

ABSTRAK

Akbar Afri Maulana. Rancang Bangun Alat Pembasmi Nyamuk Menggunakan Metode *UV Light* dan *Fan Blower* Dengan Campuran Zat Larvasida Berbasis Arduino Nano. Dibimbing oleh Hendrianto Husada, Ir., M.T

Kondisi cuaca tropis di Indonesia yang ditandai dengan suhu hangat dan kelembapan udara tinggi sangat mendukung perkembangbiakan nyamuk, terutama pada musim hujan ketika banyak terbentuk genangan air sebagai habitat larva. Peningkatan populasi nyamuk berkontribusi terhadap penyebaran berbagai penyakit berbahaya seperti Demam Berdarah Dengue (DBD), malaria, dan filariasis yang masih menjadi permasalahan kesehatan masyarakat. Metode pengendalian nyamuk konvensional seperti penggunaan insektisida kimia dan fogging memiliki keterbatasan berupa pencemaran lingkungan, resistensi nyamuk, serta efektivitas yang hanya bersifat jangka pendek. Oleh karena itu, penelitian ini bertujuan untuk merancang dan membangun alat pembasmi nyamuk yang lebih efektif, ramah lingkungan, dan hemat energi dengan mengombinasikan metode UV light, fan blower, dan larvasida berbasis Arduino Nano. Alat yang dikembangkan menggunakan lampu ultraviolet sebagai pemikat nyamuk dewasa, fan blower sebagai mekanisme penangkap, serta sistem penyemprotan larvasida otomatis menggunakan pompa DC untuk memutus siklus hidup nyamuk. Sistem ini dilengkapi sensor DHT11 untuk pemantauan suhu dan kelembapan serta sensor INA219 untuk monitoring konsumsi daya listrik secara *real-time*. Hasil penelitian menunjukkan bahwa kombinasi UV light dan fan blower efektif meningkatkan jumlah nyamuk dewasa yang tertangkap, sementara larvasida membantu mencegah perkembangan larva. Alat ini bekerja dengan konsumsi energi rendah dan stabil sehingga berpotensi menjadi solusi alternatif pengendalian nyamuk yang berkelanjutan

Kata kunci: Arduino Nano, fan blower, larvasida, nyamuk, UV light

ABSTRACT

Akbar Afri Maulana. Design and Development of a Mosquito Extermination Device Using UV Light and Fan Blower with Larvicide Mixture Based on Arduino Nano. Supervised by Hendrianto Husada, Ir., M.T

Tropical weather conditions in Indonesia, characterized by warm temperatures and high humidity, strongly support mosquito breeding and population growth, especially during the rainy season when stagnant water becomes an ideal habitat for larvae. The increasing mosquito population contributes to the transmission of dangerous diseases such as Dengue Hemorrhagic Fever (DHF), malaria, and filariasis, which remain major public health concerns. Conventional mosquito control methods, including chemical insecticides and fogging, have several limitations such as environmental pollution, mosquito resistance, and short-term effectiveness. Therefore, this study aims to design and develop an environmentally friendly, effective, and energy-efficient mosquito extermination device by combining ultraviolet (UV) light, a fan blower trapping mechanism, and larvicide application based on an Arduino Nano microcontroller. The developed system utilizes a UV lamp to attract adult mosquitoes, a fan blower to capture them into a container, and an automatic larvicide spraying system using a DC pump to disrupt the mosquito life cycle. The device is equipped with a DHT11 sensor to monitor temperature and humidity conditions, as well as an INA219 sensor for real-time electrical power consumption monitoring. Operational data are recorded automatically using Python programming in Visual Studio Code and stored in Microsoft Excel format. Testing was conducted over seven consecutive days with an operating duration of eight hours each night. The results indicate that the combination of UV light and fan blower significantly improves adult mosquito capture, while larvicide effectively prevents larvae development. In addition, the device operates with low and stable energy consumption, making it a promising alternative solution for sustainable mosquito control

Keywords: *Arduino Nano , fan blower, larvicide , mosquito, UV light.*