

ABSTRAK

ANALISIS KOMPARASI KERAGAMAN SERANGGA DIURNAL DI PERKEBUNAN KOPI ROBUSTA PADA PERIODE VEGETATIF BERDASARKAN PREDIKSI KECERDASAN BUATAN DAN EKSPLORASI LAPANGAN

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Agroforestri kopi robusta merupakan sistem pertanian berkelanjutan yang berperan penting dalam mendukung keanekaragaman hayati, khususnya serangga diurnal yang berfungsi sebagai polinator, herbivora, predator, dan dekomposer. Keberadaan serangga diurnal pada fase vegetatif mencerminkan kondisi ekologis dan stabilitas interaksi biotik dalam agroforestri kopi. Penelitian ini bertujuan untuk membandingkan keragaman serangga diurnal di perkebunan kopi robusta pada periode vegetatif berdasarkan prediksi kecerdasan buatan (ChatGPT 5.1 *Free Version*) dan eksplorasi lapangan di Desa Wiyono, Lampung. Data lapangan dikumpulkan melalui metode *hand collecting*, *sweeping net*, *pitfall trap*, dan *yellow sticky trap*, disertai pengukuran faktor lingkungan berupa suhu, kelembapan udara, kelembapan tanah, pH tanah, dan intensitas cahaya. Keragaman serangga dianalisis menggunakan indeks Shannon–Wiener (H') dan indeks dominansi Simpson (C), sedangkan tingkat kesamaan komunitas dianalisis menggunakan indeks Sørensen. Hasil penelitian menunjukkan indeks keragaman berdasarkan prediksi ChatGPT 5.1 *Free Version* menghasilkan nilai H' sebesar 2,81 dan C sebesar 0,08, sedangkan berdasarkan eksplorasi lapangan menghasilkan nilai H' sebesar 2,72 dan C sebesar 0,11, dengan komunitas serangga diurnal tersusun atas sembilan ordo dan beberapa ordo utama yang berkontribusi terhadap struktur komunitas. Perbandingan komposisi spesies menunjukkan nilai indeks kesamaan Sørensen sebesar 21,33%, yang menandakan tingkat kesamaan komunitas yang rendah. Temuan ini mengindikasikan bahwa kecerdasan buatan mampu merepresentasikan pola umum keragaman serangga diurnal, namun eksplorasi lapangan tetap diperlukan untuk memperoleh gambaran komposisi spesies yang akurat dan kontekstual.

Kata kunci: agroforestri, ChatGPT, indeks keanekaragaman, kopi robusta, serangga diurnal

ABSTRACT

COMPARATIVE ANALYSIS OF DIURNAL INSECT DIVERSITY IN ROBUSTA COFFEE PLANTATIONS DURING THE VEGETATIVE PHASE USING ARTIFICIAL INTELLIGENCE PREDICTIONS AND FIELD EXPLORATION

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Robusta coffee agroforestry is a sustainable agricultural system that plays an important role in supporting biodiversity, particularly diurnal insects that function as pollinators, herbivores, predators, and decomposers. The presence of diurnal insects during the vegetative phase reflects ecological conditions and the stability of biotic interactions within coffee agroforestry systems. This study aimed to compare the diversity of diurnal insects in robusta coffee plantations during the vegetative period based on artificial intelligence predictions (ChatGPT 5.1 Free Version) and field exploration conducted in Wiyono Village, Lampung. Field data were collected using hand collecting, sweep netting, pitfall traps, and yellow sticky traps, accompanied by measurements of environmental factors including temperature, air humidity, soil pH, and light intensity. Insect diversity was analyzed using the Shannon–Wiener diversity index (H') and Simpson's dominance index (C), while community similarity was assessed using the Sørensen similarity index. The results showed that the diversity index based on ChatGPT 5.1 Free Version predictions yielded an H' value of 2.81 and a C value of 0.08, whereas based on field exploration resulted in an H' value of 2.72 and a C value of 0.11. The diurnal insect community consisted of nine orders, with several dominant orders contributing significantly to community structure. Comparison of species composition revealed a Sørensen similarity index of 21.33%, indicating a low level of community similarity. These findings suggest that artificial intelligence is capable of representing general patterns of diurnal insect diversity; however, field exploration remains essential to obtain accurate and context-specific information on species composition.

Keywords: agroforestry, ChatGPT, diversity index, diurnal insects, robusta coffee