

Vol. 12 (4): 331-342 (2022)

## MODELLING THE POTENTIAL DISTRIBUTION OF THE CAROB (*CERATONIA SILIQUA* L.) IN TURKEY WITH MAXENT SOFTWARE

Özgür KAMER AKSOY<sup>1\*</sup>

<sup>1\*</sup>Aydın Adnan Menderes University, Faculty of Agriculture, Aydın, Turkey;

\*Corresponding Author Özgür KAMER AKSOY, e-mail: [ozgur.aksoy@adu.edu.tr](mailto:ozgur.aksoy@adu.edu.tr);

Received June 2022; Accepted August 2022; Published September 2022;

DOI: <https://doi.org/10.31407/ijeess12.441>

### ABSTRACT

Models used to predict the geographical distribution of a species identify the environmental conditions that are suitable for that species and the spatial distribution of these environmental conditions is determined. In this way, a model is created that predicts the geographical distribution of the species by associating its distribution data with the environmental and/or spatial characteristics of these places. The aim of this study is to model the present and future potential geographical distribution of *Ceratonia siliqua* L., which is a naturally distributed plant species in Turkey, using the maximum entropy algorithm. Prediction models were created using the presence data of the species and environmental variables such as bioclimatic variables and altitude, and the distribution of the species was determined according to two different global climate change scenarios. The potential distribution areas of *Ceratonia siliqua* L. under the SSP2 4.5 and SSP5 8.5 scenarios were modelled using MaxEnt software for the periods 2041-2060 and 2081-2100. According to the results of the model, it is predicted that the species will be adversely affected by climate change. The factors that determine the distribution of forest species include environmental management strategies, hydrological characteristics and climatic conditions, as well as external factors such as human intervention. Modelling the distribution of the species in any area not only facilitates forest protection and management, but also supports the sustainability of forest-related services. Species distribution modelling is used to predict species distribution based on tree presence records and a range of environmental data. It is emphasised that the adaptation resistance of *Ceratonia siliqua* L. to climate changes will be low and that it should therefore be included in species protection efforts. The results obtained will assist in decision making to determine suitable sites for carob plantations and to make use of the forest potential.

**Key words:** Carob, *Ceratonia siliqua* L., species distribution model, change analysis, MaxEnt.