Journal of the American Mosquito Control Association, 24(4):588-590, 2008

SCIENTIFIC NOTE

CULEX CORONATOR IN COASTAL GEORGIA AND SOUTH CAROLINA

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ABSTRACT. In 2007, adult Culex coronator were collected in Chatham County, Georgia, and Jasper County, South Carolina, during nuisance and disease vector surveillance efforts. A total of 75 specimens of this species were collected at 8 widely separated locations in Chatham County, Georgia, and 4 closely situated sites in Jasper County, South Carolina. These represent the first Atlantic coastal records of this species in Georgia and the first confirmed records of Cx. coronator in South Carolina.

KEY WORDS Culex coronator, Georgia, South Carolina, Atlantic Coast, mosquitoes

Culex coronator Dyar and Knab was originally described from Trinidad and several Central American countries (Dyar and Knab 1906). It is known to have a wide geographical distribution from southern portions of the United States to Argentina (Carpenter and LaCasse 1955). In the United States, this species is found in Arizona, New Mexico, and Texas (Darsie and Ward 2005). Recently, specimens have been found in Oklahoma (Bradley 2004), Louisiana (Debboun et al. 2005), Mississippi (Varnado et al. 2005, Goddard et al. 2006, Foppa et al. 2007), and Florida (Smith et al. 2006). *Culex coronator* has also been found in Georgia (Kelly et al. 2008) and, most recently, in Alabama (McNelly et al. 2007). Together, these records suggest the US distribution of this species is expanding eastward. In late 2007 (October–December), specimens were captured in mosquito traps deployed in Chatham County, Georgia, and Jasper County, South Carolina. To our knowledge, these are the first Atlantic Coast records, and the Jasper County specimens represent a new state record.

Adult *Cx. coronator* are quite distinct in their appearance from other Culex species in our area. The body pattern is similar to *Cx. quinquefasciatus* Say, but differs by having black and white instead of brown and cream scales on the abdomen, and apical and basal pale bands on the hind tarsi. Later instars are differentiated by spines near the siphon apex.

Apparently, little is known on the biology and natural history of this species. Adults have been collected in a variety of habitats including pine forest, mixed woods, pasture areas, and cypress swamps (Varnado et al. 2005, Smith et al. 2006). In British Honduras, adults were captured in both upland forest and riverine terrain, but were more numerous in the low-lying riverine habitat than the forest localities (Bertram 1971). Debboun et al. (2005) reported collecting *Cx. coronator* adults in association with *Aedes albopictus* (Skuse), *Ae. atlanticus* Dyar and Knab/*tormentor* Dyar and Knab, *Ae. canadensis canadensis* (Theobald), Ae. fulvus pallens Ross, *Ae. infirmatus* Dyar and Knabb, *Ae. sticticus* (Meigen), *Ae. thibaulti* Dyar and Knab, *Anopheles crucians* Wiedemann, *An. punctipennis* (Say), *An. quadrimaculatus* Say, *Coquillettidia perturbans* (Walker), *Cx. erraticus* (Dyar and Knab), *Cx. nigripalpus* Theobald, *Cx. quinquefasciatus*, *Cx. salinarius* Coquillett, *Psorophora ferox* (von Humboldt), and *Ps. columbiae* (Dyar and Knab) in Louisiana.

Sites in Chatham County where *Cx. coronator* adults were collected consist of cypress/hardwood river swamp (3 sites), older residential neighborhoods (2 sites), pine flatwoods (1 site), and greenways composed of mixed-wooded habitat (2 sites). The South Carolina sites (4 sites) are situated along the Savannah River in a heavily manipulated area containing silt material from channel dredging operations. These sites contain mixed woods dominated by chinaberry (*Melia azedavach* L.), hackberry (*Celtis laevigata* Willdenow), and other deciduous species. Other mosquito species captured at these sites in association with *Cx. coronator* were *Aedes albopictus*, *Ae. atlanticus/tormentor*, *Ae. Infirmatus*, *Ae. Sollicitans* (Walker), *Ae. taeniorhynchus* (Wiedemann), *Ae. vexans* (Meigen), *Anopheles atropos* Dyar and Knab, *An. crucians* complex, *An. quadrimaculatus* s.l., *Coquillettidia perturbans*, *Cx. erraticus*, *Cx. nigripalpus*, *Cx. quinquefasciatus*, *Cx. restuans* Theobald, *Cx. salinarius*, *Culiseta inornata* (Williston), *Cs. melanura* (Colquillett), *Psorophora ferox*, *Ps. columbiae*, *Uranotaenia lowii* Theobald, and *Ur. sapphirina* (Osten Sacken).

The preferred larval habitat in Panama consisted of shady or sunny pools that were considered stagnant and permanent in nature (Arnett 1950). In Belize, larval habitat included

ground pools, rock pools, tire ruts, seepage areas, log holes, and roadside ditches (Pecor et al.2002). These ran the gamut of clear to stagnant, temporary to permanent, and with or without aquatic vegetation. In urban, suburban, and rural localities of Yucatan, Mexico, *Cx. coronator* was found in temporary pools, rock holes, tree holes, and various containers (Najera-Vazquez et al. 2004). In Mississippi, larvae were primarily found in a poorly drained roadside ditch containing rotting grass and some algae (Goddard et al. 2006). Other larval mosquito species found at this location included *Cx. territans* Walker, *Cx. nigripalpus*, *Cx. restuans*, *Cx. salinarius*, *An. punctipennis*, and *Ae. vexans*. In our surveys, *Cx. coronator* larvae were only found at a single South Carolina location, consisting of a seepage pool at the base of a wooded embankment near the margin of brackish marshland. Other larval mosquito species found at this site were *An. crucians* complex, *Cx. restuans*, and *Cx. salinarius*.

In most studies, Centers for Disease Control and Prevention (CDC) light traps with dry ice (Goddard et al. 2006) or without any bait (Taylor and Turner 1998) seem to be the collecting device of choice. However, in Florida CO_2-baited Mosquito Magnet X traps (American Biophysics Corporation, East Greenwich, RI) were used (Smith et al. 2006). Debboun et al. (2005) captured this species primarily in CDC light traps, although a single specimen was collected in a gravid trap. In Mississippi, light traps equipped with ultraviolet lights captured more *Cx. coronator* than traps with incandescent lights (Foppa et al. 2007). In our work, 74 adult *Cx. coronator* were collected in Chatham County, Georgia, and Jasper County, South Carolina, with CDC light traps baited with dry ice and equipped with incandescent lights. Only a single specimen was captured in a gravid trap despite substantial use of this trap type within our service area.

Bertram (1971) indicated *Cx. coronator* in British Honduras became active primarily after dark. He further noted that this species is usually captured at ground level but could be collected at heights of up to 25 ft. In a Peruvian study, 99% of all *Culex* (consisting almost entirely of *Cx. coronator, Cx. declarator* Dyar and Knab, and *Cx. mollis* (Dyar and Knab) were collected at night (Jones et al. 2004). In our region, traps are deployed late in the afternoon hours and retrieved early the following morning. All light traps are placed approximately 1.5 m above ground level.

Although *Cx. coronator* apparently does not feed on humans in the United States (Carpenter and LaCasse 1955), it has been collected from human bait stations in Brazil (Roberts and His 1979) and Peru (Pecor et al. 2000). Furthermore, St. Louis encephalitis has been isolated from *Cx. coronator* in Trinidad, West Indies (Aitken et al. 1964). It has also been reported to carry Venezuelan encephalitis in southeastern Mexico (Scherer et al. 1971) and Ilheus virus in Peru (Turell et al. 2005). Currently, *Cx. coronator* is listed as a vector for West Nile virus (CDC 2005), based on positive pools collected in Texas (Kelly et al. 2008) and Louisiana (Mackay 2007). It remains to be seen what role this newly encountered species will play in arbovirus cycles in Georgia and South Carolina.

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