



University of Zabol

Graduate School

Faculty of Veterinary Medicine

Department of Clinical Sciences

The Thesis Submitted for the Degree of DVM

(In the field of Veterinary)

Title:

Epidemiology and molecular detection of Crimean-Congo hemorrhagic fever (CCHF),
Coxiella burnetii and *Anaplasma* spp. in hard ticks (*Ixodidae*) in the South Khorasan regions

Supervisors:

Dr. M. Rasekh

Dr. D. Saadati

Advisor

Dr. F. Faghihi

Dr. M. Fazlali Pour

By:

Amirsajad Jafari

Summer 2020

Abstract

Hard ticks are known to be important carriers of a wide range of diseases caused by viruses, bacteria, parasites and other pathogenic organisms. The aim of this study was to determine the prevalence of Crimean Congo Hemorrhagic Fever Virus (CCHF) and non-viral agents of *Coxiella burnetii* and *Anaplasma* species in hard ticks isolated from domestic animals in South Khorasan. In this study, 684 head of livestock including 302 sheep, 344 goats, 16 cows and 22 camels in five counties of South Khorasan province (Birjand, Sarbisheh, Khosf, Darmian and Ghaen) were sampled. Diagnosis was based on valid detected morphological keys under a stereomicroscopic. 2 genera and 7 species were identified, with the highest frequency belonging to the genus *Hyalomma* and the species *Rhipicephalus sanguineus*. Molecular tests were performed to identify the genomes of *CCHFV*, *Coxiella burnetii* and *Anaplasma species*. Infection with *CCHFV* (7%) and *Anaplasma* (20%) was confirmed in caught ticks, but the result of molecular tests for *Coxiella burnetii* was negative. All ticks infected with these two pathogens belonged to Birjand county and sheep and goats as hosts. Most of the infected hosts were between 1 and 3 years old and the pathogen infection was more prevalent in the plains. The dominant fauna of the region is the main carriers of Crimean Congo fever in Iran. and the presence of the virus in this province. More monitoring and controlling Strategies are needed in relation to this CCHF. High prevalence of anaplasmosis also indicates the need to increase health measures and eliminate vectors. Because the genome of the bacterium that causes Q fever hasn't been found in screened ticks, the study area can be considered clean in terms of infection with Q fever.

Keywords: Hard ticks, CCHF, *Anaplasma*, *Coxiella burnetii*, South Khorasan