

INTISARI

Posisi topografi dan kedalaman tanah yang berbeda dapat mempengaruhi sifat-sifat tanah, terutama karbon organik tanah. Perubahan karbon organik total dalam tanah relatif lambat, sehingga kurang mencerminkan perubahan yang sensitif. Fraksi karbon organik berupa karbon organik labil dan stabil cenderung lebih sensitif terhadap perbedaan posisi topografi dan kedalaman tanah. Penelitian ini bertujuan untuk mengetahui variabilitas karbon organik terutama karbon organik labil dan stabil pada beberapa posisi topografi dan kedalaman tanah di tanah Inceptisol, Samigaluh, Kulon Progo. Pengambilan sampel tanah dilakukan berdasarkan lima posisi topografi, yaitu puncak, lereng atas, lereng tengah, lereng bawah, dan kaki lereng pada kedalaman 0-20 cm dan 20-40 cm. Sifat fisika dan kimia tanah yang diamati berupa berat volume, tekstur tanah, pH KCl, pH H₂O, KPK, N-total, nisbah C/N, C-organik, dan nisbah AH/AF. Karbon organik labil yang diamati berupa C-POM (*Particulate Organic Matter*), C-Larut air, C-Mic (*Microbial Biomass*), dan C-Mineralisasi, sedangkan karbon organik stabil berupa asam humat dan asam fulvat. Analisis beda nyata menggunakan ANOVA pada taraf nyata 5% dengan rancangan faktorial 2 faktor berupa posisi topografi dan kedalaman tanah, kemudian uji lanjut menggunakan uji HSD Tukey. Untuk mengetahui hubungan antar parameter menggunakan korelasi *pearson*. Hasil penelitian menunjukkan bahwa posisi topografi dan kedalaman tanah berpengaruh nyata terhadap karbon organik labil dan stabil. Karbon organik labil dan stabil memiliki variasi dinamika karbon yang berbeda antar posisi topografi dan kedalaman tanah. Karbon organik labil seperti C-POM, C-Mic, C-Min, dan C-Lar cenderung lebih tinggi di lereng tengah. Karbon organik stabil seperti asam humat cenderung lebih tinggi di puncak, sedangkan asam fulvat cenderung lebih tinggi di kaki lereng.

Kata kunci: bahan organik, karbon organik labil, karbon organik stabil, kedalaman tanah, posisi topografi

ABSTRACT

Different topographic positions and soil depths can affect soil properties, especially soil organic carbon. Changes in total organic carbon in the soil are relatively slow, so they do not reflect sensitive changes. Organic carbon fractions in the form of labile and stable organic carbon tend to be more sensitive to differences in topographic positions and soil depths. This study aims to determine the variability of organic carbon, especially labile and stable organic carbon at several topographic positions and soil depths in Inceptisol soil, Samigaluh, Kulon Progo. Soil sampling was carried out based on five topographic positions, namely the summit, upper slope, middle slope, lower slope, and foot of the slope at a depth of 0-20 cm and 20-40 cm. The observed physical and chemical properties of the soil were bulk density, soil texture, pH KCl, pH H₂O, cation exchange capacity, total N, C/N ratio, C-organic, and AH/AF ratio. The observed labile organic carbons were C-POM (Particulate Organic Matter), C-Water Soluble, C-Mic (Microbial Biomass), and C-Mineralization, while stable organic carbons were humic acid and fulvic acid. The analysis of significant differences used ANOVA at a significance level of 5% with a 2-factorial design in the form of topographic position and soil depth, then further tests used the Tukey HSD test. To determine the relationship between parameters, Pearson correlation was used. The results showed that topographic position and soil depth significantly affected labile and stable organic carbon. Labile and stable organic carbon had different carbon dynamics variations between topographic positions and soil depths. Labile organic carbon such as C-POM, C-Mic, C-Min, and C-Lar tended to be higher in the middle slope. Stable organic carbon such as humic acid tended to be higher at the peak, while fulvic acid tended to be higher at the foot of the slope.

Keywords: labile organic carbon, organic matter, soil depth, stable organic carbon, topographic position