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Comparing Light—Emitting—Diodes Light Traps for Catching *Anopheles* Mosquitoes in a Forest Setting, Western Thailand

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Simple Summary: A field study was conducted in a forest to compare the effectiveness of light traps fitted with different bulbs across the wavelength spectrum. Ultraviolet (UV) fluorescent light was found to be most effective to collect adult *Anopheles* mosquitoes from 21:00 h to the pre-dawn hours in the dry season. These findings have important implications for monitoring vector density in the endemic malaria areas where other methods cannot be executed. A more comprehensive and systematic study of how mosquitoes respond to light would benefit Thailand's national control program. Their potential for more precisely sampling vectors holds promise as a tool for mosquito monitoring endemic malaria areas and outbreak hotspots.

Abstract: Light traps are a common method for attracting and collecting arthropods, including disease vectors such as mosquitoes. Various types of traps have been used to monitor mosquitoes in a forest in Western Thailand. In this study, four Light Emitting Diodes (LED) light sources (UV, blue, green, and red) and two fluorescent lights (white and UV) were used to trap nocturnal adult mosquitoes. These traps were used with light alone and not any additional attractant. The experiment was conducted from 18:00 to 06:00 h. on six consecutive nights, every two months, across dry, wet, and cold seasons. All specimens were first identified by morphological features and subsequently confirmed by using PCR. We collected a total of 873 specimens of 31 species in four genera, *Anopheles*, *Aedes*, *Culex*, and *Armigeres*. *Anopheles harrisoni* was the predominant species, followed by *Aedes albopictus*, *Culex brevipalpis*, *Culex nitropunctatus*, and *Armigeres* (*Leicesteria*) *longipalpis*. UV fluorescent light was the most effective light source for capturing forest mosquitoes, followed by UV LED, blue LED, green LED, white fluorescent, and red LED. The optimal times for collection were from 21:00 to 03:00 h in the dry season. Our results demonstrate that appropriate sampling times and light sources should be selected for optimal efficiency in vector surveillance programs.

Keywords: malaria; vector; light traps; mosquitoes; UV fluorescent; wavelength

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1. Introduction

Mosquitoes are well-recognized as important arthropod vectors that are responsible for transmitting many medically important pathogens and parasites, including viruses, bacteria, protozoans, and nematodes, which cause serious diseases, such as malaria, dengue, chikungunya, encephalitis, and filariasis [1]. Of these, malaria is a serious and sometimes fatal disease caused by a parasite transmitted to humans via *Anopheles* mosquitoes. Interventions can be implemented to mitigate and reduce the risk of infection and prevent disease. Long-lasting insecticidal nets and indoor residual spraying have long been used as the main interventions to combat malaria indoors [2]. Despite the efficacy of these