**Title:**  Predictive modelling of habitat distribution of plant species (Case study: Taftan Rangelands, Khash City).

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**Introduction**

Identification of rangeland with high suitability for establishment of a specific plant species is important. Predictive models of plant species are cause and effect tools which construct relationship between real distribution pattern of plants and environmental variables for prediction of plant species. The logistic regression and maximum entropy predict the potential distribution of species rather than their real distribution. It seems that comparison of the predictive efficiency of two models (Logistic Regression and Maximum Entropy) is necessary in distribution modelling of plant species because two models vary in their input data type and modelling procedure. Moreover, limitation of resources and budget, it is necessary to be characterized using of which model (the model that uses presence and absence data for modelling or the model that uses only presence data for modelling) is more reasonable in large scale. The objective of this study were to identify favorable environmental condition for plant species establishment and to compare the prediction efficiency of Logistic Regression and Maximum Entropy in distribution modelling of range plant species in the rangelands of Western Taftan, Southeast Iran.

**Methods**

The study site with an area of 64000 ha is located between 28° 20′ 35″ and 28° 42′ 39″ N latitude and 60° 39′ 36″ and 60° 58′ 19″ E longitude in hill slope of Taftan Mt., Sistan and Baluchestan province, southeastern Iran. Environmental variables were quantified by using of digital elevation model (DEM) and geology map (scale 1:25000), field survey and laboratory analysis for understanding the effective variables in distribution of plant species and development of model for distribution prediction. Sampling units were prepared through integration of landform and geology maps and separation of habitat was conducted on the basis of field survey and observations. Vegetation of each habitat was sampled with randomized-systematic method along four sampling lines with 150 and 200 m length. Soils were sampled in 0-30 and 30-60 cm depths through digging of eight soil profiles. Distribution of habitats was modelled using logistic regression and maximum entropy. Hosmer and Lemeshow test and area under curve statistic were used for the assessment of Logistic Regression model Maximum Entropy method respectively. The agreement between predicted and documented maps was calculated with Kappa index in IDRISI release 32.

**Results**

The agreement between generated predictive maps by used models with documented maps of habitats indicated that logistic regression was able to predict the distribution of Artemisi aucheri and Artemisia sieberi habitats in excellent level (Kappa value = 0.95) and weak (Kappa value = 0.39) levels, respectively. On the other hand, the agreement between predicted maps generated by maximum entropy with documented maps were very good for Amygdalus scoparia and Artemisia aucheri habitats (Kappa value = 0.82 and 0.76, respectively) and weak for Artemisi aucheri (Kappa value = 0.55). This study concludes that logistic regression and maximum entropy had the same efficiency in distribution modelling of plant species with limited ecological niche. However, maximum entropy model can receive priority in distribution prediction of plant species with limited ecological niche because it uses only presence data of plant and also small dataset.