PERANCANGAN SISTEM PENGENDALI SUHU DAN KELEMBABAN MINIATUR KUMBUNG JAMUR TIRAM MENGGUNAKAN MIKROKONTROLER WEMOS D1 BERBASIS *INTERNET OF THINGS* (IOT)

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ABSTRAK

Penelitian ini bertujuan merancang sistem pengendalian serta pemantauan suhu dan kelembaban pada miniatur kumbung jamur menggunakan mikrokontroler Wemos D1 berbasis internet, melakukan pengendalian suhu dan kelembaban selama pertumbuhan jamur, serta mengukur tingkat pertumbuhan dan perkembangan jamur. Penelitian ini menggunakan metode eksperimental dengan percobaan di Kelurahan Tanjung Karang Permai, Kecamatan Sekarbela, Kota Mataram. Data penelitian dianalisa menggunakan aplikasi Ms. Excel. Hasil kalibrasi sensor suhu DHT11 dengan higrometer pada air hangat menunjukkan persamaan linieritas $y = 0{,}0421x^2-1{,}9057x+51{,}395$ dan $R^2 = 0{,}9573$, sedangkan untuk air dingin menunjukkan persamaan linieritas $y = 0{,}4585x+10{,}66$ dan $R^2 = 0{,}9857$. Untuk kalibrasi kelembaban udara menggunakan higrometer menunjukkan nilai persamaan linieritas $y = 0{,}0013x^2-0{,}2195X+77{,}194$ dan $R^2 = 0{,}9438$. Pengujian sistem pengendali suhu dan kelembaban dilakukan pada *setting point* suhu 28°C dan kelembaban 85%. Hasil pengujian menunjukkan jamur tanpa perlakuan berwarna kekuningan, kering, dan keras. Sedangkan dengan perlakuan, jamur terlihat berwarna putih, dan basah. Jumlah jamur dengan perlakuan lebih banyak dan tumbuh merata dibandingkan tanpa perlakuan. Berdasarkan hasil penelitian dapat disimpulkan bahwa sistem pengendalian dapat mengatur suhu dan kelembaban serta dapat memantau melalui *handphone* dengan aplikasi Blynk.

Kata kunci: aplikasi Blynk, jamur, mikrokontroler Wemos D1, sensor DHT11

DESIGN OF TEMPERATURE AND HUMIDITY CONTROL OF OYSTER MUSHROOMS MINIATURE USING WEMOS D1 MICROCONTROLLER BASED ON INTERNET OF THINGS (IOT)

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ABSTRACT

This research aimed to design a control and monitoring system of temperature and humidity in a mushroom kumbung miniature using internet-based Wemos D1 microcontroller, controlling temperature and humidity during mushroom growth, and measuring the rate of growth and development of fungi. This study used an experimental method in Tanjung Karang Permai Sub-District, Sekarbela District, Mataram City. Research data were analyzed using Ms. Excel application. The results of DHT11 temperature sensor calibration on hygrometer with warm water showed linearity equation $y = 0.0421x^2-1.9057x + 51.395$ and $R^2 = 0.9573$, while for the cold water showed linearity equation $y = 0.4585x + 10.66$ and $R^2 = 0.9857$. Humidity calibration using hygrometer showed linearity equation $y = 0.0013x^2-0.2195X + 77.194$ and $R^2 = 0.9438$. The temperature and humidity control system was tested at setting point temperature of 28°C and humidity of 85%. The test results showed that mushrooms without controll system were yellowish, dry, and hard texture. Whereas with treatment, the fungus appeared white, wet, and soft texture. The number of mushrooms with treatments were higher and grew more evenly compared with without treatment. Based on the results of the study it can be concluded that the control system could regulate temperature and humidity inside mushroom kumbung also could monitor them through mobile phones with Blynk application.

Keywords: Blynk application, mushroom, Wemos D1 microcontroller, DHT11 sensor