HUBUNGAN KARAKTERISTIK KIMIA TANAH TERHADAP KEANEKARAGAMAN FAUNA TANAH DI KAWASAN HUTAN PENDIDIKAN DAN PENELITIAN BIOLOGI UNIVERSITAS ANDALAS

SKRIPSI

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FAKULTAS PERTANIAN
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Sebagai salah satu syarat untuk memperoleh gelar
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ABSTRAK

Hutan merupakan ekosistem alami yang kompleks dengan tingkat keanekaragaman hayati yang tinggi, baik flora maupun fauna. Salah satu komponen penting dalam ekosistem tersebut adalah fauna tanah yang berperan dalam menjaga keseimbangan ekosistem melalui proses dekomposisi bahan organik, pembentukan struktur tanah, serta peningkatan ketersediaan unsur hara bagi tanaman. Aktivitas manusia seperti perubahan tata guna lahan, intensifikasi pertanian, dan penggunaan bahan kimia berlebihan dapat mengganggu keseimbangan ekosistem tersebut, sehingga menurunkan populasi fauna tanah dan fungsi ekologisnya. Penelitian ini bertujuan untuk menganalisis hubungan antara karakteristik kimia tanah dengan keanekaragaman makrofauna dan mesofauna tanah pada berbagai tipe penggunaan dan kelas kemiringan lahan di kawasan Hutan Pendidikan dan Penelitian Biologi Universitas Andalas. Pengambilan sampel dilakukan dengan metode Stratified Random Sampling pada empat tipe penggunaan lahan, yaitu hutan alami (NF), kebun durian (DP), kebun campuran (BG), dan tanaman obat (MG), yang mewakili lima kelas kemiringan (0–8%, 8–15%, 15–25%, 25–45%, dan >45%). Analisis tanah mencakup pH, Al-dd, C-organik, N-total, rasio C/N, P tersedia, serta kation basa (Ca, Mg, K, dan Na). Hasil penelitian menunjukkan keanekaragaman fauna tanah tertinggi terdapat pada lahan hutan alami (NF) dengan nilai H′ tertinggi. Lahan BG dan MG memiliki kandungan N-total, Ca, Mg, dan KTK tinggi, sedangkan NF unggul pada P tersedia, Na, dan C-organik. Pengaruh kelas kemiringan terhadap sifat kimia tanah secara umum lemah. Hasil uji korelasi menunjukkan hubungan positif signifikan antara keanekaragaman fauna dengan C-organik, rasio C/N, dan P tersedia. Fauna seperti springtail, semut, rayap, dan cacing tanah berperan penting dalam proses dekomposisi, bioturbasi, serta peningkatan kesuburan tanah.

Kata kunci: Fauna tanah, Keanekaragaman hayati, Sifat kimia tanah, Penggunaan lahan, Kemiringan lahan

THE RELATIONSHIP BETWEEN SOIL CHEMICAL CHARACTERISTICS AND SOIL FAUNA DIVERSITY IN THE FOREST EDUCATION AND RESEARCH AREA OF ANDALAS UNIVERSITY

ABSTRACT

Forests are complex natural ecosystems with high biodiversity, consisting of various flora and fauna. One of the key components of forest ecosystems is soil fauna, which plays an essential role in maintaining ecological balance through the decomposition of organic matter, improvement of soil structure, and enhancement of nutrient availability for plant growth. However, human activities such as land-use change, agricultural intensification, and excessive use of chemical inputs can disrupt this balance, reducing soil fauna populations and their ecological functions. This study aimed to analyze the relationship between soil chemical characteristics and the diversity of macrofauna and mesofauna across various land-use types and slope classes in the Forest Education and Research Area of Andalas University. Sampling was conducted using the Stratified Random Sampling method on four land-use types: natural forest (NF), durian plantation (DP), mixed garden (BG), and medicinal plant area (MG), representing five slope classes (0–8%, 8–15%, 15–25%, 25–45%, and >45%). Soil parameters analyzed included pH, exchangeable Al, organic C, total N, C/N ratio, available P, and base cations (Ca, Mg, K, and Na). The results showed that soil fauna diversity was highest in the natural forest (NF) with the highest Shannon-Wiener index (H′). The BG and MG lands had higher contents of total N, Ca, Mg, and CEC, while NF was higher in available P, Na, and organic C. The influence of slope class on soil chemical properties was generally weak. Correlation analysis revealed a significant positive relationship between soil fauna diversity and organic C, C/N ratio, and available P. Fauna such as springtails, ants, termites, and earthworms played key roles in decomposition, bioturbation, and improving soil fertility.

Keywords: Soil fauna, Biodivirsity, Soil chemical properties, Land use, Slope class