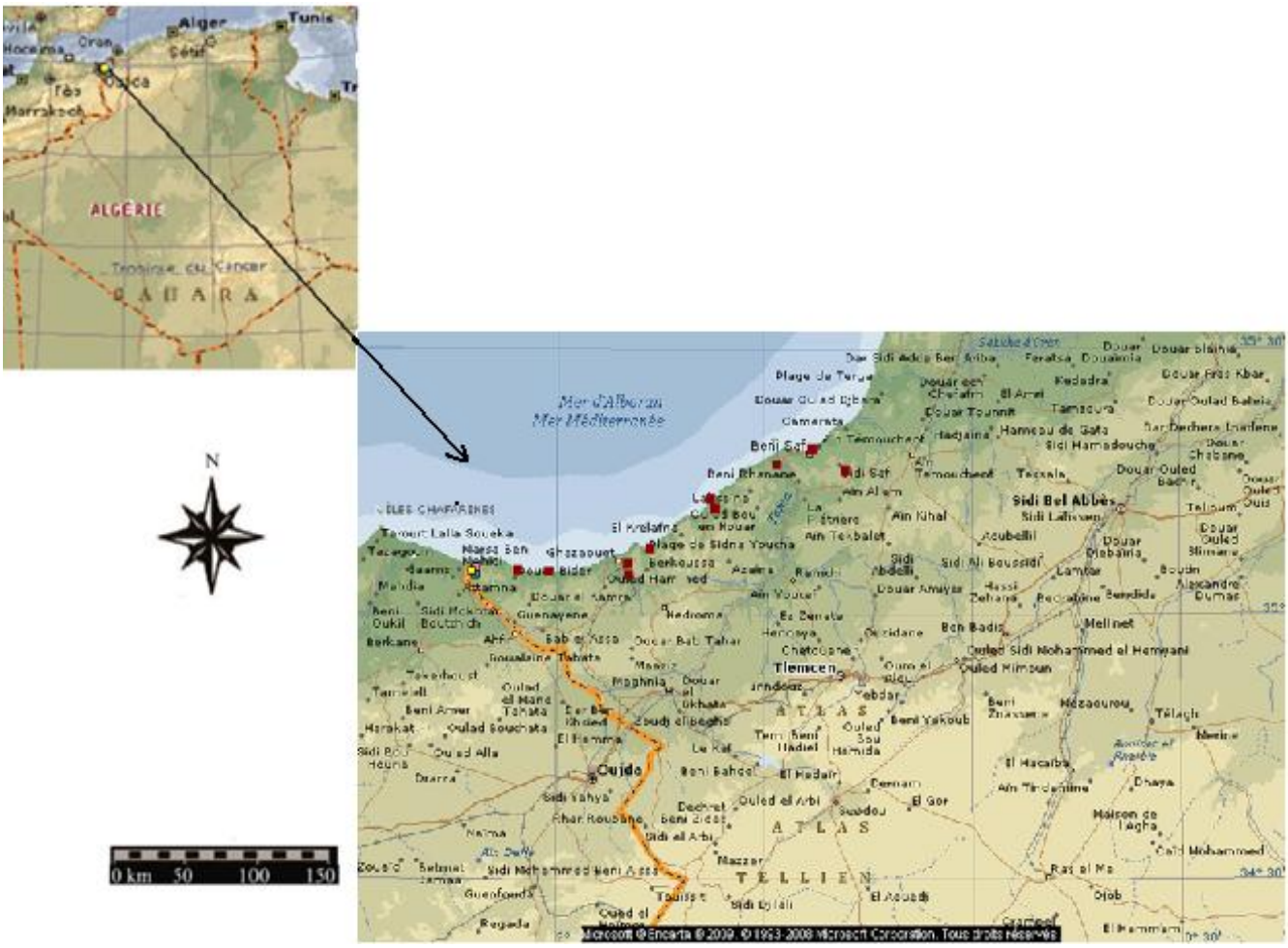


**Figure 1. Location of the Stations of study**

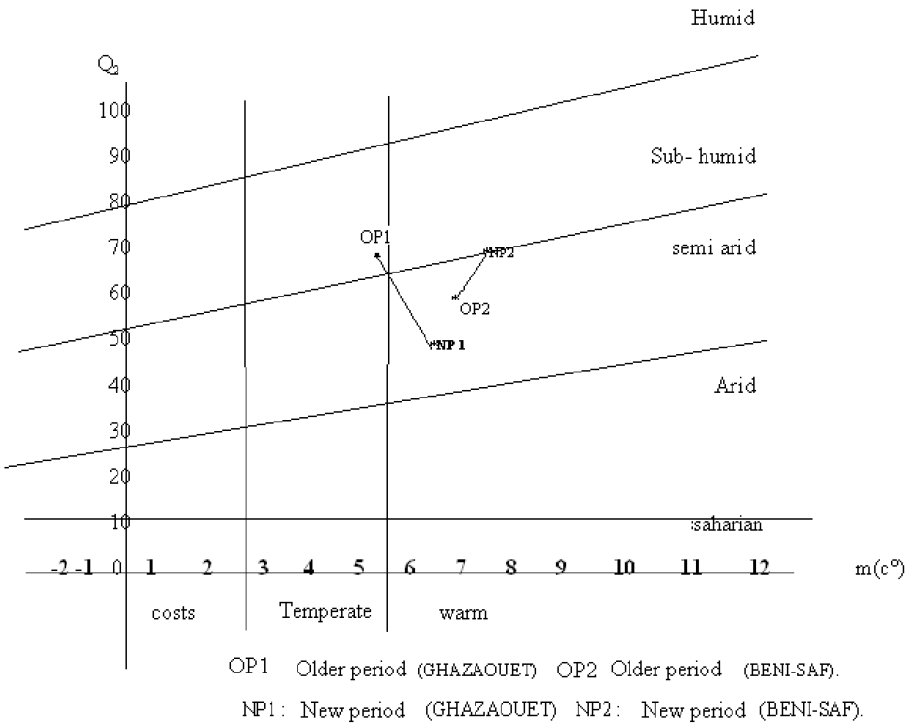


**Figure 2. Temperature and humidity within them different zones**

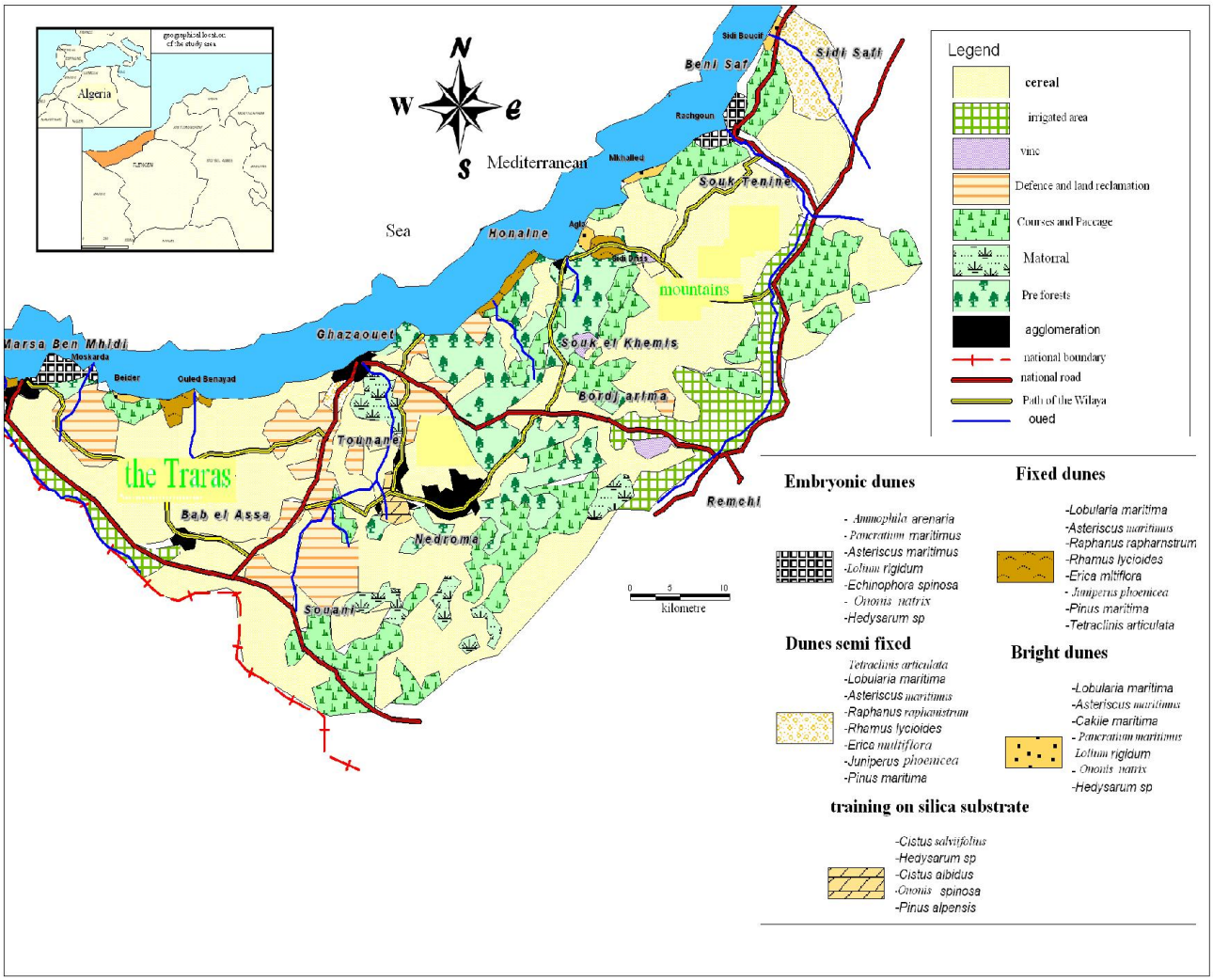


**Figure3. Distribution of the psammophile of the littoral of the region of Tlemcen**

**The embryonic dunes**: Fall der Rechgoune Beach and Marsat Ben M'hidi.

These dunes are dominated by species pertaining to AMMOPHILETEA and CAKILETEA MARITIMAE class and who are:
*Ammophila arenaria; Pancratium maritimum; Asteriscus maritimus; Lolium rigidum Echinophora spinosa ;Ononis natrix; Hedysarum sp*

**Bright Dune**: fall along the beach of Sidi Boucif, Mekhalled, Alga and Beider with the presence of the following species:
*Lobularia maritima; Asteriscus maritimus; Cakile maritima; Pancratium maritimum Lolium rigidum; Ononis natrix; Hedysarum sp*

**Dunes semi fixed**: moderately laid down by the appearance of chamaephytiques and phanerophytiques species and are divided from the beach of Sidi Boucif Ouled Ben ayed and Beider. They are dominated by:

*Lobularia maritima; Asteriscus maritimus; Raphanus raphanistrum; Erica multiflora; Juniperus phoenicea; Pinus maritima*

**the fixed Dune**: fall through all the coastline and are fixed by the phanerophytiques-based species of: *Juniperus phoenicea; Pinus maritima; Tetraclinis articulate* Path of the Wilaya

## DISCUSSION

Station Rachgoune and Marsat Ben M'Hidi to gether by excellent psammophilous species pertaining to the class of AMMOPHILETEA where CAKILETEA MARITIMAE followed the dunes live thus characterizing the following stations, which are: M'khelled, Agla and Sidi boucif.

Then the semi-fixee and fixed dune which are characterized by the presence of some phanerophytiques species has basis of *Juniperus phonicea*; *Tetraclinis articulata* and *Juniperus oxycedrus* in the *f*ollowing stations: Honaine, Ouled Benayed, Sidi Driss and Beider. And finally the formations on siliceous substrates thus characterizing Nedroma related station generally a class of CISTO-LAVANDULETEA where CISTO-ROSMARINEA on siliceous substrate.

**Conclusion**

This flora is a remarkable indicator of the characteristics of these soils; its diversity is directly related to their texture, the nature of the bedrock and their Ionic complex. The interaction of different natural factors has the mosaic of biotopes and vegetation structure.

But this arrangement, linked to the variability of the physicochemical characteristics of the substrates, is particularly disturbed by the actions of origins anthropozoogenic. This pressure results in a depletion of the most advanced sets, a loss of 'natural' biodiversity of specific groups of the coast. It causes great difficulty in accurate individualization of the beaches (Cakiletea maritimae) or even of dunes fixed sets. Finally, we say that the future is worrying about maintaining this national heritage. It is important that effective, even drastic measures be taken rapidly to alleviate this pressure of anthropozoic origin. Admittedly, this is not unique to the Algerian coast since it occurs in all countries of the Maghreb and on almost all of the territories, but the reduction of vested coastal areas to natural ecosystems is an aggravating factor.

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