



THE BITING TIMES

Hot Tips to Help You Identify Rubbed Specimens

Bruce A. Harrison, PHPM, NC DENR

Everyone that has identified female mosquitoes has encountered specimens that are damaged, rubbed, or if on a point, covered in glue. The identifier usually gets fairly close to determining the species of the specimen, but the essential character or characters have been rubbed off or cannot be seen, and the identifier is left no choice but to call it *Ae.*, *Oc.*, *An.*, or *Cx.* species, etc. Unfortunately, there is another option, **guessing**, but that is a very bad choice because if you guess wrong it can cause problems in later virus isolation, distribution, behavior, habitat, and other data that will really mess up your records. During 10 years of teaching students to identify female mosquitoes for surveillance and pooling purposes I have noted that certain species are more likely to cause this problem than others. This is particularly true when specimens have been difficult to replace and become very rubbed after use in several classes.

Below are tips for helping you through rough spots in keys when the specimens are rubbed or damaged. Most of the tips are not new, but information provided, but not used in keys. Sometimes the best characters are not used in keys. That points out a benefit from reading species descriptions. The tips may not always help (depending on the condition of the specimen) but most of the time they have been a big help to me.

Aedes cinereus versus *Culex* species. *Aedes cinereus* is not a common mosquito in North Carolina and Virginia. Probably it is also under-reported. Misidentification is one possible reason for this. Because of its small size, dark legs and reddish-brown scutum it superficially looks like *Culex restuans* (without the spots on the scutum) or *Cx. salinarius*. So, if you find a *Culex* specimen that doesn't key well, check the following characters that are not on *Culex*, but are on *Ae. cinereus*: (1) sharp pointed abdomen and (2) postspiracular setae.

Anopheles atropos versus *Anopheles quadrimaculatus* Complex. *Anopheles atropos* is a brackish water species and only occurs near salt marshes along the coast, while the *Quadrimaculatus* Complex is wide spread in fresh water habitats and also occurs along the coast. These species all lack pale scales on the palpi and wings. The four dense clumps of scales on the wing that are characteristic of the five species in the *Quadrimaculatus* Complex can also occur on *An. atropos*. So, when you have an entirely dark *Anopheles* specimen with the head scales rubbed off then look at the front coxa. If there is a large patch of black scales on the front coxa it is *An. atropos*. This patch is absent or represented by only 1-3 black scales on species of the *Quadrimaculatus* Complex.

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Hot Tips to Help You Identify Rubbed Specimens. Continued from page 1.

Anopheles crucians complex versus *An. punctipennis*. As of this time (Feb. 23, 2009) the Crucian Complex now consists of seven species (4 undescribed and unnamed). Members of that complex and *An. punctipennis* occur from the coast to the mountains. Normally these species have patches of pale scales on the wings, and while the palpi on *An. punctipennis* are dark scaled those on the species of the Crucians complex have bands of pale scales. It is common for the palpi and wings of all of these species to be badly rubbed. When this occurs look at the most posterior wing vein (anal vein or 1-A). *Anopheles punctipennis* has two patches of dark scales, i.e., a short patch near the base of the vein and a much longer patch of dark scales on the distal part of the vein. Members of the Crucians Complex have 3 small patches of dark scales on the anal vein, i.e., one basal, one middle, and an apical patch of dark scales. These scales are less likely to be rubbed.

Ochlerotatus mitchellae versus *Oc. sollicitans* versus *Oc. taeniorhynchus*. The first of these species is a fresh water species, while the last two are our ever-popular salt marsh species of tourist fame. However, the first species also occurs along the coast and the last two species can occur far inland in salty pools. All three species have a white band of the proboscis, basal pale bands on the abdominal segments, and broad basal pale bands on the hindtarsi. Since the last two species emerge in huge numbers badly rubbed and broken specimens from light traps are common. If you encounter such specimens there is a step-wise method for quickly separating them. (1) look at the wing scales – if there are mixed pale and dark scales all over the wing it is *Oc. sollicitans*. The other two species have all of the wing scales dark except for a small patch of pale scales at the extreme base of the costa (first vein at front of wing). (2) once you have eliminated *Oc. sollicitans*, then look at the dorsum of the abdomen – if there is a median longitudinal yellow stripe down the length of the abdomen it is *Oc. mitchellae*. If however, the abdomen is rubbed, then (3) look at the femur on all three pairs of legs - if they are dark and speckled with white creamy scales it is *Oc. mitchellae*. Once you have separated out *Oc. sollicitans* and *Oc. mitchellae* that leaves you with the third and usually smaller species, *Oc. taeniorhynchus*. **HOWEVER**, if the wings scales are badly rubbed, then (1) look and see if there is a yellow band of scales on the middle of the first hindtarsomere. If that band is present the specimen is *Oc. sollicitans*. If there is no middle pale band on the first hindtarsomere, then proceed through (2) and (3) above to separate the other two species. **Be careful about using the middle pale band on the first hindtarsomere.** There are two other species that occur along the coast and further inland that also have that character, i.e., *Coquillettidia perturbans* and *Psorophora columbiae*, and both can be very abundant along the coast.

Bruce A. Harrison
Public Health Pest Management
NC DENR
585 Waughtown Street
Winston-Salem, NC 27107



Training Opportunities in Spring 2009

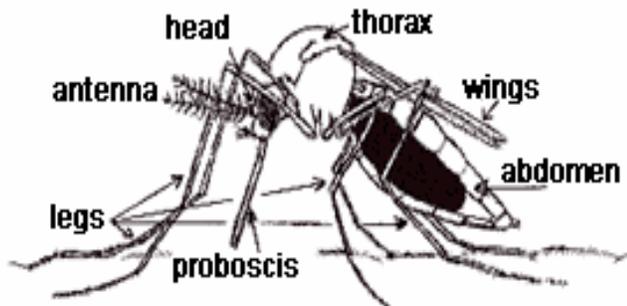
All of the workshops listed below provide continuing education credits for the Category B Public Health applicators license. All requests for Registered Sanitarian continuing education hours must be made to the Board of Sanitarian Examiners at: http://www.rsboard.com/rsweb/coned/ce_home.htm.

2009 Mosquito ID Course

The NCMVCA, in conjunction with PHPM staff, will be offering a larval identification course this spring. The larval ID course will be held on April 20th & 21st at Goose Creek State Park.

This course is designed with the mosquito professional in mind, focusing on morphology, behavioral characteristics and surveillance techniques as well as updated information on vector potential of the various species of public health significance. Individuals who are using or developing Integrated Pest Management strategies and wish to enhance their surveillance abilities or seasoned professionals who would like a refresher course are welcome.

The larval ID course has a \$ 90.00 fee, which includes course materials. More information about this course can be found on the NCMVCA's website— see the link for Courses and Workshops or contact the instructor, Parker Whitt, at parker.whitt@ncmail.net



Pesticide Applicator Schools & Exams

Category B Public Health Applicators School and Exam will be held in Kinston on April 1st and 2nd. A second school and exam will be held in Plymouth on April 14th and 15th. These are the only two Category B pesticide schools and exams offered in 2009. For more information, contact the North Carolina Department of Agriculture/ Pesticide Section at 919-733-3556, or visit the website at: <http://www.ncagr.gov/SPCAP/pesticides/exam.htm>

ULV Calibration Workshops

Public Health Pest Management will be holding ULV calibration workshops during the month of May. Contact the PHPM representative in your area or feel free to call 919-733-6407 for further information. For more complete workshop information, see pages 6 and 7 or visit the NCMVCA website at www.NCMVCA.org.

Clarke Mosquito Control Workshops

Clarke Mosquito Control will be providing 2 workshops in the month of March. The first workshop will be held March 18 in Wilmington at the Hilton Wilmington Riverside Hotel located at 301 North Water St. The second workshop will be held March 19 in Greenville at the Greenville Hilton located at 207 SW Greenville Rd. Registration can take place online at www.clarkemosquito.com. You may also contact Joe Strickhouser at 704-333-2523, or via email at JoeStrickhouser@clarkemosquito.com. Three hours of continuing education will be offered for category B applicators.

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Rodenticide and Public Health Issues

Timm Dazey, NCDA & CS- SPCAP

During the 2008 NCMVCA Annual Conference, it was discussed if Public Health Officials could place rodenticides on private property if there was a public health concern. A member of the group stated they had a letter issued by the Structural Pest Control Board, concerning this issue. This letter, addressed to Jim Bryan, indicated a government agency with a Public Health License could apply rodenticides on private property, if and only if a public health concern was present. These applications can be done without a Structural Pest Control License in limited circumstances. This applies only to government agencies acting on a public health concern and there is a Public Health License assigned to an individual with the agency.

NCDA CS - SPCD Fax:9197330633 Nov 28 2007 16:02 P.01
August 26, 1991

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Mr. Jim Bryan
Environmental Health Supervisor
Division of Environmental Health & Laboratory
P.O. Box 686
Winston-Salem, North Carolina 27102-0686

Dear Mr. Bryan:

This is to confirm the action taken by the Structural Pest Control Committee on August 21, 1991 in response to your request for advice on whether a structural pest control license is required for pest control work performed on private property for public health purposes by county health departments.

It was the opinion of the Committee that when pest control work is performed for public health reasons on private property by government agencies, no structural pest control license is required.

It should be noted that this interpretation is limited to pest control for public health purposes. If a government agency were to provide pest control services, with or without a fee, simply as a service, without a public health purpose, a structural pest control license would be required.

It should also be noted that the application of pesticides to the property of another person requires a pesticide applicator license from the Pesticide Section, North Carolina Department of Agriculture.

Please let us know if we can be of further assistance.

Sincerely,

David S. McLeod
Chairman

DSM/jm
CC: Dr. Nolan Newton
Ray Howell
John Smith

An agency of the North Carolina Department of Agriculture, James A. Graham, Commissioner

Anytime one applies pesticides in public areas, caution should be demonstrated to minimize exposure to non-target animals and humans. The applicator should follow all labeled directions. When performing rodent control, use Integrated Pest Management (IPM) practices to remove excess sources of food, water and harborage areas. This should minimize the amount of pesticide one should have to use. For more information on Structural Pest Control and Public Health License, visit the web site: www.ncagr.gov/SPCAP.

What's Ticking at PHPM?

by Marcee Toliver

Public Health Pest Management (PHPM) has initiated several long-term projects to further investigate tick species, their distribution, abundance and the pathogens they may be carrying in North Carolina. Since October, PHPM staff, partnered with several local programs, has been working hard, walking the woods with tick-drag in hand, conducting winter surveillance. So far, close to 1000 ticks have been collected, the majority of which are black-legged ticks (*Ixodes scapularis*), the vector for Lyme disease. Over 60 collection trips in 32 counties have painted a interesting picture of the abundance of this species across the state and the work has only just begun! So far, all *Ix. scapularis* specimens collected are adults and efforts will continue to further our understanding of the life cycle of this tick in North Carolina. Other species collected include *Dermacentor albipictus* (winter tick), *Ix. brunneus* (feeds on birds) and *Ix. muris* (mouse tick). Lone Star ticks (*Amblyomma americanum*) are also being collected in increasing numbers, especially since that week of 70 degree weather!

PHPM has also initiated an attachment study, duplicating a previous study conducted by Dr. Barry Engber from 1998 to 2000. Not only will this study enable us to identify and compare the abundance and distribution of tick species across the state, it will also allow us to evaluate attachment site preferences of the different species on humans. Collection kits include vials, data forms, mailing envelopes and instructions for collecting and submitting specimens. Over 150 kits were mailed to environmental health supervisors for distribution to their staff on February 17th. The first submission, received one week later, was a black-legged adult female, found attached to the head of a 5 year old boy. The parent had just received the tick kit the week before and never expected to find a tick in February. We are grateful for his interest in and cooperation with this study.

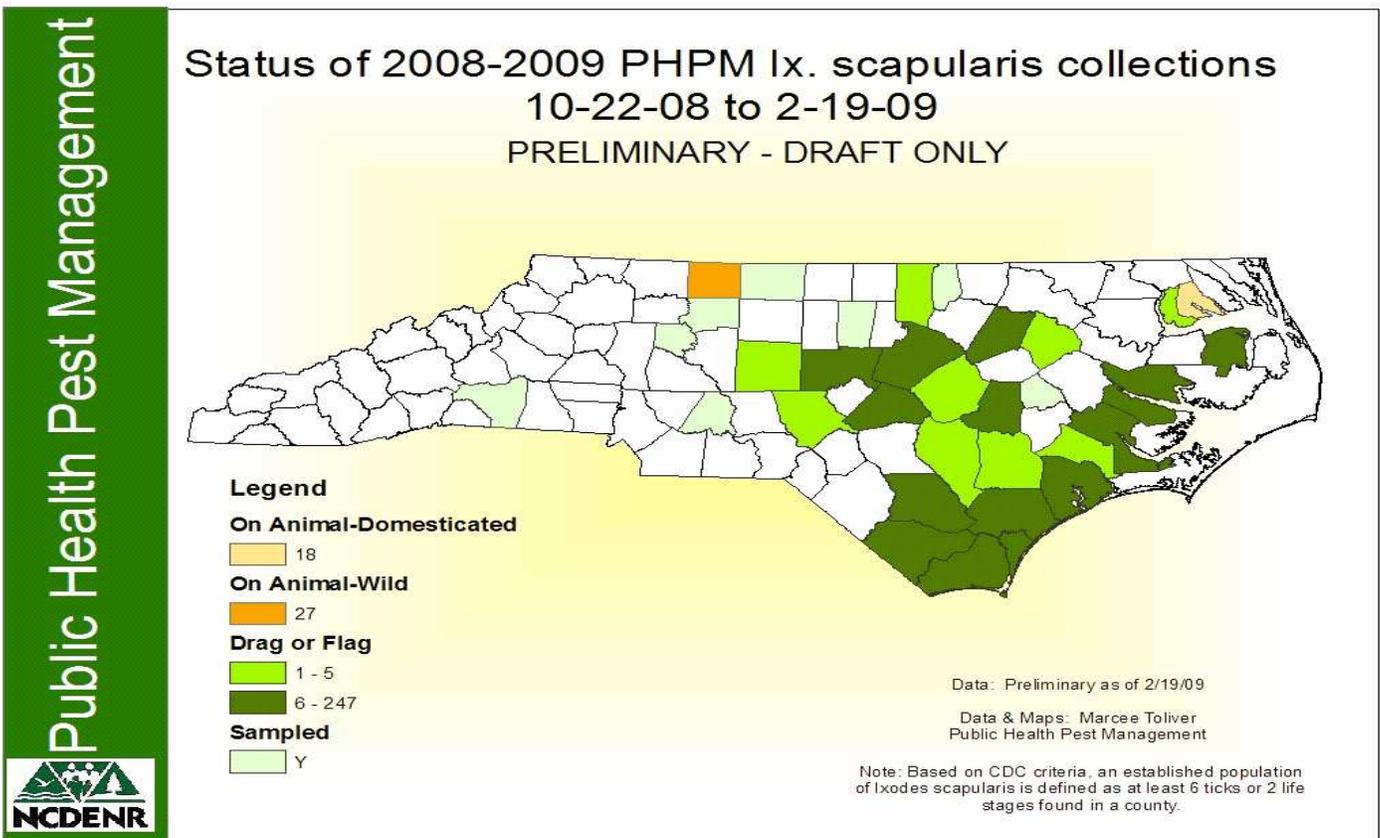
Although stalled by the budget crisis, 3 county agencies were selected to participate in local tick demonstration projects. These projects, once funding is approved, will be of great benefit to the state, as these programs work to develop educational awareness campaigns, surveillance and control methodologies tailored to their particular needs. The participants in the program are anxious to get started and all materials, data and evaluations will be made available through PHPM's website for other programs to review and implement as appropriate.

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What's Ticking at PHPM? Continued from page 5.

In addition, a contract vehicle is being developed for the NC Vet School to test tick specimens for pathogens. Funding issues are hindering this process, but we look forward to getting this project underway in the near future. This is a critical and crucial component to round out our understanding of the pathogens present and their prevalence in NC.

As we further our mission to protect NC citizens from vector-borne diseases, we are exploring all avenues to further our knowledge of tick species in the state. PHPM staff are working hard evaluating and expanding our current educational awareness programs and developing new outreach strategies. We invite the NCMVCA membership to check our website frequently for updates and new materials that may be of use in their program efforts.



Our thanks to the Tick-borne Infections Council of North Carolina, Inc, the citizen's group that brought the need for more work in the area of tick-borne diseases to the attention of the legislature. A special thanks to the following local programs for their support and involvement in our tick collection efforts: Rick Hickman and Jeff Brown of Brunswick County Mosquito Control, David Jenkins and Chris Salter of New Hanover Mosquito Control, Walker Rayburn of Albemarle Regional Health District and Robert Collins of Rocky Mount Code Enforcement. PHPM also welcomes Eugene Powell back to our staff as a contract employee and are grateful for his invaluable assistance in collecting far and wide!



2009 PHPM ULV Workshops

Register
soon!



It is that time of year again when all the ULV machines from across the state are asked to gather for mandatory yearly calibrations to ensure that your machines are working optimally.

Check this map to find the location that works best for you.

There is no charge for these workshops and pesticide credits are awarded.

- April 29th: Edenton
- April 30th: Rocky Mount
- May 6th: New Bern
- May 7th: Whiteville

To Register:
Contact Barry Engber at
919.733.6407
barry.engber@ncmail.net

- Please be sure to start and run your machine prior to attending the class to make sure things are running correctly.
- Make sure machine has product in the tank.
- Your truck should come with a spill kit., product sample label & MSDS sheets.

Pesticide continuing education credits will be given for attending the classroom portion of the workshop.

Date County Locations and Directions

**Wed., Chowan County Northeastern Regional Airport
April 29th**



113 Airport Drive, Edenton, NC (252) 482-4664

From Hwy 17, take Virginia Road Exit, Route 32. Follow Route 32 through town (turning right on Broad Street, and Left at the Post Office to take Route 32 through and out of town). Make a right onto 94 turning left into the airport after about 3 miles

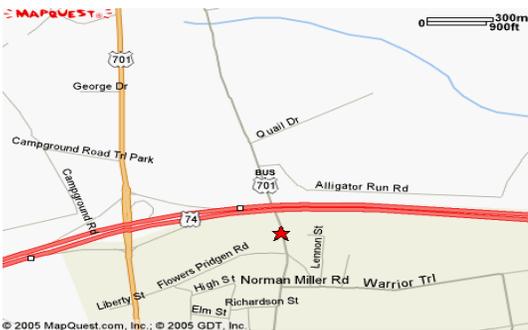
**Thurs., Nash County Rocky Mount Environmental Services Complex
April 30th**



1221 Thorp Road, Rocky Mount, (252) 972-1300

From Hwy 64, take the Hwy 43/Hwy 48, Benvenue Road, Peachtree Street exit. From the exit ramp, turn north onto Benvenue Road. Thorp Road is on the right, about 1/4 mile. The Environmental Service Complex is on the right, approx. 200 yards.

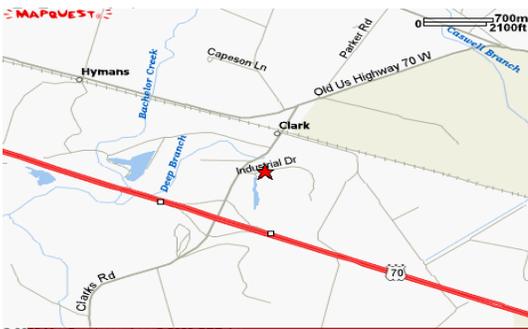
**Wed., Columbus County Cooperative Extension Office
May 6th**



45 Government Complex Road, Suite A, Whiteville (910) 640-6605

From Lumberton: Take 74 East, exiting at Whiteville-Clarkton. Go South on 701. Make a left onto Flowers-Pridgen Drive (State Employee's Credit Union is on the corner). Follow to the end, turning left onto Pinckney Street (701 Business). After passing the cemetery on the Left, turn left onto Government Complex Road. The extension office is the 2nd, larger brick building.

**Thurs., Craven County Cooperative Extension Office
May 7th**



300 Industrial Drive, New Bern (252) 633-1477

70 East from Raleigh: About 6 miles west of New Bern, exit north at Clarks Intersection (Industrial Park Exit). Take the first road to your right into the Industrial Park. The Craven County Extension Center is the 3rd building on the left, once you enter the park.

2009 Sustaining Members



Bayer Environmental Sciences

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 2 T.W. Alexander Dr.
 RTP, NC 27709
 Office #- 919.549.2534
 Fax #-919.549.3969
 Mobile #-937.209.1010.

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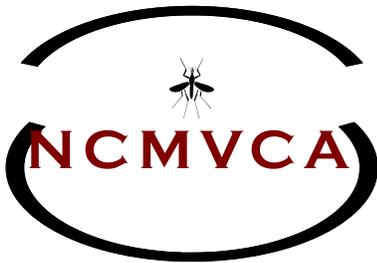
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Valent Bio Science

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Jim.Andrews@valent.com

Mail Registration to:

NCMVCA
P.O. Box 40245
Raleigh, N.C. 27629-0245



New Membership Application and Membership Renewal Form

N.C. Mosquito and Vector Control Association

Name:

Organization/Company

Mailing Address

Zip Code

Telephone Number

E-Mail:

Dues Payment for Year

Amount: (\$5.00/year)

Make check payable to NCMVCA and mail to:

North Carolina Mosquito & Vector Control Association

P.O. Box 40245

Raleigh, N.C. 27629- 0245
