Occurrence of *Rickettsia* spp. and *Coxiella burnetii* in ixodid ticks in Kassena-Nankana, Ghana

Abstract

Ticks are arthropods of veterinary and medical importance which spread zoonotic pathogens that link animal and human health. In this study, ticks were collected from 448 livestock between February and December 2020 in the Kassena-Nankana Districts of Ghana and screened for the presence of zoonotic pathogens DNA using PCR and sequencing approaches. In total, 1550 ticks were collected and morphologically identified. Three tick genera were identified with *Amblyomma variegatum* (63%) as the predominant tick species collected. DNA was extracted from 491 tick pools and screened for the presence of DNA of *Rickettsia* spp. based on the 115 bp fragment of the 17 kDa surface protein and 639 bp of the Outer membrane protein A (*ompA*) gene and the 295 bp fragment of the transposase gene of *Coxiella burnetii IS1111a* element. From the 491 pools screened, the DNA of *Rickettsia* spp. and *C. burnetii* was detected in 56.8 and 3.7%, respectively. Coinfections were identified in 2.4% of the tick pools. Characterization of the *Rickettsia* spp. in this study based on the *ompA* gene showed that the DNA of *Rickettsia africae* and *Rickettsia aeschlimannii* accounted for 39.7 and 14.7%, respectively, and were 100% similar to sequences in GenBank. Most *R. africae* and *C. burnetii* infections occurred in ticks collected in the wet season, whereas *R. aeschlimannii* occurred mostly in the dry season. These pathogens are potential public health threats, thus there is a need to implement control measures to reduce the risk of infections in vulnerable populations.