RINGKASAN

Biji jali (*Coix lacryma-jobi L*.) merupakan serealia lokal yang berpotensi sebagai bahan pangan alternatif, namun proses pengeringannya masih dilakukan secara konvensional dan bergantung pada cuaca. Ketidakstabilan suhu dan kelembapan menyebabkan waktu pengeringan lebih lama serta memengaruhi mutu bahan. Penerapan *Solar Dome Dryer* (SDD) berbasis *Internet of Things* (IoT) menjadi solusi untuk melakukan monitoring dan kontrol suhu serta kelembapan secara *real-time*.

Penelitian ini bertujuan untuk memonitoring dan mengontrol suhu serta kelembapan udara pada SDD berbasis IoT serta menganalisis pengaruhnya terhadap laju pengeringan dan penurunan kadar air biji jali dibandingkan metode konvensional. Sistem menggunakan sensor DHT22, mikrokontroler ESP32, *fan heater*, dan *exhaust* yang terintegrasi dengan *platform* Ubidots. Analisis dilakukan melalui kalibrasi sensor, perhitungan kadar air, dan uji ANOVA. Hasil menunjukkan bahwa metode SDD menurunkan kadar air dari 41,9% menjadi 12% dalam 6 jam, sedangkan metode konvensional memerlukan 48 jam dari 41,8% menjadi 12%. Dengan demikian, SDD berbasis IoT lebih efektif dan efisien dalam proses pengeringan biji jali.

Kata kunci: Biji Jali, *Solar Dome Dryer*, *Internet of Things*, Suhu, Kelembapan.

SUMMARY

Job's Tears (Coix lacryma-jobi L.) are local cereals with potential as alternative food sources; however, their drying process is still conducted conventionally and remains weather-dependent. Fluctuations in temperature and humidity result in longer drying times and affect the quality of the material. The implementation of an Internet of Things (IoT)-based Solar Dome Dryer (SDD) serves as a solution for real-time monitoring and control of temperature and humidity.

This study aims to monitor and control air temperature and humidity within an IoT-based SDD and to analyze its influence on the drying rate and moisture content reduction of Job's Tears compared to conventional methods. The system utilizes DHT22 sensors, an ESP32 microcontroller, fan heaters, and exhaust fans integrated with the Ubidots platform . Analysis was performed through sensor calibration, moisture content calculations, and ANOVA testing. The results indicated that the SDD method reduced moisture content from 41.9% to 12% within 6 hours, whereas the conventional method required 48 hours to reach 12% from an initial 41.8%. Thus, the IoT-based SDD is more effective and efficient for the drying process of Job's tears.

Keywords: *Job's Tears, Solar Dome Dryer, Internet of Things, Temperature and Humidity.*