

# ARTHROPODS DIVERSITY IN VARIOUS RICE (*Oryza sativa*) CULTIVATION SYSTEMS

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## ABSTRAK

Arthropods diversity is an important indicator in assessing the health of agricultural ecosystems because this group of organisms acts as pests, natural enemies, pollinators, and decomposers that contribute to maintaining the stability of agroecosystems. The objective of this study is to analyze the differences in diversity levels and ecological roles of arthropods across three rice cultivation systems in Sawangan Subdistrict, Magelang Regency: (1) the organic farming system introduced by PT Bhume Artani Nusantara, (2) the organic system practiced by local farmers, and (3) the conventional cultivation system. The study was conducted from May to November 2025 on three rice cultivation systems using the local variety Menthik Wangi Susu. This research uses a quantitative descriptive approach with a systematic sampling method. Arthropods specimens are collected using yellow sticky traps and sweep nets and are identified to the genus level. Diversity analysis is conducted using the Shannon–Wiener diversity index ( $H'$ ), along with the dominance index ( $D$ ) and the evenness index ( $E$ ). Arthropods samples are classified into functional groups, including pests, predators, parasitoid, pollinators, and decomposers. The diversity index values indicate that organic farming systems, both the introduced system (3.619) and the local farmer system (3.493), fall into the high diversity category, whereas the conventional system (2.727) is classified as moderate. The composition of arthropod functional roles in organic systems shows the presence of pest populations accompanied by natural enemies, particularly predators and parasitoids, in relatively balanced proportions. In contrast, the conventional system tends to be dominated by pest groups, along with a reduction in predator and parasitoid abundance. While pollinators and decomposers play a relatively minor role in all three systems.

**Kata kunci:** arthropod diversity, agroecosystems, organic farming, conventional farming, rice

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Keanekaragaman arthropoda merupakan salah satu indikator penting dalam menilai kesehatan ekosistem pertanian karena kelompok organisme ini berperan sebagai hama, musuh alami, penyerbuk, maupun dekomposer yang berkontribusi dalam menjaga stabilitas agroekosistem. Tujuan penelitian untuk menganalisis perbedaan tingkat keanekaragaman serta peran ekologis arthropoda pada tiga sistem budidaya padi di Kecamatan Sawangan, Kabupaten Magelang, yaitu sistem pertanian organik introduksi PT Bhume Artani Nusantara, sistem organik petani lokal, dan sistem pertanian konvensional. Penelitian dilaksanakan pada bulan Mei hingga November 2025 pada tiga sistem budidaya padi dengan menggunakan varietas lokal Menthik Wangi Susu. Penelitian ini menggunakan pendekatan deskriptif kuantitatif dengan metode *systematic sampling*. Sampel arthropoda dikumpulkan menggunakan *yellow sticky trap* dan *sweep net*, kemudian diidentifikasi hingga tingkat genus. Analisis keanekaragaman dilakukan menggunakan indeks Shannon–Wiener ( $H'$ ), serta dilengkapi dengan indeks dominansi ( $D$ ) dan indeks pemerataan ( $E$ ). Nilai indeks keanekaragaman menunjukkan bahwa sistem pertanian organik, baik introduksi dengan nilai 3,619 maupun petani lokal dengan nilai 3,493, memiliki keanekaragaman tinggi, sedangkan sistem konvensional dengan nilai 2,727 tergolong sedang. Komposisi peran arthropoda menunjukkan bahwa pada sistem pertanian organik, baik introduksi maupun petani lokal, populasi hama relatif seimbang dengan musuh alami, terutama predator dan parasitoid. Sebaliknya, pada sistem konvensional terjadi dominasi hama yang tinggi disertai penurunan signifikan pada kelompok predator dan parasitoid, sementara peran penyerbuk dan dekomposer relatif rendah pada seluruh sistem.

**Kata kunci:** keanekaragaman arthropoda, agroekosistem, pertanian organik, pertanian konvensional, padi