

Development of a gravid trap for collecting malaria vectors *Anopheles gambiae s.l.*

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Abstract

Background

Effective vector control targeting indoor host-seeking mosquitoes has resulted in a reduction in the number entering houses in many areas of sub-Saharan Africa, with the proportion of vectors outdoors becoming more important in the transmission of this disease. This study was intended to develop a gravid trap for the out-door collection of the malaria vector *Anopheles gambiae s.l.* based on evaluation and modification of commercially available gravid traps used for culicine collections.

Methods

Experiments were implemented in an 80 m² semi-field system where 200 gravid *Anopheles gambiae s.s.* were released each night. The catching efficacy of the Box, CDC and Frommer updraft gravid traps was compared. Later the Box gravid trap was tested to determine if the presence of the trap over water and the trap's sound affected catch size. Mosquitoes approaching the treatment was evaluated using electrocuting nets or detergents added to the water in the trap. Based on the results of these experiments, a new gravid trap that provided an open, unobstructed oviposition site was developed and evaluated.

Results

CDC and Box gravid traps collected similar numbers of mosquitoes (Odds ratio (OR) 0.8, 95% confidence interval (CI) 0.6–1.2; $p = 0.284$), whereas the Frommer updraft gravid trap caught 70% fewer mosquitoes than both traps (OR 0.3, 95% CI 0.2–0.5; $p < 0.001$). The number of gravid females approaching the Box trap was significantly reduced when the trap was positioned over a water-filled basin compared to a small pond (OR 0.7 95% CI 0.6 – 0.7; $p < 0.001$). This effect was not due to the sound of the trap. Catch size increased by 60% (OR 1.6, 1.2 – 2.2; $p = 0.001$) with the **new trap**.

Conclusion

Gravid *An. gambiae s.s.* females were visually deterred by the presence of the trapping device directly over the oviposition medium. Based on these investigations, an effective suction gravid trap was developed that provides open landing space for egg-laying *Anopheles* mosquitoes.

Key words: - gravid traps, *Anopheles gambiae*, monitoring, larval habitats, pond, oviposition, semi-field, malaria