FINAL REPORT

2002 COLEMAN TRAP EVALUATION PROJECT

Sponsored by:

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Prepared by:

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Goal

The purpose of this study was to compare the mosquito-trapping prowess of the BioSensory DragonFly, EnviroSafe Technologies Mosquito MegaCatch, Coleman Mosquito Deleto, Coleman Mosquito Deleto Prototype, American Biophysics Corporation Mosquito Magnet Liberty, Lentek Mosquito Trap, Flowtron PowerTrap and Applica SonicWeb.

Materials and Methods

Study Site: The project was performed on the 10-acre peninsula of the St. Andrews Bay surrounded by salt marsh on the campus of the Public Health Entomology Research & Education Center (PHEREC) of Florida A&M University in Panama City, Florida.

Protocol: The eight traps identified above were randomly assigned one trap/location to eight locations on the PHEREC campus. Traps were operated simultaneously from 3:30 p.m. until 7 a.m. CT from August 6 through October 24, 2002 on evenings when weather conditions were suitable for mosquito activity. After each night's operation, trap contents were collected, sorted, identified to species and counted. Both mosquitoes and biting midges were collected; however, the number of biting midges was estimated when counts exceeded several hundred. A general idea of the biting midge species collected was accomplished via random sampling throughout the season. The traps were then rotated clockwise to the adjacent location and run on the next suitable day. This sequence continued until each trap had operated at all eight locations.   A complete rotation through the eight locations was considered a replication. Three "good" replications were performed. Data from nights when any mechanical failure or adverse weather occurred were excluded from the database. During such occasions, traps were left at the same location and rerun. Thus, total trap counts were based on three collections/location/trap (i.e., 24 runs/trap). Weather data was recorded during the study from the local airport located within half a mile from the study site.

Trap Configurations: The Mosquito Magnet Liberty, Lentek Mosquito Trap, Deleto (both traps), Flowtron PowerTrap, BioSensory Dragonfly and MegaCatch traps all employ CO_2 and octenol as attractants. The first four convert propane into CO_2, heat & moisture, while the remaining traps emit CO_2 directly from a gas cylinder. The SonicWeb trap releases a low frequency sonic "heartbeat", octenol, heat and an ultraviolet reflection as well as other visual cues to attract mosquitoes. All traps were operated at the highest attractant emission setting per the manufacturer's directions.

Data Analysis: Total mosquitoes and biting midges collected by trap and species abundance by trap was charted using Microsoft Excel 2000 pivot tables and charting functions. Analysis of variance and mean separation tests were conducted on log-transformed data and tested for statistical differences among traps using SAS PC.

Results and Discussion

Environmental Data: Conditions during the study are presented in Table 1. Temperatures were very consistent with averages ranging from upper 70's to mid 80's except on two occasions near the end of the study in October when the temperature averaged in the mid to upper 60's. Rainfall was zero or trace for all days except Aug 22 (~.5 inches), Sept. 24 (~.5 inches) and Oct. 23 (~1 inch). The rain during these days did not seem to affect trap catch because much of it fell outside of the times when the traps were operating.

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Table 1.  Climatology during 2002 mosquito trapping study.

PRELIMINARY LOCAL CLIMATOLOGICAL DATA (WS FORM: F-6)

                                        STATION:   PANAMA CITY
                                        MONTH:     AUGUST-OCTOBER
                                        YEAR:      2002
                                        LATITUDE:   30 12 N
                                        LONGITUDE:  85 41 W


     TEMPERATURE IN F:            :PCPN:   SNOW:  WIND        :SUNSHINE: SKY     :PK WND
     ==================================================================================
     1   2   3   4   5  6A  6B    7    8    9   10  11  12  13   14   15    16   17  18
                                                  AVG MX 2MIN
 MO  DY MAX MIN AVG DEP HDD CDD  WTR  SNW DPTH SPD SPD DIR MIN PSBL S-S  WX    SPD  DR
     ==================================================================================
Aug.  6  90  75  83   3   0  18 0.00  0.0    0  5.5 12 250   M    M    1 1       M   M
      8  90  72  81   1   0  16 0.00  0.0    0  8.0 16  90   M    M    2          23  90
     14  88  76  82   2   0  17 0.09  0.0    0  4.2 10 190   M    M    3 1        M   M
     15  91  76  84   4   0  19 0.00  0.0    0  6.6 12 220   M    M    2          18 220
     22  91  74  83   3   0  18 0.43  0.0    0  3.8 29 170   M    M    2 8        39 160
     26  86  73  80   1   0  15 0.00  0.0    0  5.6 13 240   M    M    3          18 230
Sept. 9  93  74  84   5   0  19 0.00  0.0    0  6.8 12 100   M    M    2          18  90
     10  89  75  82   4   0  17 0.00  0.0    0  2.9  8 250   M    M    1 8        M   M
     11  92  73  83   5   0  18 0.00  0.0    0  4.5 14 190   M    M    1          23 190
     12  93  72  83   5   0  18 0.02  0.0    0  7.5 15 120   M    M    4          16  70
     16  90  74  82   5   0  17    T  0.0    0  2.9  9 280   M    M    2 18       M   M
     17  90  75  83   6   0  18 0.00  0.0    0  4.4 10 250   M    M    1 18       M   M
     18  89  76  83   6   0  18 0.00  0.0    0  2.9  9 220   M    M    0 18       M   M
     23  91  72  82   7   0  17 0.00  0.0    0 10.0 15 100   M    M    1          20 100
     24  78  73  76   1   0  11 0.47  0.0    0 11.0 18  80   M    M    8 1        23  80
     30  89  74  82   9   0  17    T  0.0    0  7.6 12  90   M    M    2 18       M   M
Oct. 1  90  74  82   9   0  17 0.05  0.0    0  9.1 23 100   M    M    4 18       29 100
      3  87  73  80   8   0  15    T  0.0    0  9.7 16 140   M    M    3 18       22 140
      7  89  72  81  11   0  16 0.06  0.0    0  4.9 15 330   M    M    3 138      24 330
      8  87  71  79   9   0  14 0.00  0.0    0  3.6  8 310   M    M    2          M   M
      9  85  71  78   8   0  13 0.00  0.0    0  8.5 12  70   M    M    4 18       M   M
     17  74  53  64  -3   1   0 0.00  0.0    0  5.7 10 360   M    M    1 8        M   M
     23  84  67  76  11   0  11 1.17  0.0    0  9.6 14 100   M    M    7 18       M   M
     24  72  66  69   4   0   4 0.04  0.0    0  8.4 10  80   M    M   10 18       M   M
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Trap Catch Comparison:

The number of mosquitoes caught during this study was relative low because it was an extremely dry year. Figure 1 presents the total catch by trap for the entire test period based on 24 runs of each trap. The MegaCatch and Mosquito Magnet collected 2.5 to 3X more mosquitoes than the next nearest trap, the Lentek Mosquito Trap, and at least 5X-6X more mosquitoes than all of the other traps. The SonicWeb caught the fewest mosquitoes, well below all of the other traps. The number of biting midges caught by trap is presented in Figure 2. The Mosquito Deleto traps (Deleto & Prototype) collected the greatest number followed closely by the Mosquito Magnet. The other traps collected as much as 10X fewer. The Sonic Web performed better with biting midges than it did with mosquitoes, but still collected about 4X fewer than the Deleto and Magnet traps. The MegaCatch trap was supplemented with a mesh bag to facilitate biting midge collection, however, a considerable number of the midges still escaped. It would have likely performed better with a better midge trapping system.

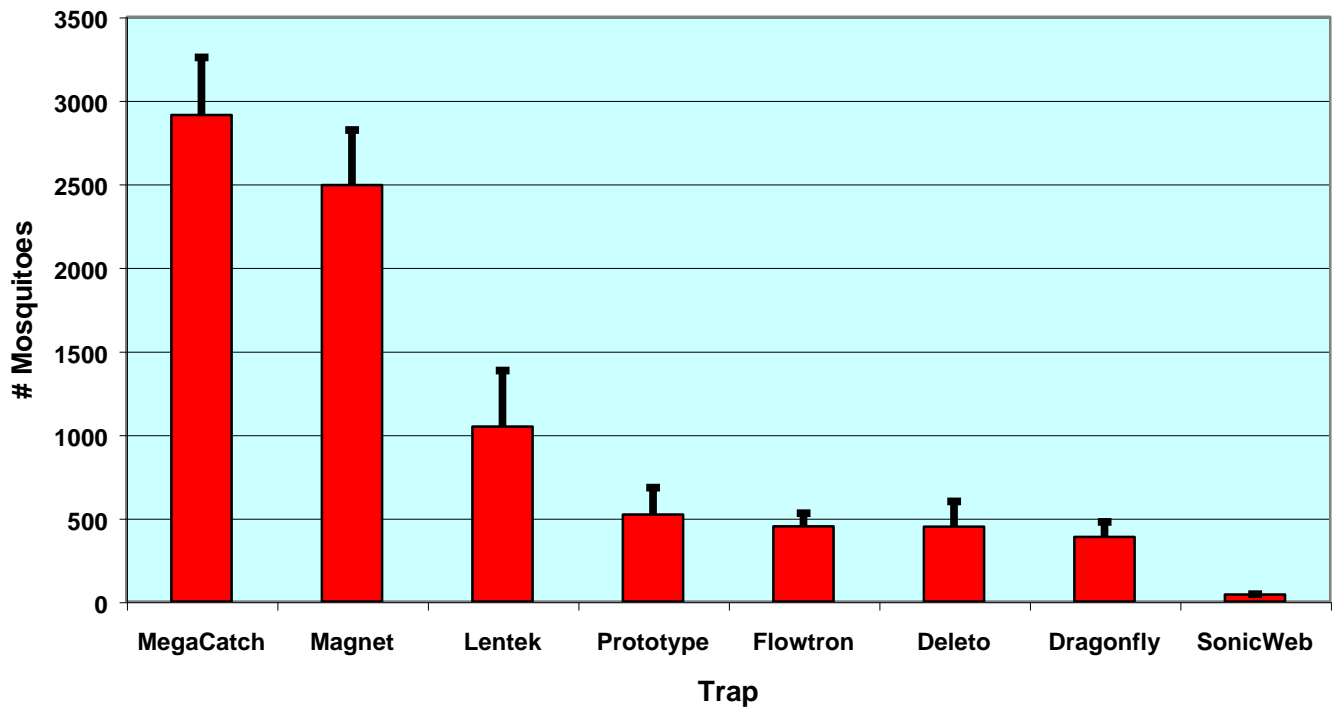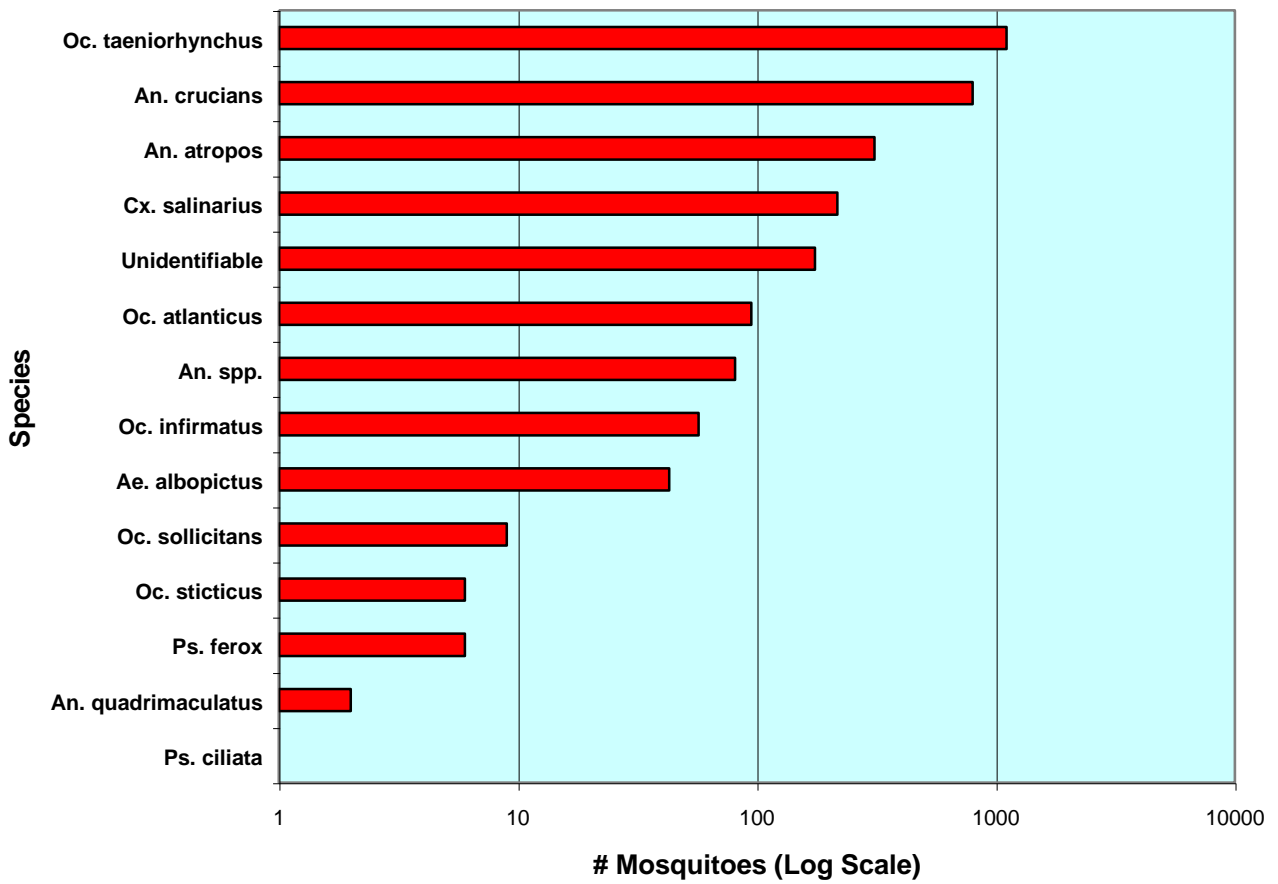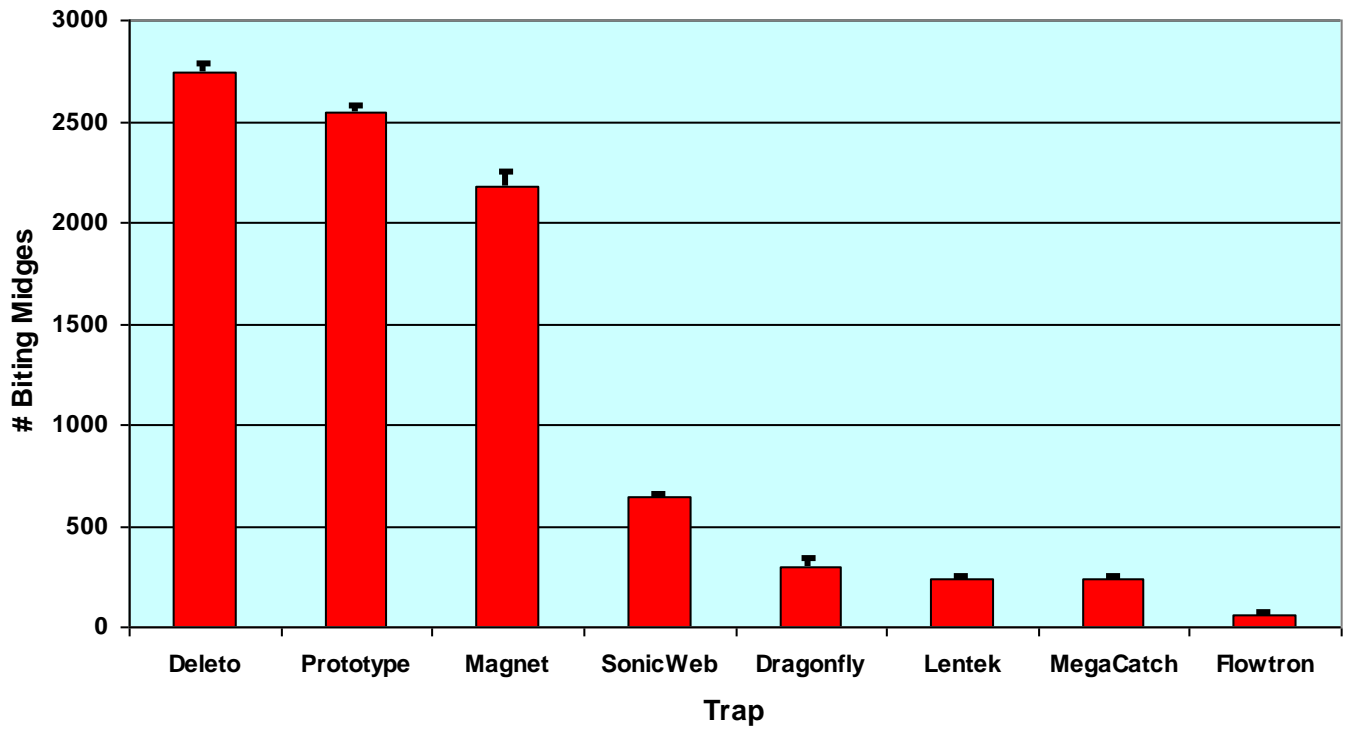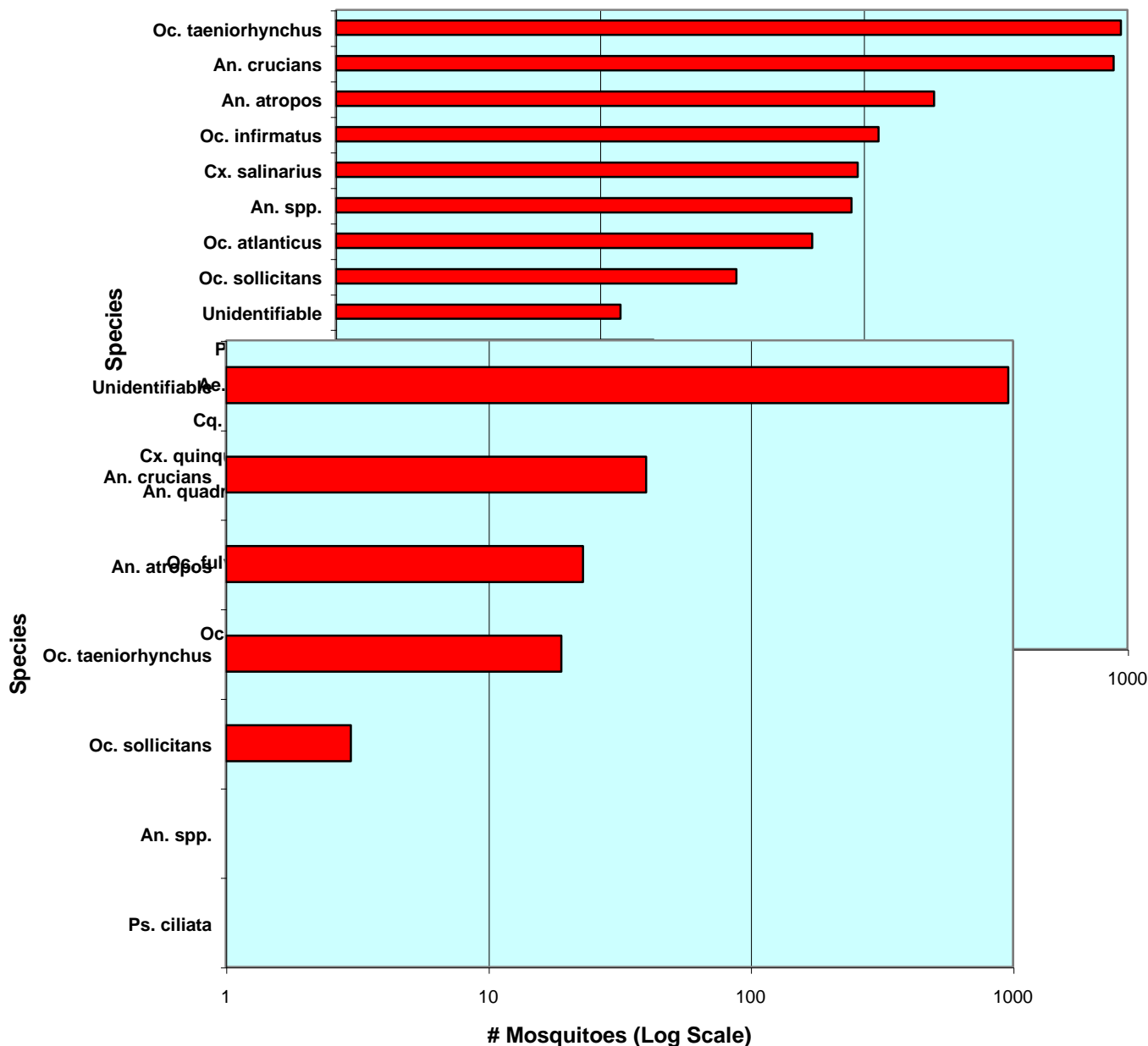**Fig. 1. Total mosquito catch and variation by trap.**

Fig. 2. Total biting midge catch by trap.

 # Mosquitoes (Log Scale)

Species Abundance & Composition:

Species abundance is presented on a logarithmic scale for the various traps in Figure 3-11. *Ochlerotatus taeniorhynchus* and *Anopheles crucians* made up the vast majority of mosquitoes collected. A total of eleven species were recovered. The MM-X trap collected the most (10), followed by the MM-P (8), MM-R (7) and the FMP (6). The FMP trap collected noticeably fewer mosquitoes and more "trash" insects (i.e., moths, lacewings, ants, etc.) This trap also malfunctioned three times during the study. Conversely, there were no problems with any of the ABC traps. Lastly, it did not appear octenol enhanced either species composition or the numbers collected as evidenced by the MM-X trap results.

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Deleto Prototype Species Composition

Species

- Oc. taeniorhynchus
- Oc. atlanticus
- An. atropos
- Oc. sollicitans
- Oc. infirmatus
- An. spp.
- An. cruquians
- Oc. taeniorhynchus
- Cx. salinarius
- Oc. infirmatus
- Ps. ferox
- Oc. sollicitans
- Cx. quinquefasciatus
- Oc. atlanticus
- Ae. albopictus
- An. atropos
- An. atropos
- An. cruquians
- Cx. quinquefasciatus
- Cx. salinarius
- Ae. albopictus
- Cq. perturbans

 # Mosquitoes (Log Scale)

Oc. taeniorhynchus

An. crucians

An. atropos

Unidentifiable

Cx. s

Oc. taeniorhynchus

Unidentifiable

Oc. a

Oc. taeniorhynchus

Oc.

Oc. atlanticus

Oc. sollicitans

Cx. quinque

Oc. spp.

An. atropos

Ae. al

Oc. infirmatus

Ps.

An. crucians

An. atropos

Oc.

An. crucians

P

Oc. infirmatus

Cx. pe

Cx. salinarius

Ae. albopictus

Ae. albopictus

Oc. atlanticus

An. spp.

An. quadrimaculatus

Species

Species

Species

Species

1   10   10   100   1000   100

1000

#Mosquitoes (Log Scale)

#Mosquitoes (Log Scale)