Detection of haemoparasites in cattle by reverse line blot hybridisation in Aydın-Turkey

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Introduction

The livestock industry plays a vital role in the agricultural economy of Turkey and provides 35% of the value of agricultural production. At present there are approximately 11 million cattle in Turkey (1). Despite the high number of animals the production level per animal is not satisfactory. The current trend is towards the increasing the number of European breeds (mainly Holstein-Friesian and Brown Swiss dairy cattle) into areas with high agricultural potential to replace the local breeds in order to increase the milk and meet productivity. However, tick-borne diseases are severely hampering the livestock production in Turkey.

The tick-borne diseases, mainly theileriosis and babesiosis are the most important factors in effecting the livestock production in Turkey. Several species of ixodid ticks, ixodes, Haemophysalis, Dermacentor, Boophilus, Hyalomma, Rhipicephalus have been reported from Turkey, which are distributed throughout the country (2,3,4). Tropical theileriosis caused by *T. annulata* occurs all over the country and threatens particularly to European and cross-bred cattle (5). In Turkey, the common Hyalomma ticks are three-host tick *H. anatolicum anatolicum* and two-host tick Hyalomma detritum. *H. marginatum* also transmit theileriosis in Turkey (6). Microscopic examination of blood smears and serological findings (IFA test) have shown bovine babesiosis also widespread in Turkey (7,8). Babesia bovis, *B. bigemina*, *B. major* and *B. divergens* have been reported from different regions of Turkey. It is believed that *Boophilus annulatus* and *Ixodes ricinus* are responsible to transmission of the disease in Turkey (2). The control of theileriosis and babesiosis has been carried out mainly by vector control, treatment and the use of attenuated macrogloboin infected cell culture vaccine for theileriosis (9).

In recent years a reverse line blot (RLB) assay has been described (10,11) that is actively where two or more parasite present in an area.

Materials and Methods

- Total of 302 blood samples which were sent, during two summer season (2003 and 2004) by the vets from different parts of Aydın (Figure 1) tested in RLB.
- The DNA from either infected or uninfected blood samples was extracted as described previously (10). The PCR for the amplification of 18S rRNA gene of Theileria and Babesia was conducted as described previously (11). The forward primer, RLB-F (5´- GACACAGGGAGGTAGTGACAG) and the reverse primer RLB-R (biotin-5´- CTAAGAATTCCCTCTGACAT) amplified within regions conserved for both *Theileria* and *Babesia* genus. Specific oligonucleotides, which contained an N-terminal C-6-Amine linker, for:
  - *Theileria* and *Babesia* genera (5´- TAATGGTTATAGGARCRGTTG)
  - *T. annulata* (5´CCTCCGGGCTCTGTCAG)
  - *T. buffeli* (5´- GAGCTTATTGCGGTATTATT)
  - *B. bovis* (5´- CAGGGTCTGCTGTTAATTGAG)
  - *B. bigemina* (5´- CGTTCCTTCTCTTTGG)
  - *B. divergens* (5´- GTTAAATGCTAATGTCCAG)
were covalently linked to the Biodyne C support membrane and hybridisation was carried out as described previously (11).

Conclusions

The blood protozoans were tested was predominantly *T. annulata*. It was followed by *B. bovis* and *T. buffeli*. Although the presence of *B. bigemina* was reported previously to be exist in Aydın province we did not detect any *B. bigemina* and *B. divergens* during the two summer season. There was no mix infection was detected amongs these samples.

References

9. Onar, E. (1989). Investigation of ticks in Siirt province we did not detect any *B. bovis* and *B. divergens* during the two summer season. There was no mix infection was detected amongs these samples.