

## OPERATIONAL AND SCIENTIFIC NOTES

### REPLACEMENT OF *Aedes aegypti* BY *Aedes albopictus* IN MOBILE, ALABAMA

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**ABSTRACT.** *Aedes albopictus* was first detected in Mobile, AL, in 1987 during a CDC sponsored ovitrap survey in the Historic District. A comparison of ovitrap and larval surveys, done in 1957, 1984, 1987 and 1990, indicates that *Ae. albopictus* had replaced *Aedes aegypti* in urban Mobile. Possible explanations of this replacement, including displacement, are discussed.

Since the discovery of *Aedes albopictus* (Skuse) in Harris County, TX (Sprenger and Wuithiranyagool 1986), the presence of this introduced species has been documented in 113 counties of 18 states (Francy et al. 1990). Along with the reports of extension of the range, there have been reports of the decline in *Aedes aegypti* (Linn.) populations after the appearance of *Ae. albopictus*. In Houston, TX, the introduction of *Ae. albopictus* was associated with a decline in the abundance of *Ae. aegypti* (Hawley 1988). A Jacksonville, FL, population of *Ae. albopictus* was observed to be increasing and possibly displacing *Ae. aegypti* (Peacock et al. 1988). This note is to document the replacement of *Ae. aegypti* in urban Mobile, AL.

Epidemics associated with *Ae. aegypti* have played a prominent part in the history of Mobile, with at least 10 major yellow fever epidemics recorded, from 1704 to 1905. The last reported cases of yellow fever in Alabama occurred in Castleberry, Montgomery and Mobile in 1905. Two victims died at Castleberry and one in Montgomery, all refugees from Mobile (Owen 1921). The mosquito control efforts of the Mobile Board of Health began during this time, when a campaign was organized to control the recently discovered transmitter of yellow fever.

In more recent years, periodic larval surveys of *Ae. aegypti* infestation have been carried out by personnel of the Mobile County Health Department. In 1957, for example, 21% of the 519 premises, and 62% of 84 blocks in the older sections of the city were found positive. In 1984, the Health Department participated in a Centers for Disease Control ovitrap survey as a part of a multi-city *Ae. aegypti* project. Fifteen sites were chosen in different blocks of the Historic

District and ovitraps (Fay and Eliason 1966) placed at each site. The paddles were collected weekly and those with eggs sent to CDC for rearing and identification. During this 1984 survey, which lasted from August to October, all 15 blocks were found positive for *Ae. aegypti* on one or more collection dates (Table 1). In addition to the ovitrap survey, a larval survey was done. Out of 1,244 premises inspected, 89 were found positive for *Ae. aegypti*.

After the discovery of *Ae. albopictus* in Houston in 1986, CDC sponsored another ovitrap survey in collaboration with state and local health and vector control agency personnel in Texas, Louisiana, Mississippi and Alabama (Centers for Disease Control 1986). Mobile was included in this surveillance network, and ovitrap surveys were initiated in the same 15 blocks of the Historic District. One ovitrap was found positive for *Ae. albopictus* in August 1987, and

Table 1. Ovitrap surveys for *Aedes albopictus* in Mobile, AL, during August–October 1984, 1987 and 1990.

Block no.	Year		
	1984	1987	1990
1	X*	X	0
2	X	X	—
3	X	X	0
4	X	X	0
5	X	X	—
6	X	X	—
7	X	X	0
8	X	0	0
9	X	X	0
10	X	X	0
11	X	X	0
12	X	X	—
13	X	X	—
14	X	X	0
15	X	X	0

\* X = *Aedes aegypti*; 0 = *Ae. albopictus*; — = Traps empty.

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this represents the first identification of this species in Mobile.

In early 1990, mosquito control inspectors, whose duties included premise inspections and landing rate counts, reported that *Ae. aegypti* were extremely rare if not completely absent from urban areas in Mobile and that *Ae. albopictus* was the most important urban pest mosquito as well as a potential vector of dengue and yellow fever. To verify this, ovitrap surveys were repeated in the same 15 blocks of the Historic District. Ten of the 15 blocks were found positive for *Ae. albopictus*, while no *Ae. aegypti* eggs were found on the paddles (Table 1). In a larval survey, 1.8% of the premises were found with *Ae. albopictus*, while no *Ae. aegypti* were found. The most important source of breeding was discarded automobile tires, although *Ae. albopictus* was also found in other artificial containers such as buckets, discarded household appliances, bird baths and tin cans.

The findings of the 1990 surveys, and a comparison of these with the 1984 and 1987 surveys, show that *Ae. albopictus* had replaced *Ae. aegypti* in urban Mobile. There are several possible explanations for the observed replacement. The decline in *Ae. aegypti* in Mobile seems to have been going on for some time. In 1957, 21% of the premises were positive; and in 1984, only 7% were positive. The decline of *Ae. aegypti* could be independent of the spread of *Ae. albopictus*. Another speculation is that *Ae. albopictus* has actually displaced *Ae. aegypti*. Possible mechanisms for this have been advanced, among them

the recent studies (Nasci et al. 1989) which indicate that mating interference, along with high densities reached by *Ae. albopictus*, may be a factor in the replacement of *Ae. aegypti*, which has been seen in other U.S. cities as well as in Mobile.

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