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[WG2] WRB - Lessons Learned from the Development of the Third Edition 2014

A New Diagnostic Horizon in WRB for Anthropic Topsoils in Amazonian Dark Earths (South America)

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The Amazonian Dark Earths (ADE), also called “Terra Preta de Índio”, are classified according to WRB as Anthrosols (IUSS Working Group WRB, 2006), and different studies attribute to them the hortic, plaggic or terric horizon according to base saturation, extractable P content, amount of artefacts, and other soil diagnostic criteria. But they do not fit the central concept of any of them: deep cultivation, intensive fertilization and/or long-continued application of human and animal wastes and other organic residues (hortic horizon); addition of sods (topsoil layers together with vegetation) and animal manure (plaggic horizon); addition of earthy manures, compost, beach sands or mud (terric horizon).

The ADEs are associated to pre-Columbian Amerindian settlements and have been reported mainly in the Amazon region. They are variable in terms of depth of the diagnostic horizon, physical and chemical properties, but mostly have dark colors, high stocks of organic carbon, extractable and total phosphorus, calcium, magnesium, micronutrients (mainly zinc and manganese) and other metals as strontium and barium. Contrasting with natural soils in the surrounding area, the surface horizons influenced by human activities have extraordinarily high CEC and nutrient availability. Artefacts of ceramic, stones and bones and pieces of charcoal are frequently found mixed into the soil. Clear evidences of past human occupation in the landscape (constructions, gardens), shell mounds (“sambaquis”), earthworks (geoglyphs) are identifiable. The ADEs may not show the evidences of animal activity required for the hortic horizons, and they were not influenced by manuring, as required for the hortic horizons, since this activity was not part of the pre-Columbian Amerindian culture. Additionally, the surface anthropic horizons typical for the ADE show a high base saturation; the base cations were added from bones (Ca), ashes, and many other organic materials (i. e. kitchen middens, palm leaves, human feces). It is still a matter of discussion, whether these fertile horizons have been created intentionally. The presence of buried ADE horizons in naturally fertile Gleysols and Fluvisols near the Amazon and Solimões rivers suggests that there was no intention to create them.

Thus, a new diagnostic horizon was proposed during the revision of WRB, identified as pretic (from Portuguese preto, black), and its diagnostic criteria will be presented in this report.

Keywords : Terra Preta de Índio; Anthrosols; Soil classification