University of Kentucky

UKnowledge

International Grassland Congress Proceedings

21st International Grassland Congress / 8th International Rangeland Congress

The Study of Physico-Chemical Characteristics of Soil-Vegetation Relationships in Saliferous and Gypsiferous Soils of Winter Rangelands in Eshtehard (Iran)

A. Ahmadi
Islamic Azad University of Arak, Iran

E. Moghiseh
University of Tehran, Iran

M. Peyrowi
University of Tehran, Iran

S. Mahmoodi
University of Tehran, Iran

The study of physico-chemical characteristics of soil-vegetation relationships in saliferous and gypsiferous soils of winter rangelands in Eshtehard (Iran)

A . Ahmadi[1] , E .Moghiseh[2] , M .peyrowi[3] , S .Mahmoodi[4]
[1]Member of scientific board of Islamic Azad university of Arak ,[2] Ph .D and [3]MSc Student and [4]Member of scientific board , Agriculture College , Tehran University . E-mail :＿bsahmadi@ yahoo .com

Key words : saliferous and gypsiferous soils , PCA , cover , physico-chemical characteristics , Eshtehard

Introduction In order to integrate management of rangelands ecosystems , it is necessary to be aware of the relationship between environmental factors and plants in these ecosystems . Aridisols occupy vast extension of rangelands in arid and semi-arid regions of Iran . Scattered vegetation cover is representative of special physico-chemical characteristics in these soils . The aim of the present study was to identify gypsophyte and halophyte plants and investigate plant distribution related to physico-chemical characteristics of soils in Eshtehard winter rangelands .

Materials and methods The study area is located in the east of Eshtehard ($35° 38'$ N , $50°13'$ E to $35°34'$ N , $50°33'$ E) . The mean elevation of the region is 1250 m and the Shour river passes across this plain . Vegetation sampling was conducted in the key area based on a randomized-systematic pattern . Vegetation data included canopy cover and density percentage , estimated quantitatively along transect within each quadrat . The four main plant types were *Halocnemum strobilaceum-Salsola crassa* , *Haplophyllum glaberrimum-Seidlitzia rosmarinus* , *Haplophyllum glaberrimum* , and *Tamarix sp .-Nitraria schober* . , The soil profiles excavated and disturbed soil samples were collected . Based on the standard methods , physico-chemeical characteristics including soil texture , electrical conductivity in saturated extract soil reaction , organic carbon content , gypsum and equivalent calcium carbonate percentage , soluble anions and cations were determined . Multivariate method of principal component analysis (PCA) was used to analyze the collected data .

Results According to Figure 1 , the first two principal components accounted for $85 .83\%$ of the total variance in data set . Therefore , $55 .62\%$ and $30 .21\%$ variance were accounted for by the first and second principal components , respectively . This means that the first principal component is by far the most important for representing the variation of the four vegetation types . Results showed that the vegetation distribution pattern was mainly related to soil characteristics such as salinity , texture , chloride , soil reaction , gypsum and gravel percentage .
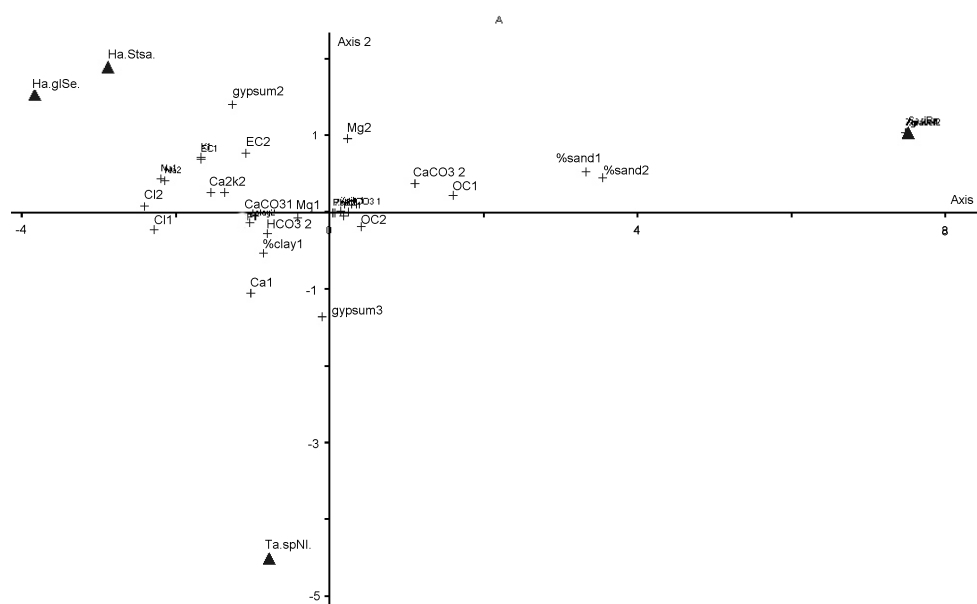

Figure 1 *PCA-ordination diagram of the vegetation types related to the environmental factors in the study area .*

Conclusion Since PCA method show high accuracy and have different abilities , it could be used for habitat analysis and determination of effective ecological factors in winter and desert rangelands .

References
USDA (2004) Soil Survey Labrotoary Methods and Precedures for Collecting Soil Samples .
Jafari .M , Zare chahouki M .A ,Tavili .A , Azarnivand .H , Zahedi Amiri .GH (2004) Effective environment factors in the distribution of vegetation types in Poshtkouh Rengelands of Yazd Province (Iran) , [J] . *Arid Environments* , 56 : 627-641 .