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## PHYTOECOLOGY OF RIPISYLVES IN THE TLEMEN REGION OF ALGERIA

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### ABSTRACT

Plant formations that develop on the edges of streams or bodies of water located in the border area between water and land. They are made up of specific stands due to the presence of water over more or less long periods, formations characteristic of the Oueds in our region. Riparian forests play an important ecological role. In particular, they offer specific natural habitats. They form biological corridors, increase the ecological connectivity of landscapes and therefore play a major role in maintaining biodiversity (forest and river biodiversity in particular), at regional scales. Finally, true filters, they protect the quality of the water and part of the wetlands of the watershed, the banks and the riparian soils.

Our study is interested in the botanical and phytoecological aspect of endemic grouping of our Oued which are the tamaricaceae.

**Keywords:** Oued Tafna –Ripisylves- Tamarix- ecological gradients - xerophyte

### INTRODUCTION

The Mediterranean region is a bioclimatic transition, and according to several recent works, it is however very difficult to separate the ecological effects generated by the climatic and atmospheric change caused by the variables according to the Mediterranean regions

The ripile vegetation present at the edge of the Mediterranean Oueds is characterized by strong climatic and soil constraints, salinity, wind, drought and shallow or mobile soils.

The vegetation allows the physical protection of the soil thanks to the fixation of the root networks (MERZOUK A, 2010) particularly developed and effective in certain species like the Tamarix By increasing the roughness forces of the Oued bed, The vegetation decreases the average speed and the erosion force of the current and slows the progression of floods; the shrubby state forms a protective cover by the aerial stalk plate. Tamarix is a genus of shrubs or small trees that belongs to the Tamaricaceae family. It is common in Mediterranean regions, where it can be spontaneous or cultivated.

#### Geographic location

The study area comprising the different stations chosen from a stratified sampling is located in the western part of north-western Algeria. It is located in the wilaya of Tlemcen, Extending over an area of 10,000 km<sup>2</sup>, the study area rises to an altitude of approximately 8 to 300 m and is limited between 35 ° 02 'and 35 ° 55' north latitude and 1 ° 26 'and 1 ° 38' west longitude.

#### 2. Choice and description of stations

The choice was guided by the presence of ripile formations. Four stations across the study area were stratified, which

may seem insufficient over a large area.

#### Site N ° 1: Hammam Boughara

This first station is located in western Algeria 10Km from Maghnia. It is located on the bridge of the national road RN 35 a few Kms from the locality of Hammam Boughara, It is installed on a longitude of 1 ° 38' West and a latitude of 34 ° 53' North and an altitude of 252m. It is characterized by a flat topography (slope of 5%) and a recovery rate of 50 to 60%.

#### Composed of species

*Anagallis arvensis* L., *Atractylis caduus*, *Bromus madritensis* L, *bromus rubens* L, *Chrysanthemum coronarium* L, *Chrysanthemum grandifolium* (L) Batt, *Daucus carota sub spgummifer* Lamk, *Erodium moschatum* L, *Lavatera maritima*, *Nerium oleander*, *Plantago lagopus*, *Reichardia picroides*, *Schismus barbatus*, *Senterium sianus*, *Sinapis arvensis*

#### Site N°2 : Zenata

This second station is located on the RN 98 national road bridge a few kilometers from the town of Zenata. It is installed on a longitude of 1 ° 29' West and a latitude of 35 ° 02' North and an altitude of 254m.

The station has a recovery rate of 50 to 60% on a slight slope of 10 to 20%.

The species dominating this station are:

*Chenopodium album*, *Chrysanthemum coronarium*, *Hordeum murinum*, *Lagurus ovatus*, *Medicago falcate*, *Nerium oleander*, *Papaver hybridum*, *Phalaris communis*, *Plantago major*, *Scolymus grandiflorus*, *Silybum marianum* et *Sinapis arvensis*.

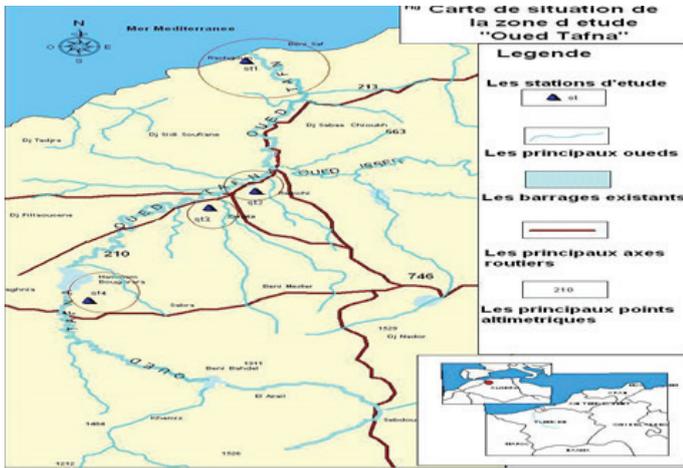


Figure 1. Map of study station location

### Site N° 3: Oued Isser

This third station is located on the Oued Isser bridge on the RN 22 national road. It is located on a longitude of  $1^{\circ} 26'$  West and a latitude of  $35^{\circ} 06'$  North and an altitude of 84m.

The station has a recovery rate of 50 to 60% on a slight slope of 10 to 20%.

The dominant species are

*Acacia cyanophylla*, *Agave americana*, *Bromus madritensis*, *Bromus rubens*, *Centaurea pullata*, *Chenopodium album*, *Chrysanthemum grandiflorum*, *Erodium moschatum*, *Hordeum murinum*, *Lagurus ovatus*, *Malva sylvestris*, *Marrubium vulgare*, *Phalaris communis*, *Silybum marianum*, *Smyrniolum olusatrum*, *Sinapis arvensis* et *Withania frutescens*.

### Site N° 4: Rachgoun

It corresponds to the beaches of Rachgoun and Siga which are located to the West of Béni Saf and to the East of Monts des Traras, it is located on the national road RN22 and is located on the valve of the Oued de la "Tafna" which leads to the Côte de Rachgoun. It has a longitude of  $1^{\circ} 28'$  West and a latitude of  $35^{\circ} 17'$  North and an altitude of 8m with and a recovery rate between 30 and 40% on siliceous substrate.

The species that dominate this station are:

*Arthrocnemum glaucum*, *Atriplex halimus*, *Bromus rubens*, *Centaurea pullata*, *Chenopodium album*, *Ephedra fragilis*, *Hordeum murinum*, *Juniperus phoenicea*, *Lobularia maritima*, *Lycium europaeum*, *Malva sylvestris*, *Pistacia lentiscu* et *Quercus ilex*.

The presence of *Juniperus phoenicea* confirms the xericity of the station and its location on the thermo-Mediterranean floor.

The dominance of *Quercus ilex* explains the presence of an ancient forest subjected to strong anthropozoogenic pressure and in particular fires on the one hand, and that it is a rustic species, indifferent to the substrate, on the other hand.

## MATERIAL AND METHODS

### Bioclimat

Given the data we have, we were able to cover, for the main reference stations, obtained from the (Seltzer P, 1946) weather report, several bioclimatic indices are used, quotient of EMBERGER, continentality index of (Debrach J, 1953) Aridity index of (De Martonne E, 1926) ombrothermal diagram of (Bagnouls F and Gaussen H, 1953) and Seasonal relative coefficient of (Musset R, 1935).

### Soils

Favor to Guy Aubert's manual, (Aubert G, 1978) we analyzed pH (electrometric method), a CO<sub>3</sub> (total limestone) and organic matter. By knowing the quantity of dichromate necessary for this Oxidation, we can calculate the percentage of organic carbon and humus in the soil (the ratio of % humus / % Cox = 1.724), the electrical conductivity by the Method of the diluted extract or the extract one fifth (1/5), the measurements are Expressed in mS / cm.). Coloring according to the Munsel code.

### Phytoecology

To have a good overview on diversity; of the heterogeneity of the plant formations present in the study stations we have carried out floristic surveys in stations occupied by riparian formations.

In this context, we proceeded to:

- Abundance scale - dominance
- Biological characterization
- A biogeographical characterization
- A morphological characterization
- A specific richness
- The Disturbance Index

The flora used to identify the taxa collected is the flora of Algeria (Quézel P and Santa S, 1962).

### Statistical method

The statistical processing from the "Minitab 16" software took into account the plant species after having coded them for readings from each station. We then placed them in a table in Excel (with the statements in rows and the species in columns). One of the fundamental interests of this method is the simultaneous representation in the same space and in a symmetrical manner of the surveys and the species so that each species is localized within the group of surveys to which it is most closely linked. Only the abundance-dominance coefficient is used. The table constitutes the matrix from which the distance calculations are made.

## RESULTS AND DISCUSSION

### Bioclimatic synthesis

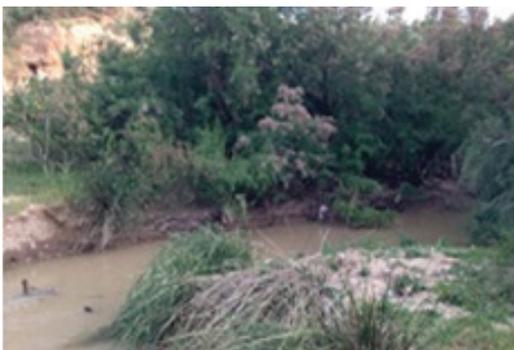
Our stations are located on the upper semi-arid floor in hot or mild winter according to Q2 of Emberger, thermo-Mediterranean according to the classification of Riva Martinez, with a dry semi-arid regime with temporary



Pictures 1 Site .Hammam Bouhrara



Pictures 2 Site .Hammam Bouhrara



Pictures 3 Site .Zenata



Pictures 4 Site .Rachgoun



Pictures 5 Site .Rachgoun

**Table-1:** Ecological significance of the axes

The Negative Side	The Positive Side
<i>Bromus madritensis</i>	<i>Acacia cyanophilla</i>
<i>Erodium moschatum</i>	<i>Arthocnemum glaucum</i>
<i>Glyceria maxima</i>	<i>Juncus maritimus</i>
<i>Medicago rugosa</i>	<i>Pistachia lentiscus</i>
<i>Reichardia tingitana</i>	<i>Senecio leucanthemifolius</i>

flow according to the Demartonne index, from semi-continental with coastline according to the Debrach index, 4 to 6 months of drought according to Bagnouls Gaussens, as well as a seasonal HPAE regime according to Musset. The current climate of our study area favors the extension of therophytic vegetation, especially xerophytes.

### Soil synthesis

All the physicochemical characters of the samples show a silty-sandy texture for the four stations,

An alkaline pH, a very low organic matter content, a percentage of limestone which varies from 30 to 43 which shows a strongly calcareous soil.

With moderately salty soil for all the stations, the water content is low and it is approximately close for the four stations.

The soils in the study area are quite heterogeneous and their characteristics follow the nature of the substrate and the topography.

### Phytoecological Synthesis

#### Statistical Analysis of the Results

#### Ecological significance of the axes

The search for the ecological significance of the factor axes will be based on the confrontation of species with high relative contributions and its distribution on the positive side and on the negative side of each axis. We will thus try to specify which will be the major ecological factors of the diversification of the vegetal carpet.

Plan 2-1 shows a gradient of anthropization

on the positive side with intense degradation of the medium, and a gradient of therophytization on the negative side.

The CAH hierarchical classification allows us to define three nuclei representing vegetation groups according to the ecological gradients defined by the factorial plane 2-1.

- Core 1 group of tamaricaceae with therophytic species.
- Core 2 with chamaephytic species.
- Core 3 with indicator species of anthropization.

### CONCLUSION

The study of the flowering procession of the riparian forests of the four stations enabled us to bring out the following results:

- The Asteraceae and Poaceae families undoubtedly dominate the study area.
- The biological type “therophyte” largely dominates in



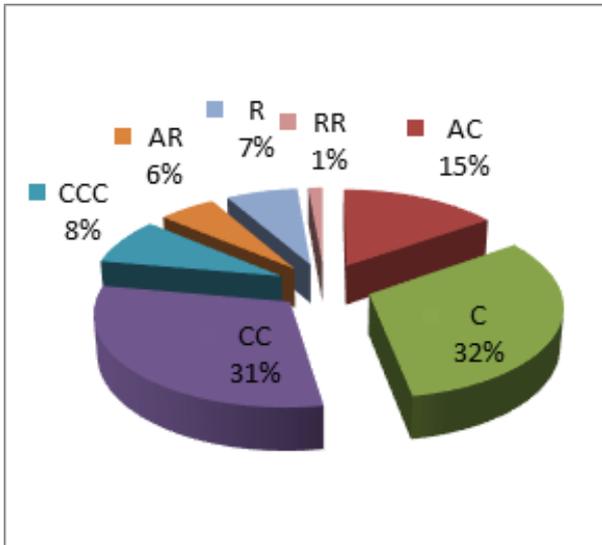


Figure6. Types of Abundance in the study area

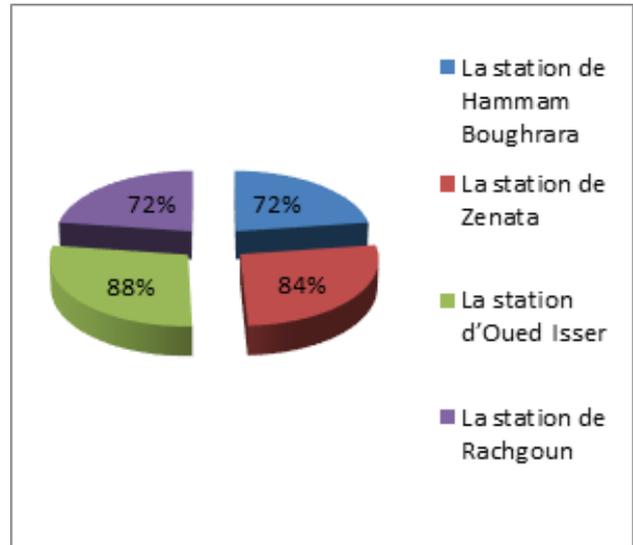


Figure7. Disturbance index in the study area

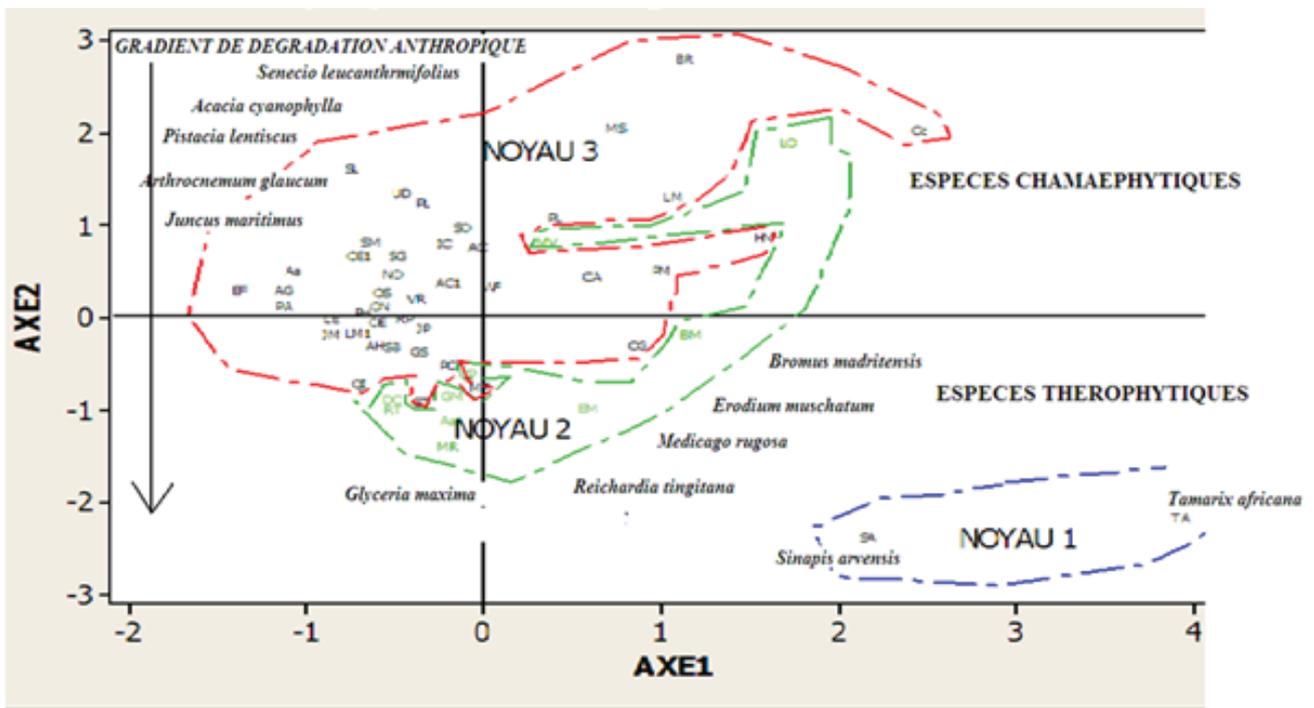


Figure8. Factorial plan of the species (Axis 2 to Axis 1)

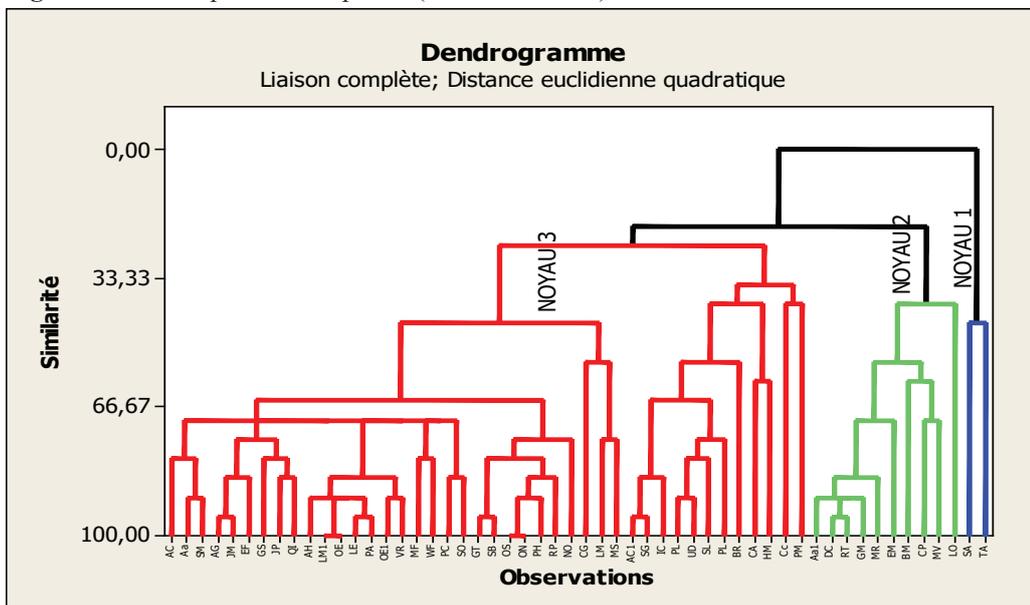


Figure9. The hierarchical classification of study stations

the four stations studied, coming in second position chamaephytes, Phanerophytes, hemicryptophytes and finally geophytes. The latter, according to (Barbero M *et al.*, (1989) require an environment rich in organic matter and a high altitude; which is not our case.

- The biogeographical distribution shows the dominance of Mediterranean elements, followed by the West Mediterranean and finally the cosmopolitans.
- The disturbance index calculation is proportional to the dominance of the therophytic species in all of the four stations studied. The dominance of the therophytization character is linked to the invasion of annual species, disseminated by herds especially in the study area. On this subject, (Barbero M *et al.*, 1981) explain therophytization by the ultimate stage of degradation of ecosystems with sub-nitrophilic species linked to overgrazing.

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