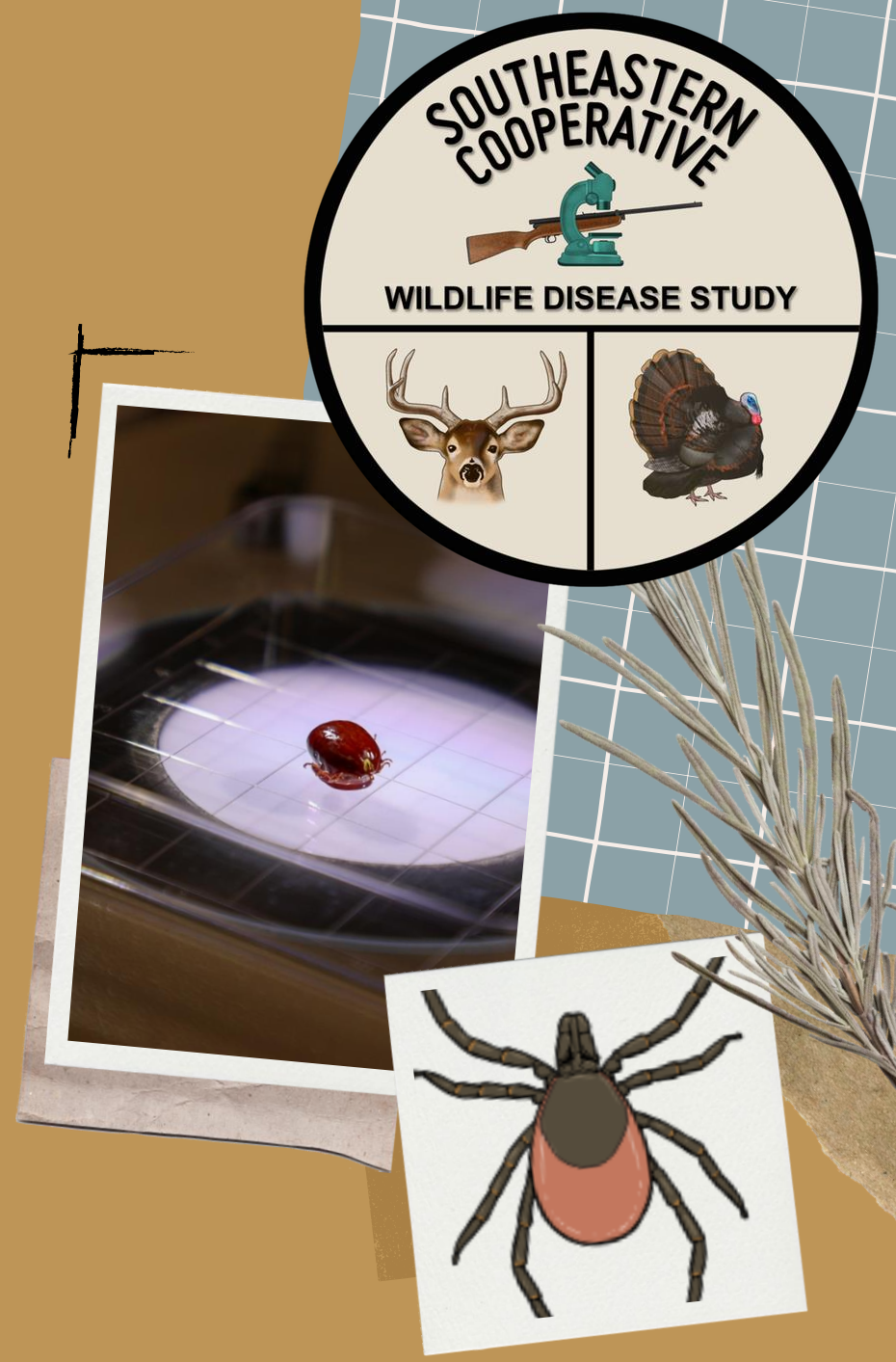


What's Ticking?

SCWDS Tick Research Updates for Georgia

Taylor A. Pearson, Christopher A. Cleveland, and Michael J. Yabsley

Southeastern Cooperative Wildlife Disease Study



ABOUT SCWDS

- A long-term and cooperative approach to Wildlife Health
  - Founded in 1957
  - Provides **wildlife disease expertise**, **diagnostic capacity**, and **research infrastructure** to state wildlife agencies in the Southeast United States
- **ONE HEALTH** Research
  - Environmental health
  - Human and domestic animal health
  - Pathogen diagnostics





Haemaphysalis longicornis: A strange invader





SCWDS Vector Insights: the Longhorn Tick

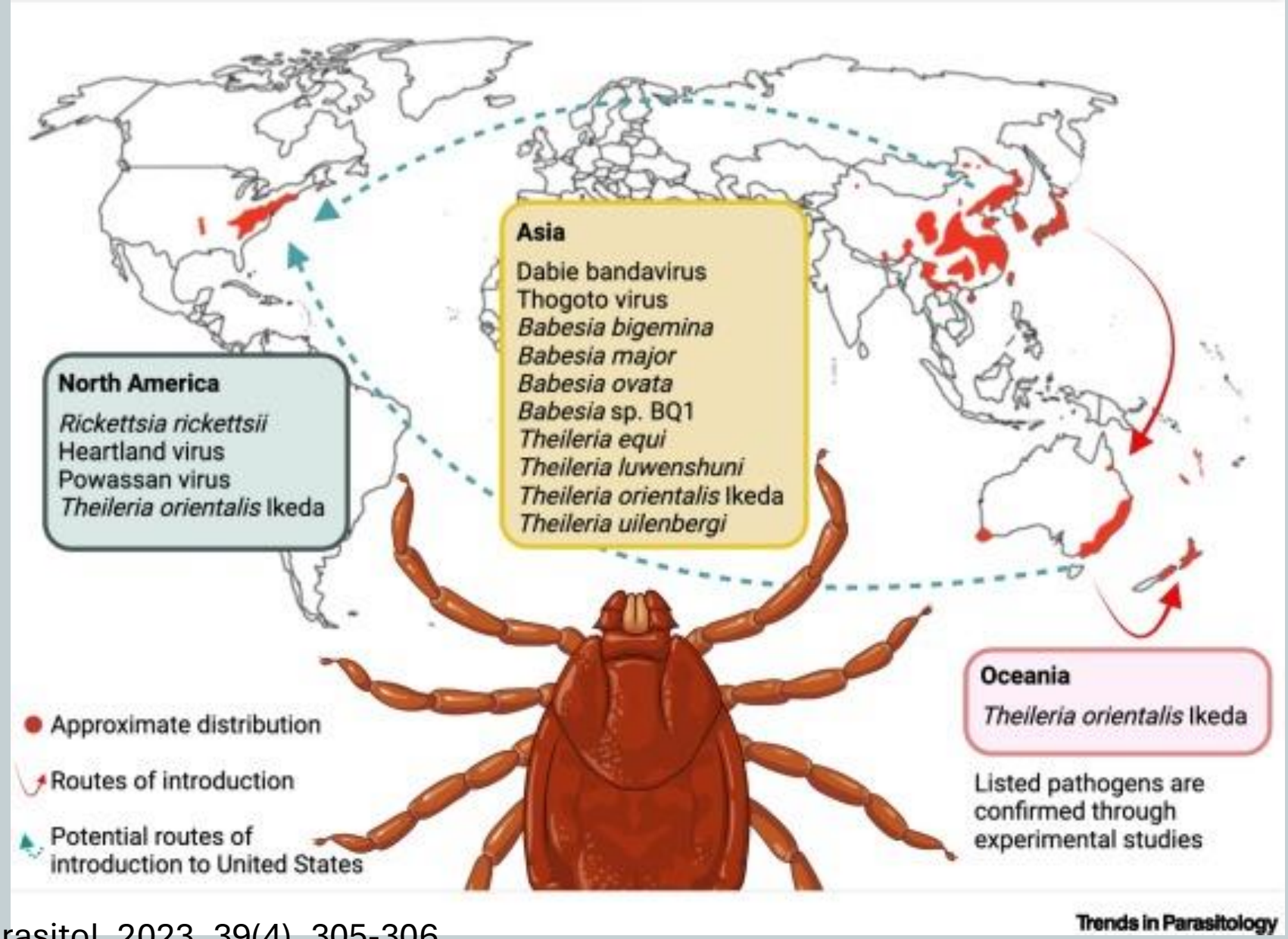
- Native to Southeast Asia
- Introduced to the United States in the late 2000's
  - Now detected in 17 states across the eastern U.S.
  - Numerous native and exotic pathogens have been detected.

HAEMAPHYSALIS LONGICORNIS



Parthenogenic reproduction: One tick introduced into a region can result in thousands!

Haemaphysalis longicornis and Pathogens

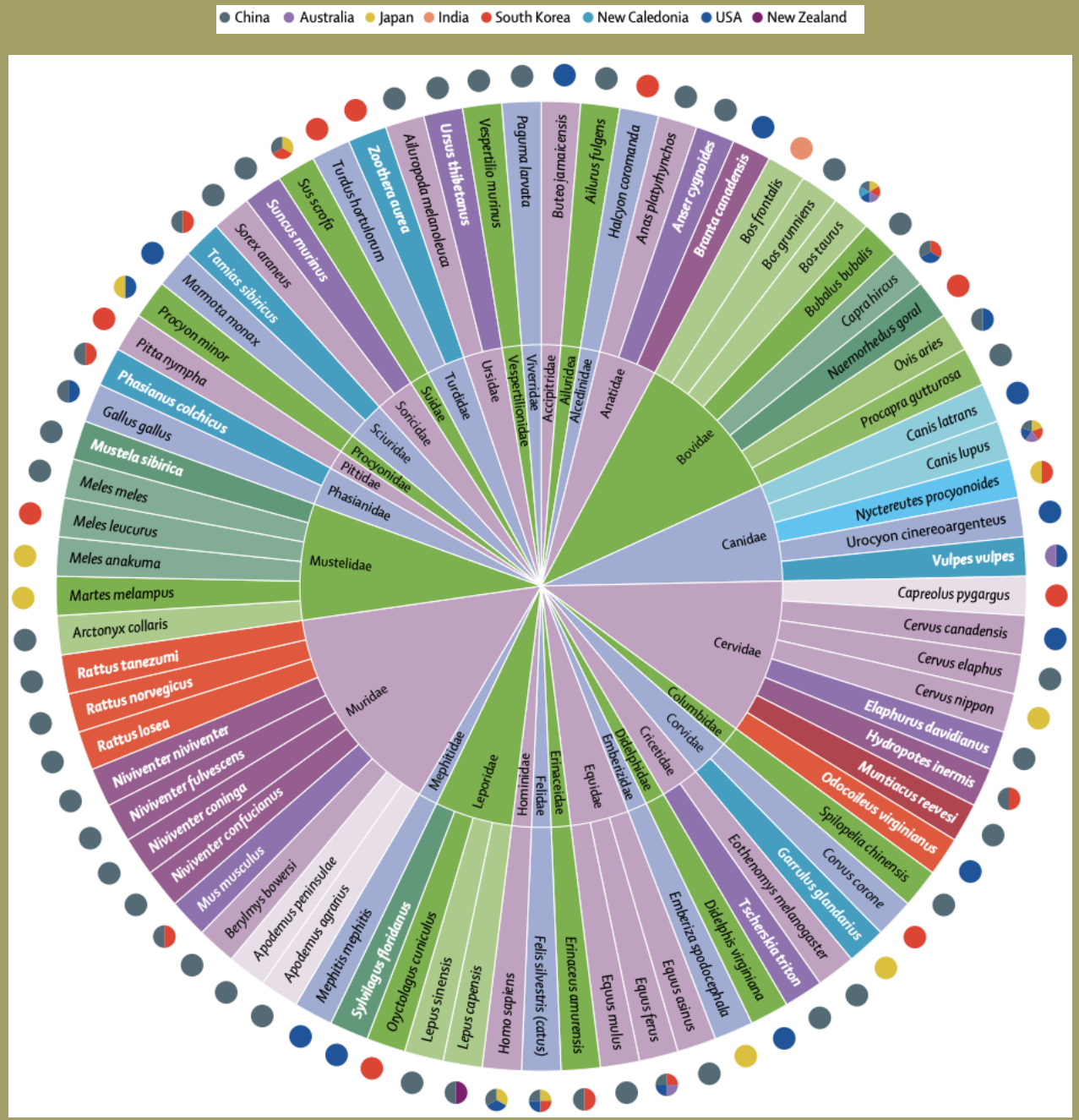


Yabsley, M. Trends Parasitol. 2023, 39(4), 305-306.

Haemaphysalis longicornis -

Longhorned tick (or Cattle bush tick)

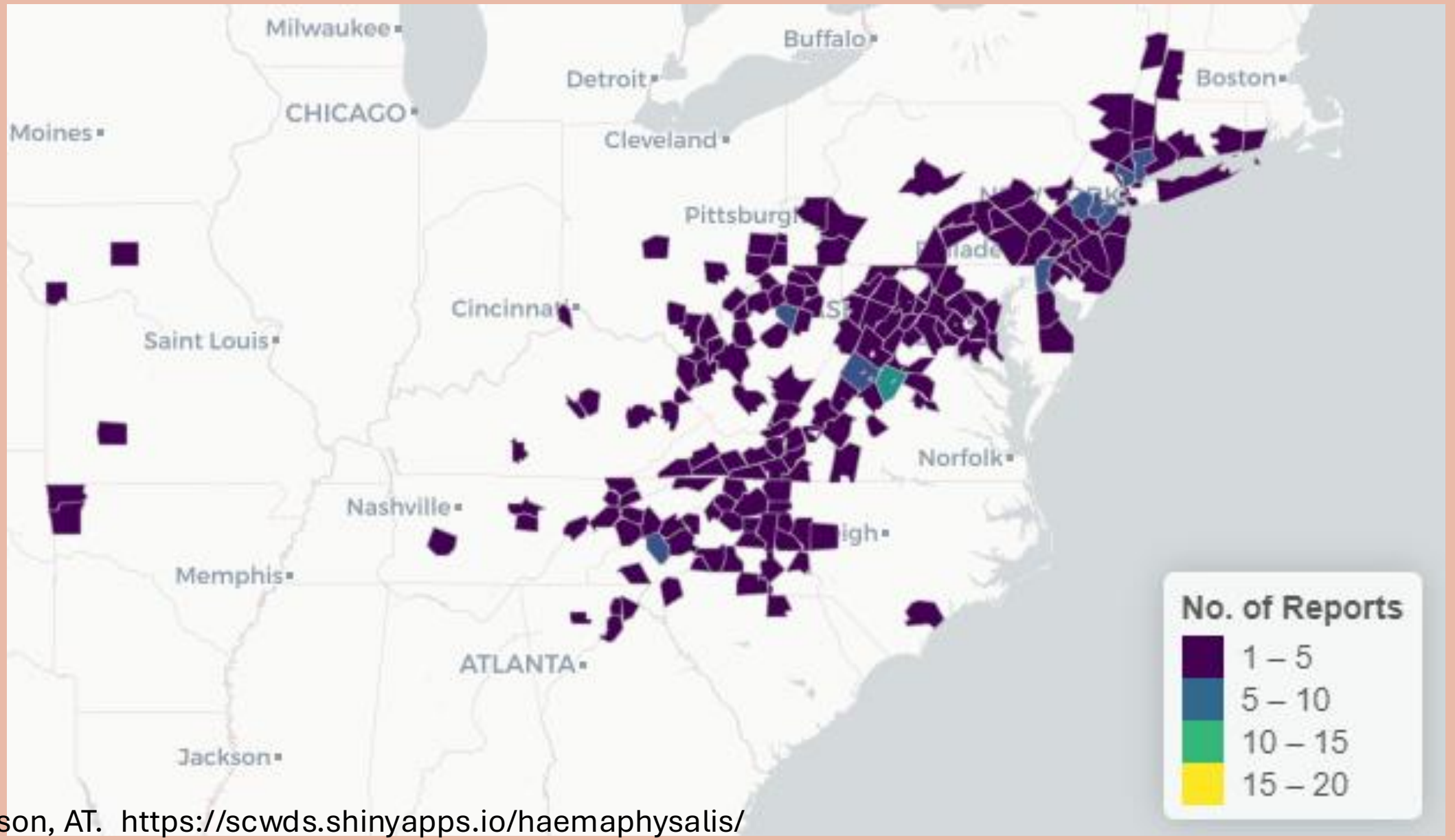
- Huge host range!
  - Cattle seem to be a primary host.
- Domestic and wildlife mammal and avian species.
- Humans are also commonly bitten by *H. longicornis*.



Zhao, L. Lancet Planet Health. 2020. 4, e320-329.

Haemaphysalis longicornis in the U.S.

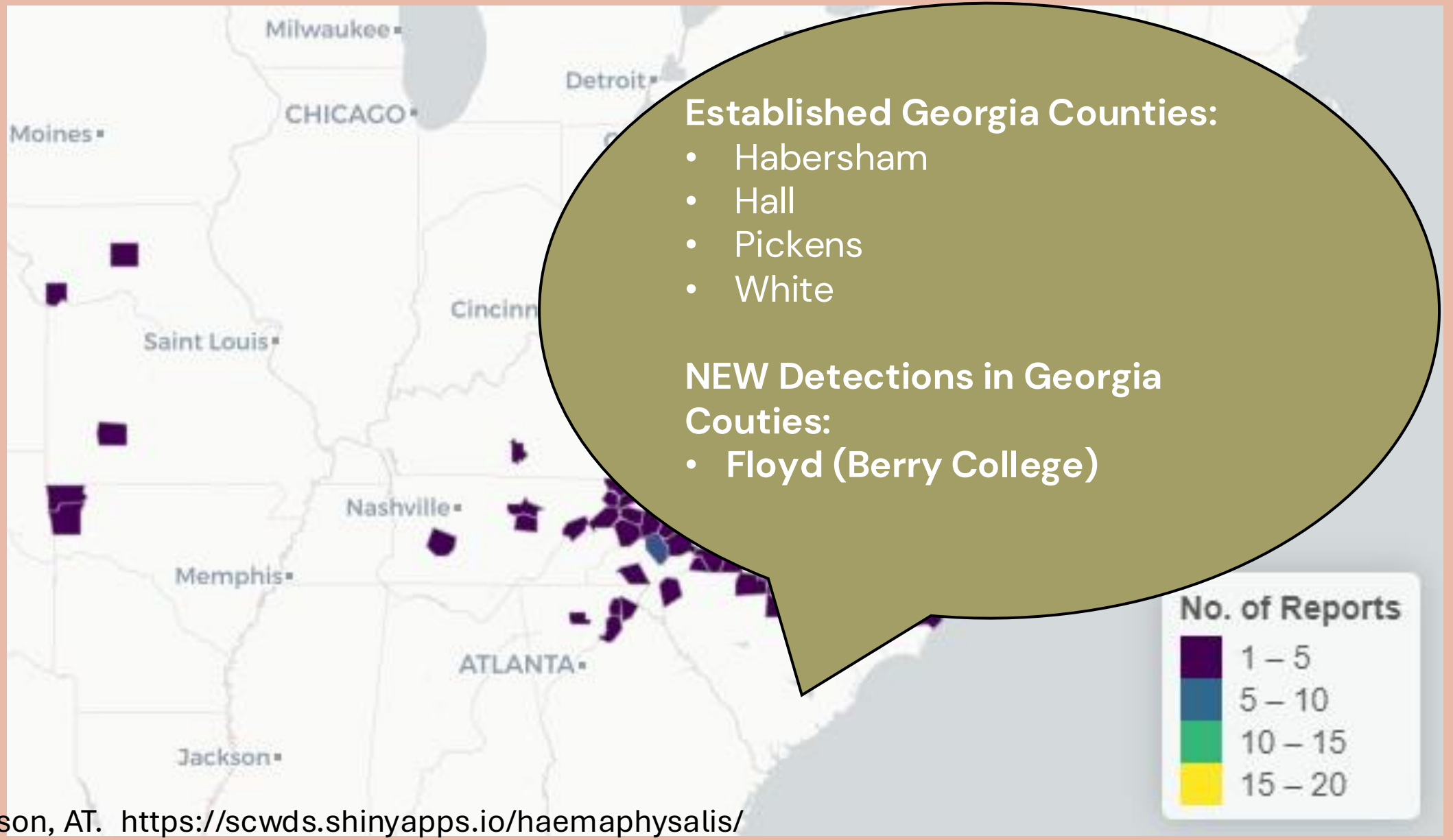
Counties with *H. longicornis* detections (2022)



Thompson, AT. https://scwds.shinyapps.io/haemaphysalis/

Haemaphysalis longicornis in the U.S.

Counties with *H. longicornis* detections (2022)

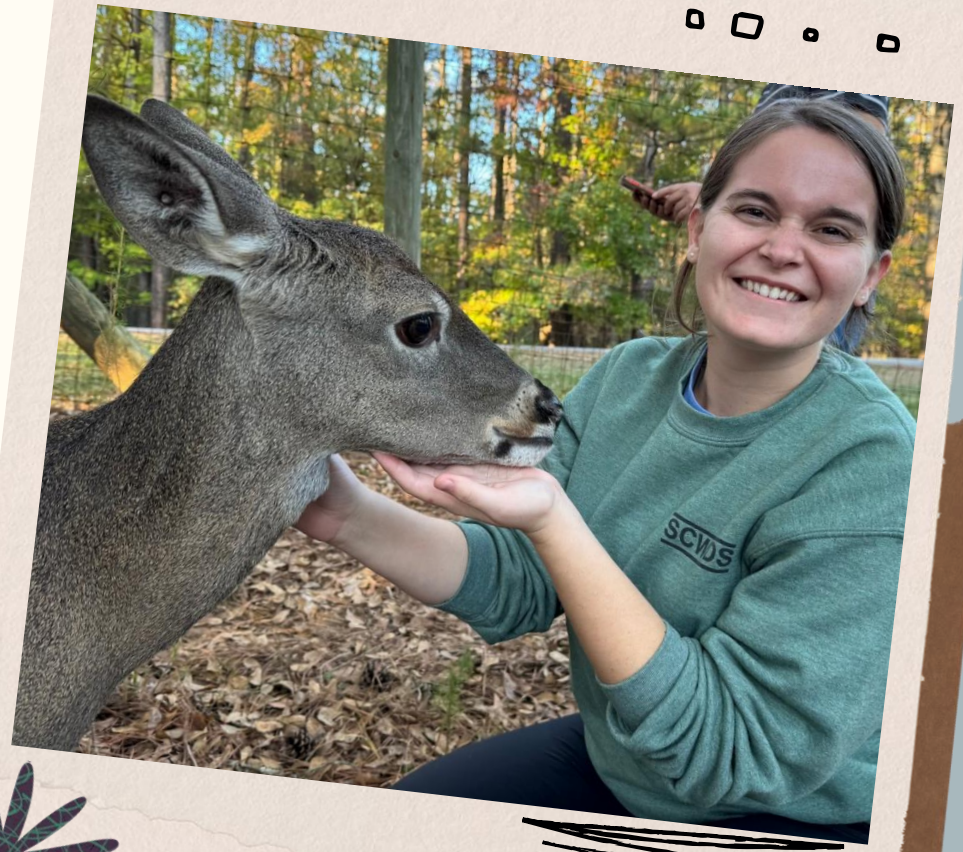


Thompson, AT. https://scwds.shinyapps.io/haemaphysalis/

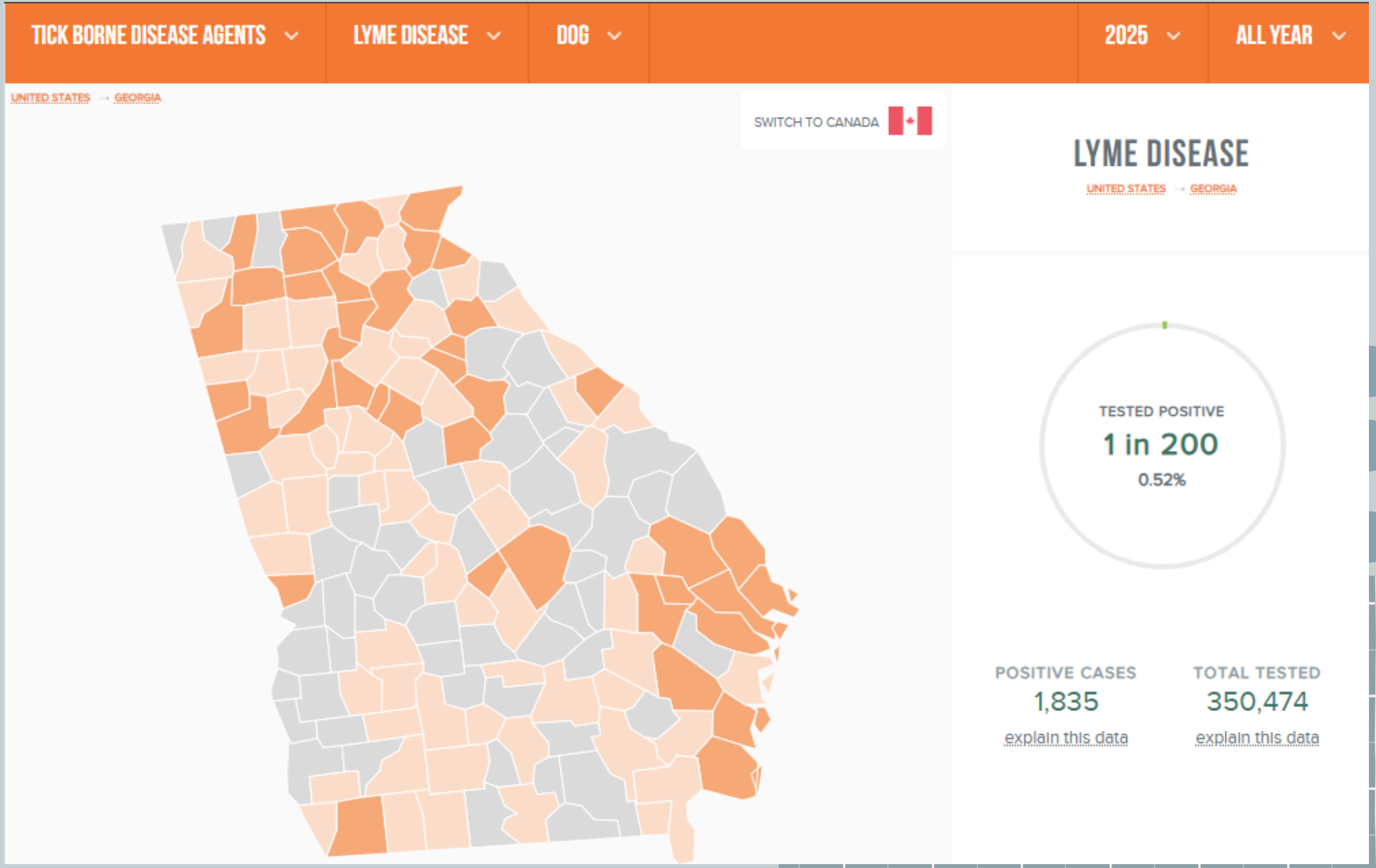
Coastal Georgia Tick Work

Surveillance of ticks and tick-borne pathogens in Georgia's Coastal Plains

Dissertation research (2023 - 2028)

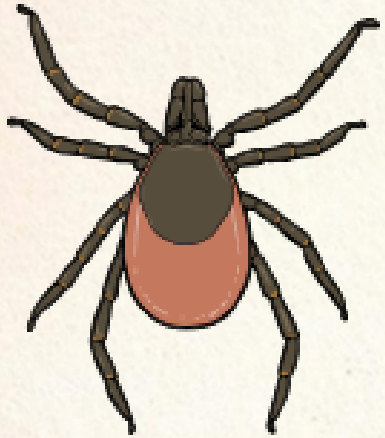


Companion Animal Parasite Council (CAPC)



Research Overview

Little is known about the prevalence and diversity of ixodid ticks and associated tick-borne pathogens in Georgia's coastal plains



What species make up Coastal Georgia tick communities?

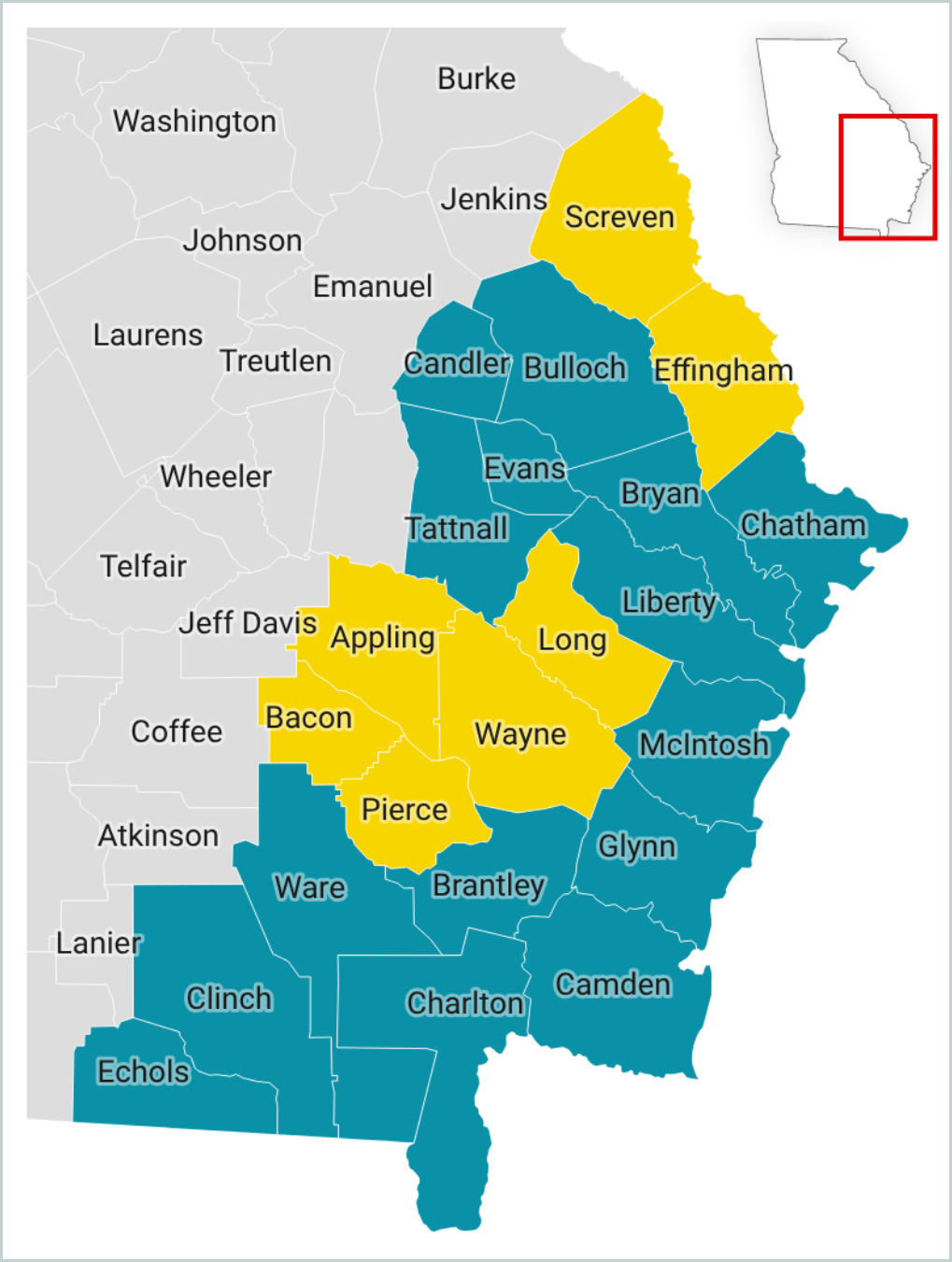


What hosts are ticks feeding on?



What hosts are acting as reservoirs for TBPs?

Dissertation study range



Total number of ticks: 13,316
Vertebrate hosts: 431
Environmental samples: 112

TBP Surveillance

- *Borrelia* spp.
- SFG *Rickettsia* spp.
- *Ehrlichia* spp.
- *Anaplasma* spp.
- *Babesia* spp.

Research Objectives



Objectives I and II: Determine the prevalence, distribution, and risks of tick-borne *bacterial and parasitic* species in Coastal Georgia from environmental (I) and host collected (II) ticks



Objective III: Investigate impacts migratory passerines have on the spread of native and exotic ticks and their associated pathogens to Coastal Georgia



Objective IV: Investigate the ticks and tick-borne pathogens associated with South Georgia black bears

Field Collections

- Questing ticks from the environment using drags
- Attached ticks from hosts
- Blood samples
- Tissue samples

All tick and tissue samples stored in 70% ethanol



Amblyomma americanum





Handling performed under appropriate scientific permits, training, and supervision.





Handling performed under appropriate scientific permits, training, and supervision.







Handling performed under appropriate scientific permits, training, and supervision.

Hosts Sampled

22 SPECIES and GROUPS; 431 UNIQUE HOSTS









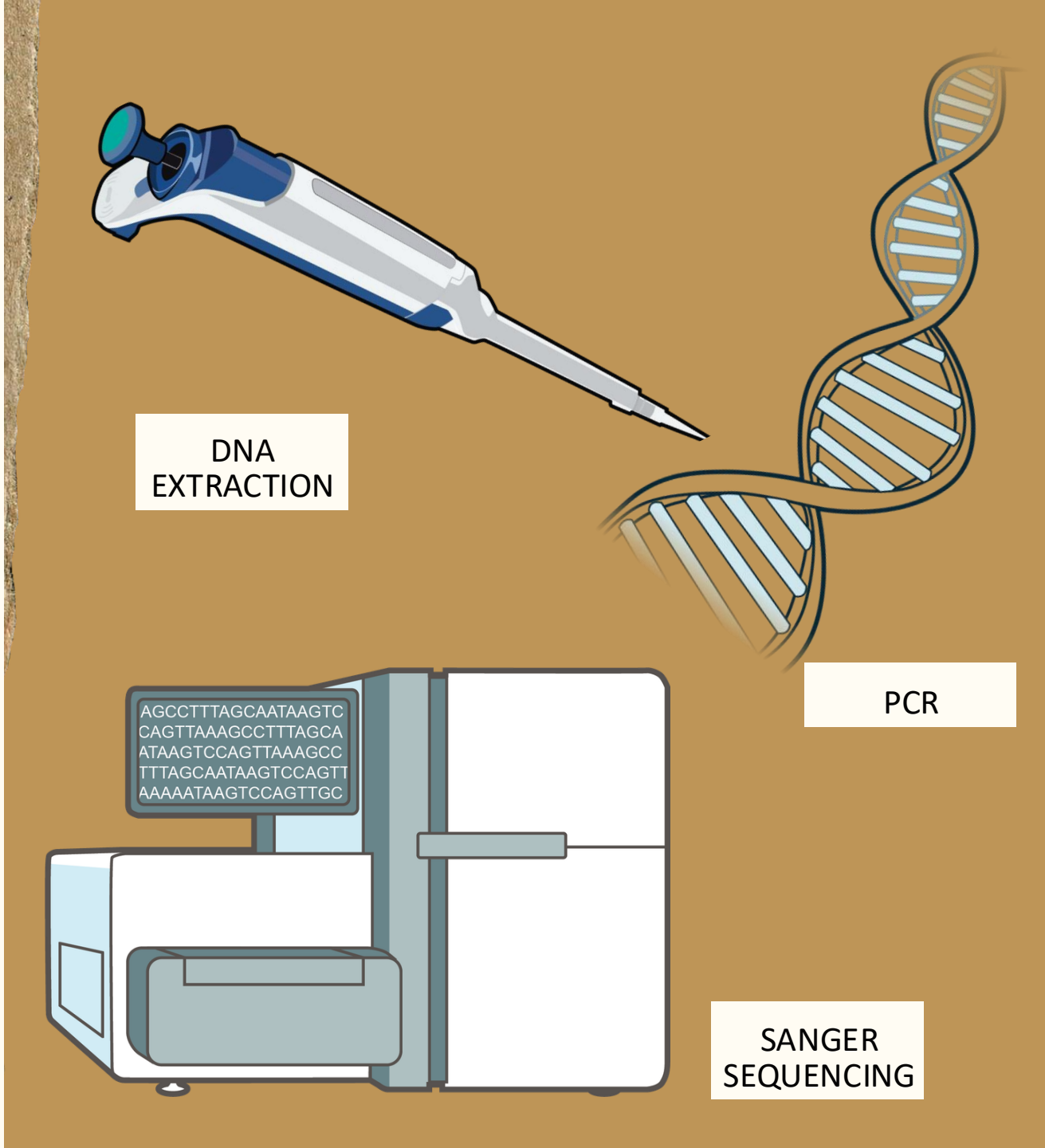



Molecular Diagnostics

Testing for different bacterial and parasitic tick-borne pathogens (*Borrelia*, *Rickettsia*, *Anaplasma*, *Ehrlichia*, and *Babesia*)

DNA Extractions
Polymerase Chain Reactions (PCR)
Sanger sequencing

ANTECH VBD qPCR Panel





Identified Ticks

Combined environmental + host collections



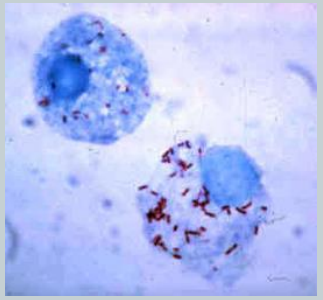
Total number of ticks collected: 13,316

Drags: 11,959
Hosts: 1,357

Total identified: 12,847 (96%)

SPECIES	TOTAL (L/N/A M,F)
Amblyomma americanum	**11,905** (11,046/303/208,348)
A. maculatum	**199** (36/12/94, 57)
Dermacentor variabilis	**573** (0/0/227, 346)
Ixodes scapularis	**123** (4, 15, 42, 62)
I. keiransi	**7** (0/0/0,7)
Ixodes sp.	**32** (0/3/5, 24)
H.leporispalustris	**8** (8/0/0,0)

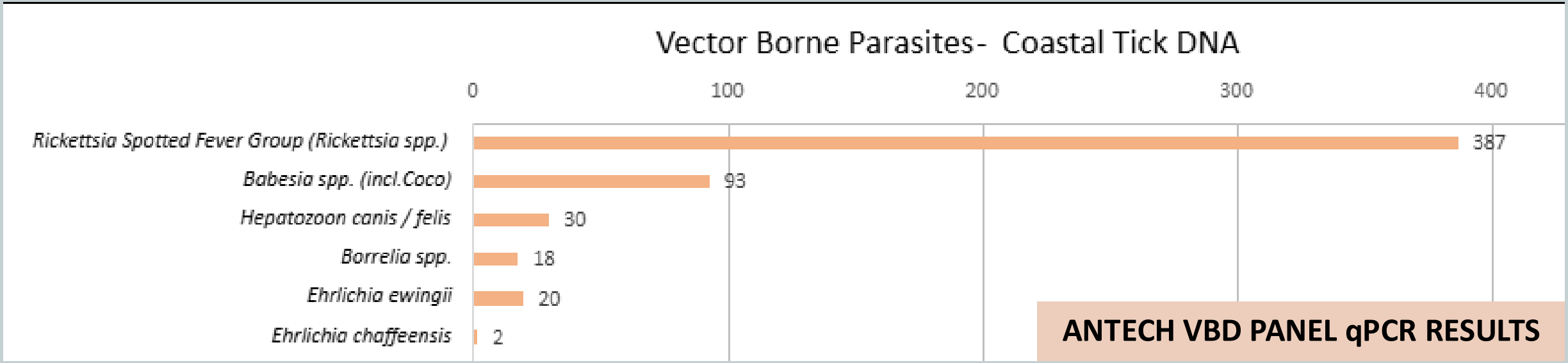
TICK SPECIES + TOTALS



Identified Pathogens

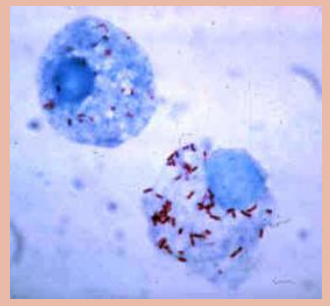
Environmental Collections





Total number of ticks tested: 839

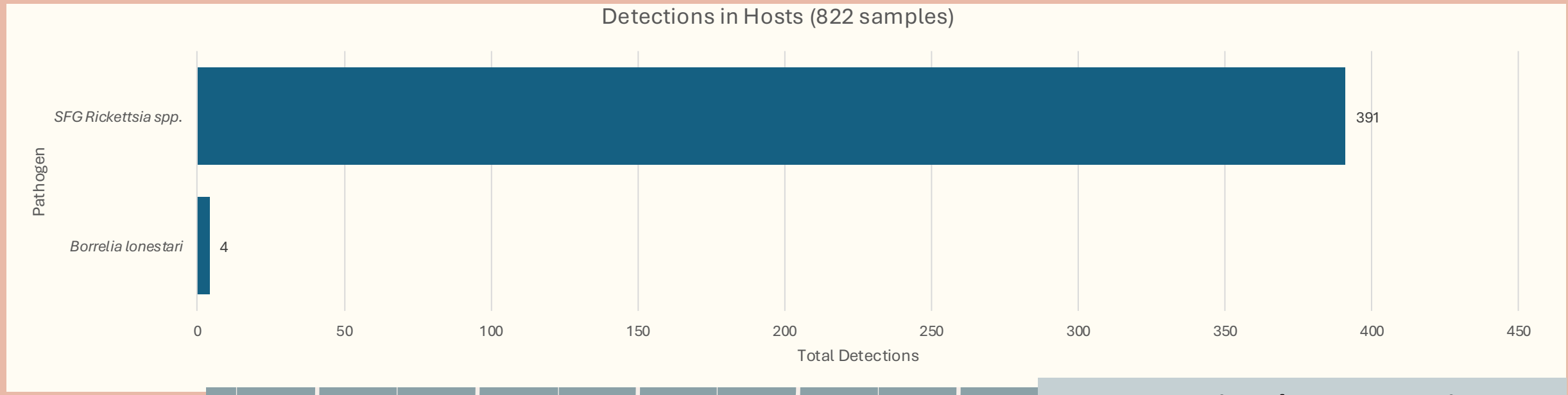
- **SFG *Rickettsia* spp. (387, 46.1%)**
- ***Borrelia* spp. (18, 2.1%)**
  - ***B. burgdorferi* (2 detections from Glynn and Tattnall)**
- ***Ehrlichia* spp. (22, 2.6%)**



Identified Pathogens

Host Collections





Conventional PCR Detections

Total number of ticks tested: 822

- **SFG *Rickettsia* spp. (391, 47.6%)**
  - ***R. parkeri* (43, 5.2%)**
  - ***R. amblyommatis* (297, 36.1%)**
- ***Borrelia lonestari* (4, 0.5%)**

DISCUSSION: PRACTICAL IMPLICATIONS

Coordinate with public health

- Alert local and state health departments on pathogen detections

Tick education

- Educate communities on tick-borne pathogens in their region
  - Tick Talks with Tick Taylor

Continue tick surveillance

- Continue collection partnerships and sampling efforts across region

Tick prevention

- Give domestic animals tick preventative medications
- Conduct tick checks on self

We are Georgia – Taking on Ticks





ACKNOWLEDGEMENTS

Funding

- *The Wormsloe Foundation*
- UGA CVM
- UGA Graduate School

Academic partners

- SCWDS
  - Graduate students
  - Necropsy service

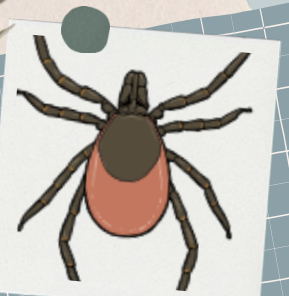
Community partners

- DNR + USFW Agents

Questions?







taylor.pearson@uga.edu

SOUTHEASTERN COOPERATIVE
WILDLIFE DISEASE STUDY