Georgia Mosquito Control Association April 12, 2013 Volume 4, Issue 1

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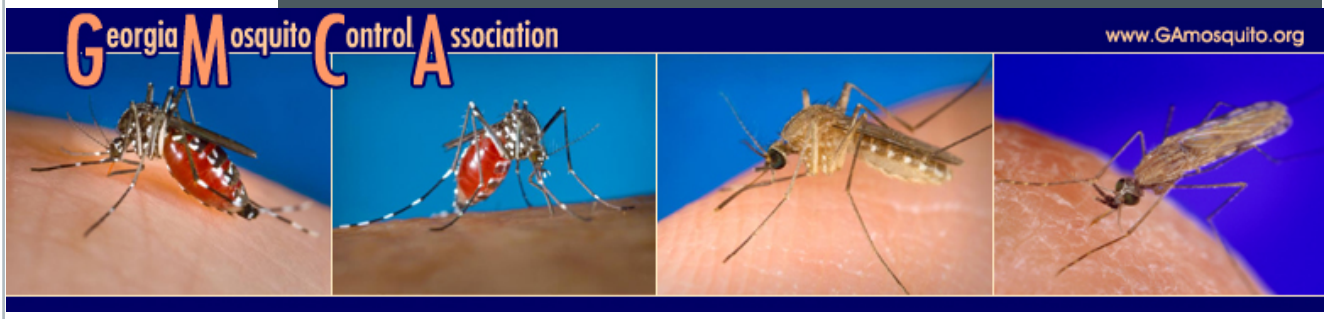


The GMCA Newsletter - DIDEEBYCHA - is a means of spotlighting various programs throughout Georgia, as well as a way of providing the membership with information about topics of interest to mosquito control.

NPDES Update

For those of you who submitted an NOI at the end of 2011, or in early 2012, …

… Biennial Reports were required at the end of 2012. Reports are then required every other year after that. Georgia EPD has indicated that these reports are to be kept on file and NOT sent in to the EPD offices.

Although the Georgia EPD had indicated that they would put together a template for the report, none was ever made available. However, the EPA has put together a template for States where the EPA is the NPDES permitting authority. The GMCA

Continued on page 4…

Georgia Arboviral Summary

The 2013 mosquito season got a head start this year, with abundant rain and periods of warm weather. Areas of South Georgia are currently dealing with large emergences of *Ochlerotatus sticticus* and *Aedes vexans*, both aggressive floodwater species.

Our final arboviral case count for 2012 was:

* 100 WNV cases
  - 47 neuroinvasive
  - 50 WN fever
* 6 deaths
* 3 cases lost to follow-up
* 17 presumptive WNV+ viremic blood donors

* 1 EEE case
* 13 Dengue fevers with travel outside the US

The highest number of WNV cases reported in Georgia prior to 2012 was 55 in 2003.

Six counties and one city continued to send mosquitoes into SCWDS for testing. Overall WNV was detected in 125 mosquito pools (2.1%). Three EEE+ mosquito pools were also detected in 2012.

Eleven WNV+ horses and 10 EEE+ horses were reported in 2012. Ten birds were sent in for testing; one was EEE+ and one was WNV+.

For additional information check the 2012 end-of-year summary. This will eventually be posted at http://health.state.ga.us/epi/vbd/pastsurv.asp.

AMCA Washington Day

The AMCA Washington Day conference (May 6-8, 2013) is THE venue to identify issues or concerns that can only be examined and resolved at the federal level or on a nationwide basis.

The American Mosquito Control Association, founded in 1935, is a scientific/educational, not-for-profit public service association. It is world-wide in scope with members or subscribers to its publications in over 50 countries; the majority of its members are in the United States. Its mission is to provide leadership, information, and education leading to the enhancement of public health and quality of life. The AMCA accomplishes this mission through the suppression of mosquitoes and vector transmitted diseases and the reduction of annoyance levels caused by mosquitoes, other vectors, and pests of public health importance.

AMCA Washington Day (cont)

2013 Position Papers

Endangered Species Act Considerations and Mosquito Control

Mosquito Control on National Wildlife Refuges and Other Federal Lands

Clean Water Act NPDES Permit Impacts on Mosquito Control Programs

Epidemiology and Laboratory Capacity Grants for Mosquito-borne Disease Surveillance

From http://www.mosquito.org/washington-conference

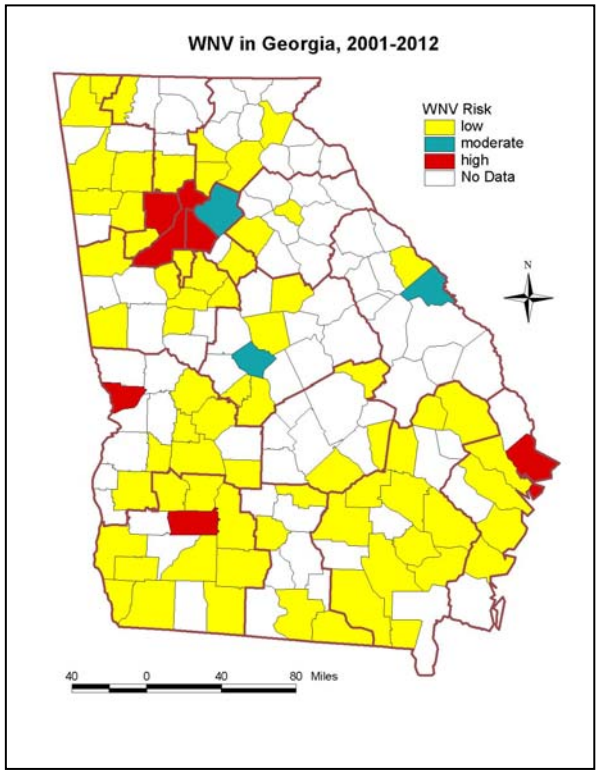
GDPH: Continued Program Cuts

In 2012, budget cuts eliminated the ability of the Georgia Department of Public Health to pay for any bird or mosquito testing. Six county and one city program assumed the burden of mosquito pool testing in areas of high risk. These programs agreed to continue to share data with the GDPH so that some measure of risk could be determined.

In 2013, the cuts to the GDPH arboviral testing program have continued. In addition, the mosquito ID classes, which have occurred twice a year since 2001, were also eliminated due to lack of funding. Knowing what mosquito species are present and where they are developing is essential to a well-planned mosquito control program. Mosquito surveillance is also an emergency preparedness issue as it aides in preparedness and control during an emergency where mosquitoes become a problem.

Fortunately, at least a few of the high risk counties in Georgia either have had the resources to support their own arboviral testing, or are located close to a county with such resources. Unfortunately, not all the high risk counties have mosquito control programs, but public health can provide appropriate educational messages in order to help reduce risk of human disease by promoting use of repellents and reduction of mosquito breeding through a "tip or toss" campaign.

It is hoped that most or all of the 6 county and one city program that have been able to support their own arboviral testing will continue to be able to do so. According to the CDC, it is important to monitor vectors and virus within a season and intervene in order to reduce infected vector populations. By monitoring virus activity it is possible to expand adult mosquito control, reducing infected vector abundance and reducing the risk of human infection.



NPDES Update (cont)

modified this template for use by mosquito control programs in Georgia. This template can be found on the GMCA website at http://www.gamosquito.org/resources/NPDES/BIENNIALOPERATIONSREPORTblank.doc.

The Fate of HR 872

(http://www.gpo.gov/fdsys/pkg/BILLS-112hr872ih/pdf/BILLS-112hr872ih.pdf)

HR 872, the "Reducing Regulatory Burdens Act of 2011", maintains the historic primacy of FIFRA jurisdiction and eliminates the duplicative regulation by CWA.

The negative impacts that HR 872 sought to redress were:

1. The only tangible result of new CWA requirements for vector control will be increased costs and burdens to strained state, county and municipal budgets – not cleaner water. Significant amounts of state and local funds and manpower are being diverted from directly protecting public health to CWA permitting activities that do not provide any additional environmental or human protection already afforded by FIFRA.
2. HR 872 avoids unnecessary and costly duplicative regulation while preserving the comprehensive environmental oversight provided by FIFRA.

According to Joe Conlon, Technical Advisor to the American Mosquito Control Association, "Ironically, the pollution incident leading to the court ruling that CWA-based regulation should also be imposed did not involve mosquito control and was a blatant violation of FIFRA, subject to substantial penalties. It wouldn't have been prevented by the CWA." Conlon further states, "Passage of HR 872 will restore the reasonable and practicable regulatory roles played by both FIFRA and the CWA, making both statutes conform with the original intent of Congress that has served successfully in protecting both our citizens and the environment for over 40 years."

HR 872 was passed in the House by a 2/3 bipartisan vote and had a significant majority of the Senate poised to support its passage if brought to a floor vote. Unfortunately, Senator Barbara Boxer has put a hold on bill, keeping it from a floor vote.

Senator Boxer suggested that no change in Federal law was necessary to protect public health. In reality, federal law *was* changed by a court decision that occurred over 3 years ago, and altered congressional intent and EPA regulations that had been in place since the early 1970's.

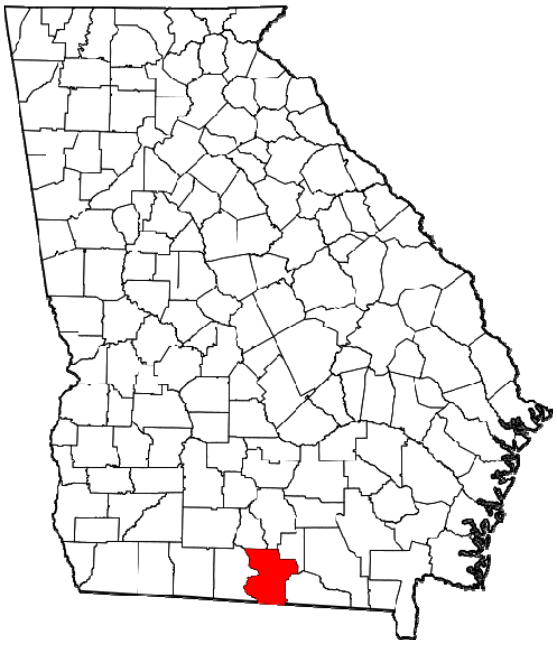
Check out the NPDES Update page on the GMCA website (www.GAmosquito.org) for continuing updates or request to be included on the NPDES e-list for up-to-date information. To be included on the list, please email Rosmarie Kelly at rmkelly@dhr.state.ga.us and ask to be added to the list.

The new Pesticide General Permit contact at GA EPD is Dan Abrams. His phone number is 404-675-1600.

PROGRAM SPOTLIGHT

Lowndes County Mosquito Control Program

Lowndes County, in south Georgia, (http://www.lowndescounty.com/) has one of the better organized mosquito control programs in Georgia. Robin Cumbus, the Public Works Director for Lowndes County is a large part of the reason why mosquito control works so well there. Robin agreed to take time out of her busy day to answer a few questions concerning the Lowndes County Mosquito Control program and its role in protecting the health of county residents.



1. **How large is the area for which you have responsibility?**

   Lowndes County consists of 463 sq miles (approximately 810 road miles). We target our treatment areas based on previous storm data, testing and surveillance data, school bus stops, nursing homes and habitat. We used our local RDC to give conditions a value then rate the areas from high to low. We then focus our larvicide and surveillance data on the high risk areas. Current resources do not allow for us to treat the entire County therefore, I feel we need to be able to justify when and why we provide treatment.

2. **What are your responsibilities as public works director?**

   Every Public Works Department has a different structure. In Lowndes County, Public Works is responsible for maintaining all County assets to include roads, buildings, grounds, vehicles, equipment and mosquito control. As Director, it is my responsibility to be a good steward of the resources provided by the County Manager, which in turn reflects the goals developed by our elected officials. I am also expected to make sure all policy and procedures are followed, that our department is financially accountable and to be as productive and effective and possible.

PROGRAM SPOTLIGHT

Lowndes County Mosquito Control Program (cont)

3. **How many employees are there in Public Works? How many do mosquito control?**

   Lowndes County Public Works has 92 full time employees. Our Mosquito Control Program has 1 full time technician and a director.

4. **What does Lowndes County Public Works do for mosquito control?**

   a. How many trucks do you have? We have 4 trucks and 4 machines (we pull employees from Roads when needed)

   b. What products do you use? We are currently using Fourstar and Aqua Reslin. I strongly urge anyone involved in mosquito control to solicit help from your Chemical Rep who can be a great asset and assist you in problem solving and improvements to your overall program.

   c. Do you do larviciding or adulticiding or both? Our primary focus is in larviciding, but based on surveillance data we will adulticide when needed. We also keep our Road Crews focused on drainage in order to keep any water moving.

   d. How about surveillance? We currently contract with Valdosta State University Biology Department for trapping, identification and testing. Our own department performs trapping as well. Our newest form of historical data collection is performing a general survey of an area when a citizen complaint is documented. Our staff will perform and document a landing count from the complaint as well as look for ways the citizen may reduce areas of holding water. The documentation allows for comparison data if the citizen makes a second complaint. This recorded information helps us to determine if the counts are going up. This form of documentation has proven to be a great response to elected officials and also provides justification for more costly treatments.

5. **What kind of education do you provide for:**

   a. Members of the public? We provide education pamphlets to citizens and educational information to various media when needed.

   b. Members of your staff? All Public Works employees that are a first point of contact with citizens are trained to give expert advice on reducing breeding sites and the use of chemicals supplied by the County.

PROGRAM SPOTLIGHT

Lowndes County Mosquito Control Program (cont)

6. **How much interaction do you have with the mosquito control program in Valdosta?**

   Lowndes County and the City of Valdosta currently contract jointly with Valdosta State University. We work closely together during emergency situations or share treatment information.

7. **What do you feel is the most important thing to remember when running a mosquito control program?**

   Surveillance data are everything! Without data you can't justify current programs, ask for additional funding or get any type of reimbursement from FEMA when emergencies are upon us. I feel if you don't have surveillance data you need to step back and revamp your program. "Knowledge is Power!"

8. **Anything else you want to add?**

   Have good documentation, keep historical data in an organized manner and focus heavily on surveillance. Lastly, be accountable by knowing why and where you provide treatment with a documented systematic method.

The Georgia Mosquito Control Association

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GMCA Newsletter Supplement

Volume 4, Issue 1s **April 2013**

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).

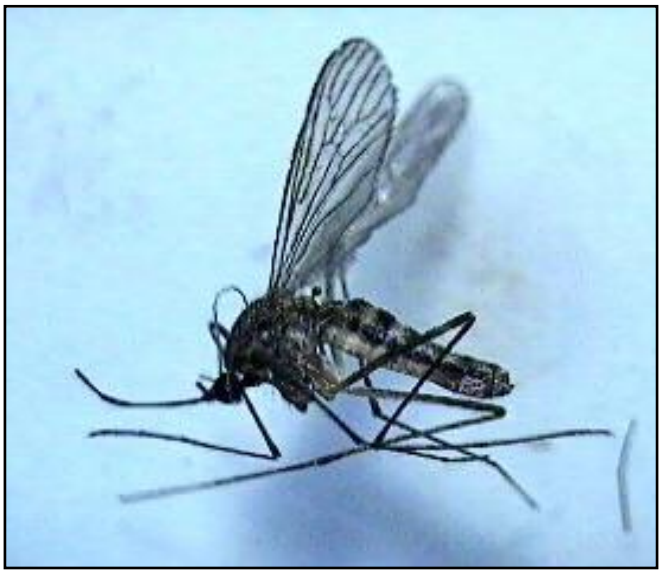

Figure 1. Adult *Culiseta inornata*

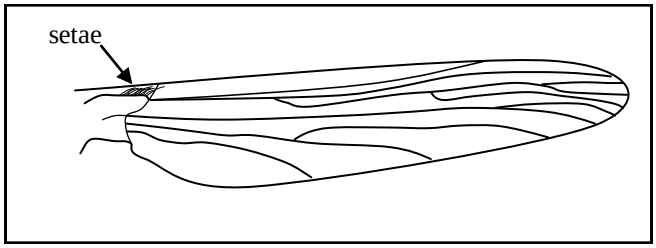

Figure 2. Underside of *Culiseta inornata* wing

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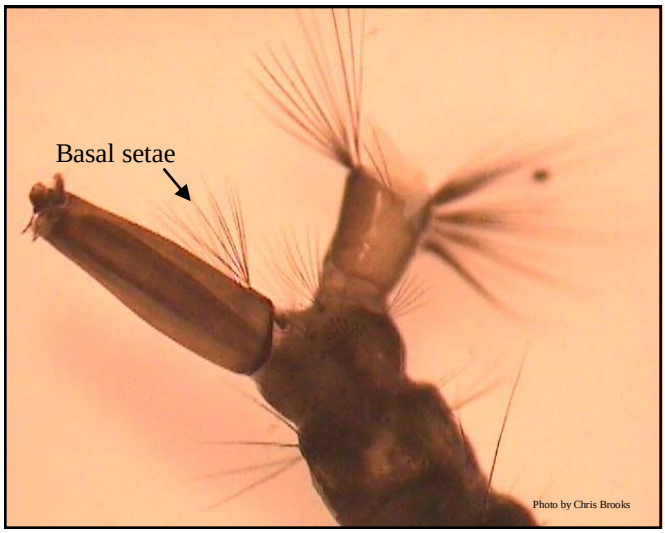

Figure 3. Larval *Culiseta inornata*

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

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Figure 5. Adult *Culiseta inornata* seasonality

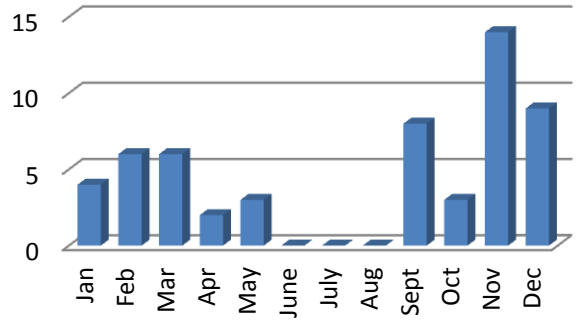


Figure 6. *Culiseta inornata* catch by trap type

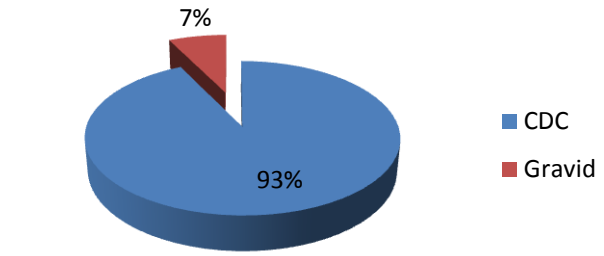
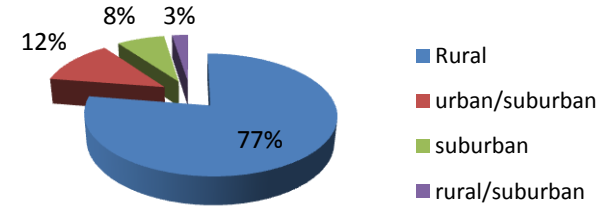


Figure 7. *Culiseta inornata* habitat preference by trap night



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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References Cited

Anderson, R. A. and W. J. Gallaway. 1987. The host preferences of *Culiseta inornata* in southwestern Manitoba. J. Am. Mosq. Control Assoc. 3:219-221.

Bernard, D. R. and M. S. Mulla. 1978. The ecology of *Culiseta inornata* in the Colorado Desert of California: Seasonal abundance, gonotropic status, and oviparity of adult mosquitoes. Ann. Entomol. Soc. Am. 71:397-400.

Bolling, B. G., C. G. Moore, S. L. Anderson, C. D. Blair, and B. J. Beaty. 2007. Entomological studies along the Colorado Front Range during a period of intense West Nile virus activity. J. Am. Mosq. Control Assoc. 23:37-46.

Crane, G. T., R. E. Elbel, D. E. Klimstra, and K. L. Smart. 1970. Arbovirus isolations from mosquitoes collected in central Utah in 1967. Am. J. Trop. Med. Hyg. 19:540-543.

Darsie, R. F., Jr. and R. A. Ward. 2005. Identification and geographical distribution of the mosquitoes of North America, north of Mexico. University Press of Florida. Gainesville, FL. 384 pp.

Davis, J. R., M. A. Delaney, T. R. Adkins, Jr., J. C. Morse, J. H. Patti, and R. J. Hack. 1984. Preimpoundment distribution of mosquitoes within the Richard B. Russell Dam and Lake area of South Carolina and Georgia. J. Georgia Entomol. Soc. 19:143-151.

Edman, J. D. and A. E. R. Downe. 1964. Host-blood sources and multiple-feeding habits of mosquitoes in Kansas. Mosq. News 24:154-160.

Fanara, D. M. and M. S. Mulla. 1974. Population dynamics of larvae of Culex tarsalis Coquillett and Culiseta inornata (Williston) as related to flooding and temperature of ponds. Mosq. News. 34:98-104.

Hammon, W. M., W. C. Reeves, S. R. Benner, and B. Brookman. 1945. Human encephalitis in the Yakima Valley, Washington, 1942. J. Amer. Med. Assoc. 128:1133-1139.

Hudson, J. E. and J. D. Edman. 1978. Dispersal of blood-fed Culiseta inornata and Culiseta alaskaensis at Edmonton, Alberta. Mosq. News 38:87-88.

Goddard, L. B., A. E. Roth, W. K. Reisen, and T. W. Scott. 2002. Vector competence of California mosquitoes for West Nile virus. Emerg. Infect. Dis. 8:1385-1391.

Holden, P. and A. D. Hess. 1959. Cache Valley virus, a previously undescribed mosquito-borne agent. Science 130:1187.

King W. V., L. Roth, J. Toffaleti, and W. W. Middlekauff. 1943. New distribution records for the mosquitoes of the southeastern United States during 1942. J Econ Entomol.36:573-577.

Love, G. J. and W. W. Smith. 1957. Preliminary observations of the relation of light trap collections to mechanical sweep net collections in sampling mosquito populations. Mosq. News 17:9-14.

Love, G. J. and W. W. Smith. 1958. The stratification of mosquitoes. Mosq. News 18:279-283.

Love, G. J., R. B. Platt, and M. H. Goodwin, Jr. 1963. Observations on the spatial distribution of mosquitoes in southwestern Georgia. Mosq. News 23:13-22.

Middlekauff, W.W., and S. J. Carpenter. 1944. New distribution records for the mosquitoes of the southeastern United States in 1943. J Econ Entomol.37:88-92.

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nte, O. and J. A. Shemanchuk. 1967. Virus of the California encephalitis comple: Isolation from *Culiseta inornata*. Science 157:692-693.

Moulis, R.A., J. D. Russell, H. B. Lewandowski, Jr., P. S. Thompson, and J. L. Heusel. 2008. *Culex coronator* in coastal Georgia and South Carolina. J. Am. Mosq. Control Assoc. 24:588-590.

Nielson, L. T. and D. M. Rees. 1961. An identification guide to the mosquitoes of Utah. Univ. Utah Biol. Ser. 12:1-58.

Pitzer, J. B., R. L. Byford, H. B. Vuong, R. L. Steiner, R. J. Creamer, D. F. Caccamise. 2009. Potential vectors of West Nile virus in a semiarid environment: Doñ Ana County, New Mexico. J. Med Entomol. 46:1474-1482.

Reisen, W. K., R. P. Mayer, and M. M. Milby. 1989. Studies on the seasonality of *Culiseta inornata* in Kern County, California. J. Am. Mosq. Control Assoc. 5: 183-195.

Schoof, H. F. and D. F. Ashton. 1944. Notes and new distribution records on the mosquitoes of North Carolina. J Elisha Mitch Sci S. 60:1-10.

Sekla, L. H., W. Stackiw, and R. A. Brust. 1980. Arbovirus isolations from mosquitoes in Manitoba. Mosq. News 40:377-380.

Shemanchuk, J. A. 1965. On the hibernation of *Culex tarsalis* Coquillett, *Culiseta inornata* Williston, and *Anopheles earlei vargas*, (Diptera: Culicidae) in Alberta. Mosq. News 25:456-462.

Spalatin, J., A. N. Burton, J. McLintock, and R. Connell. 1963. Isolation of western equine encephalitis (WEE) from mosquitoes in Saskatchewan, 1962. Can. J. Comp. Med. Vet. S. 27:283-289.

Washino, R. K., R. I. Nelson, W. C. Reeves, R. P. Scrivani, and C. H. Tempelis. 1962. Studies on *Culiseta inornata* as a possible vector of encephalitis viruses in California. Mosq. News. 22:268-274.

Wirth, W. W. 1947. Notes on the mosquitoes of Louisiana. J. Econ. Entomol. 40:742-744.