Abstract

The aim of this study was to determine a quantitative method for determining the condition of rangeland using indicator species and grazing intensity . Data of plant species frequency were assessed from 30 study locations with similar ecological conditions and also in three areas with different grazing intensity including severe, moderate and light intensities. In each region, ten transects of 100 m, one perpendicular to the slope and the other one in the direction of the slope were used. Frequency of plant species in each area was evaluated by step point method and soil data were collected at the beginning and end of each transect in Baynuj region, Haji Abad city in Hormozganprovince and analyzed in the soil laboratory. The ISPD software was used to identify homogeneous groups and DCA ordination was also applied on them. The relationship between environmental and managerial factors with distribution of species was evaluated in PATN in ISPD software and clustering analysis was used for grouping sampling sites. Then, the correlation of various factors such as altitude, direction of the slope, soil texture, electrical conductivity, grazing gradient, and other measured parameters with the first axis of ordination central analysis of principal components (CPCA) was evaluated using ISPD. This axis according to Spearman correlation analysis represented the grazing gradient and then in the next step, regression curve of Ghosen type was fitted between frequencies of species along the first axis of ordination. Variations in these curves that had acceptance index (D-Statistic) higher than 5.0 and the coefficient of determination (R^2) higher than 3.0, were selected as representative species. Based on the results of 30 identified species, 5 species were introduced as representative of grazing intensity. Based on the obtained results, plant species of *Gymnocarpus decander* was identified and classified as decreasing and *Artemisia sieberi* as increasing and finally, *Cymbopogon olivieri and Peganum harmalaas* as invasive species. The frequency of this group of plant species was created using ISPD software of an evaluation system of range condtion and the condition of the study sites were evaluated. The condition of these sites was also determined with Four-factor method (control Method) and the results of both methods were compared. The results showed that 28 sites out of 30 sites have been correctly classified and accuracy of 93% was obtained. Using analysis of grazing gradient in the form of the assessing analysis of rangeland, each year can be estimated easily and in qualitative form and it can be used as a decision support tool.

Keywords: Grazing intensity, Ordination, NMDS method, indicator species, range condition, Baynuj rangeland, Haji Abad city.

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Assessment of Range Condition and Management using Variation of Indicator Plant Species Frequency and Grazing Gradient Analysis (A Case Study in Northern Hormozgan Province)

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