Field evaluation of four commercially available mosquito traps for collecting mosquitoes in Scotland

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Introduction

As vector-borne diseases (VBDs) increasingly affect northern Europe, monitoring temperate mosquito populations is crucial for assessing disease risk.

In Scotland, where mosquitoes are under-researched, comparing trap types is essential for identifying effective surveillance methods.

This study marks the first assessment of the Biogents BG-Pro(BGP), Biogents BG-Sentinel(BGS), CDC miniature light traps(CDC) and the Mosquito Magnet (MM) mosquito traps (figure 1) in Scotland to evaluate their effectiveness in estimating mosquito abundance and species diversity.

1) 2) 3) 4)

Figure 1: the trap types used in this study 1) BGS 2) BGP 3) CDC 4) MM

Methods

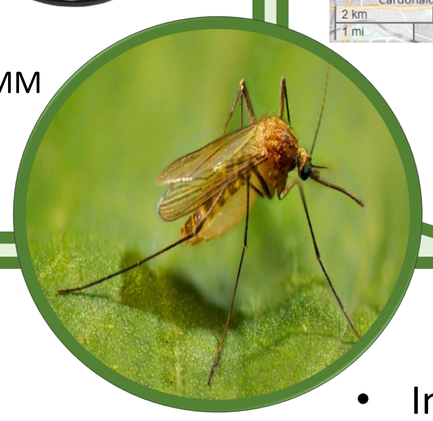
The study was conducted in August 2023 at Possil Marsh, an urban marsh located in Glasgow City (Figure 2).

Three trap types (BGP, BGS, and CDC) were compared over 15 days using a 3 x 3 Latin square design.

A subsequent experiment incorporated the MM trap, comparing it with the initial three traps over 12 days using a 4 x 4 Latin square design.

A) B)

Figure 2: A) The location of Possil Marsh within Glasgow City. B) The location of the four trapping stations around Possil Marsh.



Results

- 150 mosquitoes were collected over 93 trap nights, representing eight different species.
- In experiment one, the mean number of mosquitoes per trapping period was 1.02 (SE=6.71). No significant difference between the trapping methods was observed (Figure 3).

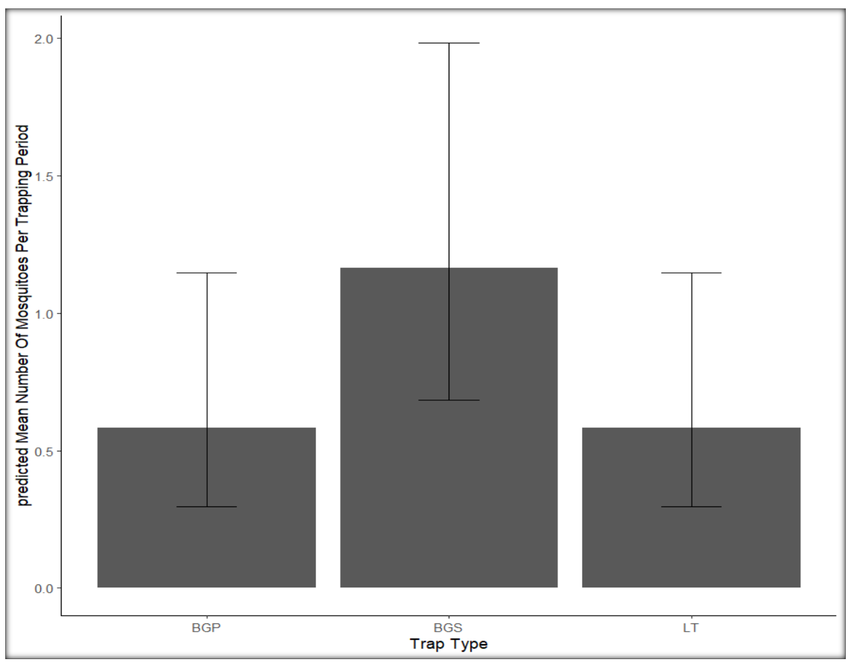


Figure 3:The predicted mean number of mosquitoes caught per trapping period by the traps in experiment 1.

- In the second experiment, the MM caught significantly more mosquitoes than any other method, with a mean of 7.5 per (SE=0.53) trapping period (p = <0.01) (Figure 4).
- The MM also caught the greatest number of species (6), predominantly from *Anopheles claviger*(70%), followed by the CDC (4), BGP(3) and the BGS(1).

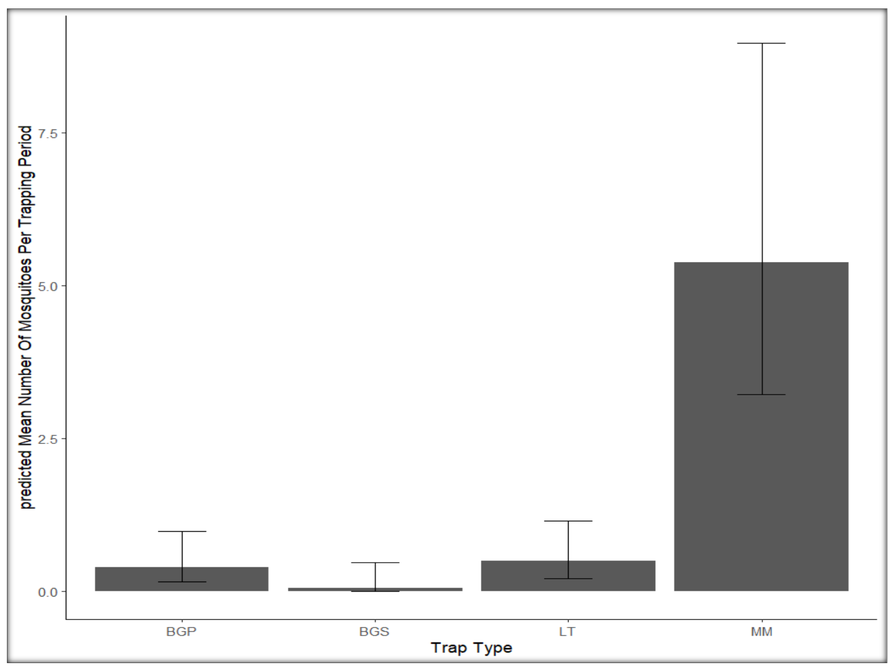


Figure 4:The predicted mean number of mosquitoes caught per trapping period by the traps in experiment 2.

Discussion

- The MM caught significantly more mosquitoes than other methods and the greatest number of species.
- MM traps could be optimal for sampling Scottish mosquito populations.
- The data here will inform future trapping protocols to enhance ongoing mosquito surveillance in Scotland.