IECD 2024 Conference

The 3rd International Electronic Conference on Diversity

15–17 October 2024 | Online

MDPI

Status of naturel regeneration of a threaten species in it distribution range: Moroccan *Alnus glutinosa* (L.) Gaertn.

Abdelouahab SAHLI[1]*, Khalil KADAOUI[1], and Mohammed ATER[2]

[1] Bio-Agrodiversity Team, Applied Botanic Laboratory, Sciences Faculty, Abdelmalek Essaâdi University, BP 2062, P.O. Box 2121, Tétouan 93030, Morocco;
[2] Independent researcher

INTRODUCTION & AIM

The natural distribution of *Alnus gltinosa* (L) Gaertn (*A. glutinosa)* is widespread in Europe and extends to North Africa, Asia and Western Siberia (Robinson et al., 1979). Alder is wind-pollinated and self-incompatible (Mcvean, 1953). It can fix nitrogen and has ability to act water and air filters (Mejnartowicz, 2007). In addition, it play very essential function for protecting streams and river, through protecting riverbanks from erosion. As pioneer tree species, *A. glutinosa* is one of the species that contribute at first stages of plant succession on wet, riparian sites, and can be introduced on dryer, impoverished agrarian and disturbed soils (Mejnartowicz, 2001). It also a forest-forming species that have a big position for composing climax communities on many soil types (Mejnartowicz, 2007).

In the Mediterranean basin, naturel regeneration is limited by the summer drought, high summer temperature, long intervals between good seed, the presence of livestock and the presence of a high density of herb and litter layer (calama et Montero 2007; Manso et al., 2013). Consequently, the understanding both dynamics and factors implicated in the success or failure of regeneration can give foresters the main knowledge for decision in forest management (Lucas-Borja, 2014).

In Morocco, the range of *A. glutinosa* is strongly reduced, due to habitat fragmentation and anthropogenic activities near of the species (Ennouni et al., 2021) and the climate change increases this threat. The IUCN (2012) has classified as endangered (Pachauri et al., 2014). Moreover, the low rate of naturel regeneration in the most of their populations is due to lack of water and over exploitation of water resources by riparian populations (Ennouni et al., 2021). In order to protect the *A. glutinosa* in its Moroccan area, it is very important to have a depth knowledge about status of naturel regeneration of this species. Firstly, evaluation its naturel regeneration through seedling density and secondly identifying the anthropogenic pressures that affect their natural populations.

METHOD

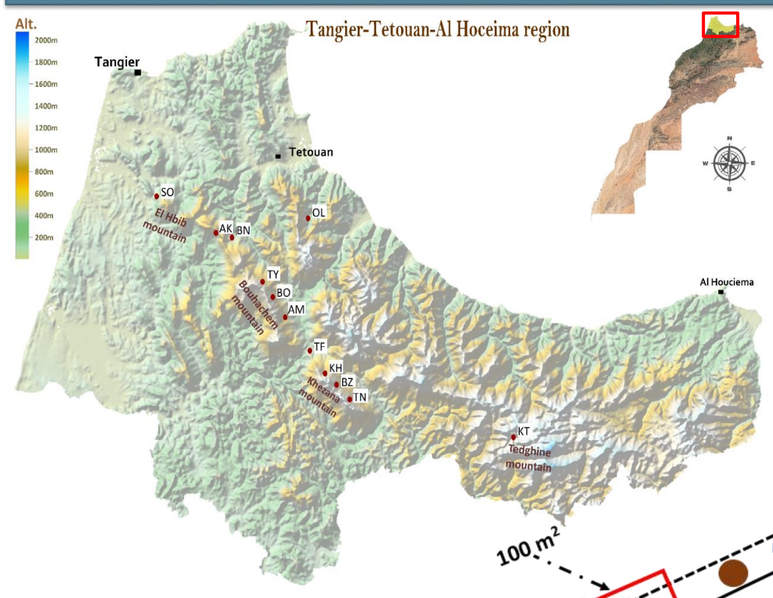

Figure 1: Geographical location of the populations studied in the central-western Rif. SO: Siouana; AK: Ain Korra; AM: Amlay; BN: Benidder; BO: Boubiyine; BZ: Bouztat; KH: Khezana; OL: Oued Lakhmis; TN: Tanghaya; TY: Tayenza; TF: Tifouzal; KT: Ketama.

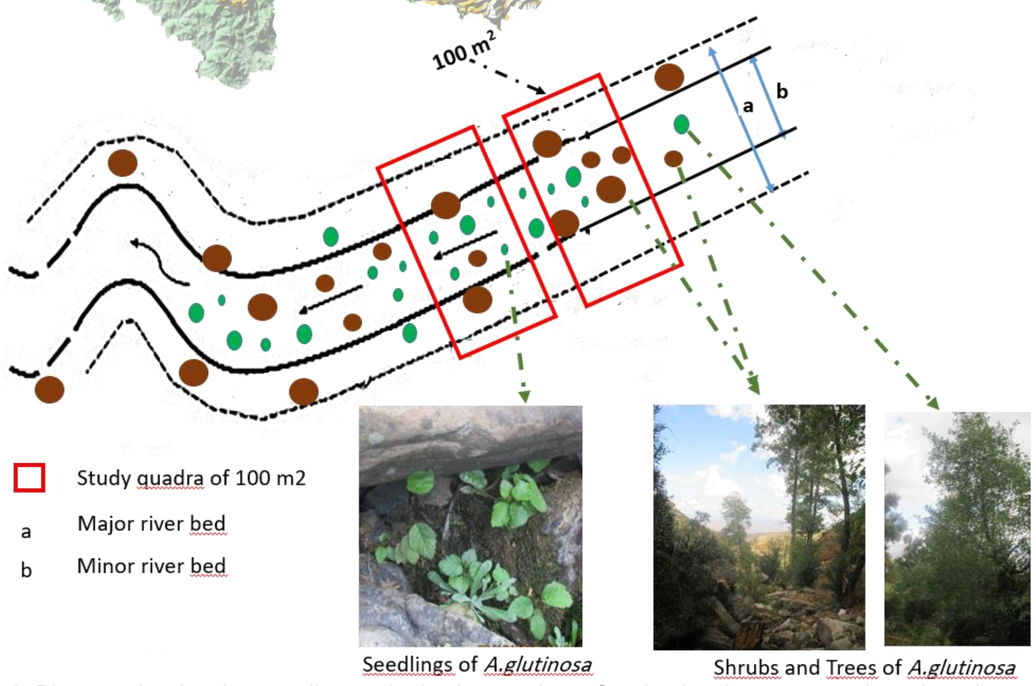

Figure 2: Diagram showing the sampling method using quadrats. Quadra has been repeated ten times in each site

Table 1 : differs factors applied for statistical analysis

Environnemental and anthropic factors	Classes
Slope (%)	P1 <10%, 10%<P2<30%, P3>30%
Cover (%)	Disconued (R1), Semi-Continnued(R2) and Continued (R3)
Altitude classes	Al1(0-300), Al2(300-600), Al3(600-900), Al4(900-1200), Al5(>1200)
Agriculture (%)	A1 <30%, 30%<A2<60%, A3>60%
Cutting (%)	Weak (C1), moderate(C2) and High (C3)

RESULTS & DISCUSSION

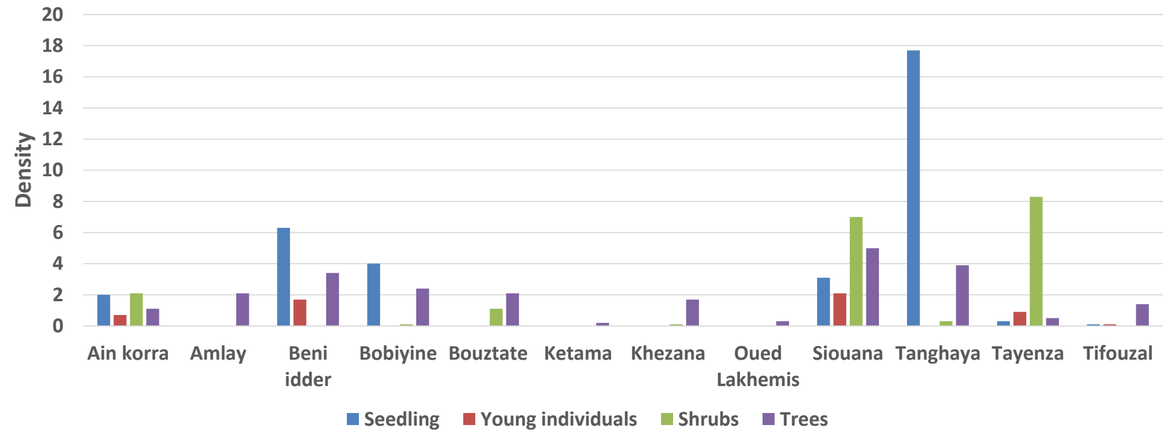

Figure 3*:* Regeneration structure in natural populations of *A. glutinosa* in 100m: seedlings (0-0.5m), young individuals (0.5-1m), shrubs (1-2m; 2-4m) and adults (>4m).

Table 1*:* Mean density ±IC (trees/100m2), height (m) and DpH (Cm) of mature trees in the study sites. Kruskal-Wallis test (P<0.001), significant correlation at P<0.01.

Sites	Density	DHP	Height
Ain Korra	1,1	37,60±0,15	5,25±0,45
Amlay	2,1	43,02±0,07	8,88±0,20
Beni Idder	3,4	42,78±0,04	7,26±0,13
Bobiyine	2,4	47,71±0,07	11,11±0,20
Bouztate	2,1	50,81±0,07	15,98±0,21
Ketama	0,2	67,51±0,69	13,50±2,09
Khezana	1,6	39,15±0,10	11,85±0,29
Oued Lakhemis	3	44,69±0,46	9,00±1,39
Siouana	4,9	21,16±0,04	6,93±0,12
Tanghaya	3,9	38,03±0,04	12,54±0,13
Tayenza	0,5	59,95±0,29	9,09±0,87
Tifouzal	1,4	41,26±0,11	8,12±0,32
Khi-deux Kruskal Wallis		69,11***	129,34***
Test Kendall (r)		42,05***	

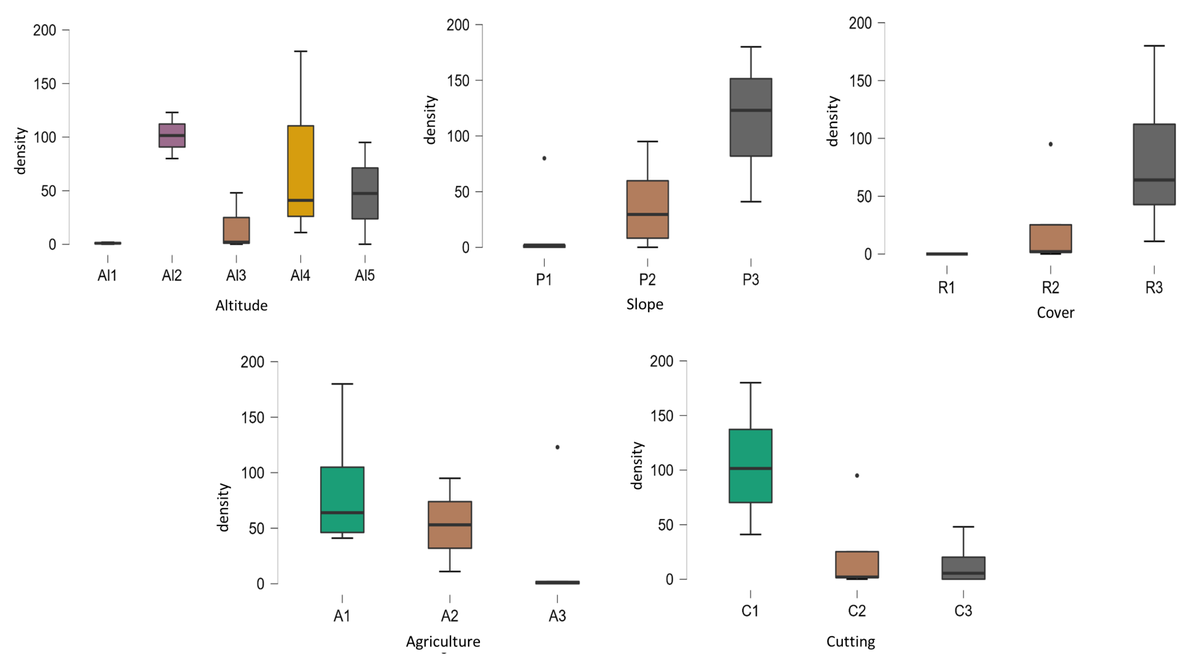

Figure 4: Variation in density as a function of environmental and human factors.

CONCLUSION

The rate of regeneration, estimated by the density of young individuals, varies from one population to another. In some populations it is zero, while in others it may be moderate. Generally speaking, however, it can be said to be low in the populations studied. This finding is very alarming in terms of the state of conservation of the populations of this species in Morocco. Situational conditions and the intensity of disturbance are decisive for regeneration. Medium-altitude sites with steep banks and low cover have the highest regeneration rates. The negative impact of human activities has been clearly established.

FUTURE WORK / REFERENCES

Future Work

1: carry out ex-situ germination tests of seeds to determine the obstacles to regeneration, 2: .raise awareness among the local population to minimize overexploitation

References

Mejnartowicz, 2001. Biological response of alder trees to environmental pollution. In: Muller-Starch G., Schubert R. (eds). Genetic Response of forest system to changing enrironnemental conditions. Vol. 70:63-73. Kluwer Acad. Publ., Dordrecht-Boston-London