

RANCANG BANGUN PROTOTIPE ASPIRATOR NYAMUK ELEKTRIK

Anggit Prihatnolo¹, Tri Baskoro Tunggul Satoto¹, Alva Edy Tontowi²

¹Magister Ilmu Kedokteran Tropis, Fakultas Kedokteran, Kesehatan Masyarakat,
dan Keperawatan, Universitas Gadjah Mada Yogyakarta

²Fakultas Teknik, Universitas Gadjah Mada Yogyakarta

Email: anggitprihatnolo@yahoo.co.id

INTISARI

Latar belakang: Survei entomologi vektor stadium dewasa digunakan untuk menentukan perubahan distribusi geografis dan kepadatan vektor, begitu pula evaluasi program pengendalian, pengukuran relatif dari populasi vektor dari waktu ke waktu dan memfasilitasi secara tepat dalam penentuan intervensi yang tepat waktu. Dalam penerapannya, metode ini mengalami permasalahan *etical clearance* ketika dihadapkan pada risiko petugas dilapangan untuk tertular penyakit, sehingga kebijakan terkini lebih mengutamakan untuk menerapkan *human landing collection* dengan tingkat keberhasilan rendah, oleh karena itu diperlukan adaptasi alat penangkap nyamuk yang dapat dibuat secara mandiri dan dapat digunakan sebagai alternatif metode survei nyamuk.

Metode: Penelitian ini merupakan penelitian Eksperimen yang bertujuan mendesain dan membuat prototipe aspirator elektrik serta menguji aspek performa teknik dan fungsi prototipe dengan skala laboratorium. Penelitian melibatkan 100 responden untuk menjaring “*need*” yang menjadi dasar menyusun spesifikasi teknis dan mendesain prototipe alat ini berdasarkan *metode quality function deployment* (QFD). Variabel yang diuji yaitu kecepatan isap alat, kemampuan menangkap nyamuk, keutuhan spesimen nyamuk. Analisa data dengan mean, dan persentase.

Hasil: Telah didesain dan dibuat prototipe aspirator elektrik sesuai spesifikasi “*customer need*” dengan biaya sebesar Rp. 2.867.000 per unitnya. Prototipe aspirator elektrik mampu mengisap hingga jarak 5,5 cm dari tepi *inlet* dengan kecepatan isap 7,7 meter/detik. Seluruh spesiemn nyamuk berhasil ditangkap melalui skema tekan tombol 30 kali dengan tingkat kerusakan hanya 8% per 1000 ekor nyamuk. Rentang kecepatan isap antara 4,9-5,6 meter/detik paling optimum dengan tangkapan nyamuk maksimal dan persentasi keutuhan nyamuk tinggi

Kesimpulan: Prototipe aspirator berhasil di desain dan dibuat. Simulasi pengujian menunjukkan aspirator elektrik mampu menangkap seluruh spesimen nyamuk, namun ada sebagian kecil spesimen nyamuk yang mengalami kerusakan pada bagian sayap dan kaki. Alat ini ini sangat bermanfaat untuk menunjang program *monitoring* vektor, penelitian bidang entomologi dan evaluasi pengendalian penyakit tular vektor.

Kata kunci: Desain, *prototipe*, *aspirator*, *elektrik*, *DBD*, *Aedes aegypty*, *Anopheles sp.*

DESIGNING PROTOTYPE OF ELECTRICAL MOSQUITO ASPIRATOR

Anggit Prihatnolo¹, Tri Baskoro Tunggul Satoto¹, Alva Edy Tontowi².

¹ Tropical Medicine, Faculty of Medicine, Public Health, and Nursing,
Universitas Gadjah Mada Yogyakarta

² Faculty of Engineering, Universitas Gadjah Mada Yogyakarta
Email: anggitprihatnolo@yahoo.co.id

ABSTRACT

Background: Adult stage vector entomological surveys are used to determine changes in geographic distribution and vector density, as well as evaluation of control programs, relative measurements of vector populations over time and facilitate precisely in the determination of timely interventions. In practice, this method is experiencing problems of ethical clearance when faced with the risk of field officers for contracting the disease, so that the latest policy is prioritized to apply human landing collection with low success rate, therefore it is necessary to adapt the mosquito catcher which can be made independently and can be used as an alternative to mosquito survey methods.

Method: This is an experimental research aimed to designing and making prototype of electric aspirator as well as testing aspects of engineering performance and prototype function with laboratory scale. The study involves 100 respondents to capture the "need" on which to establish the technical specifications and design the prototype of this tool based on the method of quality function deployment (QFD). The variables tested include tool suction speed, capable of mosquito specimen capture, wholeness of mosquito specimen. Analyze data with mean, and percentage.

Result: It has been designed and made a prototype of electric aspirator as per "customer need" specification with cost Rp. 2,867,000 per unit. The prototype electric aspirator is capable of sucking up to a distance of 5.5 cm from the inlet edge with a suction speed of 7.7 meters / sec. All mosquito specimen were successfully captured with a 30-button keystrokes scheme with a damage rate of only 8% per 1000 mosquitoes. Suction speed range between 4,9-5,6 meters/second bring in the maximum mosquito catches and high percentage of undamaged mosquito.

Conclusion: The prototype aspirator was successfully designed and manufactured. The test simulation showed that electric aspirators were able to catch the entire specimen of mosquitoes, but there were a few specimens of mosquitoes damaged on the wings and legs. This tool is very useful to support vector monitoring program, research in health entomology and evaluation of vector disease control

Keywords: *Design, prototype, aspirator, electrically, DBD, Aedes aegypti Anopheles sp.*