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Soil Chemical and Mineralogical Characteristics under Major Land Use Systems on Upper Brahmaputra Valley of Assam

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Abstract: *Study of two typical pedons representing forest and tea growing soils of upper Brahmaputra valley of Assam showed that soils were very deep, moderately well drained, brown to yellowish brown in colour with redoximorphi features like mottles in the subsoil. The soils were acidic and the pH of the soil ranged from 4.5 to 5.3. The surface soil under tea was more acidic (pH 4.5) than the soils under forest (pH 4.8). However, pH of the subsurface soil under tea was higher than that of the soils under forest. The organic carbon content was relatively higher in forest soil (12.7 g kg^{-1}) than the tea soil (5.6 g kg^{-1}). The CEC of clays indicated its association with the mineralogical composition of clays. Exchangeable Al^{3+} contributed largely towards exchangeable acidity and it is high at the surface under tea soils and at the sub-surface under forest soils. The forest soils are high in exchangeable acidity, pH dependent acidity and total potential acidity. The mineralogical studies indicated the dominance of kaolin followed by mica, smectite and vermiculite in both the soils. The study also suggested that kaolin was relatively higher in tea growing soil whereas the forest soil had relatively higher mica, smectite and vermiculite. There is no significant variation both in chemical and mineralogical properties.*

Keywords: *Clay mineralogy, Forest soils, Soil acidity, Soil characteristics, Soil organic carbon, Tea soils.*