

# Plant species diversity and tree population structure in disturbed and undisturbed stands of wet tropical forests in Dehang-Debang Biosphere Reserve of Arunachal Pradesh, India

G. Ghosh

Deptt. of Botany, Bejoy Narayan Mahavidyalaya, Itachuna, Hooghly, West Bengal, India.

## Abstract

Plant species richness, density, diversity index, species similarity, rarity and population structure including their distribution pattern of tree species were investigated in undisturbed, moderately disturbed and highly disturbed stands of tropical wet evergreen forests in Siang part under Dehang-Debang Biosphere Reserve in Arunachal Pradesh. It was studied through quadrat method and all important community parameters were worked out using standard procedures. A total of 63 tree species, belonging to 55 genera and 42 families were recorded from the three forest stands at different level of disturbances. The species richness index of tree and herb species was high at undisturbed stand which was comparatively less in disturbed forest stand while for shrub it was highest at highly disturbed forest stand. The species diversity indices of herb and tree were high in comparisons with the shrubs at undisturbed stand. It was found that most of the species exhibits clump or contagious distribution irrespective of study stands. The stem density for trees, shrubs and herbs was high in undisturbed stand in comparison with the others. The concentration of dominance for tree and herb was high as compared to others at moderately disturbed stand but for shrubs it was high at undisturbed stand. The highest basal area for trees was  $57.89\text{m}^2$  at highly disturbed and lowest at undisturbed ( $42.59\text{m}^2$ ) as compared to average basal area of  $48.58\text{m}^2$  for the study stands. Undisturbed stand has highest tree species richness and tree density (individual  $\text{ha}^{-1}$ ) with *Persea gamblei* as the dominant tree species. Where as *Meliosma wallichii* dominates in moderately disturbed and *Terminia myriocarpa* in highly disturbed stands respectively. In the whole study forest stands *Meliosma wallichii* was a dominant where as other former two was codominant species. This data may help in planning for conservation and management of the plant biodiversity.

**Key word:** Plant Species diversity, population structure, disturbed forests, management.

## INTRODUCTION

Phytogeographically wet tropical forests are rich in biological diversity (Bhuyan et al. 2003; Chandrasekharan 1960). These forests face a serious threat, both natural as well as anthropogenic. The current stress on forest communities for large-scale collection of fuelwood and minor forest products, as well as the practices of grazing and flattening may alter the habitats of many species. As a result there is a lot of spatial and temporal variation in species richness, composition and productivity. Thus, the need to set priorities for conservation of tree diversity have become inevitable. Identification of conserved area ideally requires exhaustive knowledge of species and ecosystem diversity and distribution (Bhuyan et al. 2003; Menon et al. 2001). Northeastern India is one of the 25 mega-biodiversity hotspot of the world (Myers et al. 2000) harbouring rich vegetation, both in number as well as species density and diversity (Rao and Murti 1990). The shifting cultivation is one of the potent factors changing the forest cover in the region (Ramakrishnan et al. 1981; Arunachalam et al. 2002). It is believed that if the present trends are continued and effective conservation measures are not implemented, most of the remnant native vegetation in the tropics will be destroyed or replaced by successional communities (Beniwal and Haridasan 1992; Procter et al. 1998; Menon et al. 2001). An understanding of forest process is also fundamental to the management of natural and disturbed vegetation (Congdon and Herbohn 1993). The Dehang –Debang Biosphere Reserve of Arunachal Pradesh is one of the relatively unexplored area harbouring rich plant diversity. The forests in