

***RELATIONSHIP BETWEEN CLAY MINERALS AND POTASSIUM AVAILABILITY SOIL DEVELOPED ON THE SAMBIPITU AND OYO FORMATIONS IN KEDUNGKERIS VILLAGE, NGLIPAR DISTRICT, GUNUNG KIDUL REGION***

***Hanifah Dewi Isnaini***

Prodi Ilmu Tanah, Universitas Pembangunan Nasional “Veteran” Yogyakarta,  
Sleman, D.I. Yogyakarta 55283

Supervised by : Mohammad Nurcholis

**ABSTRACT**

The type of clay minerals in the soil can affect soil properties because they have a negative charge that can fix a positive charge. The colloidal charge present in each type of clay affects the availability of potassium in the soil because potassium in permanent charge is easily fixed and in variable charge it is easily leached. There are 2 formations in the research area, namely Sambipitu and Oyo with soils developing *Typic Hapludults*, *Typic Hapludults*, and *Typic Epiaquept*. This study aims to determine the dominant type of clay mineral that is formed, to analyze the availability of potassium, and to study the correlation between the dominant clay mineral and the availability of potassium in the soil that develops in each formation. This research was carried out by analyzing soil physical properties, soil chemical properties, and soil clay mineralogy. Potassium is available in the Sambipitu Formation in *Typic Hapludults* ( $0.19 \text{ cmol}(+)\text{kg}^{-1}$ ) and *Typic Hapludalf* ( $0.46 - 0.66 \text{ cmol}(+)\text{kg}^{-1}$ ). Potassium is available in the Oyo Formation at *Typic Hapludalf* ( $0.57 - 0.67 \text{ cmol}(+)\text{kg}^{-1}$ ), *Typic Epiaquept* ( $0.18 - 0.34 \text{ cmol}(+)\text{kg}^{-1}$ ), and *Typic Hapludults* ( $0.18 - 0.34 \text{ cmol}(+)\text{kg}^{-1}$ ). *Typic Hapludalf* is dominated by smectite clay minerals. The most obvious positive correlation between smectite clay minerals and potassium is interchangeable with an r value of 0.966. The most obvious negative correlation is seen between mixed layer clay minerals and potassium which is interchangeable with an r value of -0.821.

***Keywords : Sambipitu Formation, Oyo Formation, Pottasium, Clay Mineralogy***