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Recent Establishment of the Asian Tiger Mosquito (*Aedes albopictus*) in Independence County, Arkansas

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Abstract

Three adult *Aedes albopictus* were collected on 10 August 1993 within the city limits of Batesville, Arkansas. This is the first known report of this species from Independence County. Subsequent investigation revealed the presence of at least three well established populations in the county, two of which were monitored on a monthly basis from April to September of 1994. Peak *A. albopictus* numbers were recorded in July and August when the population levels were sufficient to make this mosquito a significant pest in Batesville. Our observations suggest that the Asian tiger mosquito will likely colonize other similar communities in Arkansas.

Introduction

On 2 August 1985, the Harris County Mosquito Control District in Houston, Texas discovered the first breeding population of *Aedes albopictus* (Skuse) in the United States (Moore et al., 1988). This species, commonly known as the Asian tiger mosquito, has been described as potentially one of the most important arbovirus vectors in the western hemisphere (Centers for Disease Control, 1987). *A. albopictus* historically has occurred from Madagascar eastward through southern Asia to Japan, Korea, and China (Hawley, 1988). Since its arrival in Texas, it has spread rapidly and is now known to inhabit several large cities in the southeastern and midwestern United States (Moore et al., 1991). The interstate shipment of automobile tires is believed to be responsible for its rapid dispersal. *A. albopictus* originally was described as a woodland species in southeastern Asia where it commonly selects treeholes for its larval habitat. However, this species has quickly adapted to breeding in artificial containers, particularly automobile tires, that may periodically be flooded by rainfall. In the United States, *A. albopictus* can most frequently be encountered in the urban environment where an abundant supply of suitable artificial containers is available.

On 10 August 1993, three biting female *A. albopictus* were collected by the senior author in the city limits of Batesville, Arkansas. Until this, the only known published collections of *A. albopictus* in the state were from Grant County in central Arkansas (Moore et al., 1988), Jefferson County in southeastern Arkansas (Savage et al., 1994), and Craighead County in northeastern Arkansas

(Jamieson et al., 1994). An intensive investigation to determine the source of these individuals followed. Three breeding sites were discovered: Site 1, a tire dump at the intersection of State Hwy. 69 and Main Street in downtown Batesville; Site 2, a tire dealership 4 km north of Batesville on State Hwy. 69; Site 3, a tire dealership 1 km south of Batesville on State Hwy. 25.

Larval collections were made at Sites 1 and 3 on a monthly basis from April to October of 1994. Samples were taken in a systematic and uniform manner in order to provide data as to comparative abundance. Ten tires were selected at each site and two dips were taken from each tire using a standard 350 ml mosquito dipper. Larval and adult *A. albopictus* were distinguished from other North American *Aedes* using the keys of Darsie (1986). In this study, *Aedes albopictus* larvae frequently were collected in association with larvae of *Culex resuans* (Theobald), *C. salinarius* (Coq.), *Culiseta inornata* (Coq.) and *Orthopodomyia signifera* (Osten Sacken). *Aedes albopictus* larval populations peaked at Site 1 during July (Fig. 1) and at Site 3 during August (Fig. 2). Apparently, there is continuous production of *A. albopictus* during summer months if sufficient rainfall occurs to inundate eggs. The absence of larvae in September at both sites, despite the presence of water, suggests that females may have laid diapause eggs in response to shorter day lengths. However, according to Hawley (1988), larval production may be influenced by several other factors including water temperature, the number of floods required to hatch eggs, and the oxygen content of the hatching medium. Hawley (1988) also reported one of the most important evolutionary aspects of *A. albopictus* has been its development of

photoperiodic egg diapause which has allowed it to permanently inhabit cooler temperate regions. It is interesting to note that the yellow fever mosquito (*Aedes aegypti*), an animal similar to *A. albopictus* in that it has effectively extended its range by utilizing artificial containers as larval production sites, has not developed a diapause egg and is thus more limited by cold temperatures.

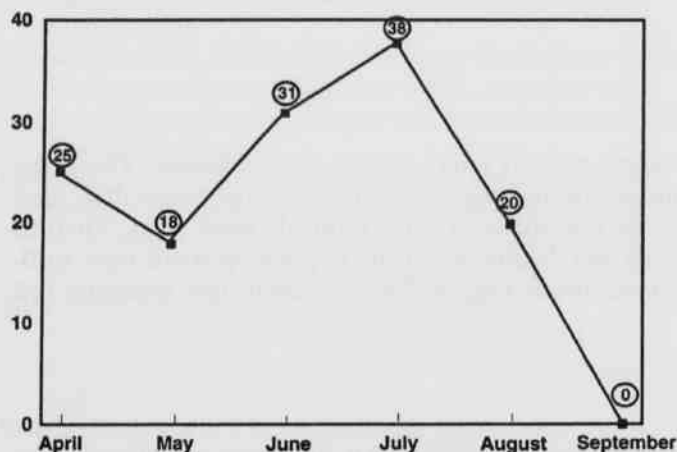


Fig. 1. Monthly larval collections of *Aedes albopictus* at old tire dump (site 1) in Batesville, Arkansas.

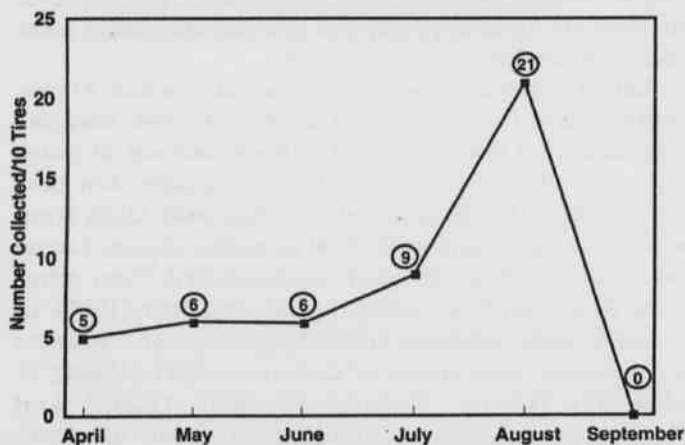


Fig. 2. Monthly larval collections of *Aedes albopictus* at tire dealership (site 3) 1 km south of Batesville, Arkansas.

Although no quantitative data were recorded, biting adult female *A. albopictus* were encountered at both sites during the entire study period. Adult populations were high enough in July, August, and September to make larval sampling almost impossible. Additional biting collections made at several locations within the Batesville city limits revealed the presence of adults several kilometers from any known production site. Although adult *A. albopictus* are known to be weak fliers with a short flight

range (Hawley, 1988), we observed this species readily dispersed in the city by utilizing a variety of artificial-container habitats. In addition to automobile tires, we collected larvae from house gutters, flower pots, bird baths, barbecue grills, and a Christmas tree stand.

In Batesville, population levels of *A. albopictus* were sufficient to restrict human outdoor activities in some neighborhoods from June to September. According to several local residents, Batesville has been transformed from a city with virtually no mosquito problem to one with a serious mosquito control dilemma.

Our observations suggest that the Asian tiger mosquito likely will become established in other Arkansas communities, especially those that do not regularly engage in mosquito control activities.

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