ABSTRAK

DETEKSI SIMULTAN BERBAGAI VIRUS YANG MENGINFEKSI TANAMAN CABAI RAWIT (*Capsicum frutescens* L.) DI KABUPATEN PRINGSEWU DAN TANGGAMUS

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Cabai rawit (*Capsicum frutescens* L.*)* merupakan salah satu tanaman budidaya bernilai jual tinggi yang sering digunakan sebagai bahan penambah cita rasa masakan di Indonesia. Namun, besarnya jumlah permintaan cabai rawit menyebabkan keberadaan tanaman ini mengalami fluktuasi. Dalam meningkatkan produksi, budidaya tanaman ini mengalami berbagai kendala salah satunya infeksi virus. Penelitian ini dilaksanakan dalam dua tahapan, yaitu koleksi sampel di Kabupaten Pringsewu dan Tanggamus, serta analisis molekuler di Laboratorium Bioteknologi, Jurusan Proteksi Tanaman, Fakultas Pertanian, Universitas Lampung pada bulan Oktober 2022 hingga Februari 2023. Penelitian ini bertujuan untuk mendeteksi adanya beberapa jenis virus pada cabai rawit, mengetahui karakter virus, serta mengetahui kekerabatan isolat virus yang berbeda. Penelitian ini menggunakan teknik *Multiplex Polymerase Chain Reaction* (PCR) untuk mengamplifikasi dua virus yang diduga menginfeksi tanaman cabai rawit serta untuk mendapatkan data hasil perunutan basa nukleotida yang dilanjutan dengan membandingkan isolat virus dengan isolat virus di daerah lain menggunakan *online software* BLAST. Isolat virus selanjutnya dianalisis dengan *software* MEGA 11 dan program ClustalW. Kemudian dilakukan analisis filogenetik untuk menentukan hubungan kekerabatan isolat virus divisualisasikan dengan *software* MEGA 11. Hasil deteksi menunjukkan tanaman cabai rawit asal Kabupaten Pringsewu dan Tanggamus positif terinfeksi TYLCV dan PepYLCV dengan pita spesifik ±912 bp dan ±550 bp. Karakterisasi molekuler dari isolat, Ca1 KH (PepYLCV), Ca1 SPG (TYLCV), dan Ca3 KH (PepYLCV) menunjukkan jumlah basa nukleotida secara berurutan sebesar 417 basa, 884 basa, dan 457 basa. Analisis filogenetik menunjukkan isolat Ca1 SPG (TYLCV) asal Srikaton memiliki hubungan kekerabatan dengan isolat asal Bali, sedangkan isolat Ca1 KH (PepYLCV) asal Srikaton dan Ca3 KH (PepYLCV) asal Gisting Permai dalam satu kelompok yang sama menunjukkan isolat mengarah pada spesiasi.

Kata kunci: Cabai rawit (*Capsicum frutescens* L.), Lampung, *Multiplex* PCR, *Polymerase Chain Reaction* (PCR), Virus.

ABSTRACT

SIMULTANEOUS DETECTION OF VARIOUS VIRUSES INFECTING CHILI PEPPER PLANTS (Capsicum frutescens L.) IN PRINGSEWUAND TANGGAMUS REGENCIES

By

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Chili pepper (Capsicum frutescens L.) is one of the high-value cultivated plants that is often used as an enhancer of the taste of cuisine in Indonesia. However, the large amount of demand for cayenne pepper causes the existence of this plant to fluctuate. In increasing production, the cultivation of this plant experiences various obstacles, one of which is viral infection. This research was carried out in two stages,namely sample collection in Pringsewu and Tanggamus Regencies, and molecular analysis at the Biotechnology Laboratory, Department of Plant Protection, Faculty of Agriculture, University of Lampung from October 2022 to February 2023. This study aims to detect the presence of several types of viruses in chili pepper, determine the character of the virus, and find out the kinship of different virus isolates. This study used the Multiplex Polymerase Chain Reaction (PCR) technique to amplify two viruses suspected of infecting chili pepper plants and to obtain data on the results of nucleotide base traceability which was continued by comparing virus isolates with virus isolates in other regions using online BLAST software. Virus isolates were further analyzed with MEGA 11 software and the ClustalW program. Then aphylogenetic analysis to determine the kinship relationships of virus isolates was visualized with MEGA 11 software. The detection results showed chili pepper plants from Pringsewu and Tanggamus districts were positively infected with TYLCV and PepYLCV with specific bands of ±912 bp and ±550 bp. Molecular characterization of isolates, Ca1 KH (PepYLCV), Ca1 SPG (TYLCV), and Ca3 KH (PepYLCV) shows the number of nucleotide bases respectively of 417 bases, 884 bases, and 457 bases. Phylogenetic analysis shows that Ca1 SPG (TYLCV) isolates from Srikaton are related to isolates from Bali, while Ca1 KH (PepYLCV) isolates from Srikaton and Ca3 KH (PepYLCV) from Gisting Permai in the same group showisolates showing speciation.

Keywords: *Chili pepper (Capsicum frutescens L.), Lampung, Multiplex PCR, Polymerase Chain Reaction (PCR), Virus.*