

Predicting geographic distribution and habitat suitability of *Opuntia streptacantha* in paleoclimatic, current, and future scenarios in Mexico

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Abstract

Mexican territory is one of the centers of origin and dispersion of the genus *Opuntia*, where several of its species have been an important plant resource for people in arid and semiarid zones. *Opuntia streptacantha* is widely distributed in Mexico; however, precise aspects of its geographic distribution and ecological status are still unknown. Here, we modeled its potential distribution under paleoclimatic, current, and future conditions through maximum entropy and predictions from 824 records and seven environmental variables. Potential distribution of *O. streptacantha* in the interglacial period was contracted and slightly north than current distribution, with 44,773 km² of optimal habitat. In other past periods, the central location of potential distribution coincides with the actual current distribution, but the period of the last glacial maximum was characterized by 201 km² of very suitable habitat, absent in interglacial, current, and future periods. The future model suggests that potential distribution will move toward the south of the Mexican territory. *Synthesis and applications.* The potential distribution of *O. streptacantha* can be applied for the conservation and management of the species, and also in the selection of areas with crassicaule scrubs for protection, conservation, and reproduction of species resistant to the hostile conditions of arid and semiarid zones of Mexican territory, where the structure and composition of the vegetation will be affected in the next 100 years.