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ERADICATION OF *AEDES AEGYPTI* ON CAYMAN BRAC AND LITTLE CAYMAN, WEST INDIES, WITH ABATE (TEMEPHOS) IN 1970-1971[1]

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In 1970-1971 an intensive campaign against Aedes aegypti *adults and larvae resulted in eradication of this mosquito from the Lesser Cayman Islands. This account of problems encountered and the measures taken to overcome them provides useful information for those concerned with* aegypti *eradication.*

Introduction

Recent History

In 1948 Giglioli reported an abundance of *Aedes aegypti* on Grand Cayman, the largest of the three Cayman Islands, and recommended control by intradomiciliary residual treatment with DDT *(1)*. These recommendations led to implementation of a yearly cycle of DDT spraying between 1950 and 1954, supplemented by use of larvivorous fish *(Gambusia puncticulata)* and kerosene oil in cisterns and water containers *(2)*. In retrospect, it can be seen that eradication of *A. aegypti* from Grand Cayman was achieved sometime between 1950 and 1953, because surveys conducted in the latter year were negative *(3)*. Larval surveys made in 1966, 1967, and 1968 were also negative *(4)*, indicating its continued eradication; and it appears that the mosquito remained eradicated until 1973, when Grand Cayman suffered a temporary reinfestation *(5)*.

The DDT campaign was not extended to Cayman Brac or Little Cayman despite the presence of *A. aegypti (6)*. Infestation of these islands was confirmed in 1967 by Giglioli and Ward *(7)*, a finding that led to establishment of a port disinsection service on Grand Cayman and initiation of an eradication campaign on Cayman Brac and Little Cayman. This article describes the behavior of *A. aegypti* on these islands and its successful eradication with Abate® (Temephos) insecticide in 1970-1971.

Geography

The Cayman Islands consist of three small corraline islands in the northwestern Caribbean that are more or less equidistant from Cuba and Jamaica (Figure 1). Cayman Brac, with an area of 38 km^2 , is 7.6 km east of Little Cayman, which covers 29 km^2. The latter, in turn, is situated 109 km northeast of the capital island, Grand Cayman, which has a considerably larger area (198 km^2).

The two smaller islands are both elongate, but Little Cayman is extensively covered by mangrove swamps, whereas Cayman Brac is dominated by an arid, central, wedge-shaped plateau largely covered by xerophytic vegetation. The plateau, which rises to 43 meters at its eastern end, is almost completely encircled by a low, narrow, inhabited coastal platform.

According to the 1970 census, the Cayman Islands' total population of 10,249 was distributed as follows: 8,932 on Grand Cayman, 1,297 on Cayman Brac, and 20 on Little Cayman.

A seasonally variable tropical climate prevails. The rainy season, from May to October, is characterized by occasional low-pressure

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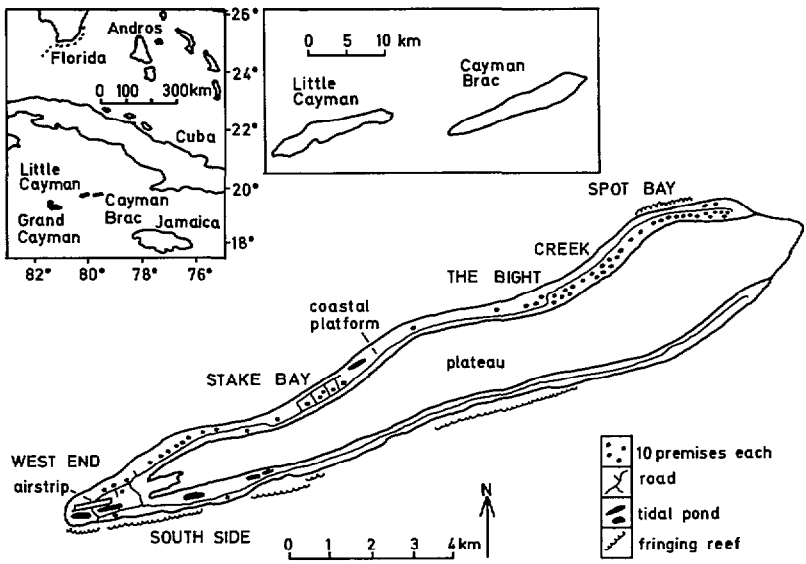
Figure 1. Maps of the Cayman Islands. The map of Cayman Brac shows the "ribbon development" pattern of premises along the single road of the coastal platform and the location of the six main communities on the island.



weather systems that provide a major portion of the total rainfall. The mean annual rainfall for Cayman Brac during the years 1970-1973 was 1,083 mm. The annual mean monthly maximum and minimum temperatures ranged from 29 to 33°C and from 20 to 25°C, respectively, in this period.

The dwindling resident community of Little Cayman lives in semiretirement near the west end of the island. This population is supplemented by a small dry-season tourist influx that also attracts temporary labor from Cayman Brac. The native population of Cayman Brac lives in a ribbon development along the north coast (see Figure 1), and a small seasonal tourist community exists on the south coast. Employment has traditionally been found in the fishing industry and merchant marine.

Modern houses on the islands are of concrete block construction, but the older homes are wooden. Most houses on Cayman Brac have electricity, but neither island has a community garbage disposal or water supply system. Drinking water is collected by roof catchment and is typically stored in 208 liter (55 U.S. gallon) steel drums or concrete cisterns. Well water of varying quality supplements the roof catchment supplies in many homes.

Materials and Methods

General Approach

The policy adopted against *aegypti* was that of making a strong logistical buildup and launching an all-out attack. This was done in order to reduce repeated cycles of treatment, to shorten the campaign, and thereby to minimize public complaint and opposition. The value of this policy and its results have been discussed in detail elsewhere *(5)*.

The campaign was jointly funded by PAHO/WHO and the Cayman Islands Government. Members of the Government's Mosquito Research and Control Unit were responsible for local execution and technical supervision. Advice was supplied through periodic visits by PAHO staff members. Excluding PAHO staff costs, the program's ex-

penses amounted to US$21,935 in 1970 and US$10,996 in 1971, the years spanning the full duration of the attack phase.

Mapping

Before the campaign, all premises on the two islands were mapped and sequentially numbered. The 49 premises on Little Cayman were considered as one area, while the 575 premises on Cayman Brac were divided into six areas on the basis of community or topographic divisions. The resulting maps were updated during each survey and treatment cycle.

Survey Techniques and Definitions

Except in the initial survey on Cayman Brac, when alternately numbered premises were searched, *A. aegypti* abundance was determined by regular larval surveys of all accessible premises. All potential breeding foci on the premises, both indoors and out, were methodically examined for the presence of mosquito larvae and pupae.

During the initial survey a count was made of all containers that provided potential sites for breeding foci. The general type of such containers, as well as the presence or absence of water in them, was also noted. After this survey, in which specimens were collected from all foci, trained inspectors only took samples when *Aedes*-like larvae or pupae were present or the larvae were too small for clear *in situ* examination. Representative specimens from all sampled foci were stored in 70 per cent alcohol for microscopic laboratory examination.

Three standard larval indexes were measured. These were as follows:

1) the premises index (also referred to as the house or *Aedes aegypti* index), which is the percentage of premises infested;

2) the Breteau index, which is the number of positive containers per 100 premises inspected; and

3) the container index, which is the percentage of water-filled containers infested.

During the latter stages of the campaign a weekly ovitrap *(8)* survey was conducted on Cayman Brac. Positive paddles were immersed in water containing a little baker's yeast to induce hatching, and the larvae were reared to the third or fourth instar for identification.

Insecticide Application

The susceptibility of wild-caught *Aedes aegypti* to Abate (Temephos) was demonstrated ($LD_{50} = 0.005$ ppm) before the campaign *(9)* and was later checked by Tinker (unpublished data) using insects reared from eggs collected in the field.

As a consequence, and to simplify provision of supplies, Abate was the only insecticide used in the campaign. Both inside and outside walls were given a residual treatment. Painted indoor walls were treated with a 1.5 per cent emulsion of Abate 500E, whilst outdoor walls, unpainted surfaces, and perifocal areas around outdoor water containers were treated with 50 per cent Abate in wettable powder used as a 1.5 per cent suspension. Formulations were mixed in the field using available supplies of fresh water from storage vessels or wells on the premises and were applied with Hudson X-Pert pressure sprayers fitted with fan nozzles (Tee Jet J.S.S. 8002) delivering approximately 800 cc per minute and depositing 1.6 g of active ingredient per square meter of target.

All potable water collections from roof catchments or wells were treated with Abate (1 per cent sand granules) to yield a concentration of 1 ppm. Treatment was based on actual water volume at the time of inspection and not upon container volume, as is usually the case *(10)*. Also, for all large containers such as cisterns the treatment dose was calculated using a dosage nomogram *(11)* with the insecticide weighed *in situ* on a kitchen scale. Strict adherence to accurate dosages was essential in order to minimize discontent among house-

holders, who objected to the taste of Abate in potable water and were apt to blame over-treatment.

Initially, all premises were treated. However, only premises within 100 meters of an infestation were included in subsequent re-treatments.

Results

Types of Breeding Sites

The initial larval survey was conducted in the dry season between January and April 1970. All 49 premises on Little Cayman and 240 (41.7 per cent) of those on Cayman Brac were surveyed. Table 1 shows the relative abundance of all types of potential breeding containers with and without water that were detected and their observed frequency of infestation with *A. aegypti.* Discarded containers (tin cans, glass jars, bottles, plastic containers, and so forth) were plentiful, accounting for 93.0 per cent of all potential breeding sites and 33.7 per cent of all sites containing water. However, they generally offered unfavorable breeding places, their container index being only 4.5 per cent. Drums for holding rainwater were the second most common type of receptacle, accounting for 1.9 per cent of all the potential breeding sites and 17.8 per cent of the receptacles containing water. In contrast to the discarded containers, however, their level of infestation was high, the recorded container index being 35.0 per cent. High container indexes were also recorded for flower vases (28.0 per cent) and rainwater cisterns (20.8 per cent), but these types of containers were less plentiful. Clay jars used for storing drinking water were uncommon (only 18 were found and only 13 contained water). However, these appeared to provide by far the most favorable breeding receptacles, the container index of infestation being 76.9 per cent.

Well-water used for domestic purposes varied considerably in quality; in some areas where this water had low salinity it was used for drinking purposes. In one such well a breeding focus was discovered 3 meters below ground in water with a salinity of 1.2 grams per liter of Cl^-. The well was located within 15 meters of a house. Adult *A. aegypti* were seen resting on the walls of a nearby well, but no other foci were found in any of 97 other wells examined.

The sparsely-soiled substrate of the coastal platform on Cayman Brac, composed of consolidated coral-sand and limestone deposits,

Table 1. Relative abundance of container types and *Aedes aegypti* container indexes at 289 premises on Cayman Brac and Little Cayman before application of insecticide.

Container type	No. found	% of total	No. with water	% of total	No. with foci	% of total	Container index (% of water-bearing receptacles with foci)
Discarded containers (tin cans, etc.)	15,114	93.0	467	33.7	21	9.2	4.5
Drums	307	1.9	246	17.8	86	37.6	35.0
Cisterns	159	1.0	144	10.4	30	13.1	20.8
Buckets	154	0.9	95	6.9	18	7.9	19.0
Flower vases	150	0.9	150	10.8	42	18.3	28.0
Tires	130	0.8	42	3.0	2	0.9	4.8
Wells	99	0.6	99	7.1	1	0.4	1.0
Wrecked cars	48	0.3	2	0.1	0	0.0	0.0
Tanks	31	0.2	31	2.3	4	1.7	12.9
Clay jars	18	0.1	13	0.9	10	4.4	76.9
Barrels	14	0.1	13	0.9	4	1.7	30.8
Rock holes	?	?	61	4.4	1	0.4	1.6
Miscellaneous	26	0.2	23	1.7	10	4.4	43.5
Total	16,250	100.0	1,386	100.0	229	100.0	16.5

provided innumerable rocky depressions and holes capable of holding rainwater. At the time of the initial survey (in the dry season) only 61 were seen to contain water, and only one active focus was found among them. However, during subsequent surveys additional breeding sites in rock holes were discovered. Tree-hole breeding, noted elsewhere in the Caribbean *(12, 13)*, was not encountered.

Three infested roof-catchment cattle cisterns on Cayman Brac's plateau were especially interesting sites. Their isolation probably precluded unaided colonization, since all were over 400 meters from the nearest habitation and were separated from it by a sheer, windswept cliff rising 42 meters high. Therefore, these foci most likely resulted from farmers carrying eggs or larvae to the cisterns in buckets used for transferring water into drinking troughs. Since the cisterns were only visited briefly and occasionally by the farmers, adult mosquitoes presumably fed on cattle or other vertebrates near the breeding sites.

Table 2 shows the relative abundance of foci by container type at the 91 infested premises included in the initial survey. Water-containing drums harbored a large share of the foci contributing to the premises index, infested drums being present at 53.8 per cent of the infested premises. Infested cisterns and flower vases (present, respectively, at 30.8 per cent and 24.2 per cent of the infested premises) were next in importance; other foci-bearing containers were of relatively minor significance.

Table 2. Relative abundances of foci in different containers at 91 infested premises on Cayman Brac and Little Cayman before application of insecticide.

Container type	No. of infested premises with foci	% of 91 infested premises with foci
Discarded containers (tin cans, etc.)	11	12.1
Drums	49	53.8
Cisterns	28	30.8
Buckets	14	15.4
Flower vases	22	24.2
Tires	1	1.1
Wells	1	1.1
Wrecked cars	0	0.0
Tanks	3	3.3
Clay jars	9	9.9
Barrels	4	4.4
Rock holes	1	1.1
Miscellaneous	9	9.9

Geographic Distribution of Breeding Sites

The initial premises and Breteau indexes obtained for each of the seven aforementioned areas are shown in Figure 2. As may be seen, the indexes varied considerably from one area to another. South Side was the only locality where the indexes were at zero. In the remaining areas, the premises index ranged from 10.7 per cent (at Stake Bay) to 61.4 per cent (at Spot Bay); the corresponding Breteau indexes were 32.1 and 165.7.

These variations may possibly have been due to differences in the availability of preferred breeding habitats. In particular, differences in infestation indexes show a correlation with the extent to which drums were used for storing rainwater. At one extreme, in the South Side area, drums were only used at 12 per cent of the premises and the premises index was zero. At the other, in the Spot Bay area, 53 per cent of the premises had drums and the premises index was 61.4 per cent.

Eradication Chronology

The initial premises index of 31.5 per cent (see Table 3) was based on data obtained from January to May during the dry season of 1970, a period when the recorded rainfall totaled only 141 mm. Approximately half the premises had been treated before the first heavy wet-season rains came in May, producing 195 mm of rainfall in two days. Observations of breeding foci made while the first treatment was being completed (in late May and June) revealed a considerable increase in the number of breeding foci since the dry-season survey. Behind one garage, for instance, a brief examination of some 100 tires revealed a container index of approximately

Figure 2. Differences in the premises and Breteau indexes at different localities on Cayman Brac and Little Cayman before application of insecticide and the relative abundance of drums used for rainwater storage.

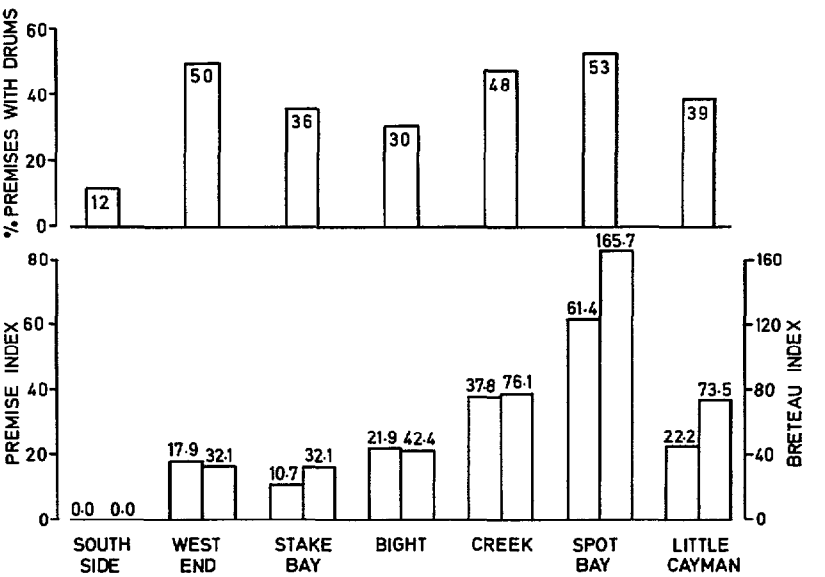


Table 3. Progress of the *Aedes aegypti* eradication campaign on Cayman Brac and Little Cayman, January 1970-April 1972.

Activity	Date	Premises			
		No. inspected	No. with foci	Premises index (% with foci)	No. treated
Initial survey and treatment	January-June 1970	289	91	31.5	624
1st verification and treatment	June-August 1970	626	16	2.6	198
2nd verification and treatment	September-December 1970	627	39	6.2	151
3rd verification and treatment	January-February 1971	628	16	2.5	96
4th verification and treatment	February-March 1971	641	1	0.2	7
5th verification	June-July 1971	641	0	0.0	0
6th verification	September 1971	648	0	0.0	0
7th verification	November-January 1972	635	0	0.0	0
8th verification	March-April 1972	654	0	0.0	0

70 per cent, whereas during the initial survey all the tires had been dry. The onset of the rains also greatly facilitated the location and treatment of previously dry rock holes.

As indicated by the first verification survey (Table 3), the initial treatment reduced the overall premises index from 31.5 to 2.6 per cent. However, the second verification survey (begun in September 1970) indicated that the index had risen again to 6.2 per cent. This latter increase probably arose in part from the initial inexperience of new staff members combined with a maximum availability of breeding containers at the end of the rainy season in September and October. One focus, discovered in a previously cleared area, was found to have been started by *A. aegypti* eggs imported from Jamaica in a glazed clay flower vase that had been shipped with a crate of personal effects one month before. At the time of discovery four other containers besides the vase had become infested, but the focus had not spread to adjoining premises.

Treatment of several detected foci was deferred from the second verification and re-treatment cycle to the third because of a delay in the arrival of insecticide supplies. This delay accounted for a significant proportion of the infestations producing the premises index of 2.5 per cent that was recorded by the third verification survey.

The last known focus of *A. aegypti* was detected during the fourth verification survey in February-March 1971, 15 months after the campaign began. Four more surveys conducted over the next 12 months yielded only negative results.

Treatment of Breeding Places

Even though tin cans, bottles, and other small discarded containers greatly outnumbered all other potential breeding containers, they harbored only 9.2 per cent of the *A. aegypti* foci detected by the initial survey. As the campaign progressed, however, it became evident that foci in these small containers (and in rock holes) would be harder to eliminate than other foci, because such breeding sites were easily overlooked during inspection and treatment procedures.

On the second verification survey a need for cutlasses—used to uncover scattered cans and bottles hidden in thick undergrowth on the periphery of many properties—illustrated the magnitude of the problem. This physical clearing effort led to detection of 19 foci—24.7 per cent of all foci found during the survey.

The difficulty of treating these areas and large piles of garbage with back-pack sprayers was overcome by using a small trailer-mounted power sprayer with a fifteen-meter hose and rod. Operated at a working pressure of 7 kg per cm^2, and with an output of 8 liters per minute, this apparatus effectively penetrated dense foliage and garbage heaps, and in this manner these persistent foci were successfully eliminated in one treatment. While undoubtedly overtreating these foci, the method proved both very efficient and economical; and in hindsight one can see that it would have been far more beneficial had it been used at the start of the campaign.

Nine rock-hole foci were detected during the second verification survey. All of these were in shady areas located within 6 meters of buildings. As a result of this finding, during dry weather the spraying of rocky depressions in the yards of re-treated premises was supplemented by broadcasting a granular formulation of the insecticide (in sparing quantities) on likely water settlement areas near buildings. In this way the granules were scattered into holes and crevices that might otherwise have been missed by the spraymen.

There was no difficulty treating cisterns or drums, but in the latter case rapid flushing by heavy rain and frequent cleaning (often immediately after treatment) reduced the effectiveness of the insecticide applications. Also, during most of the campaign road-surfacing operations were being carried out on Cayman Brac, and discarded empty tar drums were commonly collected and used by householders after their homes had been treated. These drums were large and had a dark interior color

(owing to a hardened coating of black tar). These two features, which have been correlated with attractiveness to *Aedes aegypti (14),* appeared to favor colonization.

In the case of flower vases used for household decoration, frequent changes of water minimized the effectiveness of treatment. The problem was further aggravated by temporary storage of some of these containers at the time of spraying, thus enabling larval development to take place at a later date when viable eggs were flooded.

Other Mosquito Species

Aedes mediovittatus was the only aedine species with a habitat overlapping that of *A. aegypti.* A total of 228 foci colonized by this species were found during the campaign, eight in association with *A. aegypti* foci (Table 4). Rock holes and tin cans were the most common types of refuges, respectively harboring 39.0 and 33.3 per cent of the foci. Eleven breeding places in tree holes were also noted.

Details of *Culex* breeding were recorded on the first and eighth verification surveys. The species most commonly found were *Culex nigripalpus* and *C. quinquefasciatus.* Massive breeding concentrations of the latter were often found in septic tanks; but because *A. aegypti* does not normally breed in water with such a high organic content, details of these foci were not recorded. With the exception of clay jars, both species were found in all types of containers occupied by *A. aegypti* (see Table 4). Drum breeding sites accounted, respectively, for 57.3 and 39.0 per cent of the observed *C. quinquefasciatus* and *C. nigripalpus* foci. The latter species was also commonly found in rock holes.

Other species occasionally encountered were *Anopheles grabhamii, Aedes tortilis, Psorophora pygmaea, Psorophora columbiae, Culex sphinx*(?),[4] and *Culex bahamensis.* In most instances these species were found in temporary ground pools close to a habitation. With the exception of *A. tortilis,* none are regarded as container breeders.

Ovitrap Surveillance

Following the first negative larval survey in July 1971 (the fifth verification survey), 23 ovitraps were set out at previously infested

[4]Tentative identification; species not confirmed.

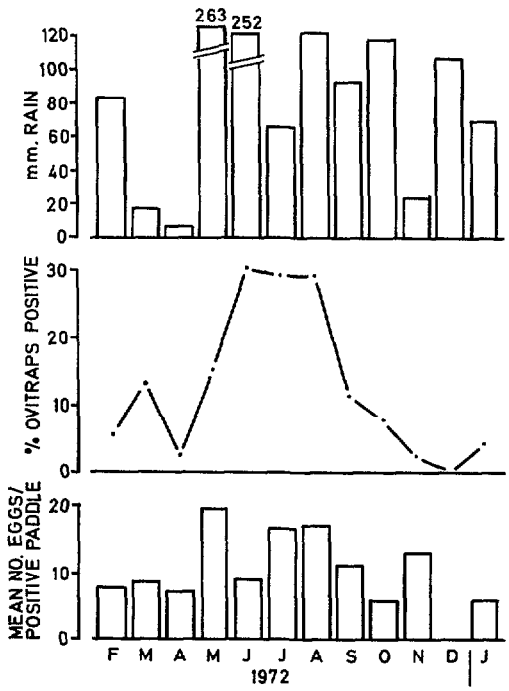
Table 4. Breeding of other mosquito species besides *aegypti* around human settlements. (The data for *Aedes mediovittatus* are from all the larval surveys, while those for the *Culex* species are from the first and eighth verification surveys.)

Container type	*Aedes mediovittatus*		*Culex quinquefasciatus*		*Culex nigripalpus*	
	No. of foci	% of total	No. of foci	% of total	No. of foci	% of total
Discarded containers (tin cans, etc.)	76	33.3	26	10.5	47	12.6
Drums	16	7.0	142	57.3	145	39.0
Cisterns	1	0.4	6	2.4	8	2.1
Buckets	4	1.8	9	3.6	6	1.6
Flower vases	4	1.8	24	9.7	16	4.3
Tires	12	5.3	4	1.6	36	9.7
Wells	0	0.0	4	1.6	14	3.8
Tanks	0	0.0	2	0.8	4	1.1
Barrels	1	0.4	5	2.0	3	0.8
Rock holes	89	39.0	7	2.8	75	20.2
Tree holes	11	4.8	1	0.4	0	0.0
Miscellaneous	14	6.2	18	7.3	18	4.8
Total	228	100.0	248	100.0	372	100.0

premises along the north coast of Cayman Brac. No *A. aegypti* eggs were recovered during 10 weeks of trapping, but a considerable proportion of the traps were positive for *A. mediovittatus,* the weekly maximum being 43 per cent.

In February 1972, ovitraps were again set out at 22 houses and were serviced weekly for a year. Again, no *A. aegypti* eggs were collected, but the program provided an opportunity to study the seasonal abundance of *A. mediovittatus,* a species poorly represented in CDC miniature light trap collections on the island (Nathan, unpublished data). As Figure 3 shows, the monthly percentage of positive ovitraps varied from zero to 30.5 per cent and was generally related to rainfall. Low positivity during the initial months of trapping was associated with dry-season conditions, while increased egg-laying activity in June, July, and August was preceded by heavy May rains. The reason for the rapid decline in egg-laying toward the end of the year, during the latter part of the wet season (September to November), is unknown. The mean number of eggs per paddle did not vary widely from month to month, there being only a small average increase during the wetter months.

Figure 3. Seasonal variations in *Aedes mediovittatus* egg-laying activity at ovitraps on Cayman Brac relative to rainfall, February 1972-January 1973.



Discussion

A policy of "total" treatment (perifocal, extradomiciliary, and intradomiciliary treatment of all premises) was adopted because it was felt that eradication would be achieved quickly, thereby avoiding the expense of a protracted campaign with extensive re-treatment, high labor costs, declining public cooperation, and possible failure to eliminate *A. aegypti.* In retrospect, the success of the campaign justified this decision. The increasing reluctance of householders to have their houses re-treated (even though none received more than two treatments) made it imperative to achieve eradication quickly before public opinion turned strongly negative.

This negative change of attitude stemmed partly from public concern about the insecticide, despite concerted efforts through public meetings to assure people of its safety. Also, many people objected to the smell in their homes after intradomiciliary spraying and to the taste of treated water. Indeed, some people claimed insecticide-induced digestive and respiratory ailments, although these were not substantiated medically. The decision to treat potable water by volume rather than by container capacity helped to minimize the discontent, because a consistent treatment concentration of 1 ppm was obtained; and it is the authors' opinion that the taste of the insecticide at this low concentration provided no basis for serious complaint.

Abate insecticide has proven an effective and safe larvicide for control of *A. aegypti* in potable water *(15-18).* However, it has not been widely used as an adulticide. In laboratory tests with DDT-resistant *A. aegypti,* one-

hour exposure to plywood panels coated with 2 g of active ingredient per square meter was shown to produce an effective kill for up to 10 weeks *(19)*. Also, field trials in Jamaica showed Abate to give good control when applied as a perifocal or intradomiciliary treatment (Tinker, personal communication). This evidence, together with our successful eradication of *A. aegypti* from the lesser Cayman Islands using only Abate at 1.6 g/m^2 or 1 ppm, has adequately demonstrated the compound's efficacy as an adulticide.

In areas such as Djakarta *(20)*, where indoor breeding predominates, the seasonal timing of anti-*aegypti* measures probably matters little, since there is little seasonal variation in *aegypti's* abundance. However, in areas such as Puerto Rico, where most breeding occurs outdoors *(21)*, perifocal treatment may be more difficult in the dry season than in the wet season because it is harder to locate certain potential foci when they are dry. The failure to control *aegypti* in some parts of Puerto Rico has been attributed to the presence of hidden and inaccessible rock-hole breeding places *(22)*. On Cayman Brac the importance of rock-hole foci, and the difficulty of locating them when dry, was not fully appreciated until the onset of the rains mid-way through the first spraying cycle. For this reason, in hindsight, it would have been more effective to have commenced treatment during the wet season.

The importance of maintaining a surveillance program after eradication was demonstrated on two occasions, once during the latter part of the campaign and once shortly thereafter. The first instance, already discussed, involved importation of viable *A. aegypti* eggs to Cayman Brac in a crate of household articles. The second occurred on Grand Cayman in early 1973, when that island became reinfested (apparently for the first time in 20 years) despite establishment of an active port disinsection program in 1968 *(5)*. By the time *aegypti's* presence was noticed, during a routine six-monthly vigilance survey in June 1973, the mosquito had spread to most areas of Georgetown, the capital. A 16.5 per cent premises index was recorded in the harbor area, and the overall distribution of foci was highly suggestive of reintroduction via this port. Foci were confined to the capital, and their elimination entailed initial treatment of 1,073 premises using the methodology adopted on the lesser islands. Only two recurrent foci, which required the re-treatment of 58 premises, were found on the next verification survey.

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SUMMARY

A successful *Aedes aegypti* eradication campaign using Abate (Temephos) for perifocal, intradomiciliary, and extradomiciliary treatments was conducted on Cayman Brac and Little Cayman in 1970-1971. Larval distribution was investigated prior to insecticide application. The majority of foci were found outdoors and within 10 meters of dwellings. One notable exception, however, was provided by several foci in roof-catchment cattle cisterns situated in pastureland over 400 meters from any habitation, on a plateau separated from the inhabited coastal strip by a high vertical cliff.

A dry-season, pretreatment premises index of 31.5 per cent was recorded. The most common larval habitats were steel drums used for rainwater storage, and an association was found between the abundance of these drums and the premises index in different areas. Other important habitats included cisterns, tires, and rock holes.

Painted indoor walls were treated with a 1.5 per cent emulsion of Abate 500E, while unpainted surfaces, outdoor walls, and perifocal areas around outdoor water containers were treated with Abate wettable powder used as a 1.5 per cent suspension. All potable water collections from roof catchments or wells were treated with Abate (1 per cent sand granules) to yield a concentration of 1 ppm.

Observation of breeding sites made while the first treatment was being completed (in May and June 1970) revealed a considerable increase in foci with the arrival of wet weather. However, the initial treatment reduced the overall premises index from 31.5 to 2.6 per cent; and although this index later rose again to 6.2 per cent, repeated surveys and retreatments eliminated all foci in 15 months. Certain types of potential habitats—notably small discarded containers hidden by undergrowth, heaps of container-bearing garbage, rock holes, rainwater drums, and flower vases—posed special problems.

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1981 MEASLES EPIDEMIC IN TRINIDAD AND TOBAGO

As of 30 June 1981, the National Surveillance Unit of the Ministry of Health received reports of approximately 3,000 cases of measles (rubeola). Although the number of sources from which communicable disease morbidity data is collected increased in 1981, compared to 1980, it is known that a measles epidemic did occur.

Greatest morbidity was observed between weeks 8 through 22, with peak activity (204 cases reported) in weeks 10 and 11. Cumulative data obtained from 13 sentinel physicians showed a trend quite similar to that observed in the data from all sources.

Between weeks 15 through 26, 54 per cent (166/309) of the reported measles cases from sentinel physicians had occurred in children between one and four years of age, while 34 per cent (105/309) were in the age group of five to nine years.

Source: CAREC Surveillance Report 7(9):6, 1981.