



Research Article

## Nutrient dynamics of *Acacia nilotica* in an open dry scrubland forest of Rajasthan

G. QAZI, J.I.N. KUMAR AND ROHIT K. BHOI

**ABSTRACT :** A study was conducted in an open dry scrubland forest of Bhilwara, Rajasthan named Sanjadia during 2008 to study the nutrient concentration in *Acacia nilotica* (the most dominant tree species in an open scrubland forest), litter and soil. Observations were recorded to determine the nutrient content *i.e.*, nitrogen, phosphorus, potassium, calcium, magnesium, sulphur, chloride and sodium in the different parts such as lateral roots, tap root, bark, cork, bole, branches, leaves and litter, and to explore nutrient content *i.e.*, nitrogen, phosphorus, potassium, calcium, magnesium, sulphur, chloride, sodium and organic carbon in soils at different depths like 0.00-10.00cm, 10.00-20.00cm and 20.00-30.00cm in the same LSE. It was found that the highest amount of the nutrients was present in the foliage and poorer concentration of the nutrients was recorded in the lateral roots. The concentration of the nutrients in the tree components was in the order: reproductive parts > leaf > branch > bole wood > cork > bark in the above ground parts and main root > lateral root in the below ground parts. Greatest amounts of the nutrients were recorded in the 0-10.00cm depth layer while as the lesser or poorer amounts were recorded in the lower layer. The upper layer of soil was found to contain more number of nutrients because of the high organic content present in the upper layer. The leaf component of the plant was found to be the most metabolically active part and it accumulated the high amount of the nutrient. It was observed that the concentration of the nutrients in the soil decreased while as the concentration of the nutrients in the trees increased indicating the accumulation of the nutrients by the plant. There was the reduction in the nutrient concentration of the litter leaves as well as branch litter indicating the transfer of the nutrients from the litter to the soil.

**KEY WORDS :** *Acacia nilotica*, Nutrient dynamics, Tropical forest, Rajasthan

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### INTRODUCTION

Most trees vary in the efficiency with which they use the nutrients, depending on the nutrient availability. Trees take up

#### MEMBERS OF RESEARCH FORUM

**Address of the Correspondence :**

**G. QAZI**, P.G. Department of Environmental Science and Technology, Institute of Sciences and Technology for Advanced Study and Research (ISTAR), Sardar Patel University, V.V. NAGAR (GUJARAT) INDIA  
Email : gazigazala@yahoo.com

**Address of the Coopted Authors :**

**J.I. N. KUMAR AND ROHIT K. BHOI**, P.G. Department of Environmental Science and Technology, Institute of Sciences and Technology for Advanced Study and Research (ISTAR), Sardar Patel University, V.V. NAGAR (GUJARAT) INDIA

large quantities of the nutrients from the soil system and much of the nutrient uptake is returned to the soil by the litter fall, large amount of nutrients are also removed when trees are harvested. If the nutrients are not available to the tree species to an optimum in a forest, the forest is liable to get disturbed. The present investigation was an initial attempt to study the nutrient dynamics of *Acacia nilotica* in dry open scrubland forest of Rajasthan as the nutrient dynamics studies in these forests of India have not been extensively studied compared to the other forest types.

### EXPERIMENTAL METHODS

The site was located between 25.20° to 51.64° N Latitude