

INTISARI

KARAKTERISASI VIRUS PENYEBAB PENYAKIT BELANG PADA TANAMAN LADA DAN PENGENDALIANNYA DENGAN MENGGUNAKAN JAMUR MIKORIZA

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15/392198/PPN/04049

Penyakit belang merupakan salah satu penyakit penting pada tanaman lada yang disebabkan oleh *Piper yellow mottle virus* (PYMoV). Penelitian bertujuan untuk mengetahui karakterisasi PYMoV secara biologi dan molekuler serta pengendaliannya menggunakan jamur mikoriza. Sampel tanaman lada diperoleh dari lahan petani lada di Desa Kleben, Putat, Yogyakarta dan Air Buluh, Bangka. Pengamatan ukuran partikel virus menggunakan mikroskop elektron. Kajian penularan virus meliputi penularan mekanik, vektor, stek, penyambungan, dan benih. Deteksi secara molekuler dengan metode *Polymerase chain reaction* (PCR) menggunakan pasangan primer spesifik PYMoV-F dan PYMoV-R, serta pengendalian virus dengan menggunakan jamur mikoriza koleksi laboratorium Mikrobiologi Pertanian Dasar, UGM. Pengamatan gejala dilapangan berupa gejala klorotik, belang disertai penebalan daun, *vein banding*, ukuran malai lebih pendek, ukuran buah kecil dan jumlah buah dalam dompolan sedikit. Kejadian dan intensitas penyakit lada di Desa Kleben, Patuk dan Air Buluh yaitu berturut-turut sebesar 85%, 93.7%, dan 25%, serta nilai intensitas sebesar 62,53%, 62,54%, dan 15%. Partikel virus yang ditemukan berukuran $\pm 30 \times 130$ nm berbentuk batang. Kajian penularan virus menunjukkan bahwa PYMoV dapat ditularkan melalui vektor kutu putih *Ferrisia virgata*, bahan perbanyakan vegetatif stek, penyambungan dan benih namun tidak dapat ditularkan melalui inokulasi mekanik. Hasil uji molekuler menunjukkan bahwa sampel lada Kleben, Putat dan Air Buluh positif terdeteksi PYMoV. Hasil analisis sekuen basa nukleotida menunjukkan isolat Putat dan Air Buluh memiliki nilai homologi sebesar sebesar 95% dengan PYMoV India 2, sedangkan isolat Kleben memiliki nilai homologi sebesar 96% dengan PYMoV India 1. Inokulasi JMA mampu menghambat intensitas penyakit belang sebesar 79,07%, dan mampu meningkatkan pertumbuhan tanaman diantaranya tinggi tanaman, jumlah daun, berat segar daun, berat segar batang, berat segar akar, berat kering daun, berat kering batang serta berat kering akar.

Kata kunci: tanaman lada, penyakit belang, PYMoV, PCR, JMA

ABSTRACT

CHARACTERIZATION OF VIRUS CAUSES OF MOTTLE DISEASE ON BLACK PEPPER AND CONTROL USING MIKORIZA

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Mottle disease is one of the important diseases of black pepper caused by *Piper yellow mottle virus* (PYMoV). The purpose of this research is to know the characterization of PYMoV either biologically or molecularly and its control by using mycorrhizal fungi. Sample of pepper plants from pepper farmland in Kleben, Putat, Yogyakarta and Air Buluh, Bangka. Virus particle size observations were performed with electron microscope. The virus transmission studies include mechanical inoculation, vectors, cuttings, graftings and seeds. The molecular studies by Polymerase chain reaction (PCR) method using specific primer pairs PYMoV-F and PYMoV-R, and the virus control using mycorrhizal fungus collection of Basic Agricultural Microbiology Laboratory, UGM. The results of the characteristic is chlorotic, mottled, vein banding, shorter internodes, smaller fruit and fewer fruits. The disease incidence and severity in each place showed different results, in Kleben, Patuk and Air Buluh the disease incidence consecutively around 85%, 93.7%, and 25%, and the disease intensity about 62.53%, 54%, and 15%. Observation of electron microscope showed bacilliform particle shape and known size of virus particle $\pm 30 \times 130$ nm. The studies of virus transmission showed that PYMoV can be transmitted through the Mealybug vector *Ferrisia virgata*, vegetative propagation material of cuttings, graftings, and seeds but can not be transmitted through mechanical inoculation. A molecular study showed that a positive sample of pepper Kleben, Putat and Air Buluh was detected by PYMoV primers. Based on the analysis of nucleotide base sequence, isolates Putat and Air Buluh has a homology with PYMoV India 2 about 95% while the isolate of Kleben are has a homology with PYMoV India 1 about 96%. Inoculated of JMA capable to inhibit the severity of mottle disease around 79.07%, and capable to increased leaves area and shoot biomass better than not inoculated JMA.

Keywords: black pepper, mottle disease, PYMoV, PCR, JMA