



Spatial variability of soils in a seasonally dry tropical forest

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Soil structures communities of plants and soil organisms in tropical forests. Understanding the controls of soil spatial variability can therefore potentially inform efforts towards forest restoration. We studied the relationship between soils and lithology, topography, vegetation and fire in a seasonally dry tropical forest in southern India. We extensively sampled soil (available nutrients, Al, pH, and moisture), rocks, relief, woody vegetation, and spatial variation in fire burn frequency in a permanent 50-ha plot. Lower elevation soils tended to be less moist and were depleted in several nutrients and clay. The availability of several nutrients was, in turn, linked to whole-rock chemical composition differences since some lithologies were associated with higher elevations, while the others tended to dominate lower elevations. We suggest that local-scale topography in this region has been shaped by the spatial distribution of lithologies, which differ in their susceptibility to weathering. Nitrogen availability was uncorrelated with the presence of trees belonging to Fabaceae, a family associated with N-fixing species. No effect of burning on soil parameters could be discerned at this scale.