CHEMICAL AND MINERALOGICAL PROPERTIES OF RED SOIL SAND FRACTION DEVELOPED ON VOLCANIC TUFF, VOLCANIC BRECCIA, AND LIMESTONE PARENT MATERIALS IN GUNUNGKIDUL DISTRICT, YOGYAKARTA SPECIAL REGION

By: Melyn Winda Himantika

Supervised by: Djoko Mulyanto

ABSTRACT

Red soil that develop from different parent materials can affect the differences in soil characteristics and morphology. This study aims to determine the process of red soil formation, physical, chemical, and mineralogical properties, and to determine the similarity of soil properties that develop from three different parent materials. Red soil developed from limestone in the Wonosari Formation is located in Karangasem Village, Ponjong Sub-district. Red soil from volcanic tuff parent material in the Semilir Formation is located in Karangmojo Village, Karangmojo Subdistrict, while soil developed from volcanic breccia parent material in the Nglanggeran Formation is located in Nglanggeran Village, Patuk Subdistrict, Gunungkidul Regency. Determination of soil profiles was carried out purposively. Parameters observed included: texture of 3 fractions, volume weight, specific gravity, soil color, pH (H2O, KCl, and K2SO4), Eh, C-Organic, KPK, Base Saturation, Exchangeable bases (Ca, Mg, K, Na), total Al, total Fe, Fe extract DCB (Dithionite Citrate Bicarbonate), Fe extract oxalate, thin incision of rocks, and sand fraction minerals in selected soil layers. The results showed that the soil chemical properties of the three red soil profiles were predominantly not similar or of doubtful similarity. The total sand fraction minerals in the three red soil profiles are dominated by opaque minerals (49-87%) and there are small amounts of other minerals such as clear quartz minerals, weathered minerals, and rock fragments. Soil classification according to Soil Taxonomy, KTN, and WRB on the red soil profiles developed from limestone are Typic Rhodudalfs, Podsolik Kandik, and Abruptic Alisols. The total sand fraction minerals in the three red soil profiles are dominated by opaque minerals (49-87%) and there are few other minerals such as clear quartz minerals, weathered minerals, and rock fragments. Soil classifications according to Soil Taxonomy, KTN, and WRB on the red soil profiles developed from limestone are Typic Rhodudalfs, Podsolik Kandik, and Abruptic Alisols. Red soil profile developed from volcanic tuff and volcanic breccia has soil classifications according to Soil Taxonomy, KTN, and WRB as Ruptic-Alfic Dystrudepts, Latosol Umbrik, and Clayic Cambic Luvisols.

Keywords: *Parent Material, Rock Formation, Similarity Index, Red Soil*