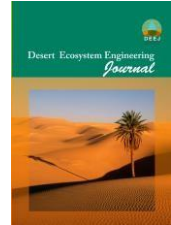




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## An Estimation of Spatial Distribution Domain of Plant Species Using Artificial Neural Networks in West Rangelands of Taftan

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### Abstract

This study aimed to estimate of spatial distribution scope of plant species and preparation of predictive distribution maps of plant species using Artificial Neural Network (ANN) in Taftan west rangelands of Khash city. To this end, vegetation sampling was carried out by random-systematic method after identification and separation of plant species habitats. In order to sample the soil at each habitat, eight holes was drilled and samples were taken from 0-30 and 30-60 cm depths. Habitats distribution of plant species was modeled using multilayer perceptron after measurement of soil characteristic in the lab and providing of environmental variable maps including physiographic characteristic (slope, aspect and elevation), geological formation and soil physical and chemical properties using GIS and Geostatistics. Simulation of presence and absence probability was conducted after selection of optimal predictive model for each plant species. Then the optimal threshold was determined using equal sensitivity and specificity method and were examined the compliance between predicted and actual maps by calculating kappa index. Based on Kappa value, the agreement of predicted and actual map was very good for the habitats of *Haloxylon persicum*. Moreover, predictive maps of *Artemisia aucheri*, *Artemisia sieberi* and *Amygdalus scoparia* habitats have good agreement with actual maps of these species. As well as, correspondence of predictive and actual map of *Zygophyllum eurypterum* was assessed at moderate level. These results indicate that multilayer perceptron method (MLP) is capable to provide precise prediction models through data mining rules and modeling of nonlinear processes. Besides cost and time saving of research, this can lead to precise prediction of geographic scope of plant habitat distribution, as a result will increase success possibility of rehabilitation plans in the rangelands.

**Key words:** Spatial Distribution, Multilayer Perceptron, Presence Optimal Threshold, Kappa Index, West Rangelands of Taftan.

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