Effects of Soil on Understorey Species Composition in Three Forests of Kumaun Himalaya

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Abstract: Shrub and herb biomass with physical and chemical properties of soil in Chir Pine (*Pinus roxburghii* Sarg.), Oak-Chir Pine mixed (*Quercus leucotrichophora* A. camus – *P. roxburghii*) and Oak-Cypress mixed (*Q. leucotrichophora – Cupressus torulosa* Don.) forest located between 1300-2600 meters elevation was estimated for six months (October-February) in 2013-14. At each site three different slope positions (ridge slope, mid hill slope and hill base) were selected for the study. The shrub density across the study sites ranged between 1040 to 2347 ind. ha^{-1} and herb density ranged between 4613 to 11120 ind. ha^{-1}. The chemical and physical property of soil was estimated upto 30 cm soil depth. The total biomass ranged between 0.63 and 2.11 t ha^{-1} in herb species while it ranged between 0.045 and 0.63 t ha^{-1} in shrub species. The environmental variables of all sites showed high inter-set correlation in Canonical Correspondence. Our inventory showed that the most important factors increasing the diversity of the understory are carbon, nitrogen, pH and phosphorus. The plant community composition explained productivity very well and was a better predictor than environmental variables.

Keywords: Kumaun Himalaya, Soil depth, Biomass, Physical property, Chemical property