COMPARATIVE EVALUATION OF SEVERAL MOSQUITO TRAP CONFIGURATIONS

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ABSTRACT: The Mosquito Magnet X trap (MMX) with CO_2, octenol and with or without oak infusion captured significantly ($p<0.05$) more mosquitoes than any other trap configuration tested. There was no significant difference ($p>0.05$) in trap catch with or without oak infusion. Significantly ($p<0.05$) fewer mosquitoes were captured in the MMX when bird seed infusion was deployed. Without CO_2, MMX catch fell significantly ($p<0.05$) below all other configurations regardless of octenol and infusion supplements. In a separate study, there was no significant difference in trap catch between A/C and D/C powered MMX traps. Both traps collected significantly ($p<0.05$) more mosquitoes than the Mosquito Magnet Defender. Species catch varied by trap.

INTRODUCTION: Mosquito traps have long been considered important tools for pest and disease surveillance. More recently, they have also been exploited for control. The purpose of these studies was to evaluate numbers and species caught in several trap configurations.

MATERIALS & METHODS: Two studies evaluating twelve trap configurations were conducted during 2006 and 2007 on the 10-acre campus of the John A. Mulrennan Sr., Public Health Entomology Research & Education Center (PHEREC) of Florida A&M University in Panama City, Florida. PHEREC resides on a salt-marsh peninsula of St. Andrews Bay in NW Florida on the Gulf Coast.

STUDY I: Traps tested: ***Mosquito Magnet Liberty + propane combusted CO_2 + octenol (MM Liberty), Mosquito Magnet X trap (MMX) - CO_2 + octenol + live oak leaf infusion, MMX + CO_2 + octenol + live oak leaf infusion, MMX + CO_2 + octenol + bird seed infusion, MMX + CO_2 + octenol – infusion, ABC Light Trap + CO_2,Hock 1012 Light Trap + CO_2, and CDC 512 Light Trap + CO_2 (Fig. 3 a-h).*** Traps were randomly assigned one per location to eight sites spaced 37 - 91 m apart and operated ca. 24 hrs starting at 7-8 a.m. Closer traps were separated by buildings and vegetation. Pressurized CO_2 was delivered at a rate of 200 ml / min for all traps except the MM Liberty+ which generated CO_2 by propane combustion. One MMX trap was operated with no CO_2. Infusion water was supplied in a dishpan from stock containing live oak leaves or wild bird seed. The dishpan was sunken into the ground directly beneath the trap. The traps were rotated in a clockwise pattern through collection sites in a 8X8 Latin-square until three good repetitions were conducted. A complete rotation through all trapping sites was considered a repetition. Trap runs were repeated when equipment failed or when unsuitable weather or poor/excessive trap catches occurred. Each trap operated a total of 24 times, three times at eight trap sites.

STUDY II: Traps tested: ***Mosquito Magnet Defender (Defender) + propane combusted CO_2 + octenol, Mosquito Magnet X + CO_2 + octenol + live oak leaf infusion + a/c power (MM-X A/C) or d/c power (MM-X D/C) (Fig. 3 i-k). A fourth trap was tested, but results not reported for proprietary reasons.*** Traps were positioned 91 m apart and operated from 3 p.m. until 8 a.m. in a 4X4 Latin-square following similar protocol listed in Study I.

RESULTS:

STUDY I: The total number of mosquitoes caught by trap configuration is presented in Fig. 1. The MMX + CO_2 + octenol and with or without oak leaf infusion collected significantly ($p<0.05$) more mosquitoes than any other trap configurations. There was no significant difference ($p>0.05$) between MMX + CO_2 + octenol traps with or without oak leaf infusion; however, significantly ($p<0.05$) fewer mosquitoes were collected in bird seed infusion water. The least productive trap configuration was the MMX + oak leaf infusion without CO_2. This system caught significantly ($p<0.05$) fewer mosquitoes than all other trap configurations emphasizing the importance of CO_2. There was no significant difference among the MM Liberty+, Hock 1012, CDC 512 and ABC Light traps (all supplied with CO_2); however, the first three listed did catch significantly more mosquitoes than the MMX + CO_2 + octenol with bird seed infusion and the MMX – CO_2 + octenol with oak leaf infusion. Species composition by trap are presented in bar charts (Fig. 3 a-h).

STUDY II: The total number of mosquitoes caught by trap is presented in Fig. 2. The MM-X traps powered by either a/c or d/c collected significantly ($p<0.05$) more mosquitoes than the Defender. There was no significant difference ($p>0.05$) between the two MM-X traps. Species are presented in Fig. 3 i-k.

Fig. 1. Study I: Average number of mosquitoes captured by trap/day (n=24).

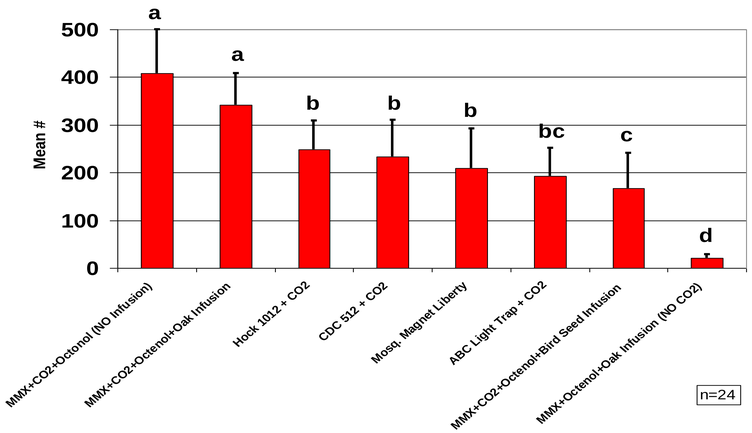
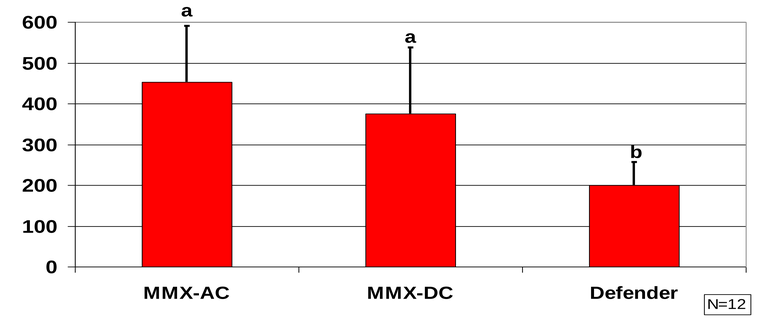
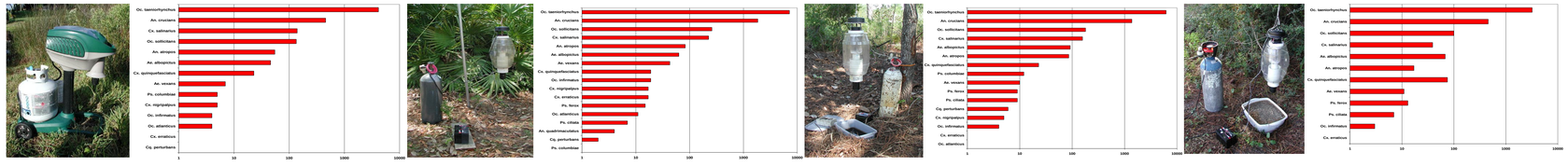


Fig. 2. Study II: Average number of mosquitoes captured by trap/day (n=12).



Means followed by the same letter are not significantly different (p=0.05) by Waller-Duncan K-ratio T-test and by Duncan's Multiple Range Test. T-bars indicate 95% C.I.

Fig. 3 a-k. Species composition for various trap configurations tested.

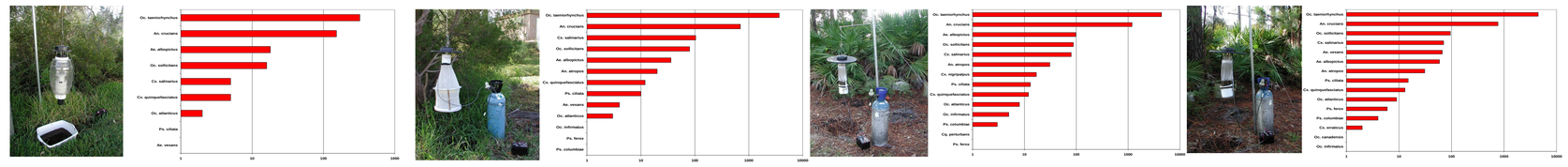


a. Mosquito Magnet Liberty

b. Mosquito Magnet X+CO_2+Octenol-Infusion

c. Mosquito Magnet X+CO_2+Octenol+Oak Infusion

d. Mosquito Magnet X+CO_2+Octenol+Bird Seed Infusion

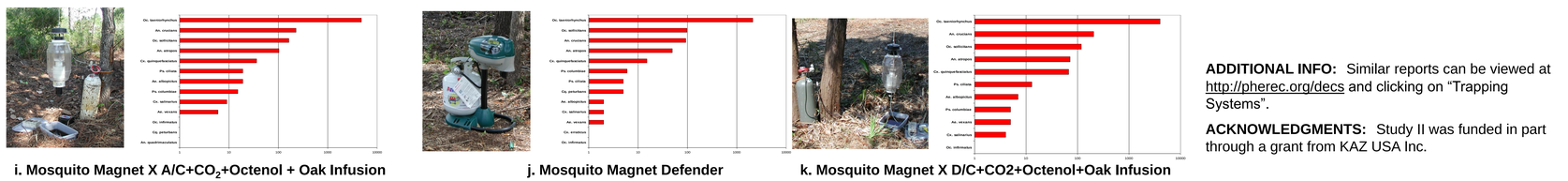


e. Mosquito Magnet X-CO_2+Octenol+Oak Infusion

f. American Biophysics Corp. Light Trap+CO_2

g. Hock Model 1012 Light Trap+CO_2

h. CDC Model 512 Light Trap+CO_2



i. Mosquito Magnet X A/C+CO_2+Octenol + Oak Infusion

j. Mosquito Magnet Defender

k. Mosquito Magnet X D/C+CO2+Octenol+Oak Infusion

ADDITIONAL INFO: Similar reports can be viewed at http://pherec.org/decs and clicking on "Trapping Systems".

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