

Effects of deforestation on physicochemical properties and microbial population of soils in a South-East Asian tropical forest

ABSTRACT

The study was conducted in deforested land and adjacent natural forest in Chittagong Forest South Division, Bangladesh, to explore the effects of deforestation on physico-chemical properties of soil and the soil microbial population. Soil samples from surface (0-10 cm depth) or subsurface (10-20 cm depth) of two hill positions (top and bottom) of deforested land and an adjacent natural forest were collected and analysed for their physico-chemical properties and microbial population. The study reveals that there was no significant ($p \leq 0.05$) difference in soil texture for soil surfaces or hill positions between the deforested land and natural forest. However, significantly ($p \leq 0.05$) low moisture content and high pH was observed in both the surfaces and hill position in deforested land compared to the natural forest. The microbial community i.e., the fungal and bacterial population was also significantly ($p \leq 0.05$) lower in both surfaces (0-10 cm and 10-20 cm) of hill positions in the deforested land compared to natural forest. Fungal population ranged from 59 to 76 million g⁻¹ and 78 to 153 million g⁻¹ of dry soil in deforested land and in natural forest, respectively, whereas bacterial population ranged from 70 to 146 million g⁻¹ in deforested land and from 127 to 218 million g⁻¹ in natural forest. A total of seven genera of fungi were primarily identified from the soils of natural forest and six from the deforested land. The six common genera of identified fungi in both the land used were *Mucor*, *Aspergillus*, *Rhizopus*, *Fusarium*, *Penicillium* and *Trichoderma* and the different one was *Colletotrichum* from the natural forest. Three genera of bacteria *coccus*, *Streptococcus* and *Basillus* were noticed in natural forest and two genera (*coccus* and *Streptococcus*) were recorded from deforested land.

Keyword: Bacterial culture; Deforested land; Microbial population; Natural forest; Soil physicochemical properties; Soil environment