

Arthropod Monitoring

Mosquito Study – Upper Site Collection of *Anopheles walkeri* Theobald

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Collecting activities were concentrated at the confluence of Flooded Area I V environs and the Beaver Pond surrounding the Bog Remnant with the intent of determining whether or not a population of *Anopheles walkeri* Theobald had been established at or near the site. The collection of five specimens over a period from 12 July through 29 September 2004 marked the first recorded occurrence of this species on any of our study sites (Butts, 2004).

METHODS AND MATERIALS

Several combinations of trapping methods involving light in conjunction with carbon dioxide and with carbon dioxide only were employed at two closely adjacent sites. CDC miniature light traps fitted with net bags for collection of live adult mosquitoes were used both in light and fan and in fan only modes of operation in conjunction with carbon dioxide generated by fermentation using a variation of the technique described by Saitoh et al. (2004).

Carbon dioxide generators were made using 1-gallon insulated containers (Rubbermaid) with a single pouring spout hinged for closure in the down position. Approximately one pound (454 grams) of commercially available sucrose was dissolved in 1.5 liters of untreated water from Otsego Lake. Just prior to placement of the trap, 90 grams of dry yeast were added and stirred into the mixture. The mixture was discarded after the trap was picked up. In the initial series, the spout was set in the open position and connected by plastic tubing to a 1 liter plastic bottle with several perforations which served as the outlet for the carbon dioxide. This was suspended directly above the rain shield of the CDC trap with the light source of the trap suspended at a distance of ca. 1.7 meters from the ground by means of a metal hook the base of which was inserted in the ground. Subsequent variations in positioning placed the light source approximately 0.7 meters from ground level with the CO₂ generator placed on the ground about .3 meters away from the trap with the spout directed upward (without attached tubing and flask).

Traps were set in late afternoon and recovered early the following morning. Net bags containing the insects collected were placed in a freezer for 4-5 hours. The contents were then sorted and mosquitoes collected were mounted and placed in museum drawers.

On two occasions landing/biting collections were attempted at the site. The author remained seated with one arm exposed and attempted to collect mosquitoes alighting and/or attempting to feed.

RESULTS

During the month of June, the initial configuration of light and CO₂ release was used. Two specimens of *Anopheles walkeri* Theobald were collected from 6 June through 21 June, and larger numbers of *Coquillettidia perturbans* (Walker) were found. (The site had been studied in 2004 in relation to the likelihood of this species developing in the *Typha* sp. in Area IV environs). On June 28 large numbers of a variety of insects were collected and considerable damage had been done by many lepidopterans. The catches were sorted by removing specimens of *Anopheles* that were sufficiently intact to permit identification. See Table 1.

Table 1. Collections made with CO₂ emitted from a perforated bottle placed above the rain shield of a CDC miniature light trap. CO₂ passing through plastic tube attached to a fermentation generator at ground level. Trap site A about 2 meters from confluence, site B about 6 meters inland from A.

Species	#	Date	Trap Type		Trap Site	
			CO ₂	CO ₂ + Light	A	B
♂ <i>Anopheles walkeri</i> Theobald	1	Jun 6-7		X	X	
<i>Anopheles walkeri</i> Theobald	1	Jun 14-15	X		X	
<i>Coquillettidia perturbans</i> (Walker)	31					
<i>Coquillettidia perturbans</i> (Walker)	6	Jun 20-21		X	X	
	7		X			X
<i>Anopheles walkeri</i> Theobald	17	Jun 28-29		X	X	
	12		X			X
<i>Anopheles</i> sp.	1					
<i>Culiseta impatiens</i> (Walker)	1					
<i>Aedes cinereus</i> Meigen	1					

Adjustments in trap placement were made for subsequent collections. Reasons were two-fold. The use of CO₂ only would tend to attract biting insects selectively and tend to attract over a shorter distance. The trapping site is 200+ yards from the boundaries of the property and *Anopheles walkeri* appears to be attracted over considerable distances by light (Carpenter and LaCasse, 1955; Horsfall, 1955). Placement of the traps closer to ground level should also maximize the collection of this species which usually feeds closer to the ground (Means, 1987). See Table 2.

Table 2. Traps suspended 0.7 meters from ground. CO₂ generators on ground ca. 0.3 meters away with spout directed upward and without tubing. Separate light source set as indicated.

<u>Species</u>	#	<u>Date</u>	<u>Trap Type</u>	<u>Trap Site</u>		<u>Light</u>
			<u>CO₂ + Light</u>	<u>A</u>	<u>B</u>	
<i>Anopheles walkeri</i> Theobald	7	Jun 5-6	X	X	X	2M high, equidistant
<i>Coquilletidia perturbans</i> (Walker)	24	Jul 19-20	X	X		0.7 M high equidistant
(specimens not retained)	35		X		X	
<i>Anopheles walkeri</i> Theobald	5	Jul 26-27	X	X		0.7 M high Above A
<i>Coquilletidia perturbans</i> (Walker)	5					
<i>Anopheles walkeri</i> Theobald	2					
<i>Coquilletidia perturbans</i> (Walker)	6		X		X	
<i>Anopheles walkeri</i> Theobald	1	Aug 2-3	X	X		
<i>Coquilletidia perturbans</i> (Walker)	5					
<i>Ochlerotatus</i> sp.	1					
<i>Coquilletidia perturbans</i> (Walker)		Aug 9-10	X	X	X	
No mosquitoes		Aug 16-17		X		
No mosquitoes		Aug 23-24		X		
<i>Anopheles walkeri</i> Theobald	3	Sep 12-13	X	X		

Addendum: Sep 21, Landing-biting count at confluence 6:00-7:15 p.m. – Three mosquitoes approached, one alighted and collected. *Anopheles walkeri* Theobald.

The collection of specimens of *Anopheles walkeri* Theobald from mid-June through 21 September 2005 coupled with extended collection at the same site in the previous year strongly suggests that a breeding population of this species is established on or near the Upper Site.

REFERENCES CITED

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