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## Approach Phytoecological of *Pistacia atlantica* Desf. in the Saharan Atlas (Region of Bechar, Algeria).

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### Review Article

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#### ABSTRACT

This work focuses on the study group to phytoecological *Pistacia atlantica* Desf in order to assess the ecological conditions of adaptation in pre-Saharan region of the Saharan Atlas Bechar. The Pistachio of the Atlas is a rustic and xerophytes tree, well suited to pre-Saharan climate and can play an important role in forestry, ecological and socio-economic. The methodology includes a device consisting of a series of transects distributed in different topographic units in the study area. The phytoecological statements are prepared every 200m depending on the variability of vegetation and ecological conditions. An analysis of the vegetation on 25 floristic surveys resulted in a floristic and ecological characterization of groups of Atlas Pistachio (scattered population in general) in the region. Thus, this analysis led to the identification of vegetation associated with Pistachio. This species can live in very dry places pre-Saharan climate between 700 to 1200 m where rainfall rarely exceeds 100 mm/year. Floristic diversity of the group in *Pistacia atlantica* is very special because of its biological characterization, systematic and phytogeographical. The study highlights the importance of Saharan - endemic species with a more favorable adaptation and resistance in typical Saharan bioclimatic.

#### INTRODUCTION

The Atlas Pistachio or Betoum (*Pistacia atlantica* Desf. Subsp. Atlantica) is a species of choice in southern foothills of the Saharan Atlas. It regenerates in the tufts of jujube which is the classic host. The systematic point of view, *Pistacia* belongs to angiosperms, the dicotyledonous; the subfamily Anacardae derived from the family Anacardiaceae and say terebinthaceae also sometimes Pistaciaceae [17].

Studies undertaken [2,3,4,6,8,9,13] show adaptive strategies *Pistacia atlantica*. This species has a remarkable ecological amplitude and plasticity since the meeting from the heart of the Sahara to the margins of wet bioclimatic of the Rif Mountains (Morocco) . It may occupy the clefts of the rocks and cliffs, deep soils on flat land or very rocky wadis or large seasonally wet depressions [15].

Our work is aimed at the preservation of plant species such as the case of *Pistacia atlantica* Desf. which is the object of our concern.

## MATERIALS AND METHODS

### Description " Djedida " study station

The "Djedida" station is located near the village of Djedida (tab1 and fig. 1), 65 km south of Bechar to connect Beni Zireg. It is a mountainous area (Jebel Djebel Bechar M'daouar If Moumen) in pre-Saharan character at the edge of desert landscape by the presence of *Acacia raddiana*. This choice is based on physical considerations of order, climate, soil and plant

### Methodological Approach

This approach has been made for a type by systematic sampling transect through the study site. We made 25 phytocological during the spring of 2009. The methodology includes a device consisting of a series of transects distributed in different topographic units in the study area. These statements are prepared phytocological every 200m with a minimum area equal to 100 m<sup>2</sup> (method adopted by Benabadji and Bouazza <sup>[7]</sup>) that the variability of vegetation and ecological conditions (topography, exposure).

### Botanical Identification

Identification of taxa was made from the plant:

- New flora of Algeria and southern desert regions <sup>[16]</sup>,
- Flora of the Sahara <sup>[14]</sup>.

## OBSERVATIONS AND RESULTS

### Characterization of the recovery rate

It was found that the recovery rate is 45%, this increase is due to an exceptional wet year (more than 130 mm in the month of October). The improvement in the recovery rate is directly influenced by rainfall and probably due to the process of biological recovery. Le Houerou <sup>[12]</sup> argues that it is the whole process of inverse to those of the steppe and desertisation.

### Floristic characterization

Floristic richness in arid area depends on the mainly annual species, environmental conditions and the correlation of all the characters of climate, edaphic and operation <sup>[4]</sup>. The study shows a clear diversification Saharan flora in the presence of 36 families, 100 genera and 118 species.

Analysis of the results reveals that the dominant life form is represented by therophytes (52.54%), followed by chamaephytes (19.49 %), and followed by hemicryptophytes (14.41%), by phanerophytes (8. 47%) and by Aroids (5.08 %). We observed that the station study to record the existence of a large number of phanerophytes represented by *Pistacia* , *Olea europaea* , *Rhus tripartitus* , *Retama retam* and *Ziziphus lotus* .

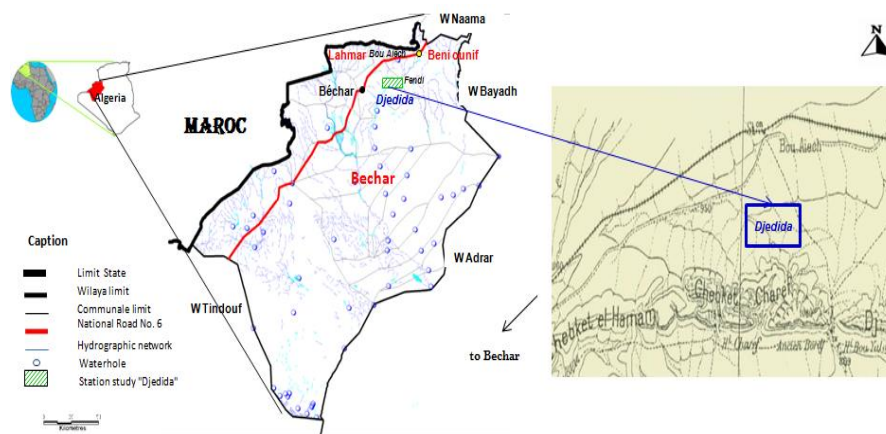
Following Figure 2, we see that the Asteraceae, Poaceae and Fabaceae are the three most dominant families in the floristic list. These three families represent 35 to 40% of the flora in each Saharan sector [14]. This dominance is justified because they are cosmopolitan families are widespread across the globe. Asteraceae, Fabaceae and Caryophyllaceae are families of Mediterranean affinity vary according to latitude: they decrease from north to south.

**Table 1: Study stations that are part of our study**

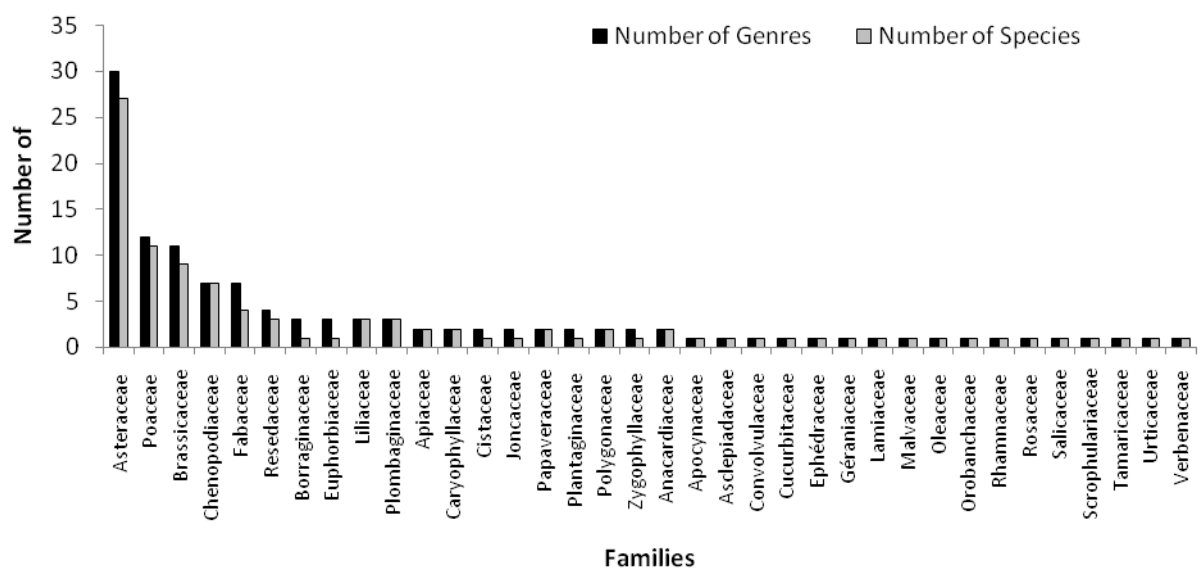
Daïra	City	Location	Altitude (m)	Physical entity	Coordinates	
					X	Y
Bechar	Béchar	Djedida	724	Mountainous	31° 48' 00" 00	1° 43' 60" 00

**Table 2: Phytogeographical affinity of the study site**

	Phytogeographical affinity	Number of species	Percentage (%)
1	Endemic	36	30,51
2	Saharien-sindien	34	28,81
3	Mediterranean	27	22,88
4	Saharan	10	08,47
5	Cosmopolitan	9	07,63
6	Ibero -Mauritanian	1	00,85
7	Tropical	1	00,85
	<b>Total</b>	<b>118 species</b>	<b>100%</b>



**Figure 1: Location of the "Djedida" study station**



**Figure 2: Botanical families of the study station**

## Phytogeographic characterization

According to the phytogeographical division of Barry and Celles [5] the study area belongs to the Holarctic empire in the Mediterranean region and the Saharan Atlas. The table 2 shows the different biogeographic raw spectra that characterize the study site

There is a dominance of endemic biogeographic element with (30.51%), followed by the Saharan - sindien element with (28.81%) and the Mediterranean element with (22.88%). Also note the presence of elements Sahara with a percentage (08.47 %), the Cosmopolitan element (07.63%), the Ibero -Mauritanian and Tropical recorded the same rate (00.85%). The station is dominated by endemic and included in the Mediterranean area; it is also subject to the Saharan influences on climate and botany.

## Phytoecological characterization

From a climate perspective, the Pistachio of Atlas is very hardy tree scrublands large amplitude with respect to climatic way affected by long periods of drought, with great bioclimatic amplitude. It occurs from the margins of the Saharan bioclimatic to those of the wet, even in the cool temperate and warm variants [11]. The approach performed on *Pistacia atlantica* has allowed us to increase the body of knowledge on this plant by various observations and analyzes conducted in semi- arid and arid region of Bechar areas. Thus we have seen that the species can live in very dry areas allowing it to acclimate to different bioclimatic environments ( $0^{\circ}\text{C} < m < 3.7^{\circ}\text{C}$ ). The altitudinal level we were able to locate the species ranging between 700 and 1200 m and / or rainfall rarely exceeds 100 mm/year altitudes. Add to that the species is widespread in areas where the temperature exceeds  $45^{\circ}\text{C}$  in summer and rainfall quotient is greater than 7 [8].

The edaphic point of view, it is very demanding it accommodates a wide range of soils: acidic soils, siliceous and calcareous, with the exception of sandy soils [10]. Alyafi [3] and Benaradj [8], notes that the Atlas Pistachio grows on alluvial soils dayas on soils rendzinas types and in mountainous regions.

The group of pistachio atlas presents a very particular landscape where coincide with *Acacia raddiana*, the Betoum (*Pistacia atlantica*) and *Rhus tripartitum*, so this is the limit of the repair area Betoum. During our trips we were able to land on a list of species associated with the Betoum, it comes to: *Zilla macropetera*, *Launea arborescens*, *Anabasis aretioides*, *Gymnocarpus decander*, *Teucrium polium* *Limoniastrum feei*, *Anvillea radiata* [8].

## CONCLUSION

Certainly *Pistacia atlantica* is a very plastic species, however its presence in the southwest plays a significant role in the balance of ecosystems Sahara. It therefore has a double aspect: Socio -economic (cooking, heating, therapeutic interest) and environmental (fight against desertification, fight against soil erosion etc.).

Its conservation and multiplication is an absolute necessity. Forest managers and administrators must address the issue of valuation of the plant genetic resources and give it more importance.

This species deserves adequate protection measures, especially in its natural environment. Indeed, in addition to its forest and ecological interest, the Betoum may also have some economic interest, including serving as a rootstock for growing fruit Pistachio (*Pistacia vera*) in semi -arid areas.

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