



# Assessment of Soil Seed Bank on Three Different Vegetation Types in Kumaun Central Himalayan Forest

Amit Mittal, Ashish Tewari<sup>1</sup>, Nandan Singh<sup>1</sup> and Shruti Shah<sup>1</sup>

Department of Allied Sciences, Graphic Era Hill University, Bhimtal Campus, Nainital-263 126, India

<sup>1</sup>Department of Forestry and Environmental Science, D.S.B. Campus, Kumaun University, Nainital-263 001, India

E-mail: amitforestry26@gmail.com

**Abstract:** The present study was conducted to assess the soil seed bank in *Shorea robusta*, *Pinus roxburghii* and *Quercus leucotrichophora* dominant forest. The study was carried out between 439 and 2145 m in Kumaun Himalayan region. A monolith of 25x25x15 cm<sup>3</sup> was used to extract the soil sample from the study sites. The soil samples were divided into 03 depth classes 0-5cm, 5-10 cm and 10-15 cm. ANOVA showed that number of viable seeds varied significantly across sites and depths ( $p < 0.05$ ) but not with species. The soil seed bank density at 0-5 cm depths was  $3.2 \pm 0.05$  and  $10.1 \pm 0.08$  m<sup>-2</sup> in *S. robusta*,  $4.5 \pm 0.08$  and  $12.4 \pm 1.07$  m<sup>-2</sup> on *P. roxburghii* and  $2.3 \pm 0.06$  and  $5.4 \pm 0.3$  m<sup>-2</sup> on *Q. leucotrichophora*. In oak dominated forest the total tree forest emergent varied from  $3.2 \pm 1.89$  to  $18.4 \pm 2.01$  m<sup>-2</sup>, shrubs forest emergent varied from  $8.3 \pm 1.21$  to  $64.4 \pm 2.97$  m<sup>-2</sup> and herb emergent varied from  $20.3 \pm 0.6$  to  $164.3 \pm 0.62$  m<sup>-2</sup>. A significant positive co-relation was found between tree and shrubs emergent ( $r = 0.228$ ,  $p < 0.01$ ) and shrubs and herbs forest emergents ( $r = 0.573$ ,  $p < 0.01$ ). Litter abundance increases in areas of high pine density, which may decrease seed banks. The highest emergent in *Q. leucotrichophora* dominant sites could be due to the high moisture present in oak forest soil and favorable climatic conditions as compare to *S. robusta* and *P. roxburghii* dominated forests. Rise in temperature and resultant enhanced evapo-transpiration which desiccates seeds more rapidly in soil.

**Keywords:** Himalaya, *P. roxburghii*, *Q. leucotrichophora*, *S. robusta*, Soil seed bank