

FIELD NOTES ON MOSQUITOES COLLECTED IN LIBERIA, WEST AFRICA *

BY

M. S. BRISCOE

The coast of Liberia is characterized by many tidal lagoons and creeks which are fringed with mangrove trees (*Rhizophora mucronata*). The land around the coastal towns and villages is low and swampy. Secondary vegetation is dominant since most of the land has been cleared of virgin forests.

Mixed forested regions prevail in the hinterland. Here, the land is marked with rolling hills and low mountains. Streams, which are fed by the heavy rainfall, are numerous. This water is usually clear and potable. There are no extensive ponds; swamps, however, are encountered frequently.

* A contribution from the Department of Biology, The Catholic University of America, Washington, D. C.

The rainy season begins in April and terminates in November. The rains are torrential and the total annual rainfall is usually more than 170 inches. During the wet season the trails are inundated and the narrow streams are considerably swollen.

Although there is a dry period, no month on the coast is entirely free from rain. As a rule, January and February are the driest months.

Due to the geographical position of Liberia, ($4^{\circ} 22'$ to $8^{\circ} 50'$ north latitude, and $7^{\circ} 33'$ to $11^{\circ} 32'$ longitude west of Greenwich), the climate is equatorial. Humidity in the hinterland, however, is much less than that on the coast.

While stationed in Liberia (1943 to 1945) I had the opportunity to make brief reconnaissance collections of mosquitoes

on the coast and in the hinterland both during the rainy and dry seasons. A list of the specimens, together with field notes and localities, follows:

Anopheles funestus Giles. Roberts Field; Harbel; Gbanga. Larvae were collected from drainage ditches, shady margins of ponds and bodies of clear water. In some instances both *funestus* and *gambiae* were found in the same breeding sites. There was a tendency for the larvae to remain away from the surface of the water a long time when disturbed.

Adults were collected in native huts which were made of mud-wattled walls, leaf-thatched roofs and dirt floors; a few were constructed of grass. These mosquitoes are domestic and essentially anophelous.

Anopheles gambiae Giles. Roberts Field; Harbel; Owen's Grove; Marshall; Fisherman's Lake; Reputa; Salala; Cape Palmas; Grand Bassa. Larvae were taken from rice fields, shallow wells, edges of swamps, drainage ditches, irrigation ditches and such temporary water collections as road ruts and small depressions made by native footprints. During the rainy season *gambiae* was found breeding almost everywhere except in fast-running water and pools covered with vegetation.

The majority of mosquitoes captured in native dwellings were *Anopheles gambiae*. The huts were poorly ventilated and the interior was usually very dark since many of them did not have windows. Favorite resting places were the walls, low ceilings, rags hanging on the walls and grass mats suspended from rafters. Captured females were usually engorged with blood. Many adults were also captured in stable traps having humans as bait.

Gambiae was the most domestic anopheline encountered. It is intensely anthropophilic. Its appetite for human blood and habit of resting indoors are causative factors in outbreaks of epidemic malaria. Developing larvae of *Wuchereria bancrofti* were found in the thoracic muscles of many of these mosquitoes. Oc-

asionally, an infective filariform larva was dissected from the proboscis.

Anopheles hancocki Edw. Roberts Field; Harbel; Fisherman's Lake. Breeding sites of this mosquito were shallow native wells, vegetated pools, drainage ditches and swamps. Although adults are known to frequent human habitations, inspection of native quarters failed to reveal a high density.

Anopheles nili (Theob.) Roberts Field; Harbel. Larvae were most generally encountered in dense shaded situations along the margins of running streams. Only a few adults were collected; these were taken in native huts.

Anopheles paludis Theob. New record for Liberia. Roberts Field. Larvae were collected in swampy areas. These situations were densely shaded and associated with aquatic vegetation. Adults were captured in a stable trap; none, however, were found in native dwellings.

Aedes (Aedimorphus) sp. very close to *filis* I. & M. Roberts Field. The larvae were found during the rainy season in temporary water collections. Adults were never taken in native quarters.

Aedes aegypti (L.). Roberts Field; Harbel; Kakata; Monrovia. The larvae of this species were found mainly in bamboo stumps, leaf axils, tree holes, wells and tin cans. Only a few centimeters of water were necessary. In Kakata and Monrovia anophelines and *aegypti* were breeding in open wells. Adults were not found far from their place of emergence. Only a few were taken indoors.

Aedes africanus (Theob.). Roberts Field; Kakata. During the wet season breeding occurred in holes of cut tree trunks in which rain water had accumulated. In some instances these larvae were associated with those of *aegypti*. Two adults were found in a stable trap; a few were taken in native huts.

Aedes luteocephalus Newst. Roberts Field. A few larvae were found during the rainy season in temporary pools. Two adults were collected in an abandoned wooden building near the breeding sites.

Aedes vittatus (Bigot). Roberts Field. Open ditches in forest clearing yielded larvae of this species. A few adults were taken in a stable trap.

Culex annulirostris consimilis Newst. Roberts Field; Harbel. Larvae of this species were found in temporary puddles in forest clearings exposed to the sun. They were in association with *A. gambiae*. Adults were not observed in native dwellings.

Culex bitaeniorhynchus Giles. Roberts Field; Harbel. Larvae were found in rice fields, ditches and hollow tree stumps during the wet season. Adults were not taken in native quarters.

Culex guiarti Blanch. Roberts Field; Harbel. Larvae occurred in temporary ground pools in forest clearing. The few adults collected were in an abandoned wooden building near the breeding sites.

Culex moucheti Evans. Roberts Field; Harbel. During the dry season larvae of this species were taken from the quiescent margin of permanent pools. In the wet season they were found in three stumps where rain water had accumulated. Adults were taken from an abandoned wooden building; a few were found in a stable trap.

Culex nebulosus Theob. Roberts Field; Harbel. Many larvae were taken during the wet period from tree stumps and felled giant silk cotton trees (*Ceiba pentandra*) which had been partly hollowed out by natives in the process of making canoes. Adults were captured on foliage near the breeding places.

Culex tigripes Gr. & Ch. Roberts Field; Harbel. Breeding sites for this species were holes in fallen trees and the axils of banana leaves. They were also found breeding in containers near human habitations. The larvae are predaceous. None of the adults were found in native huts.

Eretmapodites chrysogaster Graham. Roberts Field; Harbel. Many larvae of this species were found in the axils of

banana leaves and hollow stumps of bamboos partly filled with rain water. They are predaceous. Adults were never seen in native huts.

Mansonia africana (Theob.). Roberts Field; Harbel. The larvae were associated with vegetation in ponds and swamps. They possess a saw-toothed siphon with which they puncture the air tubes of aquatic plants. Adults were captured in stable traps and native dwellings.

Mansonia metallica (Theob.). Roberts Field. The breeding habits are similar to those of *M. africana*. A few adults were captured in a stable trap.

Mansonia uniformis (Theob.). Roberts Field. The breeding habits are similar to those of *M. africana*. Many adults were taken in native huts. They were found on clothing hanging on the wall and grass mats suspended from rafters. A few were caught in a stable trap.

Megarhinus sp. probably *brevipalpis comradti* Grönb. Roberts Field; Harbel. The larvae of this species are predaceous. Many were found in hollow stumps partially filled with rain water. In some instances they were associated with the larvae of *Eretmapodites chrysogaster*. Adults were not found in native huts.

Ficalbia (Miomyia) sp. Roberts Field. A few larvae were taken from vegetated pools. Adults, however, were not observed in native quarters.

Acknowledgments

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