PENGARUH APLIKASI BEBERAPA JENIS INSEKTISIDA TERHADAP KEANEKARAGAMAN ARTHROPODA TANAH PADA PERTANAMAN BROKOLI (*Brassica oleracea* L. var. *italica*)

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Abstrak

Arthropoda tanah adalah kelompok hewan yang berperan penting dalam ekosistem tanah pertanian. Penelitian ini bertujuan untuk menguji pengaruh aplikasi beberapa jenis insektisida terhadap keanekaragaman arthropoda tanah pada pertanaman brokoli. Penelitian tentang keanekaragaman arthropoda tanah dilakukan di lahan pertanaman brokoli yang diaplikasi insektisida dengan Rancangan Acak Lengkap (RAL) 4 perlakuan dan 7 ulangan di daerah Jorong Galagah, Alahan Panjang, Kecamatan Lembah Gumanti, Kabupaten Solok dari Januari sampai Mei 2024. Perlakuan yang diuji meliputi kontrol, insektisida nabati (nanoemulsi campuran ekstrak *Piper aduncum* dan hidrosol *Cymbopogon nardus*), insektisida thuricide HP (bahan aktif *Bacillus thuringiensis*), dan insektisida sintetik (bahan aktif sipermetrin 311 g/l). Pengambilan sampel arthropoda tanah menggunakan perangkap *pitfall trap* pada 84 titik yang mewakili seluruh perlakuan. Identifikasi serangga dilakukan di Laboratorium Bioekologi Serangga, Departemen Proteksi Tanaman, Fakultas Pertanian, Universitas Andalas, Padang. Hasil penelitian pemberian beberapa perlakuan menunjukkan perbedaan yang signifikan antar perlakuan terhadap jumlah jenis dan individu arthropoda tanah pada ketiga waktu pengamatan. Dengan masing-masing perlakuan menunjukkan pengaruh yang berbeda dari sebelum aplikasi, setelah 4 kali aplikasi hingga setelah 8 kali aplikasi seperti perlakuan kontrol dan insektisida nabati tidak memberikan pengaruh yang nyata terhadap jenis arthropoda tanah dan cenderung stabil terhadap jumlah individu arthropoda tanah. Perlakuan *Bacillus thuringiensis* mulai memberikan pengaruh yang nyata terhadap jenis arthropoda tanah dan cenderung menurunkan jumlah individu arthropoda tanah setelah 8 kali aplikasi. Perlakuan insektisida sintetik menyebabkan hilangnya jenis arthropoda tanah dan cenderung menurunkan jumlah individu sejak setelah 4 kali aplikasi hingga setelah 8 kali aplikasi. Identifikasi lebih lanjut terhadap sampel arthropoda tanah pada lahan percobaan menunjukan keanekaragaman arthropoda tanah tergolong sedang (1,523–2,868) dan kemerataan tergolong tinggi (0,703–0,968). Arthropoda tanah yang ditemukan di pertanaman brokoli terdiri dari 5 kelas, 11 ordo dan 20 famili. Jenis arthropoda tanah yang banyak ditemukan berperan sebagai detritivor dan predator.

Kata kunci: Detritivor, nabati, *pitfall trap*, predator.

EFFECTS OF THE APPLICATION OF SEVERAL TYPES OF INSECTICIDES ON THE DIVERSITY OF SOIL ARTHROPODS IN BROCCOLI PLANTATION (*Brassica oleracea* L. var. *italica*)

Abstract

Soil arthropods are a group of animals that play an important role in agricultural soil ecosystems.The purpose of this to examine effect of the application of several types of insecticides on the diversity of soil arthropods in broccoli plantation. The research was conducted in broccoli plantation applied by insecticides using Completely Randomized Design (CRD) with 4 treatments and 7 replications in Jorong Galagah, Alahan Panjang, Lembah Gumanti District, Solok Regency from January to May 2024. The treatments were included control, botanical insecticide (nanoemulsion mixture of *Piper aduncum* extract and *Cymbopogon nardus* hydrosol), HP thuricide insecticide (active ingredient *Bacillus thuringiensis*), and synthetic insecticide (active ingredient cipermethrin 311 g/l). Soil arthropod samples were taken by *pitfall traps* at 84 points representing all treatments. Insect identification was conducted at the Insect Bioecology Laboratory, Department of Plant Protection, Faculty of Agriculture, Andalas University, Padang. The results of the research on the application of several treatments showed significant differences between treatments on the number of species and individuals of soil arthropods at the three observation times. With each treatment showing different effects from before application, after 4 times of application to after 8 times of application such as the control treatment and botanical insecticides did not have a significant effect on the types of soil arthropods and tended to be stable on the number of individual soil arthropods. *Bacillus thuringiensis* treatment began to have a significant effect on the types of soil arthropods and tended to reduce the number of individual soil arthropods after 8 applications. The synthetic insecticide treatment caused the disappearance of soil arthropod species and tended to decrease the number of individuals since after 4 applications until after 8 applications. Further identification of soil arthropod samples from the experimental field showed the diversity of soil arthropod was moderate (1,523–2,868) and evenness was high (0,835–0,946). Soil arthropods found in broccoli plantation consisted of 5 classes, 11 orders and 20 families. Many soil arthropod species were found to act as detritivors and predators.

Keywords: Detritivor, plant-based, *pitfall trap*, predator.