IOCBI 2026 Conference
The 1st International Online Conference on Biology
10–12 February 2026 | Online
MDPI

A Relict on the Brink: Modeling the Current and Future Distribution of Taxus baccata in Algeria under Climate Change

Abdallah Aouadi 1,* Yacine Rouibi 2, Fethi AYAICHIA 1, Assia DJELAILIA 3

Affiliation 1: Department of Biology, Faculty of Nature and Life Sciences, Chadli Bendjedid University, El Tarf, Algeria
Affiliation 2: Department of Biology, Faculty of Sciences, Mohamed Boudiaf University of M'sila, M'sila, Algeria
Affiliation 3: Department of Ecology and Environmental Engineering, University of 08 Mai 1945, Guelma, Algeria

INTRODUCTION & AIM

Taxus baccata L. (European yew) is a relict conifer species found in temperate regions of the Northern Hemisphere, including Europe, North Africa (Algeria), and Asia. It has a fragmented distribution with isolated populations, making it vulnerable to anthropogenic pressures and climate change, which affect the availability of suitable habitats (Koç et al., 2018). Species distribution models (SDMs) are crucial for predicting the impacts of climate change on species distribution and guiding conservation strategies by identifying current and future refuge areas (Zeren Çetin et al., 2025).Various modeling approaches (MaxEnt, Random Forest, stacked models) have been applied to *T. baccata* to understand the climatic factors that define its niche and distribution dynamics under future climate scenarios. These studies stress the importance of integrating climate and environmental variables to forecast the potential contraction or expansion of suitable areas, reinforcing the need for appropriate management measures to ensure the species' long-term survival.

METHOD

The species distribution modeling (SDM) methodology used in this study involves selecting climatic and environmental variables from sources like WorldClim and GBIF, while addressing uncertainties, collinearity, and background absences. The models are trained using several algorithms (Random Forest, MaxEnt, BRF, and GLM), enabling predictions of the current and future distribution of Taxus baccata in Algeria under different climate change scenarios.

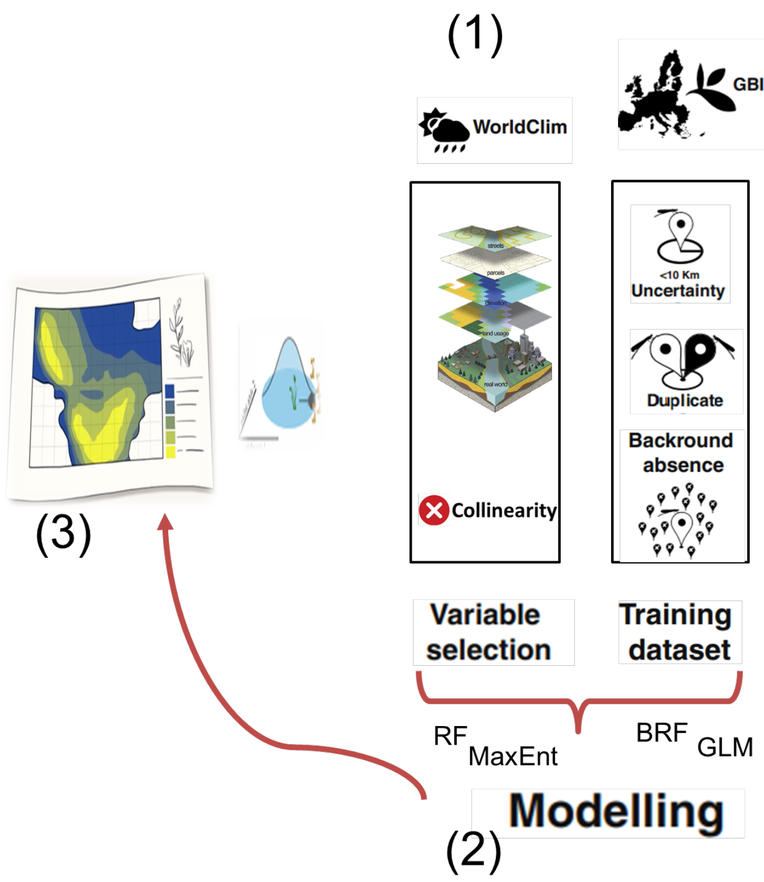

Figure 1: Methodology for Species Distribution Modeling (SDM) of *Taxus baccata* under Climate Change Scenarios

RESULTS & DISCUSSION

The current distribution of Taxus baccata in Algeria is concentrated in fragmented populations along the northern mountains and coast, with a stronghold in the eastern Tell Atlas. Future projections for 2040 show a significant reduction in suitable habitats, particularly in the western regions. The species will likely be confined to refugia in the northeast and higher elevations.

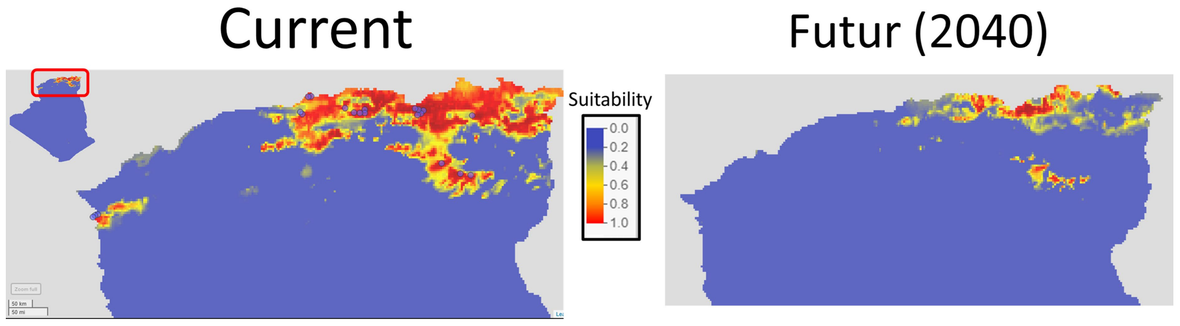

Figure 2: Current and future potential distribution under Climate Change Scenarios in Algeria.

The response curves show how habitat suitability for Taxus baccata changes with key climatic variables. For example, T. baccata habitat suitability increases with precipitation seasonality (bio 15) and temperature thresholds (bio 3, bio 5), but declines beyond certain values. These curves highlight the critical climatic factors that determine the species' distribution.

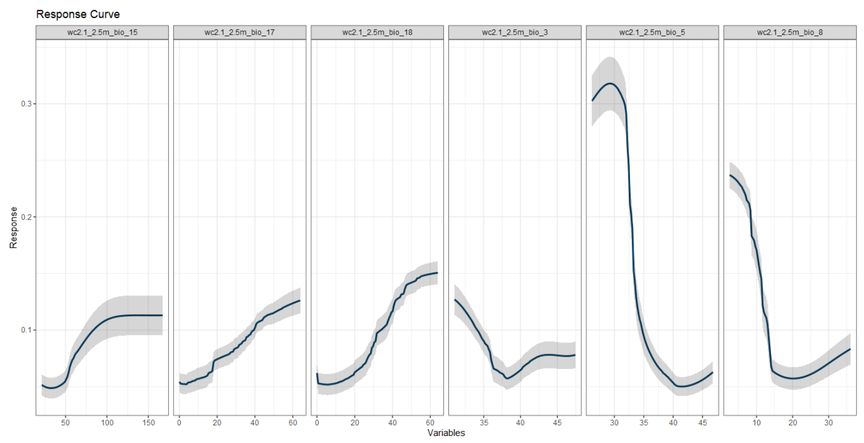

Figure 3: Response curves showing species response to key environmental gradients.

CONCLUSION

- High Vulnerability: T. baccata faces severe habitat loss due to climate change in Algeria
- Refugia Protection: Priority conservation areas identified in north-eastern mountains and high elevations
- Restoration Needs: Fragmented populations require active restoration efforts
- Policy Integration: Predictive modeling should inform conservation policy frameworks

FUTURE WORK / REFERENCES

Zeren Cetin, I., Ozel, H. B., Varol, T., Canturk, U., & Sevik, H. (2025). Climate change impacts on Taxus baccata distribution and conservation. *Journal of Forestry Research*, *36*(1), 95.

Koc, D. E., Svenning, J. C., & Avcı, M. (2018). Climate change impacts on the potential distribution of Taxus baccata L. in the Eastern Mediterranean and the Bolkar Mountains (Turkey) from last glacial maximum to the future. *Eurasian Journal of Forest Science*, *6*(3), 69-82.