SURVEILLANCE FOR *AEDES AEGYPTI* ON MILITARY RESERVATIONS IN THE CANAL ZONE[1]

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A nation-wide *Aedes aegypti* (Linnaeus) eradication program was conducted in Panama from 1949 to 1958. The program was operated under the auspices of Pan American Health Organization (PAHO) and World Health Organization (WHO). During this period all houses and dwellings were surveyed and foci treated with DDT by intradomiciliary and perifocal methods. A concurrent malaria eradication program that used a 5% DDT residual was thought to greatly aid in the reduction of *Ae. aegypti* in Panama.

In March 1969, a focus of *Ae. aegypti* larvae was found in the city of Colon. The larvae were discovered in a drinking water container of a small ship from Colombia. Panamanian health authorities quickly reinstituted a country-wide surveillance program and discovered infestations at 3 locations. After control measures, Panama was again considered free of *Ae. aegypti*.

In 1972, *Ae. aegypti* larvae were found in old tires that had been shipped in from Miami, Florida. A country-wide survey located 3 other positive areas, in Vera Cruz, a small town bordering the Canal Zone (CZ), La Chorrera in Panama province and David in Chiriqui province. An extensive control program utilizing malathion and temephos was initiated, and by 1976, *Ae. aegypti* was considered eradicated from Panama.

In February 1977, another infestation was found in Colon. The source was considered to be commercial boats from Colombia. Surveillance indicated no new areas had been infested and to date Panama is considered free of *Ae. aegypti*. (Gallardo 1979).

During the time the Republic of Panama was conducting its eradication programs similar measures were being utilized by various U.S. government agencies responsible for vector control in the CZ. There is no historical data to indicate that *Ae. aegypti* occurred in the CZ during the periods mentioned above. However, each time Panama found new foci of *Ae. aegypti* in areas near the CZ, increased surveillance was initiated by CZ and U.S. military agencies. This paper summarizes the results of the surveys conducted for *Ae. aegypti* on military reservations from 1977 to the present.

The principal method of surveillance on military reservations has been the utilization of ovitraps (Fay and Eliason 1966). The traps were set on a quarterly basis in areas considered having the highest risk of infestation by *Ae. aegypti*, i.e., near the military airport, ship docking facilities and areas adjacent to squatter housing areas in Panama.

Fifteen to 26 ovitraps were placed in various locations. The number of traps was determined by availability at the time of setting.

Traps were left in place for 2 weeks, then returned to the laboratory for determination of positive samples and identification. During a 21-month period, September 1977 through May 1979, 285 ovitraps were set and checked for the presence of *Ae. aegypti*. None was found during the period of the survey. There were 196 set in 1978 and 79 to date in 1979. In 1978 there were 47 positive samples with a total of 963 mosquitoes. Only 2 species were collected, *Culex corniger* Theobald and *Limatus durhamii* Theobald. The latter species was predominant, representing 83% of the total, and 40 of the 47 positive samples. To date in 1979 there have been only 3 positive samples, and 85 mosquitoes. These included *Cx. corniger*, *Cx. quinquefasciatus* and *Cx. nigripalpus*. Table 1 summarizes the collection results.

On military reservations in the CZ the ovitrap method is used exclusively for *Ae. aegypti* surveys. However, separate, daily larval and

Table 1. Summary of ovitrap collections on military reservations in the Canal Zone.

Species	Number	Positive Ovitraps
1978—Total Ovitraps Set—285		
Culex corniger	139	5
Cx. species	30	2
Limatus durhamii	794	40
Totals	963	47
1979—Total Ovitraps Set—79		
Cx. corniger	25	1
Cx. nigripalpus	6	1
Cx. quinquefasciatus	54	1
Totals	85	3

[1] The opinions, assertions or product names contained herein are the private views of the author and are not to be construed as official or as reflecting the views or endorsements of the Department of the Army.

light trap collections are made. These surveys are the basis of the malaria vector and pest mosquito control programs managed by the military. During these collections, artificial containers that could be suitable habitats for *Ae. aegypti* are located, positive containers sampled and either emptied or treated with insecticide. These collections have yielded no *Ae. aegypti.* This is managed as a separate program, therefore, data from these collections are not included in this report.

It is very apparent in countries such as Panama having successful *Ae. aegypti* eradication programs that continual surveillance is necessary to insure reinfestations do not occur. Epidemics of dengue in Puerto Rico and other Caribbean countries have emphasized the necessity to intensify control of *Ae. aegypti* in all Western Hemisphere countries where it occurs. Unless all nations involved are willing to accept their responsibility in the international community, *Ae. aegypti* will continue to be reintroduced into areas now considered free of this species.

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ANOPHELES BARBIROSTRIS— CONFIRMATION OF INTRODUCTION ON ISLAND OF GUAM

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Three years ago, the presence of a member of the *Anopheles barbirostris* species group on Guam was reported on the basis of 3 female specimens collected in light traps from May to October 1975 (Ward et al. 1975). At that time, a search of aquatic habitats for immature stages of this species was unsuccessful. Without associated larval and/or pupal stages, specific identification of the species was not possible.

During 1976, while assigned to the Environmental Health Service, U. S. Naval Regional Medical Center, Guam, B. Jordan made a number of larval collections on Guam to obtain further specimens of this anopheline for taxonomic studies. From 15–16 March, several collections were made at the margins of a small, temporary stream behind the Rojas Sports Arena on the Naval Station in slow-moving water with an abundance of green algae. Collection number 58 from this site produced a number of larvae, 2 of which were reared to the adult stage. The adults (058-01, −02) were tentatively identified as *An. (Ano.) barbirostris* Van der Wulp by B. Jordan and W. A. Brown, and the adults with accompanying skins were sent to R. A. Ward for further study.

Pupae are one of the most diagnostic stages of species of the *barbirostris* group (Harrison and Scanlon 1975, Reid et al. 1979), and an analysis of pupal skins indicate that this material is definitely *barbirostris.* The pupa of *barbirostris* is characterized by: 1) trumpet angusticorn, with secondary cleft, 2) abdominal seta 9 light brown, 4.0-6.0 as long as wide, 3) sum of branches of both setae 2-VI 6-18, 4) sum of branches on both setae 2-III 11-19. Our 2 Guam pupae have the trumpets and seta 9 as above, the sum of branches of setae 2-VI is 13 for both pupae and that sum for 2-III is 22 for specimen 58-01 and 19 for 58-02.

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