Biogents Sweetscent Lure increases the collection rates of *Aedes aegypti* and *Aedes albopictus* in commercially available homeowner mosquito traps

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Introduction

A wide variety of mosquito traps designed for homeowner use are available in the marketplace today. Typical traps range in cost from less than $50 to over $1000 for traps with all the bells and whistles. In this study, we tested 7 commercially available mosquito traps, ranging in price from $49 to $140, from local home improvement stores or from online merchants to test the hypothesis that collection efficacy for *Aedes albopictus* and *Ae. aegypti* could be increased through the use of Biogents Sweetscent Lures (BG-Sweetscent). In a separate study, we compared CDC light traps with and without CO_2 and BG-Sweetscent to test the same hypothesis. Tests were conducted in Florida, Louisiana, and Virginia using a modified Latin square design to assess the collection efficacy of the traps with and without BG-Sweetscent. BG-Sweetscent (EPA Registration No. 87 472-1) contains a chemical blend designed to simulate human skin emissions. In Florida, the MosClean UV LED, Dynatrap XL DT2000XL, Bite Shield Protector, Flowtron Galaxie PV 75 and Skeetervac Bite-Guard SVE6211 were tested. In Louisiana, the Black Flag BZ- 40-DX, Skeetervac Bite-Guard SVE6211 and the Dynatrap DT1000-12V were tested. In Virginia, CDC light traps were tested.

Table 1. Mosquito traps used in the study

Trap	Model	Manufacturer	Purchase Price	Light	Area covered
Galaxie	PV 75	Flowtron	$66.55	UV bulb	.75 acre
Dynatrap	DT2000XL	Dynamic Solutions Worldwide LLC	$136.45	UV bulb	1 acre
Dynatrap	DT1000	Dynamic Solutions Worldwide LLC	$99.00	UV bulb	.50 acre
Bite Shield	MK06 Protector	Koolatron	$69.99	UV bulb	.25 acre
Skeetervac Bite Guard	SVE6211	Blue Rhino	$59.97	UV bulb	.50 acre
MosClean	MQ-HN	Seoul Viosys, Ltd.	$49.95	UV LED	.02 acre
Zapper	BZ-40DX	Black Flag	$45.03	UV bulb	1 acre
CDC Miniature Light Trap	Model 512	John Hock	$106	CM-47 bulb	variable

Methods and Materials

In this study, the performance of commercially available mosquito light traps was examined with and without BG-Sweetscent (EPA Reg No. 87 472-1). BG-Sweetscent is a three component lure designed to mimic the scent of human skin. The lure is packaged in a Tyvek sachet that allows the lure odors to escape, but keeps moisture out (Figure 1). Each lure sachet is designed to provide 2 months of effectiveness in the field.

In Florida, the Dynatrap 2000XT, MosClean MQ-NH, Bite Shield Protector, Skeetervac Bite Guard and the Flowtron Galaxie traps were tested with and without BG-Sweetscent in a modified Latin Square test design. At each of 5 collection sites, 2 traps of the same model, one with and one without BG-Sweetscent were separated by a minimum distance of 50 m, and run together for 4 nights. Trap position within each site was switched every day and trap pairs were rotated at the end of the week to a new collection site. Traps were operated from 1800 until 0800 the following morning and collected mosquitoes were identified to species. The study was conducted over a period of 20 trap nights.

In Louisiana, the Dynatrap 1000, Skeetervac Bite Guard and the Black Flag Zapper were tested with and without the BG-Sweetscent. The 2 variants of the three traps were randomly assigned to 6 different collection sites. Traps were operated from 1800 until 0800 the following morning and were rotated to a different collection site each day for a total of 36 trap nights. In Virginia, CDC Light traps were tested with and without CO_2 and BG-Sweetscent. Each of the trap lure combination was randomly assigned to one of 4 different collection sites. Traps were operated from 1800 until 0800 the following morning and were rotated to a different collection site each day. Due to late season and severe weather conditions only total 8 trap nights were completed.

Results and Discussion

In Florida, all traps with BG-Sweetscent showed an increase in the number of *Ae. albopictus* collected (between 2.1 and 4.5 times) compared to the traps without the BG-Sweetscent (Figures 2 - 7). *Aedes aegypti* was also collected in higher rates (between 1.5 to 9.7 times) in all traps except the Flowtron which was also the poorest performing trap overall (Fig. 6). In Louisiana, between 1.9 and 3.8 times more *Ae. albopictus* were collected in traps baited with BG-Sweetscent (Fig. 8 - 11). No *Ae. aegypti* were collected at the study site in Louisiana. In Virginia, CDC Traps using CO_2 plus BG-Sweetscent collected 8.5 times more *Ae. albopictus* than traps run with CO_2 alone. With no CO_2, BG-Sweetscent baited traps collected 4 times more albopictus than CDC traps with no attractant (Fig. 12). In Florida, the total number of mosquitoes collected in traps with BG-Sweetscent was higher for all traps except the Skeetervac Bite Guard (Fig. 7). Total mosquitoes collected in Louisiana were higher in the Dynatrap 1000 and the Skeetervac Bite Guard with BG-Sweetscent, but not in the Zapper (Fig. 11). Interestingly, the Skeetervac Bite Guard collected more total mosquitoes with BG-Sweetscent in Louisiana but not in Florida.

BG-Sweetscent - Mosquito Attractant

Mimics naturally occuring human skin scents.
Active ingredients:

Lactic acid	34.59%
Ammonium bicarbonate	26.49%
Hexanoic acid	8.82%
Other ingredients:	30.10%
Total:	100.00%

Net Contents: 0.39 oz. (11.1 grams).
Contains 1 sachet.

EPA Reg. No.: 87 472 - 1
EPA Est. No.: 087472 - DEU - 001

Fig. 1: Biogents Sweetscent Lure

The Biogents Sweetscent will also be available in the US under the trademark OneBait™ Universal Mosquito Trap Attractant form BlueRhino.
EPA Reg. No. 87472-1-74939, EPA Est. No. 92693-DEU-001

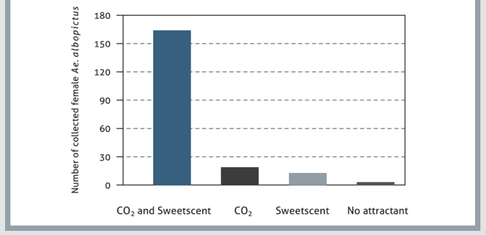
Conclusions

These results demonstrate that using BG-Sweetscent can **greatly increase the catch rate for *Ae. aegypti* and *Ae. albopictus*** when using commercially available off the shelf mosquito traps.

For mosquito control programs using **CO_2 baited CDC light traps,** the addition of **BG-Sweetscent can dramatically increase collections** of *Ae. albopictus.* Additionally, in most traps tested, adding BG-Sweetscent also increased overall mosquito collections.

VA

Fig. 12 CDC Light Trap, Suffolk, VA



LA

Fig. 8 Skeetervac Bite Guard

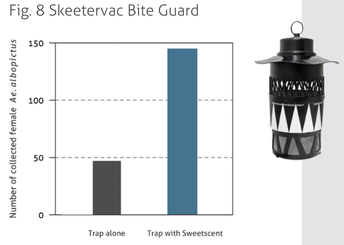


Fig. 9 Dynatrap DT 1000

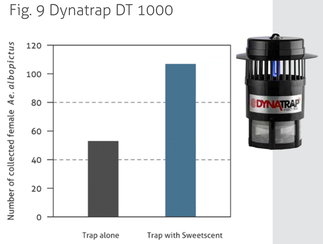
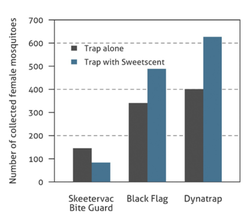


Fig. 10 Black Flag Zapper

Fig. 11 Trap performance for all mosquitoes, Lake Charles, LA



FL

Fig. 2 Dynatrap 2000XL

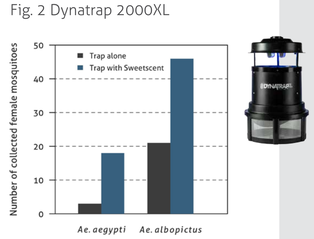


Fig. 3 MosClean MQ-HN

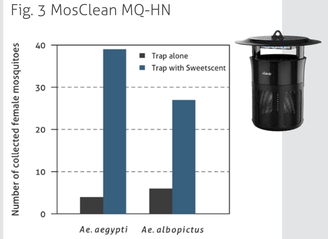


Fig. 4 Bite Shield MK06 Protector

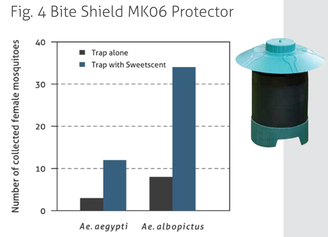


Fig. 5 Skeetervac Bite Guard

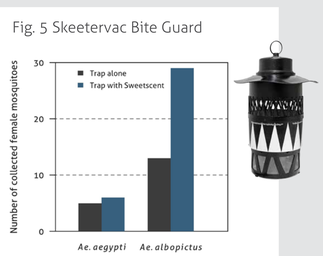


Fig. 6 Flowtron Galaxy

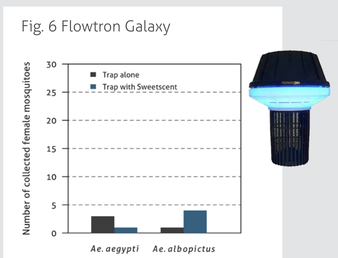


Fig. 7 Trap performance for all mosquitoes, Gainsville, FL