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The other *Culiseta*, *Culiseta inornata*

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For those of us involved with disease surveillance, particularly eastern equine encephalitis (EEE) surveillance, the “cedar swamp” or “black tailed” mosquito, *Culiseta melanura*, is probably a well-known species. However, there is another species of *Culiseta*, the “winter” mosquito or *Culiseta inornata*, found throughout Georgia (see Darsie and Ward, 2005). Yet, despite this statewide distribution, it may elude most mosquito control workers and the CDC traps that we so often deploy in the most mosquito-rich environs of our respective service areas. Little is available concerning this species in Georgia. King et al. (1943) recorded larvae in December from Fort McPherson (Fulton County), and adults on various dates from late October through December at Fort Benning (Chattahoochee/Muscogee counties); Hunter Field (Chatham County); and Camp Gordon (Columbia/Jefferson/Richmond counties). Later, Middlekauff and Carpenter (1944) reported larvae from Moody Field (Lowndes County) in February and March, and adults from Camp Wheeler (Bibb County) in March and April. Davis et al. (1984) collected a larva from tire ruts at an Elbert County site in mid April. The species has also been recorded from Baker County in southwest Georgia (Love and Smith, 1957; 1958; Love et al., 1963).

Adult *Culiseta inornata* (Figure 1) are fairly large, robust mosquitoes that have a conspicuous light band

along the basal portion of each abdominal segment. As in other members of the *Culiseta* group, a short row of setae along the base of the subcostal vein is present on the underside of the wings (Fig. 2). The larval stages, unlike other mosquito genera, possess ventral setae on the basal portion of the siphon (Fig. 3).



Figure 1. Adult *Culiseta inornata*

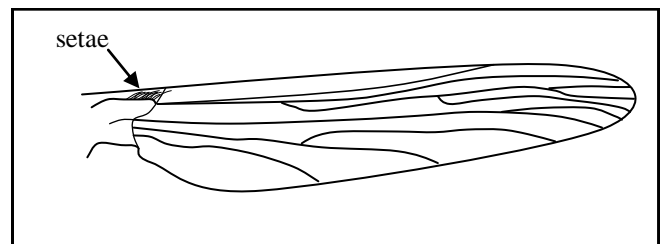


Figure 2. Underside of *Culiseta inornata* wing

continued on page 2

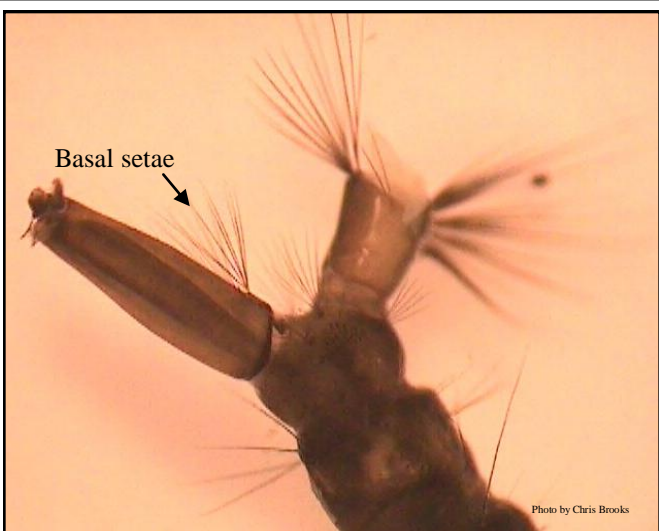


Figure 3. Larval *Culiseta inornata*

The larvae inhabit a variety of environments. Nielson and Rees (1961) indicated that the larvae are found in a number of permanent and semi-permanent waters, showing a preference for brackish or polluted waters in direct sunlight or partial shade. In North Carolina, Schoof et al. (1944) found larvae in association with *Culex salinarius* larvae at a pasture pond vegetated primarily by a common *Juncus* species. In California, Washino et al. (1962) listed ditches, canals, irrigation impoundments, seepages, rain pools, and flooded fields associated with duck hunting activities. Wirth (1947) collected larvae in late February and early April from woodland pools in Louisiana along with larvae of *Culex restuans*, *Ochlerotatus canadensis*, *Aedes vexans*, and *Anopheles punctipennis*. In Chatham County, the majority of locations where larvae have been collected are associated with coastal habitat, generally in close proximity to salt marsh areas that have the potential to be flooded by spring tides, or areas that are part of containment areas that periodically receive outflow from dredging operations conducted along the Savannah River (Fig 4). Often these sites contained *Culex nigripalpus*, *Cx. salinarius*, and/or *Cx. restuans* larvae, although *Ochlerotatus mitchellae* and *Anopheles crucians* larvae were found at separate locations at one time with *Cs. inornata*.



Figure 4. Capture locations of *Culiseta inornata* in Chatham County, Georgia. White dots represent larval sites, yellow dots represent trap sites where adults were found.

In California, adult *Cs. inornata* appear to be a winter or spring mosquito that is collected sporadically during the summer (Fanara and Mulla, 1974; Bernard and Mulla, 1977; Reisen et al., 1989), while in areas where winter conditions are severe, adults become inactive during the coldest months (Shemanchuk, 1965). Adults are not often collected in Chatham County Mosquito Control (CCMC) surveillance traps. In fact, in over 21,000 trap nights dating back to April of 2000, using a combination of CDC, exit, and gravid traps only 55 specimens have been collected in CCMC traps. Even so, these limited amounts of data can tell us a few things about *Cs. inornata*. First, adults tend to be collected in the fall/winter/spring (Fig 5), and primarily in CDC light traps (Fig 6). Also, it appears that adults are more likely to be captured at sites in less urbanized areas of the county (Fig. 7). One might argue that the seasonality of this species

Figure 5. Adult *Culiseta inornata* seasonality

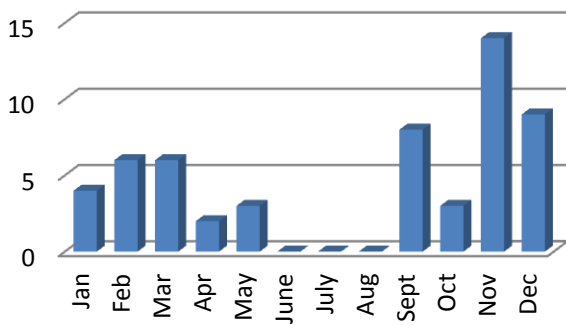


Figure 6. *Culiseta inornata* catch by trap type

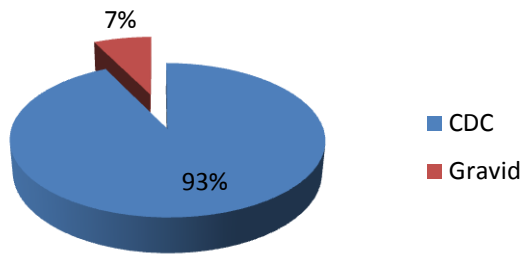
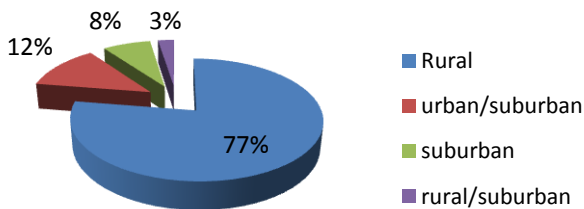


Figure 7. *Culiseta inornata* habitat preference by trap night



may limit its capture rate as fewer traps are deployed during the cooler times of the year. However, when comparing this species with another cool weather species in our area, *Culex coronator*, this is not necessarily the case. Both species are primarily collected in CDC light traps from October through March. Yet, whereas only 55 *Cs. inornata* have been caught since 2000, a total of 4572 *Cx.*

coronator have been collected, and unlike *Cs. inornata*, *Cx. coronator* was only discovered in Chatham County late in the 2007 season (Moulis et al., 2008) encompassing less than 12500 trap nights.

Preliminary observations of adults from southwestern Georgia indicated that this species is highly attracted to light, and displayed the highest “light trap attractiveness” index of 27 mosquito species captured in this study (Love and Smith, 1957). In addition, *Cs. inornata* has been found at various elevations from 3 to 50 feet, and that specimens were just as likely to be captured in traps set 3 feet off the ground as those placed 50 feet from the ground (Love and Smith, 1958). In later work, Love et al. (1963) reported that adults were captured uniformly throughout the night, and appeared more common in an open field type habitat rather than the wooded habitat.

Host preferences studies indicate that *Cs. inornata* fed mostly on larger mammals. In Kansas, cattle were the preferred host of *Cs. inornata*, although sheep, human, rabbit, horse, hog, bird, dog, and rodent blood were also detected (Edman and Downe, 1964). In Canada, the primary blood host for this species was ruminants, and contributions from horse, human, hog, rabbit, and bird were present at much lower rates (Hudson and Edman, 1978; Anderson and Gallaway, 1987).

Several reports of viruses isolated from *Cs. inornata* are known. Hammon et al. (1945) recorded western equine encephalitis (WEE) from *Cs. inornata* collected in Washington, while Spalatin et al. (1963) and Sekla et al. (1980) found WEE in this species from Canada. The first Cache Valley virus isolation was from *Cs. inornata* collected in Utah (Holden and Hess, 1959). California encephalitis virus has been found in *Cs. inornata* collected from central Utah (Crane et al., 1970) and Alberta, Canada (Morgante and Shemanchuk, 1967). *Cs. inornata* has been found to be a moderate efficient vector of West Nile virus in the lab (Goddard et al., 2002), and positive pools have been recorded from Colorado (Bolling et al., 2007) and New Mexico (Pitzer et al., 2009).

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continued on page 5

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