UNIVERSITI TEKNOLOGI MARA

EFFECT OF LARVAL DENSITY AND SURFACE AREA ON DEVELOPMENT RATES OF *AEDES ALBOPICTUS* (SKUSE) (DIPTERA: CULICIDAE) IN POLYSTYRENE CONTAINER

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Project submitted in fulfillment of the requirements for the degree of
Bachelor in Environmental Health and Safety (Hons.)

Faculty of Health Sciences

DECLARATION BY STUDENT

Project entitled "Effect of Larval Density and Surface Area on Development Rates of *Aedes Albopictus* (Skuse) (Diptera: Culicidae) in Polystyrene Container" is a presentation of my original research work. Whenever contributions of others are involved, every effort is made to indicate this clearly, with due reference to literature, and acknowledgement of collaborative research and discussions. The project was done under the guidance of Project Supervisor Dr. Nazri Che Dom. It has been submitted to the Faculty of Health Sciences in partial fulfilment of the requirement for the Degree of Bachelor in Environmental Health and Safety (Hons).

Student's Signature:

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In the name of Allah, The Most Gracious, The Most Merciful.

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ABSTRACT

Dengue is a threat to public health as the *Aedes* species are adapting to the changing ecology and it was found breeding in varies sorts of breeding containers over the times. Laboratory strains of *Aedes albopictus* were reared in control condition under different larval densities and surface area of polystyrene containers to compare their development in the immature and adult stage. This study found that the duration of fifty percent time to pupation of *Ae. albopictus* is between 6.00 to 10.00 days with shortest time in polystyrene container, C1 with 150 larvae/cm^2 at day 6.67. Meanwhile, the duration of adult emergence was the fastest in polystyrene container, C1 with 150 larvae/cm^2 at day 9.00 with averaged 9.0 to 12.00 days in other treatment. Two-Way ANOVA was used as the larval density significantly impacted the juvenile size and wing size. Polystyrene container, C1 was recorded as the smallest size with 150 larvae/cm^2: 5.92 mm for juvenile size and 2.03 mm for wing size. As for the larval development between larval density and surface area containers, there is statistically significant ($p < 0.05$). In addition, the mortality rate of larval in the polystyrene container, C1 was recorded as the highest mortality rates (2 % to 3.78%). The data indicate that competition within larval environment may indirectly regulate *Aedes* populations by reducing body size, which may in turn reduce survivorship. Thus, this could act as a point in recognizing the pattern of *Aedes* reproduction to planning vector control measure in Malaysia.

Keywords: *Aedes, larval densities, surface area, time to pupation, adult emergence, mortality, juvenile size, wing size*