RESEARCH PROGRESS REPORT SUMMARY

Grant 02386-A: Surveillance of Hepatozoon americanum in Populations of the Gulf Coast Tick

Principal Investigator: Andrea Varela-Stokes, DVM, PhD
Research Institution: Mississippi State University
Grant Amount: $12,960.00
Start Date: 2/1/2018  End Date: 1/31/2020
Progress Report: End-Year 1
Report Due: 1/31/2019  Report Received: 1/30/2019

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Original Project Description:

American Canine Hepatozoonosis is a debilitating tick-borne disease with poor prognosis and limited treatment options. Affected dogs usually experience fever, muscle pain, and body wasting, and some dogs may have a thickening of their long bones. While most tick-borne diseases occur after transmission of the disease agent during tick feeding, in American Canine Hepatozoonosis, dogs are infected by eating the tick vector carrying the disease agent. *Hepatozoon americanum* causes American Canine Hepatozoonosis. It is a protozoan parasite carried by the tick species, *Amblyomma maculatum*, also known as the Gulf Coast tick. The percentage of Gulf Coast ticks carrying *H. americanum* is unknown. The investigators will use an optimized test to perform active surveillance on Gulf Coast ticks collected in Mississippi during the summer seasons of 2018 and 2019, when adult Gulf Coast tick stages are active. Veterinary summer research students will also participate in the research each year. By involving veterinary students and obtaining active surveillance data on tick populations, the researchers will fill an important gap in the knowledge of American Canine Hepatozoonosis, and increase veterinary and public awareness of potential risk in canine patients.

Publications: None at this time

Presentations:

Alexandra N. Frankovich, Shaira L. Rivera Martinez, John V. Stokes, Andrea S. Varela-Stokes. 2018. Detection of *Hepatozoon americanum* in Gulf Coast Ticks from Oktibbeha County, MS. National Veterinary Scholars Symposium. College Station, TX. Poster presentation*
* Also presented oral presentation to fellow scholars at the end of the Summer Research Experience Program (July 17, 2018)

*Also presented poster at the 2018 ACVP Annual Meeting, November 3-7 in Washington D.C.

Report to Grant Sponsor from Investigator:

American Canine Hepatozoonosis (ACH) is a protozoal disease in dogs caused by *Hepatozoon americanum*. This organism is transmitted to dogs when they ingest the definitive host for the protozoan, the Gulf Coast tick (*Amblyomma maculatum*; GCT) or a paratenic host (rodents and rabbits). There is currently no treatment for eliminating protozoa in the infected canine. The main source of infection, tick or paratenic host, has not yet been identified for ACH making it difficult to develop preventative measures. Data on disease prevalence and distribution are reliant on detection in the affected canine. The geographical distribution of ACH is assumed to overlap GCT distribution. Currently, there is no data detailing *H. americanum* prevalence in the tick vector. This study aimed to fill the gap in knowledge by investigating infection prevalence in adult GCT. This tick is active in summer months. In 2018, we collected 129 adult GCTs from 3 different sites in Oktibbeha Co., MS and extracted DNA from half or whole ticks. We used a TaqMan quantitative PCR assay to test for *H. americanum*. No half tick extracts were positive using conservative threshold levels; two whole tick extracts had low copy numbers but could not be confirmed. To evaluate potential false negative extracts, ticks with amplifiable DNA were tested with conventional PCR. No ticks were confirmed positive. Thus far, results suggest GCTs in this area may not be a primary source of *H. americanum* infection in dogs. Future studies targeting areas with ACH cases and investigating infection rates of nymphal GCTs and various paratenic hosts will offer more insight on the main transmission route for ACH here. This information could be crucial for the development of improved methods for prevention.