

## CHAPTER 6

### CONCLUSIONS

The temperature and moisture regime of an area is determined by climate, which, in turn, controls the amount of weathering and leaching the rocks and soils are subjected to. In humid environments, high precipitation rates produces a nearly constant influx of water. Alkali ions and some aqueous silica are leached out, and the remaining Al and Si ions precipitate out as aluminum hydroxides. These hydroxides further alter to kaolinite.

Throughout the paleosol sequence, feldspars have been completely altered to kaolinite. Feldspars within the saprolite are pitted, etched and partially dissolved to kaolinite. Polycrystalline quartz grains have been dissolved along grain boundaries, resulting in numerous small monocrystalline grains. All quartz grains have been etched and pitted, and have embayed and partially dissolved grain edges.

The composition and texture of the paleosols suggests that they are residual soils which developed in a humid environment (Leyva *et al.*, 1999; Leyva and Ramirez, 1999b, 2000a,b, 2001a,b; Lima *et al.*, 1999; Ramirez *et al.*, 2002). Compositional similarities between Horizons A through D suggest that all four horizons developed in a similar rock

type. The stratigraphic position beneath the quartz arenite suggests that Horizon D's Upper Kaolinite in the north and the saprolite in the south are the same horizon, with the northern portion of the horizon having been subjected to a higher degree of weathering than the southern portion (Leyva *et al.*, 1999; Leyva and Ramirez, 1999b, 2000a,b, 2001a,b; Lima *et al.*, 1999; Ramirez *et al.*, 2002). Horizon A, exposed at stations SJH 1, SJH 4 and SJH 7, consists of a pallid zone, grading up into a mottled zone, and capped by a hematite-rich zone (plinthite) - a profile characteristic of laterites (Jenny, 1994).

Whether Horizons B, C and D can be considered laterites is unclear. The upper contact of each horizon is erosional, leaving the original thickness and composition of each horizon open to speculation. Horizon B resembles the mottled portion of a laterite sequence, while Horizons C and D each resemble the pallid lowermost portion of a laterite.