

## Effects of Sodium and Calcium on Desert Plant

High salinity is contributing significantly to land degradation. Little Rann of Kutch of 4860 ha, also known as saline desert, was selected to study vegetation and soil through quadrat method. Dominant plants are salt loving or having C<sub>4</sub> or CAM pathway. Total 39 species representing 33 genera belonging to 20 families were recorded with contagious distribution pattern for all species. Poaceae, Papilionaceae/Fabaceae, Cyperaceae and Chenopodiaceae were dominant families with maximum number of species. *Aristida adscensionis* L. (1.465 plants m<sup>-2</sup>), *Cressa cretica* L. (0.969 plants m<sup>-2</sup>), *Prosopis juliflora* (Sw.) DC. (5.125 plants 10m<sup>-2</sup>) and *Acacia nilotica* (L.) Del. subsp. *nilotica* (Benth.) Brenan (1.000 plants 10m<sup>-2</sup>) were dominating. Total biomass for *C. cretica* L. (138.407 gm<sup>-2</sup>) was maximum and minimum for *Argemone mexicana* L. (3.555 gm<sup>-2</sup>). Similarity index was 22.222 to 54.545 for herbs and 33.333 to 88.888 for shrubs and trees. Low species richness, diversity index and density suggest the need of sustainable management and conservation of biodiversity. High concentration of OC, OM, N, P, Fe and Na (0.368%, 0.635%, 0.032%, 25.541 kg ha<sup>-1</sup>, 111.884 and 227.407 mg kg<sup>-1</sup>) is beneficial for vegetation to grow sustainably (site 3). Result surprisingly shows that Na and Fe represent beneficial effect for plant growth while Ca retards the growth.

**Key words:** Calcium, Salinity, Sodium, Soil, Vegetation.

### Introduction

Vegetation and land cover is the prime indicator of land degradation and with this aspect the vegetation analysis was conducted at Little Rann of Kutch (LRK) which is a salt marshland with soaring salinity (Gupta and Ansari, 2012). LRK is nominated to be a "biosphere reserve" which is defined by the areas of terrestrial and coastal ecosystems internationally recognized within the framework of UNESCO's Man and Biosphere (MAB) program (Goswami *et al.*, 2014).

Vegetation distribution is controlled by precipitation, and at the same time, distribution and amount of precipitation affects the development and distribution of vegetation, which also modifies the atmospheric energy and the storage of water (Dekker *et al.*, 2007).

Sodium have a ubiquitous presence in soils and waters and are widely taken up and utilized by plants, but are not considered as essential plant nutrients. Sodium has a very specific function in the concentration of carbon dioxide in a limited number of C<sub>4</sub> plants and thus is essential to these plants, but this in itself is insufficient to generalize that Na is essential for higher plants. The unique role that Na can play in plant metabolism suggests that the basic concept of what comprises a plant nutrient should be re examined. Sodium nutrition of plants remains a fascinating and elusive topic. Na has still not been shown to be essential for higher plants (Certain types of C<sub>4</sub> plants are an exception). This is despite the fact that in many plants internal Na tissue levels can become extremely high (Subbarao *et al.*, 1999a,b, 2000a,b). Sodium and K are chemically and structurally similar monovalent cations. Sodium concentrations in the earth's crust are similar to that of K (2.8% vs. 2.6%) (Goldschmidt, 1954; Flowers and Lauchli, 1983).

Total 39 species (33 genera and 20 families) were recorded with low species richness; density and diversity index which suggest that there is a need of sustainable management and conservation of biodiversity.

**P. K. PILANIA AND N. S. PANCHAL**  
Department of Biosciences,  
Saurashtra University, Rajkot (Gujarat) India  
E-mail: nspanchal@live.com;  
dr\_nilesh\_panchal@yahoo.co.uk

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