

PRIMARY MINERALS OF RED-YELLOW SOILS IN JAPANIchiro KANNO and Shizuoki ARIMURA (*Kyushu Agr. Expt. Sta.*)

Morphological, mechanical, and chemical characteristics of nine red-yellow soils derived from various parent materials or rocks in Japan have been given in the previous publications. In the present paper we deal with the composition of primary minerals in the fine sand fraction (0.2~0.02 mm in diameter) in order to know the degree of weathering and the nature of potential plant food of red-yellow soils.

Hornblende, hypersthene, augite, magnetite, half-weathered biotite ($n=1.530\sim1.550$), zircon, quartz, orthoclase, plagioclase, colorless volcanic glass ($n=1.50$), and PELLE'S tear (liquid lava drop, isotropic, $n=1.450$) could be identified under the microscope. Coated grains in which abundant ferruginous compounds hindered microscopic examination were given a final cleaning with cold dilute HCl, but a considerable amount of coated grains was unable to clean up completely. This may imply the abundant presence of free ferruginous compounds which are responsible for the development of red color of the soils. Generally speaking, all specimens examined are characterized by the scarcity of heavy minerals (trace to rare), especially it is true for Oura soil, and by the abundant presence of quartz and plagioclase feldspars (common to dominant). An unknown mineral of Oura soil has a following feature: It is colorless or very light yellow, or milky white in mass. sp. gr., 2.15~2.30; refr. index, 1.463~1.484; isotropic; soluble in HIF; insoluble in boiling KOH or Na_2CO_3 ; according to the feature mentioned above it may be regarded as a polymorph of silica.

It is obvious that there is a considerable contamination of volcanic ashes in all the soils, especially in the upper horizons, because of the presence of volcanic glasses. Considering from the relation between the mineralogical composition of the fine sand fraction and the composition that would be expected from the weathering of parent rocks or materials, it is pointed out that the red-yellow soils in Japan have been subjected to intensive weathering and leaching process. Most of the minerals dealt with in an investigation of this nature have a high resistance to chemical change and therefore provide little in the way of plant nutrients.