

INTISARI

Fraksi karbon, fraksi nitrogen dan stok karbon tanah berkontribusi pada siklus karbon global. Seluruh fraksi dipengaruhi oleh jenis vegetasi dan bahan organik tanah. Oleh karena itu, perhitungan komposisi fraksi pada perbedaan tutupan lahan sangat penting untuk indikator potensial dari efek praktik pengelolaan lahan terhadap dinamika karbon organik tanah dan mendukung pengurangan karbondioksida serta penyimpanan karbon tanah. Penelitian ini dilakukan bertujuan untuk mengetahui komposisi fraksi karbon, fraksi nitrogen dan stok karbon tanah pada perbedaan tutupan lahan. Total ada 6 jenis tutupan lahan dengan vegetasi bambu berumur 10 tahun, bambu berumur 30 tahun, bambu berumur 50 tahun, ilalang, campuran semak belukar dan ilalang, dan campuran sengon dan Semak belukar, masing-masing diambil sampel tanahnya sebanyak tiga kali ulangan di Lereng Gunung Merapi. Parameter pengukuran fraksi karbon dan nitrogen antara lain karbon biomassa mikroba tanah (C-BMT), nitrogen biomassa mikroba tanah (N-BMT), karbon partikulat bahan organik (C-POM) dan nitrogen partikulat bahan organik (N-POM). Parameter stok karbon organik tanah antara lain C-organik tanah, kedalaman tanah dan berat volume tanah. Analisis parameter fisik tanah (Tekstur, Berat jenis, Berat volume, dan Porositas tanah) dan kimia tanah (pH, C-Organik, N-Total tanah, Ratio C/N, KPK, dan Kation-kation basa tertukar). Hasil penelitian menunjukkan bahwa keenam jenis tutupan lahan menunjukkan perbedaan signifikan pada seluruh kandungan fraksi dan stok karbon tanah. Lahan vegetasi bambu berumur 50 tahun memiliki simpanan karbon tertinggi sebesar 0.029 g/g. Fraksi karbon stabil, berupa asam humat dan asam fulvat pada lahan vegetasi bambu berumur 50 tahun lebih besar dibanding vegetasi lainnya. Vegetasi bambu berumur 50 tahun berpotensi dalam penyerapan karbon ditunjukkan dengan tingginya kandungan stok karbon tanah dan menyimpan karbon di tanah lebih lama dalam bentuk yang lambat terurai yaitu asam humat dan asam fulvat.

Kata Kunci: Dinamika karbon, Simpanan karbon, Nitrogen labil, Vegetasi

ABSTRACT

The carbon fraction, nitrogen fraction, and soil carbon stock contribute to the global carbon cycle. The type of vegetation and soil organic matter influences all fractions. Therefore, calculating the fractional composition of different land cover is very important as a potential indicator of the effect of land management practices on soil organic carbon dynamics and supports carbon dioxide reduction and soil carbon storage. This research aimed to determine the composition of the carbon fraction, nitrogen fraction, and soil carbon stock in different land cover. There were six types of land cover with vegetation of 10-year-old bamboo, 30-year-old bamboo, 50-year-old bamboo, weeds, a mixture of shrubs and weeds, and a mixture of session and shrubs; each soil sample was taken three times with repetitions on the slopes. Mount Merapi. Parameters for measuring carbon and nitrogen fractions include microbial biomass carbon (C-BMT), microbial biomass nitrogen (N-BMT), particulate organic matter carbon (C-POM), and particulate organic matter nitrogen (N-POM). Parameters of soil organic carbon stock include soil organic carbon, soil depth, and soil unit weight. Analysis of soil physical parameters (texture, particle density, bulk density, and soil porosity) and soil chemistry (pH, C-Organic, N-Total soil, C/N ratio, CEC, and exchanged base cations). The results showed that the six land cover types showed significant differences in all fractions and soil carbon stocks. 50-year-old bamboo vegetation has the highest carbon storage of 0.029 g/g. The stable carbon fraction, in the form of humic acid and fulvic acid, in 50-year-old bamboo vegetation is greater than in other vegetation. Bamboo vegetation that is 50 years old has the potential to sequester carbon, as indicated by the high content of soil carbon stocks and storing carbon in the soil longer in forms that decompose slowly, namely humic acid and fulvic acid.

Keywords: Carbon dynamics, Carbon storage, Nitrogen labile, Vegetation