

The Effectiveness of 2-Litre Bottle Light Traps in Collecting Aquatic Beetles (Insecta: Coleoptera) and Other Aquatic Insects on the Island of Dominica, W.I.

Thuong (Emily) Nguyen Dinh

Dominica 2012

Department of Entomology
Texas A&M University, College Station, TX 77843

Abstract

A survey of the fully aquatic beetles throughout various locations on the island of Dominica, W.I. was attempted using a submerged light trap made from 2-litre soda bottles. However, since no beetles were found, the purpose of this study became to test the effectiveness of the new trap design in collecting other aquatic insects. After collection and identification of specimens, it was found that the trap was not successful in collecting any fully aquatic beetles and was somewhat successful in trapping other aquatic insects.

Keywords: Dominica, light trap, aquatic, beetles, insects

Introduction

In Dominica, there has been little record of fully aquatic beetles—those that live all of its life stages in an aquatic environment—being found in its bodies of freshwater. Therefore, the original intent of this study was to survey the fully aquatic beetles present in various bodies of freshwater in Dominica. However, because no beetles—larval, pupal, or adult—were found, the goal of this study became to test the effectiveness of a new trap design made from 2-litre soda bottles in collecting aquatic insects present in bodies of freshwater in Dominica, since relatively

few submerged aquatic light traps have been tested for its effectiveness in collecting aquatic insects (Hilsenhoff et al., 1985).

Materials & Methods

Before collecting began, a trap was prepared by first cutting a 2-litre plastic bottle in half, then punching holes into the top half of the bottle for string to attach to. When setting the traps, a plastic glow stick was placed into the bottom portion and subsequently filled with water. The top portion of the bottle was then inverted into the bottom portion and the two halves were finally taped together and sunk into water. The traps were then tied to nearby vegetation and left at the location overnight or for several days.

Samples were collected on 25 May 2012 to 06 June 2012 from several locations on the island of Dominica: Springfield Station's Bee Pond and Checkhall River, the streams of the Springfield Water Supply, Batalie Beach, and the Emerald Pool. One trap was left at both the Bee Pond and Checkhall River, nine at the Springfield Water Supply, and four at both Batalie Beach and the Emerald Pool (table 1).

Samples were sorted on-site at the location. Insect specimens were extracted and stored in vials of 95% ethanol. In the lab, identification down to the family (and if possible, genus) level was completed. Voucher specimen of all species collected during this project were deposited in the Insect Collection, Archbold Tropical Research and Education Center, Springfield, Dominica.

Table 1. A key to the locations of sampling and respective number of traps placed at each site.

Location	Site Code	Total Number of Traps Set	Total Number of Nights Trap was Set
Springfield Station's Bee Pond	A	1	1
Springfield Station's Checkhall River	B	1	1
Springfield Water Supply	C	9	4
Batalie River	D	4	5
Emerald Pool	E	4	1

Results

After collecting insect specimens and identification, it was found that all of the insects collected were immatures and that primarily mayflies (Insecta: Ephemeroptera) from the family Baetidae were the insect specimens collected from the traps. A total of 20 insects were collected.

Table 2. Number of insect specimens collected, from 25 May 2012 to 06 June 2012, from each location and family to which they belong. Note: all insects collected were immature.

Taxonomic Classification		Locations				
Order	Family	A	B	C	D	E
Ephemeroptera	Baetidae	9*	2	2°	0	6
Trichoptera	Hydropsychidae	0	1	0	0	0

*out of 9, 3 were identified to the genus *Baetis*.

°out of 2, 1 was identified to the genus *Baetis*.

Discussion

As samples were being sorted, it was noted that there were many prawns caught in the submerged aquatic light traps, primarily immatures.

Because the original intent of this study was to survey the aquatic beetle fauna and no beetles were found, this project was unsuccessful in that sense. When the purpose of the study transformed into an evaluation of the new trap's effectiveness in capturing aquatic insects, the study will be considered somewhat successful due to more prawns being trapped than insects.

Perhaps this low degree of success is due to the location of sampling. Fully aquatic beetles (such as those belonging in the family Dytiscidae) have not been recorded from Dominica. It may be so simply due to the absence of fully aquatic beetles on the island (Woolley, personal communication, 2012). Additionally, Batalie Beach was prone to human interference and thus, two of the four traps were lost and samples could not be collected.

Although this project was only slightly successful in trapping aquatic insects, the 2-litre soda bottle submerged light traps were greatly successful in collecting prawns from the bodies of freshwater in Dominica. Hence, this trap design could be used to capture immature prawns in Dominica for study.

Acknowledgments

Thank you to Dr. James “Jim” B. Woolley and Dr. Thomas “Tom” E. Lacher of Texas A&M University for their assistance in transportation and sample collection. Additional thanks goes to Dr. Francis Gelwick of Texas A&M University and fellow study abroad friends Catherine A. Saenz, Juliet S. Vallejo, David J. Gerrity, and Alan J. Garcia for their assistance in trap setting and collecting.

References Cited

Hilsenhoff W.L. and B.H. Tracy. 1985. Techniques for collecting water beetles from lentic habitats. *Proceedings of the Academy of Natural Sciences of Philadelphia*. 137: 8-11.

Hungerford, H.B., P.J. Spangler, N.A. Walker. 1955. Subaquatic light traps for insects and other animal organisms. *Transactions of the Kansas Academy of Science*. 58, 3: 387-407.

Lehmkuhl, D.M. 1979. How to know the aquatic insects. Wm. C. Brown Company Publishers, USA. 49-65.

Nessner C., C. Garcia, Loftis-Peavy, V., and C. Ownings. 2009. A survey of aquatic insects of Dominica.