



The role of reptiles in tick-borne bacterial zoonoses worldwide

Brianna Stoye, Janet Foley, DVM, MS, PhD
University of California - Davis SVM



Introduction

- The order of ticks comprises more than 900 species of obligate haematophagus ectoparasites that utilize a multitude of hosts, and transmit more human and veterinary pathogens than any other arthropod [1-3].
- Incidence of tick-borne disease has increased in recent years as new pathogens are discovered as well as evidence of pathogenesis in previously non-pathogenic species [3-5].
- For ticks that feed on reptiles and mammals, the role of reptiles in the ecology can influence likelihood of spillover to animals including humans. Reptiles are important hosts for ticks, but their true significance in the

Objective/Methods

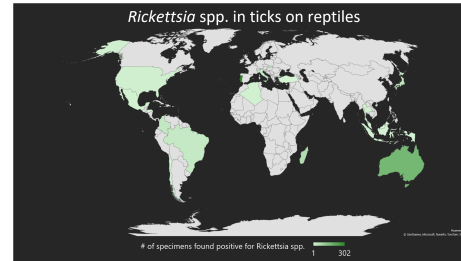
We aim to synthesize current information on tick-borne bacterial zoonoses in reptiles and ticks from reptiles, and to uncover existing patterns in the disease ecology of tick-borne pathogens with respect to reptiles worldwide to inform public health and direct future research.

- A thorough review of bacteria from the genera *Rickettsia*, *Anaplasma*, *Ehrlichia*, and *Borrelia* in reptiles and ticks from reptiles was conducted through PubMed and Google Scholar.
- Articles were included for review that included a record of these bacterial genera in ticks collected from reptiles and/or in reptile tissue samples. Studies involving native, imported, wild and captive reptiles were included.
- From each report, data extracted included location of study by country, reptile species, tick species, average tick load in the study population, bacterial genera sought, specific species detected if further sequencing was done, and positive specimens broken down by life stage, if possible.
- Statistical analysis of extracted data will be performed to identify additional relationships and patterns in tick life stages harboring specific pathogens, average tick loads on unique reptiles.

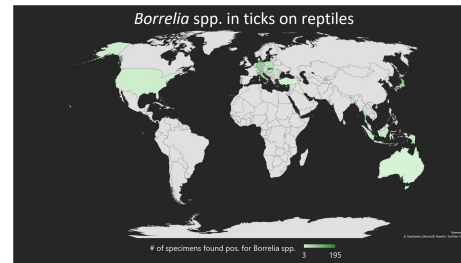
Results

We found 69 species of reptile (lizards, snakes, turtles and tortoises) as hosts for 27 species of ticks harboring bacteria across all four genera. Records spanned all continents, except for Antarctica.

What are the geographical ranges of tick-borne zoonotic bacteria in ticks feeding on reptiles?



Rickettsial isolates were found in 21 countries. In ten of these, the isolate is confirmed pathogenic and found in a tick that utilizes human hosts.



Borrelial isolates were found in 15 countries. In nine of these,

Significance/Limitations

Significance

- While the body of research into the role of reptiles in the maintenance and transmission of tick-borne bacterial zoonoses is small, the existing records highlight the potential for reptiles to influence the disease ecology of these pathogens.
- More than half of the identified tick species that harbored *Rickettsia*, *Borrelia*, *Anaplasma* and *Ehrlichia* have also been found on human hosts. This highlights that reptiles may be supporting these zoonoses whether they only maintain the tick population or are competent hosts for the pathogens detected in them.
- While the risk of introduction of new tick-borne

OPEN

Future Research/Acknowledgments

Direction for Future Research:

- A larger body of xenodiagnostic studies could advance knowledge of reservoir competency in reptiles on which ticks harboring zoonotic bacterial pathogens are commonly found.
- Further investigation and screening of imported reptiles and ticks worldwide is necessary to appropriately monitor the potential introduction of pathogens and assess public health risks.

Acknowledgments:

- I would like to thank my mentor, Dr. Janet Foley, for all of the guidance she has provided this summer, as well as the STAR program at UC Davis SVM for this opportunity.
- Funding for this research is provided through the UC Davis Students Training in Advanced Research (STAR) program, by the Woodmansee/Lider endowment funds at the UC Davis School of Veterinary Medicine. JEF acknowledges funding support from the Pacific

ABSTRACT

REFERENCES

CONTACT AUTHOR

GET IPOSTER