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PASA RA(HM)2-67 Res
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PN-RAB-651

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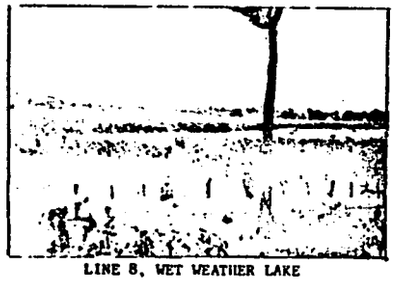
Seasonal Breeding Habitats of *Anopheles albimanus* and *A. pseudopunctipennis* in Coastal Malarious areas of El Salvador*

Samuel G. Breeland[1]

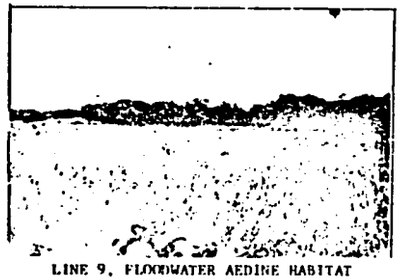
Summary and Conclusions

More than 2,000 collections of anophelines in coastal malarious areas of El Salvador indicate a seasonal pattern of larval habitat availability and use, for both *Anopheles albimanus* and *A. pseudopunctipennis*. Habitats favorable to both species, to a varying degree, during dry season are estuaries, rivers, irrigation waters, and permanent bodies of water with stable margins. Such habitats are plentiful and readily utilized throughout the coastal plain. Rainy season habitats begin with flooded coastal marshes; followed by inundations of inland basin overflows such as lake margins, inland marshes, ditches, pastures, etc.; which in turn are followed by flooding of miscellaneous habitats from peak inundations and the establishment of breeding in wet weather lakes, ponds, and sloughs. Recession of water in late rainy season reexpose permanent shallow margins and intermittent rains reflood receding shore lines to produce additional late season populations. The same rain which cause rivers cease being habitats because of flushing early in the rainy season tend to fill low areas providing some overlap in dry/rainy season habitats.

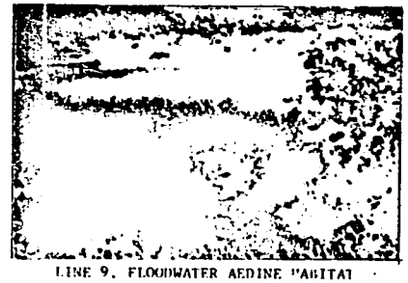
The annual low point in anopheline breeding comes during the transition between rainy and dry season. Dry season habitats are sufficiently abundant to account for dry season survival of both species.



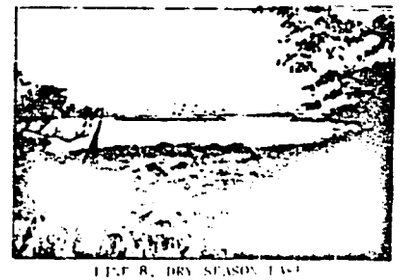
LINE 8, WET WEATHER LAKE



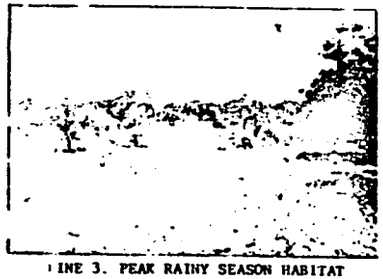
LINE 9, FLOODWATER AEDINE HABITAT



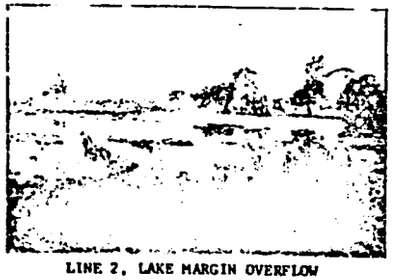
LINE 9, FLOODWATER AEDINE HABITAT



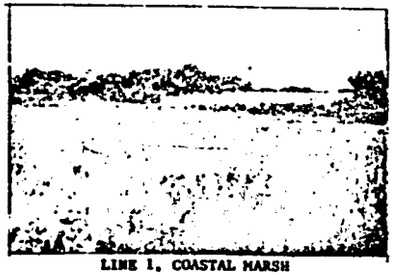
LINE 8, DRY SEASON LAKE



LINE 3, PEAK RAINY SEASON HABITAT

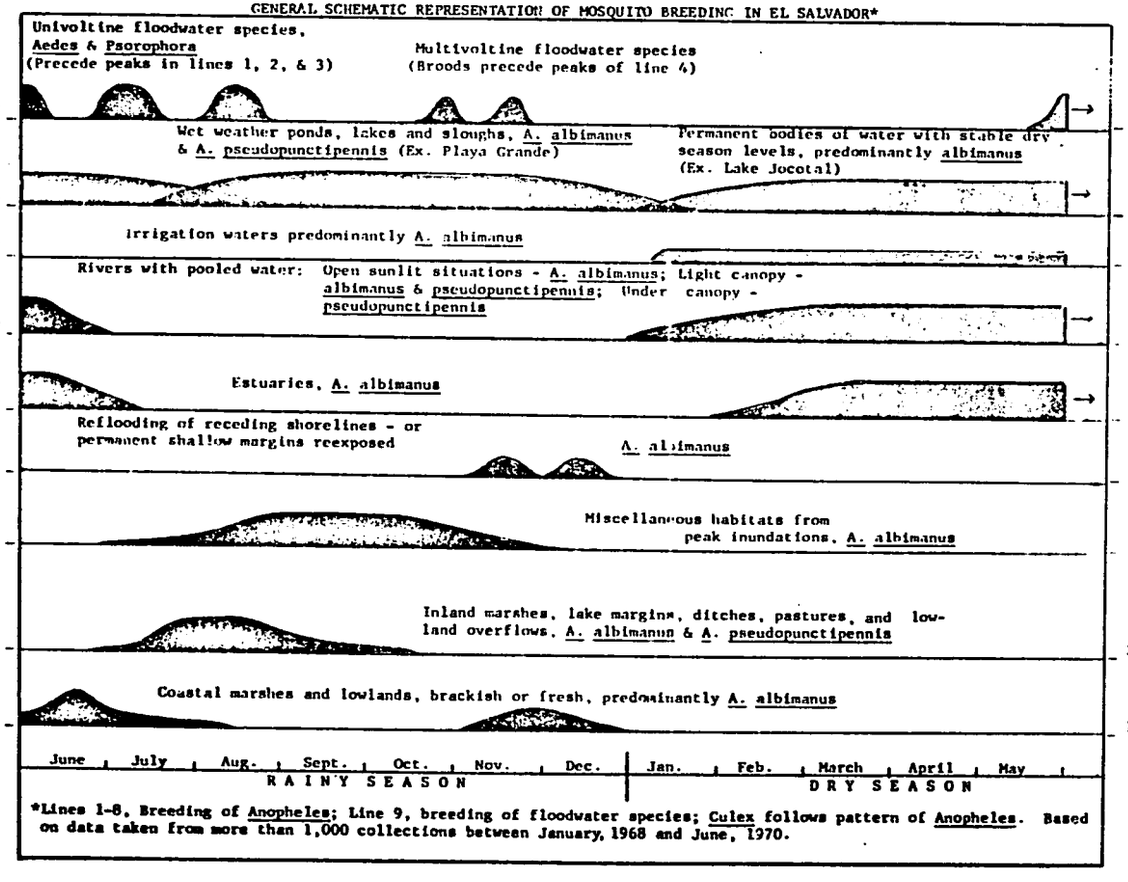


LINE 2, LAKE MARGIN OVERFLOW

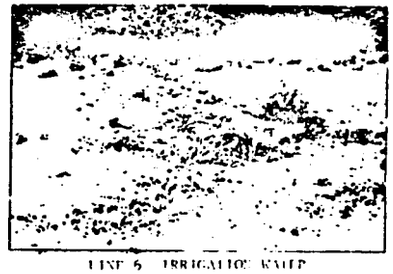


LINE 1, COASTAL MARSH

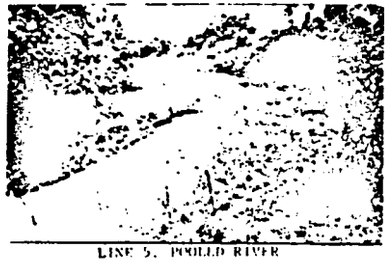
GENERAL SCHEMATIC REPRESENTATION OF MOSQUITO BREEDING IN EL SALVADOR*



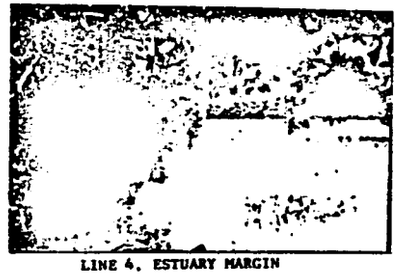
*Lines 1-8, Breeding of Anopheles; Line 9, breeding of floodwater species; Culex follows pattern of Anopheles. Based on data taken from more than 1,000 collections between January, 1968 and June, 1970.



LINE 6, IRRIGATION WATER



LINE 5, POOLED RIVER



LINE 4, ESTUARY MARGIN

Results of Anopheline Larval Sampling by Habitat and Season, El Salvador

January, 1968 - June, 1971*

Source	Dry Season (January-May)					Rainy Season (July-November)				
	No. Dips	No. Larvae	Ave.No. Larvae/Dip	alb.	pp.	No. Dips	No. Larvae	Ave. No. Larvae/Dip	alb.	pp.
Rivers	31,067	53,727	1.73	1,885 (31.0%)	4,194 (69.0%)	600	12	0.02	-	-
Estuaries	12,812	22,531	1.76	1,624 (97.2%)	45* (2.8%)	1,485	137	0.09	20 (100.0%)	0
Marshes and Pastures:										
Dry Season Irrigation	2,725	5,701	2.09	529 (78.0%)	149 (22.0%)	-	-	-	-	-
Rainy Season Inundations						7,204	11,069	1.54	1,775 (88.0%)	242 (12.0%)
Lakes and Ponds	2,570	6,983	2.72	273 (24.4%)	847 (75.6%)	2,127	7,880	3.70	1,075 (81.2%)	249 (18.8%)
Miscellaneous Habitats	675	699	1.04	42 (82.4%)	9 (17.6%)	3,857	7,870	2.02	943 (99.2%)	8 (0.8%)
TOTAL	49,849	89,641	1.76	4,353 (45.4%)	5,244 (54.6%)	15,303	26,968	1.76	3,813 (88.4%)	499 (11.6%)

* Transition months of June and December excluded to prevent overlap between seasons.

Monthly Results of Anopheline Larval Sampling by Habitat,
El Salvador, January, 1968 - June, 1971

		Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total	Sample Identification A. alb.	A. pu.
Rivers[1]	No. Larvae / No. Dips	5,117 / 3,295	13,578 / 7,934	18,173 / 8,338	10,213 / 7,490	6,646 / 4,010	418 / 1,370	12 / 600	-	-	-	-	1,314 / 1,970	55,471 / 32,007	[illegible]	[illegible]
	Ave. No. Larvae/Dip	1.55	1.71	2.18	1.36	1.66	0.31	0.02	-	-	-	-	0.67	1.73	31.6%	68.4%
Estuaries[2]	No. Larvae / No. Dips	4,478 / 2,187	4,425 / 3,480	4,264 / 2,905	5,341 / 2,930	4,023 / 1,310	1,294 / 895	55 / 250	0 / 330	0 / 200	-	82 / 705	73 / 350	24,035 / 15,542	1,644	[illegible]
	Ave. No. Larvae/Dip	2.05	1.27	1.46	1.82	3.07	1.45	0.22	0	0	-	0.12	0.21	1.55	97.3%	[illegible]
Pastures[3]	No. Larvae / No. Dips	2,141 / 1,050	1,125 / 655	1,252 / 529	987 / 400	196 / 100	1,315 / 798	1,533 / 1,035	1,073 / 1,210	1,649 / 1,970	1,593 / 905	5,221 / 2,084	912 / 450	18,997 / 11,277	[illegible]	[illegible]
	Ave. No. Larvae/Dip	2.04	1.72	2.37	2.47	1.96	1.65	1.48	0.89	0.84	1.76	2.51	2.03	1.68	80.2%	19.8%
Lakes & Ponds	No. Larvae / No. Dips	4,323 / 905	439 / 520	402 / 435	80 / 450	1,739 / 260	314 / 290	92 / 350	624 / 600	472 / 300	4,677 / 757	2,015 / 120	2,443 / 265	17,620 / 5,252	[illegible]	[illegible]
	Ave. No. Larvae/Dip	4.78	0.84	0.92	0.18	6.69	1.08	0.26	1.04	1.57	6.18	16.80	9.22	3.35	60.4%	39.6%
Other[4]	No. Larvae / No. Dips	422 / 150	4 / 150	271 / 300	2 / 75	—	3,517 / 1,793	757 / 665	1,323 / 1,240	1,890 / 539	1,862 / 773	2,038 / 670	533 / 285	12,619 / 6,640	1,643	19
	Ave. No. Larvae/Dip	2.81	0.03	0.90	0.03	-	1.96	1.14	1.07	3.51	2.41	3.04	1.87	1.90	98.8%	1.2%

* May 22, 1970 Estero San Diego, new water - 25
May 22, 1970 Estero Ticuiziapa, new water - 19
May 20, 1971 Estero Majagual, new water - 1

1 - Sum of 8 rivers (Aquisquillo, Chilama, Comasagua, Grande, Huiza, Jute San Antonio and Tunco
2 - Sum of 3 estuaries (Majagual, San Diego, Ticuiziapa)
3 - irrigation waters during dry season, flooded marshes or pastures during rain season
4 - Miscellaneous inundations (Roadside ditches, wheelruts, transient water)