Public Tick IPM Working Group
September 11th, 2019
Please send additions, omissions or other corrections to mweber@ipminstitute.org

The Working Group meets via conference call on the second Wednesday of each month at 1:00PM CT (2:00PM EST). The following notes are for September 11th, 2019

Roll
1. Abigail Matthewson, New Hampshire Department of Health
2. Allegra Lowitt, Thermacell
3. Amy Albam, Cornell Cooperative Extension
4. Andy Kogelnik, Tick-Borne Illness Center of Excellence
5. Bob Maurais, Mainely Ticks
6. Captain Eric Hoffman, Armed Forces Pest Management Board
7. Chris Stelzig, Entomological Society of America
8. Danielle Tufts, Columbia University
9. Dawn Gouge, University of Arizona
10. Dr. Andrea Egizi, Rutgers Center for Vector Biology
11. Gloria Kim, Limiting Lyme
12. Jill Auberach, Hudson Valley Lyme Disease Association
14. Kristin Garafalo, New Jersey Department of Health
15. Maria Weber, IPM Institute
16. Monica White, Colorado Tick-Borne Disease Awareness Association
17. Nicole Chinnici, Organtick
18. Rayda Krell, WCSU Tickborne Disease Prevention Lab
19. Scott Larson, Metropolitan Mosquito Control District
20. Thomas Simmons, Indiana University of Philadelphia
21. Tim Fox, Madison Area Lyme Disease Support Group
22. Tom Green, IPM Institute

Agenda
1. Dr. Andrea Egizi will present her research on the Asian longhorned tick (ALT)
2. Updates and announcements on the Tick IPM Academy
3. Updates, comments and announcements from the working group members

A recording of this call and presentation is available by visiting this link: https://global.gotomeeting.com/play/recording/5c894a5aa5199474161e91fd41dde69f729d1c90079b2da8280527503b86f8
Dr. Andrea Egizi, Tick-Borne Disease Laboratory at the Rutgers Center for Vector Biology, Andrea.Egizi@co.monmouth.nj.us

Dr. Andrea Egizi oversees Monmouth County’s Tick-Borne Disease Laboratory located at the Rutgers Center for Vector Biology and is also an adjunct professor in the Department of Entomology at Rutgers University. Dr. Egizi is presenting today on her analysis of Asian longhorned tick (H. longicornus) source populations, part of several projects that she is currently working on aimed at better characterizing the local landscape of tick-borne disease ecology, including the surveillance, pathogen prevalence, genotyping, and host preferences of medically important ticks across habitats and communities.

Introduction

- August 2017: Female Icelandic sheep infested with ticks
  - Different taxonomy from usual New Jersey ticks
    - Sheep had not left the country
- Asian longhorned tick (ALT)
  - Native to East Asia
    - China, Japan, South Korea
  - Invasive in Australia and New Zealand
  - 3 host tick
  - Parthenogenic populations
    - Female can reproduce without contact with a male
      - All you need is one tick to have an infestation
  - Broad host range
    - Not restricted in host that they can parasitize

U.S. Distribution

- 12 states: CT, NY, NJ, PA, DE, VA, MD, WV, NC, AR, KY, TN
  - NJ distribution: 8 counties
    - On livestock, wildlife, pets, environment
    - Archived sample from 2013 in Union County

Tick Blitz

- 50 attendees from 24 agencies attended a workshop on tick surveillance and were given a tick surveillance kit
  - Funded by NEIPMC partnership grant
  - Tick surveillance kit included a tick flag
    - Tick flag vs. tick drag: Can pull alongside you while you sample so that you do not need to walk through the sampling area
      - Allowed participants to target edge habitat for American dog tick sampling
  - 883 ticks collected from 5 species including ALT
    - Found ALT in new sites in the two counties it was known to be in
    - Detected for first time in two other counties (including Rutgers University campus in Middlesex County)

2018 Rutgers (Cook Douglas) Campus Survey

- Study to see where ALT was found on campus
• First site collected from: near a goat pen on the Southern part of campus
• Not just found near livestock areas
  o Found near downtown New Brunswick
• Anecdotal habitat associations
  o Found most often near tall grass/woods edge
    ▪ Area later mowed was found to no longer host ALT
  o Found near deer sites

Seasonality
• New Jersey
  o Nymphs: May and June
  o Adults: July and August
  o Larvae: August, September and October
• China (native range)
  o Similar seasons to NE US
  o Same life stage peaks

Cytochrome Oxidase I (COI) Barcoding Project
• USA
  o 340 specimens from 9 US states collected between April – September in 2018 and 2019
  o Majority (72.6%) collected from the environment (off host)
  o DNA extractions: Some on whole ticks, some on a single leg so the body could be used for other purposes
    ▪ Body: USDA National Veterinary Laboratory for morphological ID or tested for pathogens at a different facility
• International
  o 189 sequences from China, Japan, Republic of Korea, Australia and New Zealand
• Compared 612 bp of mtDNA COI
  o USA
    ▪ 3 haplotypes
    ▪ Parthenogenetic
      • Males not observed in USA
  o Internationally
    ▪ 42 haplotypes, including all 3 found in USA
  o East Asian origin seems more likely than Australia/New Zealand but statistical analysis pending
    ▪ Andrea likely finishing analysis this month and submitting paper

Phylogeography - USA
• Haplotype distribution in US
  o Differentially distributed
    ▪ Haplotype 1: Primarily New Jersey
    ▪ Haplotype 2: Primarily Virginia
    ▪ Haplotype 3: New York State, northern New Jersey, central Pennsylvania and West Virginia
  o Could indicate multiple introductions
Human Health Concerns
- 120 tested (and negative) for:
  - Borrelia burgdorferi
  - Anaplasma phagocytophilum
  - Babesia microti
  - Borrelia miyamotoi
  - Ehrlichia chaffeensis
  - Ehrlichia ewingii
- Not found on rodents (white-footed mice, shrew, chipmunk, rats)
  - Tufts et al. 2019 Emerging Infectious Diseases 25 (4)
    - Host trapping study did not find any ALT
      - Good news: If ALT are not feeding on pathogen reservoirs, then pathogens cannot be spread to humans
  - USDA Situation Reports

Livestock Concerns
- Theileria orientalis Ikeda strain infected cattle at same farm ALT were found (Virginia)
  - Oakes et al. 2019 Emerging Infectious Diseases 25 (9)
  - Strain causing outbreaks among cattle in New Zealand (referred to as cattle tick in New Zealand)
- Death of 5 cows in Surry County, North Carolina linked to ALT infestations- one bull had over 1,000 ticks

How to Identify a Longhorned Tick
- Adults: Dorsal spurs to identify longicornus species
- Nymphs and larvae: Lateral margins straight versus pointed on dorsal side

Takeaways
- Native ticks are still the biggest threat to human health
- For animal health, we should educate veterinarians, livestock owners and producers about protecting animals from ticks
- We need better biosecurity to prevent tick introductions

Questions
- Rayda Krell: Have you found any males in New Jersey?
  - Has not seen any. Anecdotally heard a report that a colleague had seen a male.
- Gloria Kim: How many longhorned ticks submitted were attached to humans?
  - 8 or 9 per USDA reports; 2 attached to humans per Andrea’s reports.
    - Occurs less than with native ticks especially considering how many are in the environment.
- Dawn Gouge: Shouldn’t we all be looking for the ALT?
  - Models came out in 2018 and this year showed potential distribution
- Monica White: How far west has monitoring occurred?
  - As far as Andrea knows, Arkansas!
- Dawn Gouge: Who is screening samples for which pathogens?
  - There is not a central repository for screening
Rutgers Center for Vector Biology
New York Department of Health
NE Center for Excellence working with partners at Cornell to do screening
CDC
University of Georgia
  - General human health and some animal health pathogens

- Tim Fox: What part of livestock do the ALT commonly attach to?
  - Not certain, but easiest for ticks to attach to thin areas such as the ears
  - Also like to attach to warm, wet areas like armpits, under the tail

- Monica White: With the livestock industry being so important in Western states and the probability of transportation, what actions, if any, are being taken to educate in western states?
  - Not certain, but the USDA hosts monthly calls to update about the activities that they are doing concerning education

- Rayda Krell: In areas where high populations have been found, is there a standard post-discovery protocol?
  - New Jersey: Areas where treatment was warranted received acaricide treatments
  - Rutgers Campus: Did not want to apply chemical treatment
    - Alternative: Mowing and animal treatment

- Chris Stelzig: What kind of pick up are you seeing from a policy perspective
  - New Jersey senators are looking into tick legislation

- Scott Larson: Any idea as to the minimum temperature at which ALT can survive?
  - There are populations in Northern China and Southeast Russia
    - They diapause so that they can survive through the winter

- Gloria Kim: How effective are deet, permethrin, or picardin as repellants against ALT?
  - As far as Andrea knows, they are effective
    - Does not believe that USA studies have been published

- Monica White: Is tick paralysis associated with ALT?
  - Not in the US, but there may be some evidence in China

Pest Alert
- Andrea’s presentation is part of our initiative to put out a Pest Alert on the ALT in partnership with the NCIPMC
- Expect to receive a draft outline of the Pest Alert approximately one week prior to the next scheduled Tick IPM Working Group conference call

Updates and Announcements on the Tick IPM Academy
- Official announcement with registration form in circulation
- Several spots still available
  - Please circulate the announcement and registration form with colleagues and contacts so that we may fill these empty spots
- Seeking donations of specimens from your area to examine
  - Donations can be sent to:
    The IPM Institute of North America, Inc.
    ATTN: Maria Weber
    211 S. Paterson Street, Suite 380
    Madison, Wisconsin 53703 USA
Updates, Comments and Announcements from the Working Group Members

- Monica White:
  - The next Federal HHS Tick-Borne Disease Working Group Meeting taking place Thursday, September 12th
  - September 21st – 22nd Educational Conferences
    - Lyme Disease Association/Columbia University Conference in Philadelphia, Pennsylvania
    - Live Line Conference in Denver, Colorado

- Dawn Gouge:
  - How many spots are still available for the Tick IPM Academy?
    - Approximately 10 spots still available; please help us fill them up!

- Andy Kogelnik:
  - Tick-Borne Illness Center of Excellence in Woodruff, Wisconsin to open September 23rd
    - Opening events occurring in early October and likely in May when Minocqua-area population increases

These notes are for a Working Group call on September 11th, 2019. Future calls will continue to fall on the second Wednesday of each month at 1 PM Central time.

The Public Tick IPM Working Group is funded by the USDA National Institute of Food and Agriculture, Crop Protection and Pest Management Program through the North Central IPM Center.