ABSTRAK

POTENSI RESISTENSI FUNGISIDA FLUTRIAFOL PADA JAMUR *Xylaria* sp. PENYEBAB PENYAKIT BUSUK AKAR DAN PANGKAL BATANG TEBU

Oleh

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Penyakit busuk akar dan pangkal batang (BAPB) pada tanaman tebu yang disebabkan oleh jamur *Xylaria* sp. merupakan faktor pembatas produksi gula di Indonesia. Salah satu alternatif pengendalian yang dapat dipilih adalah menggunakan fungisida, seperti fungisida flutriafol yang termasuk golongan *Demethylation Inhibitor* (DMI). Namun, penggunaan fungisida secara intensif berpotensi menimbulkan resistensi pada patogen. Penelitian ini bertujuan untuk menganalisis potensi resistensi fungisida flutriafol terhadap jamur *Xylaria* sp. Kegiatan penelitian meliputi: isolasi, penentuan nilai EC_{50}, generasi mutan resisten fungisida flutriafol, uji stabilitas resistensi, uji pertumbuhan koloni pada berbagai suhu, serta uji resistensi silang menggunakan fungisida carbendazim dan prokloraz-Mn. Berdasarkan hasil penelitian didapatkan nilai EC_{50} parental sebesar 0,35 µg/mL. Mutan hasil seleksi mampu tumbuh hingga konsentrasi 16 µg/mL, namun tidak pada 32 µg/mL. Uji EC_{50} *Xylaria* sp. mutan fungisida flutriafol subkultur ke-1 adalah 0,77 µg/mL, sedangkan EC_{50} mutan subkultur ke-10 adalah 0,32 µg/mL. Uji tingkat resistensi didapatkan nilai RF pada subkultur ke-1 sebesar 2,22 dan subkultur ke-10 sebesar 0,91 dengan nilai FSC sebesar 0,41, sehingga dikategorikan sebagai resisten sedang dan resistensi yang terbentuk belum stabil. Uji pertumbuhan pada beberapa suhu menunjukkan bahwa jamur *Xylaria* sp. parental dan mutan tahan fungisida flutriafol tumbuh optimal pada suhu 25-30 ˚C. Uji resistensi silang menunjukkan bahwa jamur *Xylaria* sp. mutan terhadap flutriafol menunjukkan adanya resistensi silang terhadap fungisida carbendazim. Hasil penelitian menunjukkan flutriafol memiliki potensi resistensi sedang terhadap *Xylaria* sp., sehingga penggunaannya perlu diikuti strategi pengelolaan resistensi yang tepat.

Kata kunci: BAPB, flutriafol, resistensi, tebu, *Xylaria* sp.

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Arina Mawadah

Root and basal stem rot (BAPB) disease in sugarcane caused by the fungus *Xylaria* sp. is a limiting factor for sugar production in Indonesia. One alternative control method is the use of fungicides, such as flutriafol, which belongs to the Demethylation Inhibitor (DMI) group; however, intensive use of fungicides has the potential to induce resistance in pathogens. This study aimed to analyze the potential resistance of *Xylaria* sp. to the fungicide flutriafol, with research activities including isolation, determination of EC50 values, generation of flutriafol-resistant mutants, resistance stability testing, colony growth assessment at different temperatures, and cross-resistance testing using carbendazim and prochloraz-Mn fungicides. The results showed that the EC50 value of the parental isolate was 0.35 µg/mL, while selected mutants were able to grow up to a concentration of 16 µg/mL but not at 32 µg/mL. The EC50 value of *Xylaria* sp. mutants at the first subculture was 0.77 µg/mL, whereas at the tenth subculture it was 0.32 µg/mL; the resistance factor (RF) values were 2.22 at the first subculture and 0.91 at the tenth subculture, with a fitness stability coefficient (FSC) of 0.41, indicating moderate resistance and that the resistance formed was not stable. Growth tests at different temperatures showed that both parental and flutriafol-resistant mutant strains of *Xylaria* sp. grew optimally at 25–30 °C, and cross-resistance testing indicated that flutriafol-resistant mutants also exhibited cross-resistance to carbendazim. Overall, these results suggest that flutriafol has a moderate resistance risk against *Xylaria* sp., and its use should be accompanied by appropriate resistance management strategies.

Keywords: BAPB, flutriafol, resistance, sugarcane, *Xylaria* sp.