

What's up, man? Experiments in lure types to increase capture rates of male *Culex quinquefasciatus* on Maui and Kaua'i

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What's up with catching male mosquitoes?

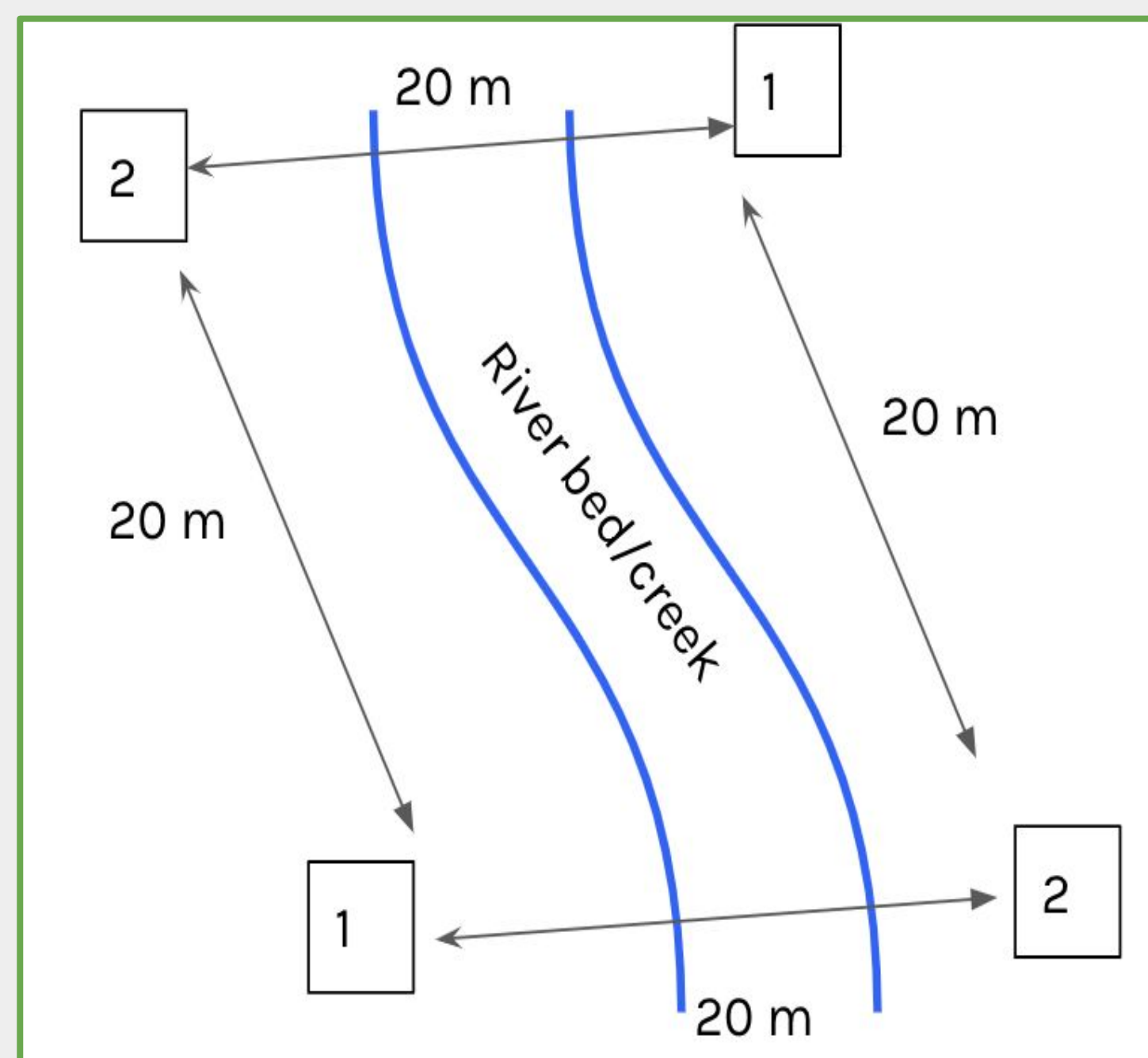
The devastating effects of mosquito-borne illness on forest bird populations has reached a breaking point. Recovery of these species is not possible without landscape-level mosquito suppression. Incompatible Insect Technique (IIT) is one of these suppression tools. IIT involves the release of male mosquitoes which need to be monitored via recapture.

Methods

With direction from partners at Verily Life Sciences, field crews carefully surveyed sites for environmental features that were most likely to host male *Culex* populations.

- Larval habitat - shallow standing water
- "Dance floor" - open area where males and females can form a mating swarm
- Daytime resting area - shady, cool, stone piles

"Latin square" configurations were used in trap set-up. Lure combinations ran for one or two weeks at a time. Placement of lure was determined by our partners or Latin square randomizer. Trapping was done from November 2022 to April 2023 utilizing BG Sentinel Traps.



Maui Set up

- 7 locations
- High elevation
- Up to 4 Latin squares at once
- Single traps in certain locations

Kaua'i Set up

- 1 location
- Low elevation
- 2 Latin squares



What's the goal?

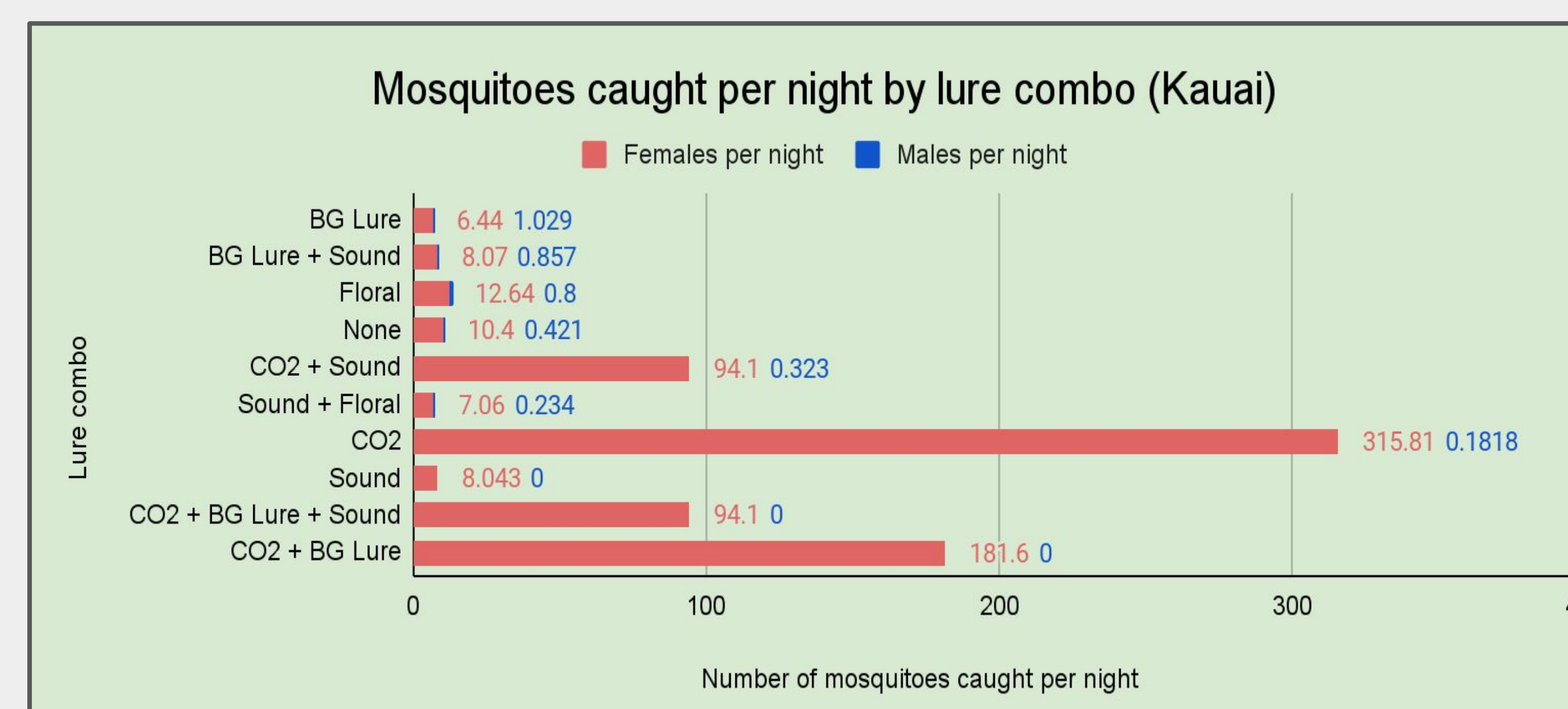
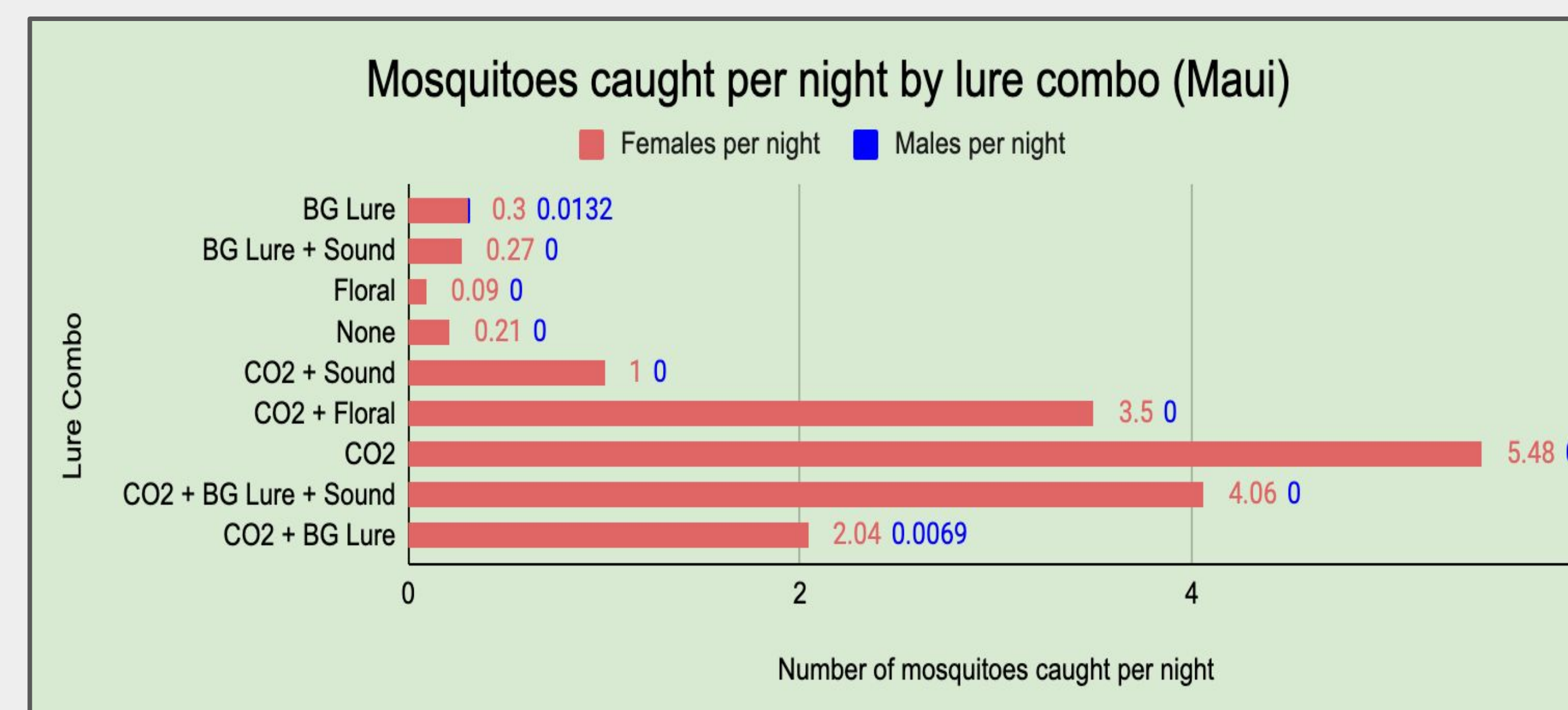
To detect the presence of *C. quinquefasciatus* males and determine the best lures to catch males.

Lures used

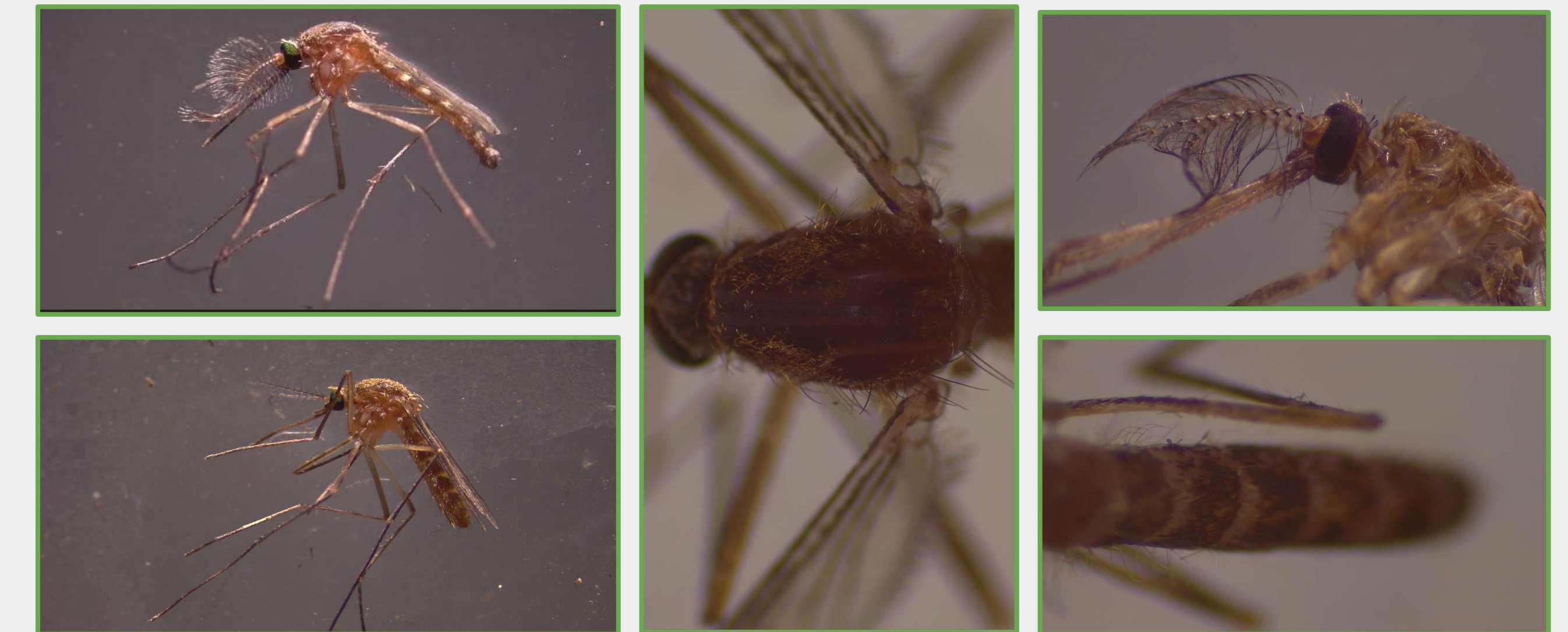


Results

Trapping efforts in Maui caught over 2.2 K mosquitoes, of which only 9 were male *Culex*. All 9 males were caught in traps that included BG Lures, and 3 of those were in a CO₂ + BG Lure combination. Kaua'i traps caught over 20 K mosquitoes, of which 163 were males. Success of lures and combinations varied; BG and floral lures had highest capture rates.



Culex quinquefasciatus



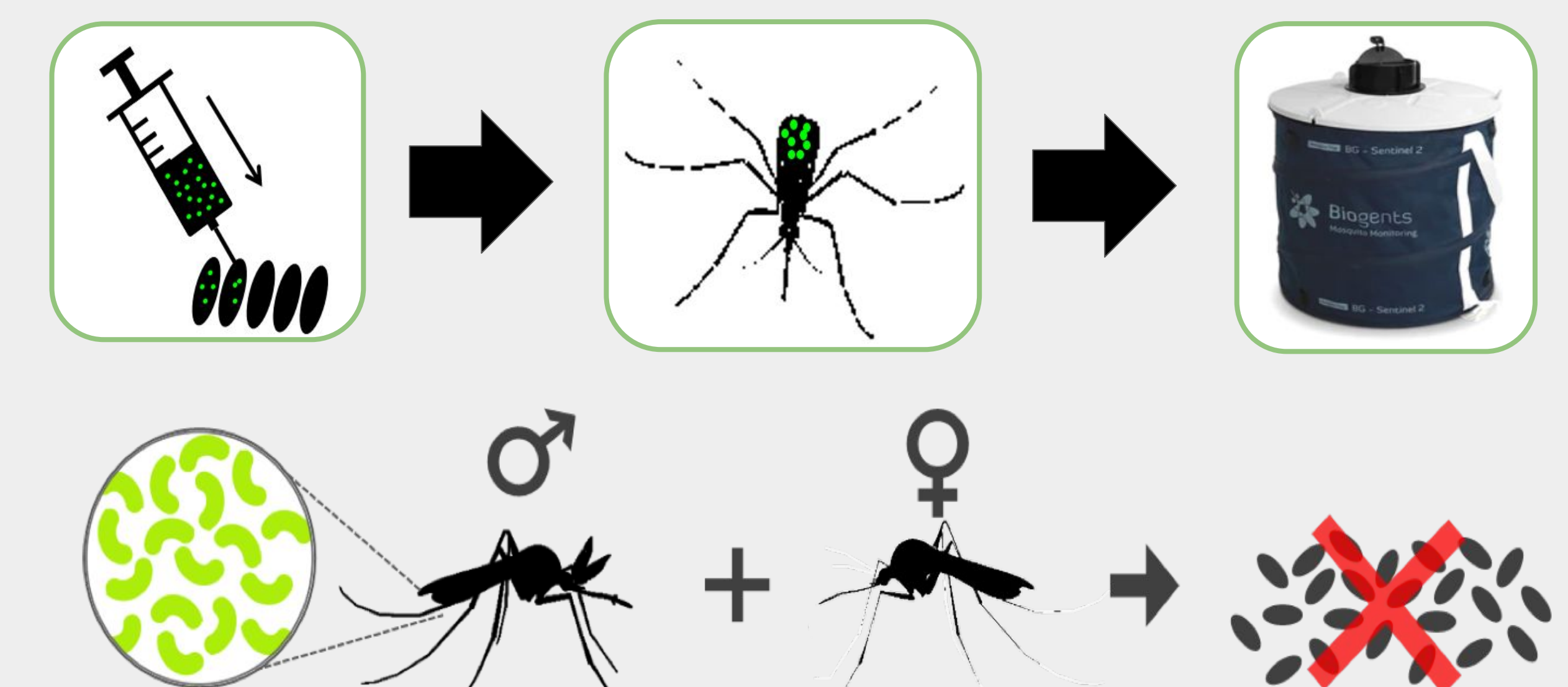
Findings and Discussion

Preliminary results suggest that different lure combinations produced varied success rates between islands, and that overall female bycatch remains high. Higher capture rates in Kaua'i may be due to the lower elevation of trapping sites compared to east Maui.

Larval surveys conducted within some of east Maui's trapping sites showed a 50/50 male to female ratio in *Culex* mosquitoes. This confirms the presence of both males and females and suggests that techniques need to be further refined as capture rates of males remain low.

What's to come?

Our trapping efforts have allowed us to move to the Mark Release Recapture (MRR) phase in Maui focusing on trapping using only BG Lures. With the MRR we aim to gain a better understanding of how male *Culex* move throughout the landscape and their average travel distances. All these efforts aim to facilitate the implementation of landscape-level mosquito/disease suppression utilizing IIT.



Citations: [1]"How does Wolbachia-Aedes suppression technology work," *National Environment Agency*. [Online]. Available: <https://www.nea.gov.sg/corporate-functions/resources/research/wolbachia-aedes-mosquito-suppression-strategy/wolbachia-aedes-mosquito-suppression-strategy-how-it-works>. [Accessed: 18-Jun-2023]