

SCIENTIFIC NOTE

DISTRIBUTION EXPANSION OF *CULEX CORONATOR* IN ALABAMA

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ABSTRACT. *Culex coronator*, a mosquito species common to the American tropics, has been recently documented from a number of temperate areas in the USA. Since 2002 specimens have been reported for the first time from Oklahoma, Louisiana, Mississippi, Alabama, and Florida. Here we provide new collection records for *Cx. coronator* in east-central Alabama. In October 2007, 2 larvae of *Cx. coronator* were collected from an artificial container in Tuskegee National Forest in Macon County, AL. The distribution of *Cx. coronator* in the USA seems to be expanding at a prodigious rate, for reasons that remain unclear.

KEY WORDS *Culex coronator*, distribution expansion

Culex coronator Dyar and Knab is a mosquito species common to the American tropics and subtropics that breeds in rain-filled depressions and water-filled manmade containers (Dyar and Knab 1906). Females are known to feed primarily upon mammals (Almiron and Brewer 1995, Reyes-Villanueva et al. 2006, Mackay 2007) and occasionally on birds (Almiron and Brewer 1995, Mackay 2007). *Culex coronator* was considered to be the most common mosquito in Mexico and Central America at the time of description (Dyar and Knab 1906) and has since been documented from a number of countries in South America, including Argentina (Almiron and Brewer 1995), Brazil (Barbosa et al. 2003), Colombia (Dyar 1924), Peru (Turell et al. 2000) Suriname (Bonnet-Wepster and Bonne 1921), and Venezuela (Navarro 1998). *Culex coronator* was first documented in the USA in southern Texas (Dyar 1921) and was later reported from Arizona (Richards et al. 1956) and New Mexico (Wolff et al. 1975). *Culex coronator* appears to be expanding its range eastward and has recently been reported in Oklahoma (Bradley 2004), Louisiana (Debboun et al. 2005, Mackay 2007), Mississippi (Varnado et al. 2005, Foppa et al. 2007), Alabama (McNelly et al. 2007), Florida (Smith et al. 2006, Connelly 2008), and Georgia (Kelly 2008).

On October 30, 2007, 2 fourth-stage larvae of *Cx. coronator* were collected from an artificial container in Tuskegee National Forest, Macon County, AL (32°25'53.94"N, 85°38'38.22"W). Specimens were first identified by Katherine M. Gray and then confirmed by Nathan D. Burkett-

Cadena using published keys (Darsie and Ward 2005). The container in which larvae were collected was a 35-gallon black plastic garbage can placed at the study site in February of the same year for the purpose of collecting resting adult mosquitoes. The garbage can held ca. 0.25 liter of water with particulate organic matter at the time of collection. One pupa each of *Aedes albopictus* Skuse and *Aedes triseriatus* (Say) were also collected from artificial containers in the vicinity. No adults of *Cx. coronator* were collected by weekly light trap collections or resting site aspirations conducted at the same site. Sampling for mosquito larvae during 2007 was extensive, with larvae collected twice weekly during the summer (May–August) and once weekly from August through November, from a variety of habitats. Mosquito larvae were sampled from natural breeding sites (freshwater marshes, beaver ponds, oxbow ponds, tree holes, vernal pools, and rain-filled depressions) and artificial containers (garbage cans and discarded tires). *Culex coronator* larvae were not collected from any aquatic habitat other than trash cans. Larvae of *Cx. coronator* are easily recognizable by the distinct spines located on the dorsal portion of the siphon at the distal end (Darsie and Ward 2005). Specimens were deposited in the Auburn University Entomological Museum (Auburn University, Auburn, AL).

Although mosquito collections have been ongoing in Tuskegee National Forest each year since 2001 (Cupp et al. 2003, Burkett-Cadena et al. 2008), specimens of *Cx. coronator* have not been collected before this report, suggesting that the arrival of *Cx. coronator* to east-central Alabama is a recent event. Concurrent mosquito collections in the city of Auburn, approximately 15 miles to the northeast of Tuskegee National Forest, yielded no specimens of *Cx. coronator*. That *Cx. coronator* was first collected in October at Tuskegee National Forest is not particularly surprising. Goddard et al. (2006) first collected

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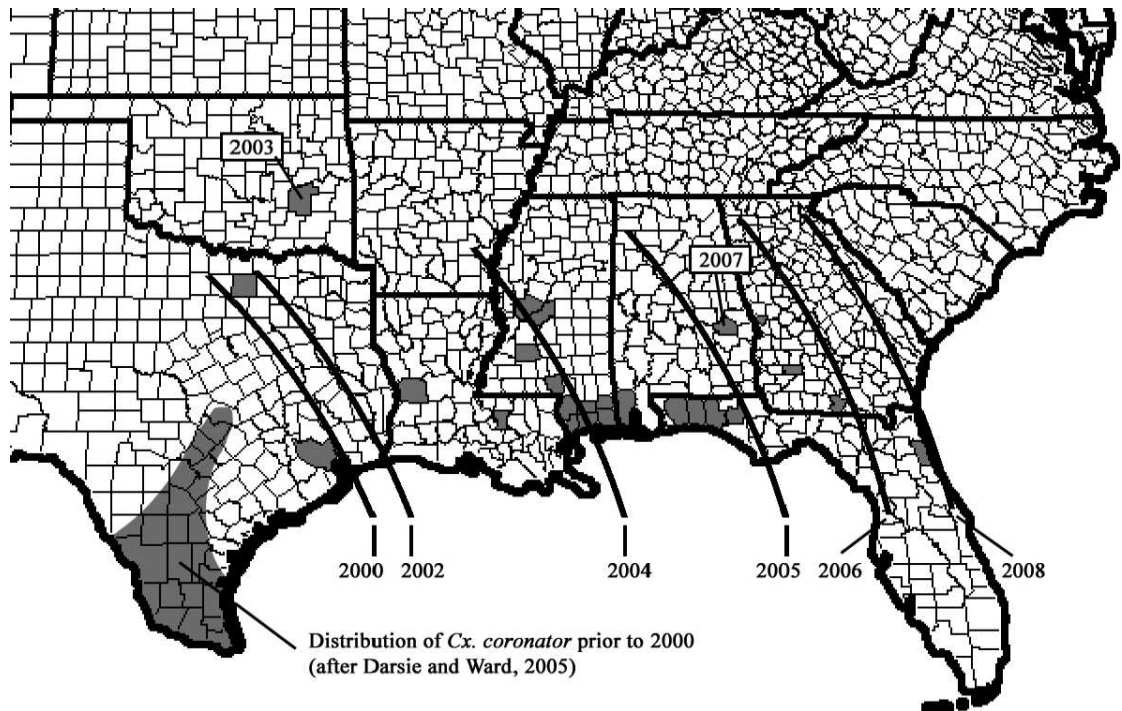


Fig. 1. Distribution records of *Cx. coronator* in the eastern USA, summarized from published reports—State: Counties (Citation):

- AL: Macon (this report), Mobile (McNelly et al. 2007)
 FL: Okaloosa, Santa Rosa, Washington, Walton (Smith et al. 2006), St. Johns (Connelly 2008)
 GA: Dougherty, Lowndes, Muscogee (Kelly et al. 2008)
 LA: Vernon Parish (Debboun et al. 2005), East Baton Rouge Parish (Mackay 2007)
 MS: Copiah, George, Harrison, Hinds, Hancock, Jackson, Madison, Marion, Pearl River, Stone, Yazoo (Goddard et al. 2006)
 OK: Pittsburg (Bradley 2004)
 TX: Denton (Bolling et al. 2005), Harris (Goddard et al. 2006)

specimens of *Cx. coronator* in Mississippi in September, and Smith et al. (2006) collected adults as late as November 29 in the Florida panhandle. Adults of *Cx. coronator* have been collected at virtually all times of the year in the southeastern USA, including April (Debboun et al. 2005) and August (Foppa et al. 2007).

The expansion in the distribution of *Cx. coronator* could have important implications for arbovirus transmission in areas where it newly occurs. Although *Cx. coronator* is not usually considered to be a species of major health importance, several pathogens have been isolated from field-collected females. Venezuelan equine encephalitis virus, which may cause death in humans, has been isolated from *Cx. coronator* females from Mexico (Scherer et al. 1971, Burguete et al. 1973). St. Louis encephalitis (SLE) virus, which also causes significant mortality in humans, has been detected in *Cx. coronator* females from Trinidad (Anderson et al. 1957). In laboratory experiments Hammon et al. (1943) showed that *Cx. coronator* could transmit SLE virus to birds after feeding on a

blood-virus suspension. SLE virus is endemic to the eastern USA, and the addition of this potential vector species could impact local transmission rates.

It seems likely that the appearance of *Cx. coronator* in 6 new states from 2003 to 2008 is indicative of a large-scale expansion in distribution, rather than isolated introductions into new habitats. The time line of published records of *Cx. coronator* indicates that the front of the expanding distribution is moving to the north and east (Fig. 1).

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