PENGARUH LAMPU LED DENGAN VARIASI WARNA PADA GERMINASI BENIH UMBI KATAK PORANG DAN PERTUMBUHAN TANAMAN PORANG (*Amorphophallus muelleri*) PADA FASE VEGETATIF

INTISARI

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Porang (*Amorphophallus muelleri* B) memiliki potensi dan prospek untuk terus dikembangkan. Budidaya intensif dilakukan sebagai salah satu strategi pengembangan komoditi porang untuk meningkatkan jumlah produksi. Pencahayaan yang optimum dalam budidaya tanaman diperlukan untuk memberikan hasil terbaik. Penggunaan lampu LED dapat digunakan sebagai alternatif pencahayaan untuk tanaman porang dalam ruang terkendali. Penelitian ini menggunakan biji katak porang sebagai materi pembibitan tanaman. *Growth chamber* dengan lampu LED merah, biru, putih, dan LED kombinasi merah:biru:putih digunakan sebagai lingkungan penyemaian dan penanaman biji katak porang. Tiga puluh hari pertama, dilakukan pengukuran parameter germinasi; persen germinasi (GP %), *mean germination time* (MGT), *germination rate index* (GRI), *coefficient velocity germination* (CVG), dan *germination index* (GI). Tiga puluh hari kedua dilakukan untuk mengamati parameter pertumbuhan vegetatif tanaman. Data hasil dianalisa menggunakan uji Kruskal Wallis, MANOVA, uji T-test, analisis korelasi Spearman, dan model polinomial. Berdasarkan penelitian, lampu LED kombinasi memberikan pengaruh paling baik dibandingkan perlakuan lain pada parameter germinasi dan pertumbuhan vegetatif tanaman porang, dengan nilai GP 100%; MGT 17,2 hari; GRI 6,33%/hari; CVG 5,81%, dan GI 138,0. Sementara itu, tinggi tanaman dibawah penyinaran LED kombinasi sebesar 29,64 cm; diameter tajuk 11,43 cm; panjang akar 21,96 cm; bobot basah tanaman 17,342 dengan berat kering 1,368 dan parameter warna daun merah dan biru dengan nilai 47,40 dan 57,53. Model prediksi tinggi tanaman dibuat untuk pendugaan hasil tanaman yang lebih baik. Koefisien determinasi (R^2), deviasi akar kuadrat rata-rata (RMSE), kesalahan absolut rata-rata (MAE), dan kesalahan persentase absolut rata-rata (MAPE), sebesar 0,9854; 0,6894; 1,2623; dan 3,9413, masing-masing untuk model validasi, ditetapkan sebagai model terbaik pada perlakuan kombinasi LED.

Kata Kunci: Porang, lampu LED, germinasi, umbi katak, pertumbuhan vegetatif.

EFFECT OF LED LIGHTS WITH VARIATION OF COLORS ON SEED GERMINATION OF PORANG BULBIL AND GROWTH OF PORANG PLANT (*Amorphophallus muelleri*) IN THE VEGETATIVE PHASE

ABSTRACT

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Porang (Amorphophallus muelleri B) has potential and prospects to be developed. Intensive cultivation is one of the strategies for developing porang commodities to increase production. Optimum lighting in plant cultivation is needed to give the best results. LED lights can be used as alternative lighting for porang plants in controlled spaces. This study used porang bulbil as plant nursery material. The research method used was a growth chamber with 100% red, 100% blue,100%white, and red:blue:white combination LED lights as the environment for seeding and planting bulbil. Observations were made for thirty days to measure germination percentage germination parameters (GP %), mean germination time (MGT), germination rate index (GRI), germination velocity coefficient (CVG), and germination index (GI). Light intensity, room temperature and humidity, plant height, crown diameter, root length, leaf color, and wet and dry weight were measured in the following thirty days. The next thirty days of measurement are carried out to observe light intensity, room temperature and humidity, plant height, crown diameter, root length, leaf color, and wet-dry weight parameters of plant vegetative growth. The result was analyzed using Kruskal Wallis, MANOVA, T-test, Spearman's correlation, and the polynomial model. Results based on the research stated that the red:blue:white combination of LED had the best effect compared to other treatments on the parameters of germination and vegetative growth of porang plants, with a GP value of 100%; MGT 17.2 days; GRI 6.33%/day; CVG 5.81%, and GI 138.0. Meanwhile, under combination LED illumination, the plant height was 29.64 cm, the crown diameter was 11.43 cm, the root length was 21.96 cm, the wet weight was 17.342 g with a dry weight of 1.368 g, and the red and blue leaf color parameters had values of 47.40 and 57.53, respectively, when compared to other LED treatments. The plant height prediction model is performed for better prediction of crop yield. The coefficient of determination (R^2), the root mean square deviation (RMSE), the mean absolute error (MAE), and the average absolute percentage error (MAPE), with 0.9854; 0,6894; 1,2623; and 3,9413, respectively, for validation model are defined as the best model under the combination of LED.

Keywords: Porang, LED light, germination, porang seedlings, vegetative growth.