

**KAJIAN SIFAT BIOLOGI TANAH PADA PERKEBUNAN KOPI  
ARABIKA (*Coffea arabica L.*) DENGAN 2 SISTEM PERTANIAN DI  
JORONG BUKIK GOMPONG KABUPATEN SOLOK**

**SKRIPSI**

**OLEH :**

**ZIKRUL HAKIM**

**NIM. 2010232002**

**Dosen Pembimbing:**

- 1. Ir Oktanis Emalinda, MP**
- 2. Ir. Lusi Maira, MAgr.Sc**



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**ABSTRAK**

Perbedaan antara sistem pertanian konvensional dan organik pada perkebunan kopi Arabika dapat mempengaruhi sifat fisika, kimia, dan biologi tanah. Perbedaan dalam penggunaan pupuk pada kedua sistem tersebut dapat berdampak berbeda terhadap ekologi organisme tanah dan kualitas tanah. Penelitian ini bertujuan untuk mengkaji sifat biologi tanah pada perkebunan kopi Arabika (*Coffea arabica* L.) dengan sistem pertanian organik dan konvensional. Penelitian dilakukan dengan metode survei, di mana sampel tanah diambil secara purposive sampling berdasarkan sistem pertanian yang digunakan, yaitu sistem pertanian organik dan konvensional, dengan tiga ulangan pada kedalaman 0-30 cm di lahan dengan kelerengan 8-15% dan umur tanaman 3,5 tahun. Hasil penelitian menunjukkan bahwa tanah pada lahan kopi Arabika dengan sistem pertanian organik memiliki kualitas yang lebih baik dibandingkan dengan sistem pertanian konvensional. Pada lahan kopi organik, nilai pH tergolong masam, nilai C-organik tinggi, nilai N-total sedang, BV rendah, dan TRP tinggi. Sementara pada lahan kopi konvensional, nilai pH juga tergolong masam, namun nilai C-organik sedang, nilai N-total rendah, BV sedang, dan TRP tinggi. Dari segi sifat biologi tanah, lahan kopi organik menunjukkan populasi makroorganisme rata-rata 16 ekor/monolit dengan dua jenis keragaman (insekta dan nematoda), populasi bakteri  $8,21 \times 10^6$  cfu/g dengan tiga jenis keragaman, populasi jamur  $7,06 \times 10^5$  cfu/g dengan lima jenis keragaman, serta aktivitas respirasi tanah yang tinggi. Sebaliknya, lahan kopi konvensional menunjukkan populasi makroorganisme rata-rata 10 ekor/monolit dengan dua jenis keragaman (insekta dan nematoda), populasi bakteri  $7,84 \times 10^6$  cfu/g dengan dua jenis keragaman, populasi jamur  $6,61 \times 10^5$  cfu/g dengan empat jenis keragaman, serta aktivitas respirasi tanah yang sedang.

*Kata Kunci : konvensional, organik, organisme tanah, perkebunan kopi Arabika.*

**ASSESSMENT OF SOIL BIOLOGICAL NATURE ON ARABICA COFFEE FARMS (*Coffea arabica* L.) WITH 2 FARMING SYSTEMS IN JORONG BUKIK GOMPONG SOLOK DISTRICT**

**ABSTRACT**

The differences between conventional and organic farming systems in Arabica coffee plantations can influence the physical, chemical, and biological properties of the soil. Variations in fertilizer use between these two systems can have different impacts on soil organism ecology and soil quality. This study aims to assess the soil biological properties in Arabica coffee (*Coffea arabica* L.) plantations under organic and conventional farming systems. The research was conducted using a survey method, with soil samples taken using purposive sampling based on the farming system employed, namely organic and conventional systems, with three replications at a depth of 0-30 cm on land with a slope of 8-15% and plant age of 3.5 years. The results showed that soil in Arabica coffee plantations under the organic farming system had better quality compared to those under the conventional system. In organic coffee plantations, soil pH was classified as acidic, organic carbon content was high, total nitrogen content was moderate, bulk density was low, and total pore space was high. In contrast, in conventional coffee plantations, soil pH was also classified as acidic, but organic carbon content was moderate, total nitrogen content was low, bulk density was moderate, and total pore space was high. In terms of soil biological properties, organic coffee plantations showed an average macroorganism population of 16 individuals/monolith with two types of diversity (insects and nematodes), a bacterial population of  $8.21 \times 10^6$  cfu/g with three types of diversity, a fungal population of  $7.06 \times 10^5$  cfu/g with five types of diversity, and high soil respiration activity. On the other hand, conventional coffee plantations showed an average macroorganism population of 10 individuals/monolith with two types of diversity (insects and nematodes), a bacterial population of  $7.84 \times 10^6$  cfu/g with two types of diversity, a fungal population of  $6.61 \times 10^5$  cfu/g with four types of diversity, and moderate soil respiration activity.

*Keywords: Arabica coffee plantation, conventional, organic, soil organisms.*