



University of Zabol
Graduate School
Faculty of Veterinary
Department of food hygiene

The Thesis Submitted for the Degree of DVM
(In the field of Veterinary)

Title:

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

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Summer 2020

Abstract

Tick are globally distributed with a great medical and veterinary importance due to their damage to reptile, bird and mammalian hosts. In this study, 220 livestock including 150 sheep, 50 goats, 20 cattle were sampled in five counties of Sistan region (Zabol, Zahak, Hirmand, Nimruz and Hamun). Species were diagnosed based on valid morphological keys under a stereomicroscopic. In terms of diversity two genera and four species were detected including 242 *Rhipicephalus* (40.6%) and 354 *Hyalomma* (59.4%) and species were 238 *Rhipicephalus sanguineus* (40.1%), 3 *Rhipicephalus* nymphs (0.5%), 283 *Hyalomma anatolicum* (47.5%), 9 other *Hyalomma* (1.5%), 62 *Hyalomma* nymphs (10.4%) and one *Rhipicephalus (Boophilus) annulatus* (0.16%). After preparing of commercial kits and materials needed for the tests molecular studies have shown that the genomes of *Crimean Congo hemorrhagic fever virus* and *Coxiella burnetii* are not present in tested ticks. However, a significant percentage (20%) of the infection with *Anaplasma* species was confirmed. All infected ticks belonged to two hosts (sheep and goats) and were caught from Zabol and Zahak counties. Also, the age of infected hosts was mainly in the range of 1-3 years. *Hyalomma anatolicum* is the dominant species of Sistan region. It has been proven that Sistan is one of the endemic areas for Crimean Congo fever, but the results indicate no presence of viral genomes in tick carriers in this province. It seems that more studies are needed in this area for a more accurate point of view. The high prevalence of anaplasmosis also emphasizes the importance of preventive health policies and the elimination of tick carriers. Since the genome of the bacterium that causes Q fever has not been confirmed in ticks, the study area can be considered clean in terms of *Coxiella burnetii*.

Key words: Hard ticks, Crimean Congo hemorrhagic fever, *Coxiella burnetii*, *Anaplasma*, Sistan