ABSTRAK

KARAKTERISASI BIOLOGI DAN EFEKTIVITAS PROTEKSI SILANG STRAIN LEMAH TERHADAP SUPER INFEKSI STRAIN GANAS *Pepper yellow leat curl virus* (PepYLCV) PADA CABAI RAWIT (*Capsicum frutescens* L.)

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Cabai rawit (*Capsicum frutescens* L.) merupakan salah satu tanaman hortikultura yang memiliki nilai ekonomi cukup tinggi. Cabai rawit banyak digunakan sebagai bumbu dan penambah cita rasa makanan karena rasa pedas yang berasal dari kandungan capsaicin. Salah satu virus yang menginfeksi cabai rawit yaitu *Pepper yellow leaf curl virus* (PepYLCV). Infeksi PepYLCV dapat menyebabkan kegagalan panen serta menimbulkan kerugian besar pada petani cabai rawit. Salah satu alternatif pengendalian yaitu dengan proteksi silang menggunakan strain lemah. Penelitian ini bertujuan untuk mendapatkan strain lemah PepYLCV yang menginfeksi populasi alami pada cabai rawit, mengetahui karakter biologi dan molekuler PepYLCV pada cabai rawit, dan mengetahui efektivitas proteksi silang strain lemah PepYLCV terhadap super infeksi strain ganas pada cabai rawit. Hipotesis yang diajukan dalam penelitian adalah infeksi proteksi silang yang berasosiasi dengan strain lemah PepYLCV dapat memproteksi tanaman cabai rawit dari super infeksi strain ganas PepYLCV. Penelitian ini dilaksanakan di Labolatorium Bioteknologi, Fakultas Pertanian, dan Labolatorium Botani Fakultas FMIPA Universitas Lampung, bulan Juli 2022 - Februari 2023. Penelitian ini menggunakan 3 tahapan yaitu inokulasi PepYLCV, analisis karakterisasi molekuler dan morfologi, serta analisis fisiologi. Data diolah dengan ANOVA dan dilanjutkan dengan uji BNJ pada taraf nyata 5%. Berdasarkan hasil penelitian diperoleh isolat C1 asal Desa Dadapan sebagai isolat lemah PepYLCV dan isolat C2 asal Desa Srikaton sebagai isolat ganas PepYLCV. Hasil isolat strain lemah menginfeksi populasi alami menunjukkan sampel terinfeksi PepYLCV berdasarkan hasil amplifikasi pita DNA spesifik. Hasil karakter biologi menunjukkan strain lemah asal Dadapan dan strain ganas asal Srikaton berdasarkan intensitas gejala, sedangkan karakter molekuler strain lemah dan ganas berbeda berdasarkan jarak genetik. Serta strain lemah mampu menekan laju infeksi strain ganas PepYLCV, berdasarkan variasi gejala, keparahan penyakit, ketahanan tanaman, kandungan klorofil, dan karbohidrat.

Kata kunci: Biologi, cabai rawit (*Capsicum frutescens* L.), *Pepper yellow leaf curl virus* (PepYLCV), proteksi silang

ABSTRACT

CHARACTERIZATION BIOLOGY AND EFFECTIVENESS CROSS PROTECTION WEAK STRAINS AGAINST SUPER INFECTION FIERCE STRAINS *Pepper yellow leat curl virus* (PepYLCV) ON CAYENNE PEPPER (*Capsicum frutescens* L.)

By

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Cayenne pepper (*Capsicum frutescens* L.) is a horticultural crop that has high economic value. Cayenne pepper is widely used as a spice and food flavor enhancer because of the spicy taste that comes from the capsaicin content. One of the viruses that infect cayenne pepper is *Pepper yellow leaf curl virus* (PepYLCV). Infection PepYLCV can cause crop failure and cause big losses to farmers Cayenne pepper. One control alternative is cross protection using weak strains. This study aims to obtain weak strains PepYLCV that infect natural populations Cayenne pepper., know the biological and molecular characters PepYLCV on Cayenne pepper, and determine the effectiveness of weak strain cross protection PepYLCV against superinfection of malignant strains in cayenne pepper. The hypothesis proposed in this study is cross-protection infection associated with weak strains PepYLCV can protect cayenne pepper plants from super-infection of malignant strains PepYLCV. This research was conducted in Laboratory Bioteknologi, Fakultas Pertanian, and Laboratory Botani Fakultas FMIPA Universitas Lampung, month July 2022 - February 2023. This study used 3 stages, namely PepYLCV inoculation, molecular and morphological characterization analysis, and physiological analysis. The data was processed using ANOVA and continued with the BNJ test at the real level 5%. Based on the research results, it was found that C1 isolate from the village Dadapan as a weak isolate PepYLCV and isolate C2 village origin Srikaton as a malignant isolate PepYLCV. The results of isolates of weak strains infecting natural populations indicate infected samples PepYLCV based on the amplification of specific DNA bands. The results of the biological characters showed a weak strain of origin Dadapan and malignant strains of origin Srikaton based on the intensity of symptoms, while the molecular characters of weak and malignant strains differ based on genetic distance. As well as weak strains capable of suppressing the rate of infection of malignant strains PepYLCV, based on a variety of symptoms, disease severity, plant resistance, chlorophyll and carbohydrate content.

Keywords: Biology, cayenne pepper (*Capsicum frutescens* L.), *Pepper yellow leaf curl virus* (PepYLCV), cross protection