

ABSTRAK

RANCANG BANGUN ALAT BANTU DEHUMIDIFIKASI MADU TRIGONA MENGGUNAKAN *PULSE WIDTH MODULATION* (PWM) *DIMMER* SEBAGAI PENGENDALI KECEPATAN *FAN DC* DI PT SUHITA LEBAH INDONESIA

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Rancang bangun alat bantu dehumidifikasi madu trigona telah direalisasikan menggunakan *pulse width modulation* (PWM) *dimmer* sebagai pengendali kecepatan *fan DC* dengan variasi *duty cycle* 30%, 50%, dan 100%. Penelitian ini bertujuan untuk mengembangkan alat pengurang kadar air madu trigona dan mengevaluasi efektivitasnya. Hasil menunjukkan bahwa variasi *duty cycle* 100% efektif menurunkan kadar air madu sesuai standar PT. Suhita Lebah Indonesia. Alat dehumidifikasi mampu menurunkan kadar air madu dari 32,0% menjadi 23,0% (penurunan 9,0%) dalam 3 jam, sementara tanpa alat bantu dehumidifikasi, kadar air hanya turun menjadi 29,0% (penurunan 3,0%). Madu trigona dikenal memiliki keistimewaan di bidang kesehatan, seperti kaya akan antioksidan dan memiliki sifat antimikroba serta anti-inflamasi yang kuat, menjadikannya bermanfaat dalam meningkatkan sistem kekebalan tubuh dan menyembuhkan luka. Alat dehumidifikasi madu trigona ini tiga kali lebih efektif dibandingkan metode pengurangan kadar air tanpa alat bantu dehumidifikasi, serta lebih efisien dan sesuai dengan standar produksi yang diinginkan.

Kata kunci: Dehumidifikasi, madu trigona, *PWM Dimmer*, *duty cycle*, *fan DC*, kadar air, efisiensi.

ABSTRACT

DESIGN AND CONSTRUCTION OF TRIGONA HONEY DEHUMIDIFICATION AID USING PULSE WIDTH MODULATION (PWM) DIMMER FOR CONTROLLING DC FAN SPEED CONTROLLER AT PT SUHITA LEBAH INDONESIA

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The design and construction of a dehumidification aid for trigona honey have been realized using a pulse width modulation (PWM) dimmer as a DC fan speed controller with duty cycle variations of 30%, 50%, and 100%. This study aims to develop a tool to reduce the water content of trigona honey and evaluate its effectiveness. The results show that the 100% duty cycle variation effectively reduces the water content of honey according to the standards of PT. Suhita Lebah Indonesia. The dehumidification tool was able to reduce the water content of honey from 32.0% to 23.0% (a decrease of 9.0%) in 3 hours, while without the dehumidification aid, the water content only decreased to 29.0% (a decrease of 3.0%). Trigona honey is known for its health benefits, such as being rich in antioxidants and having strong antimicrobial and anti-inflammatory properties, making it beneficial for boosting the immune system and healing wounds. This trigona honey dehumidification tool is three times more effective than methods without a dehumidification aid, as well as being more efficient and meeting the desired production standards.

Keyword: *Dehumidification, Trigona honey, PWM dimmer, duty cycle, DC fan, water content, efficiency.*