ABSTRACT

DADANG MUHAMMAD HASYIM. Potential of *Piper aduncum* Fruit as Botanical Insecticide against *Crocidolomia pavonana* Larvae. Under direction of TUN TEDJA IRAWADI and DJOKO PRIJONO.

Injudicious use of synthetic insecticides can cause a variety of negative impacts on human and other nontarget organisms as well as the environment. One of the efforts to alleviate the problems is by utilizing bioactive compounds from plants as botanical insecticides. *Piper aduncum* is one of plant species that is active against insects. Insecticidal activity of its leaves has been widely reported, while that of the other plant parts including fruits has not been reported. The purpose of this research was to screen the potency of active compounds of *P. aduncum* fruits as botanical insecticide against *Crocidolomia pavonana* larvae. Sequential extraction of *P. aduncum* fruits was performed with maceration method using hexane, ethyl acetate, and methanol. The phytochemical tests of *P. aduncum* fruit extracts and leaf powder were done by qualitative method. The bioassays were conducted by a leaf-feeding method. Second-instar larvae were fed treated broccoli leaves for 48 hours, then were presented with untreated leaves until the surviving larvae reached the fourth-instar stage. The results showed that *P. aduncum* fruits contain alkaloid, flavonoid, saponin, tannin, and steroid compounds. The hexane extract of *P. aduncum* fruits had the strongest insecticidal activity against *C. pavonana* larvae (LC$_{50}$ 0.13% and LC$_{95}$ 0.26%) followed by ethyl acetate and methanol extract. Fractionation of hexane extract by column chromatography yielded ten fractions. Fraction 1 possessed the strongest insecticidal activity against *C. pavonana* larvae (LC$_{50}$ 339.35 ppm and LC$_{95}$ 768.72 ppm). Results of gas chromatography-mass spectrometry and Fourier transform infrared analysis showed that fraction 1 contains dillapiole (68.8%), myristicin (4.87%), β-sitosterol (3.24%), and piperitone (2.53%).

Keywords: *Piper aduncum*, *Crocidolomia pavonana*, botanical insecticide, dillapiole.