

Effects of Botanical Insecticide from Brotowali Stem (*Tinospora crispa* L.) on Arthropod Diversity in Rice Plants (*Oryza sativa*)

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ABSTRACT

Botanical insecticide from Brotowali stems can be used as an alternative pest control method because it is safer for non-target organisms. The purpose of this study was to identify the bioactive compounds of Brotowali stems, determine the LC₉₅ toxicity, and evaluate the effects of Brotowali stem bioinsecticide application on arthropod diversity and the yield of dry grain weight in rice plants. The research was conducted at the Bioscience Laboratory, the TPB Laboratory of Politeknik Negeri Jember, and rice cultivation plots in Balung Lor Village, Jember Regency. Arthropod samples were collected using sweep nets, sticky traps, yellow pan traps, and pitfall traps. The field experiment compared two plots treated with either the active ingredient fipronil or brotowali stem bioinsecticide. GCMS results showed that the predominant compounds in brotowali stem bioinsecticide were Hexadecanoic acid (CAS) Palmitic acid (17.40%); 9-Octadecenoic acid (Z)- (CAS) Oleic acid (16.25%); and Acetic acid (CAS) Ethylic acid (11.82%). The LC₉₅ toxicity of brotowali stem bioinsecticide based on probit analysis was 40.178%. Arthropod identification revealed 2,090 individuals comprising 32 species in the brotowali bioinsecticide plot, compared to 872 individuals and 27 species in the fipronil plot. Arthropod diversity index (H) in both treatments was categorized as moderate, while the dominance index (C) indicated no dominance. Species richness (R) was moderate in both treatments, species evenness (E) was evenly distributed, and species similarity between treatments was high at 91.53%. Rice yield (dry grain weight) showed a significant difference according to the Mann-Whitney test, with brotowali bioinsecticide producing 39.8 g compared to 36.31 g with fipronil treatment.

Keywords: Botanical insecticide, Arthropods