

ALL THE BUZZ YOU MISSED

HIGHLIGHTS OF VMCA BOOK CLUB ARTICLES AND TOPICS

Presentation by Jay Kiser

Pictures, graphs, and information, all coming from referenced articles or web search



Article topics reviewed during book club

- Invasive species
- Saliva collections from mosquitoes
- New BG-Pro and Sweet Scent Lure
- DNA barcoding
- *Carios kelleyi*: Bat tick
- Sandflies and Leishmaniasis
- Biocontrol: Spiders and plants
- Lone Star distribution
- Blowflies in forensic entomology
- Brown Recluse in South Carolina
- Weather modeling to forecast mosquito distributions
- AI to model mosquito distributions
- *Culex pipiens* complex
- Pesticides and pesticide resistance
- Effects of bird feeders on bird populations
- Chagas Disease in the US

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BIOLOGICAL CONTROL

Couret et al. *Parasites Vectors* (2020) 13:208
<https://doi.org/10.1186/s13071-020-04084-4>

Parasites & Vectors

RESEARCH

Open Access

Biological control of *Aedes* mosquito larvae with carnivorous aquatic plant, *Utricularia macrorhiza*



Jannelle Couret^{1*†}, Marco Notarangelo^{1†}, Sarashwathy Veera¹, Noah LeClaire-Conway¹, Howard S. Ginsberg² and Roger L. LeBrun³

2015. *Journal of Arachnology* 43:123–142

REVIEW

Mosquito-terminator spiders and the meaning of predatory specialization

Robert R. Jackson and **Fiona R. Cross**: School of Biological Sciences, University of Canterbury, Private Bag 4800, Christchurch, New Zealand; International Centre of Insect Physiology and Ecology, Thomas Odhiambo Campus, Mbita Point, Postal Code 40305, Kenya; E-mail: robert.jackson@canterbury.ac.nz

“Carnivorous aquatic plant, *Utricularia macrorhiza*”

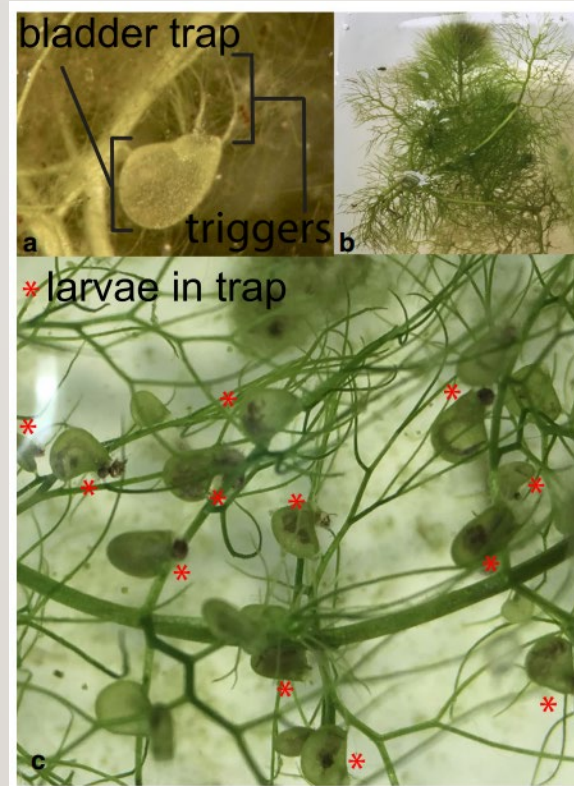
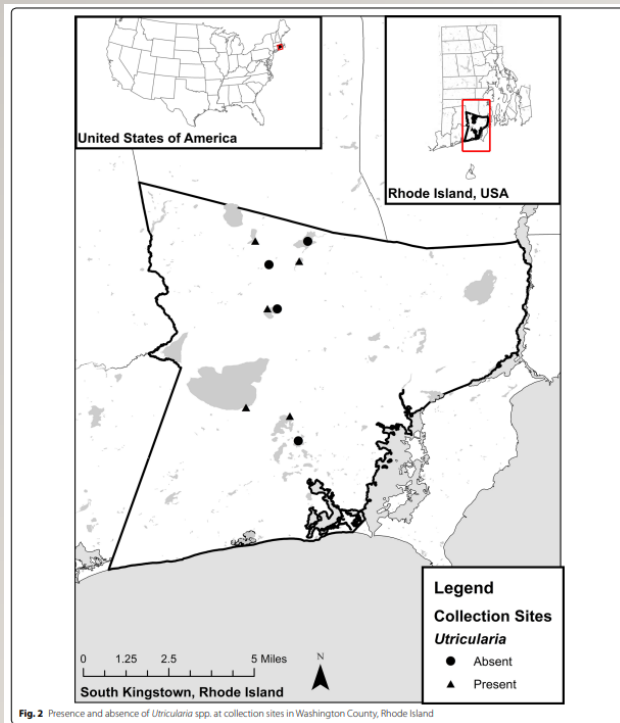
- Bladderworts
- Grows in natural permanent bodies of water
- Carnivorous: captures and digests small organisms for nutrients



“Carnivorous aquatic plant, *Utricularia macrorhiza*”



Biological control of *Aedes* mosquito larvae with carnivorous aquatic plant, *Utricularia macrorhiza*



Author's ideas:

- Will these plants eat *Ae. albopictus* and *Ae. aegypti* larvae?
- If so, you could put these in your artificial containers

Biological control of *Aedes* mosquito larvae with carnivorous aquatic plant, *Utricularia macrorhiza*

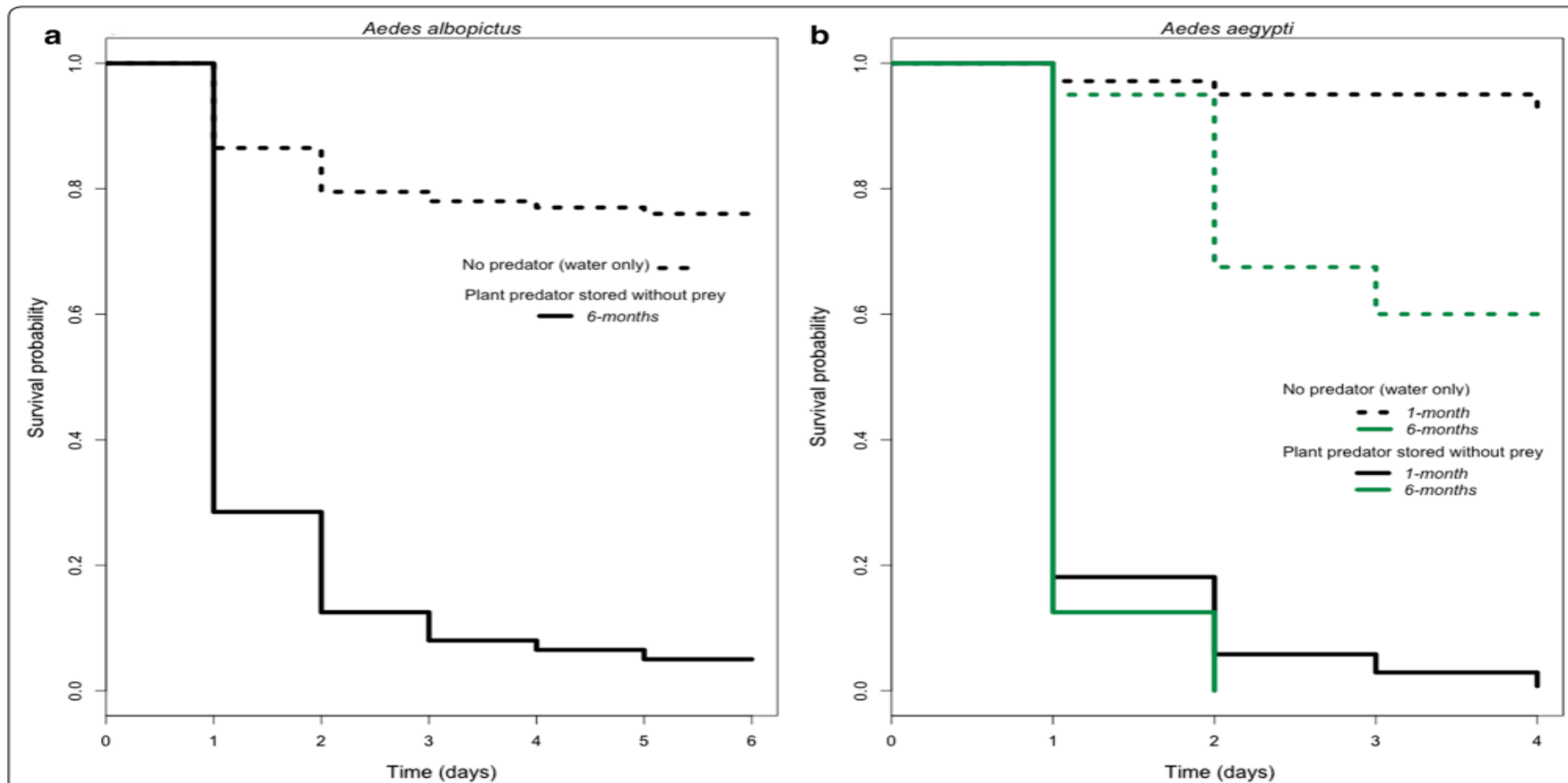
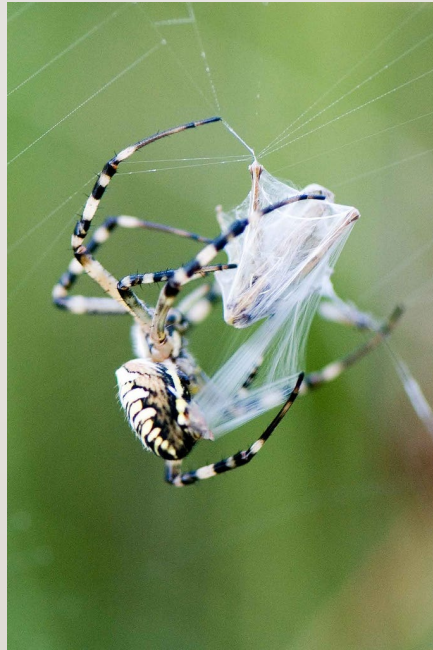


Fig. 3 Survival probability over time (in days) of *Ae. albopictus* (a) and *Ae. aegypti* (b) in the presence and absence of *U. macrorhiza* stored without prey for six months. Dotted lines represent water-only controls. Solid lines represent experimental cups with *U. macrorhiza*. Black indicates plants were stored for 1 month without prey and green indicates plants were stored for 6 months without prey. For both figures, data are censored as of the day when the last death from predation by *U. macrorhiza* was observed

Mosquito-terminator spiders and the meaning of predatory specialization

- Lots of spiders eat mosquitoes, but not all are mosquito specialists
 - **Generalist:** hunting styles that are not specific to prey types
- vs
- **Specialist:** “adaptively fine tuned to specific types of prey”
- Both can vary in dietary variety



Mosquito-terminator spiders and the meaning of predatory specialization



Figure 1.—Adult male of *Evarcha culicivora* preying on *Anopheles gambiae* s.s. Photograph: Robert Jackson



Figure 2.—Adult male of *Paracyrba wanlessi*. Photograph: Daiqin Li.

Two Salticids (Jumping Spiders)

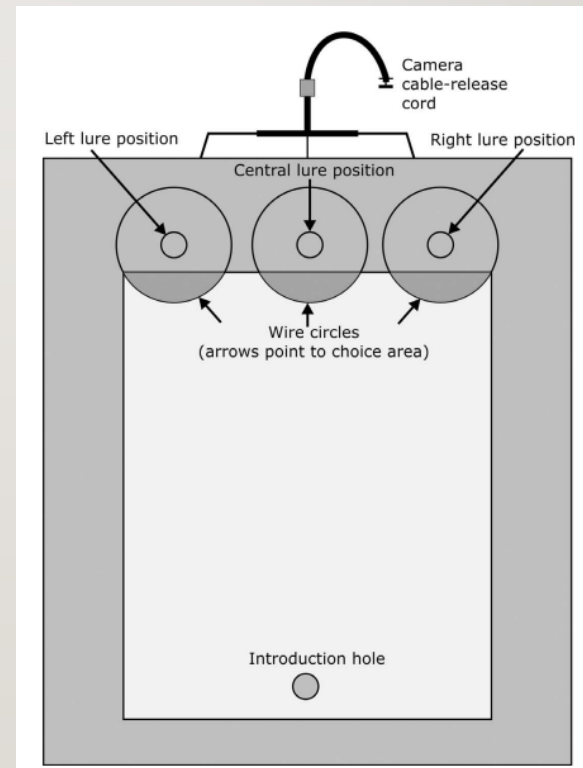
- *Evarcha culicivora*:
 - East African (Lake Victoria area)
 - Often found on the walls in buildings cohabitating with people
- *Paracyrba wanlessi*:
 - Peninsular Malaysia
 - Often found in the open cavities of bamboo

Evarcha culicivora

Dubbed the “Vampire Spider” in media

Preference profile:

- Thousands of tests were preformed
- Mosquitoes over non mosquitoes
- Anopheles over other mosquito genera
- Female over male
- Blood engorged over non-blood engorged
 - Juvenile spiders more preference for genus
 - Adult spiders more preference for blood



Evarcha culicivora

Preference profile:

- When choosing a mate, both sexes prefer a mate that recently had a blood meal
 - “Blood as perfume”
- Even when a spider has recently eaten, it will continue killing blood engorged mosquitoes for the “perfume”



Complex display behaviour of *Evarcha culicivora*, an East African mosquito-eating jumping spider

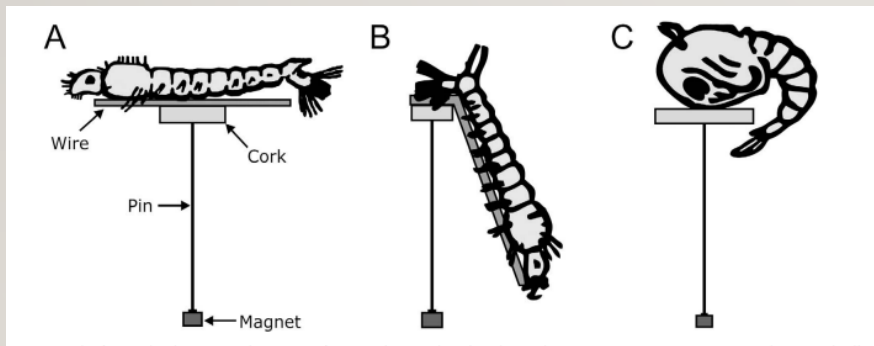
Fiona R. Cross , Robert R. Jackson & Simon D. Pollard

Paracyrba wanlessi:



Preference Profile:

- Adult mosquito over other terrestrial prey
- Juvenile mosquitoes (larvae and pupae) over other aquatic prey
- Juvenile mosquitoes over adult mosquitoes
 - Unless mosquito stage was out of habitat
- No preference to mosquito sex, genus, larvae/pupae, or blood engorgement



TICK STUDIES

Journal of Medical Entomology, 58(6), 2021, 2398–2405
doi: 10.1093/jme/tjab069
Advance Access Publication Date: 19 May 2021
Research



OXFORD

Vector-Borne Diseases, Surveillance, Prevention

***Carios kelleyi* (Acari: Ixodida: Argasidae) Infected With Rickettsial Agents Documented Infesting Housing in Kansas, United States**

Robyn M. Nadolny,^{1,8,*} Ashley C. Kennedy,^{1,2,*} James M. Rodgers,³ Zachary T. Vincent,¹ Hannah Comman,¹ Scott A. Haynes,¹ Cory Casal,¹ Richard G. Robbins,^{4,5} Allen L. Richards,⁶ Ju Jiang,^{6,7} and Christina M. Farris⁶

Journal of Medical Entomology, 58(2), 2021, 939–942
doi: 10.1093/jme/tjaa189
Advance Access Publication Date: 9 September 2020
Short Communication

OXFORD

Short Communication

First Record of *Carios kelleyi* (Acari: Ixodida: Argasidae) in New Jersey, United States and Implications for Public Health

James L. Occi,^{1,6} MacKenzie Hall,² Andrea M. Egizi,^{1,3,*} Richard G. Robbins,^{4,5} and Dina M. Fonseca^{1,*}

Journal of Medical Entomology, 59(2), 2022, 412–420
<https://doi.org/10.1093/jme/tjab215>
Advance Access Publication Date: 13 January 2022
Review



OXFORD

Review

The Original Scientific Description of the Lone Star Tick (*Amblyomma americanum*, Acari: Ixodidae) and Implications for the Species' Past and Future Geographic Distributions

Ilia Rochlin,^{1,4,*} Andrea Egizi,^{1,2} and Anders Lindström³

Carios kelleyi (Acari: Ixodida: Argasidae)

- Soft body tick called the bat tick
- Found across North and Central America
 - 31 US states, including Virginia, Maryland, West Virginia
- Parasitizes bats
 - Mainly Big brown bats, *Eptesicus fuscus*
 - Lots of other bats as well
 - May search other blood meals, including humans, when bats are not present
- These bats are commonly found roosting in human dwellings
 - Attics, barns, sheds...

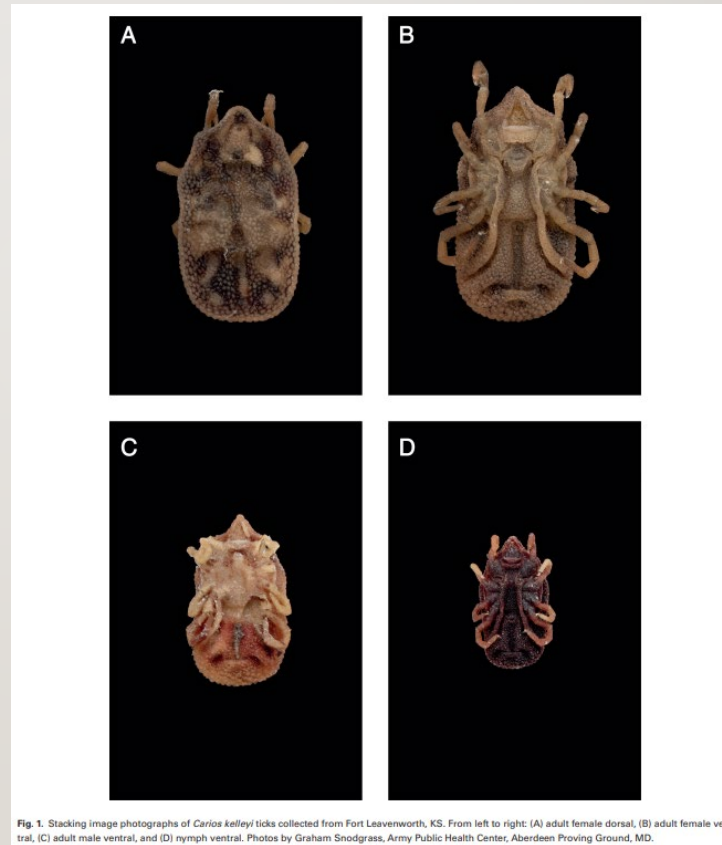
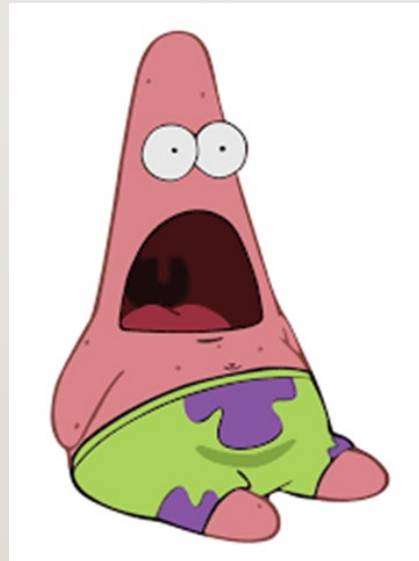


Fig. 1. Stacking image photographs of *Carios kelleyi* ticks collected from Fort Leavenworth, KS. From left to right: (A) adult female dorsal, (B) adult female ventral, (C) adult male ventral, and (D) nymph ventral. Photos by Graham Snodgrass, Army Public Health Center, Aberdeen Proving Ground, MD.



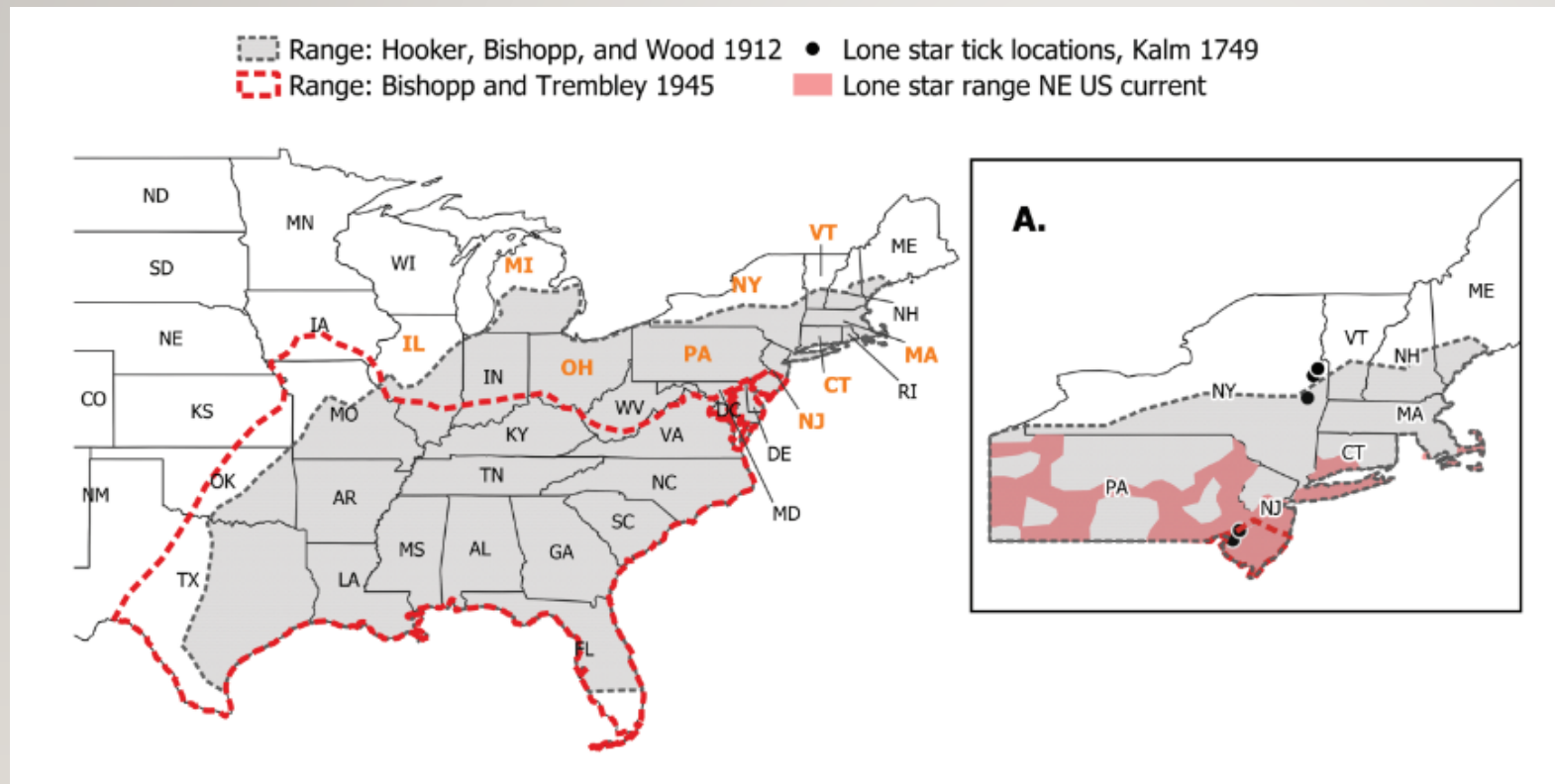
Carios kelleyi (acari: ixodida: argasidae) infected with Rickettsial agents documented infesting housing in Kansas, United States

- Big Brown Bat infestation in apartment building in Kansas in Fort Leavenworth
- Bats were removed and entrance sealed
 - Leaving behind bat ticks with no blood source
- Residents found these ticks infesting their couches, bedding, counters, floors, and walls.



- 25 ticks were collected by hand
- 9 were tested for tick-borne diseases
 - 6 of the 9 were tested positive for *Rickettsia* spp.
 - Including 2 with *Rickettsia lusitaniae*

The original scientific description of the lone star tick (*Amblyomma americanum*, Acari: Ixodidae) and implications for the species' past and future geographic distributions

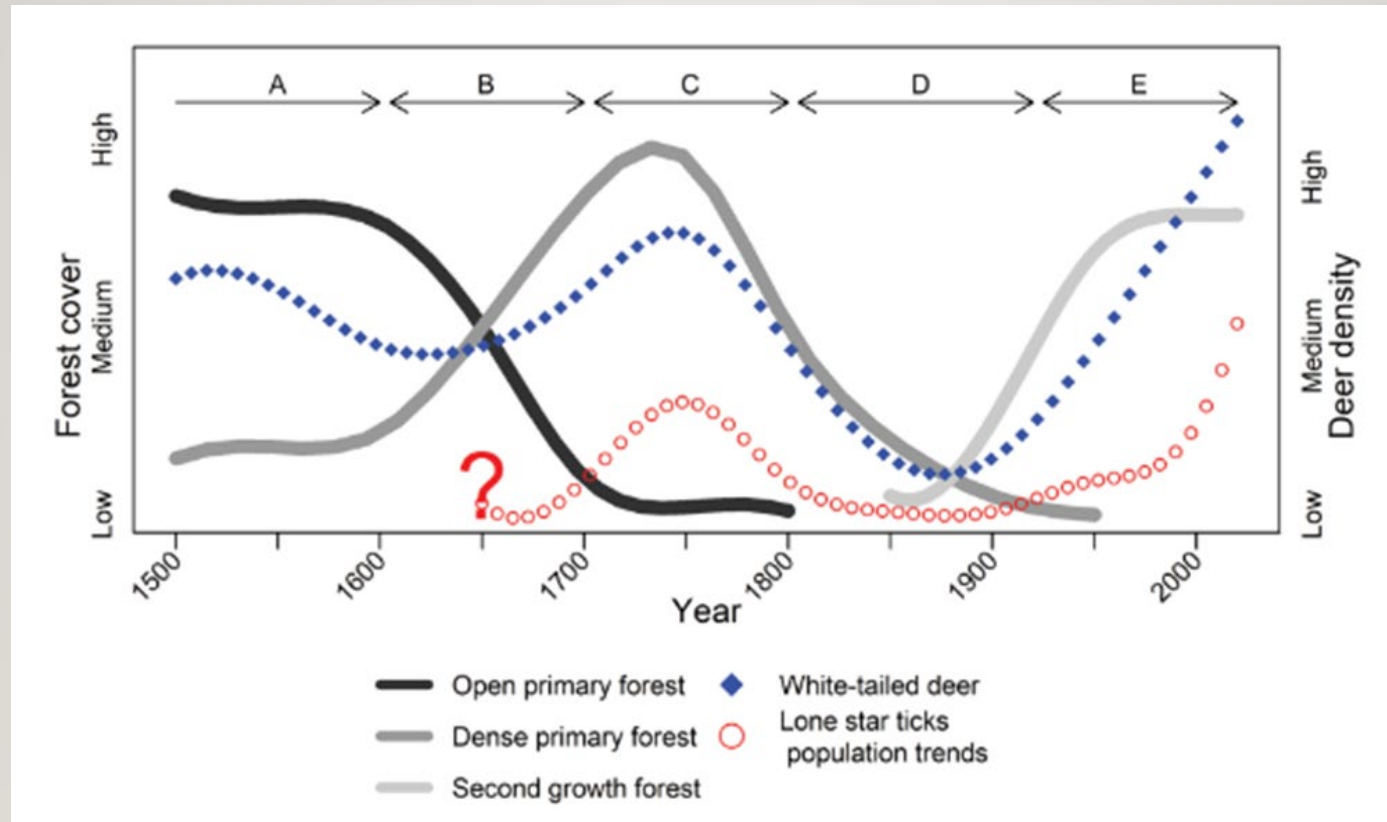


Female



Male

The original scientific description of the lone star tick (*Amblyomma americanum*, Acari: Ixodidae) and implications for the species' past and future geographic distributions



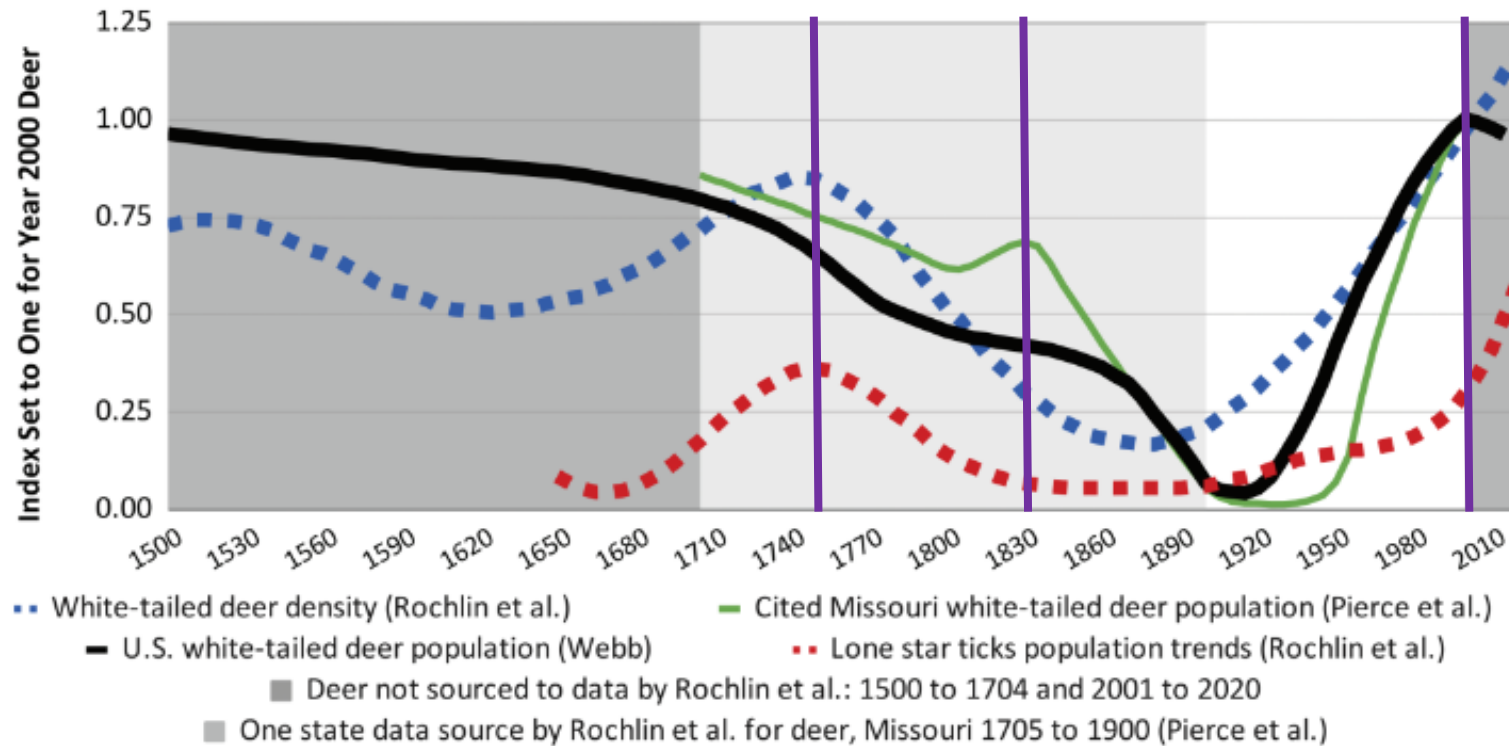
- Notice the white tail deer and lone star populations are in sync with one another.

Letter to the Editor

Problematic White-Tailed Deer Information in Rochlin et al. (2022) Regarding Past and Future Tick (*Amblyomma americanum*, Acari: Ixodidae) Distributions

G. Kent Webb¹

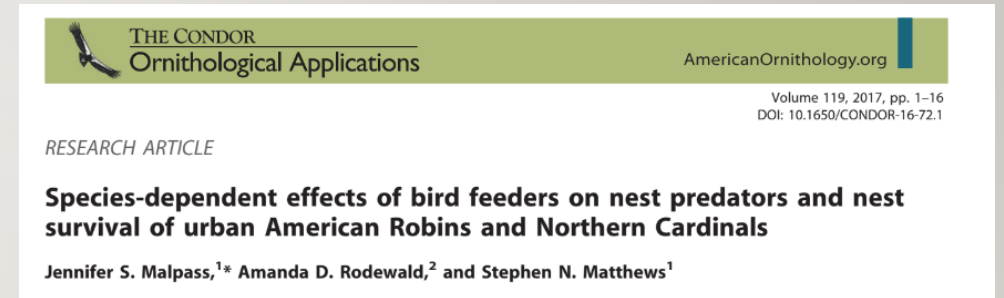
Issues with the data?



- Blue line represents deer population data reported in previous article
- Black line represents US deer population from Webb 2018 paper
- Green line represents deer population data that was cited in previous article

Species-dependent effects of bird feeders on nest predators and nest survival of urban American robins and northern cardinals

- Over 40% of US homes participate in bird feeding
- This study focused on birdseed feeders
 - 82% of feeders in the US
- Lots of birds feed from them
 - Song birds
 - Robins (**Major WNV reservoir**)
 - Cardinals
 - and others....



Species-dependent effects of bird feeders on nest predators and nest survival of urban American robins and northern cardinals

- Lots of nest predators also feed from them
 - Crows
 - Brown headed cowbirds
 - Grackles
 - Blue Jays
 - Squirrels
- All of the above have been documented in predatory behaviors on eggs and young birds in nests.



Species-dependent effects of bird feeders on nest predators and nest survival of urban American robins and northern cardinals



- Study looked at neighborhoods in Ohio with few and many bird feeders in them.
- As feeders increase, some nest predator species increase (crows and cowbirds)
- Increase in predators, increase in robin nest predation
 - Neighborhoods with many bird feeders, fewer than 1% of robin nests produced young
 - Neighborhoods with few bird feeders, saw 34% of robin nests produce young

INVASIVE SPECIES

Journal of Medical Entomology, XX(X), 2021, 1–11
<https://doi.org/10.1093/jme/tjab165>
Review



OXFORD






Detection and Establishment of *Aedes notoscriptus* (Diptera: Culicidae) Mosquitoes in Southern California, United States

Marco E. Metzger,^{1,9,*} J. Wakoli Wekesa,^{2,3} Susanne Klüh,⁴ Kenn K. Fujioka,^{2,5} Robert Saviskas,⁶ Aaron Arugay,⁶ Nathan McConnell,⁷ Kiet Nguyen,⁸ Laura Krueger,⁸ Gregory M. Hacker,^{1,*} Renjie Hu,¹ and Vicki L. Kramer¹



Article




Vector Competence of the Invasive Mosquito Species *Aedes koreicus* for Arboviruses and Interference with a Novel Insect Specific Virus

Stephanie Jansen^{1,2}, Dániel Cadar^{1,2} , Renke Lühken¹ , Wolf Peter Pfitzner³ , Hanna Jöst¹, Sandra Oerther^{4,5}, Michelle Helms¹, Branka Zibrat¹, Konstantin Kliemke¹, Norbert Becker^{4,6,7}, Olli Vapalahti⁸ , Giada Rossini⁹ and Anna Heitmann^{1,*} 



Article

Potential Distribution of *Aedes (Ochlerotatus) scapularis* (Diptera: Culicidae): A Vector Mosquito New to the Florida Peninsula

Lindsay P. Campbell^{1,*}, Nathan D. Burkett-Cadena¹ , Evaristo Miqueli², Isik Unlu³, Kristin E. Sloyer¹ , Johana Medina³, Chalmers Vasquez³, William Petrie³ and Lawrence E. Reeves¹ 

Vector competence of the invasive mosquito species *Aedes koreicus* for arboviruses and interference with a novel insect specific virus

Aedes koreicus

- Asian origin but expanded into Europe
- Similar looking to *Aedes japonicus*
 - 4 tarsi bands instead of 3
- Competent vector of Zika virus and chikungunya virus
- Dr. Bruce Harrison warned us of their invasion

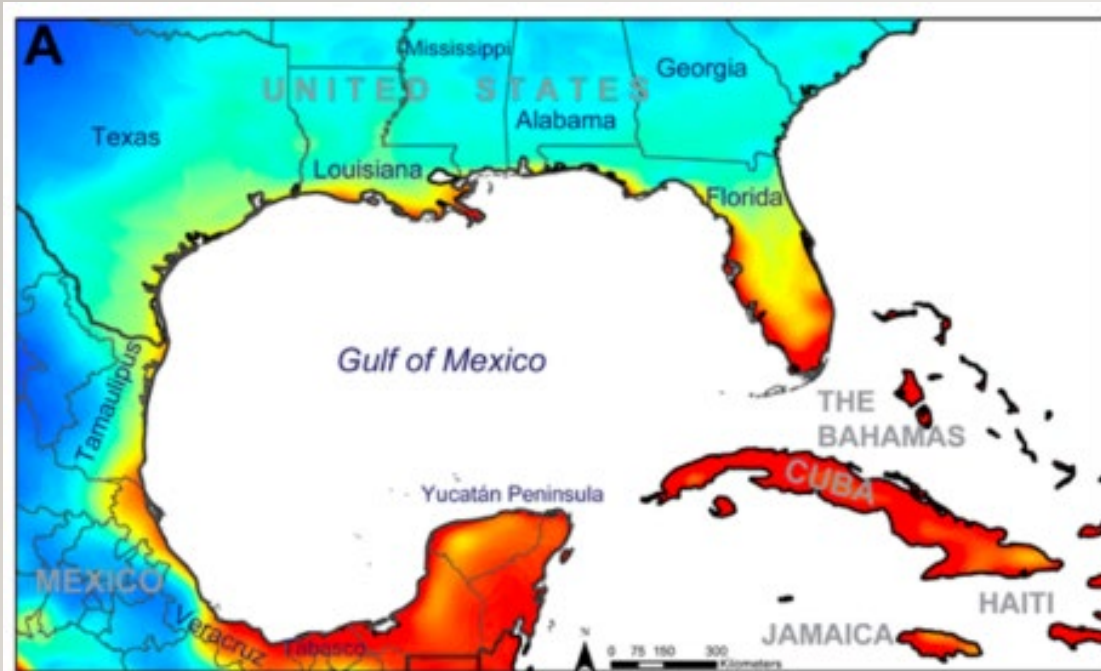


Potential distribution of *Aedes (Ochlerotatus) scapularis* (Diptera: Culicidae): A vector mosquito new to the Florida Peninsula



- Florida has 13 non-native mosquito species that have been discovered in its borders since 1985
- *Aedes scapularis* found in 2020
 - Now established in mainland Florida in Broward and Miami-Dade counties
- Similar characteristics to *Ae. infirmatus*
- Possible vector for diseases

Potential distribution of *Aedes (Ochlerotatus) scapularis* (Diptera: Culicidae): A vector mosquito new to the Florida Peninsula



- Using environmental conditions from *Ae. scapularis* current distribution
- Predictions were made of where the species can establish
 - Red areas should have higher probability

Brown recluse bites reported in South Carolina

Reports of Envenomation by Brown Recluse Spiders Exceed Verified Specimens of *Loxosceles* Spiders in South Carolina

Ivar L. Frithsen MD, MS, Richard S. Vetter, MS, and Ian C. Stocks, MS

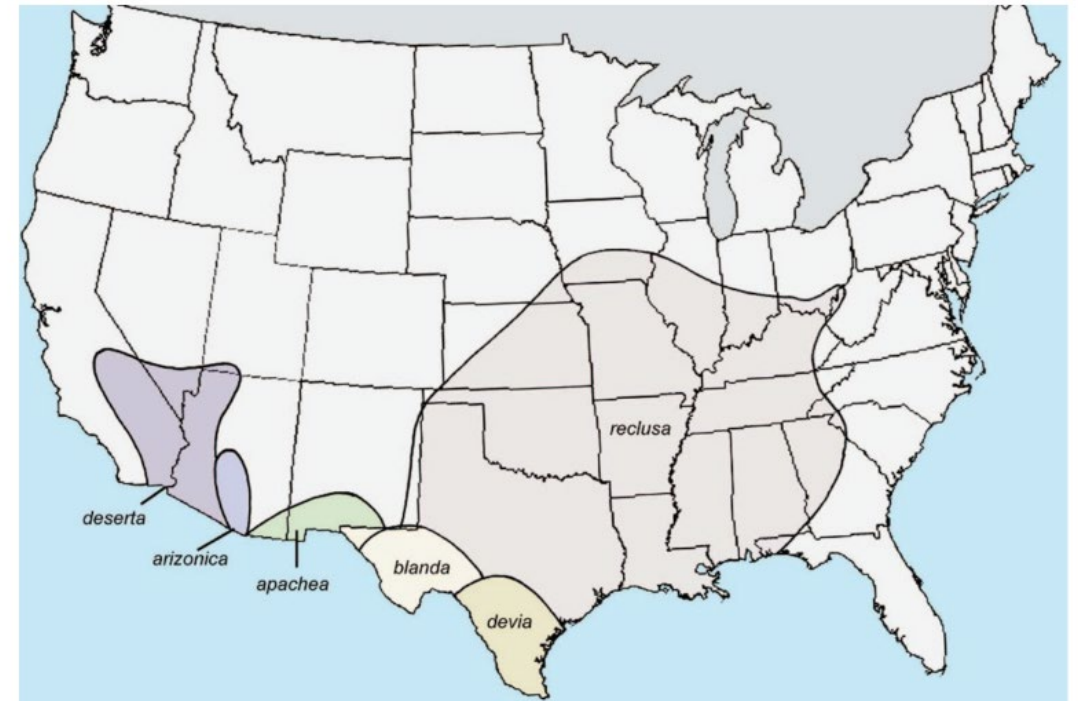
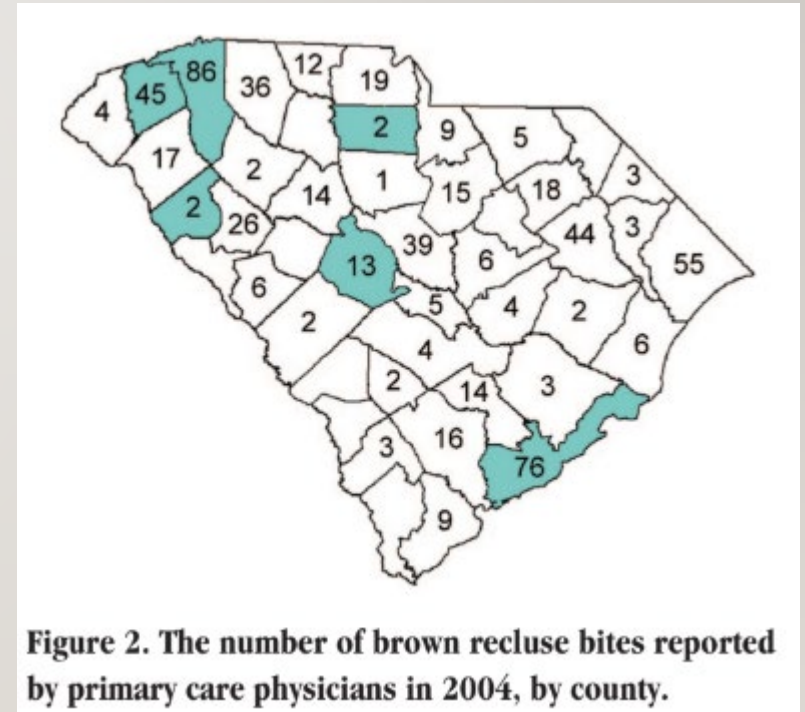


Figure 1. Geographic distribution throughout the United States of verified widespread populations of 6 native *Loxosceles* species. Reprinted with permission of the Massachusetts Medical Society.

Brown recluse bites reported in South Carolina

Physicians surveys conducted statewide

- 1990 had 478 brown recluse spider bites reported
- 2004 had 738 brown recluse spider bites reported
- Since 1953, only 44 brown recluse spiders have been documented or reported.
 - 6 counties in blue



Brown recluse bites reported in South Carolina

Brown Recluse Bites



MRSA Infections



VMCA BOOK CLUB

- We meet once a month
 - Second Thursday of the month
 - 6-7pm
 - Google Meets
 - Email Jay Kiser for more information
 - jkiser@SuffolkVA.US

Thank you!

