Modeling of current and future distribution of *Ips mannsfeldi* (Wachtl) (Curculionidae: Scolytinae) in Turkey

İsmail Şen[1,*], Oğuzhan Sarıkaya[2], İ.Burak Karaceylan[3]

[1] Suleyman Demirel University, Technology Faculty, Isparta, Turkey
[2] Suleyman Demirel University, Faculty of Forestry, Forest Engineering Department, Isparta, Turkey
[3] Suleyman Demirel University, Graduate School of Natural and Applied Sciences, Isparta, Turkey
[*] Corresponding author: ismailsen32@gmail.com

Abstract: Climate change has reached the highest rates of the last 1.000 years. This has begun to attract the attention of researchers, and the number of studies on estimation of the environmental impacts of climate change on species has also begun to increase. *Ips mannsfeldi* (Wachtl) is a bark beetle (Curculionidae: Scolytinae) species spreading on black pine (*Pinus nigra*) fields in Turkey. This study aims to model the future (2070) distribution of the species according to two different global climate change scenarios. GPS records of *I. mannsfeldi* specimens were gathered from the literature. Current and future potential distribution areas of the species have been determined using maximum entropy modeling. RCP4.5 and RCP8.5 emission scenarios reported in IPCC5 were used to model the future potential distribution of the species. As a result of the study, it is determined that the species distributes on the Black pine (*Pinus nigra*) forests throughout the Mediterranean and the inner part of the Aegean region (around the Kütahya province) of Turkey at the present time. For 2070, it is estimated that the distribution area will expand towards the Southern part of the Aegean region, Western Black Sea region and high altitudes of the Taurus mountains and will shrink low altitudes of the Mediterranean region according to RCP4.5. In the RCP8.5 emission scenario, the distribution of the species expands towards the Southern part of the Aegean region and Western Black Sea region but shrinks at Eastern Mediterranean region and low altitudes of Western and Middle Mediterranean region. Depending on the changing climatic conditions, it can be seen that this species expand its distribution area and may be a potential pest that causes economic damage to black pine fields in the coming period.

Keywords: *Ips mannsfeldi*, Maxent, *Pinus nigra*, Climate change, Future prediction, Modeling