



## 2013 FALL NEWSLETTER



**Quote of the Season:** “Do what you can, with what you have, where you are.” *Theodore Roosevelt, 26th U.S. President*

### Highlights...

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## State Vector-Borne Disease Task Force Meeting Schedule

(see below for a history of this group)

February 7<sup>th</sup>  
May 16<sup>th</sup>  
August 8<sup>th</sup>  
November 14<sup>th</sup>

All meetings are from **10 a.m. to 12 p.m.** and are open to the public. The meetings will be held at:  
Office of the Chief Medical Examiner, 4312 District Drive, Raleigh, NC, 27607

## Links to Letters to Medical Providers from the State Department of Public Health on Lyme Disease and Rickettsial Diseases

These links are to the letters the state Department of Public Health issues every year to medical providers on Lyme disease and the Rickettsial diseases such as RMSF:

[2013 Rickettsial Disease Memo](#)

[2013 Lyme Disease Memo](#)

## North Carolina Data on Reportable Tick-borne Infections

Disease	Total cases by year of report 2011 FINAL	Total cases by year of report 2012 Final	Cases between 1/1/12 and 8/15/2013
	(Confirmed/Probable/Suspected)	(Confirmed/Probable/Suspected)	(Probable + Confirmed)
Lyme disease	88 (18/70/135)	122 (27/95/80)	99 (16 confirmed)
Rickettsioses	327 (16/311/281)	591 (12/579/341)	189 (7 confirmed)
Ehrlichia	83 (27/56/102)	109 (18/91/56)	39 (13 confirmed)
Anaplasma	21 (1/20/19)	21 (0/21/21)	5 (all probable)

\* illness onset may be prior to 1/1/13

Note: Endemic counties (at least two confirmed case of Lyme disease in a person who had not traveled out of the county for 30 after their tick exposure) now total 3: **Wake, Haywood, and Guilford.**

## Our New Brochure!

Our 8 page colorful and informative [brochure](#) has been very well received. If you would like some to distribute in your area, please let us know. Some of the locations where we have placed the brochures include:

- Guilford County Property Management and Parks
- Eno River State Park office and events
- Chatham County Health Department

- Chatham County Community Library
- Sertoma Arts Center in North Raleigh
- REI Raleigh
- REI Durham
- North Raleigh Public Library
- Various local veterinarian clinics
- Annual meeting of the NC Mosquito and Vector-borne Disease Association

## **NC Mosquito and Vector Control Association Spring Newsletter 2013 Has Article from TIC-NC and a Presentation at the Annual Meeting**

**History of the Vector-borne Disease Work Group State of North Carolina** by Marcia E Herman-Giddens

State Public Health's quarterly meetings of the Vector-borne Disease Work Group (VBDWG) are run by Carl Williams, DVM, State Public Health Veterinarian, North Carolina Division of Public Health. The purpose is to foster communication and keep abreast of vector-borne disease in North Carolina. Attendance changes somewhat depending on topics and interest. The group is not legislatively mandated and has no designated powers. The entire article is at Page 2:

<http://www.ncmvca.org/sitebuildercontent/sitebuilderfiles/BTSpring2013.pdf>

Dr. Herman-Giddens gave a presentation in early November at the NCMVCA Annual Conference in Wrightsville Beach called Ticks in NC: What BBQ Lovers Need to Know and More.

## **Indy Give!Guide and Kick-Off Gala**



TIC-NC is one of the 28 non-profits participating in the [2013 Indy Week Give!Guide](#) fund raising project. The G!G Kick-Off Gala was on November 12th. All the non-profits had tables highlighting their non-profit focus and G!G partners, including our table (see the photo above), which was manned by board members Susan and Sandy. We had many people stopping by with stories about their tick

experiences. We are hearing more and more from people with the alpha-gal meat allergy. Stay tuned for our Winter Newsletter for an update our Give!Guide giving results.

### **TIC-NC Held a Program for Families at Pittsboro Toys in Downtown Pittsboro**

TIC-NC teamed up with [Grand Trees of Chatham](#) to present a September program for families about coping with some of the hazards of being outdoors, especially ticks! Children and their parents saw ticks and sample repellants. The adults learned how to check kids for ticks and proper tick removal.

### **Letter Sent by TIC-NC to Sen. Blumenthal Regarding Lack of Entomologists in “The Lyme and Tick-Borne Disease Prevention, Education, and Research Act”**

Re: The Lyme and Tick-Borne Disease Prevention, Education, and Research Act—Entomologists Needed on Advisory Board

Washington, DC, Senate office, Fax 202-224-9673 October 13, 2013

Dear Senator Blumenthal,

I commend your efforts to improve all aspects of the growing problem of tick-borne diseases in the U.S. through the “The Lyme and Tick-Borne Disease Prevention, Education, and Research Act,” first introduced in the U.S. Senate in 2011 and reintroduced earlier this year into both houses of Congress. I am concerned that the focus seems to be on aspects that occur after a bite from black-legged ticks, with little attention to the role of ticks in the disease cycle, as well as the main focus being on Lyme disease. More tick-borne diseases that affect human are being discovered. The South is particularly plagued in that many areas have more species of ticks than in the north, all of which may carry a number of diseases that put humans at risk.

Entomologists or acarologists need to be added to the list of experts advising on tick-borne disease prevention.

Marcia E Herman-Giddens, DrPH, Scientific Adviser, TIC-NC

*Thanks to Dr. Bruce Harrison, Entomologist, for bringing this to our attention.*

### **Few Deer in NC in Mid-1900s: Letter in the *Raleigh News & Observer* Regarding Efforts to “Restore” Deer to NC, 8/30/2013**

#### ***Deer survived epidemic***

“In response to John Wooding’s Aug. 16 piece “Doing our deer duty”: My first assignment, when I started working for the N.C. Wildlife Resources Commission in 1941 was to restore the statewide deer herd. This worked out too well because we now have too many deer. As we have seen the commission has not been able to reduce the deer herd by lengthening the season or increasing the bag limit or allowing the killing of antlerless deer. We have reached a “tipping point.”

The only thing that will correct the situation is a catastrophe like the outbreak of Haemorrhagic Septicaemia on the Pisgah Game Preserve in the mid-1920s. At that time dead deer were found along all the rivers and streams, and it was this die-off that I was called upon to cure.”

Frank Barick, Chief, Division of Wildlife Management, 1941-73

Read more here: <http://www.newsobserver.com/2013/08/30/3150931/frank-barick-deer-survived-epidemic.html#storylink=cpy>

## **New Tick Disease Found in Lone Star Ticks, Named Heartland Virus**

The Heartland virus, a mysterious virus first identified last year in two Missouri farmers, is indeed transmitted to people by ticks, new research suggests. The findings, published July 22 in the *American Journal of Tropical Medicine and Hygiene*, confirm what scientists had suspected.

The virus was first noticed in 2009, when two men in Missouri were admitted to hospitals with high fevers, diarrhea, fatigue and a severe drop in the number of their white blood cells, immune cells that fight infection. Because the disease's symptoms looked similar to bacterial infection, doctors gave the men antibiotics, but they didn't improve.

For entire story see: <http://news.yahoo.com/heartland-virus-carried-ticks-113130904.html>

## **Inaugural Issue of the NC One Health Bulletin**

The inaugural issue of *The North Carolina One Health Bulletin* (NC OHB) was published online in early September 2013. The Bulletin is a quarterly publication distributed electronically that informs people of ongoing One Health challenges in our state that impact humans, animals and the environments they share. One Health, as defined by the One Health Commission, is “the collaborative effort of multiple health science professions, together with their related disciplines and institutions – working locally, nationally, and globally – to attain optimal health for people, domestic animals, wildlife, plants, and our environment.” All information in the *Bulletin* is in the public domain, but can be challenging to access and assimilate across multiple platforms and disciplines that span One Health. Please see links below to access the Bulletins.

The *North Carolina One Health Bulletin* is coordinated through the **North Carolina One Health Collaborative**: NC OHC: <http://nconehealthcollaborative.weebly.com> NC OHC on Facebook: <https://www.facebook.com/pages/North-Carolina-One-Health-Collaborative/300163350109335> NC OHC on Twitter: [https://twitter.com/NC\\_OneHealth](https://twitter.com/NC_OneHealth)

Contact: Suzanne Kennedy-Stoskopf, DVM, PhD, DACZM  
NC State University College of Veterinary Medicine  
Co-Chair, NC One Health Collaborative

## **Discover Magazine has Two New Publications on Lyme Disease and Other Tick-borne Infections in the South**

*TICKED: The Battle Over Lyme Disease in the South* is the second installment of Discover In-Depth, *Discover* magazine's new longform series - just out as a Kindle book:

In this deep investigation of the science surrounding Lyme disease, writer Wendy Orent dissects how tick-borne illness is diagnosed in the Southern United States, where the Centers for Disease Control

and Prevention (CDC) do not recognize Lyme — even though thousands of people in the South have reported Lyme-like symptoms and debilitating illness after exposure to ticks.

[http://www.amazon.com/TICKED-Battle-Disease-South-ebook/dp/B00FBOVWJ8/ref=sr\\_1\\_2?s=digital-text&ie=UTF8&qid=1380554501&sr=1-2&keywords=ticked](http://www.amazon.com/TICKED-Battle-Disease-South-ebook/dp/B00FBOVWJ8/ref=sr_1_2?s=digital-text&ie=UTF8&qid=1380554501&sr=1-2&keywords=ticked)

## **Lyme Disease Bacteria Have Quirky Needs: Uses Manganese Instead of Iron Like Most**

Scientists have confirmed that the pathogen that causes Lyme disease—unlike any other known organism—can exist without iron, a metal that all other life needs to make proteins and enzymes. Instead of iron, the bacteria substitute manganese to make an essential enzyme, thus eluding immune system defenses that protect the body by starving pathogens of iron.

To cause disease, *Borrelia burgdorferi* requires unusually high levels of manganese, scientists at Johns Hopkins University (JHU), Woods Hole Oceanographic Institution (WHOI), and the University of Texas reported. Their study, published March 22, 2013, in *The Journal of Biological Chemistry*, may explain some mysteries about why Lyme disease is slow-growing and hard to detect and treat. The findings also open the door to search for new therapies to thwart the bacterium by targeting manganese.

Entire story: <http://www.who.edu/oceanus/viewArticle.do?id=164849>

## **Environmental Investigation Following the First Human Case of Babesiosis in Tennessee**

Environmental investigation following the first human case of babesiosis in Tennessee. Journal of Parasitology In-Press. doi: <http://dx.doi.org/10.1645/12-158.1> Charissa Fritzen, et al (2013) Vector-borne Diseases Section, Tennessee Department of Health, Tennessee Wildlife Resources Agency, Tufts University Cummings School of Veterinary Medicine, Southeastern Cooperative Wildlife Disease Study, College of Veterinary Medicine and Warnell School of Forestry and Natural Resources, The University of Georgia

**Abstract:** Babesiosis is an emerging tick-borne zoonotic disease in the United States caused by *Babesia* parasites. In 2009, the first case of babesiosis was documented in Tennessee. Environmental investigation at the reported site of tick exposure included collection of ticks and specimens from eastern cottontail rabbits (*Sylvilagus floridanus*) and white-tailed deer (*Odocoileus virginianus*) that were tested for piroplasms by molecular and serologic methods. One hundred and sixty-six *Ixodes scapularis* ticks and biological samples from 8 rabbits and 5 deer were collected. *Ixodes scapularis* were PCR positive for *B. odocoilei* (n=7, 4%) and *Theileria cervi* (n=24, 14%). Deer were seropositive for *B. odocoilei* and PCR positive for *T. cervi*. Rabbits were seropositive for *B. odocoilei* and *Babesia* sp. MO1 and 1 rabbit was PCR positive for *Babesia* sp. MO1. In summary, zoonotic *Babesia* sp. MO1 infection in rabbits are reported here for the first time in Tennessee as well as infection of deer and *I. scapularis* ticks with two other piroplasms of veterinary importance.

## **Vermont Public Health Starts a “Tick Tracker” Site for the Public**

This August the Vermont Health Department offered the public a new way to find out where ticks are being discovered across the state. Anyone can contribute to the Tick Tracker map by going to the Health Department website. The site also has information about tick-borne diseases and how to prevent tick bites. "Once you report ticks in your area, it shows up on a map so that everyone can know where they might want to take extra precautions when spending time outdoors," said the Health Department's Erica Berl, an infectious disease epidemiologist. "It's not too late to report - adult ticks are most active in the spring and fall."

<http://webmail.vdh.state.vt.us/vttracking/TickTracker/TickTracker.html>

From the state regarding the website:

Vermonters and visitors to the state can use this interactive Tick Tracker to share information about where and what kind of ticks they have found. Places where ticks have been seen are marked by a tick icon. Hover over or click on an icon for more information, such as date of the report, how many ticks were seen, what type of tick it was, and other comments posted by the reporter. Report on any ticks you come across – the more reports posted, the better the information for all! Please note that because tick locations and types are not necessarily provided by experts, the Vermont Department of Health cannot independently confirm the accuracy of each report. Learn more about [ticks in Vermont](#).

## **More on Red Meat Allergy and Lone Star Tick Bites**

Platts-Mills, Thomas AE, and Scott P. Commins. "Emerging antigens involved in allergic responses." *Current Opinion in Immunology* (2013).

Galactose- $\alpha$ -1,3-galactose and Delayed Anaphylaxis, Angioedema, and Urticaria in Children, Kennedy, et al., *Pediatrics* 2013; 131:5 e1545-e1552

A novel form of anaphylaxis and urticaria that occurs 3 to 6 hours after eating mammalian meat and occasionally milk is not uncommon among children in our area. Identification of these cases may not be straightforward and diagnosis is best confirmed by specific testing, which should certainly be considered for children living in the area where the Lone Star tick is common.

## **Bug Repellent Guide by the Environmental Working Group**

[The Environmental Working Group is the nation's leading environmental health research and advocacy organization. Our mission is to serve as a watchdog to see that Americans get straight facts, unfiltered and unspun, so they can make healthier choices and enjoy a cleaner environment.]

Summary: West Nile virus, carried by mosquitoes, infected more than 5,674 Americans last year and 286 of them died, according to the federal [Centers for Disease Control and Prevention](#) (CDC 2013C). The incidence of Lyme disease, spread by ticks, has more than doubled over the last 15 years, with 24,364 [confirmed cases recorded](#) in 2011 (CDC 2013A, CDC 2013B).

Both these illnesses, and other pest-borne diseases, can have serious and occasionally life-altering consequences. Many experts expect to see more cases in the future as the warming climate expands the habitat of species that spread pathogens. Yet many people are understandably concerned about the

possible drawbacks of common repellents such as DEET. At EWG, we certainly were. So we spent 18 months digging into the question: **what are the safest and most effective ways to prevent bug bites and the diseases they may transmit?**

The conclusions of our fact-finding investigation surprised and in some ways disappointed us.

**The bad news:** there's no sure, completely safe way to prevent bug bites. *All* bug repellents have pros and cons.

**The good news:** some repellents are effective and relatively low in toxicity -- *provided* you take precautions when using them, particularly on children.

**The surprising news:** DEET, which is widely used but much maligned, is among the four repellent chemicals EWG found to be top picks. DEET's safety profile is better than many people assume. Its effectiveness at preventing bites is approached by only a few other repellent ingredients. DEET isn't a perfect choice nor the only choice; but weighed against the consequences of Lyme disease and West Nile virus, we believe it is a reasonable one.

The four repellent ingredients that EWG found to be top picks are:

Picaridin [[Learn more](#)]

IR3535 [[Learn more](#)]

DEET [[Learn more](#)]

Oil of Lemon Eucalyptus and its synthetic derivative PMD [[Learn more](#)]

These repellents offer a high level of protection from a variety of biting insects and ticks, have good safety profiles, and are registered with the Environmental Protection Agency, meaning that they must provide data on both efficacy and toxicity.

[http://static.ewg.org/reports/2013/bug\\_repellents/2013\\_EWGs\\_Guide\\_to\\_Bug\\_Repellents.pdf](http://static.ewg.org/reports/2013/bug_repellents/2013_EWGs_Guide_to_Bug_Repellents.pdf)

## **Ticks Get Sick, Too**

Journal of Medical Entomology 50(1):155-162. 2013

**Effects of Infection by *Arsenophonus* and *Rickettsia* Bacteria on the Locomotive Ability of the Ticks *Amblyomma americanum*, *Dermacentor variabilis*, and *Ixodes scapularis*** by Jonathan Kagemann and Keith Clay, Department of Biology, Indiana University

The goal of this study was to determine the effect of vertically transmitted *Arsenophonus* and *Rickettsia* bacteria on locomotive ability of larvae of three eastern North American tick species: *Amblyomma americanum*, *Dermacentor variabilis*, and *Ixodes scapularis*. Clutch microbial infection status had a significant effect on tick motility with *Rickettsia* increasing and *Arsenophonus* decreasing motility averaged over tick species. There was also a significant difference in motility among tick species and a highly significant effect of the Species\*Incline interaction where *Dermacentor* had higher motility than *Ixodes* on the flat surface.

The bacterial genus *Arsenophonus* corresponds to a group of insect intracellular symbionts with a long history of investigation. First, the known host spectrum has been considerably extended with diverse insect groups and even non-insect taxa. So far, *Arsenophonus* has been identified from parasitic wasps, triatomine bugs, psyllids, whiteflies, aphids, ticks, ant lions, hippoboscids, streblids, bees, lice, and two plant species [[4,7-23](#)].



## **The Immune System Cannot Generate Immunological Memory During Infection with the Lyme Disease Agent *B. Burgdorferi***

R.A. Elsner, S.W. Barthold, N. Baumgarth. Graduate Group in Microbiology and the Center for Comparative Medicine, University of California-Davis, Davis, CA, USA. *Cytokine*: Volume 63, Issue 3, September 2013, p 261

In vertebrates including humans, mice and dogs, the bacteria *Borrelia burgdorferi* (Bb) causes a chronic, non-resolving infection known as Lyme disease, which requires antibiotic treatment to clear the bacteria. Re-infections are common in endemic regions. Similarly, mice can be re-infected with the same strain of Bb, implying a lack of functional immune responses. The mechanisms underlying this lack of effective short and long-term immunity to Bb are unknown. Using a mouse model of Bb-infection we show that infection with Bb produces strong T-dependent and T-independent serum antibodies, characterized by the unusual continued presence of IgM. Remarkably, both T-dependent and T-independent antibodies disappear rapidly when infection is controlled by antibiotic treatment and Bb-specific memory B cells could not be recovered. Thus, maintenance of Bb-specific humoral responses requires ongoing infections. Histological and flow cytometric examination of germinal centers, birthplaces of long-term humoral immunity, demonstrate their induction within 2 weeks of a primary infection and the presence of germinal center follicular helper T and B cells. However, the apparent normal induction of germinal centers is followed by their rapid and global collapse in multiple lymphoid organs by day 45.

To determine whether the lack of memory formation is due to the nature of the Bb-antigens or is a sign of Bb-infection-mediated immune suppression, we vaccinated mice with influenza virus during an ongoing Bb-infection. Remarkably, in Bb infected mice the early antibody response to this unrelated antigen was skewed towards increased IgM production compared to that in non-infected mice, and influenza specific IgG responses were strongly reduced. Together our data demonstrate that Bb infection suppresses the development of long-lived antibody production and immunological memory formation and indicates that Bb may achieve this by suppressing the function and/or causing the rapid and global collapse of germinal centers. Supported by NIH AI073911 and T32 AI060555.

## **New Lyme Disease Group Forms**

### **PAL INAUGURAL FORUM UNITES LYME COMMUNITY**

**Contact: Monte Skall, [EasternUS@PALTAD.org](mailto:EasternUS@PALTAD.org)**

**Press release from PAL: Arlington, VA, October 5, 2013:** Representatives of 33 organizations from 20 states and Canada enthusiastically collaborated Saturday at George Mason University (GMU) for the first time at a day-long Inaugural Partnership Forum of the newly formed Partners Against Lyme and Tick Associated Diseases. PAL currently has members in 44 states and 8 countries and is continuing to grow.

Comments such as “what a great success” and “we hoped for a day like this” made clear that this well-organized, unprecedented forum met the expectations of its nearly 200 attendees. Journeying from Oregon to Florida, Michigan to Texas, and most states in between, representatives explained their organization’s activities supporting patients with tick-borne diseases, detailed what collaborative initiatives interested them most, and provided their ideas on how they hoped to pool and expand their resources to achieve the PAL slogan of “**Working Smarter Together Instead Of Harder Alone.**”

## 24 Hours of Attachment is an Estimate - Not a Safety Blanket

Thanks to Camp Other, a blog about Lyme disease and other tick-borne infections for this article. Access the entire article and the references: [http://campother.blogspot.com/2013/10/24-hours-of-attachment-is-estimate-not.html?utm\\_source=feedburner&utm\\_medium=email&utm\\_campaign=Feed%3A+CampOther+%28Camp+Other%29](http://campother.blogspot.com/2013/10/24-hours-of-attachment-is-estimate-not.html?utm_source=feedburner&utm_medium=email&utm_campaign=Feed%3A+CampOther+%28Camp+Other%29)

This chart from the blog shows only a small fraction of tick-borne infections currently known to be pathogenic to people along with their transmission times (and in some cases, typical attachment times):

### Sample of Well-known and Newly Emerging Tick-borne Diseases in North America and Europe and Their Estimated Transmission Times

Tick-borne Infection	Pathogen	Tick Species	Location	Estimated Transmission Time Upon Attachment
Lyme disease Borreliosis	<i>Borrelia burgdorferi sensu strictu</i>	<i>Ixodes scapularis</i> , <i>Ixodes pacificus</i>	North America	36-48 hrs; 24 hours or more; potentially less
	<i>Borrelia burgdorferi</i>	<i>Ixodes ricinus</i>	Europe	Less than 24 hours
	<i>Borrelia afzelii</i>	<i>Ixodes ricinus</i>	Europe	Less than 24 hours
	<i>Borrelia garinii</i>	<i>Ixodes ricinus</i>	Europe	Less than 24 hours
Tick-borne Relapsing Fever	<i>Borrelia miyamotoi</i>	<i>Ixodes scapularis</i> , <i>Ixodes pacificus</i>	North America	unknown
		<i>Ixodes ricinus</i>	Europe	unknown
	<i>Borrelia turicatae</i>	<i>Ornithodoros turciata</i>	North America	30 seconds with a total tick attachment time 15-90 minutes
	<i>Borrelia hermsii</i>	<i>Ornithodoros hermsii</i>	North America	30 seconds with a total tick attachment time 15-90 minutes
Human Monocytic Ehrlichiosis	<i>Ehrlichia chaffeensis</i>	<i>Amblyomma americanum</i> , possibly <i>Dermacentor variabilis</i>	North America	12 to 24 hours
Human Ewingii Ehrlichiosis	<i>Ehrlichia ewingii</i>	<i>Amblyomma americanum</i>	North America	suspected 12 to 24 hours

Anaplasmosis (formerly HGE)	<i>Anaplasma phagocytophilum</i> (formerly <i>Ehrlichia phagocytophilum</i> )	<i>Ixodes scapularis</i> , <i>Ixodes pacificus</i> , <i>Dermacentor variabilis</i>	North America	12 to 24 hours
Babesiosis	<i>Babesia duncani</i>	<i>Ixodes pacificus</i>	North America	24 to 36 hours
	<i>Babesia divergens</i>	<i>Ixodes ricinus</i>	Europe	24 to 36 hours
	<i>Babesia microti</i>	<i>Ixodes scapularis</i>	North America	24 to 36 hours
Rocky Mountain Spotted Fever	<i>Rickettsia rickettsii</i>	<i>Dermacentor andersoni</i> , <i>Dermacentor variabilis</i>	North America	4 to 6 hours
Q Fever	<i>Coxiella burnetii</i>	<i>Dermacentor andersoni</i> (rare*)	North America	unknown - suspected fast as highly infectious
		<i>Ixodes ricinus</i> , others (rare*)	Europe	unknown - suspected fast as highly infectious
Powassan Virus or Powassan Encephalitis	Lineage 1 or 2 <i>Flavivirus</i>	<i>Ixodes cookei</i> , <i>Ixodes scapularis</i>	North America	~15 minutes
Heartland Virus	Group V <i>Phlebovirus</i>	<i>Amblyomma Americanum</i>	North America	unknown
Tickborne Encephalitis (TBE)	<i>Flaviviridae Flavivirus</i>	<i>Ixodes ricinus</i>	Europe	Within minutes

**The Wall Street Journal: Lawsuit Against Camp Where Girl Got Lyme Disease, October 16, 2013**

NEW HAVEN, Conn. — The parents of a New York girl are suing a Connecticut summer camp for \$41.7 million, accusing the camp of failing to monitor and protect their daughter, who contracted Lyme disease. Antonio Ponvert III, the family's attorney, announced the federal lawsuit Wednesday against YMCA Camp Mohawk in Litchfield. Ariana Sierzputowski, the 17-year-old daughter of Joseph Sierzputowski and Abby Horowitz, was bitten by ticks while attending the camp in 2011 at age 14, Ponvert said. She now suffers debilitating injuries including memory loss and migratory joint, muscle and nerve pain, he said. She also suffers from burning sensations in her skin, arthritis, muscle spasms, nausea, dizziness and difficulty breathing, he said.

[online.wsj.com/article/APfb14a05d16e04db2ada1915f7ca2ee18.html](http://online.wsj.com/article/APfb14a05d16e04db2ada1915f7ca2ee18.html)

A camp handbook promised to take precautions to protect campers from *Lyme* disease, Ponvert said. "Tragically, *Camp Mohawk* failed to follow ...

## **A Theory About Why Mice Are Effective Hosts for Several Human Zoonotic Pathogens**

### **When is a parasite not a parasite? Effects of larval tick burdens on white-footed mouse survival**

Michelle Heather Hersh, Shannon L. LaDeau, M. Andrea Previtali, and Richard S. Ostfeld  
Ecology. <http://dx.doi.org/10.1890/12-2156.1> October 2013

Many animal species can carry considerable burdens of ectoparasites, or parasites living on the outside of a host's body. Ectoparasite infestation can decrease host survival, but the magnitude and even direction of survival effects can vary depending on the type of ectoparasite and the nature and duration of the association. When ectoparasites also serve as vectors of pathogens, the effects of ectoparasite infestation on host survival have the potential to alter disease dynamics by regulating host populations and stabilizing transmission. We quantified the impact of larval *Ixodes scapularis* tick burdens on both within-season and overwinter survival of white-footed mice (*Peromyscus leucopus*) using a hierarchical Bayesian capture-mark-recapture model. *I. scapularis* and *P. leucopus* are, respectively, vectors and competent reservoirs for the causative agents of Lyme disease, anaplasmosis, and babesiosis. Using a dataset of 5,587 individual mouse capture histories over sixteen years, we found little evidence for any effect of tick burdens on either within-season or overwinter mouse survival probabilities. In male mice, tick burdens were positively correlated with within-season survival probabilities. Mean maximum tick burdens were also positively correlated with population rates of change during the concurrent breeding season. The apparent indifference of mice to high tick burdens may contribute to their effectiveness as reservoir hosts for several human zoonotic pathogens.

### **Scientist Sniffs out Possible New Tick Species--A Tick up the Nose**

Oct. 1, 2013 — In June 2012, Tony Goldberg returned from one of his frequent trips to Kibale National Park, an almost 500-square-mile forest in western Uganda where he studies how infectious diseases spread and evolve in the wild. But he didn't return alone. The tick turned out to be related to our lone star ticks. See link for whole story:

<http://www.sciencedaily.com/releases/2013/10/131001191522.htm>

### **Global Costs of Cattle Ticks Around \$15 Billion**

The estimated annual global costs associated with ticks and tick-transmitted pathogens in cattle amount to between \$13.9 billion and \$18.7 billion. Climate change, poor management of farms, uncontrolled movements of domestic animals, abundance of wild animals, and absence of an adequate framework to capture the ecological plasticity of certain ticks may explain the complexity of the control measures. To read more about the history of control of the cattle tick in the United States [*Rhipicephalus (Boophilus) spp.*], the role of the white-tailed deer, and issues in other countries, see:

Agustín Estrada-Peña, and Mo Salman. Current Limitations in the Control and Spread of Ticks That Affect Livestock: A Review. *Agriculture* **2013**, 3, 221-235; [doi:10.3390/agriculture3020221](https://doi.org/10.3390/agriculture3020221)

*Advertisement*



**About Insect Shield Technology:**

Insect Shield’s EPA-registered technology converts clothing and gear into effective and convenient insect protection. The repellency is long-lasting and appropriate for use by the entire family with no restrictions for use.

**Quick Facts:**

- Repellency is in the clothing and gear – not on your skin
- Lasts through 70 launderings
- EPA-registered
- No restrictions for use
- Appropriate for the entire family
- No need to re-apply
- Repels mosquitoes, ticks, ants, flies, chigger and midges including those that can cause Lyme disease, malaria and other dangerous insect-borne diseases

[www.insectshield.com](http://www.insectshield.com)

Online store: [www.insectshield.com/work](http://www.insectshield.com/work)

Treat your own clothes: <http://www.insectshield.com/PDF/IS%20Your%20Own%20Clothes%20-%20U.S.%20form.pdf>

*TIC-NC is grateful for the financial contributions of Insect-Shield, Inc.*

*Tick-Borne Infections Council of North Carolina, Inc. is a non-profit organization working to improve the recognition, treatment, control, and understanding of tick-borne diseases in North Carolina. We are all-volunteer and appreciate donations.*

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**Disclaimer**

TIC-NC’s newsletter content, including text, graphics, images and information is for general informational purposes only. The contents are not intended to be a substitute for professional medical advice, diagnosis or treatment.

Any contact information is provided for you to learn about tick-borne illnesses and related issues. Our organization is not responsible for the content of other material or for actions as a result of opinions or information expressed that may appear from time to time.

It is the responsibility of you as an individual to evaluate the usefulness, completeness or accuracy of any information you read and to seek the services of a competent medical professional of your choosing if you need medical care.

This organization is not a representative, program, affiliate of any other organization, unless specifically stated. Contact us at [info@tic-nc.org](mailto:info@tic-nc.org) or 919-542-5573

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