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## **PALEOSOL DEVELOPMENT THROUGH INTENSE WEATHERING OF A PALEOCENE SANDSTONE DURING A TROPICAL CLIMATE**

Compositional variations in a Paleocene paleosol exposed in the Santa Monica Mountains near Malibu, California, suggest it developed in a tropical climate. Samples from four zones identified in the paleosol were subjected to compositional analysis using hand specimen and x-ray diffraction techniques. The lowermost Zone 1 consists of weathered sandstone and mudstone. The sandstone in this zone is composed of 60% quartz, 20% feldspar, and 20% kaolinite. Zone 2 is mottled white and purple and consists of 60% quartz and 40% kaolinite. Zone 3 is composed mostly of iron pisolites and 25% quartz and 75% kaolinite. Zone 4 is characterized by iron pisolites floating in a matrix of 15% quartz and 85% kaolinite and by silica replacement of grains. Sandstones above and below the paleosol contain approximately 65% quartz, 25% feldspar, and 10% kaolinite. Deep weathering of the sandstone resulted in feldspar alteration to kaolinite and to quartz dissolution, which in turn, led to silica replacement of grains. Iron pisolites resulted from the accumulation of iron that was probably leached from iron minerals. Compositional variations in the rocks are similar to those of soils that form in tropical climates.