

Title : Effects of light pollution on the life cycle of urban mosquito, *Aedes aegypti* (Diptera: Culicidae)

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ABSTRACT

Currently, the increasing use of Artificial Light at Night (ALAN) disrupts the life cycles of many organisms, including *Aedes aegypti*, a mosquito species living in urban areas that transmits diseases such as Dengue and Zika virus. However, few studies have investigated how ALAN influences the developmental processes of mosquitoes. This study aims to observe the developmental time and wing length of *Ae. aegypti* larvae to the adult stage under different photoperiods. Larval *Ae. aegypti* from a laboratory strain (PMD-R) were reared in plastic containers with a water volume of 300 mL and 30 larvae per condition under two different lighting conditions: natural light and artificial light. Natural light conditions were provided in the rearing room, which received natural light. The artificial light treatment involved three enclosed plastic containers (60 cm × 80 cm × 100 cm, with an average light intensity of about 500 lux) illuminated by LED lamps (10 watts) under distinct photoperiod conditions (light: dark ratios): 8:16 hours, 12:12 hours, and 20:4 hours, with three replications per condition. As a result, the developmental time of *Ae. aegypti* reared in the three containers under artificial light was significantly shorter than that under natural light (Natural = 17.45 ± 0.50 days, 8h:16h = 16.50 ± 1.05 days, 12h:12h = 16.26 ± 0.70 days, 20h:4h = 15.62 ± 0.37 days). Moreover, the wing length of *Ae. aegypti* reared under artificial light tended to be shorter than that under natural light (Natural = 3.29 ± 0.15 mm, 8h:16h = 3.27 ± 0.15 mm, 12h:12h = 3.24 ± 0.10 mm, 20h:4h = 3.13 ± 0.16 mm). The findings suggest that artificial light, linked to urbanization, accelerates

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Ae. aegypti development, potentially increasing disease transmission risk. Further studies are needed to explore how faster growth and smaller size under artificial light may affect their vectorial capacity in urban ecosystems.

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