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**The Thesis Submitted for M,S.C Degree
(In the field of Desertification)**

**Evaluation of Habitat Status and Role of Endemic Species
(Tamarix andHaloxylon sp.) on the Soil Stabilization and
Fertility in Sistan Region**

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Abstract

Cultivation of *Tamarix aphylla* and *Haloxylon persicum* is one of the most successful projects to vegetation establishment that performed aimed to reduce wind erosion in Sistan region. This study done aimed to investigation of plantation areas of *Tamarix aphylla* and *Haloxylon persicum* physical, chemical and biological characteristics of soil. For this purpose, the plantation areas of these species were identified in Helmand region of Sistan. Soil surface factors were investigated including canopy cover, litter, sand and pebble and bare soil in plantation areas of each species. Sampling of soil was performed according to the depth of *Tamarix aphylla* and *Haloxylon persicum* roots from two depths of 0-30 and 30-100 cm at the end of the growing season from plantation areas of each species and control area. Physical characteristics (percentage of sand, clay, silt, apparent specific gravity and porosity) and chemical (CaCO₃, acidity, electrical conductivity, organic carbon, nitrogen, carbon to nitrogen ratio, phosphorus, potassium, sodium) were measured. Also, sampling from a depth of 0-10 cm was performed to measure the biological properties (fungus, bacteria and fungus to bacterial ratio) of the soil from the mentioned areas. Finally, 24 soil samples were transferred to the laboratory for analysis. In order to statistical analyze the obtained data, SPSS software and one-way analysis of variance were used, and Duncan's test was used to compare the means. The results showed that there is a statistically significant difference between soil surface factors at the level of one percent and the plantation areas of *Tamarix aphylla* species have the highest percentage of canopy and litter. According to the results, there is a significant difference between the physical and chemical properties of soil in plantation areas of *Tamarix aphylla* and *Haloxylon persicum* with the control area in the two studied depths. The highest soil porosity was obtained in the soil of plantation areas with *Haloxylon persicum* and a depth of 0-30 cm. Also, the lowest bulk density was measured at a depth of 0-30 and in the soil of plantation areas with *Haloxylon persicum*. The results of the means comparison of chemical properties in the two studied depths indicate that the highest amount of organic carbon, nitrogen and potassium was obtained at a depth of 0-30 cm and in the soil of plantation areas with *Haloxylon persicum*. The values of electrical conductivity, phosphorus, carbon to nitrogen ratio and CaCO₃ ratio in the soil of plantation areas with *Tamarix aphylla* were higher than the control and *Haloxylon persicum*. The highest acidity was obtained in the soil of the control area and a depth of 30-100 cm equal to 1/8. In terms of biological factors, the soil of plantation areas with *Haloxylon persicum* had better conditions than *Tamarix aphylla* and control area. In general, according to the results, *Tamarix aphylla* has a higher ability to establish and resist harsh environmental conditions, but the cultivation of *Haloxylon persicum* improves fertility and soil stabilization.

Keywords: Physical and chemical characteristics, *Tamarix aphylla*, *Haloxylon persicum*, soil fertility, Sistan