ABSTRAK

PEMANFAATAN RADIASI SINAR ULTRAVIOLET SEBAGAI INDUKSI KETAHANAN TANAMAN LADA (*Piper nigrum* L.) TERHADAP PENYAKIT BUSUK PANGKAL BATANG LADA

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Penelitian ini bertujuan untuk mengetahui kemampuan radiasi sinar ultraviolet dalam menginduksi ketahanan tanaman lada terhadap *Phytophthora capsici* dan meningkatkan ketahanan bibit lada Natar 1 terhadap penyakit busuk pangkal batang lada (BPBL) melalui pemanfaatan radiasi sinar ultraviolet. Penelitian dilakukan pada bulan Mei 2025 hingga Januari 2026, di Laboratorium Bioteknologi Pertanian dan Rumah Kaca Laboratorium Lapang Terpadu, Fakultas Pertanian, Universitas Lampung. Penelitian menggunakan rancangan acak lengkap (RAL) dengan 6 perlakuan yaitu radiasi sinar UV selama 10, 20, 30, dan 60 menit, serta 2 perlakuan kontrol yaitu K (+) dan K (-), masing-masing dengan 3 ulangan. Benih lada varietas Natar 1 diradiasi menggunakan sinar UV-C dengan gelombang 254 nm, kemudian disemai pada media tanam yang diinokulasikan *P. capsici*, kecuali pada perlakuan K (-). Variabel yang diamati meliputi persentase perkecambahan, kecepatan/waktu berkecambah, keterjadian penyakit *damping off*, kemunculan daun kotiledon, ukuran daun sejati, kehijauan daun, persentase bibit normal dan abnormal, keterjadian bibit lada yang bergejala bercak daun, serta isolasi bibit lada yang bergejala bercak daun. Hasil penelitian menunjukkan bahwa radiasi sinar UV berpengaruh nyata terhadap persentase perkecambahan, kemunculan dan pertumbuhan daun, pertumbuhan bibit lada secara normal, serta mampu menekan keterjadian penyakit *damping off* dan bercak daun dibandingkan perlakuan kontrol. Perlakuan radiasi sinar UV selama 10, 20, dan 30 menit menunjukkan hasil terbaik dalam meningkatkan ketahanan bibit lada Natar 1 terhadap *P. capsici*. Dengan demikian, pemanfaatan radiasi sinar ultraviolet dapat digunakan sebagai metode induksi ketahanan tanaman lada terhadap penyakit BPBL.

Kata kunci: induksi ketahanan tanaman, radiasi sinar UV, *Phytophthora capsici*, tanaman lada, varietas tahan.

ABSTRACT

UTILIZATION OF ULTRAVIOLET RADIATION TO INDUCE RESISTANCE IN BLACK PEPPER (Piper nigrum L.) AGAINST FOOT ROT DISEASE

By

Hengki Fernando

This study aimed to determine the ability of ultraviolet (UV) radiation to induce resistance in black pepper plants against Phytophthora capsici and to enhance the resistance of Natar 1 pepper seedlings to foot rot disease through the application of UV radiation. The research was conducted from May 2025 to January 2026 at the Agricultural Biotechnology Laboratory and the Integrated Field Laboratory Greenhouse, Faculty of Agriculture, University of Lampung. The experiment employed a Completely Randomized Design (CRD) with six treatments: UV radiation exposure for 10, 20, 30, and 60 minutes, along with two control treatments, K (+) and K (-), each with three replications. Seeds of the Natar 1 variety were exposed to UV-C radiation at a wavelength of 254 nm, then sown in growing media inoculated with P. capsici, except for the K (-) treatment. Observed variables included germination percentage, germination rate/time, incidence of damping-off disease, cotyledon emergence, true leaf size, leaf greenness, percentage of normal and abnormal seedlings, incidence of leaf spot symptoms, and isolation of symptomatic seedlings. The results showed that UV radiation had a significant effect on germination percentage, leaf emergence and growth, normal seedling development, and was able to suppress the incidence of damping off and leaf spot diseases compared to the control treatment. UV radiation treatments for 10, 20, and 30 minutes produced the best results in enhancing the resistance of Natar 1 pepper seedlings against P. capsici. In conclusion, ultraviolet radiation can be utilized as a method to induce resistance in black pepper plants against foot rot disease.

Keywords: *induced plant resistance, UV radiation, Phytophthora capsici, black pepper, resistant variety.*