Clay Mineralogy of Andesite Saprolite

D. M. Hendricks*, L. D. Whittig and M. L. Jackson

Department of Soils and Plant) Nutrition University of California, Davis, California
Department of Soil and Water Sciences University of Wisconsin, Madison, Wisconsin

* Present address: Department of Agricultural Chemistry and Soils, University of Arizona, Tucson, Arizona.

Abstract: Clay mineral associations in saprolite of two andesites from the Cascade Range of northeastern California were determined. Sesquioxidic allophane with a high CEC delta value dominates the clay fraction of the least weathered saprolite in each series (47% and 37% in hypersthene andesite and olivine andesite saprolites, respectively). With further weathering, the content of amorphous clay remains high (over 30% in all cases) but the CEC delta value of the clay drops markedly. The amorphous material in the more weathered saprolite has the properties of halloysitic allophane, Halloysite, present in all saprolites, is highest in concentration (over 30%) in the more strongly weathered members of each of the saprolite series. Formation of sesquioxidic allophane during early stages of weathering and its transformation to halloysitic allophane and halloysite during later stages of weathering are supported by X-ray diffraction, electron microscopic, DTA, elemental analysis, and CEC delta value data.

Clays and Clay Minerals; 1967 v. 15; no. 1; p. 395-407; DOI: 10.1346/CCMN.1967.0150140

Clay Minerals Society (www.clays.org)