

Characterization of whole plant nutrient utilization efficiency under heterogeneous environmental conditions

MANISH MATHUR

Department of Botany, Plant Ecology Section, Jai Narayan Vyas University, JODHPUR (RAJASTHAN) INDIA

Email : ravi_mm2099@yahoo.com

Water is well known, as limiting factor for plant productivity in desert and availability of nutrient has also been determined as a critical factors that limiting plant growth in arid region. In the Thar regions the total amount of annual precipitation may be too small to induce physiological activity, constitutently plant have developed adaptations such as intensive internal nutrient cycling to overcome limitation in nutrient uptake. In the work presented here, author assessed variability in whole plant Nutrient Utilization Efficiency (NUE) of plant nitrogen, phosphorus, sodium, potassium, calcium and iron in a woody perennial plant – *Corchorus depressus* under pulse, inter-pulse and non pulse events. ANOVA analysis revealed that seasonal events were non-significant factor for NUE of nitrogen, sodium and calcium, but for other nutrients significant variability were brought by both spatial and temporal factors as well as by their interaction. Community dynamics study revealed that low phyto-diversity of a habitat (*i.e.* dominance of *C. depressus*) supports P NUE in this plant. Higher P NUE were recorded with lower availability of soil P and organic carbon and higher Fe and Ca NUE were recorded with reverse trends of moisture and organic carbon, these finding supported by the theory of nutrient use efficiency suggested that nutrient efficiency increases uni-modally with decrease soil resources. NUE of Na and K increasing with decreasing contents of soil phosphorus in linear and exponential fashions, respectively. However, Na NUE shows synergistic effect with soil nitrogen in exponential manner. Synergistic relationship between total soil N availability and Na NUE indicates the potential role of this plant in bioremediation of salt.

Key words : Pulse, Inter-pulse and non-pulse events, Spatial factors, Nutrient use efficiency, Principal component analysis

How to cite this paper : Mathur, Manish (2013). Characterization of whole plant nutrient utilization efficiency under heterogeneous environmental conditions. *Asian J. Bio. Sci.*, 8 (1) : 134-144.