

## RECORDS OF IMPORTED TIRE-BREEDING MOSQUITOES IN OHIO

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The staff of the Vector-borne Disease Unit, Ohio Department of Health, in cooperation with the staff of local health departments and other mosquito control agencies, engaged in a state-wide survey for *Aedes albopictus* (Skuse) during the summers of 1986 and 1987. It was performed at the request of the Centers for Disease Control (CDC), Arbovirus Ecology Branch, Ft. Collins, Colorado, following the discovery of this mosquito species in Houston, Texas and other southeastern states (Moore 1986, Monath 1986, Sprenger and Wuithiranyagool 1986). Our search, following CDC recommendations, concentrated on the used tire industry—those businesses which remanufacture or recycle tires, and locations which store or dispose of waste tires. Among the remanufacturing companies, we concentrated on those which deal with truck tires or off-road vehicle tires.

We were especially interested in companies which imported tires from out of the state or country, since it was believed that *Ae. albopictus* could be transported to Ohio via used tire commerce. It has been postulated that *Ae. albopictus* was originally introduced into the U.S. in used truck tire casings since, on October 6–7, 1986, the species was found in a shipment of tires from Japan which arrived at the Port of Seattle, Washington (Moore 1986, Centers for Disease Control 1986).

In 1986, 92 sites were screened by telephone; 44 of these in 15 counties were visited. In 1987, 56 sites in 25 counties were visited. Mosquitoes were collected by taking samples of larvae and pupae from tires, adults with mechanical aspirators and CDC miniature light traps supplemented with dry ice, and collecting eggs in ovitraps using muslin cloth as an egg-laying substrate. Immature specimens were reared to the adult stage in the laboratory. Most specimens were identified as adults.

The following are new state, county, and locality records resulting from these and previous surveys. These and previously reported locality records are shown in Fig. 1 (Restifo and Lanzaro 1980, Berry and Craig 1984).

*Aedes albopictus* (Skuse)

**Darke County, Greenville, NEW STATE RECORD.** One male was collected on September 4, 1986 at an off-road, heavy equipment tire remanufacturer.

**Hancock County, Findlay, NEW COUNTY RECORD.** Three males were collected at an ovitrap on September 8, 1987 at a tire remanufacturer.

**Jackson County, Oak Hill, NEW COUNTY RECORD.** Twenty-one females and 3 males were collected on September 2, 1987 at an off-road, heavy equipment tire remanufacturer.

*Aedes aegypti* (Linnaeus)

**Franklin County, Columbus, NEW COUNTY RECORD.** Two females were collected on August 6 and 2 more on August 26, 1980, and larvae, pupae, 8 females and 1 male were collected on August 14, 1986 at 2 truck tire remanufacturers.

**Hamilton County, Cincinnati, NEW STATE RECORD.** A female was collected on September 19, 1972 near a transient tire pile.

**Jackson County, Oak Hill, NEW COUNTY RECORD.** Seven females were collected at an off-road, heavy equipment tire remanufacturing plant on September 8, 1987.

*Aedes atropalpus* (Coquillett)

**Crawford County, Crestline, NEW COUNTY RECORD.** One female was collected July 20, 1987 near a junk yard.

**Cuyahoga County, Independence, NEW COUNTY RECORD.** Three females and 24 larvae and pupae were collected on September 23, 1986 at a trucking company where tires were used to form a barrier.

**Independence, NEW LOCALITY RECORDS.** Forty-one females and 40 males were collected as adults and reared from larvae from 2 tire remanufacturing plants and a tire storage lot on July 23 and August 11, 1987.

**Valley View, NEW LOCALITY RECORD.** Thirty-seven females and 28 males were reared from larvae collected at a tire remanufacturer on August 11, 1987.

**Cleveland, NEW LOCALITY RECORD.** Eighty-seven females and 91 males were collected as adults and reared from larvae from a tire remanufacturing plant on August 11, 1987.

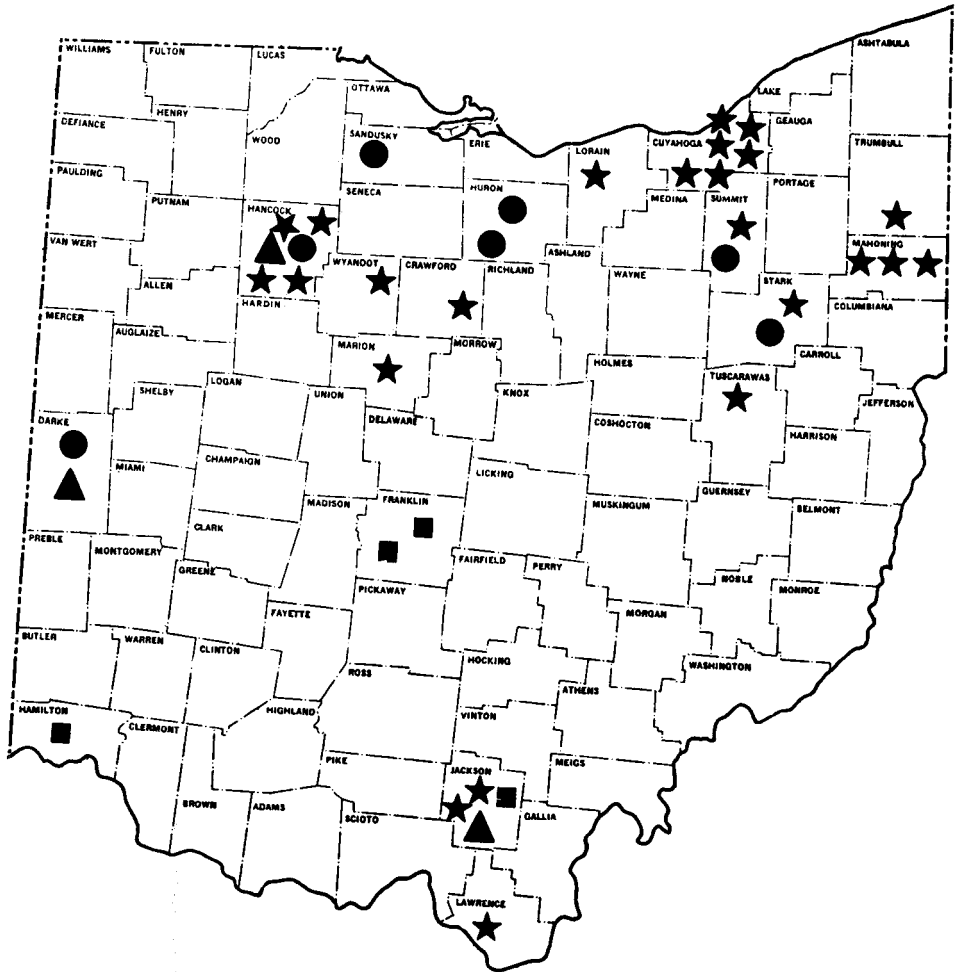


Fig. 1. Map of Ohio locality records for *Ae. aegypti* (squares), *Ae. albopictus* (triangles), and *Ae. atropalpus* (circles, old records; stars, new records).

**Hancock County, Findlay, NEW LOCALITY RECORDS.** Fourteen females and 15 males were collected at a tire dealership and a remanufacturing plant on July 24 and September 9, 1987.

**Farm near New Stark, NEW LOCALITY RECORD.** Fifteen females and 7 males were collected at a rural tire pile on September 22, 1987.

**Farm near Williamstown, NEW LOCALITY RECORD.** Forty-five females and 34 males were collected at a rural tire pile on September 22, 1987.

**Jackson County, Oak Hill, NEW COUNTY RECORD.** Twelve females, 4 males, and 42 larvae and pupae were collected on September 10, 1986 at an off-road heavy equipment tire remanufacturing plant.

**Farm north of Oak Hill, NEW LOCALITY RECORD.** Three females and 5

males were taken in bite samples at a tire pile in a pasture on September 30, 1987.

**Lawrence County, Ironton, NEW COUNTY RECORD.** Twelve females and 30 males were collected at a tire pile on private land on September 2, 1987.

**Lorain County, Amherst, NEW COUNTY RECORD.** One female was reared from a larva collected at a tire remanufacturing plant on August 12, 1987.

**Mahoning County, Struthers, NEW COUNTY RECORD.** One hundred and thirty females and 1 male were collected at an abandoned tire pile on July 21, 1987.

**Youngstown, NEW LOCALITY RECORDS.** Ninety-two females and 86 males were collected as adults and reared from larvae from a tire remanufacturing plant and a rubber tile manufacturing plant on August 13, 1987.

**Marion County, Marion, NEW**

COUNTY RECORD. Thirty-three females and 22 males were collected as adults and reared from larvae collected at a used tire recycler on July 15, 1987.

**Stark County, Canton, NEW LOCALITY RECORD.** Four females, 2 males, and 21 larvae and pupae were collected on September 24, 1986 at a tire remanufacturing plant.

**Summit County, Coventry Township, NEW LOCALITY RECORD.** One female, 3 males, and 125 larvae and pupae were collected on September 11 and 22, 1986 at a tire remanufacturing plant.

**Trumbull County, Niles, NEW COUNTY RECORD.** One female and 1 male were reared from larvae collected from tires at a trucking company on August 13, 1987.

**Tuscarawas County, near Strasburg, NEW COUNTY RECORD.** Six larvae were collected at a tire pile on October 17, 1986.

**Wyandot County, Sycamore, NEW COUNTY RECORD.** Twenty adults were reared from eggs collected in an ovitrap set at a tire pile during the period July 10–23, 1986.

The locality records presented here are for three species of mosquitoes which we regard as not native to the state of Ohio. *Aedes atropalpus* is included because it has never been found in its natural breeding habitat, rock holes, in Ohio.

Our first record of *Ae. atropalpus* was Summit County, Barberton on July 13, 1972. To date, it has been detected in a total of 31 locations in 16 Ohio counties, including four localities cited by Restifo and Lanzaro (1980) and three more cited by Berry and Craig (1984)<sup>1</sup> (Fig. 1). The majority of its breeding in Ohio was associated with tires.

Non-tire breeding has been found on several occasions. In Cuyahoga County, *Ae. atropalpus* larvae were found in wheel wells (5 cm x 13 cm x 1 m) of an inverted truck bed, in the midst of tires at a remanufacturing plant. *Aedes atropalpus* larvae were also collected from a shallow blue plastic pan (10 x 30 x 76 cm) and 2 broken light fixtures (18 x 61 x 61 cm) at a sign company 11–13 m from tires at a second remanufacturing plant. In Darke County, *Ae. atropalpus* larvae were collected from a cement bird bath, jars and plastic cups from a residence across a double-lane state route from a tire remanufacturing

plant. In Jackson County, also across a double-lane state route from a tire remanufacturing plant, *Ae. atropalpus* larvae were collected from a 5-gallon tar bucket and cup-like structures on a piece of iron. Thus, these breeding habitats were closely associated with infested tires.

In retrospect, we believe it is likely that *Ae. atropalpus* was introduced into Ohio via commerce in the used tire industry. Our historical data on the occurrence of *Ae. atropalpus* in the state indicates the dynamic potential of used tire commerce to disperse mosquitoes over a wide geographic area.

Since *Ae. atropalpus* has not been found associated with rock holes in Ohio, its occurrence at a tire business site indicates that it was transported there in tires. Such a finding thus identifies that site as a component of this inadvertent mosquito dispersal system. This information is used to prioritize sites for the surveillance of *Ae. albopictus* in Ohio. We regard any tire site with *Ae. atropalpus* to be at increased risk of introduction of *Ae. albopictus*. Indeed, *Ae. atropalpus* was known to occur in Greenville, Findlay, and Oak Hill, seven, five, and one years, respectively, prior to finding the infestations of *Ae. albopictus*. This information should be useful to other states in designing a surveillance program for *Ae. albopictus*.

We wish to acknowledge the assistance and cooperation of Ohio's local health departments, and in particular Mr. Robin Faust, Mr. George Finnerty, Mr. Jerry Heinlen, Mr. Donald Somers and Mr. Earl Paulus who assisted in the investigations which resulted in the new records of mosquitoes, and Ms. Margaret A. Parsons for guidance and encouragement in the course of these investigations.

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<sup>1</sup> Berry and Craig (1984) inadvertently listed erroneous localities for *Ae. atropalpus* found in Ohio. The correct localities are: Gibsonburg in Sandusky County; Canton in Stark County; and Findlay in Hancock County.