

Public Abstract

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Title:MOLECULAR EPIDEMIOLOGY OF TICK-BORNE ANAPLASMATACEAE AMONG CLIENT-OWNED DOGS IN MISSOURI

Several tick-borne agents of zoonotic ehrlichiosis or anaplasmosis are endemic to Missouri. Dogs are susceptible to the same infections and tick vectors, but their roles as models, sentinels or reservoirs are undefined. The goal of this thesis was to identify factors that may contribute to natural infections among pet dogs. The first objective was to adapt a universal real-time PCR assay to rapidly screen blood samples for tick-borne Anaplasmataceae. This assay became an initial step of an algorithm to identify specific anaplasma pathogens. The second objective was to survey canine blood sampled from client-owned dogs throughout Missouri. The approach to this objective was to assay samples from six districts across the state, which were submitted to a diagnostic laboratory over one year. Results indicated that three zoonotic pathogens are prevalent among undiagnosed dogs in Missouri. *Ehrlichia ewingii* was often detected in clinically normal dogs. *Ehrlichia chaffeensis* was only detected in samples co-infected with *E. ewingii*. An apparently novel strain of *Anaplasma phagocytophilum* was also prevalent, and was associated with blood or liver abnormalities. Many of these infections were detected in samples collected after the peak tick season, suggesting that tick prevention or persistently infected host physiology may affect incidence of infection. Other risk factors were associated with age, sex, size and breed group. The unexpected incidence and prevalence of these agents among undiagnosed pet dogs justifies further in depth study of these infections among canine and human populations in Missouri.