

ABSTRAK

Penyakit kuning yang disebabkan oleh *Pepper Yellow Leaf Curl Virus* (PepYLCV) merupakan salah satu kendala biotik penting dalam budidaya cabai rawit (*Capsicum frutescens* L.) karena dapat menghambat pertumbuhan dan menurunkan produktivitas tanaman. Penggunaan varietas tahan merupakan salah satu pendekatan yang efektif dan berkelanjutan dalam pengendalian penyakit, sehingga diperlukan identifikasi sumber ketahanan pada plasma nutfah cabai rawit lokal. Penelitian ini bertujuan untuk mengevaluasi tingkat ketahanan beberapa varietas cabai rawit lokal terhadap penyakit kuning, mengetahui dampak infeksi terhadap karakter morfologi, fisiologi, dan anatomi tanaman, menganalisis hubungan karakter tersebut dengan perkembangan penyakit berdasarkan nilai *Area Under Disease Progress Curve* (AUDPC), serta mengidentifikasi varietas potensial sebagai calon tetua dalam program pemuliaan tanaman. Penelitian dilaksanakan pada Januari hingga Agustus 2025 menggunakan Rancangan Acak Kelompok (RAK) dengan satu faktor perlakuan berupa sembilan varietas cabai rawit lokal, yaitu Blitar, Cangar, Hiyung, Maros, Merapi, Minahasa, Rengganis, Sret, dan Taringe, dengan tiga ulangan. Pengamatan meliputi insidensi dan intensitas penyakit, nilai AUDPC, populasi kutu kebul (*Bemisia tabaci*), karakter morfologi, fisiologi, anatomi, dan komponen hasil. Data dianalisis menggunakan analisis ragam (ANOVA), uji Duncan's Multiple Range Test (DMRT) pada taraf 5%, serta analisis jalur (*path analysis*). Hasil penelitian menunjukkan adanya perbedaan tingkat ketahanan antarvarietas terhadap penyakit kuning. Varietas Hiyung dan Minahasa tergolong sangat rentan, Blitar, Maros, dan Rengganis tergolong rentan, Cangar dan Sret tergolong agak rentan, sedangkan Merapi dan Taringe tergolong tahan. Nilai AUDPC terendah diperoleh pada varietas Merapi sebesar 291,67, sedangkan nilai tertinggi diperoleh pada varietas Minahasa sebesar 3.850,00. Perbedaan varietas juga memengaruhi beberapa karakter morfologi, fisiologi, dan anatomi tanaman. Karakter morfologi yang menunjukkan perbedaan meliputi tinggi tanaman, jumlah daun, dan luas daun, sedangkan karakter fisiologi menunjukkan perbedaan pada kandungan klorofil dan kadar gula. Pada karakter anatomi, perbedaan terutama terdapat pada kerapatan stomata, ukuran parenkim, dan ketebalan daun. Analisis jalur menunjukkan adanya hubungan antara karakter tanaman dan faktor eksternal dengan perkembangan penyakit berdasarkan nilai AUDPC. Berdasarkan keseluruhan hasil evaluasi, varietas Merapi dan Taringe merupakan sumber ketahanan terhadap penyakit kuning, sedangkan varietas Taringe, Merapi, dan Cangar berpotensi digunakan sebagai calon tetua dalam program pemuliaan cabai rawit.

Kata kunci : AUDPC, *Bemisia tabaci*, cabai rawit lokal, ketahanan penyakit, *Pepper Yellow Leaf Curl Virus Disease*.

ABSTRACT

Yellow leaf curl disease caused by *Pepper Yellow Leaf Curl Virus* (PepYLCV) is one of the major biotic constraints in chili pepper (*Capsicum frutescens* L.) cultivation because it can inhibit plant growth and reduce crop productivity. The use of resistant varieties is an effective and sustainable approach to disease management; therefore, the identification of resistance sources in local chili pepper germplasm is essential. This study aimed to evaluate the resistance levels of several local chili pepper varieties to yellow leaf curl disease, determine the effects of infection on plant morphological, physiological, and anatomical characteristics, analyze the relationships between these characteristics and disease development based on the *Area Under the Disease Progress Curve* (AUDPC), and identify promising varieties as potential parents for breeding programs. The study was conducted from January to August 2025 using a Randomized Complete Block Design (RCBD) with a single treatment factor consisting of nine local chili pepper varieties, namely Blitar, Cangar, Hiyung, Maros, Merapi, Minahasa, Rengganis, Sret, and Taringe, with three replications. Observations included disease incidence and severity, AUDPC, whitefly (*Bemisia tabaci*) population, morphological, physiological, and anatomical characteristics, and yield components. Data were analyzed using analysis of variance (ANOVA), Duncan's Multiple Range Test (DMRT) at the 5% significance level, and path analysis. The results showed differences in resistance levels among the tested varieties against yellow leaf curl disease. Hiyung and Minahasa were classified as highly susceptible, Blitar, Maros, and Rengganis as susceptible, Cangar and Sret as moderately susceptible, while Merapi and Taringe were classified as resistant. The lowest AUDPC value was recorded in Merapi (291.67), whereas the highest value was observed in Minahasa (3,850.00). The varieties also differed in several morphological, physiological, and anatomical characteristics. The morphological characteristics that differed among varieties included plant height, number of leaves, and leaf area, while physiological characteristics differed in chlorophyll content and sugar content. Anatomically, differences were mainly observed in stomatal density, parenchyma size, and leaf thickness. Path analysis indicated relationships between plant characteristics and external factors with disease development based on AUDPC values. Overall, Merapi and Taringe were identified as sources of resistance to yellow leaf curl disease, while Taringe, Merapi, and Cangar showed potential for use as parental lines in chili pepper breeding programs.

Keywords : AUDPC, *Bemisia tabaci*, local chili pepper, disease resistance, Pepper Yellow Leaf Curl Virus Disease.