

Presence of *Tritrichomonas foetus* in White-tailed Deer (*Odocoileus virginianus*) populations found in Louisiana

Hope E. Hebert and Kim M. Tolson

Department of Biology, College of Arts, Education, & Sciences, University of Louisiana, Monroe, Monroe, LA.



Introduction

White-tailed deer (*Odocoileus virginianus*) are a popular game mammal found in Louisiana and are monitored regularly by the Louisiana Department of Wildlife and Fisheries to ensure healthy and thriving populations. In 2017, hunter harvest data from Sherburne WMA indicated a decrease in fawn production and lowered lactation rates of adult does (Figure 1). Hunter-harvested deer from Sherburne and other managed areas (Figure 2) in Louisiana were tested for *Tritrichomonas foetus*, a protozoan often found in cattle herds. The protozoan is a causative agent for trichomoniasis, a sexually transmitted infection that results in spontaneous miscarriage and infertility in cows after copulation with an infected bull. In cattle herds, bulls are asymptomatic and lifelong carriers of the disease, and common practice is to cull infected males to prevent further infection. *Tritrichomonas foetus* is endemic to variety of animal hosts, but no research has been undertaken involving wild deer populations. This research project aims to determine the presence and prevalence of *T. foetus* in the state deer population, providing the groundwork for future research into the pathology and improving management practices for deer in Louisiana. Data has been collected and analysis is underway.



Figure 1: A white-tailed doe and fawn.

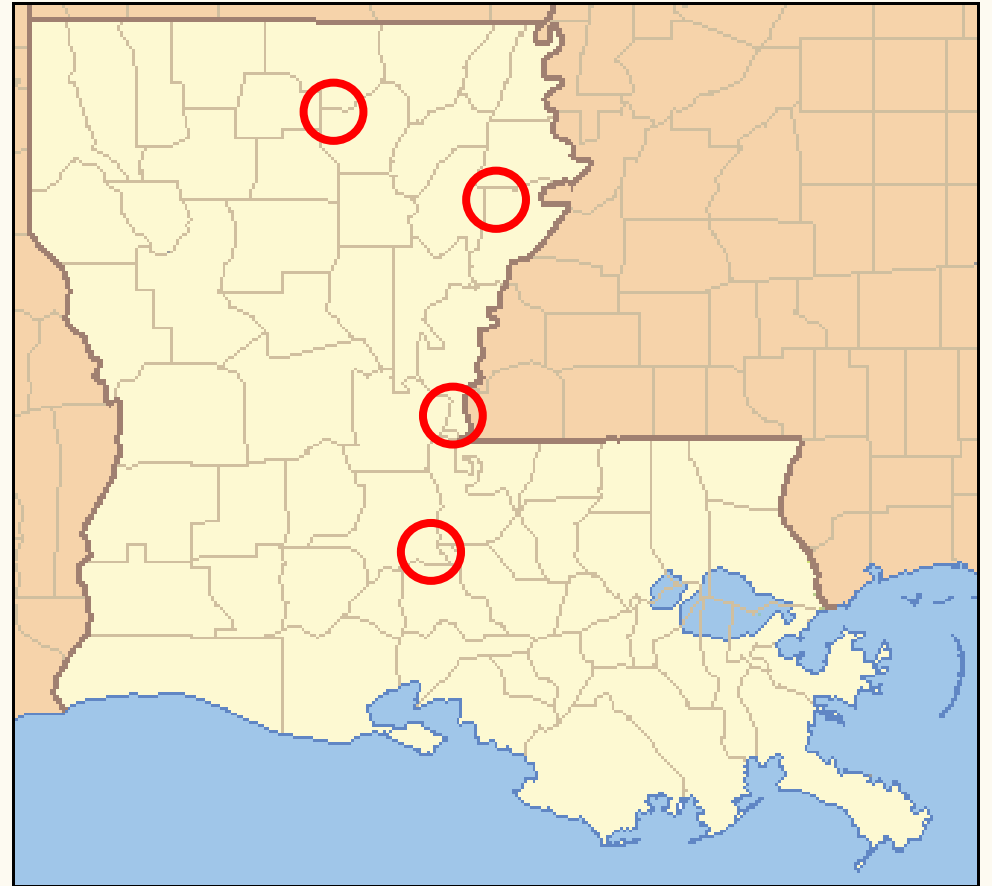


Figure 2: Map showing sampled locations in Louisiana.

Objectives

- Detect the presence of the *Tritrichomonas foetus* protozoan in preputial smegma samples taken from hunter-harvested bucks (Figure 3) through Polymerase Chain Reaction (PCR) detection.
- Determine the prevalence of *T. foetus* in the Louisiana deer population by conducting repeated sampling at multiple sites in Louisiana.
- Identify possible trends associated with infected individuals, such as correlations with age, weight, or antler characteristics to aid in future research.



Figure 3: A hunter-harvested buck.

Materials and Methods

Sampling Methods:

- **2019-2020 Hunting Season:** Preliminary data collection involved a mucosal scraping of the penile sheath from hunter harvested deer and culture of the sample in an InPouch™ TF culture test pouch from Biomed Diagnostics. Samples were incubated for up to 6 days at 37° C, then pelleted and extracted for DNA (Figure 4).
- **2020-2021 Hunting Season:** Later sampling involved a saline flush of the penile sheath combined with mucosal scraping. The flush was collected, and genetic material was extracted through boiling and vortexing samples.

PCR Procedure:

- Positive controls were acquired from the Louisiana Animal Disease Diagnostic Laboratory at Louisiana State University. PCR Primers for *T. foetus* labeled TFR3 and TFR4 were used for PCR.
- PCR procedure was conducted on genetic samples, and products were then transferred onto an agarose gel and separated via gel electrophoresis to determine band lengths (Figure 5). Positive samples will yield bands of approximately 347 base pairs.

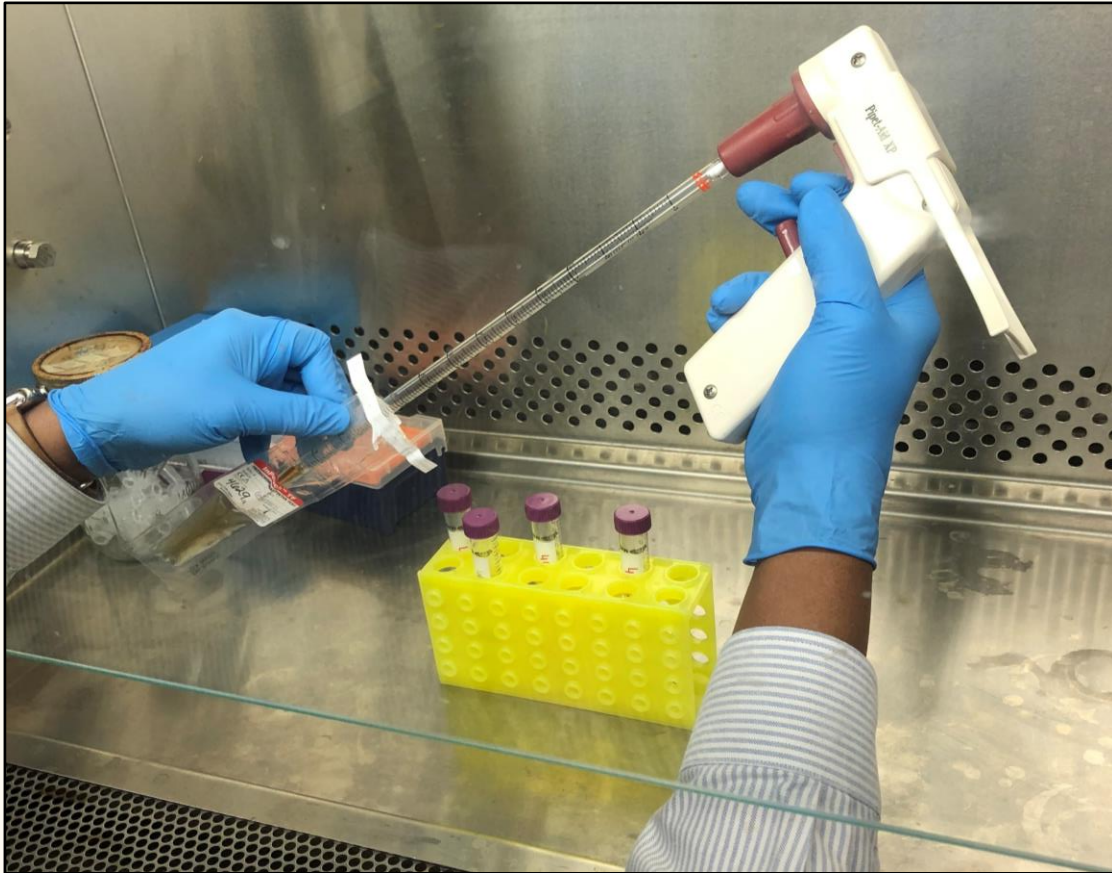


Figure 4: Preparation of culture pouch for DNA extraction.

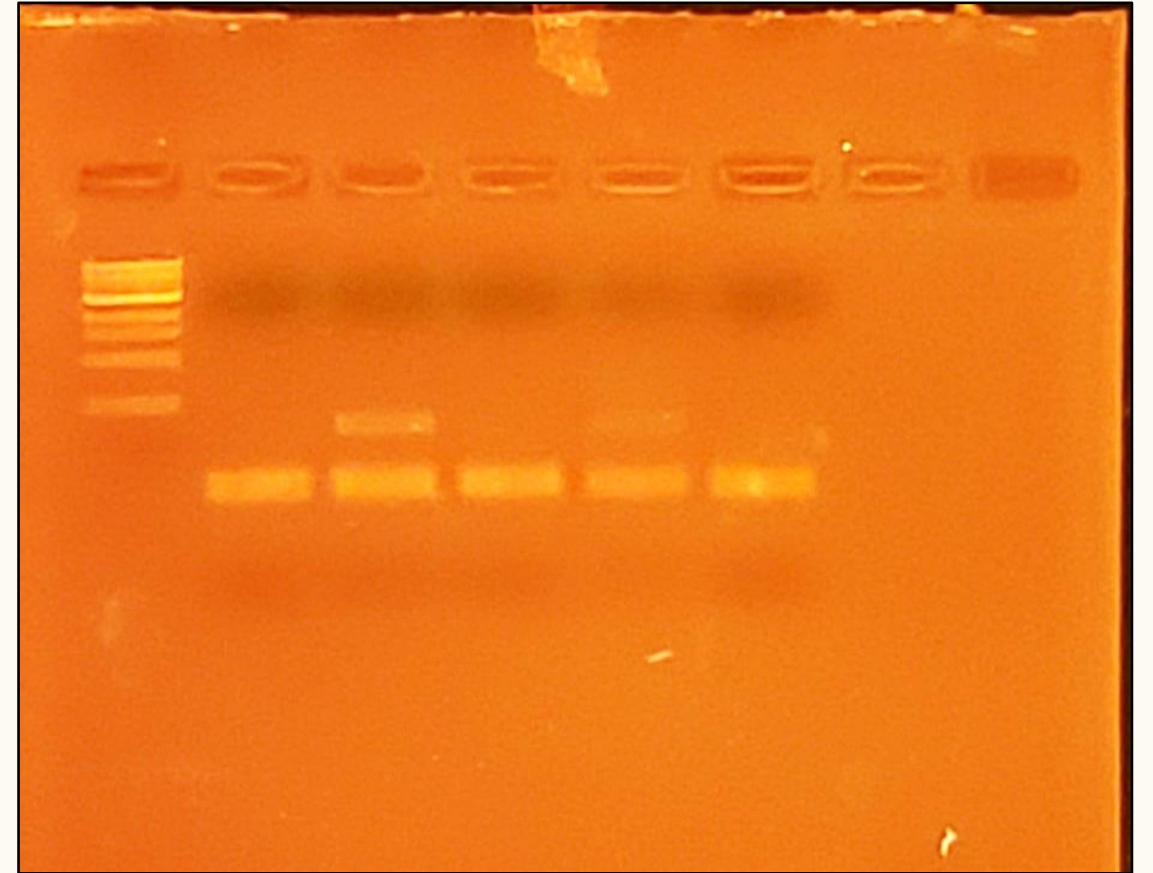


Figure 5: Agarose gel of PCR products after electrophoresis.

Management Implications

- Deer hunting in Louisiana comprises a large portion of annual hunting activity, and populations are managed intensively to maintain healthy deer herds. Environmental factors that may affect carrying capacity, health, and recruitment in deer populations should be quickly identified and managed to ensure the health and sustainability of this resource.
- Establishing the prevalence of *Tritrichomonas foetus* infections in deer species will be essential in determining the effects of the disease on deer populations, particularly in populations that have been experiencing decreased fawn production and lactation rates.
- This research project will provide the groundwork for future studies regarding the pathology and epidemiology of *T. foetus* among deer populations, allowing for improved management efficacy and increased population quality.



Sampling station for bucks at Sherburne WMA.

Acknowledgements

I would like to thank the following for all the generous assistance, knowledge, and support that has been given to me during the course of this project: Foremost, I would like to thank the Louisiana Department of Wildlife and Fisheries for their assistance and resources needed to conduct this research. I would also like to thank Tony Vidrine for providing essential data on harvested deer and assisting in sample collection. I would also like to thank my committee members Dr. Kim Marie Tolson, Dr. Srinivas Garlapati, and Dr. Jim LaCour for all of their help and guidance throughout this project. Finally, I would like to thank Nelle Jenkins and Timothy McMahan for their assistance in sample collection and processing. Without everyone mentioned, this project would not have been accomplished.