

THE DIMINUTION OF *Aedes aegypti* INFESTATIONS IN LOUISIANA

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Historically, Louisiana has been heavily and widely infested with *Aedes aegypti*. The last continental epidemics of both yellow fever and dengue occurred within the state. The authors recall that during World War II *Aedes aegypti* were found throughout Louisiana and frequently assumed significance as a pest. Johnson (1959), in summarizing work by Louisiana State Board of Health entomologists during the period 1929-1959, listed *A. aegypti* as abundant in 50 parishes and common in the remaining 14. Louisiana State Board of Health records show that during the dengue epidemic in St. James Parish in late 1945, 100 percent of 1,283 premises was found to harbor *A. aegypti* on the initial inspection. A series of maps of New Orleans prepared in 1944 by personnel of the wartime *A. aegypti* control

little work specifically directed against the species, *A. aegypti* has practically disappeared from Louisiana. The situation is remarkable, because as late as the autumn of 1965 significant infestations existed in east Texas to within a mile of the Louisiana boundary, in Texarkana and El Dorado, Arkansas, 32 and 17 miles, respectively, north of the boundary, and in Vicksburg, Mississippi, separated only by the Mississippi River from the State's eastern boundary.

Available records indicate that populations of *A. aegypti* began to diminish in Louisiana some time between 1945 and 1957 (Bradley and Atchley, 1953; Hayes and Tinker, 1958). The trend has continued with minor interruptions until the present (Tinker and Hayes, 1959; Morlan and Tinker, 1965). Table 1 shows eight

TABLE 1.—Comparative *Aedes aegypti* indices** for selected Louisiana cities.

	1943	1944	1945*	1952*	1956	1957	1958	1959	1961	1962	1964	1965
Alexandria	+	..	+	..	2.5	0.03
Baton Rouge	20.	8.5	3.1	..	..	..	..	0.0	0.0
Lafayette	—	—	..
Lake Charles	0.5	2.5	0.0	—	..	..	..	—	..
Monroe	1.5	..	2.1	..	1.8	..	..	—	0.0
New Orleans	5.4	10.5	8.8	6.9	7.4	2.0	..	..	..	..	0.0	0.0
Ruston	5.3	—	..
Shreveport	0.4	..	..	—	..	..	0.0	..	—

* Data from Bradley and Atchley, 1953.

** Percent of premises inspected found positive.

program (USPHS, 1944) showed the species distributed with remarkable uniformity and density throughout the city.

For reasons little understood and with

cities for which comparable data are available for two or more years. Most entries show the premises index for *A. aegypti* (percent of premises inspected found positive); however, a "+" or "-" entry is made to indicate a qualitative survey. The latter, made to establish positivity or negativity, consisted of inspections of the most likely breeding sites, but in numbers not statistically significant.

Most of the data have resulted from wartime *A. aegypti* control activities operated

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by the Malaria Control in War Areas Program and subsequent surveys made by the Communicable Disease Center (CDC), both in cooperation with the Louisiana State Board of Health. The Division of Foreign Quarantine has maintained surveillance in port areas, and during the last two years parish-wide mosquito abatement programs which have become operational in Plaquemines, Orleans, and Jefferson Parishes have maintained surveillance on domestic mosquitoes. Since the United States has embarked upon the program of *A. aegypti* eradication, the Department of Defense has conducted surveys of a number of its installations within Louisiana.

Prior to 1958 practically all surveys made within Louisiana were restricted to urban areas. In 1958 a series of surveys was made in urban areas to determine as quickly as possible the presence or absence of the species; in addition, a parish-wide survey was made in St. James Parish. The latter failed to reveal *A. aegypti*.

In 1961 surveys were made in four communities: Bastrop, Alexandria, Opelousas, and Bogalusa, each in a different parish. Of these, only Alexandria in Rapides Parish was found to be positive. Anticipating United States participation in the hemisphere-wide program to eradicate *A. aegypti*, the CDC, in 1962, increased its survey activities to include inspections in 18 parishes, not including Rapides. The species was found only in Ruston in Lincoln Parish.

During 1964, the first full year of its participation in the *A. aegypti* Eradication Program, the CDC conducted surveys in 435 communities in 47 parishes to complete the survey of the State. Only Rapides Parish was found positive, with infestations in Alexandria and its sister city, Pineville. In addition, the Louisiana State Board of Health inspected sites in Ruston which had produced *A. aegypti* in 1961, in Baton Rouge (East Baton Rouge Parish), positive in 1957, and in Monroe (Ouachita Parish), positive in 1959. Although the sites appeared undisturbed and were producing several other species of mosquitoes, including *Aedes triseriatus*, *A.*

aegypti could not be found. The last naturally occurring *A. aegypti* recognized in New Orleans was collected in the dock area in 1961 by personnel of the Division of Foreign Quarantine (USDHEW 1962). Thus in late 1964 *A. aegypti* was known to exist only in one area of the State, Rapides Parish.

An insecticidal and source reduction program designed for species eradication was conducted immediately following completion of the survey in late 1964. A subsequent reinspection indicated that the control efforts had achieved exceptionally good results. In 1965 emphasis in surveys was again placed upon urban areas. During the season, 100 percent of the premises in Alexandria and Pineville and their environs, 12½ percent of those in Baton Rouge and Monroe, and a lesser percentage, but significant number (15,485) of the premises in the greater New Orleans area were inspected. Also, a late season, intensive survey was made of Caddo and DeSoto Parishes. The only *A. aegypti* breeding discovered was on five of 17,419 premises inspected in the Alexandria area. The positive area was treated with insecticides and subsequently reinspected without finding *A. aegypti*.

Bradley and Atchley (1953) concluded that the overall *A. aegypti* problem was apparently lessening and attributed this, in part, to residual community awareness resulting from wartime efforts in *A. aegypti* control, and the increased use of new and potent household insecticides. Hayes and Tinker (1958) observed that the lessening of the problem noted in 1952 had continued. They concurred in the reasons proposed by Bradley and Atchley, and added the extensive aerial application of agricultural insecticides with accompanying drift, and steady advances in general standards of living characterized by improved environmental sanitation.

These reasons still appear to be valid and, doubtless, have contributed to the generally lessening national problem. There are too many exceptions, however, for these to be the complete answer, at least within Louisiana. It seems highly

probable that one or more biologic antagonists have affected *A. aegypti* in the State and possibly elsewhere, such as the coastal regions of Georgia, Mississippi, and Texas where the species can no longer be found, but from which a short trip inland will bring one into positive territory. With the advent of resistance to certain insecticides by *A. aegypti* in Puerto Rico, the Virgin Islands, and elsewhere, and with decreased public acceptance of insecticidal programs in general, the addition of a potent and specific biologic agent to the armamentarium of the *A. aegypti* eradicator presents an intriguing possibility.

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