Clay Research, Vol. 39, No. 1, pp. 31-43 (2020)

Acid Soils of Manipur of the North-eastern Region of India: Their Mineralogy, Pedology, Taxonomy and Edaphology

SONALIKA SAHOO [1], DURAISAMY VASU [1], RANJAN PAUL [1], TARUN KANTI SEN [1], SANJAY KUMAR RAY [2] AND PADIKKAL CHANDRAN [1, 3]

[1]Division of Soil Resource Studies, ICAR-NBSSLUP, Amravati Road, Nagpur 440 033, Maharashtra
[2] Present address: Regional Centre, ICAR-NBSSLUP, Jamuguri Road, Rawriah, Jorhat 785 004, Assam

Abstract – *The acid soils of the north-eastern region (NER) of India represent tropical soils of the Indian subcontinent. During the last few decades, ICAR-NBSS&LUP has developed a formidable database on the physical and chemical properties of soils of humid tropical (HT) climate, including some of the states of the NER. However, a detailed mineralogical database for Manipur state is not available. We studied the mineralogy of the soils representing four soil series of Manipur to advance the pedological knowledge on acid soils. The soils belong to Inceptisols and Ultisols that support agricultural land use, forestry, and Jhum cultivation. They have a considerable amount of clay fractions and are rich in organic carbon (OC). Addition of OC and illuviation of clays are the prevailing pedogenic processes in these soils. However, the B horizon is not always the Bt horizon because of the low B/A clay ratio (< 1.2), which is an intriguing issue in pedological parlance. Soils are not kaolinitic; instead, they have dominant kaolin clay mineral (a 0.72 nm mineral interstratified with 1.4 nm mineral), formed from the weathering of hydroxy-interlayered vermiculite (HIV). Hydroxy-interlayering of 2:1 expanding minerals in these acidic soils has caused a decrease in the cation exchange capacity (CEC) of the soils and clays, which often misled the pedologists to designate their mineralogy class as kaolinitic. However, the enhancement of soil and clay CEC after determining the total acidity by using $BaCl_2$-TEA, mineralogy class could be fixed as mixed, which is compatible to their present capacity as abetter ecosystem service provider.*

Keywords*:* Tropical soils, Inceptisols, Ultisols, organic carbon, clay illuviation, weathering, kaolin