

EE-Nano Insecticides: A Combination of Eco-Enzymes and Nano Insecticides in Taro and Basil Leaf Extracts as an Environmentally Friendly Alternative to Corn Plant Defense (*Zea mays*).

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ABSTRACT

Indonesia is known as an agricultural country because it has extensive agricultural land and plantations in its territory. One of the agricultural sector commodities in Indonesia is corn (*Zea mays L.*). Based on data from the Food and Agriculture Organization (FAO), the average Indonesian corn production in 2014-2018 was 24.27 million tons and contributed 2.19% to world corn production. However, pest and disease attacks are often the cause of failure in increasing national corn production. Efforts to control pests in corn that have been carried out so far are still unsatisfactory, especially in suppressing pest populations to a non-harmful threshold. This study aims to determine the class of active compounds contained in taro leaves and basil leaves as vegetable nano insecticides on corn plant defense. This type of research was experimental research through five stages of research, namely phytochemical screening, particle size testing, toxicity testing, effectiveness testing and plant influence testing. The phytochemical screening carried out included tests for alkaloids, flavonoids, saponins and tannins, while the particle size test was used to determine the size of the particles contained through a Particle Size Analyzer. The toxicity test on EE-Nano Insecticides used the *Brine Shrimp Lethality Test* which was calculated using the *Lethality Concentration* (LC₅₀) with the probit method. Tests on the effectiveness and effect of plants can be carried out by applying EE-Nano Insecticides with a variety of different concentrations in 5 days against the defense of corn plants. The results showed that EE-Nano Insecticides contained alkaloids, flavonoids, saponins and tannins, and the resulting particle size was 3737.6 nm with a *Polydispersity Index* (PI) value of 0.700 and an LC₅₀ value of 75.38 ppm. The smaller the LC₅₀ value of a sample, the higher the bioactive compound. This is also supported by the high pest mortality rate at 1% EE-Nano Insecticide concentration at 5 days after application and no residue left behind. Thus, EE-Nano Insecticide can be used as an environmentally friendly insecticide.

Keywords: EE-Nano Insecticide, eco-enzyme, corn (*Zea mays L.*)