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Comparative Diagnosis Utilizing Molecular and Serological Techniques of *Theileria equi* Infection in Distinct Equine Populations in Egypt

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Abstract : The prevalence of *Theileria equi* infection was studied in 301 equine samples (133 donkeys and 168 horses) from Giza and Cairo governorate using microscopic examination (ME), nested (nPCR), competitive ELISA (cELISA) and indirect ELISA (iELISA). The used antigen in iELISA was prepared from blood of naturally infected splenectomized donkey at the peak of parasitemia In ME, the parasite was detected in 79 (26.2%) equine blood samples; 33 donkeys and 46 horses with a prevalence rate (24.8% and 27.4%), respectively. The prevalence rate in equine samples using iELISA was (33.5%) from which 71 donkeys and 30 horses were infected (53.4% and 17.9%), respectively. The *T. equi* antibodies were detected with cELISA in 60 (19.9%) equine serum samples, where 34 donkeys and 26 horses with a prevalence rate (25.6% and 15.5%), respectively. The nPCR based on the *T. equi* merozoite antigen gene (EMA-1) allowed the visualization of species-specific amplified product in 171 (56.8%) equine blood samples, 67 donkeys and 104 horses with a prevalence rate (50.4% and 61.9%), respectively. Approximately 229 bp of the ema-1 gene from 3 Eqyption samples were sequenced and BLASTN analysis confirmed all sequences to be merozoite surface protein genes, with an identity of 100% to previously published *Babesia equi* merozoite antigen- 1 ema-1 gene reference sequence (our GenBank Accession number KX262963). Statistical analysis using Chi square indicated significant differences ($P< 0.05$) between ME and nPCR; microscopic examination and cELISA and between nPCR and cELISA on the detection of parasite carriers. In conclusion, the most sensitive technique in diagnosis of *T. equi* infection is nPCR, followed by cELIZA, iELISA and ME. The combination of ELISA and PCR was recommended for detection of acute and chronic stage.

Keywords: Equine, *Theilria equi*, Antigen, iELISA, cELISA, Immunoblot, SDS-PAGE, nPCR.

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