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## Survey on cattle ticks in Nur, north of Iran

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### PEER REVIEW

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#### Comments

This is a good study in which the authors surveyed ticks of cattle in Nur County.

The results are valuable as there is not published data regarding ticks of livestock animals in this area. In addition, the probable dangers of the causative agent of disease which are transmitted by the isolated ticks were highlighted properly.

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### ABSTRACT

**Objective:** To survey the prevalence of cattle ticks in Nur County and prepare a list of tick fauna in this district.

**Methods:** This investigation was carried out on 150 head of cattle ticks of rural areas of Nur city which is located in Mazandaran province during spring and summer seasons of 2011. The collected ticks were identified using light microscope and available systematic keys.

**Results:** A total number of 1563 ticks were isolated from examined cattle and their genus and numbers including: *Ixodes ricinus* 51% (111 male and 691 female) and *Boophilus annulatus* 49% (83 male and 678 female), respectively.

**Conclusions:** Results of the current investigation indicate the presence of two species of acarine ectoparasites which have potential health risk *Ixodes ricinus* and *Boophilus annulatus*. More studies are required to increase our data concerning ticks and other ectoparasites of ruminants in other areas of Mazandaran province and should be noted to their ability in transmission of infectious agents.

### KEYWORDS

Acarine ectoparasites, Tick, Livestock, Cattle, Public health risk, Iran

## 1. Introduction

Ticks (Arachnida: Acari: Parasitiformes) are hematophagous arthropods and obligatory ectoparasites which are considered significant in both veterinary and medical field by acting as vector of serious pathogens such as *Babesia*, *Thileria*, *Rickettsia*, *Anaplasma* spp. and *Borrelia*. When these obligatory ectoparasites attach to a host for the aim of blood sucking, they induce skin

irritation and anemia. Moreover, ticks are responsible for serious economic losses of animal owners particularly in livestock industries<sup>[1,2]</sup>. Ticks are classified into two major families, Ixodidae (hard ticks) and Argasidae (soft tick). The family Ixodidae comprises nearly 700 species including two major morphological and phylogenetic groups which are the Metastrata and the Prostrata. They have ability of infesting a wide variety of hosts such as mammals, birds, reptiles and amphibians. In addition, hard ticks are distributed broadly

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throughout the world[3,4].

The prevalence of the tick species which are involved on the transmission and their geographical distribution for the purpose of control and tick borne diseases are a matter of high importance. Although Nur County has considerable superficial water resources which prepare an ideal area for agriculture and animal husbandry, there is not enough information concerning tick fauna of different hosts in this district. Therefore, the current investigation was conducted to survey the prevalence of cattle ticks in Nur County and prepare a list of tick fauna in this district.

## 2. Materials and methods

### 2.1. Study area

Nur County ( $36^{\circ}34'25''\text{N}$ ,  $52^{\circ}40' 52^{\circ}00'50''\text{E}$ ) ( $2675.00 \text{ km}^2$ ) is located on the Caspian Sea coast and belongs to Mazandaran province. This area embraces abundant superficial water resources which is proper for agriculture and animal husbandry. This district contains pastures and forests which are favorable for cattle grazing (Figure 1).



**Figure 1.** Map of Iran, highlighting the position of Nur County in Mazandaran province.

### 2.2. Tick collection

An investigation was carried out on ticks of 150 heads of cattle from 25 herds of 11 villages during the hot and humid months (the spring and summer) of 2011 from rural areas of Nur County, Mazandaran province, Iran. Tick sampling was undertaken on all body of each animal at different intervals.

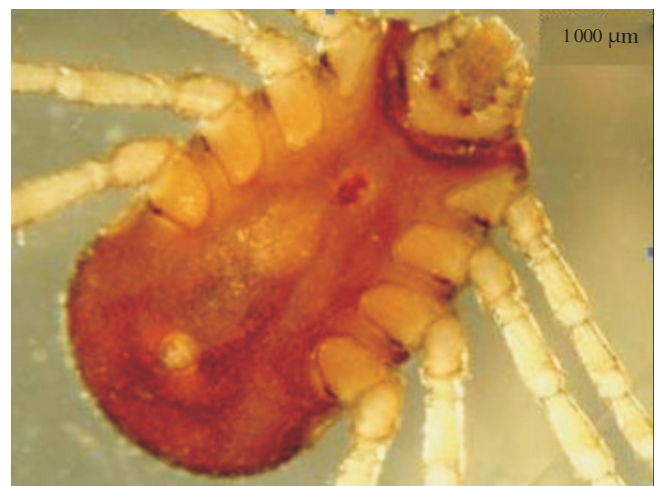
Thereafter, isolated ticks were counted and separately stored in 70% ethanol, labeled with the date until the species determination. Afterwards, all of crucial characters of tick samples were studied precisely. Their identification was undertaken based on taxonomic and structural differences of the species by means of stereoscope (Nikon SMZ1500) and light microscope (Nikon. Microphoy-FXA) which was equipped by camera (Memmert D-91126) according to available systematic keys[5–7].

## 3. Results

During the study, among 11 villages, a total number of 1563 ticks were isolated from 150 examined cattle from 25 herds. The mean intensity for each animal was 10.42. Two tick genera and species were observed and recognized during the study including: *Ixodes ricinus* (*I. ricinus*) 802 (51%) (111 male, 691 female) and *Boophilus annulatus* (*B. annulatus*) 761 (49%) (51 male and 710 female) (Figures 2 and 3). Totally 1401 female and 162 male ticks were extracted from examined cattle. Moreover, no soft tick (Argasidae family) was observed.



**Figure 2.** Extracted tick (*I. ricinus*) from cattle.



**Figure 3.** Extracted tick (*B. annulatus*) from cattle.

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