

## OPERATIONAL AND SCIENTIFIC NOTES

### *Aedes albopictus* IN SOUTH CAROLINA

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**ABSTRACT.** Published information on the distribution of *Aedes albopictus* in South Carolina is limited and fragmentary. This paper draws on various published and unpublished sources and presents synoptic information on the occurrence of the mosquito in 17 counties. Additional surveys are required to establish the infestation status of the other 29 counties in the state.

Today, *Aedes albopictus* (Skuse) occupies a wide area in the eastern United States (Riagu-Perez et al. 1994, Estrada-Franco and Craig 1995). In the southeastern USA, the mosquito appears to be found wherever an adequate search is conducted. But, unlike the bordering states of Georgia (Womack et al. 1995) and North Carolina (Estrada-Franco and Craig 1995), knowledge of the extent of infestation in South Carolina is limited and fragmentary with the exception of the area around Clemson University (Richardson et al. 1995). All 159 counties in Georgia are infested with *Ae. albopictus* (Womack et al. 1995). In Florida, not only are all 67 counties infested, but the spread of this mosquito is generally associated with the decline of *Aedes aegypti* (Linn.) in central and northern regions of the state (O'Meara et al. 1995).

This paper is a synopsis of information, collated from diverse sources, on the first finding and distribution of *Ae. albopictus* in the counties of South Carolina. In addition to publications in scientific journals, sources of information include questionnaire responses, direct correspondence from personnel involved in mosquito control operations, newsletters of South Carolina, and regional and national mosquito control associations.

The questionnaire was designed partly to elicit information from persons in charge of mosquito control operations on the first finding of, and nuisance caused by, *Ae. albopictus* in each contacted county of South Carolina. Although it was not possible to obtain information from all 46 counties, a list from the South Carolina Department of Health and Environmental Control (DHEC) was helpful in prioritizing counties to be contacted (P. Wright, personal communication). The list conveniently categorized the

counties as those that: 1) are likely to have information about the occurrence of *Ae. albopictus*, 2) may have some idea about the presence of the mosquito in their area, and 3) merely conduct some control activities without any mosquito survey.

Information was obtained from all 9 counties in category (1), all 7 counties in category (2), and 10 of 30 counties in category (3). Responses obtained from workers in category (2) counties expressing their lack of knowledge about the occurrence of *Ae. albopictus* in their areas discouraged a more vigorous attempt to obtain information from category (3) counties. Often, several phone calls were required to get any response, especially from counties in category (3).

Ovitrap programs conducted during 1986 and 1987, in 12 and 15 states in the eastern USA, respectively, included South Carolina (Moore et al. 1988). In these 2 years, 4 and 5 cities, respectively, of South Carolina were included, but no *Ae. albopictus* was found. Ovitraping efforts conducted during 1988 by U.S. Air Force installations did not discover any *Ae. albopictus* in Berkeley and Sumter counties (McHugh and Vande Berg 1989). Neither was the mosquito found in Berkeley, Horry, or Sumter counties during 1989 (McHugh and Hanny 1990).

The first record of *Ae. albopictus* in this state was a single larva collected in March 1988 by D. E. Burge, a graduate student at the University of South Carolina, from a discarded tire in Jasper County near the Atlantic coast and the Georgia border. After the specimen was confirmed to be *Ae. albopictus* by R. F. Darsie, Jr., the finding was reported to DHEC and thence to the *Aedes albopictus* Committee of the American Mosquito Control Association (Eldridge 1988). In Chatham County of Georgia, which adjoins Jasper County, the mosquito was first found in 1986 at a tire dump, whereas infestation in North Caro-

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Table 1. Counties of South Carolina positive for *Aedes albopictus* and dates of first positivity.

No.	County	First positivity	Stage found	Habitat/collection method
1	Jasper	March 1988	Larva	Tire
2	Richland	September 1988	Adult	Tires
3	Hampton	October 1988	Adults	Tires
4	Charleston	August 1989	Eggs, adults	Ovitrap
5	Lexington	ca. June 1990	Adults	Not available
6	Sumter	1991	Eggs	Ovitrap
7	Orangeburg	May 1992	Larvae, adults	Tires
8	Beaufort	June 1992	Eggs, adults	Boat ramp
9	Kershaw	June 1992	Adult	Tires
10	Berkeley	July 1992	Larvae, adults	Ovitrap, tires, bucket
11	Clarendon	August 1992	Adults	Tires
12	Pickens	ca. June 1992	Larva, pupae	Plastic containers
13	Bamberg	May 1993	Adults	Tires
14	Chester	July 1993	Larvae, adults	Tires
15	Georgetown	July 1993	Adults	Light trap
16	Florence	June 1994	Larvae	Bucket, tires
17	Colleton	June 1995	Adults	Biting

lina was first discovered in 1987 (Moore et al. 1988). By the end of 1988, *Ae. albopictus* was found in 2 other counties of South Carolina—Richland and Hampton (P. Wright and S. Ferguson, unpublished data; Francy et al. 1990). By 1989, Charleston County became positive, raising to 4 the number of infested counties (Parsons 1990). During 1991 it was found in Sumter County (McHugh 1992) and during 1992 in Berkeley County (McHugh 1993), bringing the total published record to 6 infested counties.

Williams (1991) included *Ae. albopictus* as a possible vector of eastern equine encephalitis vi-

rus, "at least [in the] eastern half of the state [South Carolina]". Out of 345 counties in 22 states of the USA reported to have been colonized by the mosquito as of September 1992, 7 were from South Carolina (Berry 1993). Based on the information obtained for this paper, 17 counties, which lie from coastal to mountainous zones of the state, are now known to be infested (Table 1 and Fig. 1).

Among the positive counties, Charleston County Mosquito Abatement Program has informative data presented in its annual reports (Table 2). In substantial numbers of ovitrap samples, *Ae. albopictus* was not detected until 1989, when the first specimens were collected. By 1993, *Ae. aegypti* had disappeared, and the numbers of *Ae. triseriatus*, the second most abundant mosquito in ovitraps, were drastically reduced. The ovitraps were set in urban and suburban areas. The number of *Ae. albopictus* specimens collected in 1993 was much higher than that of *Ae. aegypti* collected in any one of the 9 years listed. The number collected in 1994 was even more impressive, considering the relatively low number of trap-weeks. These findings warrant the monitoring of the human biting activity of *Ae. albopictus* to assess its importance as an urban pest.

In coastal Beaufort County, where *Ae. albopictus* was first found in June 1992, ovitraps were set out at 58 different locations throughout the county during that summer, and all were positive for *Ae. albopictus* (E. Hager, unpublished data). Adults or larvae of *Ae. aegypti* have not been encountered in the county since August 3, 1992. The biting problem was described as be-

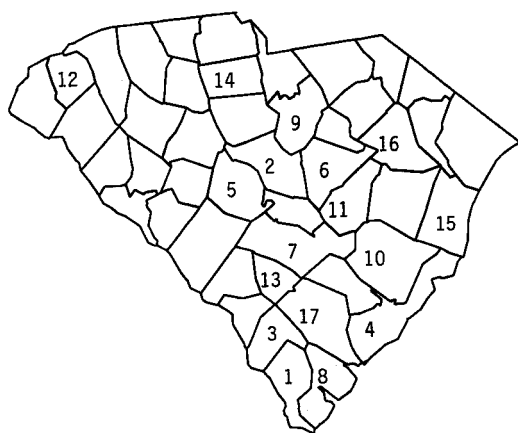


Fig. 1. Map of South Carolina showing county boundaries and the 17 counties (numbered) in which *Aedes albopictus* was found. Numbers correspond to serial numbers in Table 1.

Table 2. Data from annual reports of Charleston County Mosquito Abatement Program, South Carolina, on *Aedes albopictus* and other container-inhabiting mosquitoes collected in ovitraps.

Year	Trap-weeks	Number				Trapping duration
		<i>Ae. aegypti</i>	<i>Ae. triseriatus</i>	<i>Ae. albopictus</i>	Other species <sup>1</sup>	
1986	1,979	2,594	0	0	2,092	Apr.–Nov.
1987	3,165	11,408	0	0	2,102	Apr.–Nov.
1988	1,308	3,507	0	0	4,259	May–Nov.
1989	1,634	4,257	4,932	16	0	May–Sept.
1990	1,836	7,155	4,259	2	0	May–Nov.
1991	1,751	15,987	3,093	1,362	0	May–Oct.
1992	1,705	9,849	3,182	21,282	0	May–Nov.
1993	667	0	460	29,538	0	May–Nov.
1994	233	0	52	14,555	0	June–Aug.

<sup>1</sup> Most of the "other species" between 1986 and 1988 probably were *Ae. triseriatus* (Say).

ing "very bad, particularly in the Town of Beaufort" (E. Hager, unpublished data). In central South Carolina, "The *Ae. albopictus* mosquito has totally displaced *Aedes aegypti* in Lexington county" and is reportedly causing some biting problems (Raymond 1994).

The somewhat discontinuous distribution of the positive counties of South Carolina and their range from coastal to mountainous regions suggest that *Ae. albopictus* probably occurs in most, if not all, counties of the state. In some counties, where it has not yet been detected, the presence of the mosquito may soon be apparent by its attack on residents, especially in places where there has been little or no mosquito nuisance before. Among the counties contacted for this study, workers in 9 counties did not know if they had *Ae. albopictus* in their area, because they do not conduct any systematic surveillance for it.

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