

NOTES AND DISTRIBUTION OF *Aedes* MOSQUITOES IN PANAMA BASED ON A THREE YEAR LIGHT TRAP SURVEY<sup>1</sup>FRANKLIN S. BLANTON<sup>2</sup> AND E. L. PEYTON<sup>3</sup>

This paper represents the third of a series of small papers on the distribution of Panama mosquitoes based on light trap operations conducted by the 25th Medical Detachment during 1951 to 1953 inclusive.

In Panama there are no diseases known to be transmitted by any member of this genus at this time; however, it is a well known fact that *Aedes aegypti* has been responsible for the transmission of the yellow fever virus. In all of our surveys conducted from Colombia to Costa Rica from 1951 to 1953 inclusive not a single *Aedes aegypti* has been collected. One would not expect many from light traps as they are not readily attracted to light. No larvae were taken in any of our surveys, but with the exception of a few villages near Panama City and Colon, larva collecting was not extensive. The species may or may not be present in the Republic of Panama but the writers feel that limited populations may still be present in the more remote villages. This is a very different picture from that of a few years ago when this dangerous vector of "Yellow Jack" was so prevalent in many areas of Panama. Much of the credit for the elimination of this species from Panama goes to Dr. Pedro Galindo of the Gorgas Memorial Laboratory who was formerly Entomologist for the Public Health Department of the Republic of Panama and his assistant Mr. Gallardo who is now the Entomologist of the Re-

public of Panama. Other *Aedes* species such as *terrens*, *leucocelaenus*, and *leuco-taeniatus* that live in the deep forest and have the same ecological habits as the genus *Haemagogus* may or may not be vectors of jungle yellow fever. Members of this genus have been incriminated as vectors of dengue, yellow fever and jungle yellow fever and some of the encephalitis.

In Panama the writers have taken females of some *Aedes* species with bot-fly eggs attached. They evidently play a part in dermatobiasis to both man and probably to cattle as well as smaller mammals.

As pests, the genus *Aedes* has probably been as annoying as any genus. Salt marsh mosquitoes, *Aedes taeniorhynchus* and *Aedes sollicitans* on our Atlantic Coast have been troublesome during the entire history of the United States. Now that resistance to DDT has been encountered in several places in the United States, older methods of control such as drainage and filling may become necessary. In Alaska the senior writer has experienced extreme annoyance from *Aedes* and this has also been true for many of the Pacific Islands.

In Panama, prior to the installation of tide gates at the Farfan River spillway, *Aedes taeniorhynchus* breeding in Farfan Swamp and Fort Kobbe Swamp literally made life unbearable for residents of Fort Kobbe. This species is very troublesome at times in many areas in Panama but on the whole the genus *Mansonia* in Panama is probably more troublesome than *Aedes*.

The following 9 species of *Aedes* have been taken in Panama by our light traps, and Dr. Galindo has collected two additional species that are new to Panama: *angustivittatus*, *euplocamus*, *fulvus*, *hastatus*, *leucocelaenus*, *septemstriatus*, *ser-ratus*, *taeniorhynchus*, *terrens*.

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Other species taken in Panama by other methods are as follows: *aegypti*, *fluviatilis*, *hottator*, *leucotaeniatus*, *quadrivittatus*, *sexlineatus*.

This represents a total of 17 species of *Aedes* in Panama and the writers believe that there are two or three species in the *terrens* complex. A key has been prepared but the genus is in need of a complete revision and our key would be misleading to those not familiar with the Panama species. Specimens may be placed in the correct genus by use of the pictorial key prepared by Peyton, *et al.* (1955).

The provinces and towns as well as the species encountered are listed alphabetically. The number of specimens taken at a given time are in parenthesis.

The distribution is as follows:

*Aedes angustivittatus* (Dyar and Knab), Jour. N. Y. Ent. Soc. Vol. 15, p. 9, 1907.  
**Bocas del Toro:** Almirante, 6-27 Jan. (21); 15 Apr. (1); 15-26 Nov. (48); 3-16 Dec. (17). **Canal Zone:** Fort Kobbe, 17 July (1); Loma Boracho, 10 Jan. (4); 12 May (2); 17-29 Oct. (2); Loma Boracho, Position 9, 19-23 June (12); 7-17 July (16); Madden Air Strip, 9 Oct. (29); Mandinga River, 25 Apr. (3); 15 May (2); Mindi Dairy, 3 Dec. (1); Mojinga Swamp, 3 Jan., (1); 7 May (1); 17 June (2); 8 Nov. (1); Tarpon Club, (Atlantic Side 16 Oct. (1). **Cocle:** Anton, 11 Nov. (11); Chiru, 10 Nov. (6); La Venta, 8 Nov. (4); Port Of Farallon, 8-9 Nov. (172); Port Obaldia, 11 Nov. (4); Rio Hato, 8-9 Nov. (17); Villa Real, 12 Sept. (2). **Darien:** El Real, 8 Aug. (1). **Panama:** Bayano, 8 Apr. (1); Camaron, 23 June (2); 17 July (1); El Coco, 10 Sept. (1); Juan Diaz, 24 Sept. (2); La Chorrera, 8 Sept. (21); Neuva Gorgona, 16 Sept. (2); Old Panama, 26 Sept. (1); Pacora, 27 Jan. (3); Palm Beach, 17 Sept. (6); Rio Las Lajas, 17 Sept. (2); Tocumen, 5-29 Jan. (25); 4-13 Feb. (36); 29 Sept. (4); 19 Dec. (1). **Veraguas:** El Maria, 14 July (1); Sapotilla, 14 July (5).

*Aedes euplocamus* (Dyar and Knab), Jour. N. Y. Ent. Soc. Vol. 14, p. 190, 1906.  
**Bocas del Toro:** Almirante, 5-26 Jan.

(4); 12-26 Nov. (24); 1-15 Dec. (5).  
**Canal Zone:** Mojinga Swamp, 27 Nov. (1).

*Aedes fulvus* (Wiedemann), Auss. Zweifl. Ins., 1:548, 1826. **Bocas del Toro:** Almirante, 11-24 Nov. (4). **Canal Zone:** Fort Sherman, 9 June, (1); Loma Boracho, 18-26 June (231); 2-22 July (128) 17-29 October (4); Loma Boracho, Position 9, 19-23 July (32); 7-24 July (29); Mojinga Swamp, Station 1, 25-30 June (50); 10-28 July (57); Mojinga Swamp, Station 2, 1-15 July (12); 29 Oct. (1); 20 Nov. (1); Mojinga Swamp, Station 4, 21 May (1); 17-24 June (18); 9-23 July (36). **Darien:** Garachine, 19 Feb. (1); Patino Point, 16-27 July (4); 14-17 Aug. (3). **Panama:** Arraijan, 2-14 Aug. (9); La Jolla, 25 June (2). The writers collected the larvae of this species on the Atlantic side of the isthmus, which represents the first collection for Panama. Another paper is planned on this species with descriptions of the larvae.

*Aedes hastatus* (Dyar), Insec. Inscit. Vol. 10, p. 160, 1922. **Bocas del Toro:** Almirante, 5-27 Jan. (227); 2 Feb. (1); 10-26 Nov. (211); 1-15 Dec. (19). **Canal Zone:** Loma Boracho, 18-27 June, (4); 29 Oct. (4); Loma Boracho, Position 9, 8 May (1); 11-23 June (24); 7-24 July (24); Madden Dam, 27 June (1); Mojinga Swamp, 7 Feb. (10); 7-14 May (5); 17 June (1); 8-28 Nov. (2); 10 Dec. (1). **Cocle:** Anton, 11 Nov. (2); Chiru, 10 Nov. (6); Port of Farallon, 8-9 Nov. (24); Port Obaldia, 11 Nov. (2); Rio Hato, 8-9 Nov. (5). **Darien:** Jaque, 11 Aug. (1). **Panama:** Alcalde Diaz, 10 Oct. (1); Arraijan, 24 June (1); Camaron, 23 June (3); 22 July (1); La Jolla, 23 Sept. (7); Naranjal, 1 Oct. (1); Nueva Gorgona, 16 Sept. (2); Palm Beach, 17 Sept. (1); Tocumen, 6-29 Jan. (2).

*Aedes leucoclaeus* (Dyar and Shannon) J. Wash. Acad. Sci. Vol. 14, p. 484, 1924. **Bocas del Toro:** Almirante, 12 Nov. (1). **Canal Zone:** Madden Dam, 21 Sept. (1).

*Aedes septemstriatus* (Dyar and Knab), J.N.Y. Ent. Soc. Vol. 15, p. 10, 1907.  
**Bocas del Toro:** Almirante, 11 Dec.

(2). **Canal Zone:** Mojinga Swamp, 21 July (1).

*Aedes serratus* (Theobald), Mon. Cul., 2:45, 1901. **Bocas del Toro:** Almirante, 5-27 Jan. (68); 10-26 Nov. (254); 1-16 Dec. (92). **Canal Zone:** Fort Clayton, 18 June (1); Fort Kobbe, 26 June (8); Loma Boracho, 18-26 June (14); 29 Oct. (14); Loma Boracho, Position 9, 10 Jan. (3); 19-23 June (52); 2-8 May (6); 2-24 July (15); Madden Dam, 27 June (1); Mandinga River, 15 May (1); Mindi Dairy, 3 Dec. (2); Mojinga Swamp, 27 Feb. (1); 16 Apr. (2); 7-13 May (3); 17-30 June (15); 9-15 July (4); 15 Aug. (1); 29 Oct. (1); 15-20 Nov. (3); 10-12 Dec. (4). **Chiriqui:** Boquete, 15 Dec. (1); El Volcan, 6-9 Dec. (6). **Cocle:** Anton, 9 Dec. (1); Aguadulce, 25 Sept. (24); Chiru, 10 Nov. (2); El Retiro, 10 Nov. (4); Espino, 18 Sept. (1); La Venta, 8 Nov. (3); Port of Farallon, 8-9 Nov. (153); Port Obaldia, 11 Nov. (4); Rio Hato, 24-26 Sept. (14); 8-9 Nov. (55); Salado, 12 Nov. (1); Villa Real, 12 Sept. (2). **Darien:** El Real, 8 Aug. (1); Garachine, 19 Feb. (1); Jaque, 27-28 July (6); 11 Aug. (10). **Herrera:** Ocu, 25 Nov. (1); Paris, 23 Oct. (3); Parita, 23 Oct. (1); Pese, 22 Oct. (1). **Los Santos:** Las Palmas, 26 Oct. (1); Port Mensabe, 22 Oct. (1). **Panama:** Camaron, 23 June (2); 17 July (18); Cermeno, 11 Sept. (1); Juan Diaz, 24 Sept. (1); La Chorrera, 8 Sept. (4); La Jolla, 6 Mar. (2); 26 June (2); 31 Aug. (5); 7-23 Sept. (44); 5 Oct. (6); Pacora, 29 Sept. (2); Palm Beach, 17 Sept. (1); Rio Las Lajas, 17 Sept. (1); Tocumen, 5-29 Jan. (9); 4-19 Feb. (5); 17 Nov. (1); 20-21 Dec. (4); Vique Cove, 7 Oct. (2).

*Aedes taeniorhynchus* (Wiedemann), Dipt. Exot., 1:43, 1821. **Canal Zone:** Albrook Field, 19 June (13); Fort Clayton, 1 July (13); 22 Sept. (1); Fort Davis, 11 May (6); Fort Kobbe, 17-26 June (567); 21 July (2); 7 Oct. (6); Fort Sherman, (Devils Beach), 28 June (2); Fort Sherman, (French Canal) 8 Apr. (1); France Field, 22 Apr. (5); Galeta Island, 26 Aug. (1); Loma Boracho, 18-26 June, (4); 22 July (1); 29 Oct. (1); Loma

Boracho, Position 9, 12 May (26); 19-23 June (41); 7-17 July (9); Madden Dam, 27 June (11); Mandinga River, 11 May (2); Mindi Dairy, 12 June (13); Mojinga Swamp, 13-15 May, (17); 17-25 June (8); 15-21 July (3); Tarpon Club, 18 Apr. (2). **Cocle:** Aguadulce, 7 Aug. (62); 25 Sept. (98); Anton, 11 Nov. (5); Chiru, 10 Nov. (56); El Espino, 18 Sept. (16); El Retiro, 10 Nov. (36); La Venta, 8 Nov. (6); Port of Aguadulce, 21 Nov. (1); Port of Farallon, 8-9 Nov. (864); Rio Hato, 15 Jan. (6); 25-27 June (71); 3 Aug. (1); 24-26 Sept. (70); 8-9 Nov. (9); Salado, 12 Nov. (3); Villa Real, 12 Sept. (7). **Colon:** Pina, 18 Aug. (1). **Darien:** Garachine, 19-25 Feb. (615); Jaque, 24-28 July (77); 10-12 Aug. (5); Patino Point, 22-23 June (18); 1-21 July (444); 4-31 Aug. (101); 1-30 Sept. (257). **Herrera:** Chitre, 8 Aug. (1); Parita, 23 Oct. (6); Port of Chitre, 24 Oct. (5). **Los Santos:** Guarare, 23 Oct. (1); Las Tablas, 14 June (3); Los Santos, 24 Oct. (1); Port Mensabe, 22 Oct. (3); Santo Domingo, 26 Oct. (1). **Panama:** Arraijan, 26 Mar. (8); 7-8 Apr. (242); 24 June (124); 2 Aug. (2); 7 Oct. (2); Camaron, 23 June (285); 17-22 July (29); 17 Oct. (20); Cermeno, 11 Sept. (3); El Coco, 10 Sept. (4); Juan Diaz, 24 Sept. (5); La Chorrera, 8 Sept. (37); Nueva Gorgona, 16 Sept. (37); Old Panama, 26 Sept. (55); Pacora, 29 Sept. (1); Palm Beach, 17 Sept. (27); Pena Blanca, 9 Sept. (13); 27 Oct. (1); Port of Chorrera, 9 Sept. (68); Port Obaldia, 11 Nov. (50); Venado Beach, 28 July (8); Vique Cove, 7 Oct. (12).

*Culex terreus* (Walker), Ins. Saund., 429, 1859. **Bocas del Toro:** Almirante, 12-20 Jan. (2); 24 Nov. (2); 1-11 Dec. (5). **Canal Zone:** Fort Kobbe, 24-28 Aug. (2); 17 Oct. (1); Fort Gulick, 21 Aug. (3); Loma Boracho, 29 Oct. (4); Mojinga Swamp, 15 May (1); 28 Aug. (1); 5 Sept. (1); 29 Oct. (1); 19 Nov. (7). **Panama:** La Jolla, 26 June (1).

**SUMMARY.** This is the third of a series of small papers on the distribution of Panama mosquitoes based on light trap surveys conducted in Panama by the 25th

Medical Detachment, during 1951 to 1953 inclusive. *Aedes aegypti*, the classical vector of yellow fever has not been collected for some time. The scope of this paper included only adults; however it is noted that the larvae of *Aedes fulvus* were collected for the first time in Panama during the period of these studies. Other species of *Aedes* may or may not be responsible for the transmission of jungle yellow fever in Panama as well as *Haemagogus* spp.

The distribution of those species taken in our light traps is given. To date nine

species have been taken in our light traps and six additional species by other means. Dr. Galindo, of the Gorgas Memorial Laboratory, has collected two more species that are not listed from Panama. This makes a total of 17 known species in Panama and there are additional species in the *A. terreus* complex.

#### Literature Cited

PEYTON, E. L., GALINDO, PEDRO and BLANTON, FRANKLIN S. Pictorial keys to the genera of Panama mosquitoes. *Mosquito News*. 15(2):95-100, 1955.

## HARRY SETS THE STAGE AGAIN

A charter member of the American Mosquito Control Association, its President in 1947, National Adviser, 1949-1954, Associate Editor of and frequent contributor to *Mosquito News*, sponsor of the Good Neighbor Club—few persons have contributed as much of time, talent and enthusiasm to the Association as Harry Stage, or have been more zealous in the furtherance of its aims. Now, in addition to all this he becomes our first Life Member. This fine gesture of interest and confidence should be an inspiration to the Association.

(Life Member—Any member may become a life member of the Association upon payment to the Treasurer of \$100.00 in a lump sum, and thereafter shall be exempt from any further payment of dues.

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