

Change in Physicochemical properties of soil encourage the invasion establishment and carbon dynamics of *Lantana camara* from Doon Valley, western Himalaya, India

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ABSTRACT

Lantana camara is a documented weed of worldwide significance due to its widespread distribution and impacts on nature conservation. However, quantitative data on the impact of this invasive weed on soil ecosystem properties are meagre, especially in Doon Valley, despite the invasive presence of this weed along the Himalayan foothill and deciduous forests of Doon Valley. In this study physico-chemical properties of soil were analysed from different high and low *Lantana* infested areas. These sites vary in landscape and land use types. Significant site effect was frequently observed than effect due to invasion status. The present study tested the impact of soil properties in the measured and calculated attributes of *Lantana* by randomly sampling soil from the highly invaded and less invaded sites in different habitats namely open canopy degraded forest, abandoned land, riverine areas, swampy area, abandoned residential plots, dense Sal dominated forests and highly disturbed shrub-grassland using the Modified Whittaker plot design. Ten samples were collected at high invaded and ten at less invaded sites per habitat totalling to 120 which were obtained and analysed. One way analysis of variance (ANOVA) results indicated that edaphic factors such as soil pH, total nitrogen, soil organic carbon, Phosphorus and potassium content positively influenced the growth of *Lantana* and helped in the further invasion process. These factors were also positively influencing the measured and calculated attributes of *Lantana* such as canopy coverage, average crown diameter, shrub canopy area, phytovolume and biomass from all sites. However some attributes like shrub height and stem diameter were negatively influenced by these soil factors. The level of these soil nutrients was found elevated in all *Lantana* invaded sites from less invaded sites. The present results show that *Lantana* invasion can significantly improve the soil nutrient level but also positively increasing the chances of its further invasion with more copious plant attributes. These attributes are however, very useful for the calculation of biomass and fuel property of this invasive shrub.

Key words: biomass of shrub, carbon sequestration, invasive plants, Principal Component Analysis, soil properties