

## The Fir of Numidia: a Threatened Species

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### Summary

The fir of Numidia "*Abies numidica*" is a conifer species endemic solely to Algeria, where it covers an area of only 2,300 ha.

It may find it in the humid forests of the high mountains of Babors (Mount Babor), as well as in east Kabylie between 1,300 and 2,000 m a.s.l.

The location of Mount Babor on a high tray in the relief with steep slopes determining a cold and snow-covered climate is responsible for its environmental isolation and distinctive biological identity. Under these conditions, the difficult access difficult had provided a certain protection which caused the deterioration of some forest areas. That is why this forest includes some quasi-virgin parts where multi hundred-year-old fir trees die standing.

Being found only in the forest of the Mount Babor, this endemism which is natural and rare should be kept and protected to avoid its counting among other missing species. To fulfil this purpose, Algeria uses the artificial regeneration.

**Key words:** Fir of Numidia, endemism, threatened kind, regeneration.

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### Introduction

The fir of Numidia is a tree belonging to the *Pinaceae*. It is endemic to the mount of Babors.

The forest of Babors is part of the massif of the Tellian Atlas. It is located in eastern Algeria and only 15 km away from the Mediterranean Sea.

It owes its name to the mountain of Babors, to which it belongs. It has the highest peak at 2,004 m a.s.l., one of the highest points of the country. Given its wealth and role of protection and preservation of animal and plant species, the French administration had classified it as a national park in 1921. The ordinance was promulgated on 12 February 1921, but the 2,367 ha of forest area have enjoyed the targeted protection since then.

Studies and research notes the presence of no fewer than 416 plant species, including 23 protected by law, and eight other endemic. This place is the only one in North Africa, outside the Rif (Morocco) forest, to house the fir of Numidia (*Abies numidica*) (IUCN, 2011).

### Description of the fir of Numidia

This tree has a pyramidal port becoming conical with age. This is a very branchy tree. The trunk is straight, covered by a gray pale pink to orange bark cracking with age. The branches are numerous, glabrous,

greenish-brown when young, becoming gray and brown.

The foliage is evergreen. Needles arranged around twigs, are all pointing up. They are colored dark green, sometimes with a gray-green triangular patch on the top part. The needles are dense, short, 1 to 2 cm long and rounded at the apex.

Flowering occurs in April. The male flowers have their flower buds of red color and become yellow when they bloom. The female flowers are green and give rise to cones 15 cm long and 3-4 cm in diameter, cylindrical, brown gray at maturity. They contain winged seeds 2 to 3 cm long.

Flowering of the fir of Numidia lasts about three weeks in Babors. Cones mature the same year. Fruiting takes place every year but is abundant only every other year (Fliche, 1903).

### Ecological requirements

Fir of Numidia has a very cramped range: indeed, it appears only on the summits of Mount of Babor in Kabylia and Tababort, where it covers only 2,367 ha.

It grows on a limestone substrate in Mount Babors in little Kabylia (Quezel, 1960).

It requires fairly high humidity, because, like the Mediterranean firs, *Abies numidica* is very demanding in terms of water. Unless existing soil compensation, the species

seems to be confined to humid bioclimate or perhumid.

It tolerates poor but fresh soils and is not demanding to heat. It is affected by the dry summers and spring frosts. It is characteristic to the mountainous level of the temperate zone (400 to 1600 m a.s.l.). In terms of altitudinal zoning, like all firs, *Abies numidica* does not descend much below 1,500 m, which locates it in the Mediterranean mountainous range (Quezel, 1985).

#### **Anthropogenic factors**

The threats to the fir of Numidia are essentially human and natural, the latter ones not very important compared to the threats posed by human actions. Indeed, the causes of degradation are primarily grazing and fires that cause significant annual losses to this fir which is very sensitive to fire.

In 1988, during their visit to Babor, Barbero and Quezel noted the increasing degradation of this fir species because of uncontrolled cutting. The present situation of this species is still worrying.

#### **Trials of artificial regeneration**

To save this species, Algeria had adopted a policy of artificial regeneration by planting. The fir of Numidia was introduced experimentally in different sites in order to provide samples of conservation among these plantations. In our paper we are interested in two small plantations (about 15 ha both) established in a cork oak forest in Sérraidi in 1968.

Sérraidi is a mountainous area with the highest point at 1,008 m a.s.l. The climate is of Mediterranean type, characterized by a rainy season (September-May) and a dry and sunny summer.

The study site is located at 860 m a.s.l.; the substrate is acid (silica) housing the cork oak before (Photo 1).

This plantation was very successful, although certain conditions have not been

respected such as the distance between the plants, which created an intra-specific competition for light and prevented natural regeneration from seeds. This density has also generated an inter-specific competition (no undergrowth). The site is also subject to human impact.

The firs of this plantation have been studied by Illoul et al. to assess the ability of seed germination and seed production of trees so their potential of natural regeneration.

The vigor parameters (height and diameter) of the sampled individuals and their spatial distribution were used to determine their relationship with the characters studied.

The results indicate the potential of planted trees to produce viable seeds (seeds of good quality around 55% and germination capacity between 4.44% and 62%) and to ensure the recruitment of new individuals through natural regeneration, contributing significantly to the dynamics, maintenance and diversity of this population and the species in general.

This study demonstrates the adaptability of this tree species outside its natural range.

Indeed, an intervention affecting nearly half of the plantation (because of the passage of a high-voltage power line) has created clearings allowing the establishment of several young firs seedlings (Photo 2).

The success of this plantation in this region with climatic conditions fulfilling the ecological requirements of cork oak (average rainfall 995 mm, average temperature 15 °C) shows that the tree may well occupy other habitats. It confirms the results obtained in various arboreta and some attempts of reforestation (Quezel, 1985).

We can conclude that this tree species is water demanding and is more tolerant to soil and thermal conditions. These facts make the preservation of this species possible and highly recommended.



**Photo 1.** Plantation of fir of Numidia in Sérraidi (eastern Algeria) (*Photo Bennadja S.*)



**Photo 2.** Young trees from seedlings (*Photo Bennadja S.*)

### **Conclusion**

Today, the Algerian territories are increasingly subjected to population growth, increasing urbanization and consequently increasing pressure on natural resources.

Faced to these major risks, the forestry administration has found necessary to implement a policy that integrates both sustainable development and environmental protection.

It envisages the creation of protected areas that combine both development and environmental protection as nature reserves. This is the reason why the forest of Babors, where this fir grows, is proposed for classification as *nature reserve* (DGF, 2012).

Fir of Numidia should be used in reforestation projects because it regenerates

in an acceptable manner when the ecological conditions are favorable. It can contribute significantly to the ecological balance through reforestation in high mountain areas, to the colonization of lands with the poorest calcareous soils as well as the protection and beautification of the environment.

For this purpose, protective measures such as strengthening the security and control of forest exploitation must be taken into account by integrating the local population into the conservation programs of this species.

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