



Original article

Quantitative study of *Rickettsia massiliae* in *Rhipicephalus sanguineus* organs



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ABSTRACT

Rickettsia massiliae, belonging to the spotted fever group of *Rickettsia*, is a human pathogen causing a similar course of disease to that caused by *R. conorii*, the originally recognized etiologic agent of Mediterranean spotted fever. In view of this similarity, we performed an ultrastructural study of *R. massiliae* in organs of *Rhipicephalus sanguineus* ticks, in order to advance knowledge of the complex dynamics at the tick-pathogen interface in rickettsioses.

Adult *R. massiliae*-infected *Rh. sanguineus* ticks were fed on uninfected Hartley strain guinea pigs, and five females were collected daily throughout their feeding period up to day 6, and analyzed by quantitative real-time PCR and electron microscopy. An increase in rickettsial content was observed in the salivary glands, particularly in the first two days of feeding, and a plateau was observed between days 3 and 6. Rickettsial organisms were observed in all tick organs analyzed, in higher numbers in the fed state, and statistically significant differences were observed in measurements of the periplasmic layer of *R. massiliae* in salivary glands of fed and unfed *Rh. sanguineus* ticks, with increased thickness in the former case.

This study provides insight into the interface between *R. massiliae* and *Rh. sanguineus* ticks, highlighting the need for analysis of *R. massiliae* to fully ascertain its place as an important pathogenic agent of a spotted fever rickettsiosis.