Prevalence of Spotted Fever Group Rickettsia and Borrelia spp. in Ticks in Hot Springs Arkansas

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Ticks are vectors for approximately 16 diseases or illnesses, and in 2021, 476,000 Americans were treated for Lyme disease (CDC 2021). According to the CDC, I. scapularis ticks are responsible for most of these cases, which are concentrated in the northern United States. Lyme disease is considered rare in Arkansas, but I. scapularis ticks become active in Hot Springs National Park (HOSP) during winter. Thus, it is expected that Borrelia burgdorferi, the cause of Lyme disease, will be found in I. scapularis in HOSP. While I. scapularis is not recognized by the CDC as a carrier of spotted fever group Rickettsia (SFGR), the cause of Rocky Mountain Spotted Fever (RMSF), Dowling et al. (2021) found 33-50% of I scapularis and 39-69% of A americanum in Arkansas were positive for SFGR Rickettsia, and similar results are expected for HOSP. Ticks from Hot Spring were tested for SFFR Rickettsia and Borrelia spp. Primers Rr17.1p and Rr17k.538 were used to identify a genus-specific gene in Rickettsia. For Borrelia spp., primers FlaLS and FlaRS target sequences on Fla and 16s rRNA genes (Barber et al. 1996) and the restriction enzyme AluI digest for B. burgdorferi. In HOSP, 31% of I. scapularis were positive for RMSF Rickettsia, on the lower end of the statewide range reported by Dowling et al. (2022). Of 62 A. americanum tested for Rickettsia spp., 7 were positive for the bacteria (12%). Of 19 ticks tested for Borrelia burgdorferi, none were positive. Thus, Lyme disease was not detected.

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